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COMPUTERWORLD

IS group forms to compare processes

By Thomas Hoffman

Seeking to retain their competitive edge, a group of 30 global corporations have quietly banded together to benchmark key information systems functions against one another.

Called the Benchmark Consortium, the group hopes to achieve higher quality and improved productivity of systems and processes by sharing and comparing their successes and failures.

Fedex's Dennis Jones *uses benchmarking to gauge progress*

The companies involved in the project — including American Express Co., Federal Express Corp., Union Pacific Railroad, United Services Automobile Association and Northern Telecom, Inc. — have enlisted IBM's Consulting Group to handle the benchmarking.

Initially, the consortium will examine the best ways to approach information technology transformation, as companies try to more effectively align their legacy systems with new technologies such as client/server computing, according to Patti Prairie, a consulting director at IBM Consulting.

The benchmarking will include analysis of participants' existing data, combined with interviews and surveys of company executives, managers and end users who are involved with legacy systems. IBM Consulting will then devise a set of metrics to determine which companies have the best practices in place, based on whether the systems are meeting corporate strategies and cost and quality objectives.

But the benchmarking analyses will be more than quantitative, Prairie said. "When these companies benchmarked before, they tended to look at things from a cost perspective," she said.

The Benchmark Consortium, she added, will include the comparison of participants' management processes. Prairie said the consortium will hold a legacy systems benchmark symposium in the fourth quarter to release and

IS group, *page 16*

Novell eyes apps

Blueprint expected to cut development time up to 90%

By Elisabeth Horwitt
NEW YORK

■ Users briefed by Novell, Inc. about its embryonic development platform said they are excited by the possibility that it could slash network application development time by as much as 90% — key for companies hoping to reap competitive advantages from technology.

Novell's AppWare is a fledgling middleware platform that will allow developers to write applications across heterogeneous server and client systems without having to worry about the underlying complexities and incompatibilities, according to Novell (see story page 8).

Tempering users' enthusiasm, however, were concerns that AppWare will be just one more "marketecture" that will take years to begin meeting Novell's highfalutin promises.

And despite Novell's vow that AppWare will reach out to a variety of services across multiple client and operating system platforms, it is less clear how open the blueprint will be to competing servers, such as LAN Manager and Banyan Systems, Inc.'s Vines.

Sara Lee's Paul Bandrowski *cites competitive advantages*

In response, Novell spokespeople were quick to point out that the vendor and its partners have spent 120 engineering worker-years on the architecture since 1985. However, they contributed to users' wariness by refusing to provide any time frame for extending the platform beyond Novell and Unix System Laboratories, Inc. environments to other popular network service systems.

Likely but not definite initial candidates are Microsoft Corp.'s NT Directory Service and Apple Computer, Inc.'s Open Collaborative Environment, said Willie Teja-

Novell, *page 8*

NetWare, UnixWare to blend

Novell plans to integrate NetWare with subsidiary USL's UnixWare and is expected to announce partners and overall technologies for doing so in September, industry sources said last week. A developer's kit could ship next year, although specifics on the exact timing have not been finalized. USL/Novell engineer Bill Sherman refused to comment specifically but said Novell intends to pull the two environments together. Integrating the two systems could trigger a battle with Microsoft for share in the Unix desktop market (see story page 15).

—Melinda-Carol Ballou

IBM, Apple press for object-oriented payoff

Objects pull OS/2, Taligent onto AS/400

By Craig Stedman
ROCHESTER, MINN.

IBM plans to add its promised WorkPlace OS operating system microkernel into PowerPC-based versions of the Application System/400, due in 1995. This would enable them to run programs written for Taligent's object-oriented environment and other platforms.

With the AS/400 facing stalled revenue growth and increasing competition from Unix systems and potentially IBM PCs (see story page 14), the Mach-derived WorkPlace OS technology is the cornerstone of IBM's strategy for both opening up the AS/400 and adding

OS/2, *page 10*

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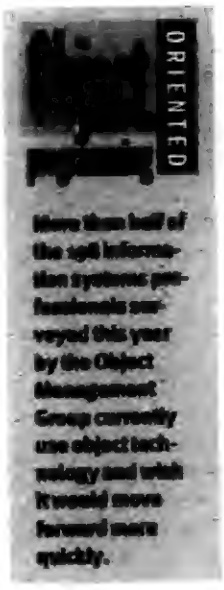

More than half of the 198 information systems professionals surveyed this year by the Object Management Group currently use object technology and wish it would move forward more quickly.

Taligent pushed to make early contribution

By James Daly

■ In the wake of executive shufflings and anticipated budgetary cuts, managers at Apple Computer, Inc. and its equally restless partner, IBM, are reportedly pressing their Taligent joint venture to deliver more quickly on its object-oriented charter.

While competitors Microsoft Corp. and Novell, Inc. each race forward with their own next-generation operating system plans, Taligent has been fairly quiet. Industry observers said there is a sense that Taligent needs to start contributing to ongoing projects such as Apple's System 7.0, especially with the research and development cutbacks expected from newly appointed Apple Chief Executive Officer Michael Spindler.

"Taligent's parents don't have infinite pocketbooks anymore," said Frank Dzubeck, president of Communications Network Architects, Inc., a consulting firm in Washington, D.C. "When you get closer to the delivery points, you've got to produce."

A source close to Taligent said the company may be entering a "make or break" period, after allegedly missing some internal deadlines. Under

Taligent, *page 13*

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■**70,000 people are expected to leave IBM** by year's end, roughly three times the number originally projected to take advantage of retirement and other options. *Page 4*

■**Legent** plans to integrate a tool for software distribution into its product for application software management and file transfer. *Page 6*

■**Users will have a chance to make changes to the COSE** specification for a common Unix desktop delivered in draft last week to **X/Open**. *Page 6*

■**Novell** unveils its **AppWare** architecture, designed to ease the process of developing and distributing applications across heterogeneous networking environments. *Page 8*

■**Users of SunOS 4.X** win assistance with the difficult migration to **Solaris 2.X. Sunsoft** bows to pressure and provides migration software and services. *Page 10*

■**IBM** says details on its plans to improve the file and database server capabilities of its **AS/400** will be available in September. *Page 10*

■**Apple** gives attendees of **Mactivity '93** a sneak peek at its **Apple Open Collaborative Environment** extension to System 7.0, a set of APIs that promise to tie together applications running under that operating system and provide groupware-like capabilities. *Page 12*

■**Five leading PC software vendors** collaborate on building a cross-platform architecture for the next generation of object-oriented operating systems. *Page 12*

ADVANCED TECHNOLOGY

■**Fractal geometry may hold the key to data compression.** Applications have recently been developed using fractal equations as a kind of shorthand to identify the contents of complex images. *Page 28*

KATHERINE LAMBERT

Stu Mentzel of the U.S. Customs Service spearheaded development of the agency's newest foil for smugglers: a sophisticated imaging system. *Page 65*

DESKTOP COMPUTING

■**Providing seamless access** to corporate data for remote users is becoming a top priority for IS. *Page 37*

WORKGROUP COMPUTING

■**Client/server** products are cropping up for finance, human resources and manufacturing, but many still need work. *Page 45*

ENTERPRISE NETWORKING

■**Novell** is set to introduce two affordable LAN internetworking products. *Page 51*

■**NASA** uses software to guide neophytes through the **Internet**. *Page 51*

LARGE SYSTEMS

■**DEC** customers aren't about to bet the farm on **Alpha**. Surveys show they'd rather let someone else make the first move from VAX. *Page 55*

APPLICATION DEVELOPMENT

■**Developers are venturing into object-oriented** territory and finding it isn't as wild as they feared. *Page 61*

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■**Imaging is the U.S. Customs Service's** secret weapon in the fight against drug smuggling. *Page 65*

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MARKETPLACE

■"If you don't see it, ask" is a good rule of thumb in terms of LAN service options. Many providers will customize their offerings. *Page 81*

COMPUTER INDUSTRY

■**IQ Software** isn't exactly a household name; its report writer is frequently private labeled. Still, revenue for its first fiscal quarter of 1993 earned IQ a place on *BusinessWeek*'s list of the 100 hottest growth companies. *Page 89*

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Executive Briefing

Desktop competition heats up with definite word that Novell plans to integrate its NetWare network operating system with its USL subsidiary's UnixWare. This puts Novell on a collision course with Microsoft. Last week, Bill Gates told a PC Expo audience that Windows NT is the best Unix on the market. *Page 1.* **In the meantime, reports are surfacing that Apple and IBM are leaning on their joint venture, Taligent, to begin delivery on its object-oriented promises.** *Page 1*

Users weigh in with some concerns about the NetWare/UnixWare juggernaut, even before the planned integration of those two operating systems. Some who attended a Novell briefing about its new and supposedly open middleware platform, AppWare, are expressing concern about just how open the scheme will be to other network service systems. *Pages 1 and 8.* **Users will also get a chance to air their feelings and reportedly influence the final version of a draft COSE specification for a common Unix desktop. User feedback will be solicited at an open meeting of X/Open's Desktop User Requirements Group next week.** *Page 6*

Mobile computing is becoming more connected. A new protocol for wireless LANs from Xircom, Inc. could give mobile PC users the option of forming ad hoc, peer-to-peer networks with other mobile types, as well as the ability to connect with their in-office LANs. *Page 14.* **Is there a point when connection begins to feel like a too-tight leash? Networking senior editor Joanie M. Wexler says it may be time for the wireless industry to start thinking about usage guidelines to go with the technology.** *Page 51.*

Object technology is picking up steam. Even if Taligent hasn't released its long-awaited product, bits and pieces are emerging from Apple and IBM. Apple's OpenDoc platform uses "chunks" of Taligent technology. *Page 12.* **IBM is also reported to be using Taligent technology in a PowerPC-based AS/400 platform. Its promised WorkPlace OS microkernel will be incorporated into PowerPC-based versions of the AS/400, due in 1995, enabling users to run programs written for Taligent's object-oriented environment and others.** *Page 1.* **Developers are starting to move with more confidence in object-oriented environments.** *Page 61*

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Network management

GE will take OpenView of global net

By Joanie M. Wexler
FAIRFIELD, CONN.

In a sweeping attempt to gain a common, global view of what are mere islands of managed networks today, General Electric Co. last week said it has standardized corporatewide on Hewlett-Packard Co.'s OpenView platform.

The decision was based on a team review by key internetworking managers from each of GE's 12 business units, said William Taliaferro, program manager at GE's corporate technology management group.

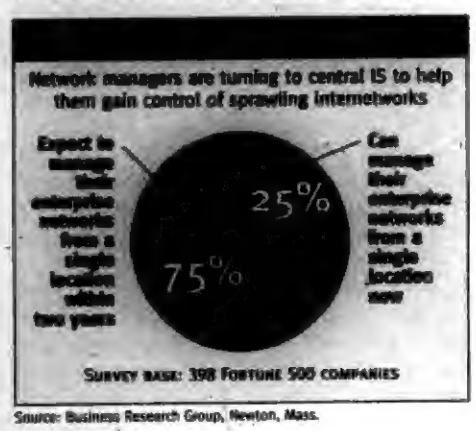
The move represents one of corporate America's early commitments to expand beyond pockets of departmental or business unit management systems into a cooperative effort spanning a global enterprise — in GE's case, nearly 26,000 networked nodes.

OpenView is HP's Unix-based platform for integrating task-specific network management applications from various vendors. GE has already begun implementing the system in about a half-dozen sites. Taliaferro said he expects OpenView to span most of the global firm's Cisco Systems, Inc. router-based internetwork within two years.

The CiscoWorks management application for OpenView, which manages Cisco routers, is thus likely to be one application that GE will run atop OpenView.

Taliaferro said GE based the OpenView decision largely on its status as the Open Software Foundation's Distributed Management Environment standard.

The OpenView rollout is one result of a GE decision to pool control of the local-area networks springing up willy-nilly throughout far-flung sites [CW, Jan. 13, 1992]. OpenView will help deliver better network services and uptime by seeing the whole network picture.



Source: Business Research Group, Newton, Mass.

"If tools are coordinated and people share information, this enables you to resolve problems quicker," Taliaferro said. Better network planning and trouble-shooting can result from cohesive management because problems often span beyond a single network, he said.

The HP OpenView move will enhance the company's ability to communicate on "an even keel" in differing regions of the world running multiple platforms, said Curt L. Kemmerer, manager of information systems at GE Wiring Devices, a business unit in Warwick, R.I.

Currently, GE runs some enterprise systems, such as Sun Microsystems, Inc.'s SunNet Manager, but they do not cross business boundaries, Taliaferro said.

This scenario is common today in the Fortune 500, said Cheryl Ball, a senior industry analyst at Business Research Group, a consulting firm in Newton, Mass. She said this is because LANs have grown up piecemeal and their accompanying management systems have emerged accordingly.

Now that networks are becoming the foundation for corporate computing environments, LAN managers are returning to central IS departments for consolidated management (see chart). However, the integration of the myriad management tools that IS needs to do the job is in its infancy, Taliaferro said.

Taliaferro said IBM's NetView for Systems Network Architecture networks and OpenView will soon "share alerts and management processes." However, he declined to comment on specific IBM integration plans or HP's intention to support telecom applications.

Kick off

GE's internetwork backbone consists of multiple platforms and myriad communications protocols. The company plans to kick off its integrated network management effort of these environments by globally deploying HP OpenView Network Node Manager, an application that allows system administrators to discover, monitor and control networks from a single workstation.

Notably absent in OpenView and other integrated management systems today, however, is the capability to pull in a coordinated view of telecommunications equipment. "There is no enterprise system fully functional today," said William Taliaferro, a program manager at GE.

Off and running

HP's aggressive OpenView partnership program has led Ball to believe that HP will hook into the telecommunications side of the house, though. For example, HP recently teamed with Unix-based network management vendors IBM, Sun and SynOptics Communications, Inc. to spur applications that run across the three companies' platforms [CW, June 14]. One goal is to integrate telecommunications applications as well.

Meanwhile, a corporate telecommunications group at GE is embarking on a network utility project to consolidate business unit network connections so GE can reap economy-of-scale dividends.

The group, which will purchase, install and manage internetworking equipment, will run OpenView for tracking traffic patterns so it can install appropriate-speed wide-area links.

Analysts predict more IBM layoffs in offing

Total loss of jobs could reach 70,000 by year's end; Gerstner mulls next move

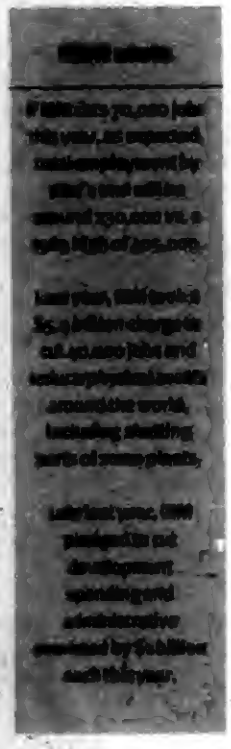
By Johanna Ambrosio

By the end of the year, IBM could well be 70,000 employees smaller, some analysts said last week.

IBM said earlier this year that it would eliminate 25,000 positions in 1993 through retirement programs and layoffs, but that number is now expected to be much higher.

Last week, IBM spokesmen declined to comment on analysts' figures. But one IBM staff member said, "We've known for several months that the original 25,000 would be higher, but we don't know by how much more."

Although some of those people were laid off, primarily from plants in the Hudson Valley in New York, most of the employees who are leaving are doing so voluntarily through programs that expired June 30. As of last week, IBM spokesmen said, the final tally was not available.



Further, the IBM source added, new IBM Chairman Louis V. Gerstner may well decide to cut even deeper as he and his new team analyze the different parts of IBM and come to decisions about priorities. No decisions have yet been made, he said.

Others, however, said the original estimate of 25,000 is way too low. "My prediction is that by the end of 1993, there will be a minimum of 70,000 less people in IBM," said Sam Albert, a consultant in Scarsdale, N.Y.

Robert Puffer, an analyst at Gartner Group, Inc. in Stamford, Conn., said, "We've heard numbers as high as 72,000." For customers, this means that it will probably be 1995 before the sales, support and marketing forces are stabilized, he added.

In the meantime, Gerstner has begun seeking the counsel of industry analysts and consultants. Typically the meetings last about half an hour, with Gerstner asking questions about IBM's perceived strengths and weaknesses and taking notes on the responses. At least a half-dozen such meetings have taken place.

"He is very much still in learning mode, as can be expected," said one meeting participant who, like the others, was asked not to talk about it. "He's only been in the job about two months, so it would be premature to expect any decisions."

Some observers say they expect Gerstner to slowly unveil pieces of his new strategy over the next six months or so.

"His actions so far give us some clues about what he might be thinking," said Bob Djurdjevic, president of Annex Research in Phoenix, referring to Gerstner's naming a chief financial officer with experience in cutting corporate fat. "Restructuring assets is one of them."

Corrections

- Because of an editing error, a story in the June 28 issue incorrectly cited Stratus Computer, Inc.'s commitment to offer 99.999% availability on its fault-tolerant systems in the next few years.

- Because of an editing error, a column in the June 14 issue incorrectly identified Software Emancipation Technology, Inc. in Waltham, Mass.

- A chart on mobile workers on page 98 of the June 28 issue should have been attributed to The Yankee Group in Boston.

- Jim Odell, chief methodologist at Intellicorp., was misidentified in a column in the June 28 issue.

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News Shorts

ICC/Comdisco suit takes a turn

The initial round of the 2-year-old lawsuit filed by IBM Credit Corp. (ICC) against Comdisco, Inc. ended in a split decision last week. The Superior Court of Delaware ruled in IBM's favor on two counts, granting a summary judgment to IBM and other IBM-aligned parties and said that the rest of the case will go to a jury trial. The lawsuit claims Comdisco's reconfiguration and remarketing of IBM computers violates ICC's master lease agreement, charges which Comdisco refutes. Both sides claimed victory.

Judge affirms spreadsheet ruling

The copyright saga of Lotus Development Corp. vs. Borland International, Inc. continued last week as the Federal District Court in Boston reaffirmed an opinion issued earlier this year that the command structure of the 1-2-3 menus can be copyrighted. A Lotus spokesman said the court has set up an August conference to hear any further issues. Next up: Lotus must declare what it wants in damages. Borland, meanwhile, continues to maintain that the copyright issue will ultimately be decided in an appeals court because "there's been a number of court decisions that seem to contradict what has happened in this court."

Oracle readies development templates

Oracle Corp. plans to augment its computer-aided software engineering (CASE) line this month with templates targeting vertical industries that give utilities, financial firms and other kinds of companies a head start on building applications. Oracle Industries products will be packaged with consulting services from Oracle and third-party providers. Separately, Oracle announced pricing for its 14-tool CASE suite: $100 to $18,000 per user per tool, depending on platform and type of license.

Novell to buy full-motion video maker

As expected, Novell, Inc. has reached an agreement to aquire Fluent, Inc., a Natick, Mass.-based vendor of software for integrating full-motion video into desktop applications [CW, June 14]. Details of the deal, which has a reported purchase price of $17.5 million, are expected to be announced this week, according to Ames Abbot, Fluent's director of channel marketing.

ATM scammers arrested

Federal authorities arrested two men who were suspected of setting up a bogus automated teller machine in a Connecticut shopping mall and allegedly bilking victims for more than $100,000. Federal officials arrested Alan Scott Pace, a 30-year-old computer specialist, and Gerald Harvey Greenfield, 50, both from Tucson, Ariz. They face fines of more than $250,000 and prison terms ranging from 10 to 30 years on each of four counts.

SHORT TAKES President Clinton last week nominated Washington, D.C., antitrust lawyer and former Yale University Law School classmate Reed E. Hundt to head the Federal Communications Commission. ... Commerce Secretary Ron Brown is expected to go to the well of high-tech executives and tap David Barram, Apple Computer, Inc.'s vice president of worldwide corporate affairs, to be the department's deputy secretary. ... Sun Microsystems, Inc. is expected to break out a service and support independent business unit tomorrow that will handle its own and non-Sun gear. Larry Hambley, Sun Microsystems Computer Corp. marketing vice president, will oversee the unit.

News shorts, *page 16*

Legent extends management

By Gary H. Anthes

VIENNA, VA.

Legent Corp. last week formally unveiled a software distribution product that it plans to integrate into its products for application software management and file transfer. The company also said it will expand the scope of distribution management to include software asset management and backup and recovery.

Components of the software distribution tool, called DistribuLink, reside on mainframes, workstations and local-area network servers. Working together, the components prepare packages of software and data for distribution, store the packages on a central warehouse, send them electronically to remote sites, install them automatically at specified times and verify the installations.

DistribuLink can perform multitiered distribution — from central host to departmental server to desktop — or can be linked with Novell, Inc.'s Network Navigator, which will move the software over the LAN to desktops.

The DistribuLink server runs on an MVS host, accessible by an OS/2 administrator's workstation via a graphical user interface. Support for Windows access will be available later this year.

Distribution can be made to target machines running DOS, OS/2, Windows, MVS, VAX/VMS and Unix systems from IBM, Hewlett-Packard Co. and Sun Microsystems, Inc. IBM's Systems Network Architecture, LU6.2 and Transmission Control Protocol/Internet Protocol are supported.

Steve Mallion, manager of technical and development support at Royal Bank of Canada in Toronto, said the bank evaluated all the major distribution products before settling on DistribuLink. He said a key requirement was the ability to send different files of financial data to each of some 2,000 bank locations every day, a job he said is much more difficult than broadcasting software updates, which tend to be the same to every site.

DistribuLink components

Legent's DistribuLink server has four major components:

- **Warehouse Manager** — allows software files to be identified, grouped and stored as "product" groups.
- **Profiler** — defines target machines as "persons," "machines" or "groups" of persons or machines.
- **Scheduler** — allows unattended distribution to any target at any date and time.
- **InSure** — centrally logs results of distribution and includes automatic error-recovery and checkpoint/restart.

"DistribuLink best suited our needs," Mallion said. "But I'll be quite honest — it fell way short of what our full needs are. We want to be able to manage the whole software change process, which ends with performing distribution into a production network."

To meet those needs, the bank is working with Legent to build automated links between DistribuLink and Legent's Endevor family of application software management products. Mallion said the bank has 40 software "change teams," which bring all software updates together in a common source-management system using Endevor. He said Legent is developing the "glue code" that will automatically take those changes and move them out to target machines in an easy, error-proof way.

"Legent has done an especially good job with heterogeneous client support," said Patrick McBride, program director at Meta Group, Inc. in Westport, Conn.

But McBride said Legent will also have to carry through with its plans to link distribution to asset management. With shrink-wrapped software particularly, software distribution needs to be able to access a software inventory containing data such as license terms, he said.

The bridge between DistribuLink and asset management software is expected to be developed within six months, Legent said.

Users to give feedback on open desktop specification

By Jean S. Bozman

Users may have the final say on the very first Common Open Software Environment (COSE) specification for a common Unix desktop, which was delivered to the X/Open Co. last week.

COSE group members IBM, Hewlett-Packard Co., SunSoft, Inc. and Unix System Laboratories, Inc. (USL), all members of COSE's working group to develop a Common Desktop Environment (CDE), last week electronically delivered a draft of the common desktop specifications to X/Open. That draft will be available to the public in printed form this week.

But some observers said they believe COSE members may have spoken too soon about meeting their June 30 deadline, as the printed specifications will not be out until Wednesday.

"They didn't quite meet the deadline," said Dave Smith, director of advanced operating environments research at International Data Corp. in Framingham, Mass. "It's a nit, since I haven't really seen it. But the [COSE] white paper is not a spec — that doesn't qualify. When I see the spec, I can comment more on what it really says," Smith said.

However, he added that it is realistic to expect that the integration of COSE vendors' software to create a common Unix desktop could be done in 1994.

User feedback

X/Open said the next step will be to ask for user feedback on the draft specification at an open meeting of X/Open's Desktop User Requirements Group on July 12 in San Francisco.

A CDE developer's conference is now scheduled for San Jose, Calif., starting Oct. 26.

"The user group is going to look at this functional specification and compare it against user surveys for the last four years," said Mike Lambert, chief technology officer at X/Open. "We will flag any major discrepancies." However, if users at the meeting ask for any changes, he said, "I would expect the [COSE] development team to listen very carefully."

Key elements of the COSE draft specifications include HP's Visual User Environment desktop, IBM's Common User Access shell, the Open Software Foundation's Motif graphical user interface, SunSoft's ToolTalk, which is a part of an object-oriented development kit, and Novell, Inc. subsidiary USL's Unix System V Release 4.2 desktop manager components.

COSE members still have a lot of work to do before the common Unix desktop comes to market.

Bill Filip, president of IBM's Advanced Workstations and Systems unit, said about 80% of the code exists. "There's a lot of integration to do to make this a very smooth, transparent environment," he said.

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Novell greases app development process

By Elisabeth Horwitt
NEW YORK

Novell, Inc. last week unwrapped its blueprint for alleviating the pain of developing applications for heterogeneous networking environments, cutting costs and speeding up software delivery in the process.

The AppWare architecture contains application programming interfaces and software building blocks said to shield developers from the complexities of the underlying system, which in the case of corporate networks is a proliferating mess of network transport protocols, client operating systems and graphical user interfaces (GUI). Novell is cobbling it together out of technologies from acquired or partially acquired companies: Software Transformation, Inc., Serius Corp. and Hyperdesk Corp.

AppWare will also relieve developers of the need to write multiple ports of the same application, according to Matthew Miller, director of product marketing at Gupta Corp. Miller, who has seen early versions of AppWare, said using the architecture will enable him to cut back on project staff.

The platform accomplishes all this through the AppWare Foundation, a common higher level API that will incorporate lower level APIs that can link to a wide range of network, GUI and client systems, Novell said. Also key are Application Loadable Modules (ALM), which are reusable modules of code that can call up specific network services such as electronic mail or printing across a variety of local client and networked server environments (see chart at right).

Novell's Willie Tejada *would not give time frame for adding support for other network systems*

Private workspaces

AppWare's APIs will even incorporate rival networked application development environments, such as Apple's OpenDoc and Microsoft's Object Linking and Embedding, a Novell spokesman said. No time frame was given.

Novell will offer development tools for building ALMs using third- and fourth-generation languages. A Visual AppBuilder will enable users to build applications by calling up different ALMs as icons and then merging the ALMs' functions by drawing lines between them.

Right direction

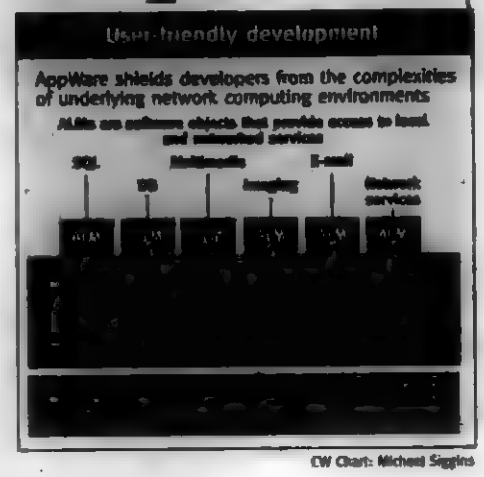
Initial user response to AppWare was highly favorable.

Novell's concept of "middleware that frees you from being [network operating system and client] platform-specific is exactly where we'd like to see the industry going," said Paul Dunton, director of technical planning and assessment at Pacific Gas & Electric Co. "Someone should have done this five years ago."

The San Francisco-based utility is part of the Network Applications Consortium, a user group that has been trying to promote networked applications within the Banyan Systems, Inc. Vines environment.

Novell plans to ship an AppWare Software Development Kit in October, and the initial customer release is set for May. The initial releases will support the network service environments of Novell and its subsidiary, Unix System Laboratories, Inc., as well as Windows, DOS and Macintosh clients, according to Willie Tejada, Novell's director of developer relations.

Applications written to AppWare will also be able to access services that comply with the Object Management Group's Common Object Request Broker Architecture, Novell spokesmen said. The links are being developed by recent Novell acquisition Hyperdesk.



CW Chart: Michael Siggins

Tejada refused to provide even a vague time frame for adding support for other network operating systems or even to commit to which ones would be supported first. He added that while Novell is definitely looking at providing AppWare support for popular platforms, such as Apple Computer, Inc.'s Open Collaborative Environment, Vines and Microsoft Corp.'s Windows NT, the order and timing will depend on market demand.

While no pricing was available, a Novell spokesman said AppWare would be priced low for high market penetration.

Novell

CONTINUED FROM PAGE 1

da, director of developer relations at Novell. Direct support for distributed platforms such as Vines and the Open Software Foundation's Distributed Computing Environment depends on user demand, he said.

Still, some users were impressed. Louis Kahn, chief of network operations at the National Immunization Program in Atlanta, said, "Programming to NetWare can be quite difficult, and programming to mixed Novell and Unix, or Novell and LAN Manager, even more so." But he said he would have to see AppWare before he believed Novell's claims that its unified application programming interface (API) did not represent "a trade-off in speed for ease of use."

Sara Lee hopes AppWare APIs and ALMs will cut application development from 100,000 lines of code to only 1,000 to 2,000 lines

Paul Bandrowski, manager of advanced technology at Sara Lee Corp., said applications generated with these object-oriented tools did have "phenomenal performance in some cases." He said he thinks AppWare solves the high-level efficiency problems by "taking the 20% of code that does 80% of what development needs and making it extremely fast."

Bandrowski has seen demonstrations of Serius Corp. and Software Transformation, Inc. products that are the forebears of Novell's platform.

Sara Lee is already preparing to use AppWare to design a series of client/server applications, Bandrowski said. The company expects AppWare's APIs and Application Loadable Modules (ALM) to cut the amount of code needed to develop applications from 100,000 to only 1,000 or 2,000 lines and to cut the time and money spent by 80% or even 90%, he added. "Projects that cost $1 million or $2 million will cost $100,000 or $200,000."

But some analysts suggested Novell may be biting off more than it can deliver in a timely fashion.

The vendor has committed to providing what "all the object-oriented vendors have said will take another two years to solve," said Tom Kucharvy, an analyst at Summit Strategies, Inc. in Boston.

The success of AppWare as a standard depends on how quickly Novell can generate support from key independent software vendors and application development tool companies, according to David Cearly, an analyst at Meta Group, Inc. in Westport, Conn. And that means making it very easy to build the ALMs, the reusable application building blocks that are a core AppWare component, he added.

Third-party skepticism

While a number of third parties voiced general support for AppWare, only a few said they were committed to hooking their products to Novell's platform. Among these are Gupta Corp., Borland International, Inc., WordPerfect Corp., Easel Corp., Powersoft Corp. and Oracle Corp.

Some doubts about AppWare's viability cropped up even among the most public supporters. One of the third parties that has committed to supporting the architecture said privately that if the price of support is too high, it may back off.

Furthermore, Gupta and Powersoft spokespeople said that while they are likely to support the ALMs with their application development tools, they will wait and see how difficult it is to port to the AppWare Foundation's high-level programming interface.

Senior writer Melinda-Carol Ballou contributed to this story.

DEC takes plunge into low-end routing

By Joanie M. Wexler
MAYNARD, MASS.

Digital Equipment Corp. entered its bid last week for a share of the most fertile ground in the internetworking market: the ultra-low end.

By including support in a branch office product for all of today's key routing algorithms — software that allows routers to exchange network topology information — DEC is hoping to penetrate other router backbones. These include those from Cisco Systems, Inc., said Charlie Robbins, an analyst at Aberdeen Group, a Boston consultancy.

The DECbrouter 90, developed in cooperation with Cisco, supports Cisco's proprietary routing algorithm along with standard algorithms for Transmission Control Protocol/Internet Protocol and Open Systems Interconnect networks. This means users choosing the DEC bridge/router for a remote office could hook into a Cisco or other backbone.

Interoperability doubts

Users are generally shying away from building multivendor router networks today because of their lack of confidence in interoperability among products.

John Johnson, senior vice president at Anixter Distribution, a Skokie, Ill.-based DEC reseller, said the announcement could appeal to companies with Cisco backbones and some DEC equipment at remote sites. Small remote staffs would then have just one vendor to deal with, he said.

The DECbrouter 90 supports most communications protocols and optionally comes as a module for the low-end DEChub 90 smart wiring hub. It accommodates Ethernet local-area networks only.

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Sun simplifies Solaris migration

By Jean S. Bozman
NEW YORK

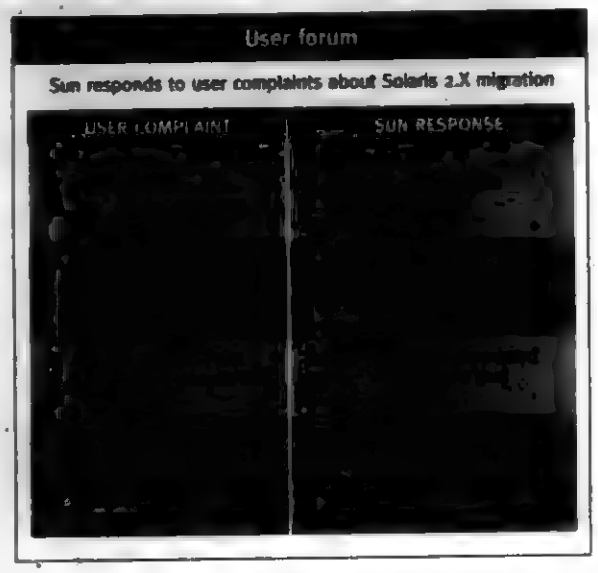
Responding to user complaints about moving applications to SunSoft, Inc.'s Solaris 2.X operating system, the Sun Microsystems, Inc. subsidiary last week provided software and services to ease migration from older SunOS systems.

Sun Chairman Scott McNealy acknowledged the painful transition from SunOS (Solaris 1.0) to Solaris 2.X at last May's SunWorld show in San Francisco. "Transitions are always hard; they're always painful," he said. "We have tried to provide the best migration path."

But ever since last spring's Solaris developer's conference in Santa Clara, Calif., users have been grousing that Sun was minimizing the difficulty of recompiling older SunOS applications. At the same time, Sun pushed Solaris 2.X sales higher by bundling it with new Sun machines, from the high-end SPARCcenter 2000 symmetrical multiprocessing machine to the low-end SPARCclassic.

"I was very critical of them because they did not provide a true migration path," said Michael Prince, director of information services at Burlington Coat Factory, Inc.'s data center in Aetna, N.H. The retail firm owns more than 300 Sun workstations and servers nationwide. "We have not migrated all our applications to Solaris 2.0 yet. It's not that it's difficult, but I don't want the technical issue of migration to interfere with my business priorities. I need the flexibility to get there at my own pace."

Sun responded by combining "transition" software with support for those migrating from SunOS to Solaris 2.X, including third-party software developers and information systems shops. Software that is binary-compatible with SunOS 4.X code and Solaris 1.0's file-naming system for network systems administrators will be supported under Solaris 2.X.



An on-line database of migration tips and techniques and more phone support round out the SunSoft migration program's offerings.

At the same time, Sun said it would start selling Solaris 1.1 software with microSPARC hardware, including the SPARCclassic and SPARCstation LX. Until the announcement, users buying new low-end Scalable Processor Architecture (SPARC) systems had been forced to move to Solaris 2.X.

"That's exactly why we purchased 100 [Sun] clones," said Jerry McEachern, manager of technology resources at *The Houston Chronicle*, which has a publishing system on 16 Sun file servers and 300 Sun workstations. "We weren't willing to take Sun's LX and their Classic if they only ran Solaris 2.X."

SunSoft expects Solaris 2.X to become the dominant operating system in the Sun installed base sometime in 1994. But so far, that growth has been fueled less by longtime users than by booming shipments of Solaris 2.X on new Sun machines. "We want to make all of this [migration] information available to people so we can get past the inertia," said Michael Zadig, SunSoft's director of sales and development engineering. Zadig said third-party software firms are shipping 660 Solaris 2.X-compatible applications now, and 1,400 more are expected to ship by year's end.

Industry analysts agreed that Sun's program was created to respond to users who want to maintain new and old applications alike. "To their credit, they are addressing it and not sweeping it under the carpet," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

Hard move
Sun Chairman Scott McNealy acknowledged the painful transition from SunOS (Solaris 1.0) to Solaris 2.X at this spring's SunWorld show in San Francisco. "Transitions are always hard; they're always painful," McNealy told an open-mike session at SunWorld in May. "Sun has a limited engineering budget, and we cannot continue to support old operating environments on all new platforms," he told hundreds of users. "We have tried to provide the best migration path."

IBM readies server versions of AS/400

By Craig Stedman
ROCHESTER, MINN.

IBM executives last week said the company expects to lay out plans in September for improving both the file and database server capabilities of its Application System/400s, but they left unclear the date of actual product shipments.

"I think we'll talk about a lot of this in September and then ship the products later," said Glenn Van Benschoten, who manages AS/400 development for IBM's Application Business Systems (ABS) unit.

IBM will make high-end AS/400 central processors available on lower end models of the system, off-load file processing functions from the CPU to I/O processors and offer a streamlined kernel version of OS/400.

Van Benschoten said the low-end platforms with the faster CPUs will be positioned as "specialty models optimized for client/server." IBM wants to get the pumped-up hardware out "soon" to provide cover while it works to improve the throughput of the AS/400's Transmission Control Protocol/Internet Protocol (TCP/IP) implementation.

"We'd like to throw some MIPS at it until we get the software paths in place," Van Benschoten said. IBM originally put TCP/IP "up too high at the application level" and is now reimplementing it below OS/400 in hopes of getting a tenfold performance boost during 1994, he added.

One thing IBM does not plan to do is put Novell, Inc.'s NetWare on the AS/400. Dick Kincaden, ABS client/server solutions manager, said performance would not be good enough to justify the move. Instead, he said IBM is "working on improving general coexistence capabilities."

OS/2, Taligent

CONTINUED FROM PAGE 1

a range of object-oriented client/server features to the machines.

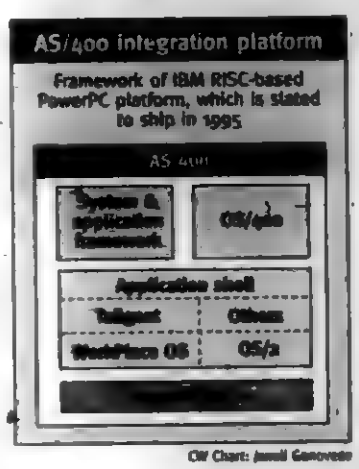
Also planned on the latter score, IBM executives said here last week, is the rollout during the next two years of a full application development environment based on C++. The company said that should supplant the RPG language as the key platform for the AS/400.

Also, IBM is working on object extensions to the AS/400's relational database and rewriting its PC Support networking software to an object-oriented model. Both should also be ready in 1995.

WorkPlace OS will be built into the PowerPC machines as an application shell below the OS/400 operating system, rather than as a base microkernel with OS/400 residing on top of it as a personality, said Frank Soltis, AS/400 systems architect at IBM's Application Business Systems (ABS) line.

That approach will prevent other operating systems from being run directly on the AS/400, but having that capability was "not that interesting" to ABS, Soltis said. "What we'd like to do is run some selected applications, not [another] operating system."

IBM is especially interested in access to applications that will run under Taligent's planned object-oriented operating system and in enabling client/server programs to be written on the AS/400 for execution on Taligent-equipped hardware, Soltis said. Applications for OS/2 and potentially IBM's AIX derivative of Unix could also be run via WorkPlace OS, he added.



CW Chart: Jamil Genovese

Initial user reaction is very cautious. Scott Plumer, project manager for technical support at Gannett Co.'s data center in Silver Spring, Md., said he is uncertain how useful the application-sharing capability will be, but he said it at least "would show it's not a fixed, closed machine."

Marc Cohn, senior vice president of information systems at Enterprise Rent A Car Co. in St. Louis, also has mixed feelings about the WorkPlace OS plan. "I have a huge number of questions as to how truly transportable applications will be under this concept," he said. "Melding all that together seems to be a great start, but I don't know what the finish is."

Teresa Elms, president of consulting firm Elms Information Services Group in San Diego, said the move is likely to increase system management complexities. "It just becomes a lot more messy, but on the other hand, the world's moving in that direction," she said.

IBM's object-oriented development road map calls for C++ to be supported this year on OS/2 and Windows machines that could connect to the AS/400 through PC Support. A native AS/400 version is due in tool kit form next year and full release in 1995.

One more "major crank" of RPG is planned next year, but that language "is not going to be that relevant to new applications built in the 1995-1996 time frame," said John Swainson, manager of application development technology at IBM's Toronto software lab.

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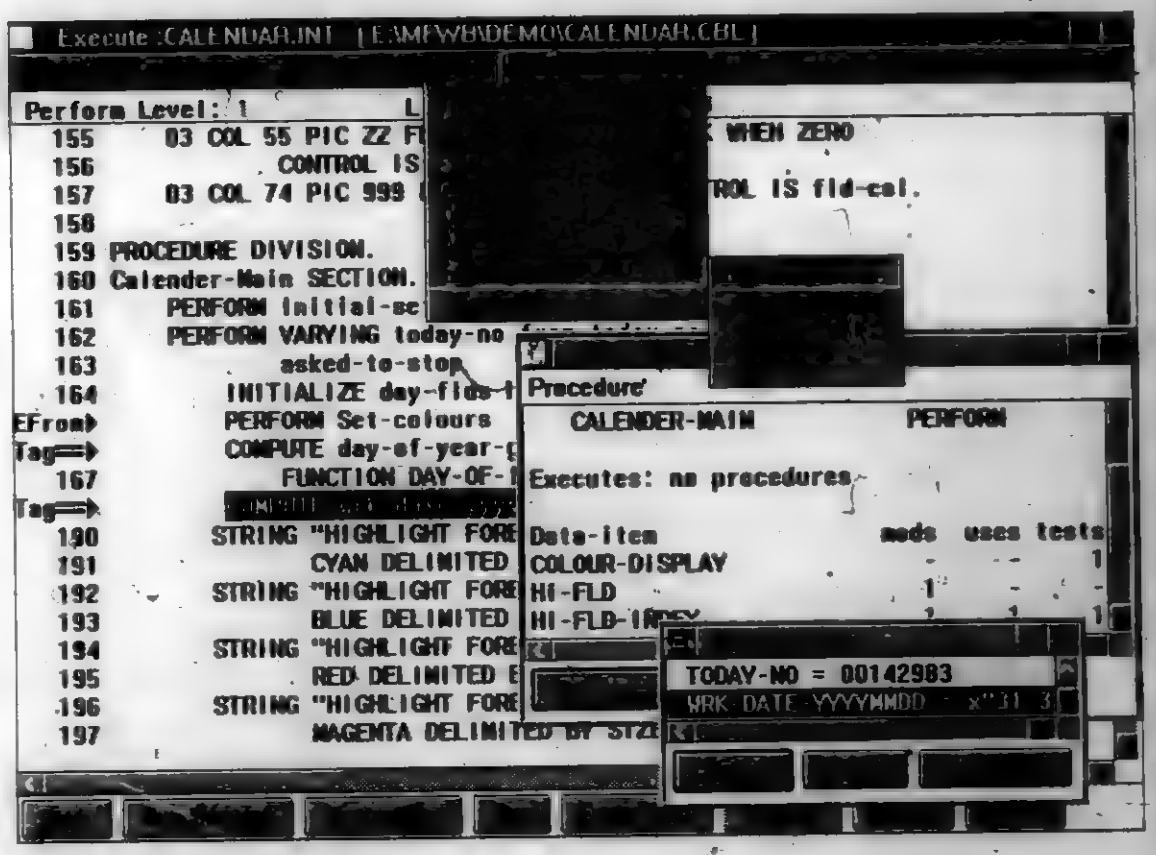

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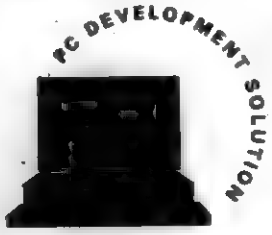

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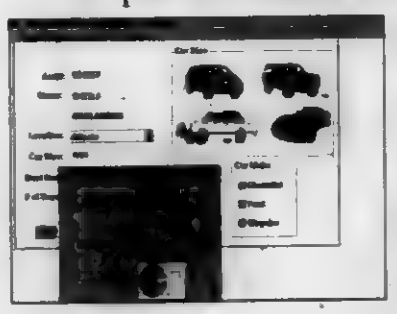

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Apple previews groupware

By James Daly
SAN JOSE, CALIF.

Apple Computer, Inc. users got a taste of real interoffice collaborative abilities last week when they were given a sneak peek at the upcoming Apple Open Collaboration Environment (AOCE) System 7.0 software extension.

The demonstration at Mactivity '93 marked the first forum outside of last May's closed-door developers conference where AOCE was demonstrated. AOCE, Apple's first stab at the type of interactive groupware capabilities provided in products such as Notes, is expected to be officially announced at Macworld Expo/Boston in August.

AOCE is a set of application programming interfaces (API) that promises to link and integrate disparate applications running under System 7.0. Developers will be able to tap into the power of the extension simply by hooking into AOCE APIs. Users will have immediate access to a wide variety of communication methods, including fax, telephone, electronic mail, calendaring and Internet messages.

While user enthusiasm for AOCE is high, gripes have already surfaced. Topping the list: cross-platform capability, which will not be available for at least six months. "I'm glad [AOCE] is almost here, but they don't have all the pieces there yet because we're really going to need that cross-platform capability," said Nancy Tresnak, a project manager at Sprint Corp. in Kansas City, Mo.

Until that capability is added, users will have to maintain transport and delivery services on other platforms. "We can't solve all of the world's problems in one single sweep of the hand, but our top priority after this first release is to take it to other platforms," said Andy Lauta, product manager for AOCE.

Even with this shortcoming, collaborative computing is clearly where users want to go. Marcello Gallardo, a test specialist at Princeton University, said he could envision an AOCE in which professors could instantly mail out lecture changes or course additions to every student. Such unified updating is difficult now because of the wide variety of E-mail packages used by students.

AOCE is divided into AOCE system software, a set of technology services to foster collaboration, and At Your Service (AYS) server software, which was designed to centralize management of these services.

At the heart of the technology services is an information repository containing "data cards" that can be customized for mailboxes. Also included are several security features, such as a digital signature technology called DigiSign that ensures that a message has not been altered in transmission.

Apple will allow users to access third-party products through back-end hooks called Software Access Modules.

Here, AOCE would require roughly an additional 1M byte of memory; each service access module would require about 100K bytes each.

Both a Catalog and a Mail server package will be offered, with the Mail server able to handle 8,000 messages per hour in tests.

AYS server software will work on any server running System 7.0 and based on a 68020 chip or higher.

Vendors ally on object blueprint

By Michael Vizard
NEW YORK

Five of the leading PC software providers last week unfurled plans to develop an infrastructure positioned as the foundation for the next generation of object-oriented operating systems.

The plan calls for Apple Computer, Inc., IBM, Novell, Inc., WordPerfect Corp. and Borland International, Inc. to cooperate in the development of a cross-platform architecture due out in one year that will be based primarily on an object file format from Apple running on top of IBM's distributed system object model.

Collectively, these technologies, which will comply with the Common Object Request Broker Architecture specification created by the Object Management Group, will be promoted under the OpenDoc architecture. This architecture, which will include support for Microsoft Corp.'s Object Linking and Embedding (OLE) protocol, is seen as a counter to the Windows-specific object-oriented environment called Cairo that Microsoft is building.

What they bring to the party

OpenDOC Alliance members	Contribution
Apple	• Bento object file format • Application integration technology
IBM	• Distributed system object model
Novell	• Support for AppWare API • Lower level network services
WordPerfect	• OLE 2.0 integration with Bento
Borland International	• Application development compilers

Important role

Such architectures are expected to become pivotal as the industry moves away from discrete operating systems and applications toward document-centric operating systems where system services and individual features can be called on by any user to create compound documents.

"People want to see objects architectures that will work across platforms," said Jesse Berst, editor of the "Windows Watcher" newsletter.

OpenDoc "essentially means you'll have built-in groupware type functions in the documents," said Rick Spitz, vice president of system services at Apple.

So far, the industry's latest coalition has drawn little attention from either Microsoft Corp. or Lotus Development Corp., and information systems directors are somewhat skeptical about the initiative's overall impact.

And while OpenDoc is expected to serve as the foundation for distributed objects, the technology required to distribute and track the licensing of such objects is still in its infancy. For example, using OLE, an application can be turned into a 2M-byte object that can be called by other applications. But making individual components of an application into discrete objects that can be called by other applications requires a much more intensive development effort.

According to WordPerfect Chairman Alan Ashton, however, the technology to manage object licenses should fall into place at about the same time that object-oriented computing becomes mainstream, which is expected to happen in the latter half of this decade.

As a result of these and other issues, IS managers are saying that while they applaud the OpenDoc initiative, they do not think it will have an immediate impact on their IS strategies.

"Once they build the architecture, they'll have to optimize the compilers, and there is a lot of baggage in terms of inheritance between objects that has to be dealt with," said Carl Hane, manager of applications development at MCI International, Inc. in Rye, N.Y.

In the meantime, neither Lotus, which markets Notes as a cross-platform set of middleware services for groupware applications, nor Microsoft appears ready to endorse the OpenDoc initiative.

Specifically, Lotus executives said that while the company has contributed technology to Apple that allows Bento objects to run under Windows, it has no plans to endorse the OpenDoc effort yet. Bento is the object file format used by Apple. Microsoft said it welcomes any increased focus on object technology but noted that its plans call for deploying OLE across Windows, Macintosh and Unix platforms.

A developer's kit for OpenDoc is due around the beginning of 1994.

Taligent

CONTINUED FROM PAGE 1

pressure, Taligent, which has only talked about mid-1994's product deliveries, is considering some "interim" releases to appease its masters, the source said.

Recently, Taligent CEO Joseph Guglielmi said the company will begin integrating early pieces of its emerging technologies into both System 7.0 and OS/2.

And although Taligent is not scheduled to launch its full object-oriented operating system for at least 18 months or more, the early fruits of Taligent's already extensive technological work came at last week's PC Expo during Apple's announcement of its OpenDoc platform (see story at right). OpenDoc uses several "chunks" of Taligent technology, said Mike Potel, Taligent's vice president of technology development.

Also, IBM is reportedly preparing to take other pieces of Taligent technology and hook them into both a PowerPC-based Application System/400 platform (see story page 1) and two technologies being used in OpenDoc: the System Object Model interface and the Distributed System Object Model.

Users might see more activity as Taligent developers hustle to beat speculation by Apple insiders that as much as $150 million of the company's $600 million-plus yearly R&D budget could be whacked by Spindler [CW, June 28].

There is also speculation that Taligent may turn to other companies either for money or programming. The leading contender is Borland International, Inc., which has shown great flair in the field of object-oriented technology.

According to Potel, it will be awhile before Taligent releases its own commercial product. He said Taligent is on schedule to deliver its operating system by "mid-decade."

A rudimentary version is running in the lab, but "it's like a skeleton, and now we have to add some meat to the bones."

Around the corner

Some Taligent insiders said the company could demonstrate a basic implementation as early as Comdex/Fall '93 in November. Taligent is expected to release an early version of the operating system as soon as the end of next year, but it is not going to "drop the whole system in the laps of users all at once," said a spokesman.

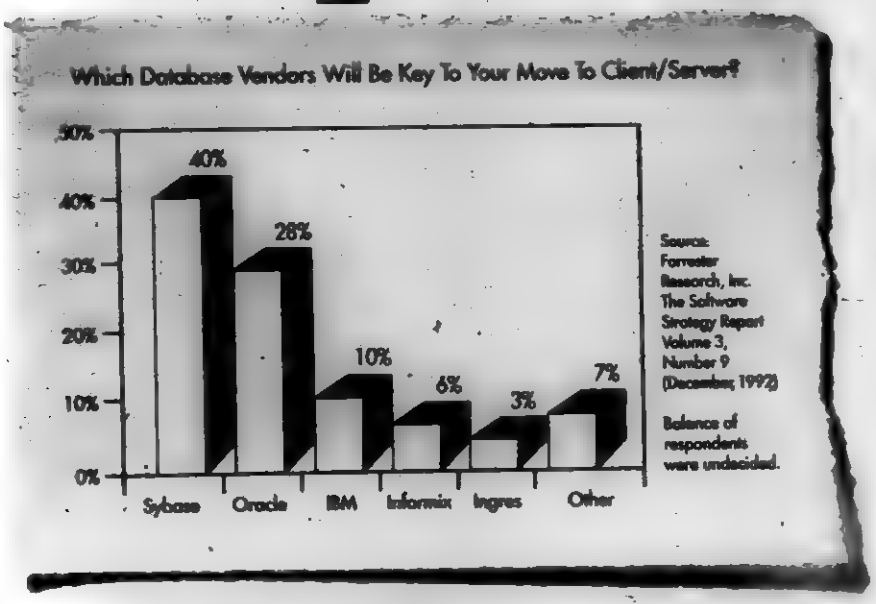
Users are not holding their breath.

"I've seen both companies go down this partnership road before, and I can't build our future around their plans," said Allen Head, information systems development manager at Universal Flavor Corp. in Indianapolis.

Taligent officials acknowledged that they have done a poor job of selling the why's and wherefore's of their ambitious two-year foray to their targeted users. Many IS professionals still regard the lofty blueprint as little more than an interesting sideshow.

West Coast correspondent Christopher Lindquist contributed to this report.

The analysts have graphed the future of Client/Server computing.



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IBM PC Co. restructures

By Michael Fitzgerald
NEW YORK

IBM last week made its first shifts in the PC realm since last September's creation of the independent IBM PC Co., folding one of its Personal Systems units into the IBM PC Co. and forming a new unit devoted to the PowerPC.

Separately, IBM officials discussed plans to invigorate the Personal System/2 line.

The Power Personal Systems (PPS) Division will focus on building lower cost machines, possibly down to the handheld level, based around the PowerPC architecture, which was jointly developed by IBM, Apple Computer, Inc. and Motorola, Inc. IBM's Advanced Workstation Division, which builds the RISC System/6000, will continue to focus on building high-end PowerPC servers and workstations.

Nobuo Mii will serve as president of the PPS unit, reporting to James A. Cannavino, an IBM senior vice president. Mii was formerly general manager of the Entry Systems Technology (EST) Division, which last week was folded into the IBM PC Co. Paul C. Mugge will run EST and report to Robert Corrigan, president and chief executive officer of IBM PC Co.

IBM said it made the moves to speed delivery of new technology to market. Insiders suggested that Corrigan was not given responsibility over the PowerPC group to let him focus on turning around IBM's Intel Corp.-based business.

As part of that turnaround, IBM officials said last week at the PC Expo trade show that they were planning to shake up their PS/2 line some, shifting some of its branding and giving customers purchasing and technology options in packages it has not presented before.

For example, IBM will no longer bill the PS/2 brand as the domain of high-end technologies but instead will target it at customers expressing more interest in product stability than in rapid and frequent advances in technology.

"Our major accounts are saying, if anything, 'slow down' [the technology onslaught]," said James G. Turner, IBM's general manager, premium brands.

Turner said IBM finds that its major customers typically test a new system for several months before they decide whether to deploy it. Consequently, the company will in the future tend to bring new technologies into the PS/2 line through prototype machines, a la what it did recently with the energy-conserving PS/2 E PC.

IBM expects to focus much of its efforts on providing custom packages for its PS/2 customers, he added.

The company does this on a limited basis for some of its largest customers right now but would opt for a near build-to-order strategy in the future.

IBM also expects to break out its PS/2 server products — Models 85, 95, 195 and 295 — into a separate brand to help market the server products more effectively.

Powerful DOS updates soar past old versions

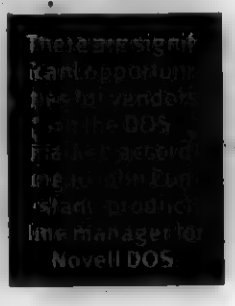
Several vendors offer beefed-up releases

By Christopher Lindquist
NEW YORK

Although Microsoft Corp., IBM and Novell, Inc. all recently announced or shipped "more-powerful-than-ever" versions of DOS, the best is yet to come.

Microsoft opened the enhancement floodgates this spring when it released MS-DOS 6.0, which despite mixed reports of problems, subsequently broke all records for initial software shipments.

IBM followed up last week at PC Expo, unveiling PC-DOS 6.1, due this month, along with plans to aggressively target Microsoft's DOS market share with price and service options aimed at attracting users and OEMs to IBM's DOS.



One analyst said some hardware vendors may welcome the opportunity to escape Microsoft. IBM has "released a DOS product that allows Microsoft to not be able to put pressure on resellers with DOS," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C.

Meanwhile, Novell's DR DOS 6.0 will get a name change and some powerful new features in September, when it is slated to ship as multitasking, multithreaded Novell DOS 7.0.

"There are significant opportunities" in the DOS market, said John Constant, product line manager for Novell DOS. These include changes related more to the functionality that surrounds DOS than to DOS itself, he said. DOS 7.0, which is due to go into beta testing shortly, is also being designed to make it an optimal networking client, Constant said.

Meanwhile, IBM's PC-DOS 6.1 includes full versions of backup, memory management and virus protection programs and includes a coupon for AddStor, Inc.'s data compression program, SuperStor.

It also contains Personal Computer Memory Card International Association Version 2.0 support for PC cards as well as basic pen input support that allows a pen to be used much as a mouse is today.

Walter Casey, director of marketing for IBM Personal Software Products, said despite the fact that IBM's technology sharing agreement with Microsoft runs out in September, IBM will launch another version of DOS later this year. Tentatively called WorkPlace DOS, it will include a WorkPlace shell-like graphical interface. He also hinted at a multitasking version of PC DOS.

Microsoft is not idle either. The company is already preparing for the next revision of MS-DOS, which should also include multitasking and multithreading capabilities. A subset of Microsoft's "Chicago" technology, it will reportedly ship next year.

Tony Audino, director of marketing for MS-DOS 6.0, said Microsoft owns the rights to the de facto DOS standard. After the technology sharing pact runs out, both Novell and IBM will have to clone MS-DOS technology to maintain compatibility, he said. Cloning "is a tough game to be in," he said. "I don't care who's doing it and how sharp they are."

Compaq boards the OS/2 bus

Compaq Computer Corp. last week said it will bundle OS/2 2.1 from hardware rival IBM into its hardware. Compaq will provide support for OS/2, using a technical staff trained by IBM.

Compaq Vice President John Paul said a "double-digit" number of customers, particularly those with "big iron," requested OS/2 on Compaq boxes. Also preloading OS/2 are AST Research, Inc., Northgate Computer Systems, Inc., Toshiba America Information Systems, Inc. and Everex Systems, Inc.

—Christopher Lindquist

Xircom links mobile users

By Lynda Radosevich

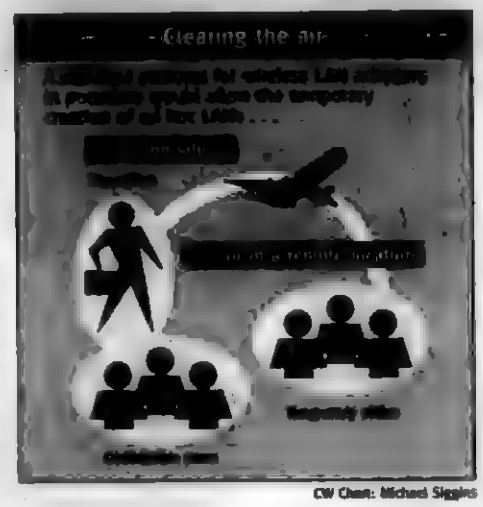
Xircom, Inc.'s Netwave wireless local-area network protocol, announced last week at PC Expo, aims to give mobile PC users the option of connecting to their wired office LANs or forming ad hoc peer-to-peer networks with other mobile users, regardless of their brand of wireless adapter [CW, June 7].

For instance, an executive could wirelessly load information from the corporate LAN, then fly to a remote location and share the information on-line with others by forming an instant network.

The protocol may catch on. Digital Equipment Corp. and chip makers Advanced Micro Devices, Inc. and NCR Corp.'s Microelectronics Products Division expressed interest in developing products using Netwave.

Others, such as Novell, Inc., Dell Computer Corp., NEC Technologies, Inc. and Sun Microsystems, Inc., have voiced general support for Netwave's goals.

However, vital backing from other wireless LAN vendors is missing. Representatives from Proxim, Inc. and the wireless LAN division of NCR said they will wait to support a formal standard from the IEEE 802.11 committee. That standard is not expected to be finalized for two to three years.



CW Chart: Michael Siggins

Xircom also demonstrated its own Netwave products, which are due this fall, including a parallel port adapter, a Personal Computer Memory Card International Association Type 2-compliant adapter and a bridge to wired Ethernet networks. A bridge to Token Ring networks will be available in 1994, Xircom said.

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Boston, MA	❑ July 20	San Francisco, CA	Washington, DC
❑ July 13	❑ October 19	❑ July 27	❑ July 16
❑ October 6	Houston, TX	Santa Clara, CA	❑ October 5
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Gates says Windows NT is a form of Unix

By Christopher Lindquist
NEW YORK

Windows NT came full circle last week — from snubbing Unix to becoming Unix — when Microsoft Corp. Chairman Bill Gates used his PC Expo address to proclaim that "Windows NT will be the most popular form of Unix ever."

Early in its history, Windows NT was perceived as having an anti-Unix bent, but months of development have brought a variety of Unix-like features to the as-yet-unreleased operating system, including Posix compliance, a Sockets interface and Transmission Control Protocol/Internet Protocol support.

Gates' declaration took some users by surprise, but analysts said it made sense. Among the skeptical was Bob Young, editor of the "New York Unix Newsletter."

"While NT is vaguely compatible with Unix, it's a stretch to say it is a form of Unix in any way," he said.

Stable by association

Analysts reacted by suggesting that comparing Windows NT to Unix may be an attempt by Microsoft to associate the unhatched operating system with a more established and mature environment. "I'm not surprised to hear Bill Gates tack himself onto Unix," said Judith Hurwitz, president of Hurwitz Consulting in Newton, Mass. "Unix is something that has been out there 20 years, and it's stable."

That could have a calming effect on customers who would be wary of going with an entirely new operating system but might be willing to try another form of Unix, she added.

Positioning Windows NT as Unix could also have been designed to have a chilling effect on Windows NT competitors, such as UnixWare from Novell, Inc. Novell recently began a media campaign to increase awareness of its "desktop Unix" and to present it as a viable desktop operating system.

Gates' comments that Windows NT is indeed Unix could be an attempt to keep some customers from adopting UnixWare before Windows NT begins shipping, possibly as early as next month.

"Bill Gates understands perfectly well where NT is competing and that's at the Unix vendors," said Rikky Kirzner, an analyst at Dataquest, Inc. in San Jose, Calif. She added that Novell is also the only software firm suitably equipped to compete directly with Microsoft for the desktop, and therefore Microsoft must take its Unix offering seriously.

Gates fired some practice rounds at his Unix competitors during a question-and-answer session after the keynote. He criticized the "design by committee" nature of the Unix world, describing the system as one where companies get together to define a standard before going off to work on proprietary extensions. Gates said Microsoft would not tolerate that with Windows NT development.

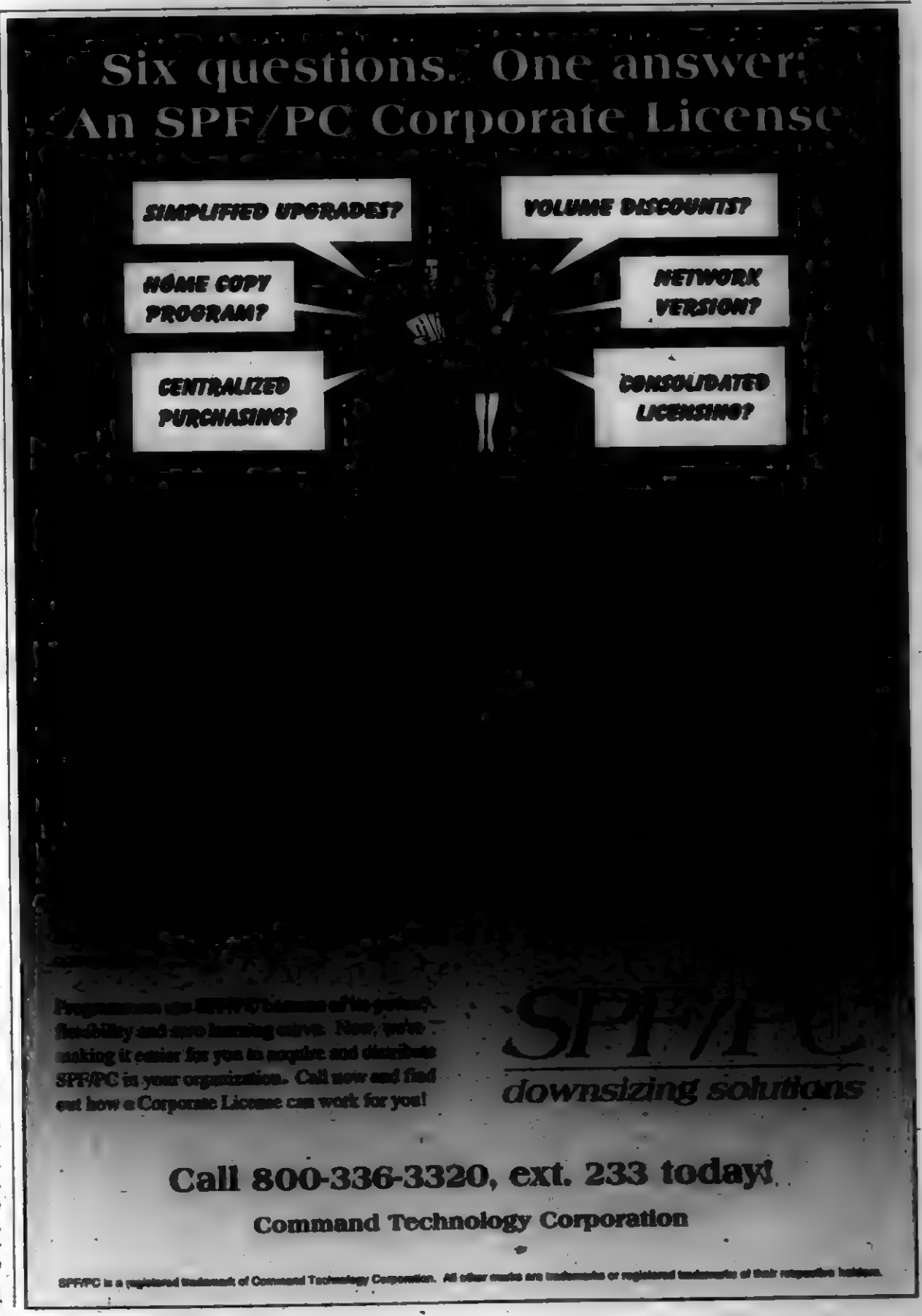
IBM commits to peer networking product

IBM used the PC Expo show last week to once again demonstrate its vision of peer networking. But this time, there was one important difference: IBM made a commitment to market the product.

Lee Reiswig, president of IBM's Personal Systems Products Division, said his unit plans to ship a peer networking product late this year or early next year. The yet-to-be-named OS/2-based product, which has been demonstrated at previous PC conferences, would compete with Microsoft Corp.'s Windows for Workgroups in the emerging small workgroup computing arena.

IBM showed off the latest version of the software, which included an object-oriented interface and a clipboard for linking data residing on applications running on different workstations. The software was licensed from Symbotica, Inc. The new build also featured more robust messaging capabilities than those previously demonstrated.

—Alan Alper



News Shorts

Sterling consolidates after acquisition

The effects of the merger between **Sterling Software, Inc.** in Dallas and **Systems Center, Inc.** in Reston, Va., came swiftly last week. Within hours of the final filing with the Securities and Exchange Commission, 400 employees of the combined 3,200-member work force were terminated — and the $390 million merged company's scattered business units were reorganized into four groups of four divisions. Many of the 400 layoffs resulted from overlap in administrative functions.

KnowledgeWare revenue not so bad

KnowledgeWare, Inc. last week offered a preliminary glimpse of fiscal fourth-quarter revenue, which exceeded analysts' estimates. The firm is expecting to post revenue of $38 million, compared with $34 million for the comparable period last year. Revenue for fiscal 1993 is expected to be $127 million, up 9% from last year. But the company is expected to post a $25 million net loss for the year, including about $20 million in restructuring charges, financial analysts said.

Compaq restructures PC division

Compaq Computer Corp. split its PC division into separate units for desktop and portable computers. Compaq brought in John T. Rose, who headed Digital Equipment Corp.'s PC business for eight years, to serve as senior vice president of the Desktop Division. Jim Hartzog, vice president of engineering in the former PC division, is now senior vice president and general manager of the portable PC division. Tom Bunch, formerly at **Toshiba America Information Systems, Inc.**, will become vice president of communications products, reporting to Hartzog. Compaq also hired Robert W. Stearns, a **McKinsey & Co.** consultant, to be its vice president of corporate development, handling technology sharing ventures and alliances.

Apple connecting Newtons to Macs, PCs

With its Newton personal digital assistant slated to be officially introduced at next month's Macworld in Boston, **Apple Computer, Inc.** last week announced the Newton Connection Kit, which enables the transfer, backup and updating of information between a Newton and a PC or Macintosh computer. Newton Connection Pro version will translate information created on the Newton so it can be shared with common Windows applications on a PC.

3Com scales networks

3Com Corp. last week sketched out plans for helping users migrate from today's packet-based local-area networks to higher speed networking. The company said it will double the number of Ethernet ports on its NetBuilder II multiprotocol router in the third quarter and will allow its hub users to software-configure "virtual" workgroups during the first half of next year. 3Com said it will also add a module called "CellBuilder" to its hubs and routers to convert LAN packets to Asynchronous Transfer Mode cells during the second half of next year.

SHORT TAKES **Chemical Banking Corp.** is standardizing its 385 New York branches on **NCR Corp.**'s Unix-based System 3000 workstations and servers, under the $32 million contract. . . . **Wang Laboratories, Inc.** last week agreed to sell the consumable office and computer supplies portion of its Wang Express catalog and telesales business to **Nashua Corp.** . . . Nine more vendors, including **Hewlett-Packard Co., Epoch Systems Inc.** and **Remedy Corp.**, have signed up to support the object-oriented Tivoli Management Environment for distributed computer networks from **Tivoli Systems, Inc.** in Austin, Texas.

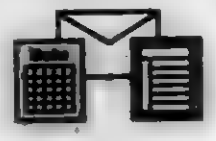
IBM announces LAN/ host scheduling tools

By Lynda Radosevich
NEW YORK

IBM last week joined the growing list of vendors trying to meet the scheduling needs of users in mixed hardware environments [CW, June 14] with product introductions from its Programming Systems Group and a demonstration of technology designed to help its host-based OfficeVision customers migrate to local-area networks.

"IBM has the opportunity to lead this industry because they own the back end," said Mike Anderson, an analyst at Gartner Group, Inc. But first, IBM must live up to its strategy of developing open applications — right now it is "OS/2-centric" — and sprupe up some "cumbersome" client software, he said.

An IBM official said the company plans to ship products for platforms, including OS/2, Windows, Macintosh, Application System/400 and OfficeVision "within a two-year time frame," and will continually work to upgrade the applications interface.



Meanwhile, because information resides on a central database, IBM's back end is faster and more robust than LAN-based scheduling packages that rely on messaging engines, such as Microsoft Corp.'s Schedule+ for Windows, Anderson said.

Included in IBM's rollout were the following:

- Software that allows IBM's OS/2-based Time and Place/2 LAN scheduling software and OfficeVision/VM users to view one another's calendars in real time and look for free time slots.
- Address book synchronization software that lets users extract OV/VM directory information and transmit the data to mail directories for Lotus Development Corp.'s CC:Mail and Notes.
- Translation software that enables the exchange of electronic mail between Notes and OV/VM.
- A Windows interface for IBM's host-based Current-OfficeVision/400 workgroup program that provides PC users with a graphical interface to OfficeVision information on AS/400s.

The above products should be generally available in two to three months, IBM officials said.

Group forms to compare processes

CONTINUED FROM PAGE 1

discuss the results.

"There is considerable value in benchmarking your organization against world-class organizations. Maybe we could learn and adapt to some of the other best practices," said Gen. Donald R. Lasher, chief information officer and president of the information services division at USAA, a San Antonio-based insurance firm.

USAA's Gen. Donald R. Lasher: *'We found that we were average'*

"What I have proposed is that [Fedex] maintain benchmarking so we can gauge our progress on an ongoing basis," said Dennis Jones, senior vice president at the information and telecommunications division of the Memphis-based package carrier.

The consortium grew out of benchmarking work performed in late 1991 by IBM Consulting for Amex's Travel Related Services Co. (TRS). IBM Consulting benchmarked TRS's information technology management processes against those from 17 other major companies, including Fedex and USAA.

"In the past, we had compared our IT function with that of other companies, but we had always looked at costs," recalled Garland Cupp, CIO at TRS.

"The difference in [the 1991] benchmark was that we were examining processes and interrelationships, which gave us a whole new insight on how IT fit into the overall business environment," Cupp said.

Lasher said the Amex benchmark was an eye-opener for him. "We found that we were average — as opposed to above average — in competitive assessment. We realized that while we had constantly measured our business against our competitors, we had done little to assess our competitors' information systems," he said.

The willingness by companies to openly share information about themselves with competitors and others has proven effective and is on the rise, according to Tobey Choate, a vice president at Arthur D. Little, Inc. in Cambridge, Mass. "If you can organize key IT processes and gather information on what other people do, it can be very enlightening."

Lasher said he is hoping that type of open dialogue will carry over to the Benchmark Consortium. One of his objectives is to gain greater insight on how other companies have been making the transition from older Cobol programs to computer-aided software engineering, object-oriented programming and client/server systems.

"Everybody is sort of feeling their way through these technologies right now, so it would be interesting to see how the other guys are transitioning their work forces," Lasher said.

According to Fedex, benchmarking helped unify the company. "By involving users outside the IS function in the benchmarking study, they felt like they were a full member of the quality improvement process," Jones said. "It strengthens the relationship between IS and users by asking them to participate and provide feedback."

What they're looking at

The Benchmark Consortium — 20 U.S., 10 European, three Japanese and two Australian member firms that formed to benchmark IS functions and business processes against one another — has earmarked seven areas for assessment:

- Legacy systems.
- Balancing legacy systems with new technologies.
- Aligning business needs to drive information technology.
- Getting a firm's culture to work for it.
- Partnerships to develop information technology more efficiently.
- Business/technology processes on human systems.
- Value delivery: Are companies getting the most bang for the buck?

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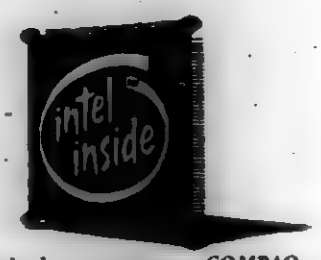

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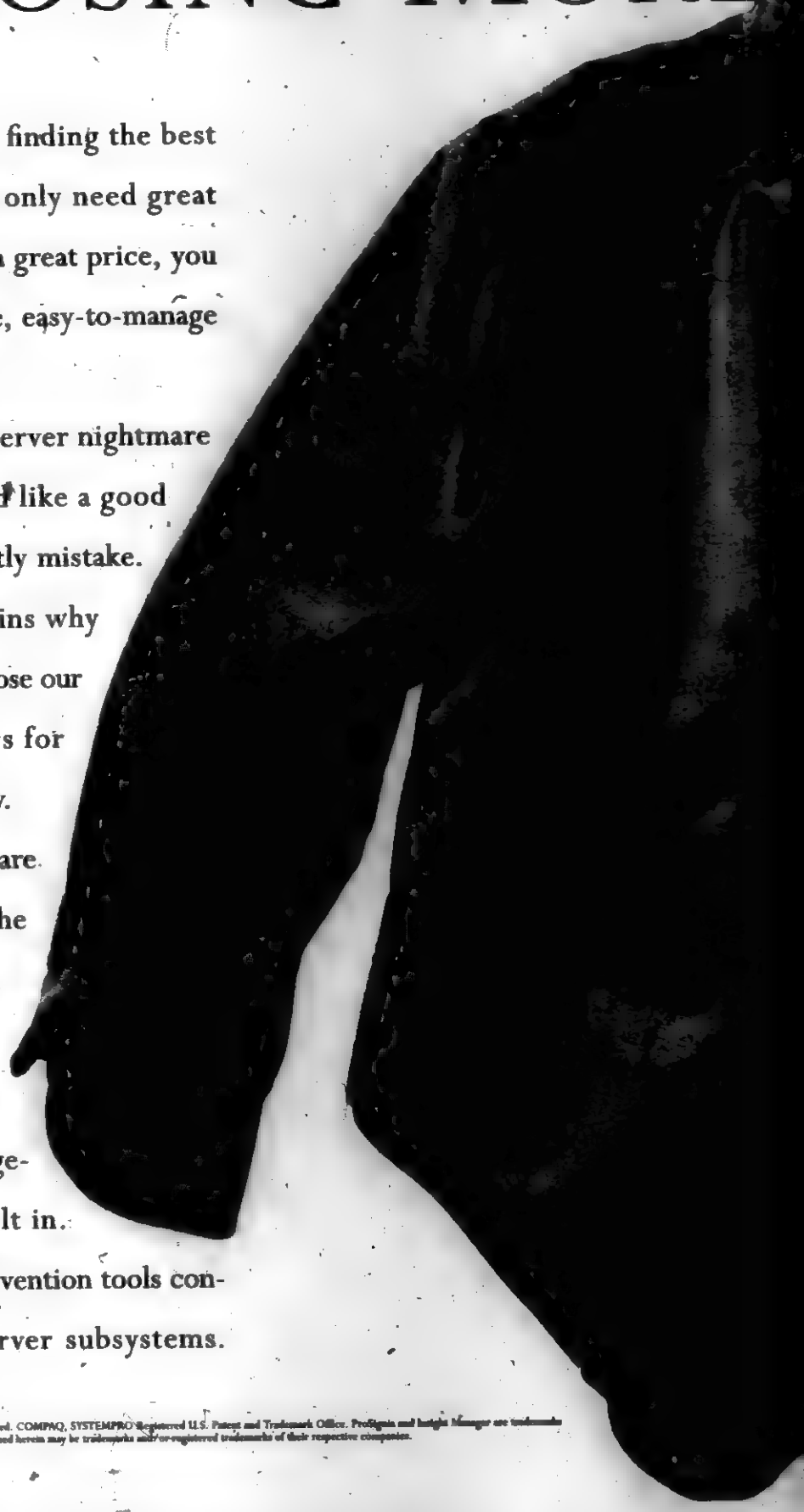

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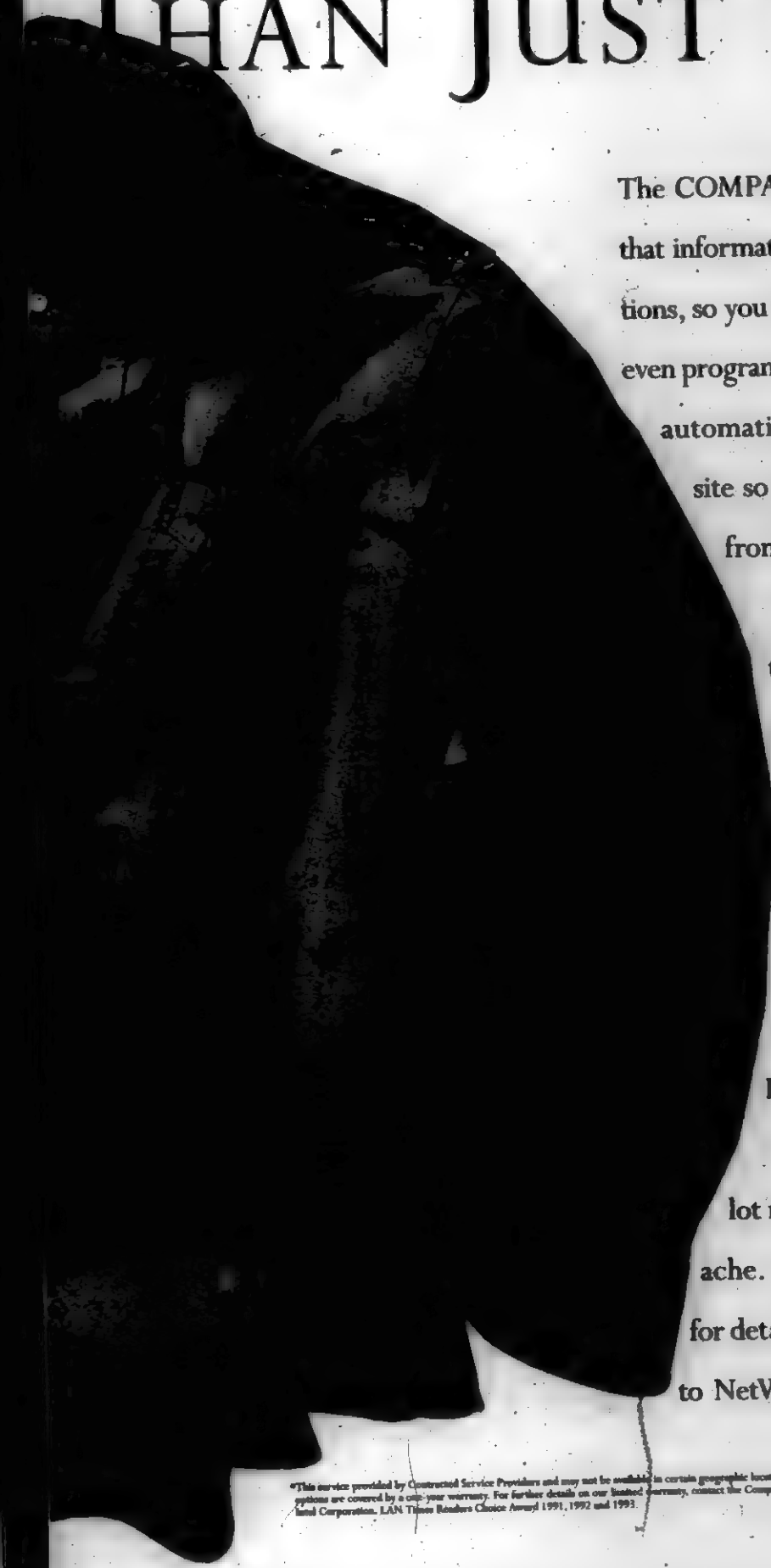

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DG hopes Aviion servers revive results

By Stephen P. Klett Jr.
BOSTON

Trying to right listing revenue, Data General Corp. this week unveiled its next-generation family of Avilon servers, a new version of its DG/UX Unix operating system and several software partnerships.

Analysts called the announcement a near make-or-break move in light of DG's recent string of weak financial showings.

DG reported a net loss of $7.6 million for the second quarter this year and said it anticipates that its third-quarter results will be lower than expected.

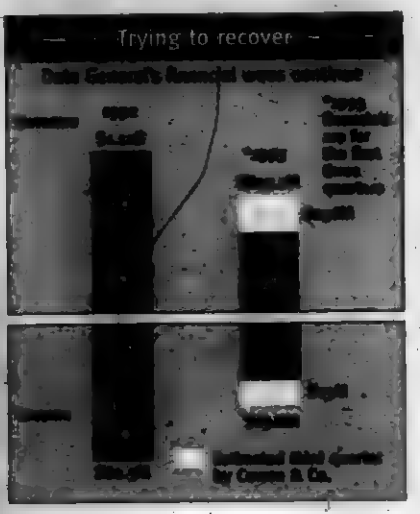
"It's very critical for them to do well over the next eight to 12 months," said John Morell, an analyst at International Data Corp. in Framingham, Mass. "If they don't, it will be tough for them to continue in what is already a cutthroat market."

Barely making its self-imposed deadline, DG announced two server lines based on Motorola, Inc.'s 88110 microprocessor. The high-end AV9500 line ranges from two to 16 processors, and prices range from $84,000 to $280,000. Two- and four-processor models are available.

DG said the 16-processor AV9500, due to ship next spring, will top out at 1,000 transactions per second and 1,600 million instructions per second, with more than 2G bytes of main memory and support for more than 1T byte of on-line storage. The midrange 8500 line comes in two- and four-processor models and is shipping now starting at $36,000.

Houston-based Star Enterprise has ordered a four-processor 9500 for one of its three Avilon-based data centers.

"When we started up, we were faced with a corporate mandate to find the cheapest way to run that we could," said Gary Richardson, director of information technology. "Based on our own benchmarks, we felt Avilon was the best server for the money."



In conjunction with DG's announcements, Computer Associates International, Inc., Information Builders, Inc. and Dun & Bradstreet Software said they will announce plans to port software to the Aviion platform.

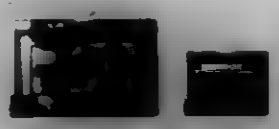
DG/UX 5.4.3, DG's new version of Unix System V Release 4, comes bundled with Legato, Inc.'s Networker software for unattended network backup and recovery. It is available now at prices ranging from $500 to $25,000.

Here to stay

DG hinted at future plans for the 88000 processor. Thomas West, senior vice president of advanced development, said customers can expect to see a third generation of Avilon servers based on an 88000 chip two years from now.

"The rumors of the 88K's demise are premature," West said. "It's well-designed for [symmetrical multiprocessing] and is definitely a part of our future plans."

West said once the company has exhausted the capabilities of the 88000 it will consider alternatives such as Motorola, IBM and Apple Computer, Inc.'s forthcoming PowerPC chip.



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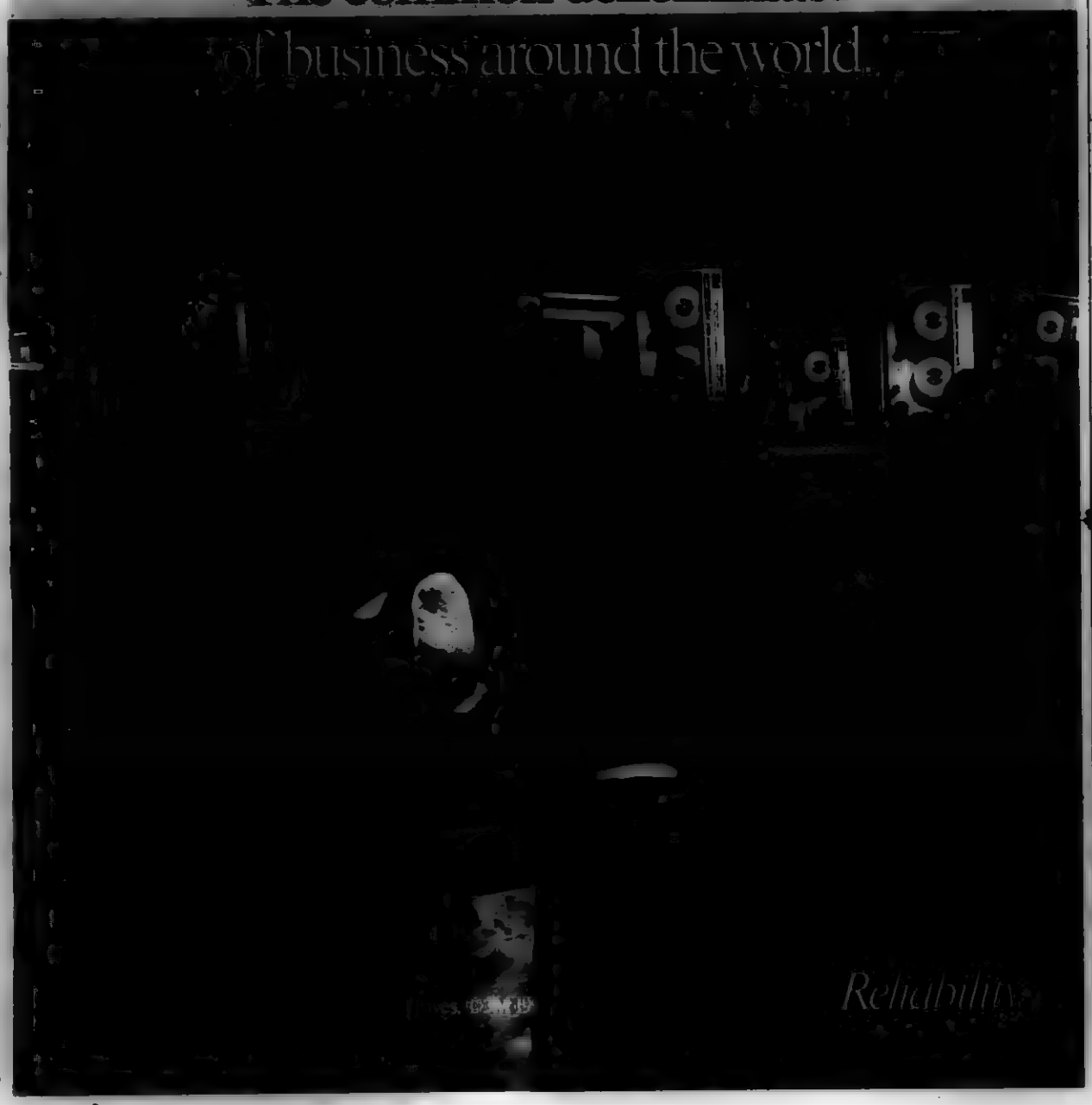

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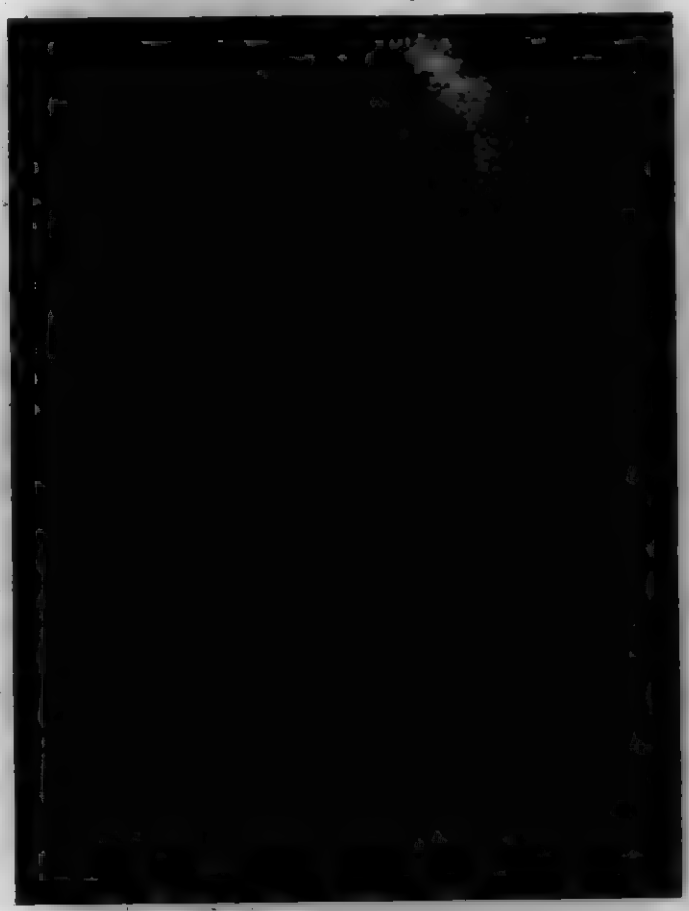

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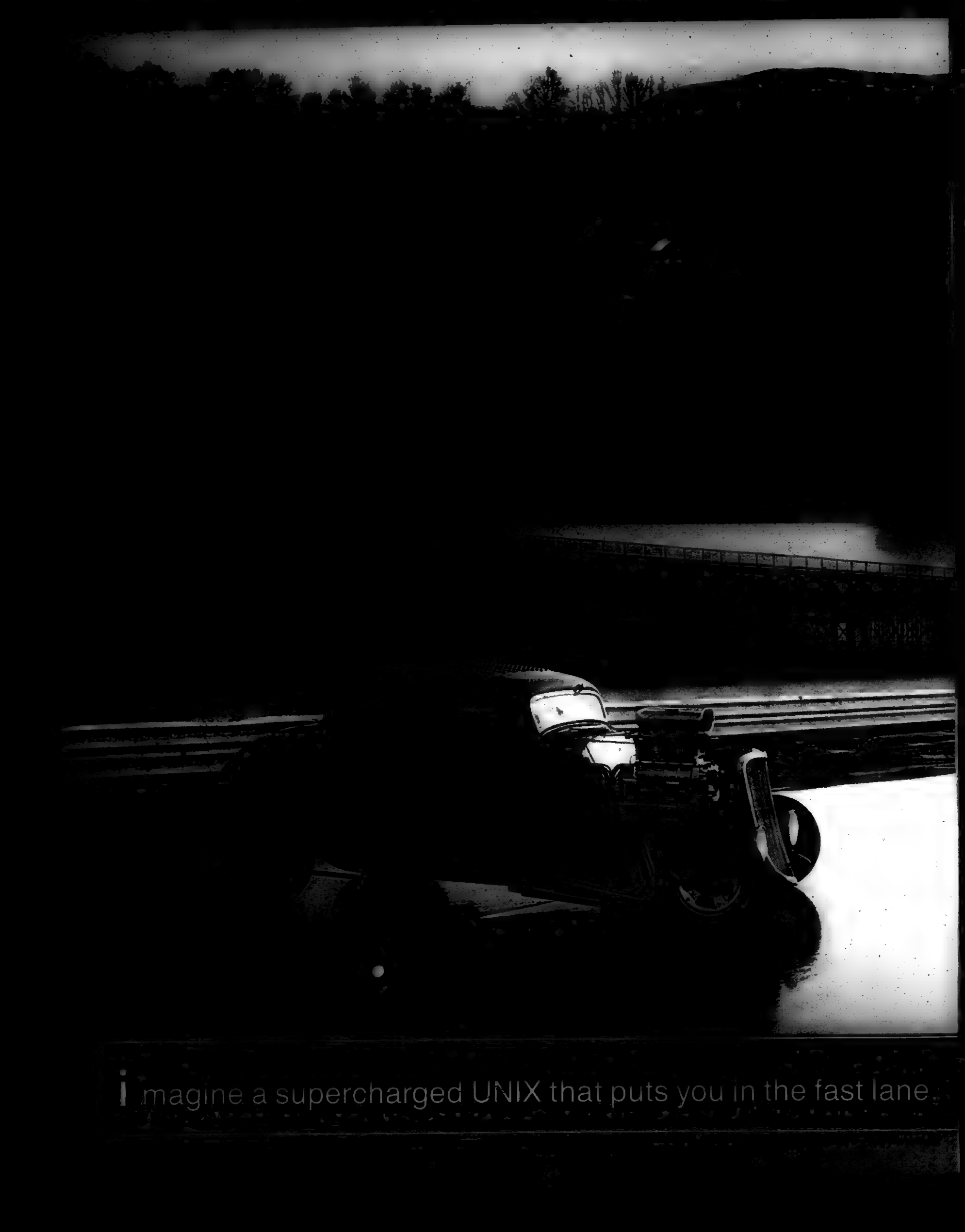

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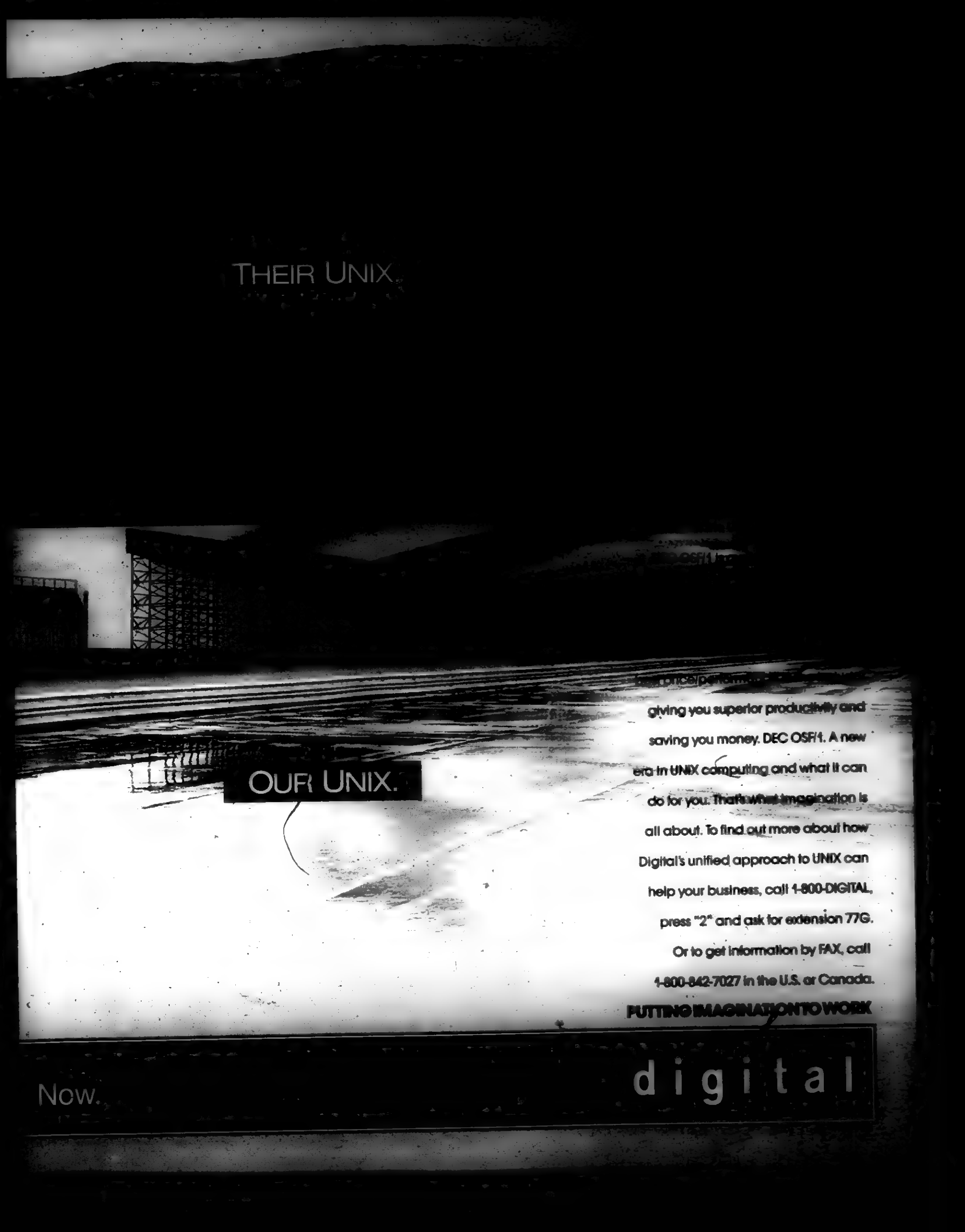
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Chipcom, SynOptics offer LAN switch innovations

By Joanie M. Wexler

Users gained options for widening their local-area data highways last week when smart hub vendors Chipcom Corp. and SynOptics Communications, Inc. put new spins on today's local-area network switching technology.

LAN switches allow users to dedicate a LAN's worth of bandwidth to an individual server, workstation or small group of computers. This can ease network slowdowns caused by computers vying for a fixed amount of bandwidth.

Chipcom's twist on the network-resuscitating technology is a hardware module for its OnLine Concentrator that users can upgrade from an Ethernet switch to a bridge, then from a bridge to a router as their internetworks expand. The capability could be less expensive than buying new hardware devices when growing networks require the traffic filtering functions of bridges and routers.

For example, Chipcom shop MetroWest Medical Center in Framingham, Mass., prefers to get these various functions out of one card rather than from multiple devices, said Steve Flis, network manager. "I assume it will be cheaper, but I'll have to make sure" before committing to a purchase, he said.

MetroWest, which will soon begin beta-testing the Chipcom module, plans to use it as a switch to provide two bandwidth-munching billing applications with its own 10M bit/sec. Ethernet.

Source: The Yankee Group, Boston

Meanwhile, SynOptics unleashed its year-in-development Ethernet switch for its LattisNet System 3000 hub. The switch is based on Kalpana, Inc. technology and includes Kalpana's recently announced "full-duplex" two-way technology [CW, May 28].

SynOptics also developed applications to help users design switches into their networks to yield better performance. For example, a user might leverage the SwitchMan package of traffic monitoring and design tools to determine whether higher throughput would be achieved by placing a switch in front of a given group of servers or an individual workstation.

The Chipcom and SynOptics moves, along with competing rollouts in the past several months, are attempts to tide over users with network bandwidth until higher speed LANs kick in, analysts said.

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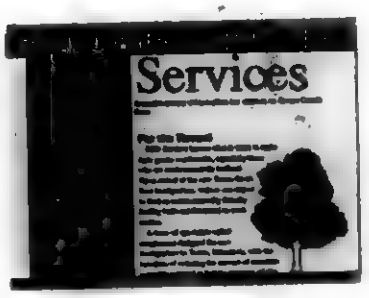

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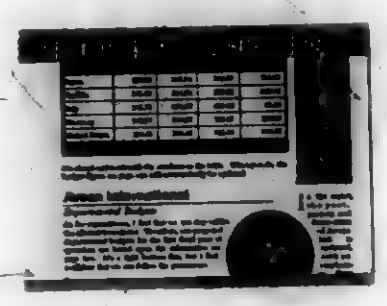

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Tech Talk

Education grant

AT&T's University Equipment Donation Program last month awarded $7 million worth of NCR Corp. computer gear to 61 colleges and universities. Each donation included a server and workstations, some of them with multimedia capabilities. Since 1984, AT&T's program has donated nearly $287 million to educational institutions. This year, for the first time, AT&T also donated equipment to a non-U.S. site: The Academy for Technology and Agriculture in Bydgoszcz, Poland.

IBM Fellows

Honoring its own, IBM named six scientists IBM Fellows and awarded nearly $1 million to another 28 technical employees. Named as Fellows were James T. Brady at AdStar, IBM's information storage subsidiary in San Jose, Calif.; Donald M. Eigler at the IBM Almaden Research Center in San Jose, Calif.; Charles R. Hoffman at Networking Systems in Raleigh, N.C.; Martin E. Hopkins at the IBM Thomas J. Watson Research Center in Hawthorne, N.Y.; Peter M. Kogge at IBM's Federal Systems Co. in Oswego, N.Y.; Anthony C. Temple at Programming Systems, Warwick Laboratory in the UK.

3-D star search

In May, a team of astronomers at Johns Hopkins University won a $1.2 million contract from the U.S. Air Force to develop a three-dimensional computer model of the ultraviolet sky. In 1968, Johns Hopkins researchers created the first two-dimensional map of ultraviolet radiation from stars. The planned three-dimensional map, however, will be both an astronomical and computing challenge, because associating ultraviolet radiation with diffuse objects in the night sky — such as interstellar gas and the scattering of starlight off interstellar dust — is much more difficult to model. The data for the model will come from a European satellite and will be gathered at the National Space Data Center.

Rebirth of fractals

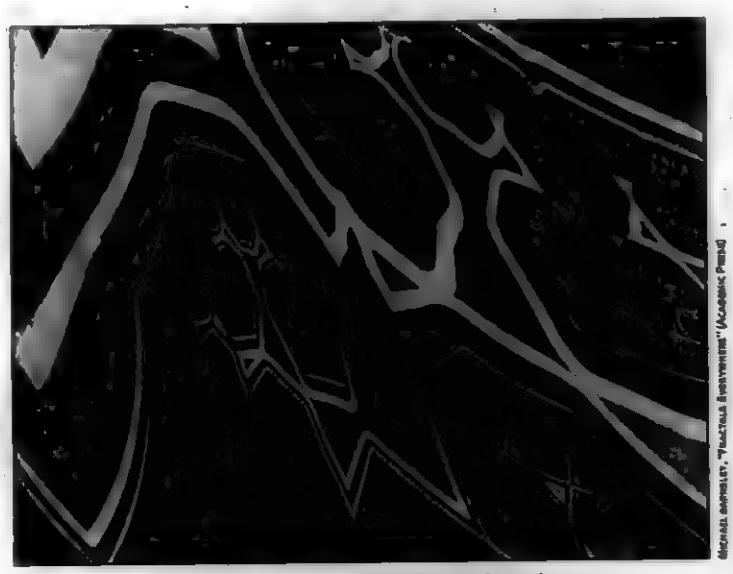
Fractal equations find raison d'etre in data compression

By Ellis Booker

A few years ago, the arcane mathematical subject known as fractal geometry enjoyed a brief pop-culture notoriety. There were colorful fractal posters, T-shirts and even games that allowed one to map exotic, swirling and infinitely changing fractal images on a PC screen.

At the same time, researchers were at work on a real-world use of fractals: data compression. In a superb example of a technology that was in the right place at the right time, fractal-based compression algorithms came just as electronic document imaging, multimedia and on-line, interactive video caught the imagination of the industry and users.

Very recently, in fact, applications have been developed that not only compress images via fractal equations but also use these fractal components as a kind of shorthand to identify the content of complex images. (Observers agree that some scheme for indexing complex images will have to be devised as users increasingly add images and video to multimedia applications.)



Fractal geometry *at first found its way into pop-culture imagery*

Michael Barnsley, "Fractals Everywhere" (Academic Press)

Sum of its parts

"The basic approach behind fractal encoding is to present an entire image in terms of parts of itself," said Alan Sloan, president of Iterated Systems, Inc. in Norcross, Ga., a pioneer in the development of fractal compression systems.

According to Sloan, the central idea of fractal compression is to partition an image into nonoverlapping pieces and then find one image region that, when properly transformed with things such as rotation and scaling, comes to resemble other parts of the image.

"The code word for [image region] A becomes the location of [image region] B and the transformation information of B," Sloan said.

An interesting difference between fractal-based compression systems and compression standards such as JPEG (a standard of the Joint Photographic Experts Group) is that more computation means better compression. For example, a supercomputer calculating a JPEG algorithm would derive the result faster than a PC would, with an identical outcome; a fractal compression done on a supercomputer would yield a significantly better compression than one done on a desktop computer.

It is hard to pin down the "average" compression ratio using fractals because compression is related to image quality, Sloan said. He said color maps can be compressed 60-to-1 and photos can be squeezed as much as 80-to-1 or 100-to-1. In an application in which only the broad outline of the original image is needed for analysis — for instance, satellite data — a compression of 800-to-1 is possible.

Currently, Iterated's system, which is used in products such as Microsoft Corp.'s Encarda CD-ROM multimedia encyclopedia, is a batch procedure. The "crunching" is done on supercomputers, although the images can later be "uncrunched" by a PC for viewing.

More efficient

Fractal image compression can reduce overall costs by cutting down media storage and transmission line needs

	Number of possible images stored on a 650M-byte CD-ROM	Time to transmit a single image over a 9.6K bit/sec. modem
[illegible]	275	[illegible]
[illegible]	5,510	1.6 MINUTES
[illegible]	27,550	[illegible]
5[illegible] compression	137,752	[illegible]

Source: Iterated Systems, Inc.

Show me the trains

Say you have several gigabytes worth of images, some of which contain pictures of railroad stations. How would you go about searching this massive resource for trains?

One way might be to use fractal representations of the objects in question to search for fractally compressed images, as Iterated Systems' MatchMaker does. The product is now in beta testing in the U.S. intelligence community.

At the moment, MatchMaker is a prescreening aid only. The system looks through a large number of fractally compressed images trying to match a key code (say, the fractal representation of a freight train) against codes in the compressed images.

MatchMaker someday may be teamed with an intelligent front end such as a neural network.

— Ellis Booker

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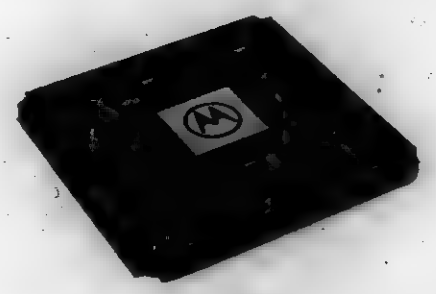

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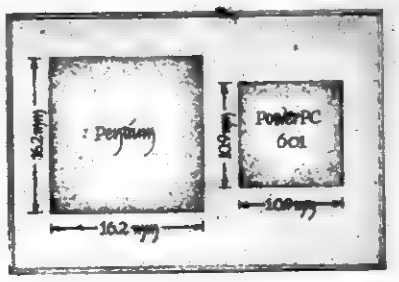

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Leash on life

Can an old dog learn new tricks? Probably yes, even from a little pup on occasions.

Take IBM. Now there's an old canine in desperate need of a new routine. And what better place to look for pointers (no pun intended) than among its own litter of independent, autonomous business units.

Specifically, the company as a whole ought to do what it should have done 12 years ago: Carefully study the operating philosophy of its PC division. In it, IBM might just find some of the keys it seeks for a brighter future and some relief from the dreadful position in which it has been mired for two years now.

It was 12 years ago this summer that IBM launched a subindustry with its IBM PC before there was a Dell or a Compaq or an AST or anything even called a clone. Within a short time IBM's PC division, operating as a truly autonomous unit in Florida, scored unprecedented market success.

Its success, however, was too much for the bureaucrats at IBM headquarters, who promptly reigned the division back into the centralized corporate web. Before you could say I-B-M, the PC unit fell into disrepair and disrespect.

Now the newly minted PC division(s) at IBM are at it again. They are feisty, numerous and turning out quality products that are sopping up market share. Moreover, the multiple PC subdivisions, soon to be selling everything from bargain-basement PCs to servers, will sell products that will compete with and even possibly cannibalize one another. That's fine with PC division head Robert Corrigan, who knows that if IBM doesn't eat some of its own lunch, some competitor surely will.

It sounds awful to think that way. But that's business today at the low end of the hardware market. It is also a precursor of the way the market will develop higher up, say at the level of high-end servers and extending into the midrange. The measure of IBM's success in the future will be the degree to which it submits to the stark but oh-so-obvious reality that smaller, cheaper hardware will replace the really profitable machines around which the IBM of old was built.

Today, however, you will find the same IBM salespeople selling both RS/6000s and AS/400s. If you were the salesperson, which box would you push? The RS/6000 for $40,000 or the AS/400 selling for several hundred thousand? Remember, you're a salesperson, not the customer.

Logic would dictate that the new management at IBM will react favorably to the well-earned success of its PC division and emulate its entrepreneurial spirit in other divisions. That logic escaped management a decade ago. This time, however, failing to learn some new tricks will most assuredly destroy what a short time ago was the most admired, profitable company in the world.

Bill Laberis

Bill Laberis, *Editor in chief*

Missed the point

In News Shorts [CW, June 14], you mention that SQLWindows 4.0 has been ported to IBM's Application System/400. This is incorrect. SQL Windows 4.0 Corporate Edition is a client/server front end that now works against the AS/400 and operates on client PCs running Windows. The Corporate Edition includes a component called TeamWindows that allows teams of programmers to work collaboratively on enterprise client/server applications.

The article "Visual basic stirs competition" in the same issue states that our $199 special promotion of SQLWindows Standard Edition is directed against low-priced Visual Basic. This is wrong. We rarely, if ever, compete head-to-head against Visual Basic. Our promotion has to do with increasing market share of SQLWindows against PowerBuilder in Microsoft/Sybase SQLServer accounts.

Daniel C. Berkowitz
Gupta Corp.
Menlo Park, Calif.

Graphic grumbling

I'm still scratching my head over the chart accompanying the VAR story on page 37 of your June 7 edition. What does it say, and how relevant is it?

The story was about how software companies are preparing to distribute their software directly to users through electronic channels. Did the chart refer to the costs vendors incur in selling each license? It was unclear.

Was it a reference to the costs faced by end users? If so, what users? Are you telling me there is a successful, technology-dependent company that hangs onto software or hardware for five years? Mark Halper's front-page story in the same issue dispelled the five-year depreciation fallacy nicely.

And how many companies in the world have 2,000 workstations? Once you stop looking at the sexy Fortune 500, the average desktop computer network supports about eight machines, and that's in the technology-rich U.S. The best information for me is easily understood and relevant to me, someone in the middle market of computing.

David Killilea
San Jose, Calif.

No quick fix

In "IT's coming" [CW, June 14], Bill Laberis comments on the apparent contradiction between the old "productivity paradox" and the new "productivity payoff."

The paradox is not that we invest in technology and wonder where the promised productivity went, but that we continue to look for the quick fix.

Technology by itself will never solve problems. People solve problems. Technology enables them to solve larger problems if, and only if, they have the necessary skills. The answer to productivity will always lie in training and skills development.

As for the new productivity payoff? It smells of the quick fix again. Unless it is backed by solid training and education, the theme of "productivity paradox" will be back with a vengeance within a year or two.

Peter de Jager
Brampton, Ontario

Word watch

I was delighted by Michael Cohn's complaint about the abuse and misuse of words such as "paradigm," "infrastructure" and "world-class" ["Don't talk to me about paradigms" CW, June 14].

But just below his column I found a piece by Elaine Bond. Her prose suffers from all the excesses that characterize the technodialect that Cohn is bemoaning. Note the mixed metaphor in: "The pendulum swings are knee-jerk reactions...." Then we have: "Technology choices at the business-unit level are frequently suboptimized...." There is no such word as "suboptimized" in the *American Heritage Dictionary*. She also uses "apportioning" when she should have used "reassignment." Could Mr. Cohn help me out with this dilemma?

Javaid "Jay" Qazi

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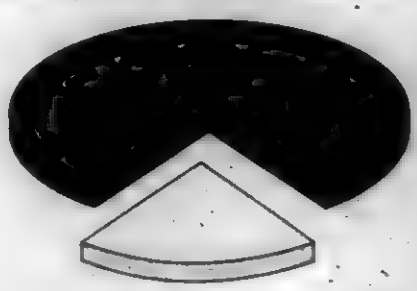

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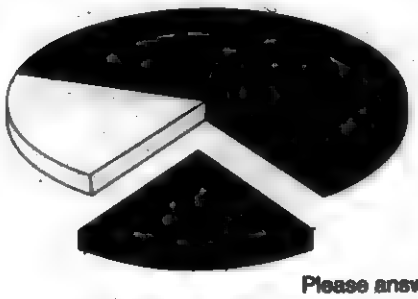

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Stealth beta

W. D. Riley

Purchasing a beta application disguised as production software is like getting carjacked and then pressed into service as the thief's chauffeur.

Phrases like "developers' release" and "early availability" simply don't convey the right message. They should have a picture of a bomb on the box and a suicide pill taped to the installation disk. That way, when your clients start losing their data, you can take the honorable way out while they're still forming a mob at your office door.

Frankly, I don't know anyone in his right mind who would pay good money for a "test" product, that is, if he knew that was what he was buying. I'm sure the people (me included) who bought OS/2 Version 2.0 a year ago thought they were buying production software. The same goes for the poor souls (me included again) who stuck with Ashton-Tate through the early dBase IV years.

In both cases, what we got was a thinly disguised beta version. OS/2 had so many patches that I don't know anyone who ever caught up with them.

Anyone remotely involved in the maintenance and installation of networks knows there are plenty of headaches to go around. No matter how "polished" the application, you're going to find a few bugs. But the difference between finding a few bugs and acting as a patsy for some company that just wanted to beat its competitors to market is the difference between flying United Airlines and the NASA space shuttle. In one case, you're paying good money to get from point A to point B; in the other, you're simply being strapped into the nose of a rocket with no flight attendant or peanuts.

I've been around this business for a while, and I've seen some really shady practices. But I was shocked when I found out about this little shell game. It reminded me of the time Cadillac decided to put Chevy engines in its cars without telling its customers. Now we're paying for unfinished software, and the manufacturers think they're giving us a break because they charge less for the privilege.

The jury is still out on Microsoft's Windows NT and OS/2 Version 2.1, but after paying good money for this latest release of OS/2, I'm going to be mighty upset if I find out it's no better than the last effort.

My only consolation is the fact that I bought my copy from a large software retailer. I think manufacturers are smart enough to realize that playing with their own reputation is one thing, but playing with the good name of another company is something else altogether.

Let me make this perfectly clear to software manufacturers: The people who buy your products are not going to stand for this. If you're giving your product away, you can do what you want. In fact, if you tell people it's a free beta version, they will line up to help you test it. But, if you're asking for money, we want something that works.

Riley is the microcomputer support manager for the City of Hope National Medical Center in Duarte, Calif.

We're all bozos on this bus

COUNTER-INFORMATION *by* Michael Schrage

True story: As a naive new hire at the *Washington Post* a decade ago, I was furiously typing a story on our Raytheon computer system in a bid to beat deadline. Nearly finished, I called out to my editor, "I'll be done in five minutes!" He yelled back, "Don't bother. I've already edited your story and sent it on to the copy desk."

Using a special "editors-only" function, the human reptile had digitally replicated my story and finished it off himself. I publicly cursed him and privately swore that, as God was my witness, I would only write stories in the "personal" mode, the one that denied access to meddlesome editors.

Another true story: The *Los Angeles Times* bureau in Washington, D.C., has a network configuration that effectively prevents its correspondents from filing their stories directly to Los Angeles. Stories must be routed through the editors' desks at the bureau. The Washington editors don't like to be bypassed, and they've got the software to enforce it. This annoys more than a few reporters.

Last true story: On the WELL (the Whole Earth 'Lectronic Link) bulletin board on CompuServe, participants now have the option to slap on a "bozo filter" to block comments made by people they consider trite, boring or a pain-in-the-pixels. Whenever you log in to the WELL conversation, your bozo filter flashes to let you know when you're screening out undesirables.

I sometimes wonder if mischievous sysops ever let people know how many bozo filters they trigger. . . . Am I being bozo filtered? Or am I just being paranoid?

What all these true network stories have in common is that they are more about power and politics than information and ideas. The millisecond I realized what my editor had done, my view of the newsroom network darkened into defensiveness. The instant I heard about bozo filters, my sense of WELL comity and community changed.

Issues such as who owns "your" E-mail and whether networks should allow anonymity are merely probes to the larger question of whether networks do a better job of social engineering than information systems management. More explicitly, should MIS (what a misnomer!) play an explicit role in using technology to better manage organizational values — or should they run, not walk, away from such combustible responsibilities?

Frankly, I've grown a little tired of the E-mail Eichmanns who "are just following orders/specs" when they install networks that make it easy for top managers to browse through other people's files.

But they're not other people's files; they're the company's files! If you say so. . . . I think it's unprofessional — and unethical — to offer LANs and WANs without broad consultation and discussion of their social implications.

Should a company offer bozo filters on its networks? Should it energetically promote their use? These aren't simple questions: I could make an excellent case either way. But I can tell you for a fact that when the rumor circulates (and one will) that, *whisper, whisper,* the boss now bozo filters his vice president of marketing, the politics of that firm will change.

Please don't consider this a plea for new media ethics or corporate compassion. In 1993 America, ethics arguments tend to be persuasive only when backed up by the threat of a lawsuit. Similarly, appeals to compassion aren't compelling at a time when people live in fear of being outsourced to save someone's budget.

Consider this an appeal for pragmatism: If networks breed roughly the same number of unpleasant surprises as pleasant ones, people won't trust them or one another. When politics, not productivity, is seen as the crucial design criterion, nobody will care what client/server architecture you choose.

Yes, human beings are "information processors," but anyone who treats human beings like information processors has a pretty warped notion of what it means to be human. Bozo filter them.

Schrage is a visiting scholar at the MIT Sloan School and the Laboratory for Computer Science. His Internet address is schrage@media-lab.media.mit.edu.

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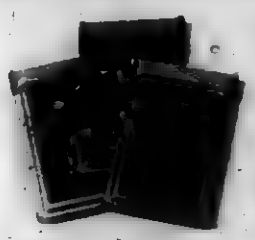

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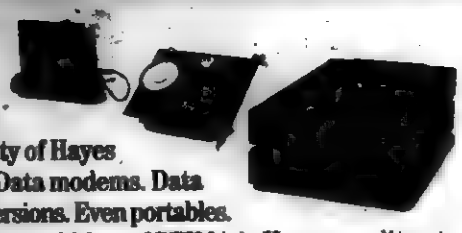

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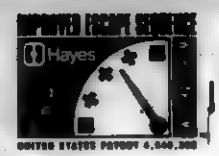

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Desktop Computing

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Recording company stays on top of its numbers with EIS

By Michael Vizard
NEW YORK

Being an information systems manager in the record and publishing industries during a tumultuous period of acquisition and growth has made Claudia Longo one of the most sought after people at the Bertelsmann Music Group (BMG).

In the last five years, this U.S. arm of a German parent organization, The Bertelsmann Group, has acquired the RCA Records and Arista recording labels in addition to the Bantam, Doubleday and Dell book publishing operations. And those operations are now being pulled together under one roof in a recently acquired 44-story office building near Times Square in New York, which last week was the site of a grand opening party that drew the likes of author Norman Mailer and jazz artist Kenny G.

ON SITE

Bertelsmann Music Group
New York

Profile: Privately held German conglomerate that expects to have revenue of $2.6 billion in fiscal 1993 from diverse recording and publishing interests, including RCA Records, Arista Records, Doubleday, Bantam and Dell book publishers.

Challenge: To provide top-level managers with a system that analyzes trends across business units.

Technology: Comshare's Commander EIS and One-Up multidimensional spreadsheet.

Overseeing business

To keep track of these business units, as well as two other recording labels, song publishing operations, children's music video offerings and a direct catalog sales business, all major executives at the BMG use the Commander executive information system (EIS) and the One-Up multidimensional spreadsheet software developed by ComShare, Inc.

As a project leader in the IS department at the BMG, Longo is responsible for developing applications, using Commander and One-Up, that will make it easy for BMG executives to analyze sales trends across business units operating in 39 countries.

Using this system, BMG executives are able to decipher the extent of a trend using data that is downloaded from an IBM DB2 database running on IBM mainframes in Indianapolis using Comshare's System W decision support software.

"For instance, we know that stores are already ordering country singer Clint Black's next album by the buckets," Longo said.

Companywide access

To accomplish this, Longo has installed 78 copies of One-Up in every major BMG office. Data entered into this spreadsheet is then polled by the IBM mainframe using an electronic mailbox service offered by General Electric Co. Daily sales information is downloaded into the Commander EIS systems that have been deployed on 20 DOS-based PCs in the offices of the company's top managers, including the company's chairman in Germany.

"I wish we could push the system further down the organization, but we just don't have the resources to do that," said Longo, who has two assistants to help deploy and main-

Recording firm, *page 40*

Portable challenges

IS managers find unexpected problems as PC users go mobile

By Michael Fitzgerald

Outfitting a business unit with notebook computers might at first seem like nothing more than just extending the desktop environment, but users will tell you that is not the case.

"You have to think about the world of mobile computing when you design your systems because systems must be as functional in the field as in the office," Sheldon Laube, national director of information technology at Price Waterhouse, said at the recent Dataquest, Inc. Mobile Computing Forum.

Price Waterhouse may represent the cutting-edge fringe of the portable world because 85% of the PCs it buys are notebook computers.

Also, the company's newer office buildings are structured like hotels, where employees who normally work at client sites call ahead to reserve an office.

Still, Price Waterhouse's needs seem to reflect what companies with numerous mobile users run across everywhere.

Apples and oranges

"The mobile paradigm is as different from PCs as PCs were to minicomputers," said J. Gerry Purdy, a Dataquest analyst. "Workers in general look to be more dispersed, so how do you do everything the same, or even better, on the road as in the office?"

The issue, according to Laube, is how to manage knowledge so end users are not constantly "reinventing the wheel" by doing work that has been done elsewhere in the organization, yet is not generally available.

IS managers at the show agreed that this was a major problem that many of them were just starting to get their arms around.

"We do 150 research projects a year, and each one becomes a little database in and of itself, so we don't have a good way to use all the information we have," said Randall Huber, director of information systems at Audience Research & Development in Dallas.

Huber added that when his company's researchers go on the road, even basic data management becomes a problem.

"We're still trying to do just simple things like coordinate addresses and phone numbers," he said.

Even vendors agreed that data management for a portable environment is thorny.

"Our corporate fleet users are still working on security issues, on how to keep up databases and on issues as small as how do you track removable hard drives," said Steven Andler, product marketing director at Toshiba America Information Systems, Inc.

Price Waterhouse's Sheldon Laube: *"Systems must be as functional in the field as in the office"*

Much of the focus centers on communications, particularly wireless communications. All sides agreed that wireless is simply not capable of supporting heavy-duty data needs right now [CW, June 28]. Future data types such as voice support or video will clog even land lines.

"This is a huge issue. How do you get big amounts of data out to the sales force?" said Alan J. Soucy, vice president of product strategy and advanced planning at Zenith Data Systems.

How to manage portable computers has become a hot button, in part because corporations such as Price Waterhouse are shifting their buying patterns from desktop PCs to notebooks.

Most analysts said they think personal digital assistants and other small, mobile computers will only increase the need for IS to figure out how to get information to end users.

Staying up to date

At Turner Corp., a large multinational construction company based in New York, "We've started to get really serious about notebooks as desktop replacements, and data management is something we're working on right now from a lot of angles," said William I. Lodge, project leader at Turner.

Lodge said the company was working on ways to keep electronic-mail connections and Lotus Development Corp.'s Notes groupware program, among others, up to date.

Better data throughput and improved communications clearly are important, and work proceeds on improved land-line communications as well as the brave new world of remote wireless computing.

"We are going through a reconstruction of the communications infrastructure to accommodate the mobile paradigm, and users definitely need to think about this before they implement systems," Purdy said.

At the same time, users such as Laube charge that the remaking of the communications infrastructure falls short of their needs.

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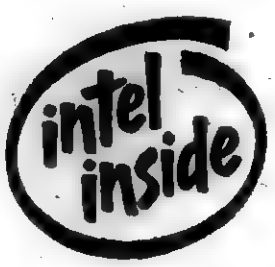

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Briefs

Switch announced

Microsoft Corp. named Patty Stonesifer vice president of the consumer division, effective next month. Her job as vice president of product support and services will be filled by Deborah Willingham, now general manager of end-user support.

OS/2 support offered

Unisys Corp. has agreed to support OS/2 Version 2.1 on its PW2 Advantage and Advantage Plus PCs. Unisys will also offer OS/2 2.1 as an option on its A series mainframes.

NT applications

The first effect of Microsoft's Windows NT push against Unix was seen at the recent Architectural/Engineering/Construction Systems conference in Anaheim, Calif. Seven software vendors that earn most of their revenue on Unix and OpenVMS workstations demonstrated their applications running under NT. They included Intergraph Corp., Timeline, Inc., Intellution, Inc., Graphisoft, Inc. and Autodesk, Inc.

Firm inks pact

4th Dimension Software Ltd. in Tel Aviv has signed an OEM pact with Fremont Systems, under which 4th Dimension will include support for Fremont's Advanced Printing Function technology in Be Control-D/PC for Windows report writer.

Kaleida works to build market for multimedia

By James Daly

The slow creep toward multimedia enjoyed a microburst of momentum recently when Kaleida introduced a set of services for developers crafting cross-platform multimedia titles.

Analysts, however, noted that the link between multimedia — the blending of audio, video and animation into traditional data presentations in an interactive manner — and the needs of the average computer user remains elusive and could represent a serious marketing challenge.

"I think a lot of these companies still have a lot of evangelizing to do," said Robert Anderson, a senior analyst at A. O. Smith Automotive Products Co. in Milwaukee. "They need to better explain how it would fit into our organization and exactly what it could do to help us better perform our jobs."

Expanding the market

By offering multiplatform compatibility via its ScriptX programming language, Kaleida officials said they hope to create more market opportunities for multimedia developers and grow the market beyond its current limited use. For now, multimedia use seems to be confined to the areas of marketing or training.

ScriptX is an object-oriented multimedia description language that will allow developers to craft one title that will work on many kinds of devices, from desktop PCs to consumer electronic devices. ScriptX is currently in a "pre-alpha state," a Kaleida spokesperson said, with availability not expected until spring.

So far, multimedia applications have made limited inroads in the corporate world. "IS still tends to be data- and applications-driven, and I think it will remain so for some time," said Brian Comnes, manager of the information center at DHL Airways, Inc. in Redwood City, Calif.

One notable exception is BC Hydro in Burnaby, British Columbia, where information systems manager Eric Joa recently used a sophisticated multimedia presentation to explain to management some recent progress on a complex $10 million client/server networking project that will service 600 users.

"Directors can sometimes be very nervous, but multimedia made it very easy to describe all the complex things we're doing," Joa said. "I think they're a lot more comfortable now."

Repair help

Another interesting use of multimedia occurred at Union Carbide Corp. in South Charleston, W. Va., where repair personnel tap into nearby computer monitors to watch video descriptions of the correct ways to fix complex machinery.

Kaleida officials said they hope the introduction of the cross-platform tools will free developers to create more applications. Currently, financial constraints force many developers to limit their titles to a single platform. But without a single, widely accepted standard for these platforms, it is tough to get user acceptance.

Developers can sign up for the Kaleida Developer Program at either the Vanguard or the Associate level. Vanguard members will receive both Alpha and Beta ScriptX Software Development Kits, along with four days of training and consulting. Associate members will receive Beta ScriptX Software Developer Kits, training and consulting on a for-fee basis.

Free software tracks errors

By Christopher Lindquist

As reports of problems with Microsoft Corp.'s DoubleSpace disk compression continue to fill CompuServe's forums, a utility software vendor is offering a free version of its product designed to check for potential problems before they cause data loss.

TouchStone Software Corp. in Huntington Beach, Calif., is supplying a no-cost copy of the CKMedia applet from its CheckIt Pro hardware diagnostics software. The applet performs media tests on hard drives to determine whether bad or questionable sectors or clusters of the disk are being used. It also checks for invalid characters in file names and for cross-linked files, both of which can lead to difficulty with DoubleSpace, according to the company.

Microsoft has reportedly removed CKMedia from the MS-DOS forum, but the utility is still available under the name DOSPR6.ZIP in the IBMSYS forum.

If any problems are discovered, an information file informs users how to make their system as safe as possible for data compression.

The issue came to TouchStone's attention when three employees had hard-drive failures after loading DoubleSpace. A search of CompuServe indicated that other people were also experiencing problems, according to Shannon Jenkins, company president and chief executive officer. "We deduced that there was a problem that users were not aware of — the fact that they should be testing their drives," she said.

As a result, the free version of CKMedia was released to help users identify potential conflicts and to educate them about the need for periodic system diagnostics. "I think people are willing to accept that you can't drive your car 20,000 miles without changing the oil," she said, noting that users should treat their computers in the same manner.

Recording firm

CONTINUED FROM PAGE 37

train EIS applications.

According to Longo, the major benefit of having the Commander EIS coupled with the One-Up spreadsheet is that they let the company's executives easily analyse and compare data.

"They use it to compare business plans and forecasts with historical data and actual sales figures across about 550 line items. And because we're an international company, you have to be able to provide that data in a format that matches their local currency and accounting procedures," Longo said.

Because of this, the BMG needed a spreadsheet that was tightly linked to an EIS, rather than just an off-the-shelf multidimensional spreadsheet, according to Longo.

In the immediate future, Longo said, her goal is to upgrade users of the EIS systems to a Windows operating environment. "Our fiscal year begins in July. You'd be surprised how much money in the department becomes available to buy hardware around here in July," Longo said.

She added that she expects it to be much easier to program under Windows as well. "What used to take about 540 buttons is now going to take three buttons to create," Longo said.

In conjunction with that effort, Longo plans to tie the BMG's systems into a new numbering scheme for recorded music that has been adopted by the recording industry.

"Most of the U.S. and Canada uses a common numbering scheme, but getting the international units up to speed has been a problem because of different languages and numbering schemes," Longo said.

Airlines curtail PC use

By Ellis Booker

United Airlines recently became the latest carrier to limit passenger use of personal electronic devices (PED), including PCs, during takeoffs and landings.

Chicago-based United said its policy, which went into effect July 1, is a precautionary measure "to address the possibility of such devices causing electromagnetic interference with cockpit navigation or communications systems."

Passengers will be told not to use personal electronic devices while the plane is on the ground or when it is flying below 10,000 feet.

Similar restrictions have been adopted by Northwest Airlines, Delta Air Lines and American Airlines. On June 1, Japan's nine airlines established a ban. All airlines outlaw the use of signal-generating devices such as cellular phones and radio-controlled toys.

Since 1986, there have been about 40 anecdotal reports from U.S. airline pilots about navigational and communications systems being affected by PEDs.

Aircraft navigation and communications systems operate in the 108- to 118-MHz and 118- to 136-MHz radio bands, respectively.

Under the Federal Aviation Administration's direction, RTCA, Inc., a not-for-profit federal advisory committee, is currently reexamining its 1988 report and recommendations on PEDs. RTCA expects to issue an interim report in October.

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GA-1304

Jeffrey Henning

Open systems challenges

In the mid-1980s, users hungry for PCs were satisfied with whatever vendors were willing to serve up. Often that amounted to just two combination platters — the Apple Macintosh and the IBM-compatible PC. But users' palates have grown more sophisticated. Now they have a hankering for more choices, and they want more open systems.

True, today's IBM-compatible PCs are more open than ever before, with operating systems available from multiple vendors and — in a dramatic change from the past — with X86 chips available from multiple vendors. But users want even more.

They want to avoid being locked into one vendor, should that vendor offer too narrow a product line, be slow to innovate, fail to provide adequate pricing and service or — in the worst case — go out of business. As a result, users want even more freedom of choice than they have today: They want to be able to run their PC and workstation software on any hardware platform.

Users want applications to be as interchangeable across operating systems as cassettes are across tape players.

To meet this need, vendors are implementing a new layer above the operating system — the application platform — to enable systems to run software designed for other operating systems.

> **Users should choose hardware vendors willing to act as system integrators.**

Windows applications platforms are or will be available for OS/2, Novell's UnixWare, Sun's Solaris and other Unix variants, and a Macintosh application platform will be available for Apple and IBM's new Unix variant, PowerOpen.

Any combination

By the late 1990s, users will be able to deploy almost any application on any operating system on any CPU architecture, in a system from any vendor. The next decade of computing will be driven by processor independence and operating system independence — in other words, vendor independence.

Users will be free to almost instantly discontinue business with a vendor without jeopardizing their information technology investments. A user organization that loves the Macintosh interface will no longer be beholden to Apple for its hardware but free to buy hardware from IBM and others.

A company that has standardized on Windows applications will still be able to use that software on a more powerful operating system, whether it be Microsoft Windows NT, OS/2 or Unix. Users will have more opportunities to determine exactly which configurations will provide them with a competitive advantage.

Dig deeper

In order to fully take advantage of their new opportunities, users will need to research various solutions in more detail, placing special importance on the ability of products to work together.

With all this freedom comes responsibility, of course, and users will face more bugs and more support problems as they create unique environments that strain the ability of products to interoperate.

Worse, users will experience their greatest frustration as vendors pass the buck and respond to crises by saying, "It's not a problem with our product; talk to your other suppliers."

Users will have to pressure vendors to talk to their other suppliers and will have to take their business elsewhere when vendors are not up to the task.

Despite having the freedom to switch, users will actually want to work with fewer vendors.

This may seem counterintuitive, but while users like the freedom to choose, they want that freedom mainly as an option, to keep suppliers on their toes. For the most part, users want to build long-term relationships with their suppliers.

Golden handful

With PCs used in ever more critical applications, users will want to work with that handful of companies that can support them across the enterprise and can help them manage the complexities of heterogeneous environments.

As a result, users should seek out hardware vendors willing to act as system integrators and flexible enough to integrate hardware, software and peripherals from competing vendors according to users' specifications.

It is a brave new world. Vendors are changing from gourmet chefs to short-order cooks. The days of the combination platter are over, and the PC market is becoming a buffet table: Users hungry for PC meals a la carte.

Henning is a senior industry analyst at BIS Strategic Decisions in Norwell, Mass.

Peripherals

Seagate Technology, Inc. has announced the 2.5-in. 170M-byte ST9190AG and the 127M-byte ST9140AG disk drives.

According to Seagate, the disk drives provide up to 35% higher capacity and 45% lower power dissipation than other 2.5-in. products now available.

Both the ST9190AG and the ST9140AG feature an industry-standard AT interface, 120K-byte multisegmented adaptive cache and a 16-millisecond average seek time, the company reported.

Mean time between failure is said to be 300,000 hours.

The disk drives use Seagate's SafeRite shock-sensing system.

The ST9190AG costs $390, and the ST9140AG costs $325.

▶*Seagate Technology*
920 Disc Drive
Scotts Valley, Calif. 95066
(408) 438-6550

Software application packages

Altsys Corp. has announced Virtuoso 2.0, an Adobe Systems, Inc. PostScript design and production program for Microsoft Corp.'s Windows NT.

According to Altsys, Virtuoso is the first graphics program to incorporate advanced PostScript drawing, page layout, text creation/editing and production capabilities into a single program.

A comprehensive spell checker, an on-screen font panel and a new path utility function have also been included, according to the company.

The Windows NT version will be available during the third quarter of this year.

A floating network license for Virtuoso 2.0 costs $695.

▶*Altsys*
269 West Renner Pkwy.
Richardson, Texas 75080
(214) 680-2060

Cadman Corp. has introduced ViewPort+, a software program that allows users to instantly view specifications, drawings and other forms of data.

ViewPort+ offers the ability to batch process files, view scanned images, function on any DOS network, support 61-character file names, link text with graphics and support multisheet drawings.

ViewPort+ costs $595 for View-Only capability and $795 for View-and-Markup capability.

▶*Cadman*
Suite 306
223 E. Thousand Oaks Blvd.
Thousand Oaks, Calif. 91360
(805) 371-0424

Utilities

Q-Soft, Inc. has started shipping Smart Palette, a Windows utility that provides floating icon tool palettes for any Windows 3.1 application.

Sample palettes are provided for use with common Windows programs such as File Manager, Program Manager, Windows Write, Paintbrush, Cardfile, Calendar, Terminal and Notepad.

A bit-map editor called Smart Paint allows users to create their own bit-mapped images or change the existing samples for use on the Smart Palette buttons, the company said.

Smart Palette costs $99.

▶*Q-Soft*
Suite 33C
16 Winter St.
Waltham, Mass. 02154
(617) 899-4685

Macintosh products

No Hands Software has started shipping Common Ground 1.0, an electronic document exchange and distribution program for the Macintosh.

With Common Ground, users can create documents and view, search or print them without needing to make fonts or applications on their systems, the company reported.

Documents created in any application can be turned into a platform-independent file format with DigitalPaper, a technology included with the product.

A Macintosh running System 6.05 or higher with a minimum of 700K bytes of free memory is required.

Common Ground costs $189.95

▶*No Hands Software*
Suite 220
Belmont, Calif. 94002
(415) 802-5800

The Triangle Software Division of Datawatch Corp. has released Virex 4.0, a feature upgrade to the company's Macintosh antivirus software.

Virex 4.0 includes a simplified installation procedure, a new color interface, an enhanced network installer, drag-and-drop diagnosis, support of Apple Events and diagnosis of active and open files.

The product offers a feature called ScanStalker that scans files and disks for the presence of known viruses, according to the company. Before the program is installed, ScanStalker fixes any infections.

One unit of Virex 4.0 costs $99.95.

▶*Datawatch*
Triangle Software Division
3700-B Lychan Pkwy.
Durham, N.C. 27707
(919) 490-1277

Applied Engineering has introduced the FastMath LC III, a math coprocessor.

The FastMath LC III was designed to increase statistical applications on the Macintosh LC III.

The product consists of a 68882-25-MHz floating-point unit that plugs into the coprocessor socket on the Macintosh LC III. It has the ability to accelerate math-intensive programs, including scientific functions, spreadsheets and computer-aided design programs.

The FastMath LC III coprocessor costs $109.

▶*Applied Engineering*
2210 Beltline
Dallas, Texas 75234
(214) 241-6060

Why PowerBook is popular with people who use Macintosh.

Flexible choices. *Five all-in-one models with built-in floppy drives provide a range of choices for screens (color, black-and-white or gray-scale) and processor speeds. Two PowerBook Duo models turn into powerful desktop systems when used with a Duo Dock.*

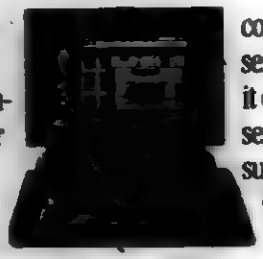
Colorful possibilities. *Mobile presentations are easy with a color PowerBook, or by using built-in video-out to drive up to a 16-inch color monitor.*

Quick service. *A toll-free repair hotline gives PowerBook users access to the fastest possible service, anywhere in the U.S.*

Easy data transfer. *PowerBook easily shares files with a desktop Macintosh over a network. It can also connect directly in SCSI mode, transferring files almost as quickly as an external hard disk.*

Fully expandable. *Most PowerBook models have a SCSI port that lets you connect to up to seven external devices, such as a scanner, CD-ROM drive or Ethernet interface.*

As people search for new ways to boost productivity outside the office, more and more are choosing Apple® PowerBook™ computers. And not just because of the familiar benefits of the Apple Macintosh® system.



Unlike other notebook computers, PowerBook is designed for the way people actually work when they are away from their desks.

Beyond the walls of the office, they need to stay connected to their network for access to servers and e-mail, and PowerBook makes it easy. They need to make full-scale presentations, and PowerBook provides built-in support for color monitors, sound and QuickTime™ software-based movies. They need to be able to send and receive faxes, and PowerBook can make that simple, too.

In fact, with its award-winning design, PowerBook makes it easier to get any kind of work done, anywhere.

Even people who need both portability and full expandability find a solution in PowerBook. Because the PowerBook Duo™ System offers the best of both worlds—a notebook computer that transforms itself into a powerful desktop computer.

Clearly, organizations using Macintosh have helped make PowerBook the nation's best-selling notebook.

But they haven't done it alone.

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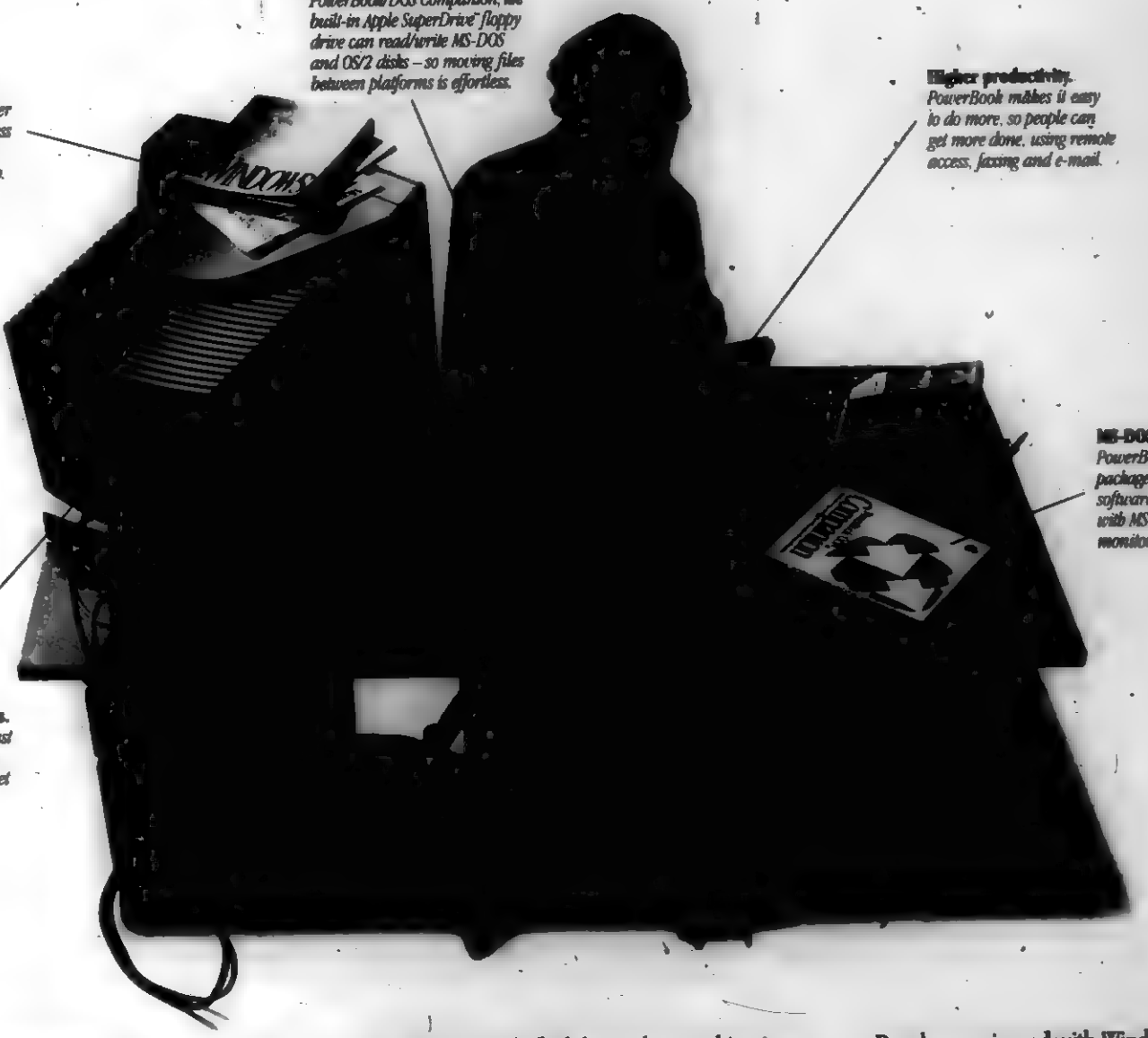
Why PowerBook is popular with people who use MS-DOS and Windows.

Easier support. *PowerBook requires less training than other notebooks. So you can spend less time helping frustrated users, and more time doing your job.*

One drive fits all. *Using software included in the optional PowerBook/DOS Companion, the built-in Apple SuperDrive™ floppy drive can read/write MS-DOS and OS/2 disks – so moving files between platforms is effortless.*

Higher productivity. *PowerBook makes it easy to do more, so people can get more done, using remote access, faxing and e-mail.*



MS-DOS-friendly. *The optional PowerBook/DOS Companion package gives you the necessary software and cables to work with MS-DOS files, printers and monitors you already own.*

Preserves your investments. *PowerBook is designed not just to work with existing desktop equipment, but to help you get the most out of it.*

PowerBook has also become the notebook computer of choice in some rather surprising places. Not only because it's designed for the way people work outside the office, but because it works so well with computers running MS-DOS or Windows.

The optional PowerBook/DOS Companion™ lets PowerBook users access MS-DOS files from most popular business applications, connect to VGA and SVGA monitors and work with over 1,000 different printers.

So whether people find themselves working in a branch office, a client's office or their own office, it's always business as usual.

PowerBook is designed so people can easily share files with colleagues who use Macintosh or MS-DOS computers. Without a dedicated server, it can connect directly, over the office network or over the telephone lines. It also gives people a simple way to retrieve data from mainframes and minicomputers.

People experienced with Windows applaud the simplicity of PowerBook. They also appreciate a notebook that integrates essential mobile-computing features like networking, video-out and file sharing.

And they appreciate a notebook computer that finally gives them the power to get the most out of their existing investments. The kind of power that's easy to get used to. The power to be your best.™ Apple.

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According to IDC (International Data Corporation), the installed base of internetworking devices has been growing at an average annual rate of over 65% for the past four years.

With this explosive growth comes the need for network management systems to simplify management operations. The SNMP (Simple Network Management Protocol) has rapidly become the de facto standard for these management systems.

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Users tread lightly in client/server water

Financial manufacturing applications making progress, but slowly

By Kim S. Nash

While underautomated human resources departments have become a proving ground for prepackaged client/server software, financial and manufacturing groups are starting to see similar applications.

However, recently released products, and some that are due soon, from Dun & Bradstreet Software, PeopleSoft, Inc., SAP America and other firms sidestep some sticking points in moving to client/server, users and analysts said.

By and large, the applications are too small and focused to effectively convert the masses to client/server, they said.

The products are workable in departmental, decision-support-type areas, such as human resources. However, moving to heavy-duty on-line transaction processing means users are looking for help with support, administration and understanding how the conversion from mainframe-based systems wrenches business practices.

"It can get ugly," said Brian Summer, worldwide director at the Software Intelligence Group, a market research arm of Andersen Consulting.

A large Canadian firm that Summer is working with, for example, wants to move a mainframe-based general ledger system to a client/server setup of PCs and Unix machines.

"That involves running through 1.1 million journal entries per day. We'll see whether client/server is ready for that," Summer said.

Make no mistake: Current client/server packages do fill several needs, such as making better use of less expensive millions of instructions per second in PCs and workstations and giving end users reporting tools to free glass house staff for other work.

However, in a chaotic, infantile market, users have to take extra care to distinguish between problems caused by new software and those resulting from networking equipment or an information systems staff and users struggling with the changes.

Hot seat

"We don't have a raging inferno, but there's a brushfire out there every day," said Jay Stright, manager of operations and technical planning at the human resources and employee services unit of Chevron Corp.

Stright said he is generally satisfied with the progress of several projects under way to migrate human resources for about 400,000 current and former employees from IBM mainframes to a series of local-area networks linking Intel Corp. 1486-based PCs and servers.

To extinguish the fires, he counts on a close relationship with Tesseract Corp., a software maker in San Francisco.

"Chevron tries to identify companies to have a strategic relationship with, where we can influence their direction and they can work with us, too," Stright said.

New client/server financial, human resources and manufacturing applications have specific strengths and weaknesses. For example, some so-called client/server applications are simply Unix ports of mainframe- or minicomputer-based systems. D&B Software's Open Millenium line and several Compuatron products are of that genre.

"Some of these things may not even have a GUI," said Dick Dionne-Keay, an analyst at Summit Strategies in Boston. "Client/server certainly has many meanings, doesn't it."

Client/server, *page 48*

Standards spelling

Boston consultancy Advanced Manufacturing Research is developing standards for client/server manufacturing software that supports multifunctional teams and connects suppliers and customers with manufacturing companies.

Price plummet

By now we know that client/server is not cheap, but software prices will drop during the next 18 months, analysts said.

Along with the steep costs of installing network software and hardware, PCs and workstations, first-time client/server users have to shell out large sums for client/server software.

For example, a single human resource or financial module from Cyborg Systems, Inc. can run up to $900,000, depending on platform. PeopleSoft products start at $100,000 each, and the base price of D&B Software's new flexible benefits module is $88,000.

But new entrants and/or modified pricing from rivals will drive down those high tags, said Dick Dionne-Keay, an analyst at Summit Strategies in Boston.

FlexiWare Corp. in Shelton, Conn., offers a financial package for between $15,000 and $100,000. "It doesn't have all the functionality of a PeopleSoft," Dionne-Keay said, "but that might be enough for some users." — *Kim S. Nash*

A SAMPLING OF NEW CLIENT/SERVER APPLICATIONS*

[illegible]	[illegible]	Windows, OS/2, Unix; SQL Server, Oracle	$35,000 - $750,000 Shipping
IFA	CA-HYDRA	Windows, OS/2; DB2	$85,000 Expected Q1 '94
Cyborg	Solution Series	Unix, NetWare; DB2, Rdb, Oracle	$50,000 - $360,000 Shipping
[illegible]	Financial Stream	Windows, DOS, HP/UX, DG/UX; SQL Server	To be announced in July
	HR Stream	See above	$88,000 + Flex module shipping, others Q4 '93
[illegible]	FlexiPayables	Windows, DOS, OS/2, NetWare, Unix; SQL Server, SQLBase	$5,000 - $100,000 Shipping
[illegible]	[illegible]	OS/2, NetWare; SQLBase	$50,000 + Shipping
PeopleSoft	PSFinancials	Windows, OS/2, Unix; SQLBase, DB2, Oracle, Allbase, Rdb, SQL Server	$100,000 + Expected Q4 '93
[illegible]	SoSoft to Platinum	Windows, OS/2, NetWare; SQL Server	$10,000 Shipping
SAP	R/3	Windows, AIX, HP/UX, Ultrix; Oracle, Informix	$150,000 - $500,000 Shipping
[illegible]	Tessaract HR	OS/2, Windows; DB2	Expected Q1 '94

*excludes products that are simply ports of host-based systems

Insurer's financial model spawns profits

By Mitch Betts

As the insurance business became more complicated, Yasuda Fire and Marine Insurance Co. in Tokyo found that the computer model it used to guide financial investment decisions was not keeping up.

Like many insurance companies worldwide, Yasuda is becoming more of a financial services firm as it issues a growing number of savings-oriented policies. The policies have a wide range of maturities and fluctuating interest rates.

So Yasuda teamed up with Frank Russell Co., an investment consulting firm in Tacoma, Wash., to develop a more sophisticated financial planning tool that could deal with all of those complications, as well as new government regulations for minimum capital reserves.

In essence, the challenge was to create a decision-support system that would tell Yasuda's investment managers how to invest their portfolio of assets in order to meet multiple and conflicting objectives.

The new Russell/Yasuda model enables the firm to produce a high income to pay the annual interest on savings-type policies without sacrificing the longer term goal of maximizing profits.

In its first year in action, the model increased Yasuda's income by $26 million more than would be expected using Yasuda's old methodology, without sacrificing total return, according to Kunihiko Sasamoto, deputy president of Yasuda.

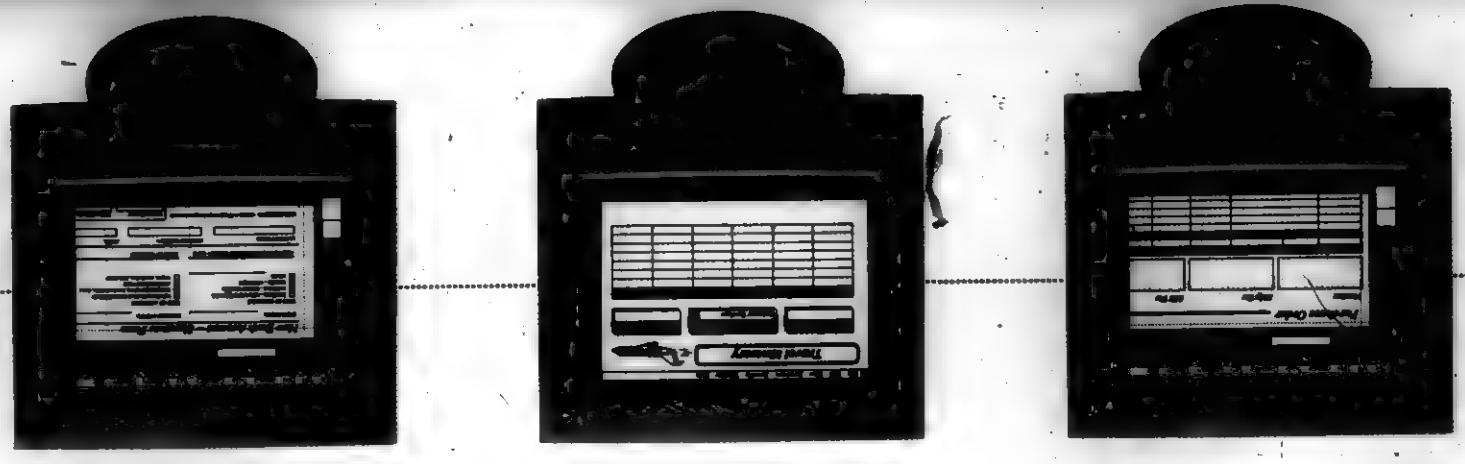
The higher income yield gives Yasuda a competitive advantage by allowing it to pay larger bonuses to savings-type policyholders. That helps the company retain existing customers and attract new ones, Sasamoto said in a prepared statement.

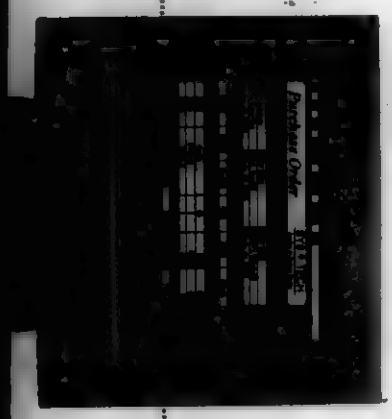
Award winner

Because of its breakthrough success, the Russell/Yasuda model recently won second prize in the prestigious Franz Edelman Award for Management Science Achievement competition, sponsored by The Institute of Management Sciences.

According to the award-winning technical paper, much of the model's benefit is derived from the fact that it paints a

Financial model, *page 48*





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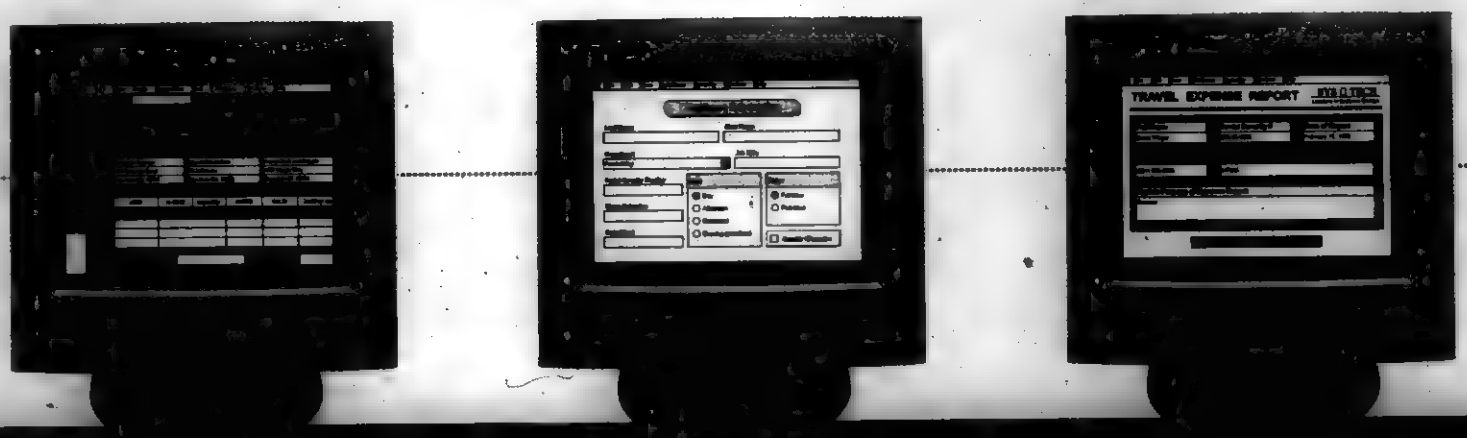

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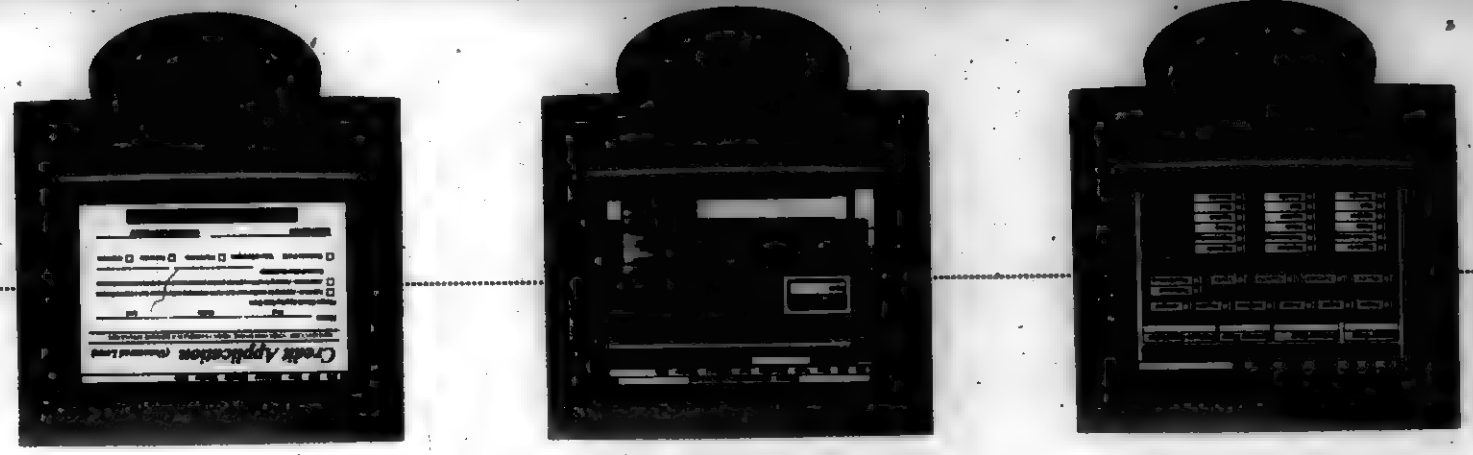

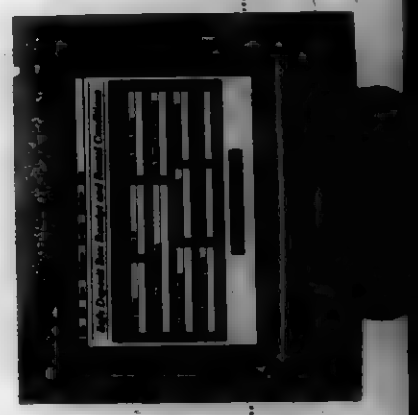

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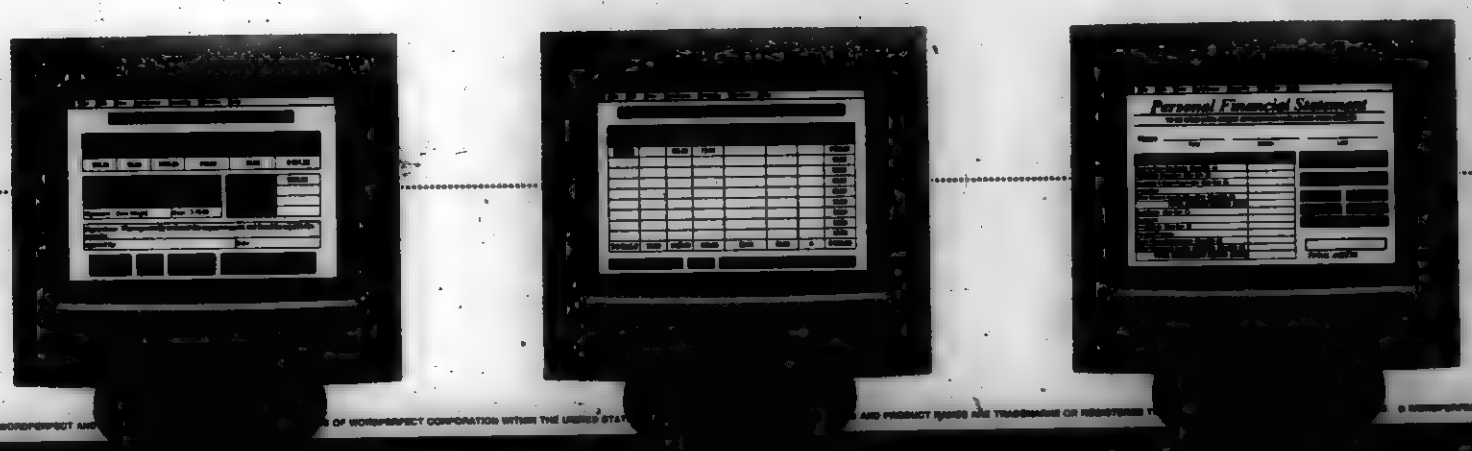

INFORMS

WordPerfect

Users tread lightly in client/server

CONTINUED FROM PAGE 45

While the vendors duke it out, analysts offered assessments of some of the players.

Avalon Software, Inc. is one of the relatively few companies selling client/server manufacturing software. But distributed manufacturing is so new that few Avalon users have set up a full-fledged client/server operation, said Ted Rybeck, analyst at Advanced Manufacturing Research, Inc. in Boston.

Users must redesign how manufacturing is done, spreading out the tasks to different locations and people, Rybeck said. Plus, effective manufacturing systems must be tied to a company's financial programs. "That's a lot of client/server to throw at someone," Rybeck said.

D&B Software's strength is the work-flow tools in its client/server offerings, but the company is bogged down by a large installed base of mainframe customers who it must support, according to Summer.

Work-flow tools can help users identify and revamp business processes, providing at least an outline of what new systems should look like, he said. "That's where the real benefits of client/server come from — not just reautomating the old ways," Summer said.

As a young firm, PeopleSoft does not have to deal with demands from big iron customers, but it does have to convince potential users that it can play in a Fortune-class market.

Like D&B Software, PeopleSoft has to come through with financial modules promised for this year (see chart page 45).

Financial model

CONTINUED FROM PAGE 45

more realistic picture of Yasuda's complex business environment.

"In the past, for computational reasons, simplifying assumptions had to be made. Today, the power of workstations and the mathematics of stochastic programming make it possible" to develop a realistic business model and solve complex problems in a reasonable time frame and cost, the paper stated.

The financial model, which is programmed in C and Fortran and uses IBM's Optimization Subroutine Library, runs on an IBM RISC System/6000 Model 530. Depending on the number of scenarios, the system arrives at a solution in one to three hours.

Traditional simulation techniques may find a satisfactory investment strategy, but there is no guarantee that a much better solution is not waiting to be found. The Russell-Yasuda optimization model seeks out the best possible course of action, the paper said.

Because the model is realistic and can cope with complexity, Yasuda's managers trust it enough to make core business decisions, Sasamoto added.

The Russell-Yasuda model can be adapted to a variety of financial institutions, as well as to manufacturing and other resource-allocation problems, according to Christine Noonan, director of marketing at Russell Business Engineering, a unit of Frank Russell Co. that is marketing the system.

Place of honor

The Russell/Yasuda financial planning model won the $3,000 second prize in the 1993 Edelman awards competition, which concluded last month in Chicago. The award, sponsored by The Institute of Management Sciences in Providence, R.I., is named in honor of Franz Edelman at RCA Corp., one of the earliest industrial advocates of the management sciences. The 1993 first prize went to AT&T for a simulation tool that helps customers analyze their toll-free number call center operations.

[redacted]

CPU

NCR Corp. has introduced the NCR System 3333, a multifunctional, industry-standard PC that offers the capabilities of a server.

The product can be used as a standalone PC, a client workstation or a small departmental or branch office server, according to the company.

Based on Intel Corp.'s I486 microprocessor system, the NCR 3333 offers three graphics adapter options: a workstation graphics adapter, a Windows graphics adapter and a Super VGA graphics adapter. A typical configuration costs approximately $1,356 and consists of a 486SX 25-MHz microprocessor, a 120M-byte hard drive, 4M bytes of random-access memory, a 3½-in. flex drive, MS-DOS 5.0 and Windows 3.1 preloaded, a workstation keyboard and a mouse.

▶*NCR*
1700 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-2078

Tatung Science & Technology, Inc. has started shipping the micro COMPstation LC, a workstation similar in design to Sun Microsystems, Inc.'s SPARCclassic.

According to Tatung, the product is being bundled with SunSoft, Inc.'s Solaris 1.1 distributed computing environment, enabling users to access more than 3,500 compatible software applications.

Entry-level models of the micro COMPstation LC feature 16M bytes of random-access memory expandable to 128M bytes and a 207M-byte hard drive expandable up to 2G bytes.

Prices start at $3,690.

▶*Tatung Science & Technology*
1840 McCarthy Blvd.
Milpitas, Calif. 95035
(408) 383-0966

Workgroup software applications

Minx Software, Inc. has announced its new line of "Integration by Design" products.

According to the company, DataBench is a graphical query-and-analysis package that offers a point-and-click interface for easy manipulation of data. The product provides access to presentation-ready data.

With PlanningBench, users can create, adjust and analyze planning scenarios in minutes, without shutting down their system for a weekly manufacturing resource-planning run.

A single-user license of DataBench starts at $3,500. Pricing begins at $7,200 for a single-user license of PlanningBench.

▶*Minx Software*
Suite 224
1762 Technology Drive
San Jose, Calif. 95110
(408) 453-6469

Unix

Workstation Solutions, Inc. has introduced Quick Restore (QR), a backup-and-restore solution for enterprisewide Unix networks.

The QR engine features the company's LibMan library management module and a graphical user interface. QR controls both local and remote backups and restorations from any point in a heterogeneous network.

The product employs an advanced tape drive technology called "direct-to-block positioning" that eliminates the process of reading data sequentially by allowing the product to quickly find a file or directory for restoration anywhere on a backup tape, the company said.

Base price for the QR engine is $2,950.

▶*Workstation Solutions*
1 Overlook Drive
Amherst, N.H. 03031
(603) 880-0080

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Joanie M. Wexler

Wireless etiquette

Start saving up now for therapy sessions to deal with the guilt.

I'm talking about the nagging tugs on your priorities that are bound to intensify when those slick-looking gizmos known as wireless personal communicators become a way of life.

Your guilt complex will probably kick in around the same time your frustration level blasts through the roof as you fork over still more control of your time to people now able to contact you wherever (think about it — *wherever*) you are. And if you are conscientious, you'll likely also start agonizing over whether you're really doing your job if you shut your gadget off.

Anytime, anyplace

The dilemma of when to put the workday behind you — already an issue for many — is soon destined to hit the wireless-empowered masses. New corporate cultures will be structured around the assumption that employees *really* can be reached if they *really, really* have to be because technology makes it possible.

Wexler, *page 53*

Branch offices enter LAN fold

By Elisabeth Horwitt
SUNNYVALE, CALIF.

■ Two forthcoming products from Novell, Inc. may finally put local-area network internetworking within reach of corporate branch offices with limited equipment and technical support budgets.

The two turnkey packages will provide users with everything they need to interconnect LAN clients over an IBM Systems Network Architecture (SNA) or multiprotocol router backbone. Each package is priced at 47% less than it would cost to buy the components individually, Novell said.

NetWare SNA Branch Office and NetWare Internetworking Branch Office also minimize the need to employ technical personnel at each branch site by enabling data centers to remotely configure and manage the packages' components from a central NetWare server, a Novell spokesman said. Users can set up a configuration on the headquarters server, then distribute that "cookie-cutter" configuration to all branch offices.

Fewer user worries

This is welcome news for one user at a large manufacturing firm. "Our operation runs fairly lean, so we have probably a 20-to-1 or 50-to-1 ratio of branches to people supporting them," he said.

"We've been hitting Novell with the fact that they've got to bundle these things together, into a LAN in a can, for integration and support purposes," the user said. By offering users a preintegrated turnkey networking package, Novell saves users from worrying about whether they have the correct software version or whether it is fully integrated with other pieces, he added.

"Novell is aiming at branch offices at the low, low end, where the action is now" in terms of LAN and internetwork deployment, said Janet Hyland, director of network strategy research at Forrester Research, Inc., a Cambridge, Mass., consulting firm.

"Cutting the price was a terrific idea; the $64,000 question is whether Fortune 500 companies will want to put everything, hubs included, in one server," she said.

Forrester's clients have indicated that they want to put their hubs and routers on boxes separate from NetWare servers, Hyland said.

Integration and support

A number of internetworking and SNA controller companies have agreed to support Branch Office packages on their boxes and provide integration and support services. This gives Novell a new, potentially fertile channel that can provide more effective SNA and internetworking support products than most value-added resellers, according to Rick Villars, a director at International Data Corp., a Framingham, Mass., research firm.

Both of Novell's Branch Office packages include NetWare, NetWare Global Message Handling System 2.0, NetWare Hub and a NetWare Management Agent.

Internetworking Branch Office also includes NetWare MultiProtocol Router Plus 2.1. SNA Branch Office includes NetWare for SAA 1.3 and NetWare SNA Links 1.0.

The 20-user NetWare v3.11 version of SNA Branch Office is scheduled to ship at the end of this month. The 20-user NetWare v3.11 version of Internetworking Branch Office is scheduled to ship this fall.

Third-party contributions

Novell's Branch Office is very much a third-party vehicle, depending on other vendors to provide users with a broad choice of connectivity applications and underlying hardware.

Among the slew of vendors that announced support for the packages last week were several SNA controller vendors that plan to run the SNA Branch Office on their own hardware.

Bus-Tech, Inc., for example, is working on two SNA controllers that will support SNA Branch Office. A data center version will provide a host channel connection for the central NetWare server; a remote version will support SNA connections at the branch office, a Bus-Tech spokesman said. In keeping with Novell's strategy of minimizing support and maintenance at remote sites, the platforms will be "ruggedized" and will support Novell's software for remotely managing and configuring its branch office platforms. The products are scheduled to ship by year's end, with the branch office version to be priced at $10,000 to $15,000.

In addition, Bus-Tech and its parent company, Network Systems Corp., will provide crucial service and support for the SNA Branch Office package, the Bus-Tech spokesman said. Indeed, Branch Office opens up a whole new channel for Novell, consisting of major SNA companies such as Bus-Tech and Memorex Telex, which can provide the SNA expertise and "direct interaction with IS departments" that most Novell VARs lack, said Rick Villars, a director at International Data Corp.

—*Elisabeth Horwitt*

NASA makes the Internet user-friendly

By Gary H. Anthes
WASHINGTON, D.C.

At NASA, you don't have to be a rocket scientist to use the Internet.

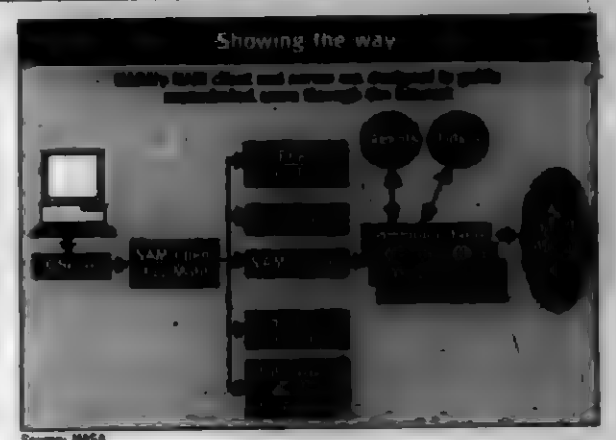
Internet resources have grown so rich that the network of networks has become an indispensable tool for some. But unless you are a seasoned user and a bit of a networking wizard, traveling the Internet can be like flying to the moon without navigation gear.

Now, the National Aeronautics and Space Administration has put together a package of software that will give its 25,000 scientists and engineers something of an automatic pilot. A prototype has been greeted enthusiastically, and the public-domain software is attracting attention from other federal agencies and the private sector.

NAM, which stands for NASA Access Mechanism, is a collection of C language software tools that provide a graphical user interface (GUI) to remote and heterogeneous information. NAM's icons and menus allow users to access bulletin boards, send electronic mail, browse through libraries of scientific information, locate colleagues and a few other things, all without knowing much about where information is or how it flows over the global network.

NASA research analyst Denise Duncan said she found pockets of Internet use among the space agency's scientists and engineers when she embarked on a requirements analysis two years ago. For example, she said, a scientist at one site used the Internet extensively for interacting with colleagues and obtaining software.

At another site, a scientist in the same discipline did not use the Internet at all. "He said, 'Yes, I've heard about it. It's really wonderful.' He wanted to use it but he had no idea how; he was at ground zero," Duncan said.



Source: NASA

NAM is still in the prototype stage, but it will ascend to production status later this year after NASA digests and acts on

NASA, *page 52*

Briefs

Wireless gains spectrum

The Federal Communications Commission late last month reserved 3 MHz of spectrum — 11 channels — in the 900-MHz band for wireless personal communications systems. The agency assigned one channel to Mobile Telecommunications Technologies Corp., a Jackson, Miss., company building a nationwide, two-way messaging network. As with all wireless networks, how many companies receive spectrum and what they do with it will have great impact on the ultimate speeds available to users.

After-hours trading

AT&T and the New York Mercantile Exchange recently launched an electronic trading system that allows the exchange to conduct after-hours trades in energy futures and options. Designed to accommodate international trades during the exchange's normal business hours, the Nymex Access system reportedly mimics electronically the "open outcry" trading floor auction process.

Gigabit network experiments

Bellcore reported that its four-state, broadband networking trial, called Aurora, is now functional for researchers to explore business and scientific applications of gigabit networks. Aurora links laboratories in several Eastern locations using fiber services and equipment from Bell Atlantic Corp., MCI Communications Corp. and Nynex Corp.

Site Manager expanded

Wellfleet Communications, Inc. said recently that its router-specific network management application, Site Manager, will run on IBM RISC System/6000 workstations and Hewlett-Packard Co. HP 9000 workstations. Site Manager already runs on Intel Corp. 80386 and I486 PCs running Windows and on Sun Microsystems, Inc. SPARCstations.

Ethernet eight-port switch

Cabletron Systems, Inc. recently committed to shipping a $7,495 eight-port Ethernet switching module for its smart wiring hubs at summer's end. The module is based on Artel Communications, Inc.'s stand-alone Galactica product. Cabletron has also announced an application that enables IBM's AIX NetView/6000 to manage Cabletron hubs. Cabletron and IBM also signed an agreement under which IBM's Systems and Operational Services organization will provide 24-hour-a-day network diagnosis and maintenance services for Cabletron networking hardware.

Racal goes for OpenView

Racal-Datacom, Inc. has agreed to integrate its Racal Management System into HP's OpenView. Racal's product is said to manage Racal local- and wide-area networking products as well as Simple Network Management Protocol-compatible network devices.

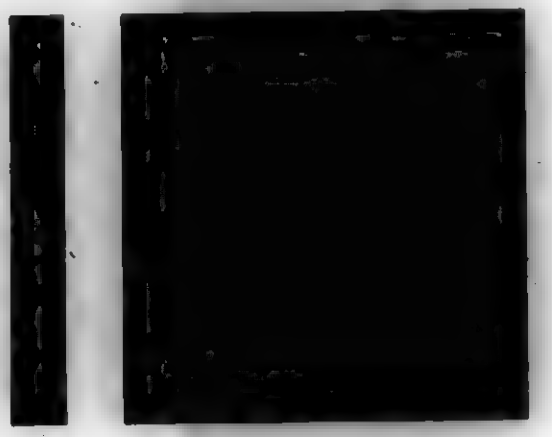
Certified network experts

Registration has begun for a new program devised to give organizations a yardstick for assessing and hiring network managers. The Certified Network Expert program, sponsored by HP, Network General Corp. and four other networking companies, tests Ethernet and Token Ring managers. The examination costs $395, and a pretest study guide with sample test costs $50. For more information, call the AG Group, Inc. at (510) 937-7900 or HP at (719) 531-4429.

Going public

Token Ring vendor Madge N.V. plans to go public next month. The company filed a registration statement for its initial public offering of more than 6 million shares of common stock priced between $10 and $12 a share.

"Workflow technology now provides a [illegible] platform for the critical business process of organizations all over the world."



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Sue Wolk
Executive Director
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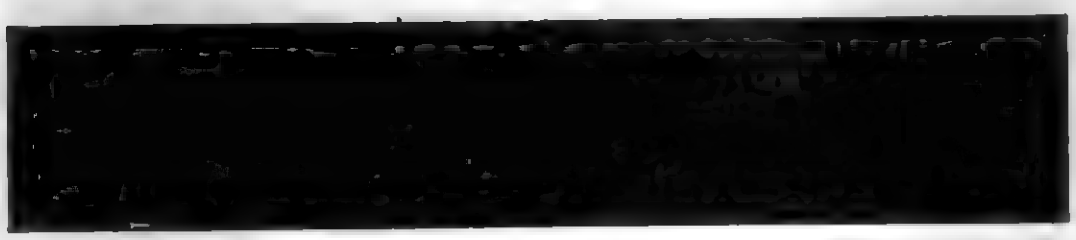


NASA

CONTINUED FROM PAGE 51

lessons learned from a just-completed beta test at a dozen sites. The intelligent gateway now provides the following:

- Source locator and query functions that locate and retrieve information from databases and libraries at NASA and elsewhere on subjects selected or typed in by users.
- Options for E-mail, faxing, printing, saving or sending by File Transfer Protocol information retrieved.
- A peer locator that offers several ways to find NASA employees, contractors or colleagues at universities and other federal agencies. The locator module uses X.500 directories, electronic telephone books, Knowbots — which can travel over the Internet looking for user lists — and the Internet's standard Whois and Finger protocol utilities.
- Bulletin boards that are available through Usenet tools — Archie, Gopher and the Wide Area Information Server — able to transparently search thousands of remote Internet hosts.

Platforms abound

The NAM GUI was built using the X Window System and the Open Software Foundation's Motif tool kit. It will run on DOS-based PCs, Unix workstations or Macintoshes. The NAM server currently runs on a Sun Microsystems, Inc. 4/470 server on a local-area network that attaches to the Internet through NASA's Science Internet.

Judy Hunter, special projects manager, said user response has been very positive. "A tool like this has never existed before," she said. "It was targeted to the end user — those who never had to use an information system before — and they are very excited."

And NAM has generated interest among nonusers as well, Hunter said. "I'm getting five or six calls a day, one-third of them from the private sector," she said.

Duncan said an idea for an enhancement has come from the artificial intelligence laboratory at NASA's Ames Research Center. The laboratory wants to add intelligence to the NAM GUI so that it remembers the preferences of users — for example, the types of information they typically seek and their preferred sources.

Information about NAM can be obtained by sending E-mail to NAM@STI.NASA.GOV.

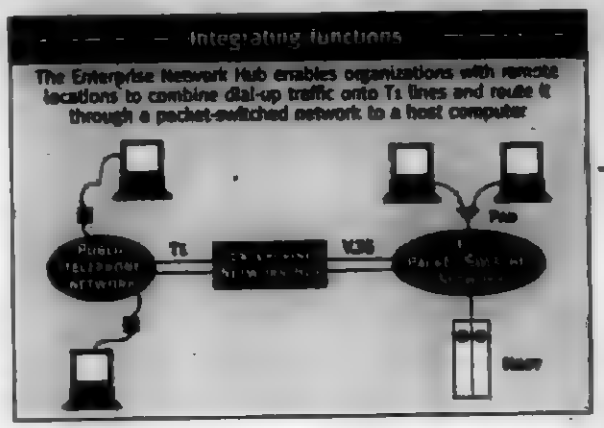
Hubs merge digital, analog traffic

By Lynda Radosevich
SKOKIE, ILL.

U.S. Robotics, Inc. has moved to integrate analog and digital traffic into a single box with the introduction of two wide-area internetworking hubs.

Called the Enterprise Network Hub and the Transaction Processing Hub, the devices combine the functionality of modems, terminal servers and channel service unit/data service unit (CSU/DSU) devices into one chassis.

"It amounts to taking a stack of modems and turning it into a smart device with one line in and one line out," said Jay Batson, analyst at the network strategy service of Forrester Research, Inc., a consulting firm in Cambridge, Mass.



The main benefit of the hubs is their ability to centrally manage different functions — such as digital-to-analog translations and multiplexing — and to reduce the time it takes to verify modem connections.

The Enterprise Network Hub is optimized for organizations with remote locations. For instance, if a company has 24 lines leading to remote offices, today they are often aggregated by the phone company into one T1 trunk that plugs into a private branch exchange at the customer site. The line is split into 24 phone lines, which plug into modems or CSU/DSUs. With the new hub, the connection goes from the phone company to the hub to the host.

The Transaction Processing Hub interfaces with the local carriers' exchange services, routing traffic through T1 trunks to local-area network interfaces for transaction processing applications. Circuit- and packet-switched buses minimize processing time, according to U.S. Robotics.

Don Letendre, manager of communications at Medpower, Inc. in Minneapolis, said that in tests, the Transaction Processing Hub saved his company eight seconds in establishing end-to-end modem connections.

Medpower provides electronic services, such as verifying the eligibility of employees using scanning cards, to health care organizations. The faster processing amounts to a $750,000 savings in hardware costs, Letendre explained, because the company can process more calls per modem.

However, U.S. Robotics is not the first to market with such a product. Primary Access Corp. is the main competition in this area, according to Batson. The San Diego company has a similar product, called Aperture, that has been shipping for several years. The latest rendition includes an X.25 packet assembler/disassembler, a feature U.S. Robotics said it plans to add to its products in September.

Additionally, the Primary Access system can support more than 130 ports unified under the network management system, said Andy May, vice president of marketing.

U.S. Robotics said its product is limited to 64 ports per chassis but that future configurations would probably provide more.

Currently, the hubs are managed under U.S. Robotics' Total Control management system. However, the company said it plans to ship hubs compatible with the Simple Network Management Protocol in September.

Wexler

CONTINUED FROM PAGE 51

So how does the worker know when it's "OK" to sever the electronic leash?

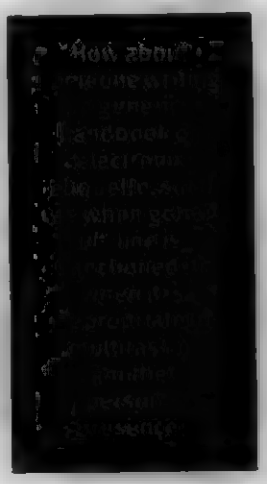
That employee will need corporate guidelines. But my impression from talking to users embarking on "virtual office" projects is that technology is being deployed anarchistically — a recipe for communications chaos and worker burnout.

Wireless has the potential to be a liberating, welcome tool. But while vendors are feverishly developing products and services to keep up with the "anywhere, anytime" ethic propagated by AT&T, RAM Mobile Data, Motorola and others, business managers aren't planning for wireless deployment so that it is more useful than it is a pain in the neck.

Learning from mistakes

We've already made this mistake with voice mail. We've done somewhat better with E-mail, thanks to visionaries such as Beyond, Inc., which led the industry in building "smart" message filters into applications. And wireless is the final communications frontier.

What do we do to control the barrage of electronic communications spiraling toward us? How about someone writing a generic corporate handbook on electronic etiquette, such as when going offline is sanctioned or when it's appropriate to multitask in another person's presence?



In fact, would you care to join me in this challenging endeavor? If you're hesitant, consider the following vignettes — unembellished experiences that could foreshadow the shape of things to come:

- A vendor from a wireless communications company scheduled a meeting with me in my office. The vendor carried an alphanumeric pager so his assistant could keep him updated on happenings at headquarters.

During what was supposed to be a half-hour meeting, he was contacted three times with office business important enough that he had to phone the assistant with instructions. The meeting stretched to more than an hour — good for him, I guess, as he was multitasking. Bad for my attempts at time management and my perception of how important I was in this person's day.

- A vendor from a wireless communications company scheduled a meeting with me in his office. The vendor carried an alphanumeric pager that linked to his company's PBX. Callers could push "1" to notify him that they were waiting for him to get to the phone.

The vendor received several notifications during our meeting. He was courteous to me and ignored them, but I was distracted by his abandoning real people on hold and could see he was growing more uncomfortable with each call he missed.

Bad for him — he annoyed the people who believed he was going to pick up the phone while they hung on. Bad for me — I felt I was in the way and couldn't concentrate on the meeting at hand.

If you're bullish on wireless, you might consider doing at least two things. First, press vendors for technical filtering and prioritization schemes on their gadgetry. This is a tall order, given that our jobs and businesses have become so dynamic that our priorities continually shift.

Too many gadgets?

Second, plan to stave off user burnout as employees' attention becomes further and further fragmented by the many modes of communication yanking them in more directions. This means sitting down and thinking through what you expect of mobile workers and making the ground rules apparent.

Better yet, cross-sections of companies could team (electronically, of course) to write some generic corporate rules of thumb. This is where my proposal comes in. If you would like to contribute to something along the lines of "The Corporate Guide to Electronic Etiquette," contact me at MCI Mail: 597-8027. Maybe we can kick some ideas around and break some ground.

Remember: It could be your sanity that's at stake.

Wexler is a *Computerworld* senior editor, networking.

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Transfers to Alpha slow

DEC customers look for others to make first move from VAX to Alpha

By Craig Stedman

Digital Equipment Corp.'s Alpha AXP systems have been shipping since last fall. Their performance benchmarks are impressive: DEC is on or even ahead of schedule in moving much of its OpenVMS layered software to Alpha, and by virtually all accounts, porting applications from the older VAX line to Alpha is a relative breeze.

But all that and a good haircut likely would not get a DEC salesperson an Alpha order from a production-oriented commercial OpenVMS user. For now, many users appear to have a philosophy regarding migrating to Alpha that can be boiled down to two simple words: "After you."

Many commercial accounts would have a hard time moving to Alpha before well into 1994 anyway because DEC does not plan to ship key layered products, such as the Application Control and Management System (ACMS) transaction processing software and full clustering support, until then.

Proof before the plunge

However, even staunch DEC customers interviewed recently said they want to see the proof in someone else's pudding before they even start to look seriously at moving their mission-critical applications from VAX to Alpha.

"We're really going to have to see that this is successful," said Dave Federman, vice president for systems and planning in the broker/dealer services department at Chemical Banking Corp. in New York. "We have to make sure we're plunging into a pool with water, not an empty pool."

"We don't sort of want to be the first one in," added George Kerns, assistant vice president of cellular information management operations at GTE Telecommunications Products and Services in Atlanta. He said he wants to be shown that the software product set GTE uses "is mature in that environment" before making any VAX-to-Alpha moves.

PacifiCare Health Systems, Inc., a Cypress, Calif., health maintenance organization, is also looking for some other major OpenVMS business users to take the Alpha plunge before it does. "We'd like to see some success stories out there," said Matt Holdrege, a senior network specialist at PacifiCare.

Production environment

That kind of attitude does not surprise analysts. Using Alpha AXP workstations for development purposes at this point is one thing, "but as far as a production environment goes, I wouldn't touch that with a 10-foot pole," said David Santistevan, executive vice president of The Parsec Group, a Lakewood, Colo., training and software services company.

Mitch Hall, an OpenVMS marketing manager at DEC, agreed that the transition to Alpha "is kind of on the very leading edge" of what the company terms the initial production deployment stage.

Hall said he does not expect to see full commercial production use of the reduced instruction set computing technology start for another six to eight months.

Besides the wariness about going first, software is the major roadblock. A lack of third-party applications has forced DEC to point customers toward VAX systems upgradable to Alpha, although Hall said he expects that to change shortly. About 850 applications were supposed to be available for OpenVMS AXP by the end of June, according to DEC.

AXP sales

Alpha AXP sales are still not up to $100 million per quarter, according to William Demmer, vice president of DEC's Computer Systems Group. At that level, the RISC line still is not significant to DEC's overall sales, "except for the ways it's helping us sell more VAXs," Demmer said. The company expects Alpha to top the $100 million per quarter mark at some point during the fiscal year that starts this month.

On the layered side, DEC is now shipping a range of compilers and development tools plus its DEC Rdb and DEC DBMS databases. Oracle Corp. and Sybase, Inc. have released Alpha versions of their databases, and Cognos, Inc.'s PowerHouse fourth-generation language is out as well.

Most of the key development tools are available or will be "imminently," said Wes Melling, an analyst at Gartner Group, Inc. However, Rdb still needs "to settle down," he added, and products such as ACMS and full-blown VMSclusters are critical for commercial users.

Q2 '94

Some aspects of ACMS are not scheduled to be available on Alpha until the second half of 1994, according to an updated software schedule DEC released in June. The All-in-1 integrated office system and DEC's Reliable Transaction Router also will not be available until then.

Most users appear willing to wait and to buy new VAX systems while doing so. Randall Gannaway, director of information resources operations and technology at FMC Corp., a Chicago-based manufacturing and chemicals company, is looking at the feasibility of moving some of his financial and engineering applications to lower cost Unix systems.

However, FMC is also eyeing a six-processor VAX 7000 system as a replacement for an existing system, and Gannaway said he expects to go to Alpha once the necessary software is

Alpha, *page 59*

OpenVMS AXP software phases

Now shipping	July-December 1993	January-June 1994	July-December 1994
CASE development and runtime environment with clusters	**Full network environment**	**Full TP and production systems environment**	**Full TP and production systems environment**
OpenVMS AXP O/S V1.0, OpenVMS AXP O/S V1.5, SMP, New Batch/Print, Network Booting, limited VMS clusters	Posix (1003.1, .2), XPG3 base branding, RMS journaling, Volume shadowing	OpenVMS AXP O/S Epsilon, SEAVMS, VMS clusters (no restrictions)	
Sample layered products: Pathworks Server, DECnet IV, X.25 Client, DEC Ada, DEC Cobol, DEC Fortran, DEC C, CDO/Reposition, Macro-64, DECset, DECmigrate, ACAS, DECwindows Motif, SQL Services, DEC Rdb V5.0, DEC DBMS V5.0, DECforms V1.4 runtime, Desktop ACMS Client, Polycenter Scheduler	Sample layered products: SNA 3270, TCP/IP Services, DEC C++, DEC Rally, CDO/Administrator, Data Distributor, DEC Rdb/Expert, DEC Rdb V5.1, DEC DBMS V5.1, Storage Library System	Sample layered products: Token Ring, DCE, DEC X.500 Directory Services, Mailbus 400, DECnet/OSI, DECpresent, DECwrite, DEC/EDI, DECFonts, DEC Rdb V6.0/6.1, DEC DBMS V6.0/6.1, DEC DB Integrator, ACMS/TDL, Desktop ACMS (Server)	Sample layered products: All-in-1 IOS, DEC Basic, DECeis Real Time Tools, DBA Workcenter, ACMS/STDL (MIA), DECforms V2.0, RTR Client/Server, Polycenter HSM

Source: Digital Equipment Corp.

Good migrations

As a rose by any other name would smell as sweet, so VMS is VMS — at least according to the resident poets at DEC. AECL Research Corp., an Ottawa-based atomic and nuclear energy research firm, said it feels no need to take away DEC's poetic license.

"It's true," said David Donahue, a senior systems analyst at AECL Research's computing and information systems operation. He said he found "no real problems whatsoever" in moving the company's OpenVMS scientific simulation programs to an Alpha AXP-based DEC 4000 Model 610 system.

"I loaded the applications, recompiled them, and they ran just fine, only a heck of a lot faster," Donahue said. The only difficulty came in initially booting up the Alpha machine, but that was due to a low-tech issue, he noted: No instruction manuals were available.

The DEC 4000, a loaner system, has been running for two months without problems, Donahue added. AECL Research is now in the process of buying a Model 610 to replace the loaner, and Donahue said he expects it to be shipped to the firm's computer center in Pinawa, Manitoba, this week.

The University of Miami's Rosenstiel School of Marine and Atmospheric Science is also "very pleased" with its early Alpha experience, according to Peter Evans, a senior research associate there. "It's been remarkably smooth, all things considered," he said.

After beta-testing the DEC 7000 AXP midrange system and an Alpha workstation, the Rosenstiel school bought 10 workstations in April and has "pretty much" moved more than 1 million lines of custom satellite data and image processing code onto those systems.

"We're talking less than 60 days. Probably, more on the order of less than 30," Evans said.

The university also wants to buy the DEC 7000 and move a cluster of VAX 9000s to Alpha, Evans said, but it needs to find funding first.

—*Craig Stedman*

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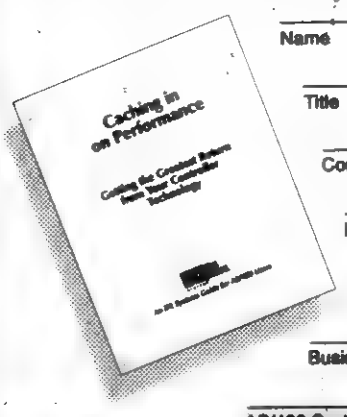

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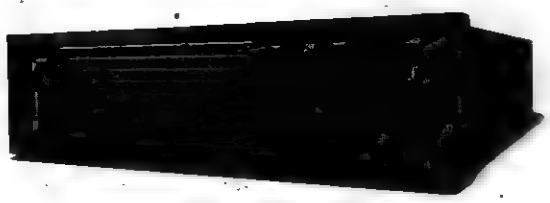

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Stat tool weeds out bid-rigging companies

Info Tech tools detect collusion among competitors

By Gary H. Anthes
GAINESVILLE, FLA.

For years, it was like taking candy from a baby. Now, computerized statistical techniques are putting a brake on the theft of milk and ice cream money from millions of schoolchildren.

The Information Technology Co., or Info Tech, has developed a suite of statistical and graphical tools for exposing price collusion among companies bidding on local and state contracts for dairy products and other items. After uncovering rigged milk bids in Florida that robbed schools of $33.5 million, Info Tech's approach is being applied across the country.

The company's "collusion detection system" originated in the late 1970s, when Info Tech helped Florida's attorney general develop automated tools for spotting suspicious patterns in highway construction bids. The results were so good, Info Tech built a mainframe-based package called Bid Analysis and Management System (BAMS), now licensed by the American Association of State Highway and Transportation Officials to 30 state departments of transportation.

When asked by Florida officials what else might be worth probing, Info Tech suggested school milk. According to Info Tech President James McClave, no suspicion of collusion on milk bids existed, but school dairy programs had all the earmarks of a market ripe for bid rigging: high dollar volume, commodity products, a small number of competitors and inelastic prices.

Info Tech used software from SAS Institute, Inc. to perform regression analyses, discriminant analyses and other statistical tests on the Florida milk data.

Put to the test

Twenty or so tests are applied to find "the fingerprints of collusion," McClave said. For example, Info Tech looks for the following:

•**Market share stability.** "Typically in bid-rigging cartels, there is a stability not seen in competitive markets, where you see dog-eat-dog and some companies going up while some go down," McClave said.

•**Clustered bids.** For example, a bid of 16 cents per half pint and another of 16.05 cents are suspiciously close.

•**Price-distance anomalies.** For example, prices not adjusted for the distance from a processing plant to a delivery point.

•**Trends in bid prices over a single annual bidding cycle.** Bids in a competitive market should fall slightly over time as bidders become more competitive. In rigged markets, they are likely to remain stable or rise, McClave said.

While these tests do not conclusively prove illegal pricing activity, they are so persuasive that they often enough do win out-of-court settlements. Info Tech gave Florida officials the results of its 18-month analysis of milk bids, and "within two weeks, they had witnesses talking," McClave said.

Now, sparked by the pioneering work done in Florida, Info Tech is helping law enforcement officials in 15 other states go after dairy companies suspected of bid-rigging and price-fixing. The federal government has picked up the cases and, according to a recent report in *The New York Times*, has obtained convictions or guilty pleas from 43 companies.

However, as much as computer analysis helps, it is not enough, McClave said. "You still need the analyst. You can't just turn the computer loose and say, 'Turn the red light on when you find something.'"

Building on principles in the mainframe-based, highway construction-oriented BAMS, Info Tech is now using SAS to develop a Collusion Detection System usable in a wider variety of bid situations.

Building fraud torn down

The North Carolina Department of Transportation recently used BAMS to spotlight a case of "front-end loading" on a large highway construction bid.

The state figured that paying too much at the beginning of the contract would have cost some $97,000 in extra interest charges. State officials got the bidder to agree to shrink out payments.

Exactly how did BAMS do that?

"I won't get into particulars," said Jeff Denver, head of the contract monitoring section. "That would be like putting the blueprint of your burglar alarm on your window."

Denver said it is hard to estimate how much the software has saved the state, adding, "Since we've been using BAMS, the vendors know they are being scrutinized much more closely, and that helps hold costs in check."—*Gary H. Anthes*

Parallel systems

Sequent server clusters bust benchmark barriers

By Mark Halper
BEAVERTON, ORE.

When it comes to running Oracle Corp.'s Oracle 7 Parallel Server database, it is Sequent Computer Systems, Inc.'s turn to claim it has built a better mousetrap — or at least a better cluster.

The multiuser computer supplier recently said it is making available clustered configurations of its Symmetry line of Unix platforms running Oracle 7 Parallel Server.

While Sequent is by no means the first to offer Parallel Server clusters — Tandem Computers, Inc., Digital Equipment Corp., NCR Corp. and Pyramid Technology Corp. already offer their own versions — Sequent is claiming record performances.

Sequent said its system scored a 1,002 tpsA rating under the Transaction Processing Performance Council's "A" benchmark test, using two Symmetry 2000/750 servers housing a total of 48 50-MHz 486 processors, 1.3G bytes of memory, 238G bytes of storage and eight Sequent clients. The configuration's cost per transaction score was $9,313.

They like it

Users were impressed.

"The fact that they broke the 1,000 tpsA barrier is a major announcement," said Michael Higgins, technical support manager/database administrator at San Francisco women's apparel maker Byer California.

As did other users implementing clusters, Higgins lauded the technology for providing backup: Users have constant access to a database if one box goes down because the other(s) will continue to run the same database.

"Our mission-critical applications are protected by being on two machines," he said.

Higgins praised Sequent for building a lock manager for Parallel Server, know as Dynix/ptx, into the kernel of Sequent's Unix operating system. Lock managers help ensure that two or more machines in a cluster keep consistent tabs on data, even as one machine is manipulating the data.

Prices for the Oracle software range from $12,500 to $37,500 per node, depending on options, and system prices range from $15,380 to $307,200 per node, depending on number of users and the hardware model. Storage capacity is 768G bytes through 384 shared disks.

Higgins said he plans to migrate his company's purchasing, inventory and production software from a single Sequent platform to a Sequent cluster at the end of this month. Those now run under Oracle Version 6.0. The company is also migrating Oracle 6.0 versions of Oracle general ledger and accounts payable programs running on a separate Sequent machine to the same cluster.

"What we've been fighting is how to get data back and forth between those two machines. Now we won't have to do that," he said.

Higgins said he expects the cutover will take up a weekend late this month.

Byer's Sequent systems tie into about 20 Macintosh computers, about 60 X Window system terminals and about 250 ASCII terminals, Higgins said.

Briefs

The IBM Consulting Group has added a service designed to help clients understand and manage the human and cultural aspects of business transformation. The Business Culture Analysis will provide clients with a set of techniques and diagnostics to assess an organization's cultural environment and its alignment with overall business operations strategy.

Jacksonville, Fla.-based Barnett Banks, Inc. information systems subsidiary Barnett Technologies, Inc. is about to sell the Tampa-based operations of its Financial Processors, Inc. correspondent bank data processing business. The buyer: Milwaukee-based Marshall & Ilsley Corp. The price: undisclosed. Barnett acquired Financial Processor as part of a 1988 acquisition; it will hang on to units based in Miami and Jacksonville.

Interex, the Sunnyvale, Calif.-based user group for owners of Hewlett-Packard Co. computer systems, has shipped the 1993 HP/UX Contributed Software Library, a compendium of 53 software programs, to users who pay a $495 annual membership fee.

NCR Corp. and Perot Systems Corp. have teamed up to develop the Pro-BanX Financial System, a Unix program designed to provide a single view of customer transactions and accounts across multiple applications and hardware platforms. The first installation was recently made at Southside State Bank in Tyler, Texas.

Manufacturing

System simulates future inventory options

By Elisabeth Horwitt
HATBORO, PA.

With the cable television industry ballooning — and likely to explode as soon as interactive television gets off the ground — the last thing a major cable TV equipment vendor needs is to have its order-filling capacity held back by a stodgy manufacturing resource planning (MRP) system.

Jerrold Communications, a subsidiary of General Instrument Corp., has three traditional MRP systems that work fine for inventory tracking and for allocating factory and material resources among orders that have already been received and documented.

However, the company needed to start planning how to allocate materials and factory floor facilities well before it had firm orders in hand to anticipate bottlenecks and ultimately fill more orders, said Patrick Sim, director of operations. The system is expected to result in a 1% improvement in sales, or $4 million on revenue of $400 million.

"We needed something to pull together what goes on in manufacturing facilities so that we can do procurement planning for the supplier base we deal with, facility utilization planning and order management, such as how to deal with unexpected orders," Sim said.

The firm's answer: a client/server-based front end that enables users to query across the three MRP systems and simulate the effect of future orders, as well as perform resource planning enterprisewide. The product chosen was Advanced Planning System from Carp Systems International in Lexington, Mass.

With the product, "you can extract live databases from manufacturing applications, such as resources, routing, planned orders and materials, and then simulate scenarios with real data without affecting the [MRP] execution systems," Sim said.

Best of all, he added, such simulations can be run in minutes, while MRP systems can take 30 hours to put together a new planning scenario.

Testing without implementing

Traditional MRP packages lack the flexibility for plotting out future resource allocation based on incomplete or hypothetical orders. What users want is a way to test different scenarios without actually implementing them.

"We want to sit down and say something like, 'If we start production 15 weeks from now, what products do we need to buy?' " Sim said. "Or if I want to add 50,000 units to the production schedule over the next three weeks, do I have the factory floor capacity and/or materials?"

The only way to run such simulations under the current system was to download the data from the MRP application into a spreadsheet, "which was cumbersome and didn't let us get at the data in a meaningful way from a decision-making standpoint," Sim said.

In addition, Jerrold has three different MRP packages running on three different systems: The ASK Group, Inc.'s Man Man running on a Digital Equipment Corp. VAX; Panacophic Systems, Inc.'s software on an IBM System/38; and QAD, Inc.'s software on a Hewlett-Packard Co. HP 9000.

This made it difficult to do resource planning across the facilities and to track resources managed by the different systems.

Filling product gap

Two recently announced Carp products are addressing the gaps in Jerrold's MRP systems.

APS:Enterprise, which is now being installed on an HP 9000 running Unix, is a decision-support front end to the MRP software. The product can consolidate data from the different MRP systems for cross-facility planning. It also has the flexibility to run what-if scenarios on the effect a new order will have on production before that order — or the bill of materials and production plans needed to fill it — is cast in concrete, Sim said.

In addition, Jerrold is installing Carp's APS:Solo as a decision-support system for each plant. This means plants can download information about the overall production plan developed at headquarters and then run simulations to get a more exact fit between the production schedule and the plant's resources on a day-to-day basis.

The deal was signed four months ago. Jerrold recently completed the profile for data mapping its first MRP system — ASK's Man Man — so that users can now use APS:Enterprise to extract data for simulation purposes.

The company said it hopes to have the APS software up and running at all four factory sites and to interface with all three MRP systems within a year.

ON SITE

[redacted]
Hatboro, Pa.

Technology: Client/server front ends to MRP systems using the Advanced Planning System from Carp Systems International.

Benefits: Improving inventory turns per year from 6.3 to 7.3 for an annual savings on inventory-carrying costs of $400,000. Negotiating volume prices through more consolidated purchases should result in a purchase price improvement of at least 1% on an annual basis on purchases of about $250 million per year of raw materials.

VAX users hesitate to switch to Alpha

FROM PAGE 55

there. "We have all kinds of alternatives, but we're locked into Digital for the near future for what we're running on Digital," he said.

GTE Telecommunications just added a six-CPU 7000 to its cluster, Kerns said. And PacifiCare is bringing in 7000s "almost one a week" as it replaces its entire cluster, Holdrege said; it also has purchased a mainframe-class VAX 10000 and may eventually get another one.

"When we do want to cut over to Alpha, it will just be a board swap," Holdrege noted. And there is little doubt that PacifiCare will eventually do so. "We're stuck," he said. "Come hell or high water, we're making a big commitment to DEC."

Porting made simple

Vendors that have ported their applications to the Alpha AXP platform do not seem to have been forced to ruin the corporate soft drink and pizza vaults to fuel their efforts.

Sybase, Inc. had to rework "maybe 5%" of the code in moving the OpenVMS version of its Sybase relational database management system over to Alpha, said Dwight Chen, a group product manager at the Emeryville, Calif., company.

While that is somewhat more than usual for a Sybase port, it was not viewed as particularly onerous, Chen said. "There were some pieces that had to be totally rewritten, but in general it took about as long as any other port for us."

Gary Henry, senior systems programmer at Acucobol, Inc. in San Diego, said his company's Cobol compiler was ported in one day. Tom McIntyre, president of McIntyre Consulting, Inc., a Concord, Mass., reseller, moved his health care applications over in "about 45 minutes."

L. Stuart Vance, vice president of engineering at TGV, Inc. in Santa Cruz, Calif., said porting TGV's networking software to Alpha was comparable to making the leap to symmetric multiprocessing on the VAX several years ago.

Executive Software in Glendale, Calif., did find some steps "that were more difficult than we expected" in porting over its disk defragmentation software, said Vaughn McMillan, research director. The company had to rewrite about 10% of its code in C.

For the most part, though, the porting process has been relatively predictable, even for vendors "who had no right to have it easy" because of their use of privileged code, said Gartner Group, Inc. analyst Tim Melling. "It's horribly uneventful."

—Craig Stedman

[redacted]

Database management

Dun & Bradstreet Software Services, Inc. has announced HR Stream Flex Benefits, a client/server human resources application.

According to the company, HR Stream Flex Benefits runs under Windows and Sybase, Inc.'s SQL Server database on Unix-based systems from Hewlett-Packard Co. and Data General Corp.

Pricing begins at $88,000.

▶ *Dun & Bradstreet Software Services*
3445 Peachtree Road NE
Atlanta, Ga. 30326
(404) 239-4636

Must Software International has announced Version 1.0 of Open Database/Server (ODB/Server).

The product provides client/server access to DB2 data for users on Windows, DOS and OS/2 workstations. For flexibility and interoperability on every level, the ODB/Server employs a layered, modular architecture, the company reported.

Through the ODB/Client application programming interface, this version will provide Microsoft Corp.'s Open Database Connectivity Core function call support.

Prices for the product range from $30,000 to $50,000.

▶ *Must Software International*
101 Merritt 7
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Cross Access Corp. has introduced CrossAccess software. According to the company, CrossAccess provides high-performance technology for users who need to construct and maintain complex client/server applications.

Features include access to data stores via ANSI/ISO standard SQL, allowing applications to be built on any SQL-compliant language; the ability to access nonrelational and relational files on remote and local processing platforms; support for large, flat files up to 32K bytes; and use of C language in all CrossAccess software components to ensure application portability across different platforms, the company said.

Prices for a single configuration of CrossAccess software range from $90,000 to $150,000.

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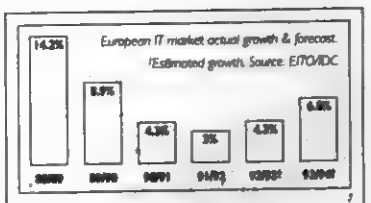

European IT market actual growth & forecast.
*Estimated growth. Source: EITO/IDC

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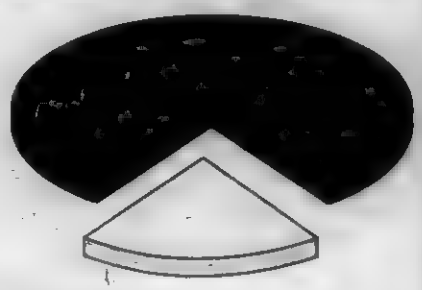

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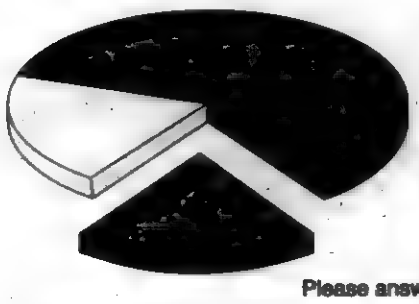

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Briefs

Plans for ObjectView

KnowledgeWare, Inc. recently outlined plans for upgrading ObjectView, an object-oriented development tool the company inherited when it acquired Matesys Corp. early this year.

ObjectView 3.0, due out in the fall, is scheduled to include features for letting several developers work simultaneously on a project, such as version control and concurrent access to objects and code in the repository.

The product will also be linked more tightly to the design module under KnowledgeWare's Application Development Workbench computer-aided software engineering tool set, the company said.

USL licenses technology

Unix System Laboratories, Inc. (USL) has licensed remote-procedure call technology from start-up NobleNet, Inc. in Southboro, Mass., for the Unix System V Release 4 operating system.

The new software contains compilers capable of converting standard C language applications into code that can be distributed to remote servers over a Unix network. The NobleNet modules will be incorporated into Unix System V Release 4.2, USL said.

Bachman kits ship

Bachman Information Systems, Inc. began shipping two products as expected: Bachman/Generator for PowerBuilder and Bachman Distributed Development Kit [CW, May 10].

The Bachman Generator for PowerBuilder is a Windows-based tool that creates components for PowerBuilder applications using data models from Bachman/Analyst and database designs from Bachman/DBA to let users migrate existing applications to client/server or create new ones.

Bachman Distributed Development Kit provides three copies of the Generator and limited-use licenses for the Analyst and DBA design tools.

The Generator is priced at $995, and the Distributed Development Kit is priced at $9,500.

Inference tool debuts

Inference Corp. in El Segundo, Calif., has shipped early release versions of its Art Enterprise/Windows development product for client/server applications.

The 32-bit object-oriented tool is compatible with the Windows 3.1 operating environment and with Microsoft Corp.'s Win32s developer's kit. It will be generally available next month for $7,000 per developer. A Windows NT version will follow, the firm said.

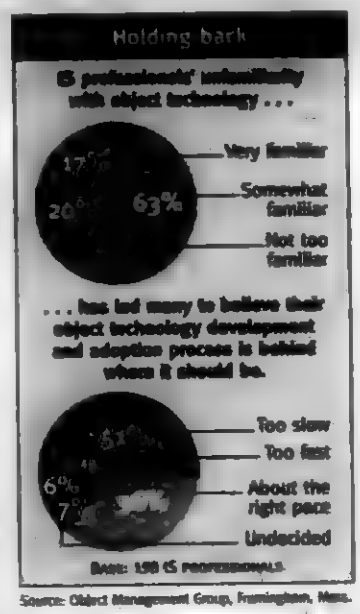
Early users ride object wave

By Melinda-Carol Ballou

The report cards are in from early users of object-oriented development techniques, and those pioneers said there are benefits to be reaped from object-oriented work. However, those users also described a series of pitfalls, which they said were generally outweighed by the faster development and greater flexibility of object-oriented applications.

The comments of two dozen attendees interviewed at the recent Object World conference in San Francisco jibe with results of a survey of 196 information systems professionals conducted by the Object Management Group (OMG) in Framingham, Mass., as well as with other recent surveys [CW, June 14].

In the OMG study, which will be available this week, about half of the professionals interviewed said they now use some sort of object-oriented technique, and the majority of the 196 interviewed said they want object technologies to advance more quickly (see chart), even though most said they are not yet familiar enough with object technology.



Source: Object Management Group, Framingham, Mass.

One of the key challenges facing early implementors is making the transition from procedural development using Cobol or C to object-oriented techniques, according to users at the conference. The shift from the use of dumb terminals to programming on Windows-based PCs also involved a steep learning curve for many.

Programmers "had to relearn everything they had ever learned and do it with browsers and debuggers on the PC," said Jim Dykas, senior technical services consultant at Cigna Systems in Hartford, Conn.

"The key thing about objects is to be able to view things abstractly," said David Filani, lead programmer at American Express Travel Related Services Co. In choosing members of the pilot project for object-oriented development, his organization chose those who were willing to learn something new and listen to team members.

Even with the difficulties in making the transition, Filani said, development using object-oriented techniques was three times faster than using conventional programming.

Design comes first

First and foremost, developers must examine the business problem the application will solve, according to early users at the conference. Nearly all users who had experimented with the technology said they spent a much greater percentage of their time on design than on the coding portion of the development process. This differs from conventional programming techniques where the actual coding made up more than half of the amount of time

Object wave, *page 62*

Court limits damages for breach of developer contracts

By Thomas Hoffman
NEW YORK

A state appellate court here ruled that because a software vendor did not willfully injure a customer's business by failing to complete a development contract, the vendor is responsible only for returning the contract fees it received. As such, the vendor will not have to pay the $5.4 million in additional damages assessed by a lower court, money that was not provided for under the original agreement.

The ruling applies to a 1984 contract under which Noble Lowndes International, Inc., a Roseland, N.J., software developer, agreed to build — but failed to complete — a suite of customized claims processing software for Metropolitan Life Insurance Co. Legal experts said the decision is significant because it could severely limit the amount of damages awarded to user companies for such uncompleted contracts.

"The bottom line is that this is a fairly authoritative decision that supports the proposition that people will be held to their written contracts," said Ron Abramson, an intellectual property counsel for the New York law firm of Hughes, Hubbard, & Reed.

The unanimous decision was reached by a four-justice panel in the New York Supreme Court's Appellate Division.

In 1991, a New York Supreme Court jury found Noble Lowndes guilty of breach of contract. However, the jury awarded Met Life $204,000 to cover the amount paid under the contract and an additional $5.4 million to cover expenses, damages and expected savings had the software performed as specified.

The jury decided that Noble Lowndes willfully breached the contract, thereby entitling Met Life to additional compensation. Noble Lowndes appealed the decision and asked the courts to limit the damages to those specified under the contract.

Although the June 17 decision technically can be applied only to certain cases in New York, the court is highly regarded by other states, and the decision will likely have a persuasive influence in other jurisdictions, according to attorneys familiar with the case.

Tort terms

Peter Brown, a partner at the New York law firm of Brown Raysman & Millstein who represented Noble Lowndes, praised the appellate court for distinguishing "willful" as a term of tort and not contract. Nearly all computer contracts, Brown said, express a limitation on damages for which a plaintiff can sue.

Meanwhile, torts, or unethical acts, allow plaintiffs to apply for — and often receive — more generous compensation on breach of contract claims, regardless of the written agreement.

Others agreed on the importance of the distinction. "You cannot use the examination of a tort to do an end run around a contract," said Daniel T. Brooks, a partner in the Washington, D.C., branch of Cadwalader, Wickersham & Taft.

"What the court really did was issue a decision that was highly protective of the computer industry," Brown said.

Anthony D'Amore, associate general counsel at Met Life, said the insurer plans to appeal the decision.

Object wave

CONTINUED FROM PAGE 61

spent on the project.

Determining those business processes and involving end users were key advantages to object-oriented vs. procedural languages.

"Involving end users is the Holy Grail ... and the object paradigm lets computer techno-weenies talk with end users in terms that they can understand," said Tom Hassler, IS director at the State University of New York's (SUNY) Institute of Technology in Utica, N.Y.

Objects on their mind

In comparing IS plans for object technology, a survey of 198 IS execs by the OMG found that 49% of leading-edge users, 29% of mainstream users and 25% of conservative companies were "probably" going to move to object technology; only 22%, 18% and 0%, respectively, of these types of users were "definitely" going to make the move, the survey found.

The use of object-oriented techniques allowed Hassler and others to work together with end users to determine the appropriate business model and then create the application that most appropriately met their needs.

This was easier to do because developers were able to discuss the actual business processes involved rather than having to fit those processes into a particular technological model, such as relational tables, Hassler said.

Another key issue that must be addressed is that of legacy data — being able to separate it from archaic applications and then access it as needed; object-oriented techniques also facilitated this process, users said.

"The real business problem was trying to determine how to get out from under legacy systems, and when we used structured development techniques, they produced the Manhattan phone book," said Tom Hadfield, a supervisor at the IS office of Chrysler Motors Corp. who is reorganizing the payroll system for the company. Using object-oriented techniques, his group was able to come up with a flexible and simplified model for the business, which was then used to design the object-oriented application.

With shrinking budgets and smaller IS staffs, Hassler was looking for "people extenders — intellectual prosthetic devices," which he said were provided by object-oriented techniques, in setting up a new library system for SUNY. "We had no clue about how long it would take, but after we did the analysis and design, we were able to set up a prototype in a single afternoon and then share it with end users."

Hassler's organization was able to work with other universities that had previously been using object-oriented techniques. Other users emphasized the importance of "mentoring" — bringing in experts who can help developers make the paradigm shift from conventional to object-oriented techniques.

Industry consolidation behind standard services and interoperability for objects across platforms and network protocols, combined with the availability of tool kits and class libraries, should make the transition to object-oriented design easier, according to other users.

"As we try to provide interoperability between new and legacy systems, we view standards, such as the OMG's Common Object Request Broker Architecture, as an underlying technology to provide that," said Jeffrey Fleisher, senior scientist at the National Photographic Interpretation Center of the National Exploitation Laboratory, a nonprofit federal research institution.

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CenterLine adds Unix testing tool

By Melinda-Carol Ballou
CAMBRIDGE, MASS.

CenterLine Software, Inc. this summer will ship TestCenter, a software testing tool that helps Unix C and C++ developers locate and correct program errors and manage test coverage information.

"Today there's a disconnect between the quality assurance [QA] folks designing the test suites [at the end of the application life cycle] and programmers who test the code as they go along," said Sesha Pratap, chief executive officer and co-founder of CenterLine. Pratap said programmers always share code but rarely share the test suites. "They usually throw them away since they think of it as a QA job and don't want to take the 10 minutes to document the tests."

TestCenter is the first in a series of testing products planned by CenterLine. It features automatic runtime error checking and memory leak detection on executables to enhance memory use and code quality, company officials said. Graphical test coverage lets programmers more easily determine which parts of the code have not yet been tested, and an intuitive graphical user interface and querying capability facilitate access to test result files, they added.

No recompilation is required to use the product, officials said, which makes for faster turnaround times.

TestCenter can be used in conjunction with any Unix tool set, including SunSoft, Inc.'s SPARCWorks or CenterLine's own CodeCenter or ObjectCenter programming environments, Pratap said.

TestCenter, available on Sun Microsystems, Inc.'s Scalable Processor Architecture workstations, will be priced at $995 for a user license and $1,995 for a floating license until Sept. 20. After that, pricing will be $1,295 for a user license and $2,995 for a floating license, respectively.

Languages

Acucobol, Inc. has released Acucobol-85 for Windows, a specialized version of the Acucobol-85 runtime system that runs Cobol programs as native Windows programs.

With Acucobol-85 for Windows, users can program icons, customize titles, modify application screen size and select window placement.

The product enables a Cobol application running as a native Windows program to offer Windows features such as network compatibility, multitasking support, automatic mouse support and Windows print spooler support.

Extensive color mapping facilities are provided.

A runtime version of Acucobol for Windows costs $240. A development system costs $1,200.

▶ *Acucobol*
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(619) 689-7220

Code libraries

Berard Software Engineering, Inc. has announced the Berard Object & Class Specifier (BOCS).

According to the company, BOCS is an object-oriented development tool that helps users in documenting and modeling a system and its underlying objects.

BOCS comprises a series of components, including a set of libraries to manage requirements, object and class specifications and graphical models; an object and class specification editor to specify objects; a set of graphical editors that can be used within the context of an object and class specification; and a traceability tool.

BOCS will be available during the third quarter for $595 per copy. An introductory offer of $395 will end July 30.

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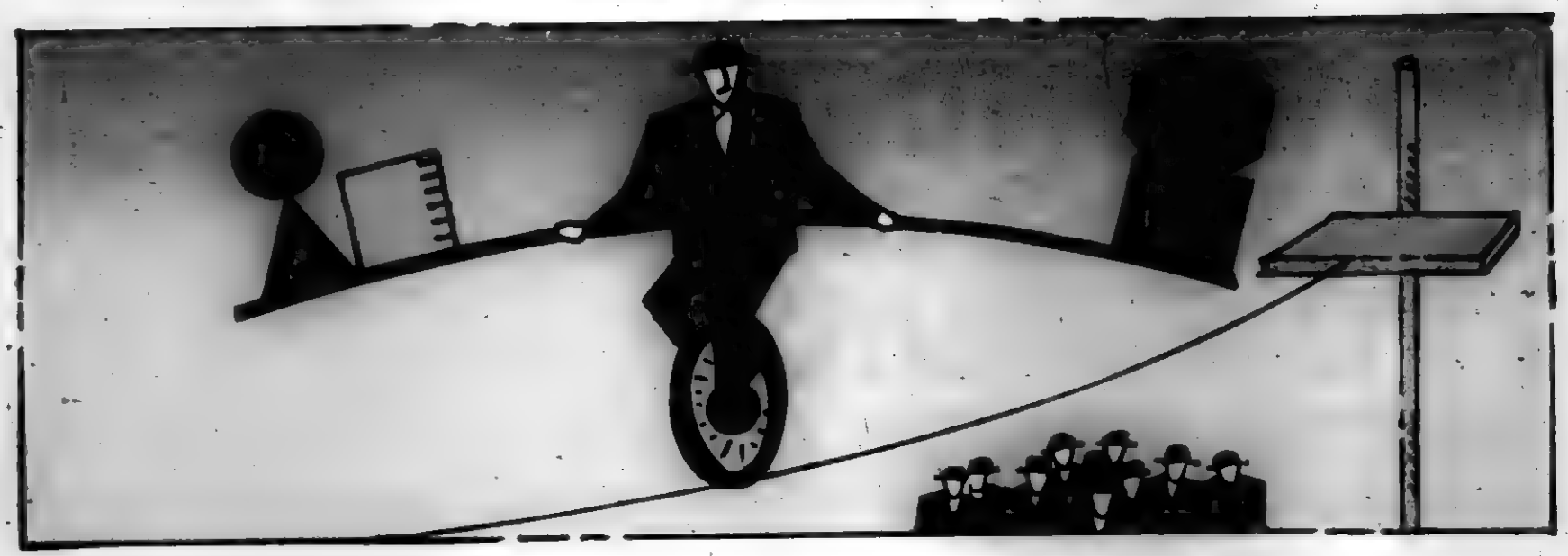

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Custom [redacted]e

Smuggling is big business. But now, U.S. customs officials can call on imaging to help nab the crooks.

U.S. Customs' Stu Mentzel: *'We wrote our own imaging application'*

By Amy Bermar

Just a few months ago, a young man heading to Chicago was caught smuggling heroin when he changed planes at Boston's Logan International Airport.

The suspect agreed to cooperate with officials and continue with the delivery. But first, customs inspectors took his picture with a video camcorder linked to a 386 PC. They also photographed the two local agents who would tail the courier on the remainder of his journey.

It took 30 seconds to upload the information to the U.S. Customs Service's central mainframe in northern Virginia and another 30 seconds to send each image to Chicago, where colleagues at O'Hare International Airport would be waiting.

"Two hours before we got there, they knew who we were and what we would be wearing," says Bob Malonson, a customs inspector at Logan. "There was no need to flash our badges and risk scaring the guy who was supposed to pick up the stuff and have him run away."

The suspect arrived at O'Hare, followed by the undercover customs agents. The drop occurred in minutes, and the man who picked up the bag was taken into custody.

Each week, more than 2 million people try to enter this land of opportunity. Many are citizens. Most of the rest are equally legal. But several hundred are smuggling heroin, gems, guns and counterfeit merchandise ranging from pirated software to fake Louis Vuitton luggage.

Thanks to a new imaging system installed at the Customs Service, the job of deciding who should head for the hoosegow has been made easier.

Anyone who has traveled overseas has had his passport

Custom image, *page 66*

Bermar is a free-lance writer based in Newton, Mass.

inside

Custom image

CONTINUED FROM PAGE 65

stamped. But peering at passports reveals only the basics. Now, at a growing number of airports, seaports and land crossings, customs' first enterprisewide imaging system provides the kind of information that helps agents make double-quick decisions.

What's new? Digitized photos of the criminals, terrorists and human "mules" who carry illegal drugs from Asia, Africa and Latin America. Customs' worldwide Imagery System also holds a record of images of the many ingenious ways in which smugglers attempt to hide their booty.

"If someone arrives at an airport and is bringing in drugs, they may be part of an organized smuggling operation," says Scot Tydeman, the national program officer at U.S. Customs' Office of Inspection and Control, which initiated this project in 1988. "If they're a runner, they may not know the name of the person they're expected to meet at the airport. But they'll know the image."

At most airports, uniformed customs inspectors operate from a discreet and darkened operations center; its mirrored walls deflect attention. Typically, the center is in the middle of the international arrivals luggage carousels. The Imagery System is also located in this booth. From there, inspectors can unobtrusively take travelers' pictures. Anyone arrested by customs also has his picture taken. The camera is brought to the examination room.

Most research on passengers is done before the flights arrive. Once the luggage starts coming through, trained dogs sniff for heroin. In the hectic moments that lead up to a search and seizure, few officials can remember to record every step on film.

"Everybody gets excited," Malonson says. "Nobody says, 'Hey, wait a minute, where's the camera?' "

So stored images help inspectors understand new smuggling techniques, including how a brown Kaluha-like liquor bottle can be specially molded to create a hidden cavity in the center of the bottle for heroin. Or how a 5-pound can of lard was recently used to carry heroin. Or how a steel cylinder had been hollowed out to hold heroin. In that case, experience carried the day: The cargo inspector noticed the two axles turned in different directions. Imagery preserved the information for other inspectors around the country.

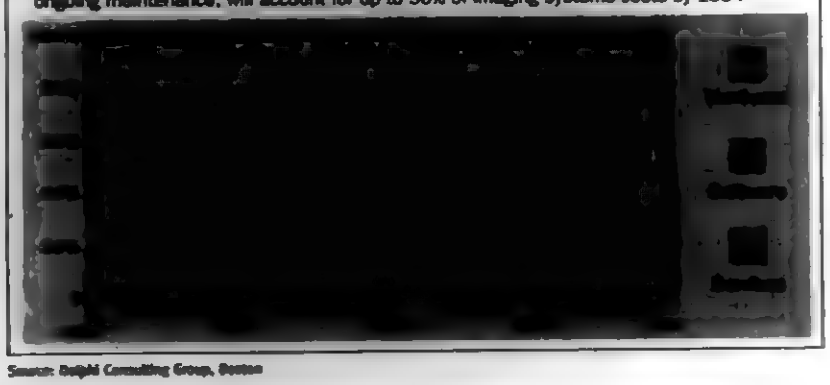
The system also helps document how passengers carry drugs on their bodies and who has been apprehended.

For example, when a woman with a beehive hairdo came into New York, dogs discovered she was carrying heroin inside her coiffure. Her image was entered into the system. Six months later, when she was listed as a passenger on a flight coming into Boston, the local inspectors knew just what to look for. And when she walked off the plane with the same piled-high hairdo, she was caught again.

How imaging helps customs catch crooks

Spotlight on service

Services, including business process redesign, application development and ongoing maintenance, will account for up to 50% of imaging systems costs by 1994



Source: Delphi Consulting Group, Boston

Negative image

But when the idea of the imaging system first came up five years ago, it got a flat "thumbs-down" from information systems.

"As data processing people are wont to do, we said, 'You don't want that — it's way out there,' " recalls Rod MacDonald, director at the U.S. Customs' Office of Enforcement Systems, which manages application development for customs' enforcement activities.

"What we meant was, 'We don't know a lot about it,' " he says.

But, he says, the users persisted. Having ready access to pictures would help inspectors, analysts and agents collaborate more effectively on nationwide investigations. A picture could eliminate confusion when two people share the same name and date of birth, especially if one is wanted by the police. The fact that customs supports virtually every other federal agency simply strengthened the argument for taking a risk.

And it was a risk: In 1988, customs did almost no work with PCs and minimal research and development. This project would involve both — as well as input from five different departments. MacDonald appointed a two-year agency veteran named Stu Mentzel as technical liaison and told him to learn all he could about commercial imaging.

No imaging Goliaths

At the annual imaging show sponsored by the Association for Information and Image Management, Mentzel drew his first uncomfortable conclusion: There were no big players.

"The big vendors, like IBM, went after document management, where they could get a return on their money quickly," Mentzel says. "But photo imaging tended to be dominated by smaller companies, which were PC- or LAN-based."

In addition, standards were just being established. The hardware standard at the time, 286-based PCs, also meant that both software compression and video capture would require separate, additional boards.

Two small companies were selected to provide imaging software and compression boards. Both proved to be strikeouts: The hardware vendor could not meet the delivery dates, and the software vendor was reluctant to rewrite its code without a long-term sales agreement. So customs decided to do the job itself.

"We wrote our own imaging application," says Mentzel, who changed hardware vendors at the same time. "The software we created is now totally the property of the U.S. government, so we can distribute it as we like."

There are currently 96 systems in place, and imagery officials say their colleagues are eager for more systems. Another 42 are slated for installation this year, covering the 50 busiest U.S. airports and crossing points along the Mexican and Canadian borders. If $16 million in funding is approved, the 920 systems could be rolled out as early as this fall.

Downloading the Imagery software from the IBM host means that this new mission-critical application can be distributed to the field for approximately $30 per user. The gear for recording images would be centralized at each site.

"We want to treat imaging as a standard capability," MacDonald says. "It will be there, just like word processing, spreadsheets and access to the mainframe."

Today, some 40,000 images are in-

Custom image, *page 68*

On-line offshoots

Customs hopes in the long run to integrate a wide variety of federal agencies and images into the system.

Here's what could eventually be on-line:

- Customs: Images of people, merchandise, reports and related validation applications.
- State Department: Passports and visa applications that have been denied.
- Immigration and Naturalization Service: People who have been deported or denied admission to the country.
- FBI: Digital images of fingerprints and photographs.
- Internal Revenue Service: Tax returns and financial images.
- Department of Agriculture.
- Secret Service.
- Interpol: European Secret Service information.
- Center for Missing and Exploited Children.
- Private organizations involved in smuggling and trafficking.

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Custom image

CONTINUED FROM PAGE 66

stalled on the system, which the pilot team delivered in four months and rolled out in 1990.

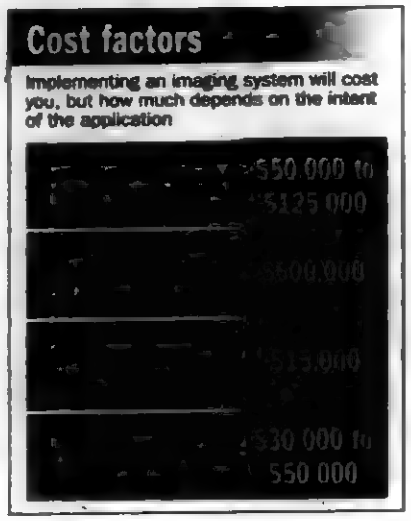
The inspectors currently using the systems are responsible for adding new images. Generally speaking, each site has one or two self-appointed gurus who handle most of the imaging work, which can have a long reach: The agents, who are comparable to detectives, sometimes ask for an image to be printed and faxed to them on the road.

Expansion plans

The agency plans to expand Imagery's reach to exchange information with nine other federal agencies participating in the Interagency Border Inspection System, known as IBIS, each of which has thousands of images and its own unique definition of the data format that should be considered the government's standard (see story page 66).

But coming together will not be simple. While customs' system is full color, for instance, the FBI's is gray scale, with the higher resolution required for fingerprint scanning.

Customs officials say they expect each agency to keep its own records on its own mainframe, and a committee of representatives from each agency is already considering developing conversion software. Still, some people in customs indicate that the sheer volume of customs' records may persuade others to adapt the Imagery format.



Imagery is fully integrated with customs' core relational database, known as the Treasury Enforcement Communications System, or TECS, which is written in Cobol running under CICS. The compressed image data is stored on Computer Associates International, Inc.'s DatacomDB, a hierarchical database. Customs' 12,000 users routinely access TECS, which contains more than 5 million records.

Making sure Imagery would support this information was the No. 1 priority. Many vendors experiment with new technology without planning for real-life use.

"We said at the outset that we want to use it in the field, where we have 10,000 end users," MacDonald says. "It had to play on the PC and on a 286."

Three years ago, each complete system cost about $16,000 and included a still-video camera, an IBM Enhanced Graphic Adapter monitor, a video camcorder and a color video printer, write-once read-many storage, a low-end and a high-end scanner and basic office automation software. The new 386 systems are slated to cost $5,000 per seat and will still use the internally developed 3270 emulation program that handles the data and image file transfer, says Jim Ryan, director of Office Systems Engineering and Operations, which is managing the rollout.

Costs could diminish further if the system is eventually ported to the client/server module using object-oriented programming techniques, particularly as new enhancements are added, Ryan says. In the near term, though, customs will continue to run the system on its mainframe and 150 Novell, Inc. NetWare networks in the field and evaluate Microsoft Corp.'s Windows NT as it matures.

A few glitches

But because the system was not designed to track drug concealment methods, inspectors trying to find old records sometimes run into snags. There is no cross-reference method for identifying coffee can seizures, for instance, or cassette tapes, both of which have been used to carry drugs. Creating this ad-hoc search capability is considered a high priority, after the software conversion.

In the meantime, the inspectors have created their own workarounds. For example, Malonson reviews the previous day's images at the beginning of his shift.

"Thirty seconds is pretty good response time for images," MacDonald says, adding that asking most users to wait more than a couple of times a day is still too long. "I'd like to improve it so it is the same as every other record in the system — three to five seconds."

An early wish

There's only one improvement MacDonald says he wishes he had made early on: encouraging greater communication between the customs R&D team that developed the application and the group that eventually installed it.

The lack of teamwork slowed down Imagery's implementation, often unnecessarily, he says.

But MacDonald is optimistic about the prospects for eventual interagency cooperation. In fact, he says, IBIS is already prompting agencies to work together, some for the first time.

"It's been a tremendous driver of interagency cooperation," he says, "simply because all of us realized the benefits of sharing data and we have so many common interests. We need to work together to give our employees the information they need." ■

Transition time for telecom giants

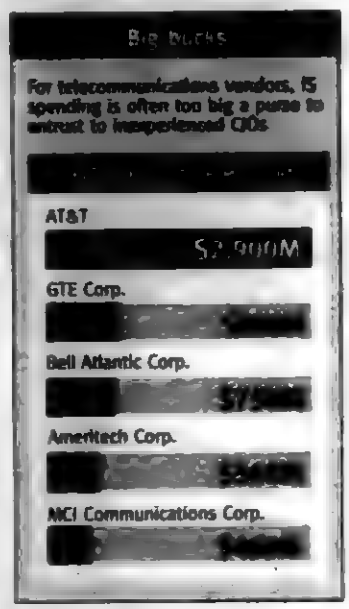
By Neil Margolis

Squeezed by competition and caught in a technological paradigm shift, telecommunications giants are racing to acquire information systems expertise as a hedge against winding up as exhibits in the corporate equivalent of *Jurassic Park*, analysts said last week.

"The pressure is on for companies to re-engineer, and fast," said Alan A. Burgess, worldwide managing partner at Andersen Consulting's telecommunications industry group. To help them do it, he added, firms "want people with experience at making technology work in an exceptionally competitive environment."

At multibillion-dollar Bell Atlantic Corp., for instance, "a sense of urgency, commitment and desire to leave our bureaucratic, monolithic ways behind" is driving a massive re-engineering initiative collectively known as Systems 2000, said Mark Wegleitner, IS group assistant vice president of systems architecture and standards.

The 2-year-old project already has Bell Atlantic in the throes of a move from mainframe-based customer contact support to a Unix-based client/server sales and service negotiation system, which will support some 50 to 100 Bell Atlantic representatives. In addition, an initial release of the Bell Atlantic Automated Record System — a computer-aided design-based engineering and construction support system — has been up and running for the past several months.



Source: Computerworld Premier 100

That's why longtime Texas Instruments, Inc. IS Vice President and Chief Information Officer Ralph Szygenda is packing up to move into the CIO slot at Bell Atlantic next Monday. During his years at TI, the 44-year-old Szygenda racked up a record in adept IS/business alignment, wrapping IS into five distinct businesses and lowering costs along the way. He also consolidated 36 data centers into one, spearheaded the implementation of a single-image, peer-to-peer network and oversaw a manufacturing operation's move into object-oriented, multimedia, workstation-based client/server computing.

TI's Ralph Szygenda's record as a fast-moving, business-savvy manager helped him become CIO at Bell Atlantic

Similarly, AT&T is in the midst of molding its maiden CIOis job around Ron Ponder, who rose to prominence as the IS director who helped fuel Federal Express Corp. to a Malcolm Baldrige National Quality Award. He has also spent the past 18 months leading a massive IS consolidation aimed at drastically cutting costs for Sprint Corp.

Mandate to change

"The telecom industry is in a state of flux," said John Rasmus, director of voice communications at San Jose, Calif.-based market research firm Dataquest, Inc. Technologically and commercially, he noted, "All at once, companies have to deal with the acceleration of the melding of telephony and computers, integrate video and multimedia, downsize and go global."

That's an especially tall order for firms whose technology and pricing structures, unlike those of many of their whippy new competitors, grew and overgrew during an era of big iron and regulated monopoly, Burgess noted. "Competitive access providers have cost structures about one-tenth [those] of the Bell companies," he estimated.

Can telecommunications firms avoid the dinosaur trap without drafting battle-tested CIOs? Few are likely to try to find out, analysts agreed. "It's possible for anyone to learn anything and do it correctly," said Wegleitner, "but it's easier to tap experience." ■

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Thomas J. Buckholtz

Productive step forward

During the past several years, there have been a number of negative claims under the heading of "Productivity gains: Are the benefits from information technology real?" A popular conclusion seems to be that productivity gains are small to nonexistent.

However, my experience indicates quite the contrary.

While leading the office automation program of a gas and electric utility in the mid-1980s, I observed specific increases in output with no increases in staff. For example, use of PCs by a few people allowed several dozen other people to be one-third more productive in reviewing homes for energy use and recommending how the households could improve lighting and heating, often while reducing energy consumption.

While staffing for this program remained constant, work output increased in quantity and quality, and, by eliminating the need for the traditional supporting computer services, the total cost decreased.

I also saw cases in which the same amount of work got done — with significant decreases in staff.

Several projects fell into this category. For example, use of handheld computers for recording meter readings eliminated dozens of in-office data-entry positions while keeping the field staff of meter readers constant.

More recently, while leading the deployment of information technology for the Executive Branch of the federal government, I observed the effects of automation at the Social Security Administration.

During the 1980s, Social Security simplified and automated data-intensive procedures. Determining that 40% of the information the public had been supplying on forms was data it already knew, Social Security removed most of that redundancy from its procedures.

It also improved its service by installing a computer system to facilitate responding to inquiries from its tens of millions of constituents; now, a clerk can answer questions about an account during a phone call. Concurrently, Social Security decreased its employee count by 20%, from 80,000 to 64,000.

> **A more telling question is how today's work could be accomplished at all if it were not for information technology.**

Measurement issues

So, although I have observed actual cases in productivity improvement due to technology, a problem remains: We have no way of defining or measuring what is being reported.

What are some of the issues?

One issue is that of "local" measurement vs. "global" measurement within an organization.

Suppose a corporation makes an improvement through automation that results in halving the staff devoted to a function, while continuing to handle the same work load with the same quality. Dividing output by input, there is a 100% gain in productivity per person — locally. But what about for the entire firm?

If the extra staff is laid off and no other functions are affected, there is a corporatewide gain in productivity per person — the same work is done with a smaller work force. If, on the other hand, the extra staff is redeployed just to the task of improving the quality, but not the throughput, of other corporate operations, then there is an argument for no overall productivity gain. The company handles the same number of units of work with the same number of people.

This example points out another issue in focusing on quantitative measures of productivity. How does one recognize, in the productivity numerator, qualitative improvements in outputs? Where is the place for timeliness or customer satisfaction?

The composition of a unit of output can also change. Is a car made today the same as one made 25 years ago? No. A new car has a special brake light, a sophisticated pollution control system and one or more air bags.

Today's unit of output can differ considerably from yesterday's. For processes that occur in offices, automation has facilitated accomplishing work. However, society continues to increase the requirements per transaction — more service or features to stay competitive; more complexity generated by new government programs; additional refinements in laws and regulations; new subtleties in interpretations of laws and regulations; and growing requirements for accountability and auditing.

Indeed, one could ask a question as to the extent that the flexibility for change provided by automation is providing opportunities for society to require such growth in complexity.

In the final analysis, there are clear-cut productivity gains. In the 1990s, Social Security handles more accounts, with more timely public service, than it did in 1980. It does so with a significantly reduced staff.

I suspect that a close look at many situations would lead to conclusions that gains have been achieved. Indeed, a more telling question than whether there have been gains is probably how today's work could be accomplished at all if it were not for information technology.

A close second for serious consideration is whether society needs to roll back, or at least slow down the growth of, self-imposed complexity. Perhaps systems can be built to support the complexity, but should we have to expand the resources so they can? Do we not have better goals to accomplish, with or without the systems? And, how can people be informed members of society if they themselves cannot keep up?

Buckholtz is a consultant in Washington, D.C., and San Francisco. Until recently, he was commissioner of the General Services Administration's Information Resources Management Service, where he led the deployment of computing and telecommunications throughout the U.S. government.

Executive Track

Mark D. Cox, former assistant commissioner for information systems development at the **Internal Revenue Service**, is newly in place as director of the **IRS' Phoenix District**. A 23-year IRS veteran, Cox has served in IS development since 1987. The division he now heads is responsible for all federal tax matters for the state of Arizona.

Meanwhile, in Missouri, **Ladd Ellis Jr.** is the new director of the **IRS Service Center** in Kansas City. Ellis, who joined the IRS in 1972 as a revenue agent, comes to his new post from a stint as assistant regional commissioner for data processing at the Chicago headquarters of the IRS Midwest region.

In Washington, D.C., the **Urban and Regional Information Systems Association (URISA)** recently elected three new members to its board of directors and selected **Randy Gschwind** as the board's president-elect. Gschwind, who is information center manager at the Department of City Development in Milwaukee, will serve a three-year term.

URISA is a 3,800-member, nonprofit organization dedicated to providing ongoing education related to automated information systems within local, state/provincial and federal governments and related private sector environments.

Last week marked a changing of the guard at **Computer Task Group, Inc.** Former IBM Professional Services Vice President **Gale S. Fitzgerald**, who has served as senior vice president of the Buffalo, N.Y.-based information technology consulting firm since 1991, has stepped up to the post of president and chief operating officer and has also been made a member of the board of directors.

Fitzgerald replaces **John P. Courtney**, who served as the firm's president and chief operating officer from 1984 until his retirement on July 1. Courtney remains a member of the firm's board.

Have you or a colleague in the information systems field recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact Senior Editor Nell Margolis at (800) 343-6474 to pass along the news.

Calendar

JULY 18-JULY 24

Guide '93 Conference. Montreal, Quebec, July 18-23 — Contact: Guide International Corp., Chicago, Ill. (312) 644-6610.

Windows World. Mexico City, July 20-22 — Contact: World Expo, Framingham, Mass. (508) 879-6700.

Equipment Resources Planning Institute. Albuquerque, N.M., July 22-23 — Contact: Equipment Resources Planning Institute, Santa Monica, Calif. (310) 394-2997.

JULY 25-JULY 31

All about IBM '93. Aspen, Colo., July 26-28 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

AUG. 1-AUG. 7

Siggraph '93. Anaheim, Calif., Aug. 1-6 — Contact: Siggraph '93 Conference Management, Clarendon Hills, Ill. (708) 850-7843.

Downsizing Expo. Santa Clara, Calif., Aug. 3-5 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

AUG. 8-AUG. 14

Sounds of Change: Emerging Technologies/Re-engineering State Government. Nashville, Aug. 9-11 — Contact: National Association of State Information Resource Executives, Lexington, Ky. (606) 231-1970.

AUG. 15-AUG. 21

International Networking Conference '93. San Francisco, August 17-20 — Contact: Universities Space Research Association, Mountain View, Calif. (415) 390-0317.

Client/Server '93 East. Washington, D.C., Aug. 17-20 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-5717.

AUG. 29-SEPT. 4

Structured Development Forum. Philadelphia, Aug. 31-Sept. 2 — Contact: Espirit Systems Consulting, Inc., West Chester, Pa. (215) 436-8290.

Users' champion

Mark Bolster

There's nothing Bonnie John hates more than a system that gets in its user's way. A sworn enemy of poor interfaces and cryptic error messages, John has spent years crusading for user-centered design.

Bonnie John
Age: 37 (married, two children)
Schooling: Bachelor's degree, mechanical engineering, from Cooper Union; master's degree, mechanical engineering, from Stanford University; master's and Ph.D., cognitive psychology, from Carnegie Mellon University
Notable work: Responsible for the design and usability of the Merlin phone system while on the technical staff at Bell Laboratories in late 1970s and early '80s

Q. What is your definition of HCI?
A. Think of a triangle. In one corner you've got tasks, in another you've got humans with all their capabilities, and in the third you've got computers (processor, keyboard, Help systems, speech input, documentation, etc).

HCI is looking at these three things together to understand how to design the next system or evaluate several designs or design alternatives. Too much design stays in one corner or the other. If all you do is stay in one corner, my definition is that you are not doing HCI.

You are either doing computers or you're doing psychology.

Q. What does not fall under your definition of HCI?
A. Algorithms for graphics to make a beautiful rendering faster; that's computer science.

Q. Can you think of any common system or software feature you feel should be immediately outlawed?
A. I would rather tell you what feature it should be made illegal NOT to have: Undo. Most good software does have it, but boy, a lot doesn't, like in the Unix world.

Q. You have developed several theories that predict how users will interact with systems. Have your theories been put to the test?
A. In December 1988, I was consulting with Nynex Corp. A workstation manufacturer had approached Nynex with workstations it said would make toll and assistance operators work 10% to 20% faster. Nynex was very excited about this. It has a rule of thumb: If you save a telephone operator one second per call on average, you save the company $3 million a year.

Everyone in the phone company was convinced that the new workstation was better. It had a graphical user interface, and it had screen information flowing logically, not haphazardly. It worked at 1,200 bit/sec. instead of 300 bit/sec. It used packet switching so the screen zipped right up entirely instead of one character at a time. The keyboard was ergonomic. Keys were logically placed. This thing looked good; everybody loved it.

However, I predicted the new workstation would be 3% slower than the one in use, which would translate to a $2.4 million annual increase in the costs of the company. Nobody believed it.

When information came back from field trials, it showed the operators were indeed 3% slower!

Users' champion, *page 72*

Users' champion

CONTINUED FROM PAGE 71

Q. What was the problem with the workstations?

A. It was only when we studied the complex interaction of talking, seeing and keying that we knew the proposed workstation would be slower.

The vendor had reduced the number of operator keystrokes, and if operators were doing things serially, that would have reduced the time. But because activities go on in parallel, the picture was much more complex. It was a matter of a bunch of little problems adding up.

[One problem] was that the vendor took two keystrokes out of the middle of a call and put an additional keystroke at the end. This reduced the keystrokes by one, but the stroke at the end of the call was done on the critical path. The net reduction of one keystroke actually increased the time of the call.

Q. The idea of holding vendors accountable for user-unfriendly systems became a public issue during an appeals case in which you appeared as an expert witness. Can you describe the case involving AT&T, IBM and Lockheed?

A. I am under protective order, so the details of the case are private to the companies. What I can tell you is that AT&T, IBM and Lockheed all bid to supply an office automation system to the Internal Revenue Service. The IRS chose AT&T's system, which was the most expensive at $1.4 billion. IBM's system cost $700 million while Lockheed's went for $900 million. IBM and Lockheed protested and appealed the decision.

The courts wanted to know if the added money the government has to spend to buy this system is worth it. How much easier is it? How much is it going to save? I had to quantitatively show that the AT&T system was worth the extra expense for the IRS in terms of human productivity.

Q. Can you describe your ideal computer system or software package?

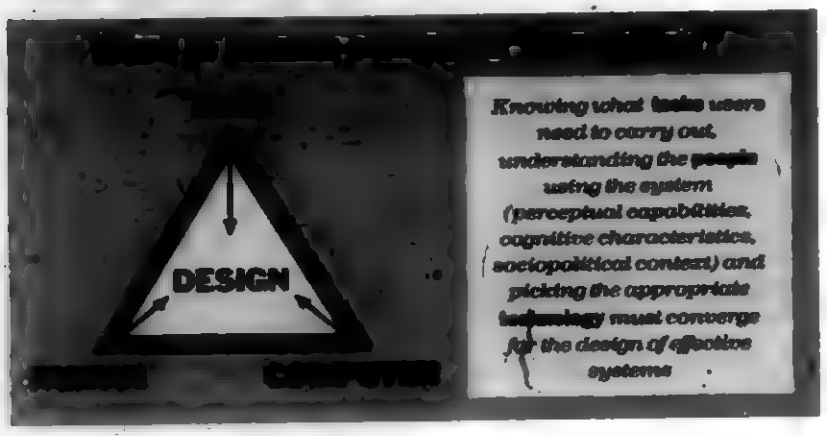
A. The one that does what I want, not what I tell it to do. The ideal system would read my mind.

Q. Given the increasing publicity surrounding usability, are companies changing what they look for when they buy a system?

A. Before the discipline of HCI, buying a system was solely judged on whether it was cheaper and faster. And faster was defined by processor and communication speed, not in terms of the whole task that includes the person. That is how we have judged systems in the past. We're making small steps to getting rid of that thinking.

The bottleneck is becoming the information processing of the person, not of the system.

Q. What advice do you have for information systems staffers who want to ease the interaction between humans and computers?



A. If you are designing something, probably the most valuable and easiest thing to do is just videotape users. The important thing is not to forget the task — you have to know what your system is going to be used for.

For instance, I'm sure the manufacturer who wanted to sell Nynex its workstations analyzed how many keys an operator had to press and figured it could reduce keystrokes and all would be fine. What it didn't do was look at the whole task — talking, dead airtime, dead key time.

The other thing designers can do is ask users to think aloud. Just let people do what they normally do and wait for "critical incidents" — that is, a grunt or an exclamation of "Oh! That's great!" There are good incidents and bad ones. In this way, when you go back to redesign your system, you preserve the good pieces and get rid of the bad ones.

Q. What about advice for the actual design of the system?

A. The ability to transfer the knowledge users have about one application to another one is a measure of how integrated something could be, how usable from system to system. That has a tremendous impact on user learning time. Once you learn a particular application, how much do you know about some new one?

In the Macintosh world, for instance, a whole bunch of menu items are exactly the same and are in exactly the same place in different applications. Users know a lot about a new application before they've even seen it.

Q. Why are so many human/computer interfaces so bad?

A. Primarily it's because the designers cannot think like users. And they think they can. They make systems that are good for designers. But more and more people are reacting to the fact that there are so many boxes of software hanging on shelves and not being used because they're so bad. There are people who are waking up to this and whole companies that are waking up to this. Apple, for instance, is committed to user testing.

But there are still a lot of designers that haven't woken up. The Unix area has been much maligned in this regard for over 10 years.

"The ideal system would read my mind."

Q. Proponents of ideas such as ubiquitous computing — in which computers will embed themselves in everyday objects — promise that tangible user interfaces will give way to more intuitive-type inputs, such as voice. As these ideas become real, will the need to worry about HCI fade?

A. As computers become more ubiquitous and more exotic in their I/O, people are going to become more and more of a bottleneck.

Right now, the computer just dumps everything at the user, and the person has to figure it out. But the person is getting overwhelmed.

As we start introducing artificial intelligence for intelligent agents and data visualization and things like that, we have an opportunity to make things more intelligible for people, but we also have an opportunity to screw it up and start hiding the information they really need.

I think HCI — that is, understanding tasks and humans — is going to become more and more important in the design of future systems. ■

According to the book The Design of Everyday Things *by Donald A. Norman (Doubleday), if you really want to mess up a system design, then do the following:*

Make things invisible. Don't let the user know what operation to do, and don't offer feedback.

Be arbitrary. Pick command names and actions that don't make intuitive sense.

Be inconsistent. Use a bunch of different rules. Create inconsistency in the way things are done in different modes.

Make operations unintelligible. Use unusual language, abbreviations and cryptic error messages.

Be impolite. Treat users like dirt.

Make operations dangerous. Make it easy to destroy important work.

But if you want a good design, the following qualities are important:

Visibility. Users can tell what's going on and what their options are.

A good conceptual model.

Good mappings. Users can determine the relationship between action and results; controls and effects; and system state and what is visible.

Feedback. Users know the results of their actions.

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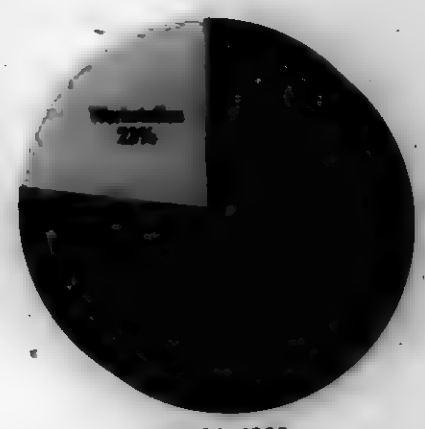

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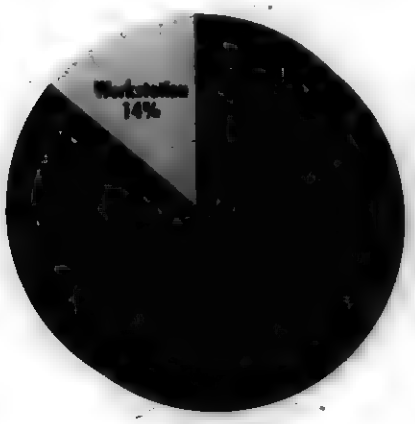

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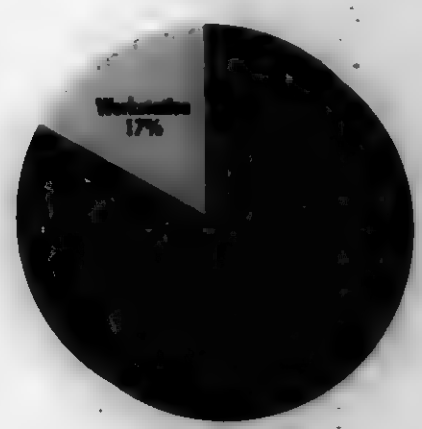

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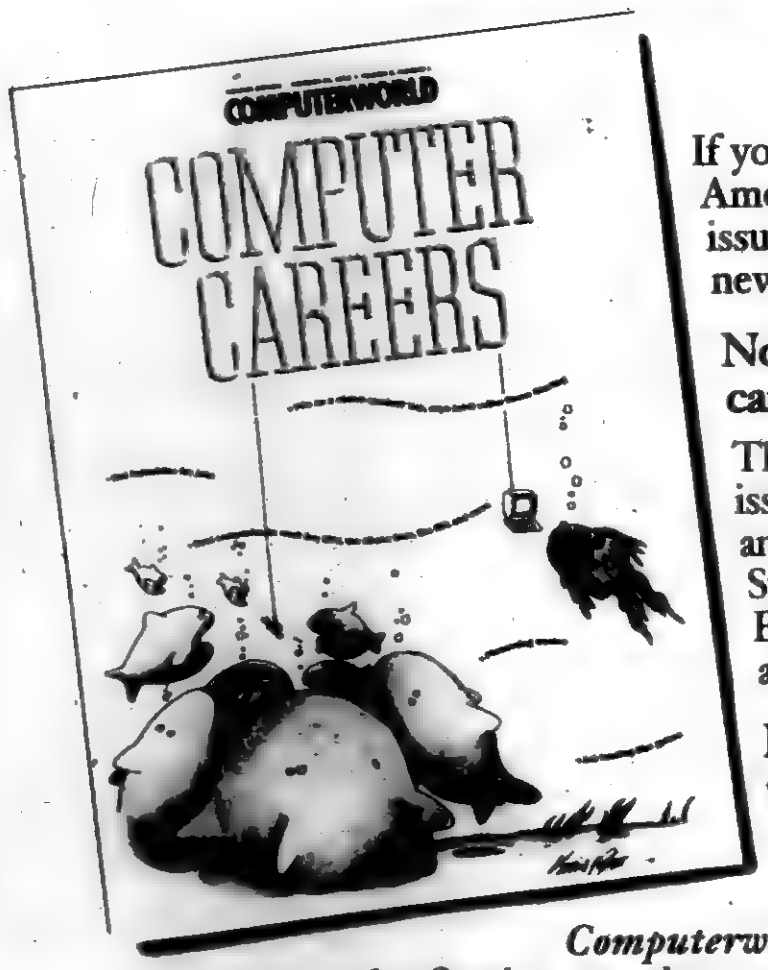

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Planned Editorial Features:

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- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!

UNIX: Are you prepared?

Companies are still hiring developers for proprietary systems but agree that learning the emerging standards is a must

By Alice Bredin

UNIX APPLICATION development. It's a hot skill, and companies want employees who have it. To land such a job or to stay on the cutting edge of the one you have, knowledge of emerging technologies and a willingness to learn are crucial.

Most experts agree that it's essential for anyone in the Unix area to be familiar with the standards. The important ones to watch include Posix and those emanating from the Object Management Group and Unix International.

"People have to invest time and ego in training themselves in the existing and emerging standards," says Nina Lytton, editor of "Open Systems Advisor," a Boston newsletter on multiplatform computing. "If you are in the airline industry or banking and you don't know the industry standards, you're in trouble."

Opinions on the level of knowledge necessary vary depending on who you talk to. Many companies are still working primarily in proprietary systems and are satisfied as long as employees keep up to date.

At Com Squared Systems, Inc., a St. Paul, Minn., records and document management application vendor, Vice President of Development Craig Wilson says Unix standards are something for the future. Industry awareness is important, but he says he does not expect new hires to program to standards. Because Wilson hasn't found too many that he can use, he is more interested in hiring people who can help figure out how to port from one proprietary system to another. "Unix is the future, and I can't deal in the future," he says.

Employers may not be asking for these skills now, but some experts say the capability to create applications using industry standards will soon be imperative. Their advice: Learn them now and become a hot commodity; don't and become extinct.

"You may choose to develop with unique interfaces, like HP, but you should do it knowing that you are restricting yourself," says Shane McCarron, project manager at Unix International, the Parsippany, N.J.-based trade association for Unix systems and related technologies.

"You may choose to develop with unique interfaces, like HP, but you should do it knowing that you are restricting yourself," says Shane McCarron, project manager at Unix International.

"If you can say you know the difference between proprietary and open and you can make sure an application will run across any platform by adhering to standards, you'll be marketable."

Object-oriented programming is one area on which industry analysts and employers agree. C++ is the language of choice and is perceived as easier to learn for the many C programmers. However, Smalltalk is considered a good next step for people who know Cobol.

Wilson hires people who understand the difference between C and C++. He acknowledges, however, that there are few experts in C++, and he is willing to hire someone who still has learning to do.

"If someone came in and told me they were an expert in C++, I'd be skeptical."

On the other hand, Dan Amedro, vice president of MIS at Hyatt Hotels Corp. in Chicago, looks for the ability to use object orientation in any language, not necessarily in C++.

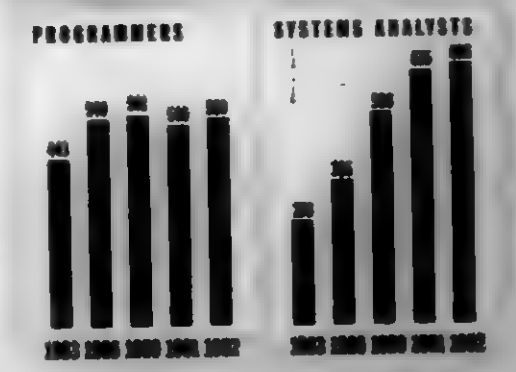
Amedro also looks for Unix programmers who are familiar with communications protocols — particularly people who can apply standards such as X.400 and X.25 to manage networks.

Who needs this type of background? Anyone who makes decisions about what applications are being developed, says Jim Brennan, senior director at WorkGroup Technologies, Inc., a Hampton, N.H., industry consultancy.

Once armed with this knowledge, look for jobs in retailing, banking, airlines and hotels. These industries offer services similiar to those of their competitors and are particularly interested in finding ways to create a competitive advantage. "Companies like these are competing on time and are cost-sensitive," Lytton says.

Bredin is a free-lance writer in New York.

JOB watch *A first in a series of closer looks at job types and employment trends*



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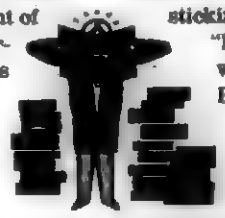
What employers won't teach

By Stephanie Wilkinson

"FIRE IN THE BELLY." That's what it takes to get experience with technology you don't work with every day, those who have been through the self-education process say.

Gaining exposure to new and/or hot technologies requires energy, stamina and a significant investment of personal time, but many information systems professionals are starting to regard this kind of investment in their future as a must.



"Nobody will look out for your career like you do, so you had better stay on top of it," says Terry Tippie, a systems engineer at Cabletron Systems, Inc. in San Jose, Calif.

More than 9 to 5

As an employee in the IS department at Boeing Corp., Tippie says he felt stuck in a dead-end job.

"It took me three to four years of educating myself before I was given a chance to prove my skills," he recalls. "This required staying after work until 8 or 9 o'clock, getting my hands on the hub, router or whatever I wanted to learn, reading the documentation cover to cover, then taking it apart and figuring out how it worked."

Sometimes companies will provide access to education or help you foot the bill, but don't count on it. Even at relatively enlightened companies, such as Shaw Industries, Inc., a carpet manufacturer in Dalton, Ga., there is often a gap between philosophy and reality.

For instance, although Shaw's IS director C. Rae Quinn says the company encourages the IS staff to seek out educational opportunities and will even pay half of their tuition, systems analyst Carlton Beard notes that time is often a sticking point.

"If I wanted to learn DB2, it would still be on my own time," Beard says.

Going it alone

More than likely, you'll be searching and paying for training on your own, so be prepared — it can be expensive. J. D. Cox, an independent networking consultant in Philadelphia who took a series of courses to become a Certified NetWare Engineer (CNE) for Novell, Inc.'s network operating system, warns that even basic certification carries a big price tag.

"It requires seven to eight courses, which run a couple of thousand dollars each. There's still a whole lot more I'd like to know, but I can't afford it right now." Instead, Cox has turned to books and manuals to give him a start on his new interest: wide-area networking.

As you begin to explore your options, you'll find that some of the approaches are less than unique, but those who have done it stand behind them. There are at least six simple things you can do to find the best source of training for the technology you want to learn:

- Contact the vendor. It often has the most complete knowledge of training options for its products.
- Talk to anyone who knows what you want to learn. Experts are often generous with their knowledge. Ask how they got their own training and what's required.
- Call your local chamber of commerce. Members may give computer training as part of community service projects or run local seminars.
- Invest in books and magazines. If you know the basics, your training will be more effective.
- Join user groups. Even if the group isn't exactly focused on the technology you want to learn, chances are someone there shares your interest.
- Visit local training vendors. "Shop around for prices and availability," suggests Michelle McLean, manager of professional computing services at Casco Northern Bank in Portland, Maine. Do anything that will give you hands-on experience.

"In the end, determination is the best teacher," Tippie says.

Wilkinson is a free-lance writer in Charlottesville, Va.

Hot technologies cost

- **Novell's NetWare:** Novell offers home computer-based courses that range from Introduction to Networking ($295) to NetWare 4.0 Administration ($1,195). To become a CNE, it is not necessary to take the courses, but you must pass six tests that cost $85 each. For more information, call (800) 638-9273.

- **AS/400:** To become an Application System/400 system operator or advanced system operator, you can take a computer-based training course or attend a class at one of IBM's training facilities located in most major cities. The cost, either way, is $945. Call (800) 426-8322 for more information.

- **Object-oriented programming:** James Martin Insight, Inc. in Naperville, Ill., offers several video seminar courses on object technology. Call (708) 369-3000 and ask for the marketing department.

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Requires 3 or more years of professional SQA experience in a commercial software development environment, proven knowledge in multiple phases of the SQA process, with a defined view of the environment necessary to ensure bug-free software. Technical capabilities are critical.

SQA Director

Extensive experience in the management and implementation of a successful SQA environment. The candidate that we select will have a strong background in both methodologies and technologies. Experience in the design/development of financial applications is a big plus.

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Requires 5 years of experience working closely with mini/mainframe packaged accounting solutions. The ideal candidate will possess strong project management, interpersonal and communication skills. Experience with Client Server and RDBMS technology a plus.

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The Senior Database Administrator will be responsible for all aspects of designing and implementing a large system development effort. This position will play a key role throughout the development life cycle from analysis to installation and tuning. The system must be able to support a high volume of on-line transactions and also provide a responsive decision support facility. The successful candidate will be a senior technical contributor with experience:

- designing large databases for both OLTP and decision support applications
- developing database distribution and synchronization strategies
- tuning and maintaining mission critical production databases
- using systems development methodologies, CASE tools and the AS/400 Database Manager

Technical System Architect

The Technical System Architect will be responsible for the overall design and integration of a large system development effort. The Architect will be responsible for providing the technical vision, developing the technical framework, gaining consensus on key technical issues and ensuring standards and procedures are followed. The technical framework must enable a smooth integration of components and allow for the addition of new components in the future. The successful candidate will be a senior technical contributor with experience:

- designing the hardware and application architecture for many complex systems
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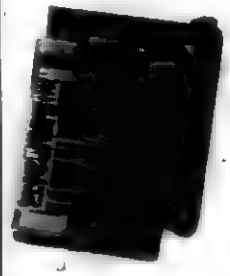

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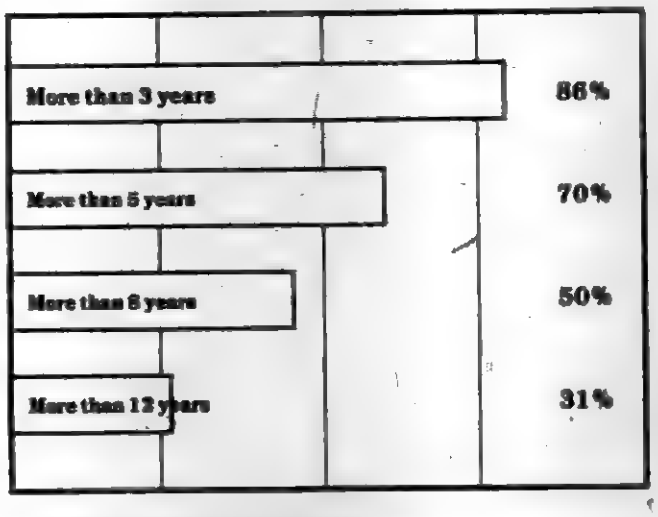

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HOW TO APPLY: Send resume and letter of application focusing on your qualifications for the job duties and requirements listed above to: DoIT Personnel (PVL #20730); 1210 West Dayton St., Madison, WI 53706-1685; FAX (608) 262-4679; TDD (608) 263-4205. Electronic applications accepted at mary.lenk@mail.admin.wisc.edu. Resumes will be professionally reviewed and those individuals who appear best qualified will be invited to participate in the next step of the selection process. Deadline date for receipt of all completed materials is 4:30 p.m. on July 27, 1993.

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Programmer/Analyst - Moline, IL - Design and develop batch and online applications and programs; responsible for project life cycle; write specifications; develop databases; use MVS/XA, TSO/ISPF, DB2, IMS/EXPERT and DB/DC, XPEDITER. 3 years experience. 40 hours per week (8-5); $38,000/year. Must have proof of legal authority to work permanently in U.S. Send TWO copies of your resume to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Jean Woodson. Reference # V-IL 10424-W. NO CALLS. AN EMPLOYER PAID AD.

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SYSTEMS ANALYST (REF. #111283) to analyze, design, develop & implement comp s/ware for clients' EDP sys, incl: analysis, design & development integrated welfare sys on IBM 3090, IBM PC/ATs using DB2, TELON, IMS/DC, VS/COBOL-II, MVS, DB2, & ADW Knowledgeware CASE tool incl process/data flow design, data modeling, meetings with users to gather requirements, overall design of documentation using Word Perfect 5.0 for DB2. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs exp in the related occupation in lieu of the req ed & exp. Related exp must have incl design & development of computer s/ware using IBM mainframe, DB2, VS/COBOL II, IMS, TELON, & user interaction. Pay is $38,000/yr. 40 hr/wk.

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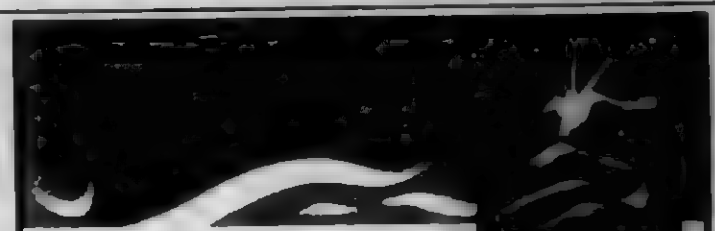

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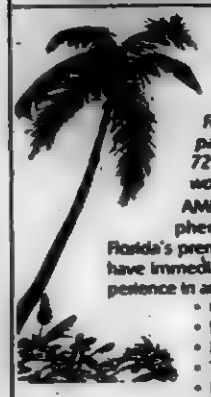

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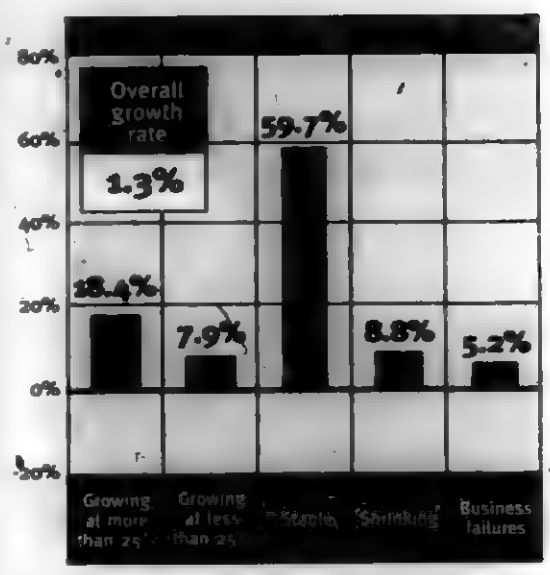

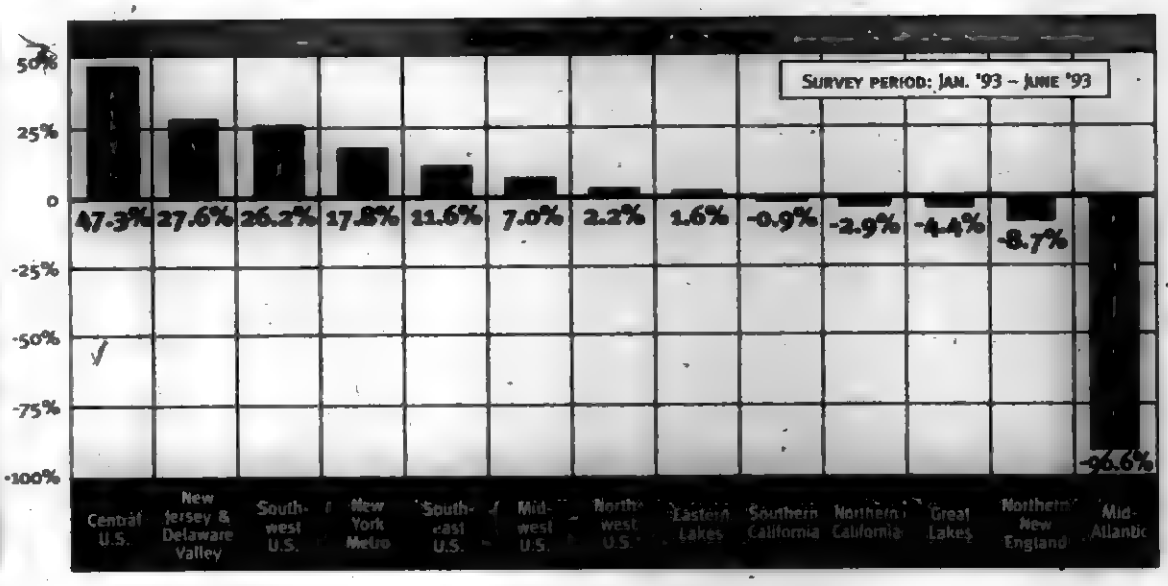

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Customize your own LAN personnel team

By Robert J. Panza

For companies with complex networks, building a team to install, support and maintain local-area networks is neither one-stop shopping nor a straightforward deal.

You might ask a technology consultant to slide into a value-added reseller role to offer broad technical know-how and a total solution. A computer retail store might maintain a team of LAN consultants. Another large company might hire a management consulting firm to act as a general contractor.

The root of the problem is the number of tasks associated with LAN installation and maintenance, combined with the chameleon-like nature of the various providers' roles. It's difficult to determine where to turn, not to mention assessing what you need.

Services offered

LAN services can be shared by in-house personnel as well as outside providers. A combination works best in large companies with complex networks. At some point, most firms use an outside provider. Depending on what you need, services range from the very basic to the very technical. These include design and engineering consulting services, systems integration, installation, hardware and software maintenance, support and repairs, technical support and troubleshooting.

Large firms with 500 to 1,000 complex networks (more than 100 nodes) generally use all of the providers listed (see chart) to fill particular niches, while firms with smaller networks usually limit the providers to three or fewer.

Generally, it is very efficient to outsource routine work, such as hardware maintenance or work that demands a high level of technical expertise, such as interoperability of heterogeneous systems or advanced routing technology.

In theory, the profit margin of the provider should make outsourcing expensive. In reality, in-house operations are often very inefficient due to politics and other disincentives. However, total outsourcing across the board is a cop-out by in-house management.

Panza is a LAN consultant affiliated with the consulting firms EJR Computer Associates in Hoboken, N.J., and The Systems Expert, Inc. in Woodbury, Conn.

Provider	Strengths	Weaknesses
	Personalized service; good product knowledge.	Limited experience; weak in software and services; usually better with hardware; not always cost-effective.
	Low prices; good quality; hardware-focus; most offer national on-site service themselves or through third-party firms; more cost-effective than the retail store.	Long-distance; impersonal; difficult to control; risks the chance of being locked into its products.
	Highest level of product expertise; geographic breadth; often puts consultant on-site; hardware-oriented.	Technical expertise might be limited to product line; product bias; limited system integration.
	Combines consulting and products; can deliver a total solution in horizontal and vertical markets; gives value-added service.	Product bias; not always cost-effective.
	Knows core business applications.	LAN technology limited to routine tasks such as network administration, loading software and setting up users.
	One of the more sophisticated sources besides the technology expert; deals with enterprise networks and a wide range of products and problems; geographic breadth.	Expensive; exercises a high degree of control.
	Often hired by other providers; offers expertise in various aspects of LAN technology that is broader than the product specialty vendor; routine support.	Limited knowledge of non-LAN technology; niche-oriented.
	Does almost everything; has access to many resources; works well with upper management; geographic breadth.	Expensive; difficult to control.
	A guru; in-depth mastery of broad range of LAN and related technology; flexible; cost-effective; engineering focus.	Limited availability and resources.

Source: Robert J. Panza

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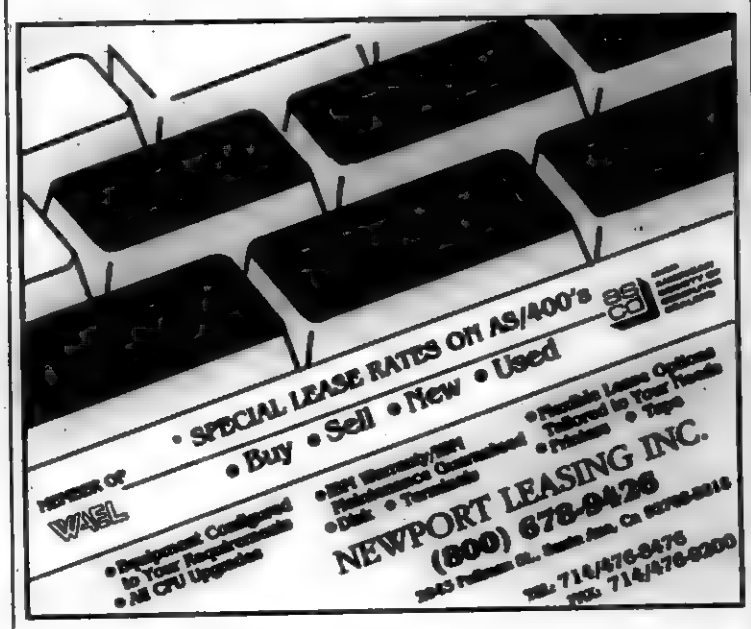

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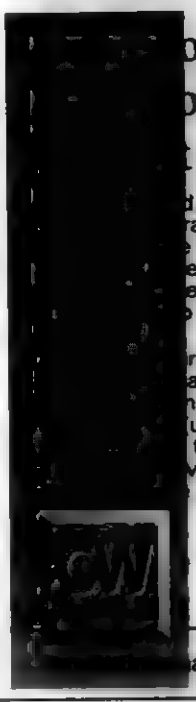

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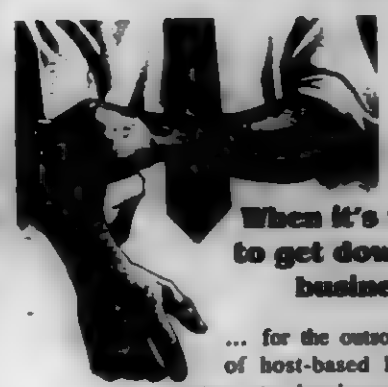

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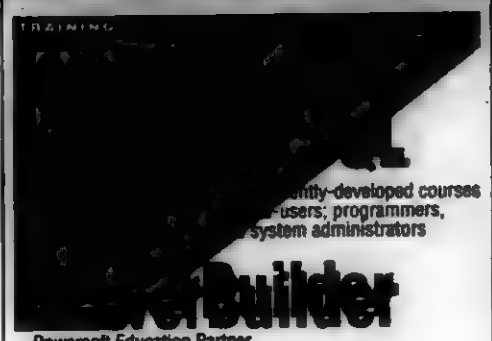

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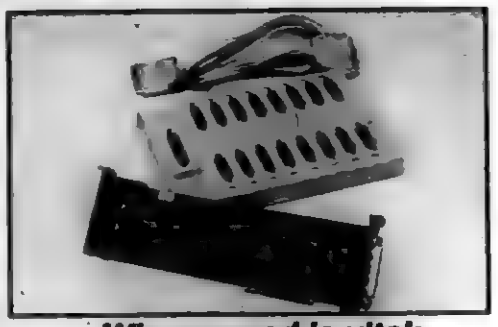

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Percent

Autodesk Inc.	31.9	Meca Software	-38.8
ManEdge	31.0	Northern Telecom Ltd. (L)	-27.5
Wyman	27.3	Compuphonics Corp.	-22.8
Cyrix and Technologies	25.9	Network Computing Devices	-17.5
Exabyte Corp. (L)	25.0	McAfee Associates	-15.3
Kronos Incorporated Inc.	23.1	CompuUSA Inc.	-14.8
Maxtor	18.0	Interlan Inc.	-14.7
American Mgmt. Systems	18.0	State of the Art	-13.6

Dollar

Computer Sciences (H)	5.25	Northern Telecom Ltd. (L)	-10.13
BMC Software Inc.	4.88	Adobe Systems Inc.	-7.50
Systems Technology	4.50	Compaq Computer Corp.	-5.50
Wellfleet Networks Corp.	4.13	CompuUSA Inc.	-4.88
Oracle Corp. (H)	3.75	Meca Software	-3.88
Raymond Telecommunications Inc.	3.50	Hewlett Packard Co.	-3.00
Cheyenne Software Inc. (H)	3.13	Zilog Inc.	-2.50
American Mgmt. Systems	2.88	Intelligent Info. Systems (H)	-2.25

Chipsoft does not reach Meca

Even though the proposed union of Chipsoft, Inc. (CSFT) and Meca Software, Inc. (MECA) would have created a dominant position in the tax software market for the combined firm, analysts and investors said it may have been for the best when Chipsoft left its rival standing at the altar last week.

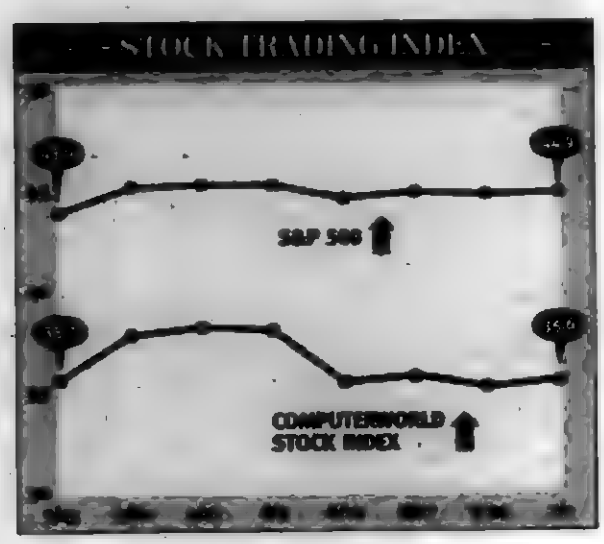
Chipsoft's intended buyout of Meca was scrapped in light of threatened federal antitrust litigation. Chipsoft would have emerged with 70% of the personal tax preparation software market, according to data from Donaldson, Lufkin & Jenrette Securities Corp. Chipsoft's Turbo Tax and MacInTax packages currently hold 56% of the market.

Meca shares dropped precipitously when Chipsoft's offer fell through. Meca's share price dropped 38% to close at 8¼ on Wednesday.

However, Meca remains a likely acquisition target, analysts said. "If Meca is low on cash, someone might be able to shout them an offer south of what they were going to get from Chipsoft," said Mike Stanek, senior technology analyst at Piper Jaffray, Inc. Several analysts mentioned Computer Associates International, Inc. (CA) and Intuit, Inc. (INTU) as possible suitors for Meca.

Chipsoft issues actually rose on the news, hiking up 1½ on Wednesday. "I think investors were concerned about the impact the merger would have on Chipsoft's earnings and growth," said Peter Rogers, a software analyst at Robertson Stephens & Co.

—Derek Slater



Exch	52-Week High	52-Week Low		July 2 Stock	Wk Net Change	Wk Pct Change
COMMUNICATIONS & NETWORKING						
OTC	40.00	9.63	3 COM Corp.	36.75	0.13	0.5
NYS	81.00	63.38	American Info Techs Corp.	79.63	1.13	1.4
NYS	63.88	40.63	AT&T	62.25	0.13	0.2
OTC	4.06	0.75	Aztel Communication Corp.	3.13	0.13	4.2
OTC	24.50	10.25	Banyan Systems Inc.	17.00	0.25	1.5
NYS	59.00	44.25	Bell Atlantic Corp. (H)	58.00	0.50	0.9
NYS	57.50	46.75	Bellsouth Corp.	54.63	-0.13	-0.2
NYS	8.50	3.63	Bolt, Beranek & Newman (H)	7.88	0.38	5.0
OTC	18.50	9.50	Brooktrout Technology	13.75	0.00	0.0
NYS	108.38	47.00	Cabletron Systems	107.38	2.63	2.5
OTC	22.75	5.00	Centigram Communications	21.50	-0.50	-2.3
OTC	43.50	19.00	Chipcom Corp.	41.00	-1.25	-3.0
OTC	57.25	22.13	Cisco Systems Inc. (H)	55.25	1.50	2.8
OTC	16.38	5.50	Compression Labs Inc.	13.50	1.00	8.0
OTC	36.00	12.25	CrossComm	31.25	2.25	7.8
OTC	4.63	1.38	Data Switch Corp.	2.75	0.13	4.8
NYS	19.88	12.38	Digital Comm. Assoc.	13.13	0.63	5.0
OTC	12.75	6.00	Digital Systems Int'l Inc. (L)	4.75	0.00	0.0
OTC	51.25	4.38	DSC Communications (H)	51.25	1.75	3.5
OTC	9.50	5.00	Fibronix Int'l, Inc.	6.00	-0.50	-7.7
OTC	24.00	8.75	Filenet Corp.	11.50	-0.25	-2.1
OTC	4.38	1.50	Gandalf Technologies Inc.	2.88	0.00	0.0
OTC	2.06	0.69	Gateway Communications	1.13	0.06	5.8
NYS	15.75	7.88	General Datacomm Inds.	14.00	0.13	0.9
ASE	3.75	2.00	Go Video	2.63	-0.06	-2.3
NYS	37.75	31.75	GTE Corp.	36.13	-0.13	-0.3
NYS	86.75	62.75	ITT Corp (H)	85.13	1.25	1.5
OTC	57.13	30.75	MCI Communications Corp.	56.63	0.25	0.4
OTC	6.75	2.25	Microcom Inc.	3.44	-0.06	-1.8
OTC	24.25	4.75	Netrix Corp.	5.00	-0.25	-4.8
OTC	19.00	8.25	Network Computing Devices	8.25	-1.75	-17.5
NYS	15.00	5.38	Network Equipment Tech.	7.50	0.13	1.7
OTC	20.13	8.00	Network General	11.25	1.50	15.4
OTC	15.75	8.13	Network Systems Corp. (L)	9.50	1.00	11.8
OTC	47.38	7.50	Newbridge Networks Corp.	47.38	4.13	9.5
NYS	46.00	26.25	Northern Telecom Ltd. (L)	26.75	-10.13	-27.5
OTC	35.25	22.50	Novell Inc.	26.25	-1.00	-3.7
NYS	92.50	79.00	Nynex Corp.	90.25	2.50	2.8
OTC	30.00	14.50	Octel Communications Corp.	22.25	1.50	7.2
OTC	6.13	3.38	Pinnacle Data Comm Networks	3.75	-0.38	-9.1
OTC	30.50	10.25	Picturetel Corp.	22.50	1.88	9.1
OTC	15.25	4.63	Proteon Inc.	5.13	0.25	5.1
NYS	35.00	15.00	Scientific Atlanta Inc.	32.38	0.75	2.4
NYS	40.75	31.66	Southwestern Bell Corp.	39.13	1.88	5.0
NYS	34.50	21.63	Sprint Corp. (H)	34.13	0.38	1.1
OTC	27.00	10.50	Standard Microsystems Corp	16.00	0.25	1.6
OTC	18.50	6.88	Sybaton Inc.	13.13	1.38	11.7
OTC	42.75	9.75	Synoptics Communications	37.50	2.75	7.9
OTC	7.00	3.38	Telebit Corp.	3.38	-0.25	-6.9
OTC	9.38	2.13	Telematics Int'l Inc.	7.88	0.00	0.0
OTC	25.50	13.38	US Robotics	23.50	0.00	0.0
NYS	46.75	35.25	US West Inc. (H)	46.75	2.00	4.5
OTC	55.50	12.00	Wellfleet Communications	49.63	-0.25	-0.5
OTC	16.75	7.25	Xircom (H)	15.75	0.25	1.6
COMPUTER SYSTEMS						
OTC	5.56	2.50	Advanced Logic Research	3.63	-0.13	-3.3
OTC	65.25	38.50	Apple Computer Inc. (L)	38.50	-1.50	-3.8
OTC	24.25	11.25	AST Research Inc.	14.75	-0.25	-1.7
NYS	10.25	2.50	Commodore Int'l (L)	2.88	0.13	4.5
NYS	61.75	24.25	Compaq Computer Corp.	46.13	-5.50	-10.3
OTC	49.88	16.00	Dell Computer Corp.	18.75	-2.25	-10.7
NYS	89.25	50.25	Hewlett Packard Co.	79.88	-3.00	-3.6
NYS	38.50	16.38	Silicon Graphics	37.63	1.25	3.4
OTC	41.00	23.38	Sun Microsystems Inc.	30.25	0.88	3.0
NYS	32.38	22.25	Tandy Corp.	29.50	0.50	1.7
OTC	7.00	2.75	Zeos International Ltd.	3.50	0.00	0.0
APPLICATIONS						
ASE	18.38	4.63	Ardent Corp.	5.13	-0.13	-2.4
NYS	8.75	4.25	Convex Computer	5.00	0.00	0.0
OTC	4.13	1.88	Cray Computer	3.13	0.00	0.0
NYS	30.88	19.00	Cray Research Inc.	27.75	1.75	6.7
NYS	13.88	7.50	Data General Corp.	9.25	-0.75	-7.5
NYS	49.25	30.38	Digital Equipment Corp.	40.88	0.13	0.3
NYS	39.00	26.88	Harris Corp. (H)	38.25	0.88	2.3
NYS	100.38	45.88	IBM	48.13	-1.25	-2.5
OTC	22.00	5.50	Kendall Square Research	19.25	2.50	14.9
NYS	127.50	83.00	Matsushita Electronics	119.25	0.50	0.4
OTC	23.75	8.25	NetFrame	14.88	1.13	8.2
OTC	15.50	9.25	Parallan Computer	15.00	2.25	17.6
OTC	20.50	6.00	Pyramid Technology (H)	20.25	1.75	9.5
OTC	24.00	13.75	Sequent Computer Sys.	17.00	0.00	0.0
OTC	8.75	1.38	Sequoia Systems Inc.	7.06	0.00	0.0
NYS	48.38	29.50	Stratus Computer Inc.	32.88	2.25	7.3
NYS	16.88	9.88	Tandem Computers Inc.	11.75	0.13	1.1
OTC	22.50	10.63	TaxCord Systems (H)	21.75	1.88	9.4
NYS	13.88	7.75	Unisys Corp.	12.13	0.63	5.4
SOFTWARE						
OTC	74.00	25.25	Adobe Systems Inc.	59.00	-7.50	-11.3
OTC	20.75	10.25	Aldus Corp.	16.50	0.50	3.1
OTC	14.25	5.50	American Software Inc.	7.63	-0.13	-1.6
OTC	28.13	9.75	Ask Computer Systems	10.88	0.13	1.2
OTC	56.50	32.75	Autodesk Inc.	54.50	2.00	3.8
OTC	13.00	2.50	Bachman Info. Systems	3.06	0.06	2.1
OTC	43.00	32.00	BGS Systems Inc.	32.00	-0.13	-0.4
OTC	84.13	37.25	BMC Software Inc.	54.38	4.88	9.8
OTC	28.25	17.00	Boole & Babbage	25.50	1.25	5.2
OTC	49.00	17.50	Borland Int'l Inc.	21.50	-1.25	-5.5
OTC	5.38	3.00	CE Software	3.50	0.00	0.0
ASE	31.88	6.25	Cheyenne Software Inc. (H)	31.88	3.13	10.9
OTC	19.50	8.25	ChipSoft	10.25	0.00	0.0
OTC	9.13	5.63	Cognos Inc.	7.50	0.50	7.1
NYS	31.38	11.25	Computer Associates	28.75	0.38	1.3
NYS	12.38	2.75	Computervision Corp.	3.38	-0.25	-6.9
OTC	34.25	19.25	Compuware Corp.	27.50	1.75	6.8
OTC	14.75	5.75	Conshare Inc.	6.00	-0.25	-4.0
OTC	17.25	10.75	Corel Corp.	15.50	-1.00	-6.1
OTC	15.25	5.00	Easel Corp. (L)	6.88	1.38	25.0
OTC	25.25	12.00	4th Dimension	18.63	0.13	0.7
OTC	19.50	5.25	Frame Technology (L)	5.75	0.00	0.0
OTC	20.75	8.50	Group I Software (L)	8.50	0.00	0.0
OTC	35.25	18.25	Gupta	18.25	0.75	4.3
OTC	8.75	3.75	Hogan Systems Inc.	8.13	0.38	4.8
OTC	25.75	11.25	IMRS	19.75	1.13	6.0
OTC	38.00	21.00	Information Resources (H)	35.13	0.13	0.4
OTC	26.75	6.06	Informix Corp. (H)	26.00	2.25	9.5
OTC	16.75	8.88	Intergraph Corp.	9.50	0.13	1.3
OTC	13.63	6.88	Interleaf Inc.	7.25	-1.25	-14.7
OTC	18.00	5.50	Intersolv Inc.	7.75	1.88	31.9
OTC	16.00	7.75	Knowledgeware Inc.	12.00	2.25	23.1
OTC	54.75	26.00	Legent Corp.	34.75	1.00	2.8
OTC	37.00	14.25	Lotus Development	33.25	0.75	2.3
OTC	23.00	6.50	MathSoft	9.50	2.25	31.0
OTC	23.75	5.25	McAfee Associates	6.13	-1.13	-15.5
OTC	11.63	1.88	Meca Software	6.13	-3.88	-38.8
OTC	12.88	5.25	Mentor Graphics	10.13	-0.25	-2.4
OTC	46.00	27.25	Micro Focus	31.63	-0.13	-0.4
OTC	14.50	4.38	Microsoft Inc.	5.75	-0.25	-4.2
OTC	98.00	66.50	Microsoft Corp.	87.25	-0.50	-0.6
OTC	49.75	15.75	Oracle Corp. (H)	49.75	3.75	8.2
OTC	34.25	15.38	Parametric Technology	32.25	2.50	8.4
OTC	40.50	22.50	Peoplesoft	30.75	1.75	6.2
OTC	7.13	3.50	Phoenix Technologies	5.00	-0.38	-7.0
OTC	40.00	22.00	Powersoft	28.63	1.13	4.1
OTC	41.50	17.00	Platinum Software	25.00	1.50	6.4
OTC	25.00	11.25	Platinum Technology	11.88	-0.38	-3.1
OTC	61.50	32.25	Progress Software Corp.	46.00	1.25	2.8
OTC	7.38	2.56	Quarterdeck Office Sys.	3.25	-0.13	-3.7
OTC	28.75	13.75	Rainbow Technologies Inc.	28.75	3.50	13.9
OTC	12.25	4.00	Rasterops	9.13	0.50	5.8
OTC	15.25	3.63	Ross Systems	11.75	-0.75	-6.0
OTC	27.50	9.63	Sapiens Intl. Corp. N.V.	24.88	0.38	1.5
OTC	14.50	6.63	Software Publishing Corp.	6.63	-0.50	-7.0
OTC	12.00	2.00	Software Toolworks Inc.	10.00	0.38	3.9
OTC	3.38	0.75	Spinnaker Software	1.38	0.19	15.7
OTC	12.75	3.25	State of the Art	7.75	-1.00	-11.4
NYS	24.63	15.00	Sterling Software Inc.	20.00	1.50	8.1
OTC	21.50	8.00	Struct. Dynamics Research	15.88	-0.50	-3.1
OTC	76.50	22.75	Sybase Inc. (H)	71.88	-0.63	-0.9
OTC	37.25	5.88	Symantec Corp.	12.63	-1.38	-9.8
NYS	12.50	5.25	Systems Center Inc.	10.25	0.38	3.8
OTC	25.50	10.00	System Software Assoc.	20.00	0.75	3.9
OTC	6.38	2.50	Tbyte Corp.	3.00	0.00	0.0
OTC	22.75	9.13	Virtual Systems	17.88	-0.88	-4.7
OTC	23.50	6.75	Walker Interactive Systems	7.00	-0.25	-3.4
OTC	3.19	1.38	Worldtalk	1.53	0.03	-2.0
SEMICONDUCTORS						
NYS	32.88	7.38	Advanced Micro Devices	23.75	2.25	10.5
NYS	21.38	9.38	Analog Devices Inc.	19.88	1.00	5.3
OTC	25.63	7.63	Atmel Corp. (H)	25.63	1.00	4.1
OTC	6.63	2.75	Chips and Technologies	4.25	0.88	25.9
OTC	39.75	13.00	Cirrus Logic	17.25	-0.25	-1.4
NYS	14.75	7.38	Cypress Semiconductor Corp (H)	14.25	1.25	9.6
NYS	16.13	8.75	Dallas Semiconductor	15.00	1.25	9.1
OTC	60.63	27.13	Intel Corp.	54.00	-0.75	-1.4
NYS	16.00	4.88	LSI Logic Corp. (H)	15.50	0.50	3.3
OTC	33.25	14.00	Lattice Semiconductor	26.50	0.75	2.9
NYS	38.38	13.63	Micron Technology (H)	38.38	2.25	6.2
NYS	88.63	37.63	Motorola Inc. (H)	85.63	0.00	0.0
NYS	16.63	8.50	National Semiconductor (H)	16.00	-0.25	-1.5
OTC	16.50	6.50	Sierra Semiconductor	7.00	0.00	0.0
OTC	46.25	22.25	SynOptics (H)	44.88	1.88	4.4
NYS	72.38	36.00	Texas Instruments (H)	68.88	0.38	0.5
OTC	10.50	6.00	VLSI Technology (H)	10.50	1.50	16.7
OTC	14.00	2.13	Weitek	11.00	2.38	27.5
ASE	9.63	3.63	Western Digital Corp. (L)	3.88	0.13	3.3
OTC	39.25	14.50	Xilinx (H)	38.50	2.00	5.5
OTC	33.00	13.86	Zilog Inc.	26.25	-2.50	-8.7
SERVICES						
OTC	23.75	14.25	American Mgmt. Systems	18.88	2.88	18.0
NYS	4.75	2.38	Analogic Inc. (L)	2.88	0.38	15.0
OTC	35.75	16.25	Analysts Int'l	29.50	0.38	1.3
NYS	56.13	38.75	Auto Data Processing	48.88	0.75	1.6
NYS	17.25	11.75	Ceridian Corp.	14.50	-0.25	-1.7
NYS	17.38	13.13	Compusco Inc.	14.38	0.00	0.0
OTC	8.25	4.50	Computer Horizons	7.25	-0.50	-6.5
NYS	83.88	57.00	Computer Sciences (H)	83.88	5.25	6.7
NYS	9.25	6.50	Computer Task Group	7.50	0.50	7.1
NYS	60.50	22.00	CompuUSA Inc.	28.00	-4.38	-14.8
OTC	14.25	6.00	Corporate Software	11.25	0.25	2.3
OTC	19.25	7.38	Egghead Discount Software	8.25	-0.13	-1.5
NYS	35.88	25.25	General Motors E (EDS)	28.50	-2.13	-6.9
NYS	25.50	9.75	Inacom Corp.	20.50	-0.25	-1.2
OTC	15.38	6.50	Intelligent Electronics	13.00	0.25	2.0
OTC	13.00	6.63	Medisel	12.50	2.00	19.0
OTC	16.50	5.75	Microdyne Inc. (H)	14.25	-1.25	-8.1
OTC	43.00	23.00	Paychex	40.88	1.88	4.8
NYS	87.25	32.88	Policy Management Sys.	36.13	-0.50	-1.4
NYS	38.50	16.81	Reynolds and Reynolds	37.75	1.38	3.8
OTC	33.00	22.00	SEI Corp.	32.00	1.25	4.1
OTC	24.38	17.75	Shared Medical Systems	23.50	0.50	2.2
OTC	12.63	5.75	SNL Systemhouse	10.00	-0.50	-4.8
OTC	30.00	18.25	Software Spectrum Inc.	39.00	1.00	3.4
OTC	33.75	22.50	Sungard Data Systems	30.25	0.00	0.0
NYS	4.38	1.13	Ultimate Corp.	3.38	0.13	3.8

KEY: (H) = New annual high reached in period (L) = New annual low reached in period Copyright Nordby International, Inc. Louisville, CO
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Briefs

Oracle soars

Oracle Corp. credited strong database sales in the Unix arena for a 31% jump in fourth-quarter revenue to $473 million. Profits in the period ended May 31 more than doubled to $69 million, the Redwood City, Calif., company said. For fiscal 1993, sales topped $1.5 billion, up 28% from $1.2 billion last year. Net profits grew 130% to $142 million.

Convex results to fall

Convex Computer Corp. said it expects to report a second-quarter loss on revenue of less than $55 million, results that were below analysts' expectations. The Richardson, Texas, supercomputer maker said near-term demand was below expectations, though it is seeing interest in its data management and scalable processors. Final results will be released July 26.

Progress grows

Progress Software Corp. posted net profits of $3 million in its second quarter ended May 31, an increase of 39% from the same quarter last year. Sales in the period increased 35% to $26.6 million, the Bedford, Mass., company said.

SHORT TAKES AST Research, Inc. reached an agreement to acquire Tandy Corp.'s manufacturing facilities in Texas and Scotland, its pen-based and multimedia product lines and its Grid sales operation. AST will also supply PCs to Tandy under a three-year agreement.... Lotus Development Corp. completed its acquisition of Approach Software Corp.... American Management Systems, Inc. purchased 300,000 shares of its common stock owned by IBM for $4.8 million, decreasing IBM's equity interest to less than 5%.... Open Vision has acquired Demax Software, a developer of Unix and VMS security management software.

Report writer sales take off

Users empowered by ability to import relational data to desktop applications

By Derek Slater

■ You may or may not have ever heard of IQ Software, Inc. Then again, you might be using the company's report writer without realizing it.

The Norcross, Ga., software firm has drawn some attention by posting $15.2 million in fiscal 1993 revenue, good enough to make *Business Week*'s list of the 100 hot-growth companies in the U.S.

A big portion of that income comes from resellers and vertical application developers that relabel IQ Software's report writer software.

IQ offers two report writer products: Intelligent Query (IQ) and IQ Access. IQ includes a full-screen painter and lets end users design ad hoc database reports without any knowledge of the underlying database structure.

User's choice

IQ Access, released earlier this summer, pulls information out of the database and reformats it for whatever desktop application the user selects, including popular spreadsheets and word processors.

Robert Ott, vice president of sales at IQ Software, said IQ targets heterogeneous computing environments. "Many users have to access several file systems and databases, and we read a number of formats. Plus we're multiplatform," Ott said. IQ runs on approximately 35 Unix-based platforms in addition to DOS-based systems and Digital Equipment Corp. VAX platforms.

Expanded reach

Beta-test users also expect the new Windows version of IQ to be ready for general availability before the end of the year, opening new market opportunities for IQ.

Continuing to grow rapidly will be a challenge, though, for several reasons. First, the total report writer market is worth approximately $450 million, with third-party products such as IQ accounting for $120 million, according to Laura Lederman, an analyst at William Blair & Co.

More small competitors are jockeying for space in the Windows report writer market.

This means IQ Software may have to expand into other product areas to continue its growth.

Tough act to follow

IQ Software tallied record revenue and profits for its first fiscal quarter, which ended in April. Revenue for the quarter was $4.3 million, with a profit of $663,000. The Norcross, Ga., company went public last year.

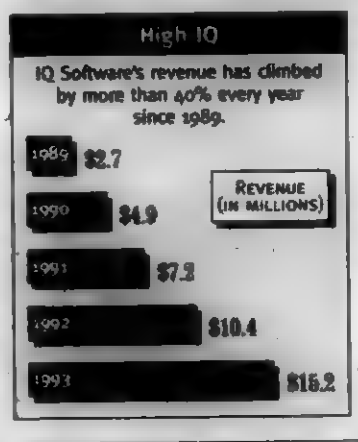
Vendor threat

More fundamentally, the market interest displayed by big relational database management system companies will be a crucial issue for IQ Software. Lederman said an aggressive push into the report writer technology by Oracle Corp. and its ilk could put the squeeze on third parties.

Until now, that has not happened. Ott said IQ Software has worked with the Ingres Products Division of The ASK Group, Inc. to provide an end-user solution that Ingres can recommend to its DBMS customers.

However, Sybase, Inc. recently purchased SQ Software, Inc.'s SQR and Easy SQR report writer products, which may signal that RDBMS vendors are growing less willing to concede any portion of the report writer market.

IQ offers a more elegant and simple product than the current generation of DBMS vendors' report writers, according to Jim Freeman, a lead software engineer at Atlantic Research Corp. "We looked at Oracle's products, but they weren't even in the running because they were just too complicated for the end user."



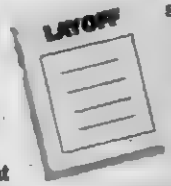
Orders for consulting tome reliable predictor of layoffs

By James Daly

Many a financial analyst will employ a carefully constructed matrix of profit projections and cash-flow capabilities before gazing into a crystal ball to determine if a struggling company is going to announce layoffs.

Alan Canton just checks to see how many books he has been selling.

Canton, the author of *Computer Money: Making Serious Dollars in High-Tech Consulting*, claims that by tracking the sales of his book, he often knows when and where the layoff ax will drop.



"The news of possible layoffs at Apple was no surprise," said Canton, a technical consultant in Fair Oaks, Calif. "We've received a bunch of orders from the Cupertino area [Apple's home office] in the past few weeks."

Analysts projected that anywhere from 1,000 to 2,000 of Apple Computer, Inc.'s 14,000-member work force may lose their jobs this summer as the company tries to pare its overhead and expense structure [CW, June 28]. Apple officials declined comment.

Crystal ball

Canton said when book sales increase in a certain area, he knows company insiders fear a layoff. Likewise, if attendance at one of his daylong seminars increases, Canton only has to look at the enlistment sheet before he figures out where the next layoffs will come from. With major layoffs at many high-tech employers during the past year, business has been brisk for his career-change companion.

Canton said his company is sometimes tipped off by outplacement firms.

"When they call and order a lot of books to be sent to certain locations, we pretty much know what is going on," he said.

As a longtime Apple follower, Canton said he thinks if the company does announce layoffs, the research and development department could be the most severely hit area.

R&D drain

During the past few years, John Sculley, Apple's former chief executive officer, pumped hundreds of millions of dollars into exploratory technologies ranging from voice recognition to infrared communication, and many are years away from fruition.

"Apple has too many people working on too many projects that won't come to market until cows fly," Canton said.

Judging from recent book orders, Canton is currently predicting cuts in the information systems departments at The Boeing Co. in Seattle and American Express Co. in Phoenix.

Plus, there is one other mystery contender. "I'm getting a lot of orders out of Torrance, Calif.," he said. "Something is definitely going on down there."

Are the folks at Hughes Aircraft Co. listening?

Wysiwyg

Illustration by Paulette Bogan

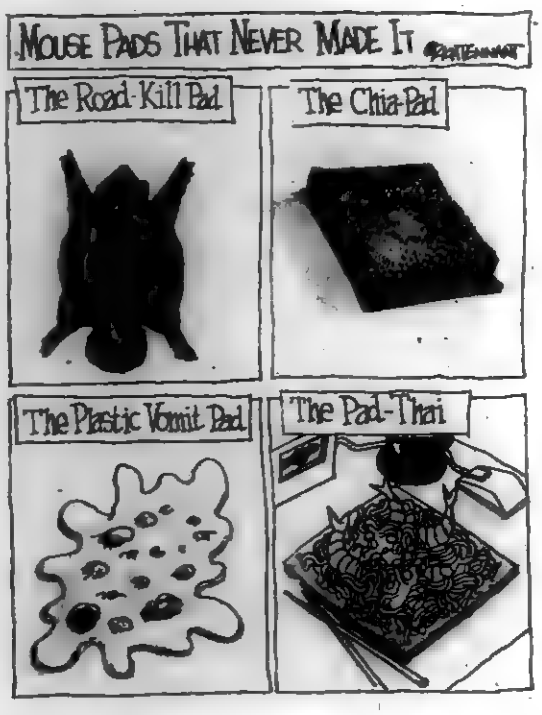
What a long, strange trip it's been...

About five or six years back, I was going on a business trip and was scheduled to fly into San Francisco at 9 p.m. on a flight from Boston. My seat was a middle seat in the middle section of a wide-body plane. We were told there would be a delay, and two hours later, we took off.

During the delay, the air-conditioning in the plane broke, and the temperature must have reached 90 degrees. While we were flying over St. Louis, the captain announced we had to make an emergency landing. No one was sure what was going on until we saw the paramedics come on board to take one of the passengers off. He had had a heart attack and died while we were in the air. When we got to San Francisco, the airport was closed, so we had to fly into Oakland. It was about 2 a.m. and all the car rentals were closed. Then a man who spoke broken English came up to me and asked if I wanted a ride. He was driving a 20-year-old car with a windshield that was so very cracked that you almost couldn't see out of it. When we finally reached my hotel, it was the wrong one: There were two hotels in San Jose with the same name. The driver finally got me to the right hotel around 3:30 a.m. I had a 7 a.m. appointment.

Craig Benson,
Chairman and COO,
Cabletron Systems, Inc.
Rochester, N.H.

The 5th Wave *by* Rich Tennant



Inside Lines

Can't keep a secret

We'll ship no X terminal before its time

After years of stalling at X terminals, Sun will shortly announce one, sources close to the company confirmed. Industry analysts were buzzing about rumors to that effect, and some have already been briefed on the new product under a nondisclosure agreement. Sources said the X terminal, a "headless" low-end workstation, was designed and built by Sun rather than manufactured by an outside supplier. The unique twist with Sun's X terminal is that it reportedly can be upgraded to a regular Unix workstation with the addition of a processor board. Competitive pressures from other Unix workstation vendors that sell X terminals, plus demands from its customers, may have "SPARC'd" the move, sources said.

Midrange to go

A new mobile computing concept should emerge soon from the somewhat unlikely environs of IBM's Rochester, Minn., labs — home of the AS/400. IBM has a luggable single-user AS/400 in the works that would be aimed mainly at software vendors and resellers looking to do on-site customer demonstrations and AS/400 programmers who want to take their work home or on the road with them. Pricing is expected to start in the $5,000 to $8,000 range for the machine, which would contain the OS/400 operating system in full. One issue still to be resolved is how the luggable would be sold. IBM's own sales force "is not all that interested in it," said Glenn Van Rensselaer, AS/400 system manager in Rochester.

Keep on truckin'

SynOptics is marching right along with plans to spur Asynchronous Transfer Mode (ATM) networking. The company's ATM product manager told *Computerworld* recently that products will "soon" emerge for its ATM switch, due in the third quarter, that allow users to run ATM at lower-than-specified speeds, such as T3 (45M bit/sec.). SynOptics also said the switch will gain a Sonet interface in the fourth quarter and that its under-development fiber adapter for linking Sun SPARCstations into an ATM network will cost less than $1,500 and will off-load all of the communications process from the SPARC.

Like father, like son

Word is that IBM's massive staff reduction (see story page 1) will also be felt by Big Blue's 13,000-strong outsourcing subsidiary, ISSC. The unit reportedly will make significant payroll cuts in an attempt to lower services costs by one-third. An ISSC spokesman disputed that explanation, saying the unit would pare staff to accommodate cuts at its largest client, IBM.

The Javelin Center was jammed with 30,000 attendees for PC Expo, which featured the normal high-intensity product salesmanship (personality split of any trade show. The usual rash of digital songs and alpha hawking the wonders of vendors, suppliers, and assorted hype), naturally, it was just a gag to open the mail when several attendees started getting letters and faxes and digital greetings to people wearing Company Secrets that said "I survived the Jungle!" and finding, unfortunately, little proof, save from Compaq, whose staff members were hard pressed to deny a jungle animal print. Please, fax or Compuserve Postal Mailbox photo Compuworld thinks lips at (800) 343-6474, (508) 879-4882 or 71077,2473, respectively. Or try Compuworld's 24-hour voice mail at (508) 820-8666.

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COMPUTERWORLD

IBM pushes sales team specialists

Gerstner's directive stalls units' expanded autonomy

By Johanna Ambrosio
ARMONK, N.Y.

IBM, in a nod to its biggest customers, is quickening the pace at which it is bringing product and industry specialists into the sales force.

This tack, spokesmen said, will help IBM provide large users with both individual products and broad-based, integrated baskets of products and services targeted at a particular industry or business problem.

While this takes place, however, the overall structure of the sales force will remain essentially the same, according to a July 2 memo written by IBM Chairman Louis V. Gerstner. In other words, he has ruled out — at least for the time being — the possibility that each IBM line of business would have its own sales force. Many industry observers said they had expected Gerstner to approve separate sales forces to allow the different business units true autonomy.

Instead, Gerstner said in the memo, "I do not want to undertake a major reorganization at this time" because, among other reasons, "I do not want the company focusing on internal changes [but rather on] customers, marketplaces and competitors."

Thus, the 40,000-person-strong U.S. sales force, broken up into 63 geographic regions

IBM, *page 14*

The Travelers' Lawrence Bacon *says the focus and intensity of the IBM account team have increased in the past year*

Open NLM tools on way

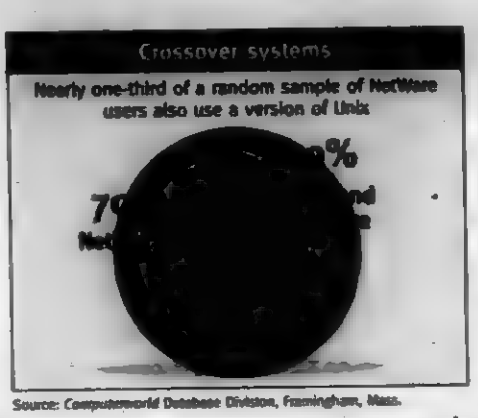
By Elisabeth Horwitt
SANTA CLARA, CALIF.

Novell, Inc. is expected this week to reveal development tools that will allow NetWare Loadable Modules to be ported beyond Intel Corp. 80386 platforms to Novell's UnixWare environment running on three key RISC systems.

The cross-platform NLM development tools will be based on program compiler and debugger products from Cygnus Support, a 40-person Mountain View, Calif., software company, Novell and Cygnus spokespeople confirmed last week. Shipment is slated for next year.

Novell's goal is to provide cross-platform network service applications that will work tightly with the company's recently announced AppWare, a Novell spokeswoman said. AppWare is Novell's unfolding framework for developing client applications across different computing and network environments [CW, July 5].

The ability to run NLMs on reduced instruction set computing and Unix systems rather than 386 platforms would be a nice feature,



Source: Computerworld Database Division, Framingham, Mass.

said Dan Kohner, manager of network services at the University of Texas MD Anderson Cancer Center in Houston. "We're getting more heavily into Unix here, and there is currently a limit on how many NLMs you can put on an Intel platform," he said.

Kohner said he would be interested in seeing what capabilities would be provided by NLMs running on a powerful Sun Microsystems, Inc. SPARCstation running

Open NLM, *page 12*

Banyan to extend enterprise net services

By Elisabeth Horwitt
WESTBORO, MASS.

Banyan Systems, Inc. is beginning to fill in major pieces of its strategy for tying together computing resources across the enterprise.

During the next few months, Banyan will disclose enhancements to its Foundation Services line of global network services. It is targeting integrated network management and user access across different network operating systems, as well as integration of X.500-based enterprise directory services with popular desktop mail systems, said Bob Martin, Banyan's director of product marketing.

Foundation Services, which include existing Banyan offerings such as the StreetTalk global directory, act as the glue that enables a variety of clients to transparently access resources and applications across multiple, multivendor network operating systems, Martin said.

Banyan, *page 12*

Virus vagaries foil feds

By James Daly

If talk is cheap, then the nation's capital must be a very inexpensive place to live.

Study after study claims the cleanup of computer viruses costs U.S. businesses billions of dollars a year, and federal lawmakers have vowed to address the problem with legal rigor. But the updated laws that are desperately needed to fight virus distributors are nowhere in sight. Some wonder if they will ever be enacted.

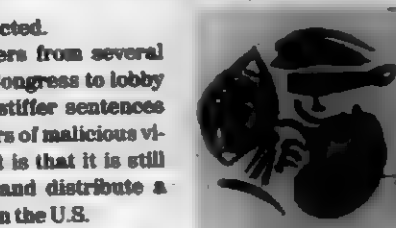
Last month, frustrated users from several major corporations went to Congress to lobby for increased vigilance and stiffer sentences for the writers and distributors of malicious viruses. Their major complaint is that it is still legal to create and distribute a computer virus in the U.S.

"Why should the initial sources of these pernicious programs be free from prosecution or civil liability?" asked Edward Benack, an operations manager at Nynex Corp. in New York.

Viruses will cost businesses nearly $2 billion this year, according to a survey of corporations by the National Computer Security Association and Dataquest, Inc. In addition, the average virus attack affects 142 PCs and takes more than two days to eradicate. One quarter of the attacks require more than five days to correct.

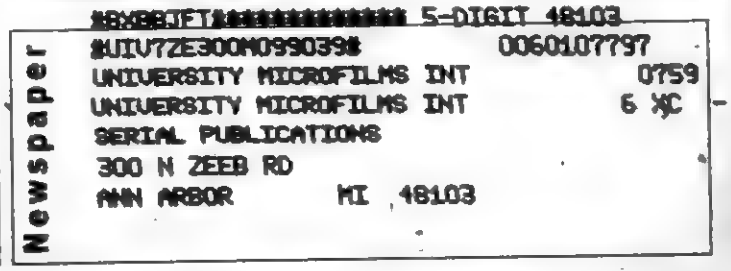
"The damage from viruses is

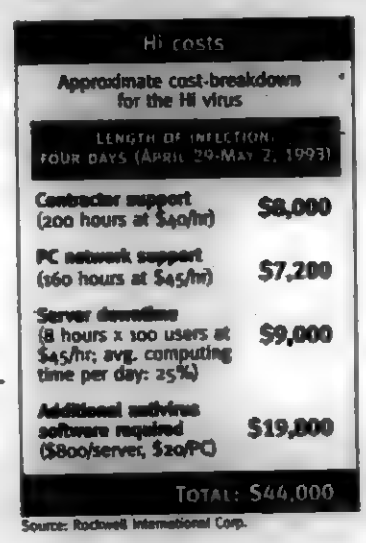
Virus vagaries, *page 16*



PHONE HOME

Symantec Corp.'s Peter Tippett says the public has been able to close down virus distribution bulletin boards in England simply by phoning the parents of the teenage operators and expressing their displeasure.





Source: Rockwell International Corp.

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■Expectations run high for the PowerPC-based AS/400s expected in 1995. Until then, the struggle will be to hold the line against Unix. *Page 87*

APPLICATION DEVELOPMENT

■**KnowledgeWare** introduces a tool for maintaining, redesigning and migrating legacy applications and enhances its Application Development Workbench. *Page 96*

MANAGEMENT

■Users disagree sharply on whether consultants can help with an outsourcing decision. *Page 97*

IN DEPTH

■Interoperability isn't going to happen tomorrow, but Dan Lynch at the Interop Co. expects some progress in the next couple of years, as data exchange standards mature. *Page 115*

CAREERS

■Learning to work in Windows is no piece of cake for DOS developers. Achieving the proficiency required to create complex programs takes at least six months. *Page 119*

MARKETPLACE

■Nullifying your PC warranty can be costly. Luckily, most violations, such as opening the computer case, are easily avoided. *Page 127*

COMPUTER INDUSTRY

■**HP** a powerhouse in the PC market? Mighty possible, especially with a new line of low-cost models. *Page 133*

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Friday Stock Ticker ..... *Page 132*

Executive Briefing

Integration of computing resources is on just about everyone's to-do list. **Banyan** moves aggressively to stake its claim in enterprise network integration, enhancing its Foundation Services line of global network services and preparing versions of its Enterprise Network Services for operating systems beyond NetWare. Windows NT is a likely first target. *Page 1*. **Lotus** also aims to be more ecumenical, promising a Unix implementation of Notes to run on Sun machines by late summer or early fall. *Page 4*. **IBM**'s APPC is catching on as a building block for distributed networks, particularly those that rely on transaction processing. *Page 77*. And the first batch of beta-test code is due this week from the Desktop Management Task Force. *Page 79*

Networks within and between companies are mushrooming. This growth and changing requirements contribute to a growing demand for modular equipment and data exchange standards. *Page 77*. Dan Lynch at the Interop Co. says he expects that by the year 2000 multimedia mail will be as easy to use as regular E-mail, thanks in part to a de facto standard called Mime. *Page 115*. Will demand be there for multimedia mail? Most likely. E-mail, groupware and faxback links into transaction processing systems are already ubiquitous at companies where electronic data interchange was considered cutting-edge not long ago. *Page 101*

Keeping up is a major issue in today's fast-moving environment. For example, Windows may seem to be everywhere, but many IS managers are still struggling to make the transition from DOS. Costs for end-user training and technical support are still stumbling blocks. *Page 66*. AMR's Max Hopper cautions that CIOs risk being sidelined in operations and purchasing functions if they don't jump into new roles as the frontier moves away from the technical infrastructure. *Page 57*

Customer relations come into question for two large vendors. Reactions from customers are mixed, as IBM struggles to make its sales force more responsive. While rejecting a radical restructuring and breakup, the company has accelerated its efforts to infuse sales groups with product and industry expertise. *Page 1*. Meanwhile, industry analysts say work force reductions at Apple could curtail its focus on major corporate accounts. *Page 4*

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Apple cuts could sidetrack focus

By James Daly
CUPERTINO, CALIF.

Apple Computer, Inc.'s decision to cut 16% of its worldwide work force — or about 2,500 workers — could severely impact its Enterprise System Division (ESD) and its focus on major corporate accounts, industry analysts said last week.

The 2-year-old ESD is expected to be a target of Chief Executive Officer Michael Spindler's budget-cutting ax because it has not penetrated new corporate accounts as quickly as was expected and is seen as overlapping Apple's other sales channels, analysts said. And while products handled through ESD have been well-received, many users said they will curtail server purchases until models based on the speedy new PowerPC chip arrive early next year.

"There are many people out there who are drooling for a server with a PowerPC chip, and I'm one," said Warren Young, director of neuropharmacology computing at the Scripps Research Institute in La Jolla, Calif.

Young, who works with two models servicing the needs of more than 200 researchers and scientists, said the servers are "wonderful machines" in terms of ease of use and setup. But he added that Apple could have done a better job with remote administration functions.

In recent weeks there have been reports that large companies such as Boeing Commercial Airplanes Group, General Motors Corp. and the U.S. Department of Energy's nuclear facility in Savannah River, Ga., may suspend Macintosh purchases. The reason: low-cost Windows-based PCs.

Can't get it across

The message of ESD — that the Macintosh can be a fine corporate team player — just does not seem to be getting through. In a *Computerworld* Database Division survey conducted this spring, less than 40% of the respondents said Apple addresses the needs of the corporate customer.

But 62% said they feel more confident today of Apple's ability to provide timely business-oriented products than they did two years ago. So users said cutting into ESD would be a big mistake.

"We've really made a lot of progress in the past years, and I'd hate to see that momentum lost," said Tim Yancy, who serves as director-at-large of MacIS, a user group representing 300 member companies and 450,000 Macintoshes scattered throughout the Fortune 500 and higher education communities.

Before ESD, corporate users had to deal with a confusing mix of divisions within Apple: "Service and support one day, another product group the next, with a lot of the groups not talking to each other," Yancy said.

Users fear losing hard-fought gains in enterprise support. Apple announced an expansive corporate support program in May but has yet to deliver most of it. Full availability is slated for September.

The first round of layoffs — the largest in Apple's history — will begin this week and continue during the next year, sources said. Restructuring costs for the workforce reduction will be accounted for in the company's third quarter ending Sept. 30 and could top $250 million.

Apple insiders said not only are senior staff positions expected to be slashed, but Apple implemented a companywide pay freeze and a 5% pay cut for staff at vice president and above levels. Some divisions may also be combined or eliminated. Apple may make cuts in research and development and hand pink slips to some of its 3,000 engineers.

"No one is going to be immune," said Doug Kass, a principal analyst at The Viewpoint Group, a research firm in Santa Cruz, Calif. "We're going to see a top-to-bottom overhaul."

The realignments are a by-product of a highly competitive IBM-compatible clone market that has seen the price of PCs plummet during the past 18 months. That trend has particularly hurt Apple, which has typically fielded more expensive Macintoshes.

Tough times

MILESTONE	PC price wars	Apple changes CEO
WORK-FORCE REDUCTIONS	After layoffs of 400 and 1,500 in previous years, Apple cut another 345 jobs by closing its plant in Fremont, Calif.	2,500 layoffs planned
PRICE CUTS	Reduced standard resale prices an average of 15%-25%	20%-40% price reductions on PowerBook 165C, Macintosh Quadra 610, Color Classic
BOTTOM-LINE RESULT	$7.1 billion – revenue $530.3 million – income	First half: $4 billion – revenue $270.2 million – income

Borland gives Notes the nod for sake of users

By Michael Vizard
SCOTTS VALLEY, CALIF.

Lotus Development Corp.'s campaign to have Notes widely accepted as a cross-platform development environment received another boost last week with Borland International, Inc.'s decision to support the groupware offering's application programming interface (API) within its Quattro Pro for Windows spreadsheet.

The Borland initiative, seen as a response to customers beginning to require Notes compatibility from other PC application vendors, follows similar moves by Microsoft Corp. and WordPerfect Corp. [CW, May 10].

For example, Price Waterhouse in Menlo Park, Calif., is one of Lotus' largest Notes accounts, with 31,468 licenses as of April 1. It is also one of Borland's largest Quattro Pro customers, having agreed to purchase 30,000 copies of Quattro Pro for Windows worldwide. More than 12,000 of those licenses are already deployed in the U.S.

"The good news for Lotus is now that the big boys are on board, it should make it easier to attract the smaller players," said Matt Cain, an analyst at Meta Group, Inc. in Stamford, Conn.

Jeff Papows, vice president of Lotus' Notes division, said the company has thus far shipped about 300 Notes API kits to independent software developers. For developers, supporting Notes is likely to be a two-step process. Borland will initially support the Vendor-Independent Messaging (VIM) protocol to make Quattro Pro for Windows compatible with Notes. By supporting it, Borland applications will be able to exchange data with other VIM-compliant applications.

All together

NOTES API COMPONENT SERVICES

- Messaging
- Replicated object file system
- Directory service
- Security
- Systems management
- Remote procedure call
- Transport independence
- Global time

That effort will be followed by a full implementation of the Notes API, said Spencer Leyton, Borland senior vice president of business development.

But Borland, Microsoft and WordPerfect have not committed to ship dates for applications that make use of either VIM or the Notes API, and each is pursuing its own groupware strategy.

For example, Microsoft is pursuing a course under which groupware facilities will be bundled in its operating systems, while Borland is developing an Object Exchange Facility that will allow its users to more easily share data. WordPerfect, meanwhile, is a leader in an initiative to link objects across Windows and Macintosh platforms using IBM's Distributed System Object Model [CW, July 5].

Despite growing enthusiasm for Notes as an application development platform, consultants said the Notes API is not the easiest development tool to work with.

"The API in Version 3 is a lot more powerful, but the ease of use has not caught up with the power," said Brownell Chalstrom, president of Chalstrom Consulting, Inc. in Oakland, Calif. Chalstrom was formerly Lotus' general manager for the Workgroup Applications Division.

Jeff Papows: *Lotus is committed to offering full Notes access*

Lotus' move to broaden the Notes application development environment beyond the relatively simple @Commands is a critical part of the company's efforts to position Notes as a set of robust cross-platform middleware services for application developers.

To further the effort, Papows said Lotus plans to offer a graphical development tool for Notes, dubbed Notebook. He added that the company is actively working with third-party tool providers to support Notes databases alongside SQL databases.

Lotus is also working to make Notes compatible with its LotusScript macro language, a Basic derivative that will be employed across all Lotus and Notes-compatible third-party applications.

Lotus applications take advantage of Notes facilities using the Notes API, while applications from other vendors will work with Notes but will not be as integrated.

Papows said Lotus is committed to offering independent software vendors full access to all Notes system services. "We're going to take a page from Microsoft's Windows effort and hopefully learn how not to do things," he said.

Game plan

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News Shorts

AT&T streamlines prices

AT&T said it has filed with the Federal Communications Commission a simplified pricing structure for its Accunet digital data local-channel access services. The revamped rates have been lumped into two categories and are slated to go into effect today. Depending on customer locations and circuit lengths, user costs could increase or decrease, AT&T said, though it predicted that most customers will see an average change of less than 2%.

Open systems group forms

Four of the biggest users of Hewlett-Packard Co.'s OpenView formed an international user group dedicated to sharing information, promoting additional OpenView applications and furthering industry standards. The initial members are Duke Power Co., GTE Government Systems Corp., Martin Marietta Corp. and US West. The OpenView Forum is open to all companies that use or develop applications for HP's network and systems management platforms.

New AMD processors, sans Intel code

Advanced Micro Devices, Inc. announced the first microprocessors to use its own microcode, rather than code copied from Intel Corp. It released three new processors, the 33-MHz and 40-MHz AM486SX and a 3.3V, 33-MHz AM486SX. AMD said it may still produce new chips containing Intel's microcode. The company added that it would attempt to offer enhanced features, such as the first 40-MHz 486SX, with its own microcode.

Electronic PC software distribution

The move toward electronic distribution of PC application software took another step forward last week. Merisel Computer Products, Phoenix Technologies, Inc., Alexander & Lord and Softbank Corp. have formed a joint venture under which they will ship a compact disc library along with computer systems and upgrades. After previewing a software package, users will be able to request a key that will electronically unlock the package if a user decides to purchase it. The venture, based in Monterey, Calif., is called Softbank, Inc. Meanwhile, IBM is expected to announce distribution of its software on compact disc later this month.

Electronic newspaper planned

Cox Newspapers and Prodigy Services Co. last week announced plans to create an interactive electronic newspaper available to local print publishers. Cox said its newspapers in Atlanta and West Palm Beach, Fla., will develop the on-line service, which will include bulletin boards, databases of print stories and expanded coverage and background articles, as well as directories of community and educational services. Prodigy's existing national network will be used to transport the service, which will also be available to current Prodigy subscribers. Cox and Prodigy said they hope other major newspaper groups will join their consortium.

SHORT TAKES Microsoft Corp. last week began delivering a Transmission Control Protocol/Internet Protocol link for its Windows for Workgroups package.... The federal government chose Oracle Corp. to replace Sybase, Inc. databases in its $744 million Joint Computer-Aided Acquisition and Logistics Support project.... Novell, Inc. has formed the Unix Systems Group, a new business unit, to leverage its Unix systems activities and to develop synergies between its Unix and NetWare product lines...

More news shorts, *page 16*

Client/server ship docks in Seattle

Port dumps minis in favor of PCs; expects to save $500K/year

By Nell Margolis
SEATTLE

Only four years after putting the final touches on an eight-year migration from a Burroughs Corp. mainframe to a raft of Wang Laboratories, Inc. minicomputers, the Port of Seattle is shipping out its minis and sailing into client/server waters.

Information systems director Cecil Patterson has a $4.1 million budget with which to move the port to its new architecture — its third since 1980. This latest technical voyage is expected to take three years, phasing out the Wang equipment over time.

When fully functional, the client/server system should yield an annual $500,000 in savings, said Patterson, whose yearly IS budget is currently in the $8 million neighborhood.

Once the new system is in place, he said, gains are likely to result from the department's ability to do the following:

- Take advantage of lower costs and economies of scale afforded by newer, industry-standard computer and networking technologies.
- Use powerful application development tools to develop more effective systems in a shorter amount of time.
- Communicate electronically with worldwide business and trading partners.

The port's new system will rely on four to seven servers, which will likely be purchased from Sequent Computer Systems, Inc. or Hewlett-Packard Co., Patterson said.

Charting toward client/server puts the port in the vanguard of a transportation industry trend. Information technology interwoven throughout the business "is incredibly important, often a competitive edge," said Tom Rasmussen, senior consultant at Cambridge, Mass.-based management consulting firm Arthur D. Little, Inc. "It's absolutely vital for things like preclearing customs and tracking merchandise."

Seattle's Cecil Patterson *expects to communicate with worldwide partners*

The port might opt for the HP 9000 series to leverage homegrown, Unix-based client/server database technology, according to systems manager Ted Hutton. Sequent's calling card, meanwhile, is its ability to satisfy the port's foreseeable need for uptime in the 90% ballpark, Hutton said.

Cost breakdown

Port of Seattle IS director Cecil Patterson figures the cost of a planned 3 1/2-year transition from mini-based client/server to be as follows: $2.36 million for hardware; $2.12 million for software; $500,000 for training; and $500,000 for consultants. The grand total: $5.48 million.

The client role will be filled by a slew of IBM-compatible PCs in use at the port's IS department — a triple plus, according to Patterson. "We'll save on hardware costs, we'll be able to get more mileage out of PCs that are largely underutilized right now and we'll save on training by letting people continue to use their own familiar machines," he said.

In 1990, Patterson began to move the department off its Burroughs mainframe onto the Wang VS network. Ten years later, he started drafting Wang's ship-out orders when the mini maker's equity partnership with IBM — a move meant to buoy customer confidence — struck him as the act of a company conceding its player status.

At the same time, Patterson said he resolved to lead his organization into the flexibility and stability of an open systems environment. A client/server system proved to be the best approach, primarily because it fit the highly distributed business of the port, which is an international gateway handling some $32 billion worth of two-way trade annually. In addition to handling more than a million containers a year, it manages Seattle/Tacoma airport traffic.

First up on the client/server implementation agenda is network design, said IS systems manager Linda Dyson. The port's current communications layout — a WangNet supporting about 100 users, plus several PC local-area networks — will give way to a port-wide, standards-based network that will include Transmission Control Protocol/Internet Protocol and Banyan Systems, Inc.'s Vines for the LANs.

Also given the nod is Microsoft Corp.'s Windows-based Office set. Sybase, Inc. and Oracle Corp. are emerging as finalists in the bid to supply the relational database.

The network, Dyson said, will bring intraport communications up to the sophistication level afforded outward-bound transactions through a recently implemented electronic data interchange system called LINX. Manufactured by Sterling Software, LINX allows the ports of Seattle and nearby Tacoma and their shipping partners to jettison paper in favor of electronic worldwide tracking of containerized cargo.

Lawmen snare bootleg DOS, Windows booty

By James Daly
BELLEVUE, WASH.

U.S. marshals have completed a four-month series of nationwide raids that netted more than 170,000 bootleg copies of DOS and Windows with a street value of nearly $10 million, Microsoft Corp. officials said last week. Several of the defendants named in three separate federal lawsuits were either former Microsoft affiliates whose licensing agreements had run out or firms selling DOS and Windows on their own.

Microsoft licenses DOS and Windows to computer manufacturers to include with their PCs for sale but prohibits their distribution without the accompanying hardware. Named in the suits were Unitron Computer, Inc. in City of Industry, Calif., CMOS Technologies, Inc. in Piscataway, N.J., and Micro Innovation, Inc. in Houston.

The largest raid occurred at Unitron, where more than 125,000 illegal copies of DOS 5.0 and Windows 3.1, with a street value of approximately $7 million, were seized. At Micro Innovation, law officers rounded up approximately 35,000 phony copies of DOS and Windows with a street value of approximately $2 million.

More than 10,000 illegal copies of Windows 3.1 were snared at CMOS, a former Microsoft licensee whose distribution agreement ended last year. Microsoft officials said that even as marshals served the seizure order, a printer continued to manufacture the counterfeit product in full view of the officers.

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Data superhighway plan panned

Congressional report says fed initiative overestimates user demand

By Gary H. Anthes
WASHINGTON, D.C.

The Congressional Budget Office (CBO) last week threw several buckets of cold water on the federal government's High-Performance Computing and Communications (HPCC) initiative, a program that until now had drawn mostly enthusiastic reviews.

According to a nonpartisan CBO report, the near-$800 million program is focusing too much on supercomputer technology, has overly optimistic hopes for massively parallel computers and is overestimating user demand for very high-speed networks.

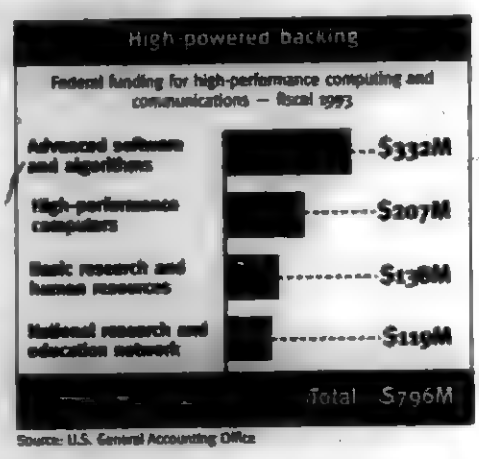
The report also said the HPCC program is marked by "unresolved tension" between the basic research community and those who would have it deliver practical applications to society as a whole. "By trying to be all things to all people, the HPCC program might lose its focus and dissipate its resources without effect," the CBO warned.

The HPCC program was codified into law in 1991 under the sponsorship of then-Sen. Al Gore. Two key goals were to build parallel processing supercomputers able to work at a trillion operations per second and a network, or "data superhighway," for connecting research laboratories at speeds of more than a billion bit/sec. (gigabits).

In January, 13 computer company chief executive officers involved in the Computer Systems Policy Project (CSPP) urged the Clinton administration to significantly broaden the scope of the HPCC. They proposed building a National Information Infrastructure (NII) — a broadband digital internet connecting computers and people to bring medical care, interactive training, advanced manufacturing techniques, government data and the like to broad sectors of the country.

That proposal is reflected in pending legislation on Capitol Hill but has made little visible progress elsewhere in the government. "I don't think we can be hard enough on the HPCC program for its failure to define a partnership with American industry," said Kenneth Kay, executive director of the CSPP. "Since the new administration has taken over, we have not had one piece of dialogue with [HPCC program administrators]. We've never had one inquiry from them about our January NII report."

HPCC officials did not return telephone calls by press time.



Source: U.S. General Accounting Office

'Win-win situation'

John Rollwagen, an architect of the NII idea and until recently chairman and CEO at Cray Research, Inc., said he is not troubled by the multitude of opinions about what HPPC's goals should be. "I see it as a win-win situation. I look at the HPCC initiative as the R&D department of a much larger effort to use high-performance computing in a broad range of applications."

In addition to raising policy issues, the CBO report made the following assertions about technology, calling into question HPCC's emphasis on very high-performance computers and networks:

- Computer technology no longer "trickles down" from supercomputers. The most important advances are now coming from the microprocessor end of the spectrum.
- The rapid increase in computational power from relatively cheap workstations may preempt growth in the commercial market for HPCC-developed supercomputers. "The economic benefit from HPCC may not . . . justify the large funds devoted to it on purely commercial grounds," the CBO said.
- Massively parallel computers, despite a decade of federal support, remain difficult to use and have found just a handful of real-world applications.
- The number of applications requiring transmission speeds above, say, 45M bit/sec. may not be enough to commercially justify the deployment of gigabit networks.

Data flows

The CBO said there is a fly in the HPCC ointment in the form of local leased data lines, whose costs are not dropping as fast as they are for interexchange communications. According to the CBO, the cost of a 1.5M bit/sec. long-distance line declined 13% per year on average between 1990 and 1992, while charges for a local 1.5M bit/sec. circuit from the Bell operating companies rose by an average of 7% per year. "Local data lines are crucial if the widespread internetworking conceived by HPCC is to become a reality," the CBO said. Not to worry, said Educom's Michael Roberts. "Big organizations have all kinds of bypass opportunities from alternate service carriers. People like to complain about the last mile thing, but in terms of the total cost of workstations, LANs and WANs, this component couldn't possibly be more than 5% or 10%."

Proceed with caution

"The [CBO report] bears out what I said two years ago about massively parallel computers," said Reed Phillips, director of information resources management at the U.S. Department of Commerce, whose agencies (such as the National Weather Service) are major users of high-performance computers. "Our people were getting all enamored about massively parallel computers, and I said we didn't know enough to be enamored. So instead of upgrading to the 'state of the art,' I'm advising caution."

"Massively parallel technology holds great promise," countered John F. Carlson, Rollwagen's replacement at Cray Research, which will introduce its first massively parallel supercomputer later this year. He acknowledged that few real-world applications run on the highly parallel machines but said that is due to a lack of application code and standards — problems he said will be overcome in time.

Michael Roberts, networking vice president at Educom, a 600-member association of college and university information technology specialists, said the need for gigabit/sec. bandwidth will not come solely from esoteric applications such as medical imaging. He said the Internet will soak up additional bandwidth as fast as it becomes available while it evolves from a text-only orientation to image-based uses such as multicast video.

Workstations

Rivals Sun, Intergraph align on 64-bit SPARC chip, NT port

By Mark Halper
PALO ALTO, CALIF.

It wasn't too long ago that Sun Microsystems, Inc. Chairman Scott McNealy joked that "NT" stands for "not there." But his attitude turned less derisive last week after he struck a microprocessor development deal that includes porting Microsoft Corp.'s Windows NT to Sun's Scalable Processor Architecture (SPARC).

The agreement with workstation rival Intergraph, Inc. calls for the two companies to jointly develop a 64-bit version of SPARC known as the UltraSPARC and for Intergraph to port NT to that chip.

Runner-up

Intergraph will be the second-leading computer-aided design and manufacturing vendor in 1993, with $1.2 billion in revenue, behind IBM's $1.75 billion, according to market research firm Dataquest, Inc.

Sun has made a history of seeking development partners for microprocessor development: Previous mates have included Texas Instruments, Inc. and Fujitsu Ltd. Analysts noted that its selection of Intergraph is notable because of Intergraph's NT wherewithal.

Porting projects

Huntsville, Ala.-based Intergraph has porting projects well under way for separate lines based on the Clipper chip and Intel Corp. microprocessors and will now apply Microsoft's Windows NT expertise to a SPARC port.

Intergraph said last week that it plans to offer UltraSPARC-based systems running NT programs by 1995.

And while Sun said it has no present plans to offer Windows NT on its own SPARC or UltraSPARC platforms, analysts pointed out that the teaming arrangement with an NT-happy Intergraph makes a Windows NT port readily available to Sun when and if it decides to market an operating system other than its own Solaris.

Industry watchers said they believe Windows NT will eventually overtake Solaris in market acceptance.

"Sun wants to go to NT but can't say it's going to NT," said Charles Foundyller, president of Daratech, Inc., a Cambridge, Mass.-based market research firm. "I think Sun is running scared. There will be 10 times more shipments of NT than of Solaris."

Andrew Allison, a Carmel, Calif., consultant and editor of the "RISC Management Newsletter," called Solaris' chances against NT "slim to negligible" and noted that Sun is "trying to have its cake and eat it, too," by continuing to market Solaris itself while simultaneously setting in motion a SPARC-based NT effort through Intergraph.

He said that if Sun starts marketing its own Windows NT UltraSPARC boxes, Intergraph would then have difficulty marketing the same boxes against Sun. "Intergraph is putting its head in the lion's mouth and hoping the lion doesn't bite," Allison observed.

For Intergraph, the move shifts the company's higher end systems plans to SPARC and relegates its Clipper-based line to midrange performance, a spokesman said. The company's Intel products will occupy the lower end of its product stable, he said.

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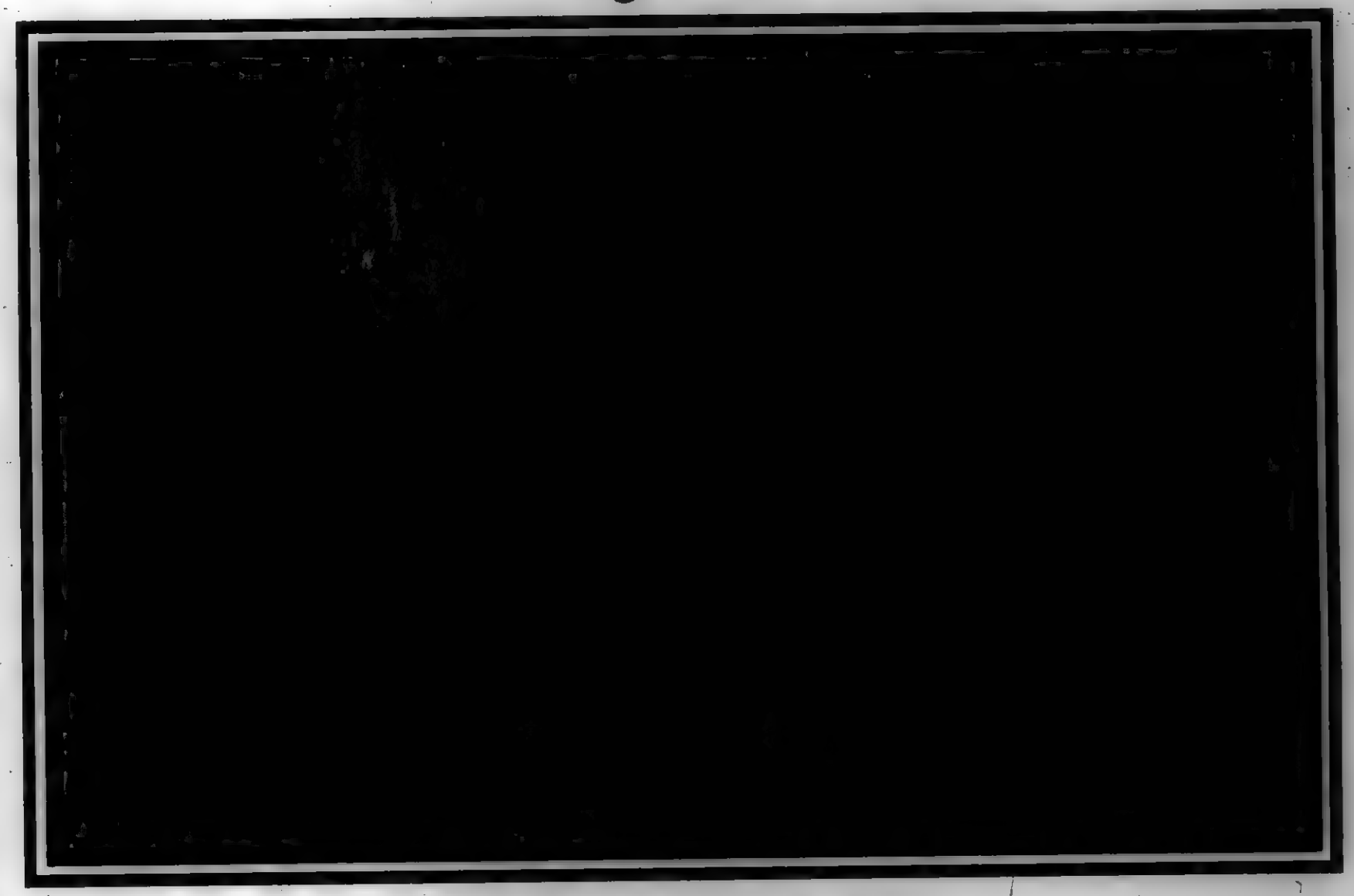

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Benchmarks

Questions arise on validity of DBMS testing methods

By Kim S. Nash
SAN JOSE, CALIF.

The Transaction Processing Council (TPC), which oversees Unix hardware and software benchmarking, confirmed last week that it is reevaluating its rules in the wake of questions about the validity of Oracle Corp.'s latest benchmarks.

The TPC is weighing proposals to "close loopholes" that let vendors run stripped-down or specially optimized versions of databases during benchmark tests, according to Kim Shanley, chief operating officer at the TPC.

"Oracle followed our rules, but we do have some concerns about the ethical problems of 'benchmark specials,'" Shanley said.

The TPC's 41 hardware and software members plan to pass ethics guidelines at a meeting next month, he said.

The review was triggered when The Standish Group, a consulting firm in South Yarmouth, Mass., accused Oracle of publishing "fraudulent" TPC-A benchmarks for the Oracle 7 database. Oracle's use of a so-called discrete transaction database for the tests produced abnormally high performance marks, according to Jim Johnson, editor of "The Standish Compact" newsletter.

Such a carefully tuned database would be "useless" in a typical production setting, Johnson said. Oracle, which has sued Johnson for libel and defamation, contends that The Standish Group's allegations are untrue.

Top numbers

Oracle's most recent TPC-A claim is just shy of 1,003 trans./sec., maximum throughput on a Sequent Computer Systems, Inc. Symmetry S2000 Model 750 cluster. As of last week, no other database vendor had published TPC-A figures topping 550 trans./sec. None of the top database vendors has yet published TPC-C results, which users and analysts said are more like real-world environments.

Denial issued

"The claim that Oracle cheated ... is wholly unfounded," said Ken Jacobs, vice president of Oracle's product planning, database and languages division.

The TPC also plans to put together an independent auditors' council by October to review benchmark results before they are published, Shanley said. Now, a group of TPC members reviews results after vendors reveal them.

"It's like the fox guarding the henhouse," said Michael Corey, president of the International Oracle User Group.

Users consider benchmarks to be one of many criteria for evaluating products from different vendors, Corey said, but the performance numbers are not the sole factor.

"We know these benchmarks are mainly just for show," he said. "I would think that the discrete transaction database would probably not be used in real life."

Meanwhile, the TPC has no plans to ask Oracle to redo the tests, according to Shanley.

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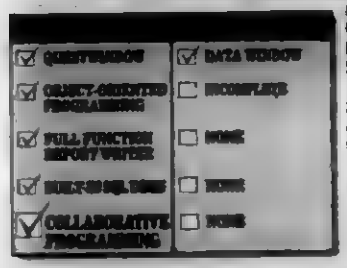

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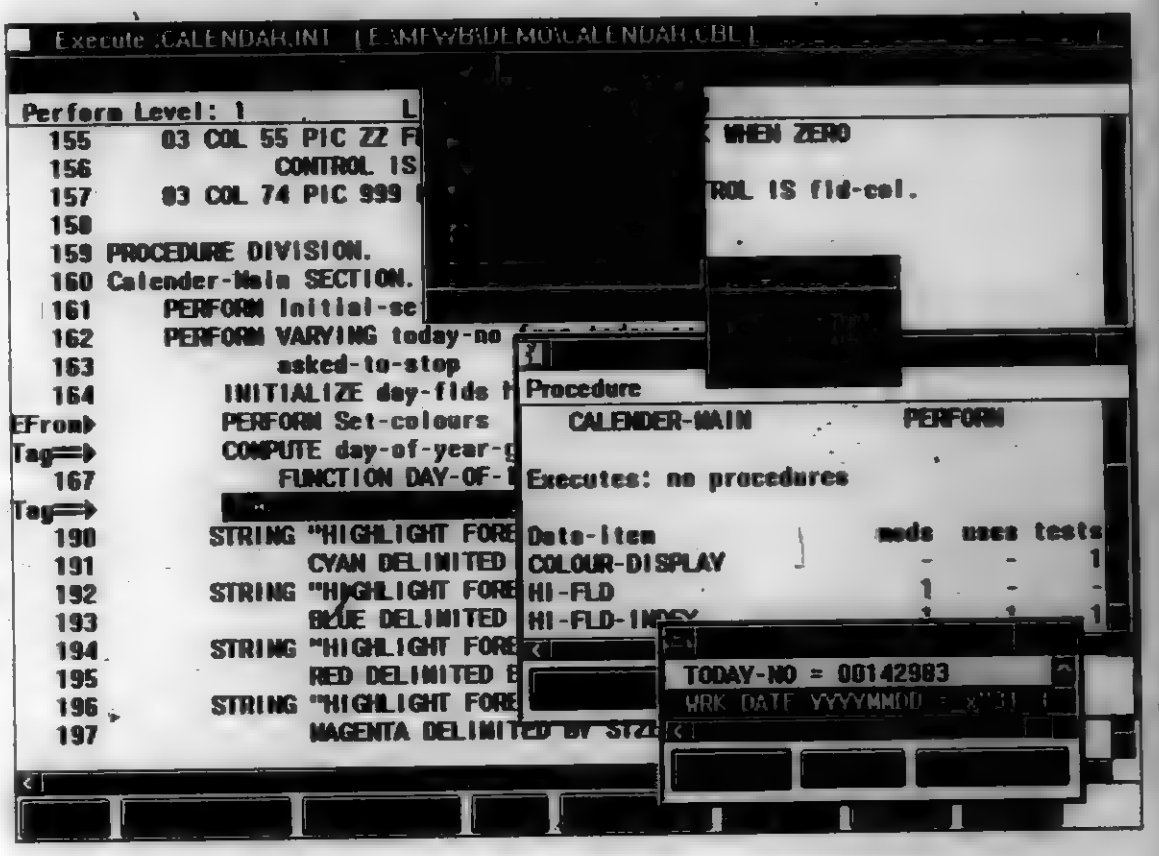

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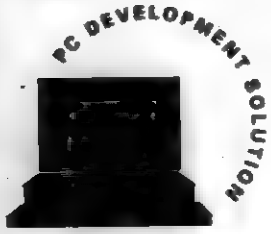

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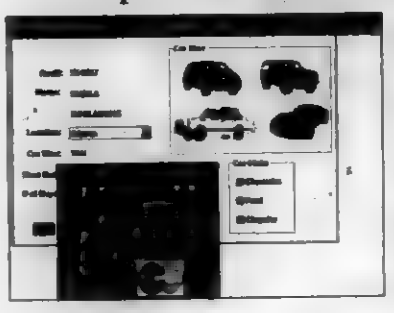

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Banyan steals NetWare users

By Elisabeth Horwitt
WESTBORO, MASS.

■ Banyan Systems, Inc.'s NetWare for ENS has made some enthusiastic converts out of Novell, Inc. shops that want to administer and interconnect local-area network resources across the enterprise without having to migrate all of their NetWare 2.x and 3.x servers to Novell's NetWare 4.0.

Indeed, some users said now that Enterprise Network Services (ENS) gives them access to Banyan's global directory, server management and security services, they have no need to move to NetWare 4.0. Users' principal objection to 4.0 is that its global directory services are inaccessible to older NetWare servers.

The Massachusetts Registry of Motor Vehicles is the sole Novell shop among Massachusetts agencies; the rest use Banyan, said Dave Russo, manager of the registry's PC information center. Other agencies pressured the registry to implement ENS as a way of interconnecting its users with the rest of the state.

"They were very afraid I would poke holes in ENS, but I was unable to do it," Russo said. "ENS is a terrific product. I get the best of both worlds: the speed and flexibility of NetWare with the connectivity of Banyan's StreetTalk.

"For ENS to win over a die-hard Novell person like myself is a good show for Banyan," Russo added.

Novell has played into Banyan's hands by making migration to NetWare 4.0 an all-or-nothing move, users and analysts said. "With 4.0, you take all the 3.11 servers down, bring up 4.0 and hope it works," Russo said. "With ENS, you can add one user at a time" while testing.

NetWare 2.x and 3.x users can log on to NetWare 4.0 servers, but the older servers cannot participate in 4.0's global directory update service, said Kevin Auger, a product line manager.

As a result, network administrators still must update a user account, or add a resource, to each v3.11 or 2.x server individually, according to Alvin Jones, a system engineer at Transitions Optical, a Pinellas Park, Fla., eyeglass lens manufacturer. In contrast, ENS provides global updating across the older servers.

"It's idiotic not to have NetWare 4.0 backward compatible with NetWare 2.x and 3.x," said John Dunkle, president of WorkGroup Technologies, Inc., a consultancy in Hampton, N.H. "Banyan is offering to integrate NetWare environments better than Novell is."

Novell's "direction is to provide more integration and interoperability in a mixed environment for 4.0 and 3.11 servers," Auger said.

While Novell plays catch-up, some users have jettisoned their NetWare 4.0 upgrade plans. The Massachusetts registry is one: ENS, combined with third-party products that perform tasks such as centralized tape backup, provides the agency with 80% or 90% of what 4.0 would provide, plus the integration with NetWare 2.x and 3.x that Novell's latest network operating system lacks, Russo said.

No go 4.0

Transitions Optical has also abandoned 4.0. "We chose ENS because NetWare 4.0 has problems, and we needed something now," Jones said. One major problem was that the new network operating system version is so different from the older versions, it is like learning a whole new system, Jones said.

ENS for NetWare should help Banyan move beyond its own customer base, a crucial maneuver if the vendor wants to compete in the network services market, Dunkie said.

One user was particularly excited about ENS 1.1, scheduled to ship next week. Children's Hospital, Inc. has been using ENS since April and is awaiting 1.1's Macintosh support and the ability to access a Banyan and a Novell server with one log-on, said Cindy Comyns, a systems programmer at the Columbus, Ohio, hospital.

Open NLM

CONTINUED FROM PAGE 1

Unix.

Cygnus is providing Novell with development tools for NLMs and a single compiler that will allow new and existing NLMs to run across four major hardware platforms, said Cygnus President Michael Tiemann: the 386, the SPARCstation, Digital Equipment Corp.'s Alpha and Hewlett-Packard Co.'s Precision Architecture-RISC.

Novell, meanwhile, is providing an NLM development environment for UnixWare servers and clients running Unix System Laboratories, Inc.'s Unix System V Release 4.

"I think you'll see Novell bringing Unix tightly into [the NetWare environment] more quickly than anyone thought," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. "It means that you have Unix applications on the server, native to NetWare — a true distributed computing environment."

A compiler that "crunches existing NLMs and spits them out on new platforms" would be Novell and its Univel subsidiary's ultimate weapon against Microsoft Corp. and Windows NT, said David Pool, president of Spry, Inc., a communications software company and NLM vendor in Seattle.

Greater selection ahead

Within a month after Novell provides a UnixWare version of the tools, "you'll have more third-party applications, drivers and products for UnixWare than any operating system or network operating system out there," Spry predicted. "Novell has more third-party developers running NLMs than Solaris has application developers."

NLM developers will also find it a lot easier to develop NLMs in Unix rather than in DOS, Tiemann said.

Cygnus' tools are commercial implementations of an MIT project called Gnu. They will support C and C++ programming languages.

Road work

Novell is expected this week to repair two chinks in the armor that rivals have filled in their...

Making good on a statement of direction revealed last year, Novell is expected to announce a Simple Network Management Protocol (SNMP) management information base that will let NetWare servers be managed via SNMP-based systems.

Banyan Systems, Inc. not only provides SNMP management for its Vines network operating system but also provides software that interfaces with NetWare's proprietary API.

Novell is also expected to announce support for the Department of Defense's C2 security standard via a new network security "model."

—Elisabeth Horwitt

Enterprise net

CONTINUED FROM PAGE 1

Other Foundation Services provide security, administration and messaging.

Banyan is banking a lot on its network service strategy, particularly given the vendor's failure to pit its Vines network operating system successfully against Novell, Inc.'s NetWare, analysts said. Vines had about 7% of the installed network operating system market in 1992, while NetWare had 69% and Microsoft Corp.'s LAN Manager, along with derivatives such as IBM's LAN Server, had about 18% of the market, according to WorkGroup Technologies, Inc., a consultancy in Hampton, N.H.

"Banyan has always been positioned from a technology standpoint to take on that role [of enterprise network integrator]; they're showing better enterprise-wide connectivity than Novell," said John Dunkie, president of WorkGroup Technologies. "The difficulty has been moving beyond their current customer base."

Banyan seems to be having some success doing this with Enterprise Network Services (ENS) for NetWare, which provides NetWare users with access to all existing Banyan Foundation Services (see story this page).

Popular platforms support

Banyan is also preparing to provide versions of ENS for other popular network operating systems, with Microsoft's Windows NT likely to be next, Martin said. No time frame was given.

In addition, the vendor is preparing to enhance ENS for NetWare to provide integration of Banyan E-mail services with Novell's Message Handling Service, Martin said.

Transitions Optical, a seven-month user of ENS for NetWare, is eagerly awaiting that particular enhancement, according to Alvin Jones, a system engineer for the optical lens manufacturer.

A key upcoming piece of Banyan's enterprise integration rollout is software to enable desktop application interfaces, such as Microsoft's Messaging API (MAPI), Apple Computer, Inc.'s Open Collaborative Environment and products from firms such as Soft-Switch, Inc., to interact with X.500-compliant directories, Martin said.

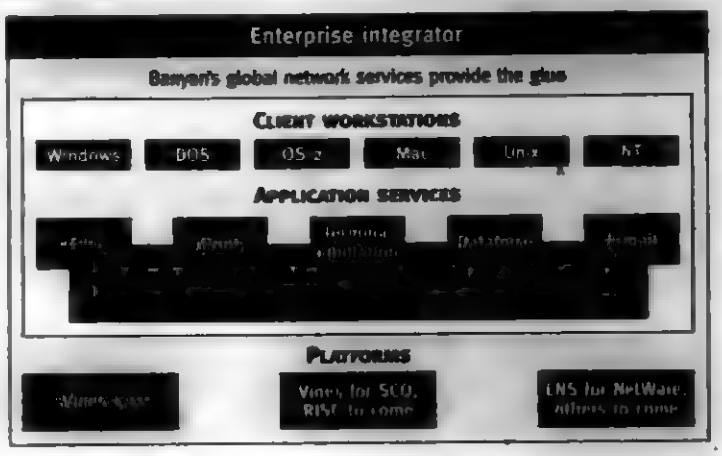
"People view X.500 as a powerful global solution, and the role of a directory company such as ourselves is delivering it to the desktop," Martin said. Banyan plans to provide MAPI support for its own directory services this year and deliver an X.500 product within a year, he said.

Other upcoming pieces of Banyan's enterprise integration framework, as detailed by Martin, include the following:

- Enhanced ENS to provide centralized software distribution.
- Network management applications, probably developed in concert with third parties, that will allow leading Simple Network Management Protocol-based platforms to perform integrated management across different network operating systems.

Banyan will also announce its strategy for delivering SNMP Version 2.0, which supports security and peer-to-peer manager interaction, at Interop '93 in San Francisco next month, Martin said.

- Shipment of Windows NT client support for Vines and Vines for Unix servers within 30 days.
- Migration of Vines to Sun Microsystems, Inc. and IBM RISC System/6000 platforms.



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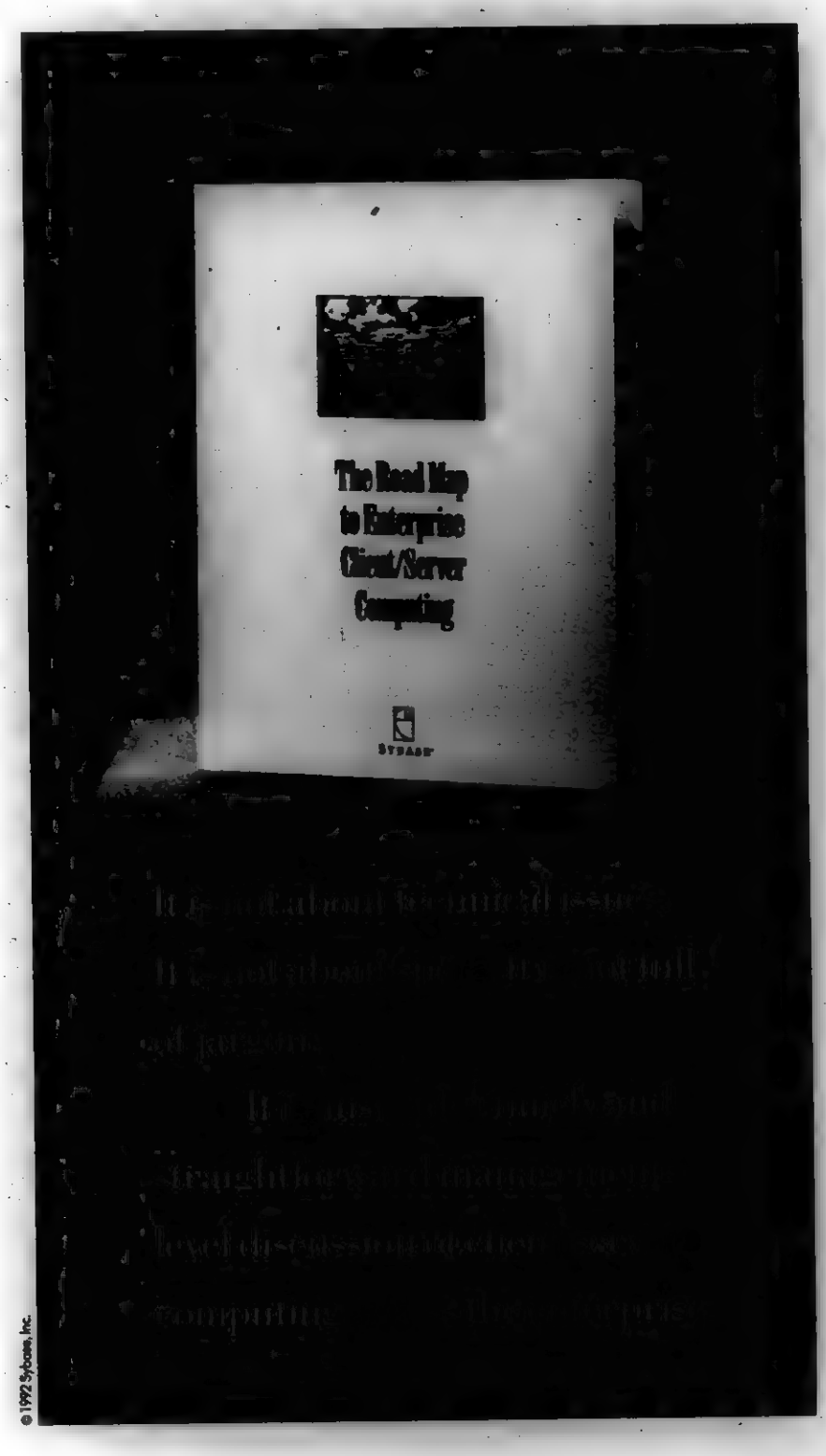

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IBM PC Co. restructuring progresses, but hurdles remain

By Michael Fitzgerald

Users say the 9-month-old IBM PC Co. still faces major challenges but is indeed figuring out how to throw off its old legacy and create a new one.

"There's still a lot they could do, but IBM under [PC Co. President Robert] Corrigan is getting its act together," said Bruce I. Linker, president of the Microcomputer Managers Association and vice president of information systems at a major financial services firm.

Despite the PC Co.'s progress, interviews with users, analysts and even some IBM officials suggest a company with something of a split personality.

On the plus side, users give it silver stars for its Personal System/ValuePoint and ThinkPad mobile computing lines. These families have been largely responsible for IBM's reversing a decline in market share that bottomed out at 7.4% in last year's third quarter but has come back to double digits since, according to Computer Intelligence/Infocorp.

The PS/ValuePoint and ThinkPad lines have come to market quickly, been refreshed within nine months and remain at fairly aggressive price points.

But analysts frequently characterize IBM's higher end line, the PS/2 desktops and servers, as being run like "the old IBM." The PC Co. is repositioning the PS/2 (see story page 63) and plans significant revisions in the way it handles its server business, officials said.

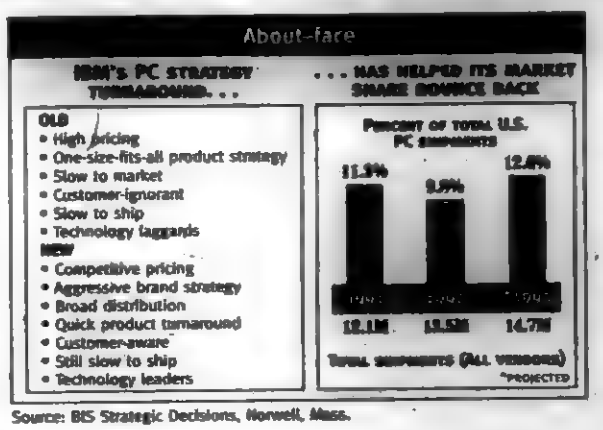
"It may be that in the future we don't announce whole new sets of models but might announce different needs for different customers," said David Andonian, director of premium brands at the PC Co.

Andonian said the PC Co. was discussing with major customers how to become more flexible in handling PS/2 contract pricing. For instance, the PC Co. is considering adopting a sliding price schedule.

IBM said a new sales structure in which one account manager draws support from various specialists in IBM, rather than a team of salespeople, should let IBM bid more effectively on the PC side, whether the customer wants PS/2s, ValuePoints or both.

Users said IBM should keep out of PC negotiations entirely and work through its resellers instead.

"I'm trying to figure out the difference between the IBM rep and the dealer rep," said Victor Mutnick, corporate vice president of IS at New York Life Insurance Co. "The dealer's been well-briefed; why do we need the IBM guy? It seems to me that's still an overhead thing they could cut."



Source: BIS Strategic Decisions, Norwell, Mass.

These changes come largely in response to IBM customers and perhaps even former customers, most of which said the company clearly listens better than it used to.

"They are listening, but they still are not listening closely enough," said Douglas Hirschfeld, vice president of IS at Kelly, Douglas & Co., a $3 billion food wholesaler in Vancouver, British Columbia. Hirschfeld buys IBM big iron but very few IBM PCs and said that when he tells IBM what he wants in a PC, the message seems to fall short of the PC Co.'s ears.

Analysts said the changes at the PC Co. come from its being outside of IBM's corporate bureaucracy. "What has changed more than anything is that they have tremendous autonomy," said Leslie Fiering, an analyst at Gartner Group, Inc.

It appears, however, that the longtime IBMers who staff the PC Co. are still figuring out how to be autonomous within the IBM wing. For instance, while the PC Co. now touts the TrackPoint II pointing device built into its ThinkPad computers as a sign of its technological eminence, the notebook team initially rejected the device as too different from industry norms. Corrigan recently confirmed anecdotes that he had to coerce the ThinkPad brand team into using the item.

"I had an L40SX jury-rigged with a TrackPoint and carried it around for a couple of weeks. Everybody got the point," he said.

IBM sales team

CONTINUED FROM PAGE 1

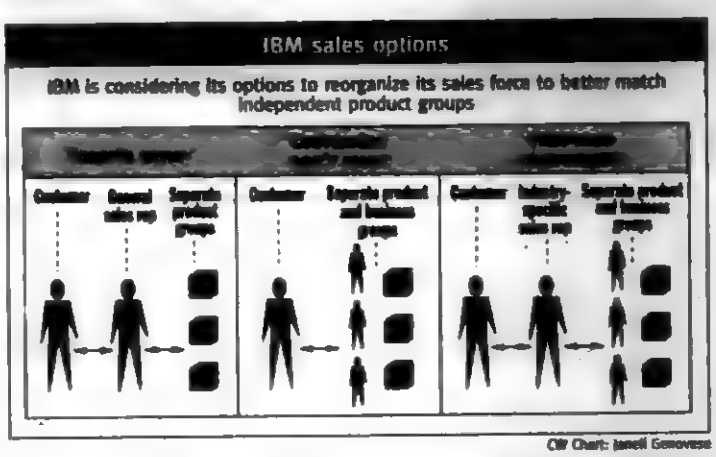
called trading areas, will stay intact. Within certain geographic areas, though, IBM salespeople will double as industry specialists and bring in product specialists from the various lines of business as needs arise.

To accomplish these dual goals, IBM will beef up its matrix management organization started by ex-Chairman John Akers (see story at right).

Although this strategy is not new, an IBM spokeswoman said, "we're accelerating the pace." The mid-Atlantic sales region was broken into industry specialties about two years ago, and the Chicago region was split up recently.

In Chicago, the salespeople are now aligned with one of four specialties: finance and distribution, manufacturing, insurance and government or public sector. A manager of each area is in charge of all customer relationships in that industry. Then there are product specialists in hardware, software, consulting and service and support.

IBM's sales efforts are meeting with mixed reaction from large customers. Some said they are satisfied, others said their relationship with their IBM account representatives is still evolving and others are unhappy. The differences seem to stem from which industry and geographic region the customer is in, as well as how much money the customer spends annually with IBM. Smaller shops or those with older equipment do not receive nearly the level of attention that those with more up-to-date gear receive, observers said.



CW Chart: Janell Genovese

Loyalty didn't pay

Fernando Gonzalez, MIS director at Hexcel Corp. in Dublin, Calif., and a 25-year IBM customer, said, "I bled blue, and they lost me. I've made all my money and all my success with IBM mainframes, and today I'm proposing to move my company away from IBM and from mainframes."

Gonzalez said he is abandoning his shop's IBM 3061 mainframe in favor of another manufacturer's equipment because "I don't know the IBM story. In the past, whenever I had a problem I would look to IBM. I just don't think that way anymore." Until he wrote a letter to Gerstner explaining the problem, Gonzalez said, he had not met with his local IBM sales representatives in "months and months."

At The Travelers Corp. in Hartford, Conn., on the other hand, Senior Vice President Lawrence Bacon said the "focus and intensity" of the IBM account team have increased during the past year. "They don't need to be the world's foremost insurance experts, but they need to be experts in their products and then have the ability to match those with our needs." IBM is doing a good job of that now, he said, but it is something IBM will have to continue to work on.

Likewise, Tom Woods, vice president at Halliburton Co. in Dallas, said that since his IBM account team started reporting to an industry group instead of the local geography, "we have more direct access to resources that understand the forces at play in the petroleum industry."

The account team even went overseas to visit with Halliburton's foreign groups.

In the middle is Dennis Klinger, chief information officer at Ryder System, Inc. in Miami. He said his account team is "in a state of flux" because of IBM's early retirement programs. The number of IBM staff members assigned to his shop is down from six to four, and the senior person is someone who came from a consulting background outside of IBM.

"It's early, and we'll need to see what happens," Klinger said. "But we need some stability here — folks who know our business and who can make proactive recommendations, not just go and get what I want."

Attacking niches

Louis Gerstner's July 2 memo made it clear that within three months he expects more focus on product specialists in IBM's sales force.

To pull it off, IBM will beef up the matrix-management organization set up by former Chairman John Akers. This will allow heads of the lines of business to have more input in sales force issues, including the kind of training required and how to compensate salespeople who act as product specialists.

Each region will have dedicated line-of-business specialists, according to the memo.

In the next few weeks, IBM's marketing chiefs — among them IBM U.S. head Robert LaBant — will meet with their colleagues in the lines of business to determine guidelines for the expanded matrix-management structure. "I want to make sure the current system is implemented well before we try alternatives," Gerstner's memo said.

—Johanna Ambrosio

Virus vagaries

CONTINUED FROM PAGE 1

enormous; we can't just consider them a nuisance anymore," said Virginia Hockett, a group manager at 3M Co. in St. Paul, Minn., who called on Congress to make the distribution of malicious viruses a felony.

Angry users have found a friend in Rep. Edward Markey (D-Mass.), who has obtained public comment on the need for antivirus legislation and begun efforts to modernize the bedrock Computer Fraud and Abuse Act of 1986. But Markey is unlikely to introduce antivirus legislation until late fall or early winter.

Viruses represent many difficult problems for legal wordsmiths. "Software is thought of as writing, and writing is protected by the First Amendment," said Peter Tippett, who has developed sample antivirus legislation as director of security products at Symantec Corp. Researchers use viruses for scholarly study, so banning them is impossible.

Any new antivirus legislation must be carefully focused. "If we make it illegal to write code that deletes information, then anyone who uses the *.* function on their PC is subject to prosecution," said Scott Charney, head of the U.S. Department of Justice's computer crime investigation unit. "We need to focus on the intent of the action."

Prosecution of malicious virus distributors is also tricky. Every state except Vermont has its own definition of what constitutes a computer crime. Sentences are often suspended or light.

Although Robert Morris' Internet worm crippled thousands of computers nationwide in the fall of 1988, he received only three years' probation, a $10,000 fine and 400 hours of community service.

Some longtime security experts maintain that there are plenty of regulations against monetary damage on the books that can be applied to the electronic community. "The rules to the game are already well-established," said Donn Parker, a security consultant at SRI International in Menlo Park, Calif.

Critics maintain, however, that these laws need to be modernized. The Computer Fraud and Abuse Act of 1986, for example, subjects violators to guidelines that rely heavily on the victim's dollar loss resulting from damage.

Users such as Miki Krause, program manager at Rockwell International Corp., which spent $44,000 cleaning up from an infection of the Hi virus (see chart page 1), advocate an aggressive education campaign to get the word out that viruses can be extremely damaging. Others decry a legal system that offers mere slaps on the hand for potentially devastating introductions of viral code.

Earlier this year, the Justice Department proposed new sentencing guidelines designed to shift the sentencing focus in federal computer crime cases away from monetary damage to consider the larger reverberations of the crime.

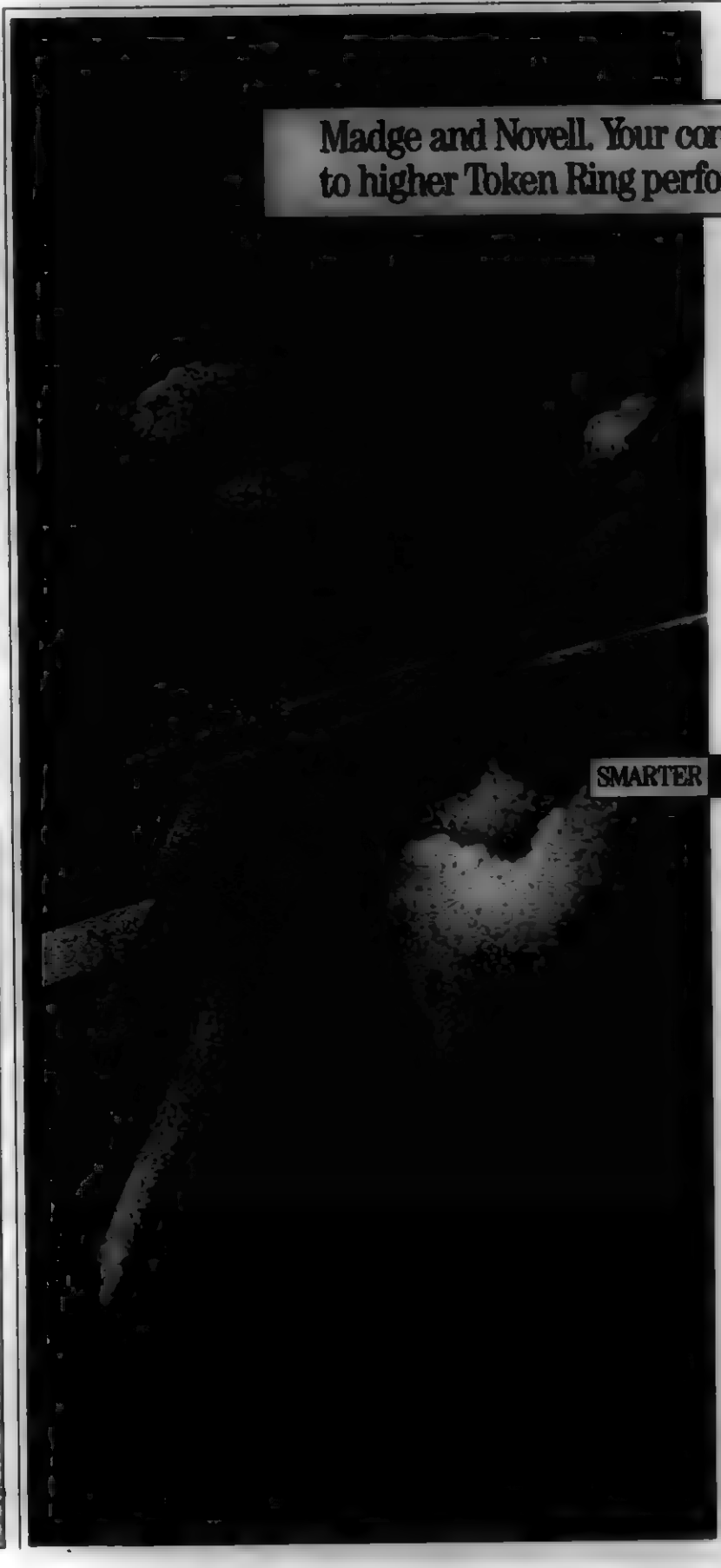
The proposals, however, are expected to remain little more than paper tigers for at least a year until the U.S. Sentencing Commission examines computer crime more closely, said deputy staff director Paul Martin.

No Holy Land

Four months ago, a PC in Nynex's New York headquarters was hit by the Jerusalem B virus. It started off infecting 10 executable files in only one system, but there was a catch: The PC was attached to a Token Ring network.

Until it could be determined that the attack was isolated, all machines that were physically connected via the network or that shared portable disks had to be examined. Operations manager Edward Benack described what it took to contain the rogue code:

- Four LAN administrators worked two full days plus overtime.
- One technician spent nine hours clearing his trouble ticket.
- One security specialist spent five hours on follow-up and reports.
- Most of the 200 users on the LAN had to endure 15-minute disruptions for course of two days.
- Cleanup cost was estimated to total approximately $5,000.



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News Shorts

Users Unite-ing

Members of Unisys Corp.'s Cube and Use, Inc. groups have voted overwhelmingly to combine the two factions into a single entity, called Unite. Former Sperry Corp. customers (Use) and former Burroughs Corp. users (Cube) will hold a joint conference this October in Minneapolis before the first official Unite conference is held next spring in Nashville.

SSA case dismissed

A shareholder's suit against Chicago-based software house **System Software Associates** (SSA) was dismissed by a U.S. District Court jury early this month. The $22 million class-action suit, brought in February 1991, alleged that company officials had committed fraud and violated securities laws. The jury found that the firm's chief financial officer, David Harbert, did not lie when he was quoted as saying he was comfortable with analyst estimates about the company's financial future — a month before SSA issued a lower-than-expected quarterly earnings report.

Carriers add ISDN twist

A multicarrier trial slated for later this year will link sites across standards-compliant Integrated Services Digital Network (ISDN) lines that allow users to select transmission speeds from 128K to 1.5M bit/sec. in 64K-bit/sec. increments on a per-call basis. The trial of what participants are dubbing "Multi-Rate ISDN" will involve regional Bell companies **Ameritech Corp.** and **Nynex Corp.**, long-distance carrier **WilTel** and equipment vendor **Northern Telecom, Inc.**

Bachman cuts employees

Bachman Information Systems, Inc. reduced its work force by 33 employees or 12% last week, bringing its head count down to 231. This reduction comes after another quarter in which revenue was down, officials said. Bachman's fiscal year ended on June 30, and results will be announced next month. A companywide restructuring earlier this year had already reduced the employee population by 15%.

Sybase's multimedia gains Momentum

Sybase, Inc. plans to announce Gain Momentum 2.0 today, a new version of an object-oriented, multimedia development tool set that Sybase inherited from a July 1992 acquisition of **Gain Technology, Inc.** Gain Momentum 2.0, which contains an object-oriented database licensed from **Objectivity, Inc.**, lets users create applications that can access Sybase and Oracle Corp. databases without writing SQL commands. Users can also build images of their own forms into multimedia applications, Sybase said. Prices start at $10,000 for a single-developer license.

SHORT TAKES **Memorex Computer Supplies** has launched a retail effort under which it will distribute PC application software, including titles from Lotus Development Corp., Microsoft Corp., Ventura Software, Inc. and Autodesk, Inc.... **Microsoft** has announced an audio-compression algorithm, developed jointly with **Compaq Computer Corp.**, that will compress voice recordings in Windows environments by as much as 10 times.... **SunGard Recovery Services, Inc.** announced the acquisition of **Uptime**, a mobile recovery service vendor, and plans to acquire the disaster recovery business of **Sun Data, Inc.**, an Atlanta-based IBM Application System/400 services provider.... **BancTec, Inc.**'s service subsidiary, BancTec Service Corp., has entered into a partnership agreement with **AT&T Paradyne**'s customer service organization to provide service and support to North American computer network users.

Skepticism greets 'new' Wang

By Craig Stedman
LOWELL, MASS.

As Wang Laboratories, Inc. moves toward exiting Chapter 11 bankruptcy protection by mid-September and mutating into an open systems and services vendor, some users are questioning whether the downsized firm's service and support capabilities are up to the task.

Wang filed an amended reorganization plan with the U.S. Bankruptcy Court last week. The company said it is counting on both its open systems and services and its local-area network integration businesses to bring in about 65% of its revenue within three years.

However, several customers who already have looked at or used Wang for migrating from VS to open systems or for LAN projects came away less than impressed with the company's services organization.

"Their maintenance is OK for the old stuff, but if you want to get into open systems, it's just not there," said Ramsay Millar, director of MIS at the British Columbia Tourism and Culture Department in Victoria, British Columbia. Millar was formerly chairman of the Americas Pace User Group for Wang application developers.

Millar turned off all but one of his eight VS systems in February and, after trading in an IBM RISC System/6000 he initially bought from Wang, has since shifted most information systems functions to Sun Microsystems, Inc. hardware.

Bill Curran, chief operating officer at Ice Miller Donadio & Ryan, an Indianapolis law firm, said he also had "a pretty unsatisfactory experience" with Wang after hiring it to install a 330-node network running Novell, Inc.'s NetWare.

"Our own technical staff had to do a lot of work that was unanticipated in the original contract," Curran said. Wang "got out ahead of themselves a little bit in terms of their claims of expertise in this area. They do have the ability, but it's spread very thin and difficult to get to."

Brandon Edenfield, vice president of IS at Trans Leasing International, Inc. in Northbrook, Ill., said his Wang service representatives lacked knowledge about the VS line, particularly in the systems analysis area. "How are they going to get involved with systems they don't even sell?" he asked.

Donald Casey, Wang's chief development officer, strongly defended the company's service capabilities, pointing to its experience in installing and supporting imaging systems as well as networks running both NetWare and Banyan Systems, Inc.'s Vines software.

"This is a market we know," Casey said. "We think we have quite a leg up" on other vendors.

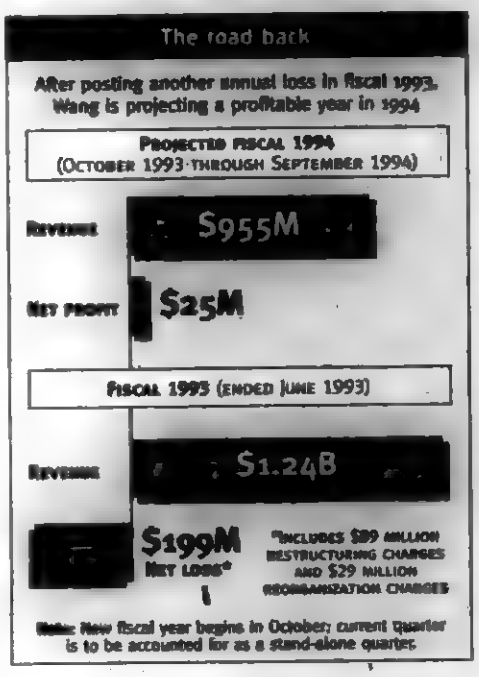
Service is one area in which Wang expects to add workers, said Joseph Tucci, Wang's president and chief executive officer. But the company is also looking for outside help through a program expected to be announced next week for training consultants and resellers to design and install imaging-based systems for small and medium-size customers.

John DaSilva, manager of systems development and database administration at the Gas Research Institute in Chicago, was more sanguine about Wang's service capabilities. "I don't think anybody has the expertise they need," he said, adding that Wang seems to be ahead of other vendors.

Analysts said they were unaware of any mass disaffection with Wang's performance in the service area. Mike Howard, a vice president and office systems service director at Gartner Group, Inc., a consulting firm in Stamford, Conn., said Wang has "a very strong understanding of office technology [and] a fair amount of expertise in complex network integration."

Meanwhile, there was mixed reaction to Wang's revised operating plan, which calls for the company to bottom out at $955 million in revenue in fiscal 1994 and then grow slowly during the next two years. "I would remain skeptical about them growing the business in years two and three," Howard said. "I think a lot of customers will not look favorably on them for a long time."

However, Tucci said he would "guarantee it is doable." The plan assumes no major economic pickup, and Casey noted that it is based on less than 25% of the top VS customers moving to Wang-supplied open systems during the next three years, a figure he said represented "a conservative view."



Closed-and-shut case

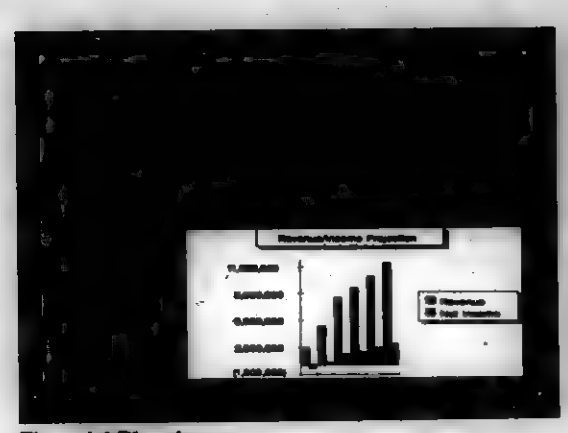
Some users passing on Wang's open software products view the firm as still proprietary at heart, as exemplified by its use of an internally developed file structure that cannot be directly accessed by non-Wang databases.

"In Wang's environment, they still try to limit your choices," said Brandon Edenfield, vice president of IS at Trans Leasing International. Wang's Portable Data Management System (PDMS) file structure "locks you into their database," he added. Trans Leasing, a longtime VS user, is preparing for a move to open systems.

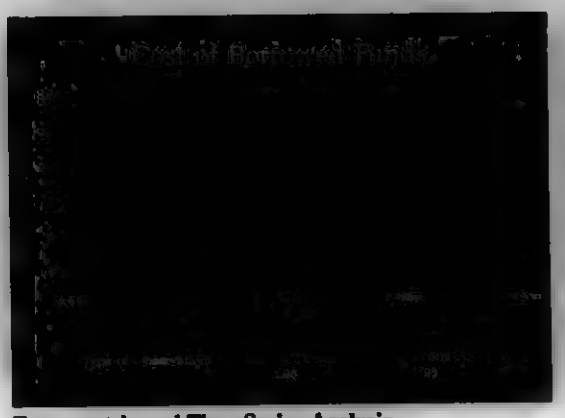
Ramsay Millar, director of MIS at the British Columbia Tourism and Culture Department, also still sees "a proprietary attitude" at Wang. PDMS is technically strong, "but the trouble is, you've got to go forward to standards," he said.

According to Donald Casey, Wang's chief development officer, "most of the user base" still values the functionality of PDMS. Wang plans, though, to release versions of its Pace for Open Systems development tools for Oracle Corp. and other databases later this year.

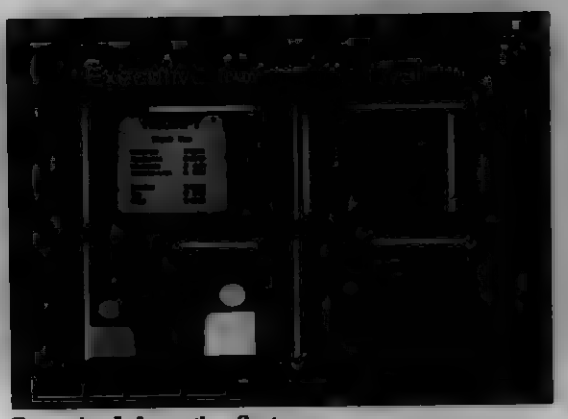
Wang also expects to eventually support Microsoft Corp.'s Open Database Connectivity technology, Casey added. For now, he said, users can write a SQL-level interface to allow outside databases to access PDMS files. — *Craig Stedman*



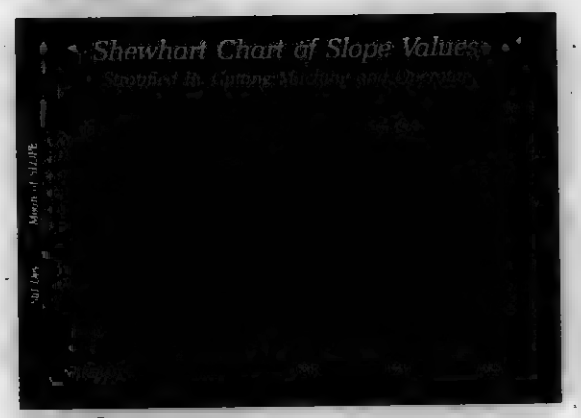
Financial Planning



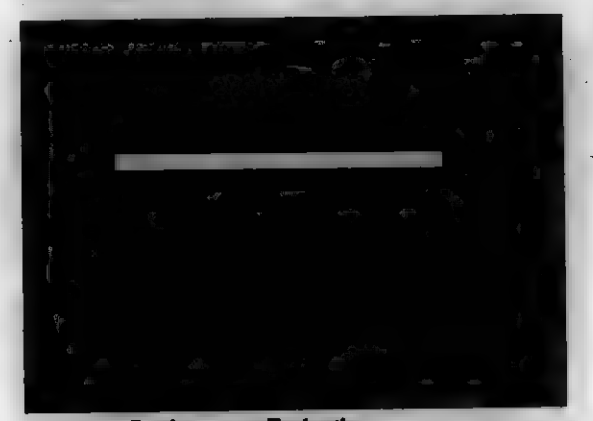
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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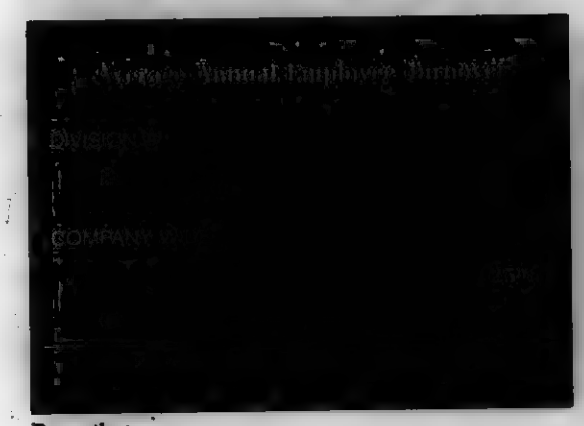
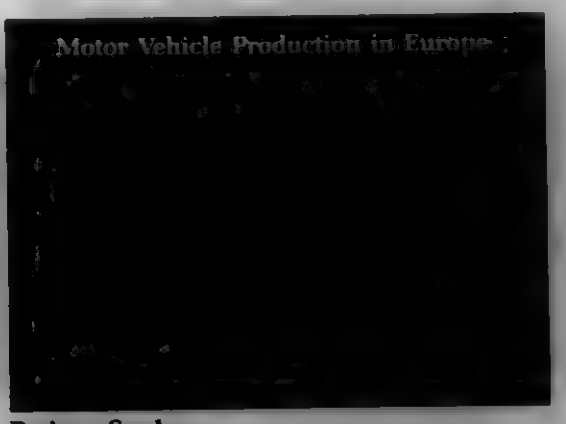


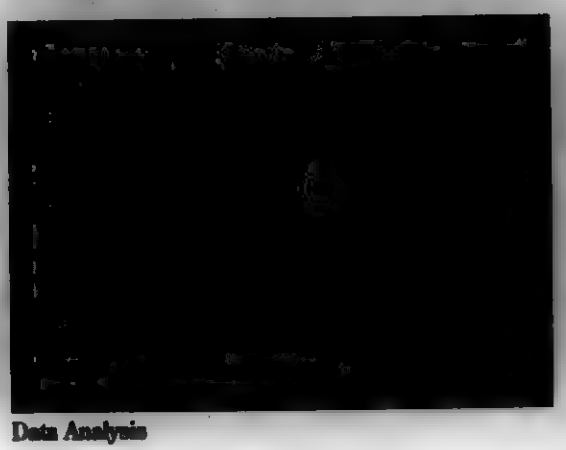
Reporting

Market Research

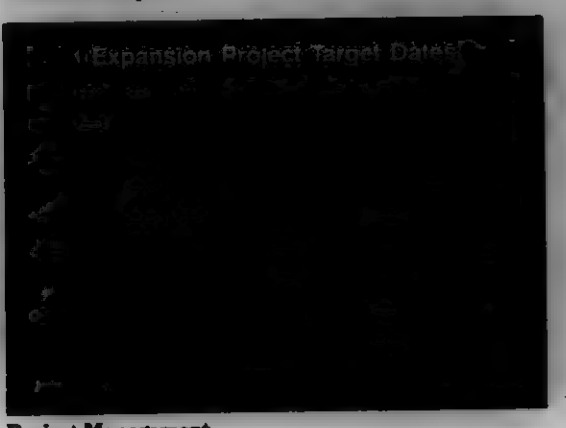


Business Graphs

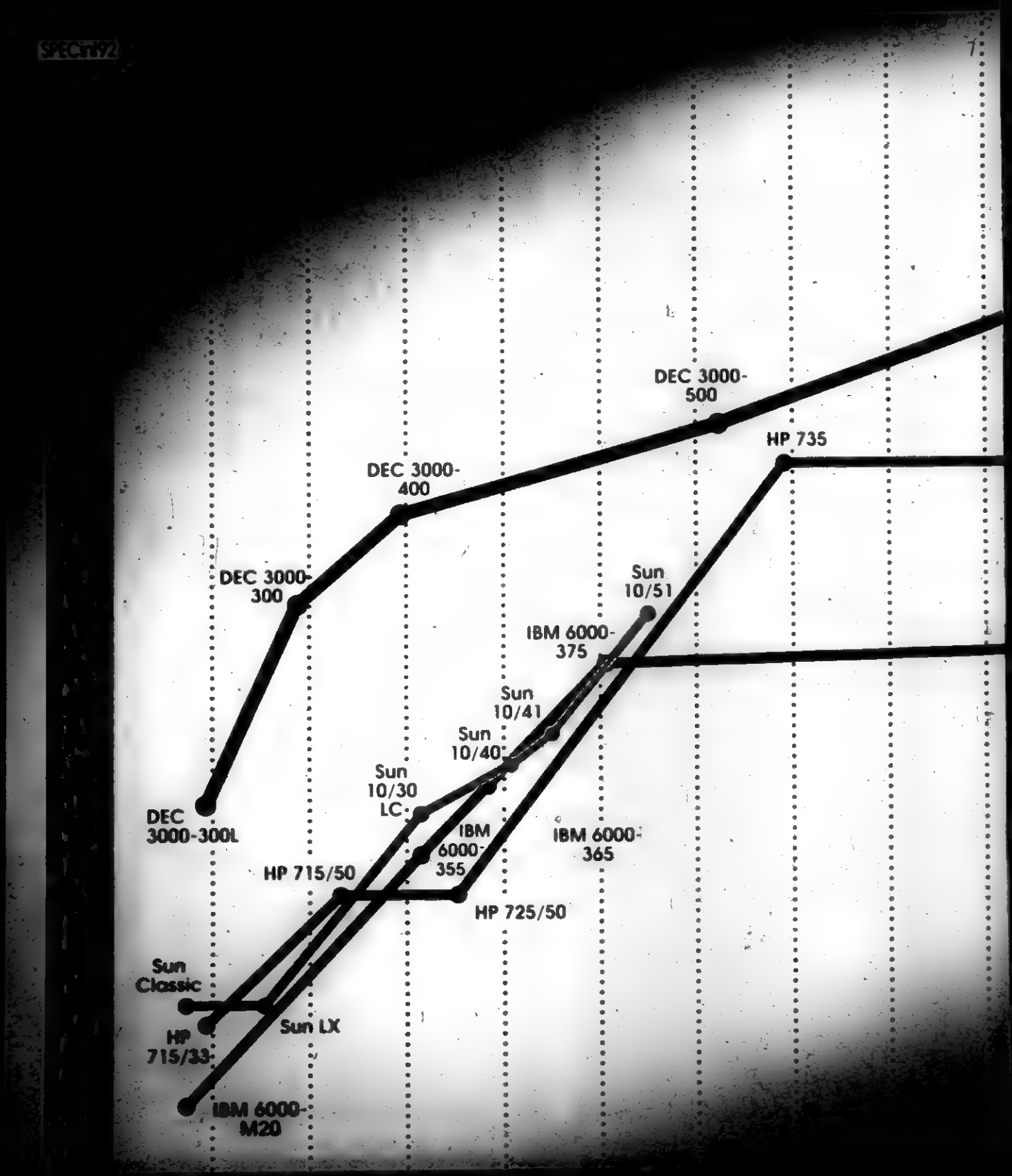
Visualization



Data Analysis



Project Management



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Court grants AT&T injunction against MCI

Ruling forces carrier to file more specific pricing information with the FCC

By Joanie M. Wexler
WASHINGTON, D.C.

AT&T's ongoing battle to create a level playing field in the telecommunications services arena saw a victory last week that could please some users while disgruntling others, depending on how competitive they consider their private carrier contracts to be.

A U.S. District Court here granted AT&T the injunction it sought in a complaint filed June 8 against competitor MCI Communications Corp. The ruling prevents MCI from inking contracts that include services at rates not specified in the tariffs it files with the Federal Communications Commission.

MCI has been filing general tariffs since a U.S. Court of Appeals ruled in November that the Communications Act of 1934 requires all common carriers to file them with the FCC.

"It's not what's in MCI tariffs that's the issue; it's what's not in them," AT&T spokesman Jim Bredeson said. "Today, they are charging rates that are different from any they have on file" with the FCC, he explained.

Last week's decision means MCI must start filing more specific pricing information about its contracts with the FCC, said Brian Moir, public policy counsel to the International Communications Association, a large user group. In effect, it mandates that individual customer contract rates be tariffed, rather than allowing a range of contracts to be covered in a combined filing, MCI said.

Leveling equal ground

AT&T continues to push for FCC equality. In February, the carrier charged that MCI, as well as Sprint Corp. and WilTel, have filed inadequate tariff information. AT&T is seeking monetary damages from all three. Just how much detail is required from the nondominant carriers is the key question, according to International Communications Association public policy counsel Brian Moir.

Competitive consequences

Telecommunications managers are divided in their opinions on whether such an expose is to the customer's advantage. Some said they believe an open price book from all carriers would spur lower rates all around. Carriers would have the incentive to beat competitors' published prices, and users would generally be more educated about comparative rates.

Others, however, said their contracts are competitive and that they would not want to tip their hands by having the prices they negotiate on public display [CW, Feb. 15].

Meanwhile, both MCI and AT&T have publicly assured MCI customers that last week's ruling will not affect service to current and future customers.

The development still forces AT&T to reveal more pricing information in its tariffs than its "nondominant" competitors, Moir said, although "this is a long way from saying MCI [tariffs] have to match AT&T's [level of detail]."

"We haven't seen the end of this," he predicted. "I'm sure AT&T will continue to push until it is at a parity with the other long-distance carriers."

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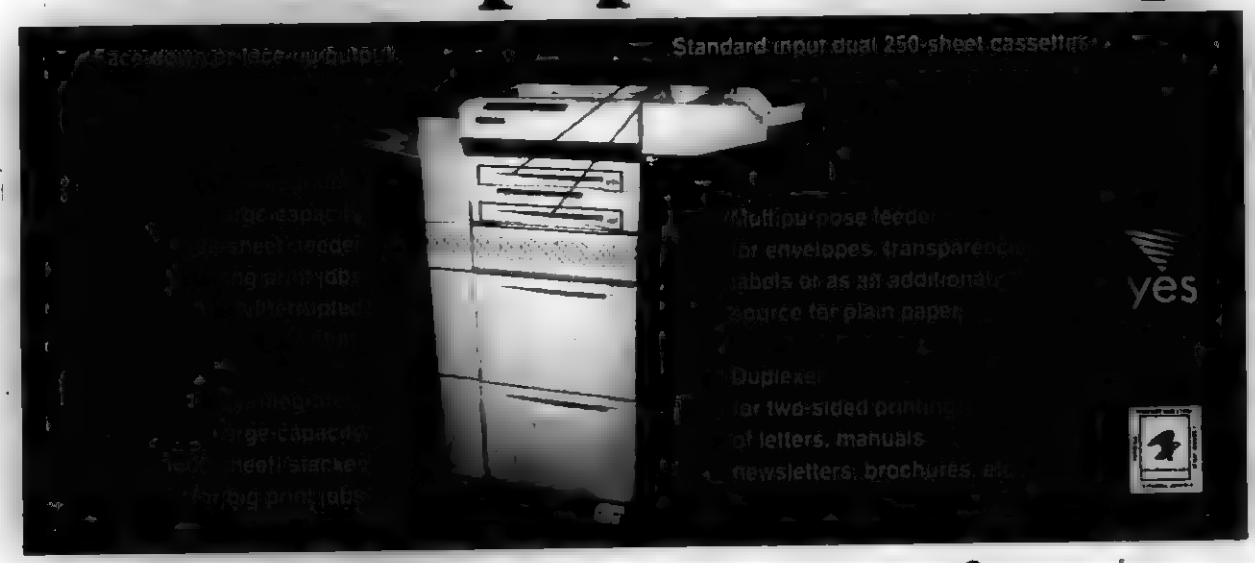

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Cellular protocol battle prompts call for unity

By Joanie M. Wexler

Vendor bickering over the comparative merits of two incompatible protocols that improve data communications over cellular networks has exposed an industry standards gap that could stall corporate moves to mobile computing.

A performance benchmark dispute between two players that offer modem software fine-tuned to keep traffic flowing in harsh cellular environments has underscored the need for an international standard. Today, wireless users on the go must worry about whether a mismatch of software on their portable and home office modems will foil communications.

AT&T/Paradyne's recent claims that its Enhanced Throughput Cellular (ETC) protocol can send a 100K-byte file in 237 seconds — compared with 296 seconds for Microcom, Inc.'s competing MNP 10 protocol, or a difference of about a minute — sparked a rebuttal by Microcom last week that the tests were conducted under biased conditions.

But rather than having two or more competing standards, observers said the industry needs a merger of MNP 10 and ETC or some third standard from the international CCITT standards body to ensure ubiquitous communications and spur data-over-cellular use.

"If the CCITT would come with a [standard] cellular protocol, we as carriers would love that," said Steve Isaacson, wireless data technology specialist at GTE Telecommunications Products & Services in Atlanta. "The best performance you'll get over cellular is with modems with matching protocols."

Some companies are considering cellular networks for large-scale mobile data applications because cellular has a much broader reach than today's packet data networks. However, many are concerned about disconnects and the general unreliability of the medium for carrying data.

The industry needs a merger of MNP 10 and ETC or some third standard from the CCITT standards body to ensure ubiquitous communications and spur data-over-cellular use, observers said.

The cellular-enhanced protocols address these issues by making initial connections at a very stable low speed. They then ramp up data-transfer speeds or slow them down as line conditions improve or erode.

These adjustments are important both from a reliability standpoint and an economic one, said Tim Macklenar, manager of data applications at Southwestern Bell Mobile Systems in Dallas. Minimizing the number of reconnections and allowing data to travel at optimal speeds along the link allows users to minimize their connection times and thus their costs, he said.

Microcom's MNP 10 protocol can communicate only with another MNP 10-based device; AT&T/Paradyne said its ETC does not require ETC at the other end but defaults back to less functional, land-oriented error-checking protocols if software at the two ends is different.

In the absence of a common protocol, GTE Telecommunications is considering offering a modem pool-like service, Isaacson said. The idea would be to allow companies to outfit their users' modems with their software of choice, then communicate wirelessly with a GTE Telecommunications central office where modem banks would exist for both protocols.

Then, GTE Telecommunications' central office switching equipment would convert the cellular data to land-line format and complete the last leg of the trip for the user.

Other alternatives would be for users to replace their modem pools with devices that all run the same protocol or — if they run newer, more sophisticated modems — to firmware-upgrade those devices, Isaacson said.

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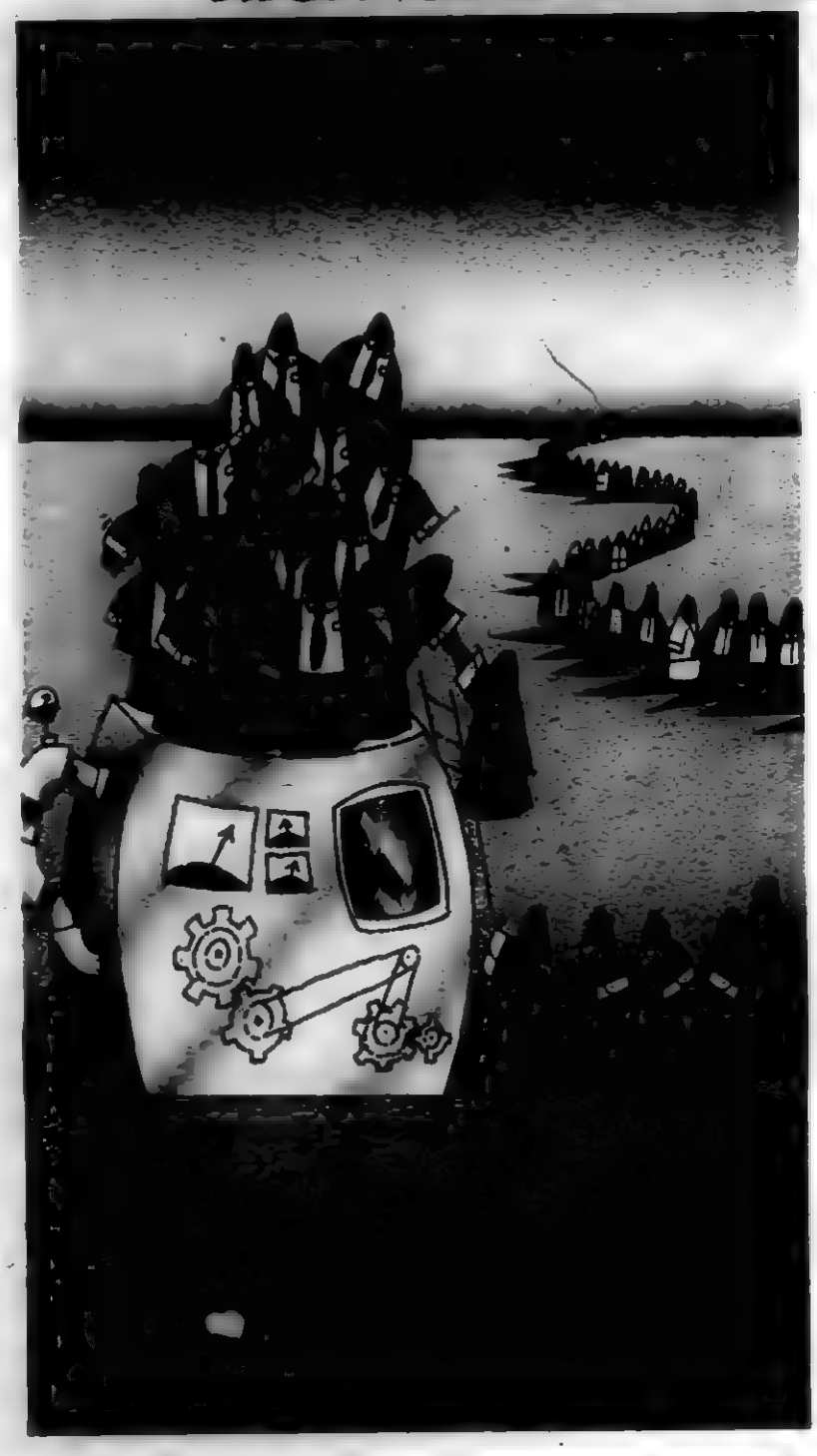

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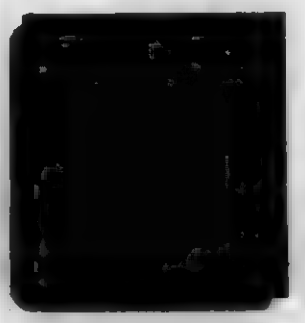

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The right to be secure

Government-backed data security standard raises Big Brother issues

By James Daly

Two months ago, the Clinton administration dropped a bomb on the world of computer security.

In an effort to assist law enforcement officers looking for a legal back door into coded criminal communications, officials from the National Institute of Standards and Technology (NIST) and the National Security Agency (NSA) said they intend to establish as a federal standard an approach to voice and data encryption called "key escrow." This method would require the technology needed to unlock a coded conversation to be kept by government-approved agencies and retrieved in the event of government-approved wiretaps.

Data encryption would be done in silicon via a device called the "Clipper chip," which would be installed in machines needing its coding and decoding capabilities.

To put it mildly, the Clipper chip proposal has generated a lot of excitement among privacy advocates who fear abuses by a technologically empowered Big Brother.

Computerworld recently tried to talk with officials from both the NIST and the NSA to further explore the Clipper issue, but neither allowed a face-to-face interview with a staff member. Instead, we had to submit written questions.

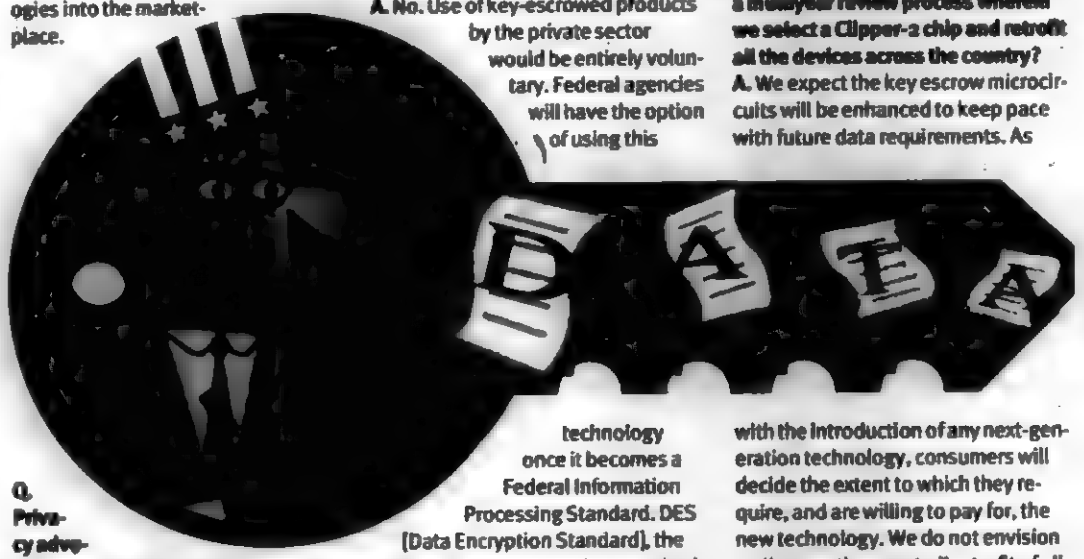
Here are the answers provided by officials from the NIST and the NSA.

Q. The proposed Clipper chip technology has generated an awful lot of acrimony since it was announced in April. Has the government lessened its level of commitment to the chip?

A. The administration remains committed to the initiative and is proceeding with the following actions: the acquisition of key escrow encryption devices by law enforcement agencies; the naming of key escrow agents to hold the keys for the key escrow microcircuits and the establishment of procedures by the attorney general for the access of the keys; the evaluation of the key escrow encryption algorithm by respected experts; the promulgation of a standard by the secretary of commerce to facilitate the procurement and use of key escrow encryption devices in federal communications systems; and the comprehensive review of encryption policy.

In addition, discussions with industry and other concerned groups have proved very productive. The administration does not intend to arbitrarily end its study of this issue while helpful consultations are under way.

It should also be understood that the use of products implementing the key escrow encryption microcircuit is voluntary. There has been no attempt to either mandate its use or to deny the entry of other encryption technologies into the marketplace.



Q. Privacy advocates say that if the keys needed to de-encrypt data are placed in the hands of government authorities, there is the potential for abuse. What kinds of safeguards would be implemented to prevent this?

A. The government may conduct electronic surveillance only when lawfully authorized. Moreover, the key escrow procedures being developed provide that each key will be split into two parts, and different key escrow authorities will hold each part. Neither part alone can be used to decrypt messages.

To obtain the key needed to unlock the encryption, law enforcement must present evidence of its authority for a key, typically a court order, to both key escrow authorities. Finally, the system will be designed to ensure that law enforcement destroys the keys it receives when its authority to conduct the electronic surveillance has expired.

Q. Vendors who have extensive business overseas say they would not be able to sell Clipper-equipped machines on foreign shores. How do you respond?

A. Key-escrowed products will be exportable to U.S. persons and companies operating overseas. One issue under consideration in the presidential review is whether a broader export policy is advisable. Should a broader export policy be adopted, we believe products implementing the key escrow technology will find favor among consumers who desire the superb encryption security offered.

Q. If Clipper would be the standard, would the use of non-Clipper encryption devices be outlawed? If so, how would you find out who was using these non-Clipper devices?

A. No. Use of key-escrowed products by the private sector would be entirely voluntary. Federal agencies will have the option of using this technology once it becomes a Federal Information Processing Standard. DES [Data Encryption Standard], the existing federal encryption standard, will still be available for use in federal systems.

Q. Regarding DES, some security experts say that with powerful chips such as Pentium already on the market and the 686 and 786 in design stages, DES is getting near to being crackable. Is DES nearing the end of its useful life?

A. NIST will recommend that DES be renewed for another five years as a Federal Information Processing Standard. We do recognize, however, that as computer technology advances, the expected effort needed to break DES-encrypted messages decreases. In time, DES will become less valuable for securing sensitive information.

Q. What eventually made DES and other cryptosystems acceptable was their ease of use in software. Do you feel companies will be willing to go back to the hassle and additional expenses of hardware-based cryptography?

A. Again, we must emphasize that use of this technology is voluntary. Software containing other cryptosystems is still available to consumers. As for use of this technology in hardware, new products are already being developed to lessen the "hassle" of hardware-based cryptography. One example would be its use of PCMCIA (Personal Computer Memory Card International Association) cards. Moreover, encryption implemented in software generally provides less security than hardware encryption.

Q. What happens when the Clipper chip's technology cannot keep up with faster networks and becomes a bottleneck? Do we then have to have a multiyear review process wherein we select a Clipper-2 chip and retrofit all the devices across the country?

A. We expect the key escrow microcircuits will be enhanced to keep pace with future data requirements. As with the introduction of any next-generation technology, consumers will decide the extent to which they require, and are willing to pay for, the new technology. We do not envision an "across the country" retrofit of all devices.

Q. What should be the role of the government, if any, in developing a nationwide computer security policy guideline?

A. The government has a strong interest in computer security policies in light of the federal agencies' need to protect their own information: for law enforcement agencies to conduct lawfully authorized electronic intercepts in order to combat crime and terrorism; to protect national security through export controls of cryptographic technologies; and the growing U.S. economic interest in protecting corporations and citizens' information that is stored and transmitted electronically.

That does not mean, however, that a government-imposed security policy is appropriate. Government must be actively involved in setting computer security standards for its own use and making its technology, expertise and guidance available to the private sector when requested and appropriate. Private-sector organizations can then make appropriate risk-based, cost-effective decisions as to protecting their information assets.

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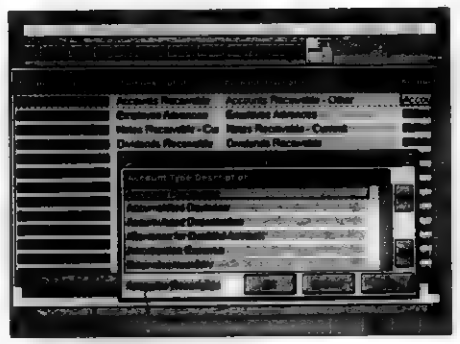

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Jurassic lark

Is the computer industry coming apart at the seams, threatening to blow itself wide open and spew some ghastly contents on an unsuspecting user community?

Or perhaps the unrelenting rash of layoffs, restructurings, Chapter 11 filings and re-emergings, organizational re-engineerings, CEO departures, assorted and sundry floods and plagues of locusts among the vendors are nothing more than a youngish industry starting to show a little gray around the temples? Uh-huh.

Make no mistake about it. The companies that produce the information technologies with which businesses define their competitive advantage are in chaos.

This would be fine if you as a mass consumer of technology could look in the direction of those companies and say, "Well, that's their problem. I've got my own."

However, while computer companies around the world are rocked and shaken by bedrock-level tremors of cataclysmic proportions (I'm not exaggerating here, either), users are reeling from the tsunami set off by these tremors. It has washed over the users and left behind the stark reality of user-as-integrator.

That reality is coming into focus more clearly as the first client/server disaster stories begin to emerge. Unsuspecting users in some companies find themselves pining for the old days when the big vendors, though ripping off the users to a fare-thee-well, at least were able to cobble together system components that worked in harmony.

Today it's different. Take object-oriented technology, for example. It is laced with buzzwords such as virtual reality, GUIs, APIs, middleware, wireless E-mail, multimedia. But you, the user-as-integrator, just try putting any two of them together. Even better, try hitching them to your legacy systems with your legacy people. You'll quickly learn that simple things such as protocols don't match because it's likely you won't buy the two pieces from the same vendor.

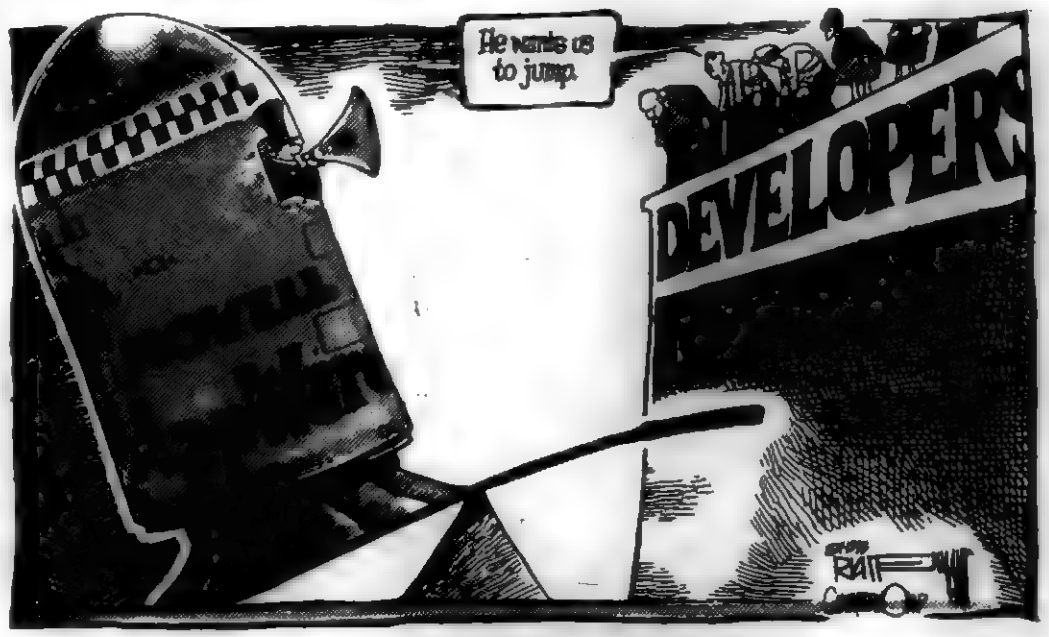
So what happens? You spend your time as user-as-integrator solving technical problems instead of business problems and find yourself up to your ass in alligators. You ask, "Hey, wasn't I here to drain the swamp?"

I think the current state of affairs in information technology and information systems can be summed up thusly: The old world of proprietary, host-based computing took nearly 40 years to evolve. It is rapidly disintegrating, but a new and orderly world is not emerging as fast as the old one is crumbling. Thus, we have severe dislocations.

While this disharmony sorts itself out, the users are under tremendous pressure to plunge headlong into the primordial soup of an embryonic environment. Your success as IS leaders may well rest on your ability to resist knee-jerk change as much as anything else.

Bill Laberis

Bill Laberis, *Editor in chief*



Visionary label not for Scalley

[redacted] Apple ousted [redacted] Sculley, a marketing [redacted] replaced the more visionary John Sculley. . . . Oh, come on. I thought it was Steve Jobs who was the visionary and Sculley who was the [redacted]

Apple has not released a single product during Sculley's tenure that has not been an extension of Steve Jobs' original Macintosh/Lisa vision. Mr. Scully has certainly helped Apple's prospect, but you are giving him way too much credit to call him a visionary.

Steven Sklaver
Santa Fe, N.M.

Reader backlash

Well, I guess I'm a "hoary guardian" of relational technology, according to Charles Babcock's column "Relational backlash" [CW, June 28]. But the analogy of disassembling your car to park it and reassembling it in the morning is just as hoary — and what's more, it's *wrong*.

Relational technology does not necessarily require complex objects to be broken down into components to be stored in the database (see my article "A fruitful union," CW, June 14). A relational system that supported domains properly would be able to do all the things that object-oriented systems can do. Moreover, it would still be a relational system and would enjoy all the usual relational advantages.

Also, the implication of Babcock's column that "object orientation is to relational as relational was to Codasyl" is completely false. Relational displaced Codasyl because it had a solid theoretical foundation and Codasyl did not — and that foundation in turn led to solid practical benefits. Object orientation does not have a comparable foundation.

C. J. Date
Healdsburg, Calif.

Tools are the key

"Mainframe utilities defy hardware trend" [CW, June 21] was on target in its assertion that the mainframe software utilities market is flourishing. Please add Programart to the article's list of thriving software vendors. Because of the pressure on mainframe users to cut costs, Programart revenue has grown an average of 33% during each of the last three years.

While monitoring system efficiency and automating operations are important to controlling IS costs, savvy managers have recognized that application portfolios actually drive costs. Tools that promote application efficiency are critical to their resource conservation strategies.

Stuart "Jeb" Hooker
Programart Corp.
Cambridge, Mass.

Group mentality

"Strength in numbers" [CW, June 7] describes the virtues of group synergism or, as Mr. Spock of *Star Trek* fame might have said, "The whole is better than the segment." I most strongly concur with and support his premise of consortia and how greater efficiencies can be achieved through them.

The Navy's World Wide Military Command and Control System (WWMCCS), of which I am the project manager, has initiated such consortia with the Marine Corps, Army, Air Force and Defense Information Systems Agency WWMCCS' offices. The thrust behind this move was an attempt to minimize duplication of efforts between the services' WWMCCS research facilities and assist one another on specific technical concerns.

As the budgets continue to head south, we have no choice but to become more efficient in how business is done. The parochialism that has existed among the services is slowly giving way to cooperation or, for lack of a better term, a greater "Jointness."

William D. Laska
Space and Naval Warfare Systems Command

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A Standish Group White Paper

THE STANDISH GROUP

Client-Server Goes Business Critical

Transaction Processing Monitors Key to Next Generation of Applications

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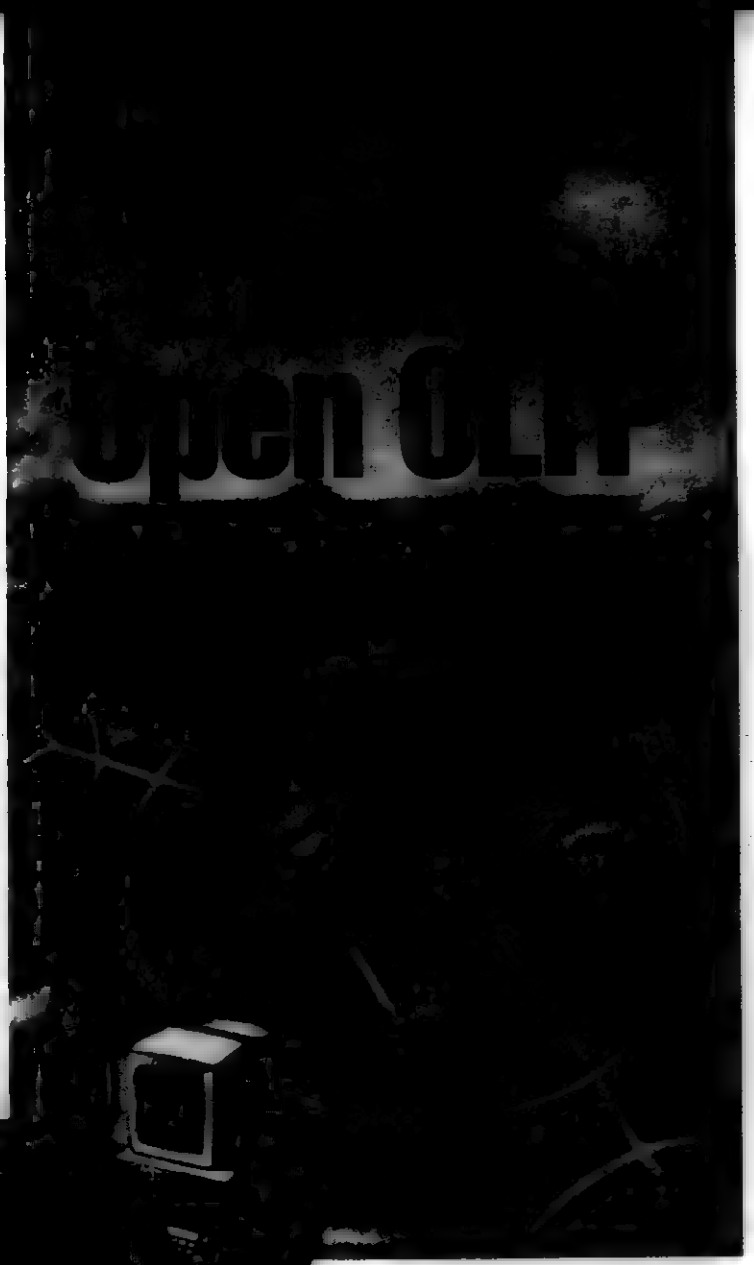

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Introduction

Looking back, business historians will no doubt describe the 1990s as a decade of corporate restructuring and re-engineering. Likewise, the annals of Information Technology (IT) will record this as the decade of client-server computing. At the intersection of these trends, modern Transaction Processing (TP) monitor technology is facilitating the deployment of business-critical client-server applications. Business-critical applications require TP monitor technology.

Distributed computing resources, and client-server application models to exploit them, have become more pervasive. The advantages of client-server approaches to computing include:

- flexible business modeling
- maximum component technology choice
- efficient use of computing resources.

Three principal approaches to client-server application design can be identified: remote data access (RDA), database server, and TP monitor-enabled application server. Of these, only the TP monitor-enabled application server approach realizes the full benefits of client-server. The remote data access approach centers the application in a client computer — communicating with backend database servers. RDA is network intensive, limiting scalability, and difficult to manage. A database server approach places the application in the database engine itself in the form of stored procedures. This approach offers limited function, performance bottlenecks and architectural lock-in to specific database systems. The application server approach, supported by TP monitors, avoids these drawbacks and fulfills the promise of client-server by supporting flexible business application development, and maximum technology choice and resource utilization.

TP monitors are positioned to be the architectural linchpin for modern approaches to distributed computation and client-server processing. TP monitors are unique products developed to assist in the most challenging of IT endeavors — to protect the integrity of the organization's resources and provide an optimal execution environment for critical "run the business" applications. No other system software product offers the same breadth of services in support of critical applications — data integrity; high availability operations; performance tuning and load balancing; resource manager integration, including heterogeneous databases, indexed file systems and message queues; wide ranging scalability; and cost savings achieved through efficient resource utilization.

For over twenty-five years TP monitors have been at the core of virtually all business-critical IT facilities. The benefits that TP monitors bring to distributed computing and the support of client-server applications ensure a continued central role for TP monitor technology.

This white paper represents a collaborative effort between the Standish Group International and the world's leading transaction processing system vendors: IBM Corporation, NCR Corporation, Tandem Computers Incorporated, Transarc Corporation, UNIX System Laboratories Incorporated and Digital Equipment Corporation.

A Standish Group White Paper

Client-Server Goes Business Critical

BUSINESS CHALLENGES DRIVE IT TRENDS

IT is evolving in concert with dramatic organizational change. To assess key forces at work, The Standish Group International researched the motivations and goals of leading organizational players — corporate CEOs and CFOs. In personal interviews with over 300 of these executives in major US companies, The Standish Group asked each one how their organization must change the way it "does business" to effectively compete in the 1990s. The concerns of these executives directly relate to the way IT must evolve to support organizational needs:

CEOs feel that their organizations must:

- recognize and adapt more quickly to business environment changes
- make more timely and effective decisions
- remove barriers across, and improve communications among internal organizations.

CFOs feel their organizations must:

- "flatten" and become less hierarchical
- migrate decision-making authority to lower levels of the organization
- streamline the execution of business processes.

The responses contain clear messages concerning the nature of organizational change in progress:

- business units will need to model their business processes to increase responsiveness, communication and maximize access to decision-supporting information
- decision-making responsibility is moving down the hierarchy to flatter, more autonomous business units
- organizations are becoming less hierarchical and more distributed.

The role of the IT executive is to support these organizational trends. From a technology standpoint this means providing a computing infrastructure that supports:

- flexible, business modeling for defining functions, policies, and procedures
- maximum choice of tools and equipment for im-

plementing the business functions
- a reliable, responsive environment for running the business.

Client-server technology holds the key to fulfilling the IT executive's task. Distributed processing maps well to the increasingly distributed nature of the organization. Processing power and tools to harness it are available to the individual, workgroup, department, and on up through the enterprise. Increased standardization at key levels of both hardware and software "platforms" brings leverage, and therefore, competition to the acquisition process.

To make it all work, though, there has to be a unifying architectural framework — an architectural linchpin. The leading candidate for this linchpin, especially for business-critical applications, is the TP monitor.

TP Monitors: Twenty-five Years and Growing

Atlanta Power & Light threw the switch on online transaction processing over twenty-five years ago. Their goal was to augment simple batch and time

sharing operating systems by creating an on-line environment supporting concurrent access to shared application services and information resources. This move to on-line processing was a large step forward for business-critical applications. For example, the common and essential order entry transaction benefited greatly. An on-line order taker knows immediately if the request can be filled from inventory, or if specific items are out of stock. This information can be conveyed to the customer at order taking time. If the transaction is successful, inventory is also immediately updated to reflect the new business state. With earlier batch transaction systems, the transaction status would not have been known until the next batch of orders was processed. That often meant the next business day.

The leading candidate for this architectural linchpin, especially for business-critical applications, is the TP monitor.

On-line transaction processing found immediate and widespread application in many horizontal and vertical industry-specific business functions. It was successfully used to implement many business-critical applications where immediate access to current information matched the need for reliable updating. Well known applications such as airline and hotel travel reservations, electronic funds transfer, securities trading, and manufacturing resource planning and control were all early examples of successful transaction processing systems.

Information processing and communication technology advances are compressing time — the time to make critical decisions, to respond to customers, and adapt to changing business conditions. As a result, in addition to traditional TP applications, more and more business functions are being supported by on-line technology. The Standish Group now estimates that 26% of all non-desktop processing resources are consumed by transaction processing applications, and this percentage is growing rapidly. There is an explosion in the raw number of transactions being generated as information technology reaches farther into everyday business and personal life.

On the business side, global enterprises need to integrate local and distributed IT resources. The updating and synchronization of these resources depends on transaction technology. Interbusiness interactions are increasingly being automated with transaction-based messaging technologies such as EDI, and reliable queue systems. Customers now demand immediate responses to requests and inquiries — the information must be on-line and up-to-date. On the personal side, it is now common to drive into a gas station, fill up, pay with a credit or debit card, and drive off without ever seeing an attendant. And, of course, we all know what ATM cards have done for personal banking transactions.

Transaction processing technology — specifically, TP monitors — makes these business-critical applications possible. They are the linchpin for on-line processing, providing:

- the execution environment for highly-available business services and guaranteed information resource integrity
- the active administration and control environment for dynamic performance and throughput tuning
- the development environment for implementing critical business functions.

To see how TP monitors extend these benefits to client-server environments — enabling business-critical client-server — a close examination of different approaches is required.

APPROACHES TO CLIENT-SERVER

Competing approaches to client-server application development are differentiated by how the application is partitioned into logical components, and how the components are distributed among network computers. Business-critical applications are typically composed of three distinct logical building blocks or components:

- presentation components for display, keyboard/device handling and data validation
- data access components for retrieving and updating stored information
- application components implementing critical business logic, policies and procedures, i.e., the business function.

A single application will generally have one presentation block, but possibly several modular application components, and several data components (e.g., files, databases). Conceptually, client-server technology employs these same components, but it also presents several alternatives in distributing the components, and therefore demands close consideration of just how the components are allocated to computers best suited to each task. A framework, or consistent approach for the distribution of the components, constitutes a client-server architecture. "Architecture" determines the amount of flexibility and control an organization has with the implemen-

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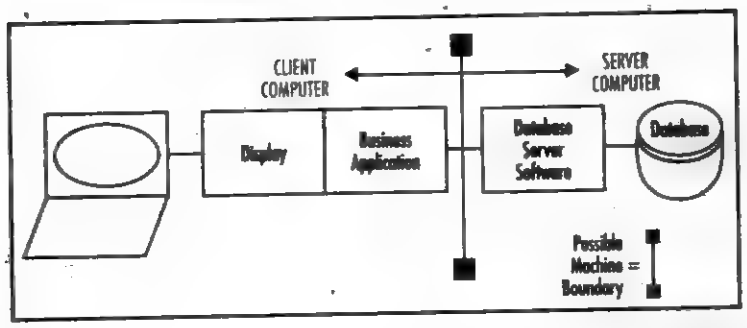
THE REMOTE DATA ACCESS MODEL



Source: The Standish Group International

In the remote data access model of client-server computing, a large amount of data and messages is sent between the database and the client platform.

tation of its applications, as well as how they are built and used. There are three main approaches to mapping the presentation, data, and application components in a client-server architecture. These can be referred to as the remote data access (RDA) model, the database server model, and the application server model. These models are described briefly below.

Remote Data Access Model

In the remote data access model, the presentation and application code executes in each client platform. The client platform process presents data, and manages keyboard and device input. As the application component, it also executes the business logic. Data is retrieved and updated through SQL statements shipped over the network to remote backend database servers, hence the term, RDA. Operationally, the defining characteristic of this model is the large amount of data and messages sent between the database and the client platform.

Database Server Model

In the database server model, the client process is limited to presentation component functions, display, keyboard/device management and data validation. The application component is defined, managed and executed in the form of database stored procedures. The database also assumes the chief data component responsibilities in this model.

Application Server Model

In the application server model, the client process presents data and manages keyboard and device input as usual. The application logic, in this case, is defined and processed remotely by a group of dedicated application servers. The application servers contain the application components and provide program-to-program calls to other application components in the same or other servers. The application components, in turn, generally provide access to database services via standard SQL calls, although other data resources, e.g., indexed files and queues, are also common. The integration of the application servers is supported by an active application management environment, a TP monitor. It is also important to note that the dedicated application servers may reside in the same physical platform as the database or on other machines. They are logically distinct in that the application server's programs/processes are not executed or managed by the database engine but are under the control of a TP monitor.

There are, of course, further gradations, mixing and overlaps among the models. For example, application components in servers can call database stored procedures, or a "presentation/application component" can control presentation and some application flow-control. These hybrid configurations do not fundamentally alter the basic architectural issues.

COMPARING THE CLIENT-SERVER MODELS

Some organizations are taking an ad hoc approach in developing client-server applications. Some implementations use RDA, some the database server, and some the application server model. Invariably, new requirements arise that require integration of existing applications. If there is a proliferation of disparate point solutions it will become a problem in the long run. IT executives concerned with long-term directions need to look toward a unifying client-server architecture. This involves the choice of a model that will predominate in the organization and shape the business-critical application environment.

A comparison of the three models points strongly toward the application server model as the preferred architectural solution. The strengths of this approach are apparent when compared with the alternatives. They are also consistent with the IT executive's goals: to deploy a client-server infrastructure supporting:

- rich, flexible business modeling
- maximum choice of development tools and plat-

forms for each of the client-server application components: presentation, data and application logic
- efficient utilization of valuable IT resources.

Remote Data Access Model

The chief strength of the RDA model is the ease of desktop application development. There is a large selection of easy-to-use tools, most of which can access multiple, remote network databases. The emergence of de facto standard APIs such as ODBC and the maturing SQL API and protocol standards are smoothing the way here. Most development tools support a wide selection of target client platforms, i.e., desktop GUIs and operating systems, from a common source code base for increased portability. An additional merit is the unified, non-distributed application logic appropriate for modeling some simple, local or workgroup-class applications. Simplicity is desirable where simplicity is useful.

As a unifying client-server architecture, though, the RDA model has several limitations. Issues with both run-time execution and administration have precluded its large-scale adoption. At run-time, this approach is restricted by its network-intensive nature. Processing individual SQL statements loads the network with messages to and from the client and backend database. In addition, large amounts of data can be passed over the network for processing by the application logic in client. The network rapidly becomes a bottleneck as the number of clients increases. Administratively, the model also has a severe downside. Because application logic is replicated on each client, any application change has to be distributed simultaneously to each client. Even if this were desirable, tools to support this type of administrative software updating are not to be found. When clients are restricted to presentation functions, internal application logic and database schema changes may not affect the application presentation. The client platform code can remain as is. Changes can be restricted to the database instances and/or a manageable number of application server instances.

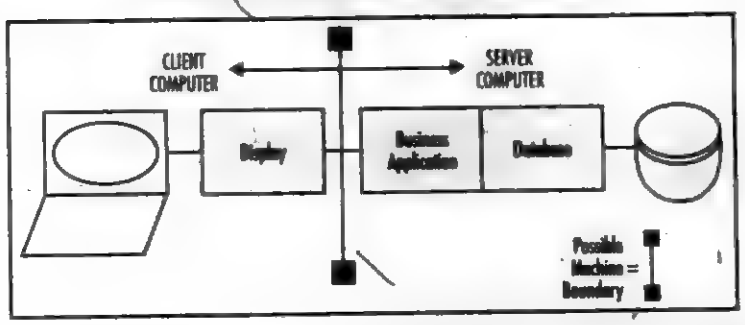
Database Server Model

Modern RDBMS products excel at modeling data. For example, database triggers are an excellent tool for enforcing data integrity constraints. Confusion ensues, however, when data and business-function modeling are synthesized into one monolithic whole. A conceptually clean separation of data and function promotes modular-procedural and object-oriented modeling techniques. Though stretching into the application modeling domain with stored procedures, the "distinct competency" of the database engines remains with modeling complex data relationships and securing the integrity of the data itself. In short, using a single database architecture to model both the data and business functions of an organization will prove difficult.

As limitations to the RDA client-server model became apparent, database vendors have moved to augment their RDBMS products with application component processing capabilities. The required new feature, stored procedures, extends SQL with procedural language constructs. This enables databases supporting stored procedure processing to define and process a distributed application's components in addition to normal SQL statement processing. While opening a new role for these databases, the use of stored procedures must be viewed cautiously.

Languages to develop stored procedures are immature and currently are proprietary to the databases that implement them. More critically, the language APIs themselves are not as expressive as mature, standard application development languages, such as COBOL, C and BASIC, and therefore not as capable of describing complex business functions. Stored procedure programs do support calls to 3GL and 4GL applications with more expressive semantics but this more or less circumvents, and thus defeats the intent of, stored procedure processing. Such exits are also

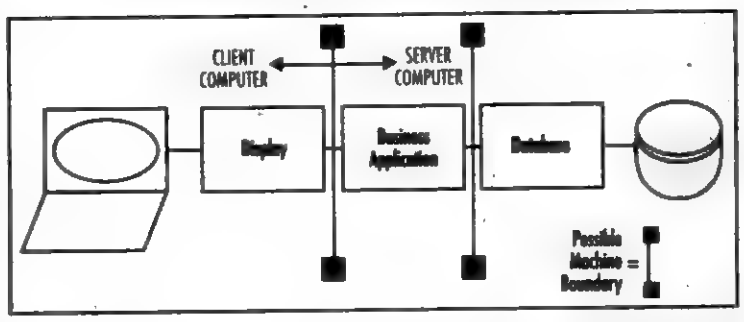
THE DATABASE SERVER MODEL



Source: The Standish Group International

In the database server model of client-server computing, the application component is defined, managed and executed in the form of database-stored procedures.

THE APPLICATION SERVER MODEL



Source: The Standish Group International

In the application server model of client-server computing, application servers contain the application components and provide program-to-program calls to other application components in the same or other servers.

unmanaged as they are beyond the scope of the DBMS.

With stored procedures the key client-server architectural criterion — the ability to model business functions — remains limited. The importance of the business modeling criterion is rising rapidly as organizational decentralization accelerates business function distribution. Discrete business units in an organization will increasingly control the implementation and execution of their own policies and procedures by exporting function calls over the network to others requiring access and integration. In addition to flexible business logic, a wide range of program-to-program communication metaphors will be required. For example, store-and-forward queuing, conversations, asynchronous request/response, remote procedure call (RPC), peer-to-peer and broadcast messaging all represent distinct communication methods. One or several of these methods may be required between application components of a single distributed application. This richness of application communication and modeling techniques is not supported within the stored procedure environment.

Databases are now highly portable. Database selection to a large extent leaves open the choice of target platform and operating system, a key benefit to user organizations. CASE and 4GL tools also target multiple databases and support choice at this level. SQL standardization has also gone a long way toward enabling choice of the database engine itself. This choice is mitigated, though, when application logic is tied to a database-proprietary language and the semantic model it implements. This will remain true until stored procedures mature and standardization become a reality.

Efficient resource utilization is another key issue. In many transaction processing installations, database throughput is the performance scalability bottleneck. When the number of clients increases, database resource requirements explode as the database allocates memory for each client context or state. This is still true, even though many databases have made significant gains in multithreading client communications and moving away from the "process pair" architecture and its attendant context-switching overhead problems. With stored procedures the database takes on the additional processing tasks of application execution. Burdening the database engine with application execution further removes its focus from its principal task — fast data access and efficient management.

Today, virtually all standardized transaction processing benchmark results, e.g., Transaction Processing Performance Council Benchmark A, are executed with a TP monitor managing the application services in front of the database. Essentially, the monitor multiplexes client service requests through a controlled number of application servers. The database "sees" these application servers as a reduced number of database clients and proves more responsive as a result. In some cases, a significant cost savings can also be achieved as fewer database server resources are needed to support a given workload.

In a distributed environment, efficient resource utilization also equates to power — the power to dynamically control the enterprise execution environment and administratively control the objects within it. For example, system architects need to be able to devise "no-single-point-of-failure" systems, to specify application request priorities, balance fluctuating workloads across network processors, and scale and replicate application services on demand. By taking on application processing in distributed environments, databases must move to add these control capabilities as well.

"Distributed database" processing — the distribution of data and stored procedure application processing — offers some effort in this direction, but it remains primitive. In effect, the database must introduce operating system-like capabilities to manage the stored procedure applications under its control. In doing so, database vendors begin to reinvent pro-

prietary operating systems, just the opposite of industry trends. IT executives must ask key questions when considering the execution and administrative control offered by a database server architecture:

- can requests be prioritized
- how does failover occur locally and remotely
- is dynamic load balancing within and across distributed platforms supported
- can applications be updated "on-line" or does the database need to be brought down
- how are stored procedure application testing and debugging achieved.

Typically, these key features are fully supported in TP monitor environments; it is their core competency. The databases have yet to provide this function and are just now beginning to proceed in this direction. Historically, for a given product, several years elapse between introduction of these facilities and their maturity.

Overall, RDBMS products have advanced tremendously in their abilities to model, ship, and protect the integrity of critical corporate data assets. Newfound abilities to also model and manage the execution of business applications, however, must be examined in light of the move to enterprise client-server applications and environments. The required capabilities are not there, and neither is an infrastructure capable of supporting business-critical applications.

Application Server Model

The third model for consideration is the TP monitor-based application server architecture. With this model, presentation, application and data client-server application components remain cleanly separated and under the control of tools optimized for each distinct function. Application server environments support a design center approach focused on application and business logic, with close integration of the data

STORED PROCEDURES

In the remote data access (RDA) model, databases act as "pure" database servers processing incoming SQL requests. With stored procedures, instead of issuing SQL statements, client applications invoke functions implemented as stored procedure programs within the database. The client receives application results rather than raw data. A commitment to develop client-server applications with stored procedures, however, or a plan to base an enterprise client-server architecture around them, raises several issues.

Stored procedures are just that — application logic developed with a procedural language — and stored in the database. The procedures can be shared among clients and are not database-function specific. They can express general procedural logic. Stored procedure languages are, however, proprietary in the sense that each database vendor implementing stored procedures has a language unique to its database product. Standardization efforts are proceeding, though no time frames for a standard and/or its implementation are available. More importantly, most stored procedures implementations are interpreted and are much slower than compiled C or COBOL code.

Databases will also need to provide a more robust execution environment for stored procedure processing. In short, they will need to reproduce features supported in current TP monitors for their stored procedure environments:

- priority scheduling for stored procedure processing
- dynamically spawning and/or killing stored-procedure execution to optimize throughput
- implementing access controls lists (ACLs) for stored procedure object security
- expanding the expressive power of the stored procedure languages
- implementing firewalls so that stored procedures do not interfere with other programs
- providing debuggers for problem determination.

If and when these features are introduced the databases will be reproducing an already extant environment for application server processing that is supported by existing transaction processing monitors. It is doubtful they can attain the same level of competency and performance in a reasonable time frame, and it is a moving target. The databases also have their hands full realizing distributed data, very large databases and a host of other issues in the data modeling arena.

Furthermore, this approach will constrain businesses to use a single RDBMS, whereas TP monitors provide the flexibility to easily mix and match data management systems without loss and data integrity.

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COST/BENEFITS OF USING A TP MONITOR

While there are many functional benefits for developing business applications using TP monitor technology, the cost advantages can also be significant. The basic argument is that transaction processing systems make database processing cost-effective for on-line applications. Spending a little money on monitors can save even more money on database and platform/resource fees.

The basic operation of a monitor is to provide application services to multiple clients (possibly ranging from hundreds to thousands). Monitors do this by multiplexing client service requests onto a controlled number of processes supporting the particular services. Clients are bound, serviced, and released using "stateless" servers that minimize overhead. These application servers, in turn, provide access to databases, and, in essence become the clients to the database. Effectively, this maps many real clients — sitting at desktops with terminals and PCs, or at ATMs — through a controlled set of services that get database results and return them out over the network. The database sees only this set of application services as clients. Database operations are such that each "client" supported entails added overhead and system resources (e.g. memory). By multiplexing many service clients onto a much smaller set of database clients, database overhead and system resources are minimized, and responsiveness is improved.

Database vendors currently charge by class of system and by the number of active users. Each time a database holds the state of a "client" it is counted as an active user. For a given transaction throughput required by the overall system, as measured in transactions per second (TPS), fewer database clients are required with a transaction processing monitor than would otherwise be the case. This equates to a lower license fee. If in addition, less memory and other resources are needed on the database, this also lowers the overall system cost.

The following cost analysis is based on a few simple assumptions:

- transactions are real world business transactions, not lightweight requests, such as those in TPC-A or B benchmarks
- the system cost is base price only, and does not include the additional memory or disk requirements
- stated efficiency rates are based on documented benchmarks and actual user experiences.

To be conservative, the service-client to database-client multiplexing ratio is set at 4-to-1. Users may be able to get a much higher ratio. When considering the typical user think time to processing time ratio — ratios of 16-to-1 and higher are reasonable. Potential savings not included are the additional cost of disk, memory, and higher license fees of additional products running on the "larger" systems. Costs not included are those for client code libraries and other supporting software.

Example 1: A 16-user system processing one transaction per second:

Architecture	System	Database	Monitor	Total	Savings
Database-centric	$20,000	$79,000	none	$99,000	
Server-centric	$20,000	$19,000	$7,500	$46,500	$52,500

A 53% savings.

Example 2: A 64-user system processing four transactions per second. In this example, two application servers are used for load balancing and higher availability.

Architecture	System	Database	Monitor	Total	Savings
Database-centric	$70,000	$120,000	none	$190,000	
Server-centric	$20,000	$ 48,000	$ 10,000		
	$20,000	—	$ 3,000	$101,000	$ 89,000

A 47% savings.

Example 3: A 128-user system processing ten transactions per second. In this example, two application servers are used for load balancing and higher availability:

Architecture	System	Database	Monitor	Total	Savings
Database-centric	$98,000	$200,000	none	$298,000	
Server-centric	$41,000	$ 63,000	$12,000		
	$20,000	—	$ 3,000	$139,000	$159,000

A 53% savings.

The monitor price is an average of the current monitors. Prices vary from monitor to monitor. The information contained in these examples is thought by The Standish Group International to be accurate. Prices contained in these examples are based on information gathered from the appropriate vendors. While we believe this information to be reliable, we cannot guarantee its accuracy or its "longevity".

model and other supporting components such as printing and messaging.

TP monitors evolved to augment operating systems with respect to system operation performance and data integrity management for on-line applications. TP monitors are designed to be the "design center" of business-critical application environments. In distributed environments, client-server TP moni-

tors have evolved to perform the same key roles while fully exploiting the benefits of distributed processing resources. They complement mainframe-based transaction systems and facilitate peer-level integration with the huge application base currently under TP monitor control. The specific benefits of the TP monitor-enabled application server model, in the context of the IT executive's goals, are further considered below.

The application server model supports flexible and robust business modeling options. As a design center, application servers encourage modular, reusable procedures as the focal point of the enterprise architecture. Application specification and development are supported in a variety of standard languages (e.g., C, C++, COBOL). A full spectrum of program-to-program communication models is supported — store-and-forward, asynchronous, RPC, conversational — enabling flexible coupling among the application components. The ability to construct complex business applications from modular, well-defined functional components is the forte of this paradigm. And, importantly, the business model, as specified and implemented, is independent of any particular database architecture.

With stored procedures the key client-server architectural criterion — the ability to model business functions — remains limited.

The application server approach maximizes choice. Application server design centers raise the API level to which business functions are written. In effect, it provides plug-in interfaces for supporting components such as heterogeneous client libraries, databases and other resource managers, and other peer-level application systems. Choice is an important consideration here because of the principle of "distinct competencies". Just as integrated PC applications failed because superior function was achieved in individual packages (e.g., spreadsheets, databases, calendars) monolithic application environments will also be found wanting. The application server approach supports maximum flexibility where each component in a distributed system is developed with the product that has the distinct competency for that function. For example, GUI-builders, database engines, 4GLs, and TP monitors each have distinct competencies, and users should have maximum flexibility in choosing among instances in each category. And, of course, there are the obvious cost/benefits of ensuring maximum competition among the technology vendors. The "Tee Pee of Independence" figure illustrates the design center choices enabled in the application server model (See chart next page).

TP monitors optimize the performance and availability of on-line applications. In distributed hardware environments they perform the same functions, and are thus just as critical for operational and administrative control. For example, TP monitors support network-scalability and dynamic load balancing of requests. It is straightforward to add heterogeneous application server platforms as required, and to balance fluctuating loads across these servers. The monitors integrate high-availability attributes into this mix by sensing failed servers, automatically rerouting requests to other available server instances, and transparently working toward restarting and recovering the failed resources.

Support for request prioritization can work to advantage in two ways, ensuring predictable response times for critical, high-priority requests, and "throttling" low priority requests, or requests that can potentially swamp the system such as some dynamic SQL applications. TP monitors also serve to optimize database performance. By supporting a distinct application service layer independent of the database, the database is left to focus on data shipping, integrity, and management. The net effect of all of the above is a powerful system for controlling the execution of business-critical applications.

Finally, the administration of the business function or application server layer needs to be considered. The ability to support application versions and to dynamically "bring up" and "bring down" specific applications is critical. The use of server classes to group application component instances is central to the effective management of distributed applications and a fundamental theme of distributed computing environment architectures. In addition, by separating application logic from both the client presentation and database components, presentation components are shielded from application logic changes, and vice versa, and likewise, database operation disruptions can be minimized.

Organizations need an architectural framework along which to develop their new client-server computing infrastructures. The application server approach enabled in client-server transaction processing environments provides just such a framework. The addition of a monitor to a growing distributed

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computing environment will support an organization's need to support rational client-server application development, focusing on business logic and supporting its most efficient execution.

Transaction Monitor Strengths

A summary of the strengths of TP monitors as application framework and control systems is presented in this section. IT executives and their organizations need to consider the growing role of TP monitors as they continue to invest in distributed computing and client-server application technology. The relationship of TP monitors to business-critical processing in distributed environments is a key theme examined below.

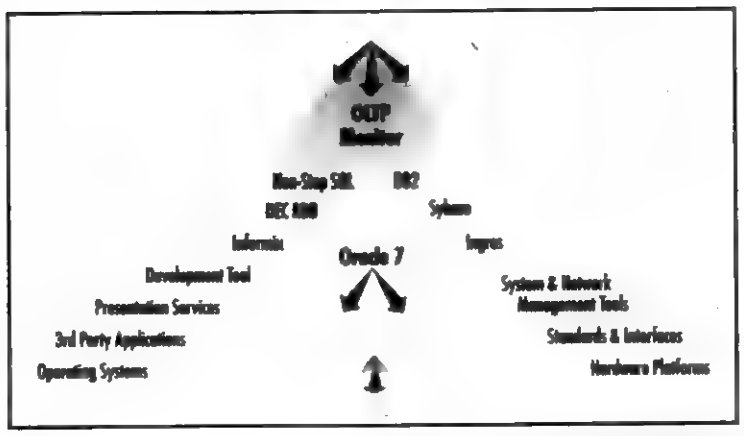
TP monitors are software systems — commonly referred to as middleware — that provide the environment for running, developing, and managing transaction applications. Transaction applications execute under the control of the TP monitor and perform the "business function" computations and database updates. TP monitors are highly active systems that include services for terminal and forms management, data management, network access, authorization and security, and restart and recovery for the applications and resources under their control.

Allocating and controlling resources is a key function of TP monitors. This aspect of monitor functionality is even more critical in the distributed computing arena. As computing resources are deployed over networks, TP monitors can distribute the transaction computations across these resources to optimize the overall system performance. For example, if one machine is running at capacity, work can be offloaded to another machine at the direction of a TP monitor.

Application Design Center: The business model of an organization is reflected in the software applications it develops to support day-to-day work. Flexible software design enables an organization to write applications supporting the way it wants to run its business — not the way the "systems" allow. TP monitors promote a function-centric approach to business application modeling. Complex business functions can be easily partitioned into well-defined application components. The components can then be integrated using a complete set of communication and transaction semantics design options supported by the TP monitor. For example, contention for data resources required by a transaction can be controlled by the choice of transaction models, e.g., conversational, pseudo-conversational, distributed and nested. Each model provides a different mechanism for ensuring the integrity of transactions with varying requirements for locking shared resources. Overall, the flexible, function-centric approach to critical application development positions the TP monitor as the application design center for an organization. It also encourages emerging object-oriented techniques for application modeling and design.

Application Development Environment: By designing a transaction application using "clean layers" and the standard interfaces supported by TP monitors, developers can snap-in and snap-out many different system components. Choice among components may include databases, server platforms, client platforms, communication systems, system management software, presentation services and development tools. With TP monitors, business applications are developed using a variety of standard 3GL and 4GL tools. Increasingly, tool vendors directly support transaction sys-

Tee Pee of Independence



Source: The Standish Group International

Initially, users were locked into platforms — processor and operating system — and the products and tools supported by one product family. With the advent of portable databases, like ORACLE, users had a broader choice of platforms and operating systems on which to run the database and associated tools: a wider Tee Pee. Now, users developing client-server applications to TP monitor APIs can have the broadest possible choice including choice of heterogeneous database solutions and development tools.

ISVs NEED TP MONITORS TOO!

ISVs gain significant benefits by writing their applications to transaction processing monitor APIs. First, the monitors support an application development paradigm independent of any database or file system. By writing to a monitor API the ISV can easily support multiple databases and not have to "drag" in a database system not supported at the prospect site. It could be countered that the monitor system must be dragged in, but the benefits outweigh the costs in most cases. For example, monitor systems are generally much less expensive than database systems for a given workload and number of client seats. If a product has to be dragged in, it is less costly if it is the monitor. In addition, monitors improve the performance of databases, and thus can save significant costs in the accompanying database software and platform. (See Cost/Benefit section). Finally, the monitors provide a rich environment for controlling the execution and availability of the on-line applications. By leveraging this functionality, the ISV can avoid having to design it into the product, simplifying designs and reducing development time.

tem APIs, and are working toward rendering the monitors transparent for development purposes. A small, common set of transaction system primitives is emerging via standardization efforts that will make these tools portable across different monitor products.

Integrity: TP monitors are designed with absolute data resource integrity in mind. In the emerging client-server world, critical data resources are likely to be widely distributed and be under the control of heterogeneous systems. Applications can be designed to manage heterogeneous database updates with strict "two-phase commit" protocols ensuring synchronous consistency of the data image, or with more relaxed asynchronous and store-and-forward techniques. In either case, TP monitors work with heterogeneous databases and other resource managers to provide the guaranteed data integrity required by transactions.

TP monitors work with heterogeneous databases and other resource managers to provide the guaranteed data integrity.

Availability: TP monitors are always "aware" of the state of the resources under their control — and can use this information to provide maximum availability for critical applications. For example, system failures always entail "lost work" — lost work in progress and lost work due to processing stoppage. Distributed systems promise to make resource failures more complex in their effects. Multiple discrete nodes in a distributed system translate into more potential points-of-failure, but also greater potential to redistribute work throughout the remaining nodes while resource recovery is initiated. TP monitors excel at this type of distributed system failure recovery. Typically, TP monitors can restart application processes and provide "failover" to processes on other nodes in the event of hardware or communication network failures.

Load Balancing: TP monitors provide both static and dynamic load balancing techniques. Transaction application server processes can be automatically "brought up" or "shut down" depending on predefined criteria and the dynamic system state. For example, to optimize throughput and response time for a specific critical application service the TP monitor can "replicate" the server processes on the same or different nodes, giving it more available processing power to service incoming requests. In the static case, as part of a manufacturing shop floor control system, for example, there may be the need to automatically start "time & attendance" application services from 8:00 a.m. to 9:00 a.m., then shut them down for processor allocation to "job ticket" application services. TP monitors support wide flexibility with these types of static and dynamic load balancing.

Queue Management Systems: Reliable message queuing will be a key application development tool in the 1990s. Increasingly, business process automation is moving document images electronically. The desktop metaphor is that of "in-baskets" and "out-baskets". The baskets are logically connected by a business process defining the workflow from task to task. Reliable queues are resource managers, similar to data-

bases, that implement these queuing abstractions.

TP monitors have introduced feature-rich queuing systems as part of their design center tool box. Support for queues enables these systems to support long-lived, multi-step, workflow-style business processes with all the availability, reliability and integrity features of TP. The queue management systems themselves allow for multiple queuing/dequeuing algorithms, trigger events, thresholds, or dequeue on demand.

Scalability: Scalability is central to networked distributed systems. What is required, though, is a system that can utilize — to maximum advantage — all the heterogeneous resources that might be put on a network. TP monitors provide this functionality and offer many scalability options. Vertical scaling is supported in the same sense as always — migrating (or upgrading) the system to a bigger, more powerful platform of the same or different architecture. This might also include adding incremental processors to a symmetric multiprocessing server. Horizontal scaling is more in the distributed system vein and provides for incrementing a group of network-resident processors with additional systems. The aggregate processor group may be homogeneous or a collection of heterogeneous processors (i.e., different microprocessor engines, different operating systems).

In essence, TP monitors support "matrix" scalability. Matrix scalability supports the addition of heterogeneous resources — any place in the configuration — without altering the existing application architecture. Generally, a complex configuration mix can be supported, providing wide-ranging choices for scaling the on-line network system. Issues of data representation (e.g., different microprocessor representations of floating point numbers, etc.) are resolved trans-

TP MONITORS DELIVER ON PROMISE OF OBJECT TECHNOLOGY

Object technology holds the promise of many benefits — cost savings due to increased programmer productivity, modeling real-world objects and business functions through "class" structures, polymorphism and inheritance, and increased code reliability and reusability. TP monitors currently support this object-view of business processing. In addition, there will be increased cross-pollination between the transaction technology now offered and the systems being defined by object technology architects. The intersection of transaction system and object technology is evident in many areas:

Object Modeling: Objects are designed as modular, discrete components, each implementing some functions, and communicating with other objects. TP monitors support this function-centric approach to modeling and support the assembly of object-like application components into more complex business objects and processes.

Object Message Passing: Techniques to "invoke" actions on objects are being standardized in "object request broker" architectures — particularly the work being done by the Object Management Group (OMG). TP monitors support function invocation with call and request models for passing service request messages. Transaction processing techniques for passing context and coordination messages among functions participating in requests (i.e., transactions) are also being assimilated into object request architectures. Common methods of function "invocation" are expected to emerge (e.g., shared name services, transaction semantics, communication protocols).

Object Encapsulation, Inheritance, and Polymorphism: Object class hierarchies for TP monitor APIs are emerging. C++ language bindings for these APIs will allow programmers to more explicitly model discrete business functions, and their interrelationships, as objects. With this comes the traditional object orientation development benefits of encapsulation, inheritance, and polymorphism: supporting a powerful, expressive system for business modeling, plus code quality and reusability.

Object Brokers and Monitor Systems: TP monitors map client requests to network-based service providers in a manner analogous to object request brokers routing messages to network-based objects. TP monitors also provide a dynamic execution environment in which the services are prioritized, scaled and made highly available. It is likely that object request brokers will evolve over time to include these functions and/or that TP monitors will evolve to become the real business-critical object request brokers by engulfing object architecture interfaces.

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parently within the TP monitor system protocols.

Cost: By supporting choice at all component levels of the system, TP monitors make the acquisition process more competitive — ultimately saving organizations money. The Standish Group reports that total system cost savings of greater than 30% can be achieved (depending on system scale) over a database server-only approach to transaction processing (See Cost/Benefits of Using TP Monitor). In addition, The Standish Group research has determined that significant development time savings — up to 40% — can also be achieved, adding to the cost savings argument.

TP monitors are designed to be the focal point of on-line application development, execution, and administration. No other system software product offers the same breadth of services in support of critical applications. TP monitors support data integrity, high availability operations, performance tuning and load balancing, heterogeneous databases and resource managers such as queue systems, wide-ranging scalability, and cost savings achieved through efficient resource utilization.

TP monitors are designed to be the focal point of on-line application development, execution, and administration.

The principal TP monitors marketed today include Digital's ACMS, IBM's CICS Family, NCR's TOP END, Tandem's PATHWAY, Transarc's ENCINA and USL's TUXEDO System.

CONCLUSIONS

Among the alternatives for a strategic client-server architecture, a TP monitor-based application server model stands out as the preferred approach. With the application server model, flexible business modeling, wide ranging technology choice (within a coherent architectural framework), and efficient computing resource utilization are each supported to the fullest extent. The architectural linchpin of the application server model is the modern, client-server TP monitor.

The 1990s has already proved to be a period of change for organizations and the enterprise IT systems that support them. As global economic conditions drive business "restructuring" and "re-engineering", IT systems are evolving to support new requirements. Key among the new requirements are the need to support flexible, powerful business modeling, to maximize technology component choice, and to control large-scale, distributed application environments. In parallel, client-server application design is emerging as the paradigm best suited to support these new business-critical needs. The challenge of IT executives is to rationally develop and deploy an IT architecture supporting business-critical client-server applications.

A database server design center approach to enterprise client-server is seen to offer limited support and promote architectural dependencies and "lock-in". Though a few RDBMS products support limited business logic development and execution capabilities via stored procedures, the technology is immature, difficult to use, and proprietary. Organizations considering enterprise business modeling with this technology need to consider its limited expressive range for complex application design and the predisposition to intermix function and data modeling. A further limitation of RDBMS products supporting stored procedures is the lack of a mature execution environment for efficient resource utilization. Distributed database technology is beginning to reproduce elements of the execution environments common to TP monitors, but it is not their core competency, and they lag considerably in needed functionality. While the databases slowly move to reproduce this functionality, it can be obtained today in any one of the existing TP monitors supporting client-server applications.

A client-server architecture with an application server design center is the optimal approach. This model is enabled by client-server TP monitors with proven track records and distinct competency in managing application environments. TP monitors have brought many benefits to the distributed computing domain, including those long-established in the centralized world, and new benefits as well. Of particular note are those benefits that support the IT executive's long-term goals for client-server computing:

- an application-centered approach to business modeling
- a high-level API maximizing broad choice for all the system components
- the most efficient use of client-server system resources.

IT executives have a clear choice for the evolution of their organization's IT architecture. The benefits of modern, client-server TP monitors uniquely position them as the preferred architectural linchpin for enterprise computing in the 1990s. ■

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In search of mainframe maintenance justice

Sonney M. Taragin

It's time to blow the lid off exorbitant mainframe software maintenance costs. I get sticker shock every time I see a maintenance invoice from one of my many mainframe vendors.

Mainframe software vendors should take a cue from their PC counterparts and "get real" about their maintenance charges. PC vendors almost always charge separately (if at all) for software support and software upgrades, which gives customers the option of purchasing upgrades when and if they want them. In addition, PC support costs and policies vary widely from company to company, which offers the customer some choice.

By contrast, mainframe software vendors bundle software support charges with upgrade costs and universally charge their customers a fixed yearly "percentage of base price" — most often 15% to 30% — for any amount of support. These costs are to be paid whether you get or install an upgrade and regardless of whether you use the vendor's support mechanism at all. Also, if you choose not to avail yourself of the company's maintenance option for some years, "company policy" will prevent you from obtaining future upgrades or support unless you pay at least two years' worth of back maintenance charges.

Because these charges are always based on a percentage of the product's so-called list price, vendors have continued to hike official prices by large increments (this year, by as much as 25%) while increasing purchase discounts. This keeps sale prices stable and allows the vendors to maintain revenue through inflated maintenance charges.

It is outrageous to have to pay $30,000 for some 10 hours of support a year (and *maybe* a maintenance upgrade with some marginally useful additional features). The only reason people *do* pay is because the alternative is to do without vendor assistance...even if the problem is caused by bugs in the software.

Many major software vendors (including IBM) are investigating or starting to implement use-based software charges. Although these policies are clearly a step in the right direction, it is unclear whether they will apply to software maintenance/support or just to purchase/lease options. Additionally, there is no indication that these vendors are addressing the need to separate product support costs from product upgrade costs or other issues related to fair pricing.

As customers, we must demand change in these policies from our software vendors. Our budgets can no longer stretch to cover outrageous and unsubstantiated software maintenance and support costs. It is very hard for me to approve a 15% increase to an already outrageous maintenance charge for a product that hasn't changed in a year, particularly when I can only approve salary increases below 5%.

At a minimum, I suggest that vendors begin to take several steps:

- Separate product support costs from product upgrade costs.
- Offer by-the-drink or reduced service, lower cost maintenance options.
- Stop tying maintenance costs to product costs.
- Provide customers who have discontinued yearly maintenance support reasonable options for obtaining support in the future.

Taragin is manager, technical support, at the Johns Hopkins Hospital in Baltimore.

CIOs: Time to move on or move out

MISPERCEPTIONS *by* Max D. Hopper

Three years ago, in an article for the *Harvard Business Review*, I predicted that as technology reshaped the nature of work and redefined organizational structures, technology itself would recede into the strategic background. I felt that, eventually, our once-exotic information systems would be regarded as just another mundane utility of business — more essential than ever for competitive parity but hardly a source of decisive, sustainable competitive advantage.

I foresaw this transition having major implications for the CIO, at least in the implementor/operator role we traditionally ascribe to that position. In essence, once the IS "plumbing" was installed throughout the corporate landscape, those of us who brought the utility into being might find we succeeded in outliving our own function.

While these information infrastructures are not yet complete — and never will be — network connectivity, data center consolidations and the proliferation of distributed processing approaches mean that the IS frontier is becoming settled. So, too, is the role of broadly integrating internal systems and even extending them to customers and suppliers. Central processing, premise and network management and other routine operations are increasingly relegated to outsourcing specialists.

In my prediction, there was an implied assumption that other corporate disciplines would recognize the critical role of information in each of their functions and integrate it more fully with other components of their specialties. While this may yet occur, there remains a vacuum that is being filled by CIOs at several companies, as they lead information-focused efforts in everything from re-engineering and corporate restructuring to the creation of external business opportunities. At some companies, it appears that the CIO is being used by the CEO as a corporate catalyst or change agent for the business as a whole.

If this is to be the future role of the CIO, how do we prepare ourselves for it? As a base, this new role implies a fundamental understanding of how technology can be strategically integrated with product development, marketing, distribution and other business processes to best advance corporate objectives. Technical savvy must be oriented at a higher level — focused on system topology and the functional benefits of technology rather than the nitty-gritty operational features. The new role also demands an astute grasp of a firm's business, its industry and the essential nature of contemporary enterprise.

Indeed, this role would likely be fulfilled by the CEO, if that executive possessed a firm footing in both the business and technology disciplines. Failing such dual enterprise at the top, "CIO" would be as appropriate a label as any for a supporting role with these broad talents.

From this strategic perspective, the CIO must take the initiative in conceptualizing, promoting and implementing solutions that extend the corporate vision to new horizons. This is the most promising future role for the CIO. The question is, will CIOs step forward to accept and execute it?

Those who don't must be prepared to accept drastically reduced positions as operators and chief purchasing agents for the information services utility.

Hopper is chairman of AMR Corp.'s Sabre Technology Group.

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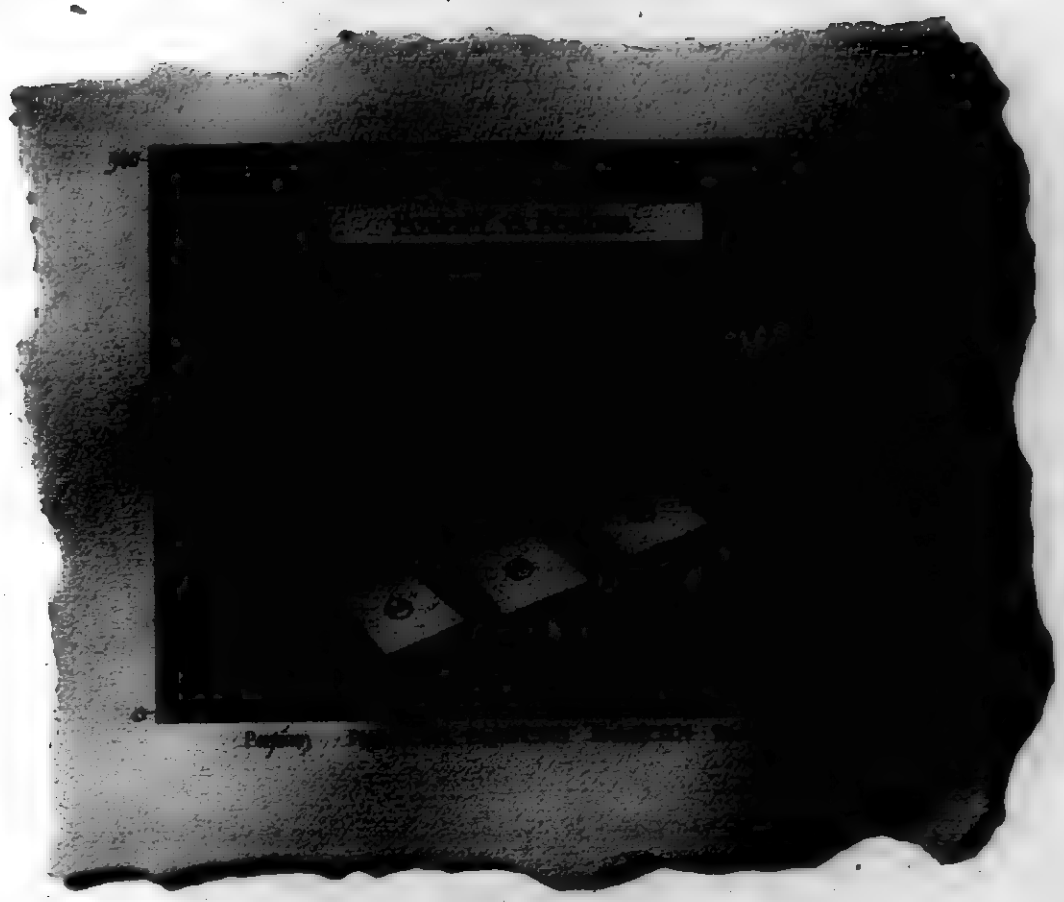

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Charles Babcock

PC prices can rise

Many analysts believe it is a law of economics that PC prices decline, and recent experience seems to indicate they decline rapidly. It's only a matter of time, some would say, before PCs with the power of a Cray 1 are sold like Rolex watches on the streets of New York.

It ain't necessarily so.

We have just lived through a period in which a number of unique conditions converged. The steep falloff in prices for 80386- and 1486-based PCs resulted, in large part, from a rare and highly competitive situation for Intel that may or may not be repeated with Pentium.

Major PC suppliers underwent a shakeout that saw them slashing prices or being threatened with extinction. Users developed an appetite for implementing Windows, fueling the sale of 40 million PCs worldwide in 1992.

It's unusual for a period of high user demand to coincide with sharply falling prices on the enabling technology, and Intel, if we can believe its top attorney, would like to see that it doesn't happen again soon.

Intel has often cited a 5% drop in prices per quarter as proof of its competitive price/performance; such was certainly the case with the 80286, which was never in short supply. Actual 386 price declines were believed to have been slower when it was the hottest chip on the block between 1986 and 1991, with no second source.

In June 1991, with the blessing of an arbitrator's ruling, Advanced Micro Devices (AMD) released its own 386 chip. Because it ran cooler, it could be produced on a plastic mounting, with AMD knocking $10 off the price for buyers who bought it that way. Until AMD entered the lists, demand for 386s had outstripped supply. As AMD ramped up production, it began to gain market share, and a funny thing happened to prices.

In the first quarter of 1992, an Intel 386SX with a 20-MHz clock speed was listed at $82. A year later, it was listed at $52, a 37% decline. During the same period, the AMD 386SX with a 25-MHz clock speed was listed first at $76 and later at $34, a 55% decline, according to the Jan. 25 "Michael Slater Microprocessor Report."

"The dramatic cuts in prices came after AMD came into the market," senior editor Linley Gwennap says.

Actual price drops for volume customers were probably greater than the list prices indicate.

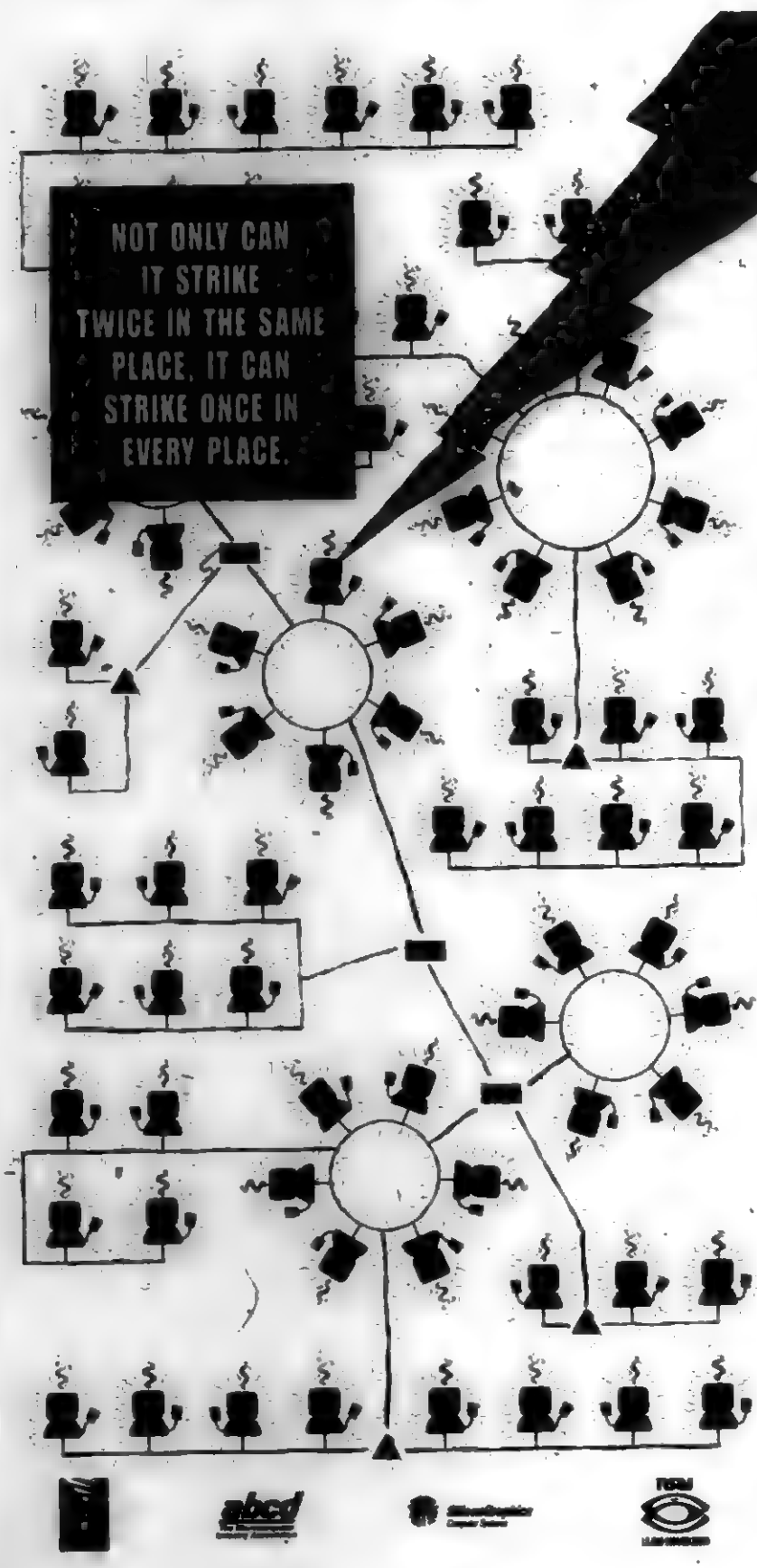
When Intel called a press conference June 5 to announce it would seek $1 billion in damages from AMD, which now supplies 70% of the 386 market, it cited a 40% drop in 386 prices per quarter since AMD appeared on the scene. Intel general counsel Tom Dunlap said the company could have made an additional $1 billion on its 386 chips without AMD's intrusion, and that amount was the basis for the damage claim.

AMD's gains on the 386 front prompted an Intel response that also contributed to lower prices. With its 486 chips coming off the fabrication line, Intel dropped prices drastically on the models that most directly competed with 386s.

We are unlikely to see a commensurate decline in the Pentium price (now somewhere around $950 a chip) any time soon. AMD has announced plans to produce a Pentium-like CPU, but it is unlikely to have anything available for less than two years. There is already a chill in the air as a result of the short supplies and high price of Pentium.

Those with a stake in equipping their staffs with Pentium PCs should pray for renewed competition. Nowhere is it ordained in new economic laws that PC prices will perpetually drop. More likely, price drops will slow or disappear altogether in response to some very old economic impulses.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.



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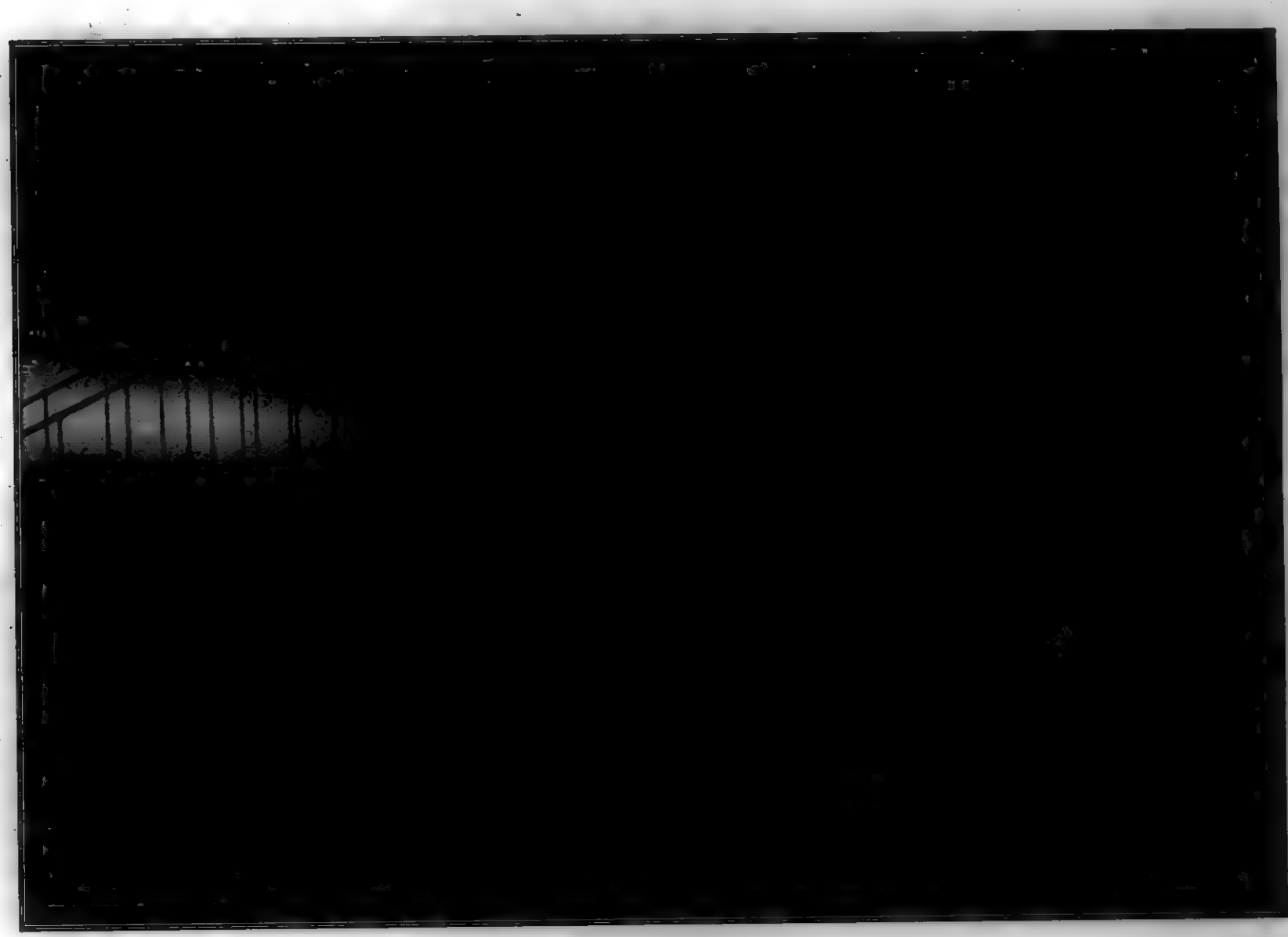

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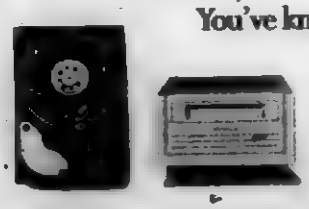

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IBM changes PS/2 positioning

By Michael Fitzgerald
SOMERS, N.Y.

Like the spinster older sister at a debutante's ball, the Personal System/2 seems practically forgotten since the IBM PC Co. was formed last September. New product lines such as the PS/ValuePoint and ThinkPad have grabbed most of the attention once focused on the PS/2, in part because they brought back former IBM customers.

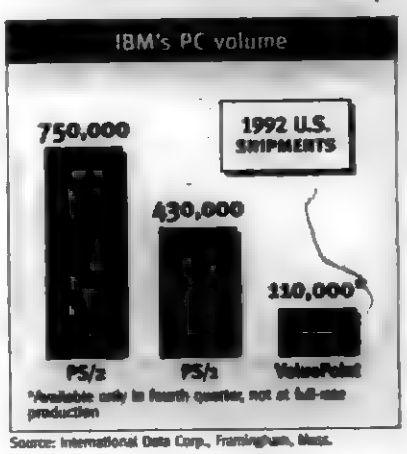
The IBM PC Co. positioned the 6-year-old PS/2 line as its "premier" product line when the company articulated its brand strategies last fall. The premier tag suggested that the PS/2 would remain IBM's flagship PC — receiver of the newest technologies first and the most aggressive marketing. Instead, the PC Co. seemed to ignore the PS/2 as the ValuePoint became a market juggernaut.

IBM has refreshed ValuePoint three times in the last nine months, while the PS/2 has undergone no significant revisions since a major announcement in September.

"There is a lot of confusion about the PS/2s," acknowledged David Andonian, premium system brand marketing manager at the PC Co. Andonian said this stemmed in part from the PC Co.'s shifting its PS/2 message after finding that buyers were less interested in cutting-edge technology than it thought.

Analysts said one reason the PS/2 may appear to have been neglected is the number of brands the PC Co. offers: four in the U.S., with a fifth, Ambra, expected soon.

"IBM has more strategies than most PC companies do, and if you've made the decision to buy IBM, you should start from that point and use the same process you'd use in comparing one vendor's products to another's," said John O. Dunkle, president of market researcher WorkGroup Technologies, Inc. in Hampton, N.H.



Source: International Data Corp., Framingham, Mass.

Still, Andonian strongly denied that ValuePoint was more important to IBM than the PS/2 line, and he disputed recent reports that ValuePoint was outselling the PS/2.

Analysts said this is still correct for now.

"ValuePoint looks to be growing much faster than the PS/2 this year, but PS/2 still represents the biggest piece of the pie," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass.

Not dead yet

"Those who are trying to declare the PS/2 dead, or even passed by ValuePoint in the market, are wrong," Andonian said. He said the PS/2 line was still slightly outselling the ValuePoint line, though analysts suggested the PS/2 would not be doing nearly so well were it not for longer term contracts signed by IBM customers.

PC Co. officials argued that these longer term contracts represent exactly the PS/2 market.

"Our big accounts want stability in rolling out projects, many of which are three to five years long," said James G. Turner, general manager of premium systems at the PC Co. "Our goal is to do things in a way that is not disruptive to our major customers' projects. These customers are not focused on technology, and none of them wants a complete overhaul of the product line."

Turner outlined a PS/2 strategy that essentially positions the line as a safe haven for major corporate buyers who want to avoid the hyperactive product development pace adopted by the market, including ValuePoint.

IBM will focus now on selling Traditional and Enhanced PS/2s.

The Traditional PS/2 buyer may have an investment in PS/2s down to the level of cabinetry tailored to its footprint. These buyers will be assured that future PS/2s will keep the same footprint and the Micro Channel Architecture, and the product line will be gradually enhanced, Turner said.

He cited on-planar/board networking, such as Token Ring or Ethernet, as something IBM would probably add to the PS/2 line in the near future. He said the company would preload software as well.

For customers who strip out the operating systems IBM now ships preinstalled, IBM will ship hardware without operating systems.

At the same time, with its Enhanced product line, IBM intends to give major PS/2 users a way to prototype new technology before IBM makes it part of the general product line.

"I feel they're reacting well to what the end user wants," said Bruce I. Linker, president of the Microcomputer Managers Association and a vice president of MIS at a major financial services company in New York.

Goodyear to drive Unix systems into retail stores

By Jean S. Bozman
AKRON, OHIO

■ This summer, tires will not be the only things rolling out to Goodyear Tire & Rubber Co.'s retail stores. The $12 billion firm will be installing more than 1,000 Unix PCs in the U.S. and Canada to replace aging IBM Series/1 minicomputers and Series/1 PCs by year's end, project coordinators here said.

The Unix system, based on an Intel Corp. 1486 PC, will handle store inventory and customer databases, which had been hosted by Series/1 minicomputers and Series/1 PCs since the late 1980s. After several months of piloting the new system, Goodyear will ramp up the rollout with volume shipments in August.

Once systems are installed, speed is expected to improve: Users said it used to take several minutes to look up an invoice on the Series/1, but it will now take only 20 seconds. Customer records that were hard to contain within the 60M-byte database on the Series/1 will have 1G byte of storage.

By year's end, some 1,600 stores operated directly by Goodyear will have the new system, said Fred Hildenbrand, director of advanced local-area network development for the tire division's information services group.

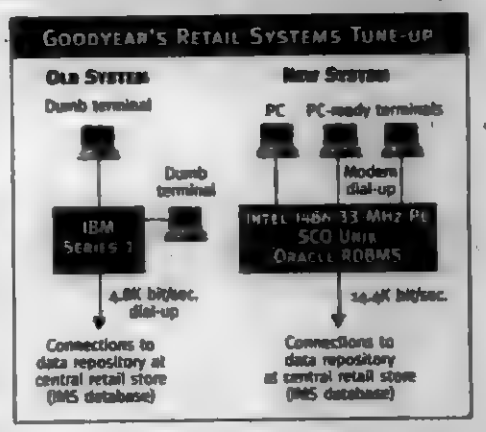
Another 1,000 stores run by independent dealers are scheduled to get the new system by mid-1994, he said. Hildenbrand helped create a prototype for the Goodyear Business Management System II (GBMS II) Unix system in late 1991.

Overnight delivery

A task force of field engineers from Digital Equipment Corp., the project's systems integrator, is replacing the old store systems through an overnight conversion process. DEC was chosen, in part, for its extensive field-support organization, Goodyear said. DEC's portion of the project could be worth as much as $27 million, the Maynard, Mass., company estimated.

Goodyear purchased 1,600 copies of The Santa Cruz Operation's SCO Unix for use with Oracle Corp. databases, according to SCO.

IBM and IBM-compatible mainframes running the MVS and VM operating systems have dominated Goodyear's information systems infrastructure. But recently, the tire maker launched some downsizing projects to reduce operating costs and the mainframe application backlog, users said.



The firm uses an IBM Systems Network Architecture (SNA) wide-area network to connect operations in more than 20 countries.

The deployment of Unix systems plays into Goodyear's strategy to move toward open systems standards as a cost-effective alternative platform, as John Frame, Goodyear's director of information technology, said last fall.

The SCO Unix system — the only desktop Unix available when the project started — acts as a multitasking server that supports multiple store-management applications.

The PC-based system also gives dealer sites the option of buying a variety of PC packages, said Sandi Brubach, GBMS II project coordinator. Cost was also a factor. The project's use of 33-MHz DECpc 433ST PCs is expected to cut the total cost of procurement and conversion in half, compared with conversion to an IBM Application System/400 platform.

Key to the upgrade was the conversion of 300,000 lines of IBM Series/1 proprietary Emulation Design Language code into PC-based Micro Focus Cobol code. Consultants from Cap Gemini America, Inc. assisted Goodyear in the Series/1 conversion effort.

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Michael Fitzgerald

Hardware tidbits

A potpourri of hardware tips and tricks culled from readers and other sources:

.....

Econo-power. A little California company with a forgettable name has developed an interesting power management product. Technology Marketing Partners, Inc. (TMPI) in Mountain View last week announced the MonitorMiser, which lets current PC monitors meet the Environmental Protection Agency's Energy Star standards.

The user connects the keyboard and the monitor to the MonitorMiser and sets a switch that tells the monitor how long to wait between keystrokes before it shuts off. William Jackson, TMPI's president, says that even the most conservative estimates, based on use and power rates, show a power savings of $130 a year. This will easily cost-justify the $79.95 product. MonitorMiser ships for IBM-compatibles and PS/2s in August, and for the Macintosh in October.

.....

CPU coolant. Remember the overheating problem for the 486? Neither do I, but Pentium's widely reported heat problems have led one enterprising type to revise his 486 cooler to work with Pentium. While a computer designer at an Air Force base, Norman Bailey started PCubid Computer Technology after a summer air conditioning failure caused a server's 486 CPU to overheat repeatedly, dropping data.

Now, the Sacramento, Calif., company has upped its I486 CPU Kooler to a Pentium Kooler. As of this month, both products will also come with the ability to work with a simple Radio Shack LCD Indoor/Outdoor Thermometer so users can monitor their CPU temperature.

Bailey says the company has sold 25,000 Koolers to date, including Koolers for non-Intel chips. Both the 486 and Pentium products cost $39.95.

.....

Dense DRAM. One user writes to complain about DRAM upgrades. He says he bought a desktop system with 16M bytes of RAM from Zeos International, which bills itself as offering easily upgradable RAM. He figured this meant that when he wanted to upgrade — the system supports 64M bytes — he could simply pop extra SIMM boards into the appropriate slots on the motherboard. In fact, he can't do this easily because the vendor had used 4M-byte SIMMs in all four slots, rather than using two 8M-byte SIMMs and keeping two slots open.

It seems like this could be an isolated instance because in general more RAM bundled on one SIMM means less cost. Still, some vendors suggest a buyer-beware attitude: Users should request specific SIMM configurations, to save potential headaches. I say c'mon guys (you know who you are), if you're going to bill something as upgradable, build it that way.

Fitzgerald is a Computerworld senior writer.

Windows migration lessons

By Michael Vizard

After being inundated with Windows for the last few years, many information systems directors are still struggling with the fundamentals of migrating from DOS to Windows.

"It's really a mixed bag out there; people tend to stay with DOS until they have an application that drives them to Windows," said Chris LeTocq, a senior industry analyst at Computer Intelligence/Infocorp in Santa Clara, Calif.

For example, the New York City Controllers Office is just beginning to move to Windows after deciding to opt for an imaging application that will keep track of all claims made against the city.

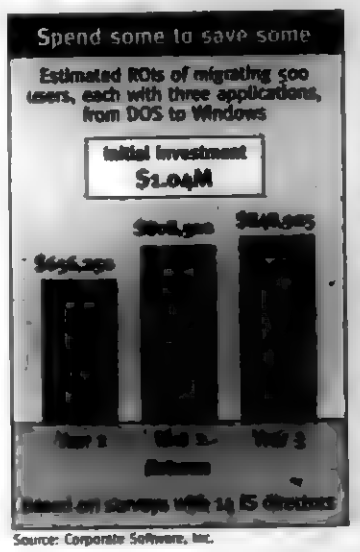
"We got about 750 workstations, and about 180 of those will be pushed into Windows in the near future," said assistant bureau chief John O'Callaghan.

Similarly, the Bertelsmann Music Group in New York plans to move to Windows starting this month, which coincides with the start of its fiscal year, as part of an effort to simplify the development of applications in its executive information system.

Both Bertelsmann and the New York City Controllers Office are likely to encounter the same hidden costs that have plagued pioneers in the Windows migration effort. Those hidden costs are typically encountered in traditional IS foibles, namely end-user training and technical support.

Julie Armstrong, the services project manager at Corporate Software, Inc., a Canton, Mass., software reseller, noted that 80% to 90% of the macros created for a DOS package will require revision if they are to run under Windows.

"Furthermore, the people who probably originally wrote those macros aren't around anymore," Armstrong said.



Source: Corporate Software, Inc.

In addition, Armstrong noted that documents converted across environments will require editing, and a file exchange process between Windows and DOS environments will have to be set up.

On top of these activities, IS shops will also have to support extensive end-user training, which Armstrong said should take about a half day for Windows, and one to two days per application.

This training, along with follow-up sessions, is one of the most critical tools in the IS arsenal for minimizing the single largest cost in a Windows migration effort. Without proper training, end users will look to their peers for Windows technical knowledge. But because these peers have other job functions, the Gartner Group, Inc. in Stamford, Conn., estimates that these indirect costs could actually inflate the cost of a Windows migration by a factor of two to five.

And despite the promises of the ease of learning new applications in a graphical environment, Armstrong said training and technical support costs are not likely to fall.

"You have to remember that under Windows, users tend to use more applications than they do under DOS, and you also have to remember that if your PCs are networked, you have to update your NetWare shells every time you upgrade an application," Armstrong said.

And when you add these costs to the prices of software and hardware upgrades, the move to Windows can easily represent one of the most expensive propositions an IS director is ever likely to face.

But while the costs are substantial, those that have made the transition said the enhanced productivity made possible by Windows is well worth the cost.

CA taps VARs, systems integrators for desktop sales

By Thomas Hoffman

ISLANDIA, N.Y.

Looking for new ways to pump up its PC software revenue, Computer Associates International, Inc. has quietly ushered in two programs that would allow value-added resellers (VAR) and systems integrators to market a handful of its desktop products.

The programs are the first in what will likely be a series of reseller agreements intended to complement CA's direct sales of desktop products. They are intended to jump-start CA's PC software sales, which last year made up a mere 10% of the company's $1.8 billion in revenue.

Last month, CA added the Project Navigation and Smartsizing programs. Under Project Navigation, selected VARs and systems integrators will be able to sell PC software for project management and estimating tasks, including CA-Estimacs, CA-SuperProject, and CA-Planmacs. With the Smartsizing program, CA will certify VARs and systems integrators to sell, train and implement CA-Realia II Workbench for customers seeking to offload mainframe Cobol development onto Windows-based PCs.

The programs represent a shift in CA's PC software sales strategy. Until recently, CA attempted to sell its PC products much like its mainframe systems software — directly through its own sales force. But while that approach was suitable for pushing systems software, it would not suffice for desktop applications.

Channel hopping

Low volumes of high-margin mainframe software, such as CA-1 or CA-7, can be sold directly by a vendor's sales force to a manageable number of accounts or information systems organizations, noted Tina Foraker-Blackwell, a senior analyst at New Science Associates, Inc., a Westport, Conn.-based market research firm. But she said high volumes of shrink-wrapped packages require additional distribution channels such as VARs, especially because PC software sales apply to a broader base of customers.

"By going with channels other than their own, they [CA] will probably have an easier time of it," Foraker-Blackwell said.

Marc Sokol, director of CA's product strategy, said the vendor recognized the need to expand into additional PC software sales channels last year during the development and market analysis of CA-Unicenter for Unix, a systems management suite that has been developed for several Unix environments.

In addition to the project management, estimating and Cobol development software, Sokol said CA will begin marketing its application development and financial desktop packages through similar channels in the next six months.

"As time goes on, more and more products that were sold direct are also going to go through VARs," Sokol said.

The strategy fits into CA's lofty plans for PC software sales to reach 25% of the company's annual revenue during the next 5 to 10 years. By tapping resellers to move its desktop products, CA will likely attract new customers.

"They'll reach a lot of new customers that they weren't able to reach before, especially those who will be exposed to CA products that probably wouldn't have taken a look at them otherwise," said Charles E. Phillips, a financial analyst at Kidder, Peabody & Co. in New York.

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[redacted]

Utilities

DeltaPoint, Inc. has announced Graphics Tools, a suite of utilities designed to capture, browse, catalog, convert, manipulate and organize multimedia and graphics under Windows and Macintosh applications.

Graphics Tools assists users in searching and viewing thousands of media files on demand and includes utilities that handle image processing, image editing, graphics file conversion, autotrace and screen capture.

The Windows version is shipping now, and the Macintosh version is slated to ship this month.

Each version costs $169.95.

▶*DeltaPoint*
Suite B-1
2 Harris Court
Monterey, Calif. 93940
(408) 648-4000

DataViz has introduced Conversion Plus, a file transfer and translation utility. It provides all the tools needed to exchange documents between Macintosh and PC applications while retaining document formatting, according to the company.

The product includes a fully integrated Macintosh disk-mounting utility that enables users to translate files on their PC and move files to and from a Macintosh disk that is inserted in the PC disk drive, the company said.

Conversion Plus costs $169.

▶*DataViz*
55 Corporate Drive
Trumbull, Conn. 06611
(203) 268-0030

Software application packages

Central Point Software, Inc. has introduced Central Point Anti-Virus 2.0, an advanced DOS-based virus protection program.

The product gives PC users up-to-date protection against existing and future viruses without frequent updates. Unknown viruses are detected by Virus Analyzer, an expert system that is used with the product.

Several new and enhanced features have been added to this version, including reduced program size, enhanced memory scanning and fast verify, a feature that boosts scanning speed from four files per second to more than 80 files per second by verifying the checksum of a file only if the size of a file has been altered, the company reported.

Central Point Anti-Virus 2.0 software costs $129.95.

▶*Central Point Software*
15220 N. W. Greenbrier Pkwy., #150
Beaverton, Ore. 97006
(503) 690-8088

Peripherals

Talaris Systems, Inc. has introduced the 1794FT Imagestation, a 17-page/min. network laser printer.

The printer has the ability to accept Tag Image File Format files (TIFF) directly, without host software or setup commands.

Based on the company's Wings Architecture for Intelligent Connectivity and Canon, Inc.'s LBP-NX print engine, the 1794FT can simultaneously accept TIFF files from an assortment of host platforms, the company reported.

Standard and thin-wire Ethernet is built into the product, and Ethernet support includes Novell, Inc.'s SPX/IPX and Transmission Control Protocol/Internet Protocol. The 1794FT can also identify TIFF files automatically and switch to a built-in TIFF reader.

The 1794FT Imagestation costs $7,490.

▶*Talaris Systems*
11339 Sorrento Valley Road
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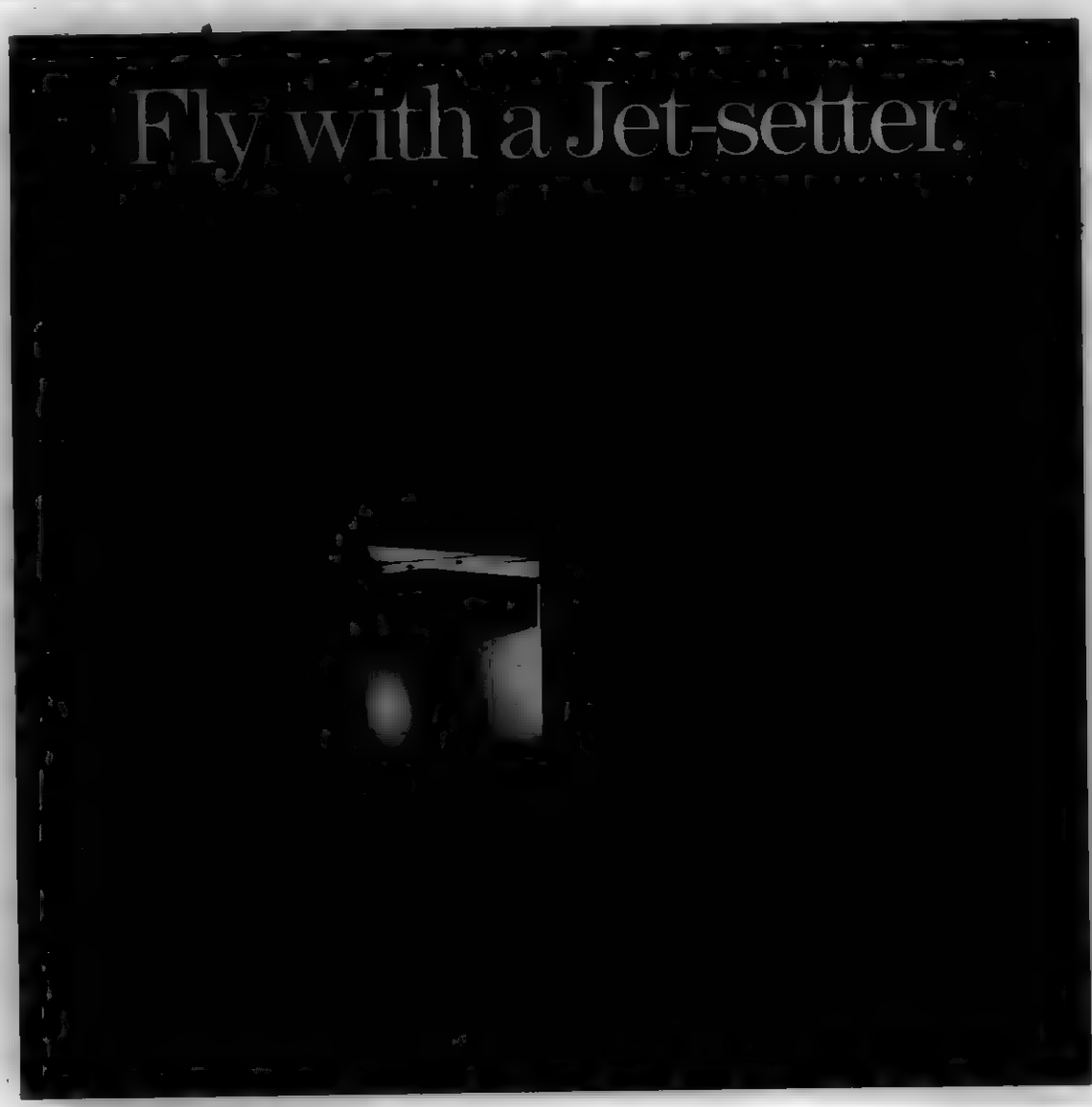

The HP Output Stacker is a great place for documents to land after a whirlwind trip through the HP Paper Feeder and HP LaserJet 4Si or 4SiMX printer.

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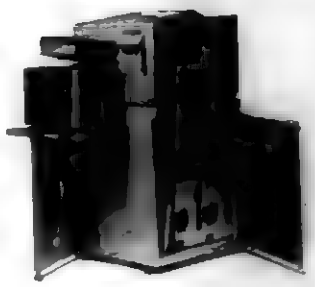

If the printer's output bin meets your needs, look into the HP Paper Feeder and the *HP LaserJet Printer Cabinet*—custom designed to hold supplies, as well as the printer.

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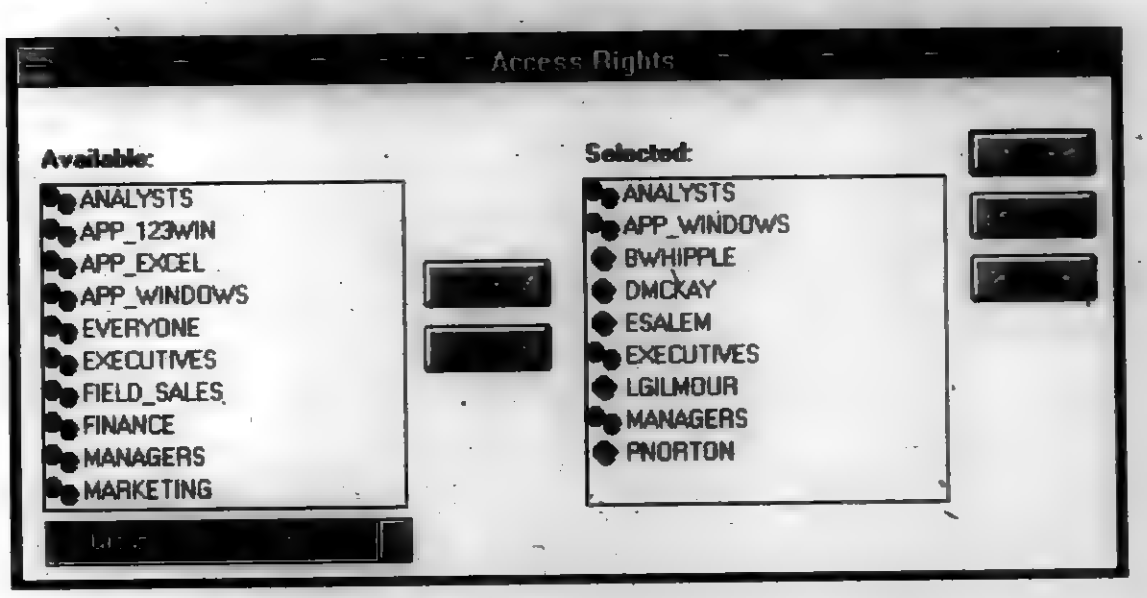

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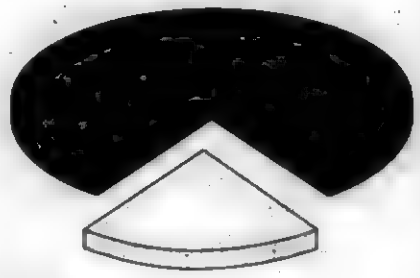

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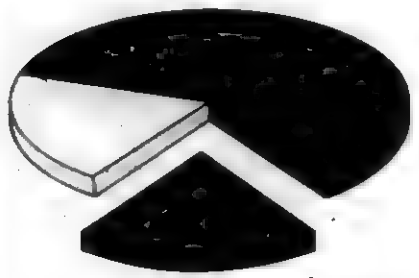

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COMPUTERWORLD

Client/server applications

Japanese manufacturer steers clear of age-old stumbling blocks

Production system gives way to client/server

By Kim S. Nash
VONORE, TENN.

If you drive a new Nissan, Subaru, Toyota or other Japanese car made in the U.S., chances are the steering wheel you wrap your white knuckles around during the morning commute is made by TRW-Koyo Steering Systems Co.

The young firm has doubled manufacturing volume compared with early 1990 levels, and officials said they expect TRW-Koyo to put out more than 1 million rack-and-pinion steering systems and related parts this year. A largely home-grown, PC-based manufacturing system cannot hack that kind of growth, according to Paul Krueger, MIS manager.

While Krueger wanted to increase capacity and throughput of the manufacturing application, he was adamant about "avoiding the mainframe," he said, including the high price tag of the box and costs of maintaining the hardware. After evaluating several prepackaged PC- and minicomputer-based offerings, Krueger settled on a client/server application from Avalon Software, Inc. in Tucson, Ariz. Being young, the company can ride the crest of the client/server wave without worrying about how to migrate decrepit legacy systems, Krueger said.

TRW-Koyo is a privately held start-up owned by a unit of TRW and Koyo Seiko, a manufacturing firm in Japan.

Krueger, who was a TRW consultant before joining TRW-Koyo in late 1989, said he liked the idea of an off-the-shelf client/server manufacturing application. He said he especially liked Avalon's hardware independence.

"You can run it on lots of different Unix systems and PCs, so we don't have to be locked into the hardware we happen to be buying now," he explained.

The company recently swapped out a local-area network of Intel Corp. 80386-based PCs and servers for two Tricord Systems, Inc. PowerFrame Model 40 superservers. Approximately 90 PCs are connected to one another and to the servers via Novell, Inc. NetWare v3.11. An Oracle Corp. database runs on top.

One surprise to Krueger was the slower throughput of the client/server-based system in overnight batch processing. Though no fault of the software, he said, the new system runs about 25% to 30% slower than a typical host-based configuration because it is bound by I/O across the network.

"It's a trade-off, I guess, but we get more functionality out of our systems now," Krueger said.

TRW-Koyo was able to buy the source code for the Avalon application, which means the firm can add functions specific to the way it operates, such as specialized electronic data interchange setups with suppliers. In-house developers used Oracle's application development tools to build an inventory tracking system based on bar codes as well.

"You're best off buying off the shelf for the basics, then building extras," Krueger said.

ON SITE

TRW-Koyo Steering Systems Co.
Vonore, Tenn.

Challenge: To grow a PC-based manufacturing system to client/server stature, keeping pace with a 100% jump in manufacturing volume for 1992.

Technology: More than $257,000 worth of products, including a CIM manufacturing/financial package from Avalon, two Tricord superservers and an Oracle database.

Users win raging graphics box war

Lower prices spoils of intense competition

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

■ Sun Microsystems, Inc. and Silicon Graphics, Inc. last week unveiled competing graphics workstation families that drive the price-point for high-end systems down into the $20,000 to $30,000 range.

The seven graphics workstations — three from Sun and four from Silicon Graphics (see chart) — will replace products that until recently carried much higher price tags. High-end, three-dimensional Silicon Graphics and Sun graphics workstations used to be priced from $25,000 to $85,000. Some went as high as $100,000, with graphics accelerators priced from $25,000 to $85,000.

However, the intense competition may erode prices even further, as Sun and Silicon Graphics carve narrow price/performance niches in their product lines, said workstation observer Marcia Brooks, managing editor of the "Anderson Report" in Santa Ana, Calif.

"Sun has been criticized for slow graphics performance and for not being competitive on a price/performance basis," said Marcia Brooks at the "Anderson Report."

Sun has more to gain than Silicon Graphics, which has dominated the graphics workstation market in recent years. "Sun has been criticized for slow graphics performance and for not being competitive on a price/performance basis," she said. "Sun just plain didn't have the in-house graphics capability of its competitors, particularly SGI."

Brooks said she sees Sun's new pricing options, including $2,000 upgrades between models, as extremely competitive. Some upgrades are made with a single accelerator board.

Sun's announcement may be as defensive as it is offensive. The firm is offering low-end models targeted at Silicon Graphics products and is expanding its portfolio of commercial applications.

"Sun's terribly dependent on the pure single-user technical workstation business," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "They understand all too clearly that they have to own that market entirely. If any vendor chips away at that market, it would hurt Sun more than anyone else."

Existing technology

Both firms are leveraging existing technology to keep costs low. Sun is using a modular approach, basing its SPARCstation ZX graphics workstation, for example, on a SPARCstation LX. Sun is using single-chip VLSI technology for its graphics accelerators, said Niraj Swarup, graphics product line manager at Sun, and software from partners such as Evans & Sutherland Computer Corp.

Silicon Graphics is also leveraging existing technology such as reduced instruction set computing (RISC) chips from its Mips Technologies, Inc. business unit, which it acquired last year. Two new graphics models use the Mips R4000 RISC chip; two others use the high-end R4400 chip, said Patti Harrell, product line manager at Silicon Graphics' Interactive Systems Division.

New graphics workstations due this month

Model	Graphics	Price
Sun		
SPARCstation 10	Turbo GX Plus 2-D/3-D wire frame	$22,745
SPARCstation ZX	Low-end 3-D graphics	$20,000
SPARCstation 10 ZX	High-end 3-D graphics	$28,745
Silicon Graphics		
Indigo² XZ	2-D/3-D vector graphics, 3-D solids modeling	Mips 4000 chip $25,500 Mips 4400 chip $31,500
Indigo² XL	2-D/3-D vector graphics	Mips 4000 chip $17,995 Mips 4400 chip $23,995

Conner ships storage management system

By Stephen P. Klett Jr.

In an attempt to bring mainframe-level data management capabilities to large PC networks, Conner Peripherals, Inc. subsidiary Conner Storage Systems Group recently began shipping a hierarchical storage management system for Novell, Inc. NetWare local-area networks.

Conner HSM automatically migrates older, inactive data files to a hierarchy of secondary storage devices, keeping server storage at an optimum level set by the systems administrator.

Sue Stanley, manager of technical services at Boulder County Information Services in Colorado, has been beta-testing the Conner HSM system for six months.

"So far, I'm impressed with how [Conner HSM] has worked," Stanley said. "To me, it's an MVS system."

A basic HSM configuration consists of a file server and storage management software, a 20G-byte magneto-optical disc library and a 50G-byte tape library for a total capacity of 70G bytes of on-line storage for approximately $55,000.

The Conner HSM software, jointly developed with Avail Systems, is available separately starting at $7,500.

Storage Dimensions upgrades RAID management

Company also delivers 3½-inch SCSI-2 drive for Continua disk array system

By Stephen P. Klett Jr.
MILPITAS, CALIF.

Storage Dimensions last month shipped a new version of its LANStor driver software aimed at improving management of redundant arrays of inexpensive disks (RAID) on Novell, Inc. networks.

Designed for the company's LANStor Continua RAID-5 system, LANStor Plus includes the following new features: LANStor DiskAlert remote error-notification software, Small Computer Systems Interface (SCSI) sense-code monitoring and support for tagged-command queuing.

LANStor Plus notifies users of the nature, location and time of a system failure by translating system codes into English error messages. These messages are sent to LANStor DiskAlert, which notifies a list of users defined by the network administrator and dials a modem for pager notification.

Newcomer

A relatively new kid on the RAID block, Storage Dimensions shipped its first RAID system, the LANStor Continua, roughly one year ago. The company currently has less than 1% of the RAID market, according to market researcher Disk/Trend.

Tagged command queuing organizes multiple simultaneous read/write requests.

LANStor Plus also includes a feature called Pre-Fix, which monitors the read-success rates of individual data blocks on a hard drive and identifies marginal or failing blocks. For instance, if a drive head makes multiple attempts in succession to read a data block, Pre-Fix interprets the attempts as a corrupted area and reassigns the data to another block before it becomes unreadable.

Moving on up

However, industry observers said LANStor Plus was a big step forward for an up-and-coming product.

"Users are looking for a good tool to monitor their RAID systems, which Storage Dimensions is providing [with DiskAlert]," said Robert Katzive, an analyst at Disk/Trend, Inc.

While RAID-0 and RAID-1 remain the most popular RAID levels due to their relatively low cost, Katzive said he expects demand for RAID-5 and products such as LANStor Plus to rise sharply during the next year or two as the cost of Level 5 drops. "RAID-5 provides a bigger bang for the buck, and it's just starting to hit its stride," he said.

Storage Dimensions also announced shipment of a new 2.1G-byte, 3½-in. Fast SCSI-2 drive. The drive gives the Continua, equipped with five drives, a total capacity limit of 8.4G bytes for $28,095. A single local-area network server can be configured to manage up to 134.4G bytes.

Continua's previous capacity limit was roughly 100G bytes using 1.6G-byte drives. The new drive modules cost $3,665 each.

The LANStor Plus driver and LANStor DiskAlert software are shipping now with all Continua systems. The ugrades are available at no charge for current Continua customers.

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Unix

Pacific Software Group has introduced TaskManager for Unix Version 1.03 for two new Unix platforms, including Hewlett-Packard Co.'s HP/UX for HP 9000 Series 800 computers and Sun Microsystems, Inc.'s Interactive Unix.

TaskManager is a desktop organizer that has an intuitive point-and-shoot interface for controlling files and devices, constructing and using menus, creating schedules and reminders, handling mail and maintaining an on-line address/phone book.

A 10-user license for TaskManager costs $295, and an unlimited user license costs $595.

▶ *Pacific Software*
4703 Filly Lane
Riverside, Calif. 92509
(909) 681-2633

UniPress Software, Inc. has announced SoftNet, a software product line that permits Unix workstations to become fully integrated Novell, Inc. NetWare servers or clients.

SoftNet comprises three parts: SoftNet Utilities (the server), SoftNet Client and SoftNet Term.

According to the company, SoftNet Utilities enables a variety of workstations, including those from IBM, Sun Microsystems, Inc., Hewlett-Packard Co. and The Santa Cruz Operation, to function as Novell NetWare 2.2 or 3.1 servers.

File and print-sharing capabilities are provided, and additional software and hardware are not required.

Prices range from $99 to $1,499.

▶ *UniPress Software*
2025 Lincoln Highway
Edison, N.J. 08817
(908) 287-2100

BoxHill Systems Corp. has introduced Tape Box, a dedicated network server for tape drives and media changers designed specifically for Unix network backup.

According to the company, data from any workstation on the network is sent directly to the Tape Box, which writes any tape format designated to a tape device.

A selection of media changers for unattended tape backup is also offered. Capacities range from 24G to 580G bytes in 4mm and 8mm tape formats.

A 50G-byte capacity system comprising the Tape Box and media changer costs $14,500.

▶ *BoxHill Systems*
161 Avenue of the Americas
New York, N.Y. 10013
(212) 989-4455

LAN software

Biscom, Inc. has announced FAXCOM for LAN, its enterprisewide network-based fax server solution.

FAXCOM for LAN provides a user interface with features such as enterprisewide fax routing, fax viewing, integration with popular electronic-mail packages, the ability to fax directly from within an application, queue control, account billing and phone book management.

The product is part of FAXCOM Enterprise, a strategy for integrating local-area network users into a corporatewide fax messaging and management service.

Prices start at $2,495.

▶ *Biscom*
321 Billerica Road
Chelmsford, Mass. 01824
(508) 250-1800

Storage

Conner Storage Systems Group has introduced the Conner Optical Jukebox (Model 16-L-MO), a high-capacity magneto-optical jukebox.

The product is supported by the company's new Hierachical Storage Management system for large PC local-area networks.

The jukebox is a Small Computer Systems Interface-based rewritable magneto-optical jukebox that has 16 disk cartridges and provides up to 20G bytes of storage.

Prices start at $19,995.

▶ *Conner Storage Systems*
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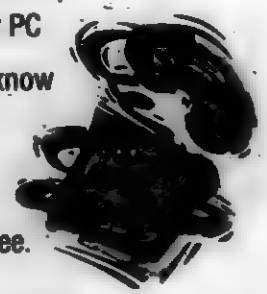

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CW71293

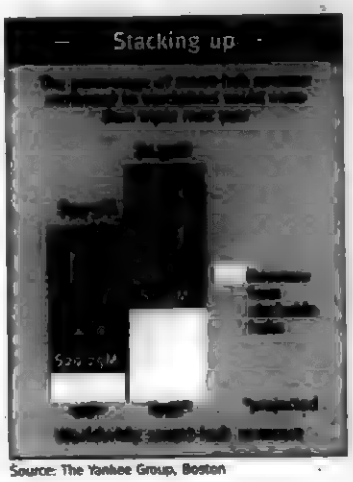
Cabling strategies

Stackable wiring hubs: Where do they fit?

By Joanie M. Wexler

Teeming with activity, the stackable-hub arena has seen most market players carve out a function- or price-based niche. The various options are helping companies accommodate clumps of users who relocate frequently or networks growing at unpredictable rates.

Stackable hubs are stand-alone "dumb" wiring concentrators supporting a small number of users — usually 12 to 24. The dumb hubs become "smart" with the addition of a management hub to the stack of daisy-chained boxes. Customers can keep buying more hubs and cabling them together as they add more local-area networks.


Stacking up
Source: The Yankee Group, Boston

The most recent vendors to jump on the stackable bandwagon were Cabletron Systems, Inc. and Hewlett-Packard Co. late last month (see story at right). These entries arrived in the wake of price-slashing moves by competitor 3Com Corp. and the release of stackables supporting copper and fiber versions of Fiber Distributed Data Interface (FDDI) LANs from Crescendo Communications.

In contrast to stackables, the chassis-based approach requires users to buy a "house" that usually contains a high-speed backplane, power supply and slots for LAN modules that get shared by a relatively large number of LAN modules.

Stackables, because they do not require the up-front enclosure investment, are often perceived as being less expensive than the chassis alternative. But users and analysts said that depending on network behavior, that is not usually the case. They cited compact size and the ability to break apart the stack and move the hubs around as more of a draw.

Stackables are "cheaper than multiple [stand-alone] smart hubs, but not necessarily cheaper than a chassis-based hub," said Dan Paton, communications service manager at Beaumont Hospital in Royal Oak, Mich., a Cabletron shop. Paton does not take that benefit lightly, though; in his organization, the wiring closets "are too darn small to accept a chassis," he said.

Without room for the large product, the alternative would be to install multiple smart hubs for which he would repeatedly pay for management and new fiber connections with the addition of each hub, Paton said.

In a large environment where "you know you have a fixed number of users or can calculate how many you'll have, go with the chassis," advised Randy Sly, network analyst at Midwest Power Systems, a 3Com stackable customer in Des Moines, Iowa. With the chassis, "each card you add would presumably be less expensive" because it spreads the cost of shared components across more users, he said.

No interference

However, Sly recommended stackables for locations such as telephone wiring closets that "are not the purest environments." Because each hub in a stack is enclosed, users do not have to worry about electromagnetic interference as they would when opening up the enclosure of a chassis to replace a module, he explained.

When the *San Diego Union Tribune* recently remodeled, it went 100% stackable with products from 3Com, said David Knight, director of computer systems and support. The reason is that "in an organization of 1,600 people, somebody is always moving," and it is easier to accommodate that with stacks that can be dismantled and redistributed, he said.

In addition, Knight said he felt chassis might not support new network technologies well because they were not initially designed for them. "We can essentially substitute in a stackable" rather than trying to shoehorn a new technology into the chassis, he said.

"The real reason you buy stackables is that they're virtually disposable," agreed Todd Dagres, vice president of communications research at The Yankee Group, a consultancy in Boston. When users need greater performance and move to a faster network, "they can move the hubs to another spot or just throw them away," he said.

New editions

Several recent stackable-hub developments have been aimed at lowering costs or adding functions.

Cabletron in Rochester, N.H., marked its territory last month with integrated bridging, routing and standard Remote Monitoring (RMON) functions for 12- and 24-port members of its HubStack family. The cost is about $187 per port.

Meanwhile, Cameo Communications in Nashua, N.H., said it has integrated a low-end router into its roughly $250-per-port, 12-port 10Base-T hub, which it will demonstrate at Interop next month in San Francisco.

3Com recently introduced a 48-port configuration 10Base-T set of stackables that works out to a record-breaking $69 per port. 3Com is also the only vendor to ship stackables for Token Ring networks. The per-port cost, including RMON, is about $180 in configurations of 96 or 240 ports.

HP, meanwhile, shipped a manageable, 24-port 10Base-T stackable that includes protection against eavesdropping and unauthorized access for $115 per port. And Crescendo Communications in Sunnyvale, Calif., began shipping this month stackables that accommodate FDDI and copper FDDI with prices starting at $645 per port for an 18-port copper wiring configuration. —*Joanie M. Wexler*

Growing third-party industry incites APPC revolution

By Elisabeth Horwitt
ARMONK, N.Y.

Textron Financial Corp. wanted to use IBM's Advanced Program-to-Program Communications (APPC) protocol to enable its PCs to interactively access DB2 databases on an IBM host. However, developing its own applications based on IBM's complex, interactive protocol "was a learning curve we didn't want to undertake," said David Wilder, systems manager at the Providence, R.I., firm.

Fortunately, Textron was able to use Sybase, Inc.'s Net Gateway, which made use of Sun Microsystems, Inc.'s APPC-based Peer-to-Peer Services to get at the host CICS region with the DB2 data, Wilder said. "So we don't need to know any foreign language, just CICS and the Sybase structure, which is very simple. It's very easy to use."

Latest link

The latest APPC-based product, Join, was announced last week by OpenConnect Systems in Dallas. It is said to connect IBM DB2 and Informix Corp. databases over a LAN. DB2 commands can be used to query Informix databases and vice versa.

Textron is just one of a growing number of companies that have been making good use of third-party local-area network gateways, file-transfer software and multivendor networking products that have APPC at their base. The revolution has been a quiet but steady one, fueled by a burgeoning APPC third-party industry and users' growing realization of the protocol's unique capabilities in distributed transaction processing environments.

More popular

APPC "is not growing like wildfire, but it is growing" as a common tool for building new distributed applications, said Donald Czubeck, president of Gen2 Ventures, a consultancy in Saratoga, Calif., that specializes in Systems Network Architecture protocols.

IBM introduced APPC in the early 1980s as a common way to handle interactive communications across different IBM systems. The protocol originally took a lot of flack from analysts and users because its programming interface was extremely complex. In addition, the original APPC took up a fair chunk of main memory, leaving little room for applications in the average DOS PC.

The reason APPC takes up so much room is that IBM built a number of utilities into it that are needed in complex application-to-application systems, Czubeck said. For example, APPC provides a standard way to synchronize database transactions between two parties, as well as encryption, security and error recovery, IBM spokespeople said.

"There are simpler interfaces you can use, such as remote pro-

APPC, page 78

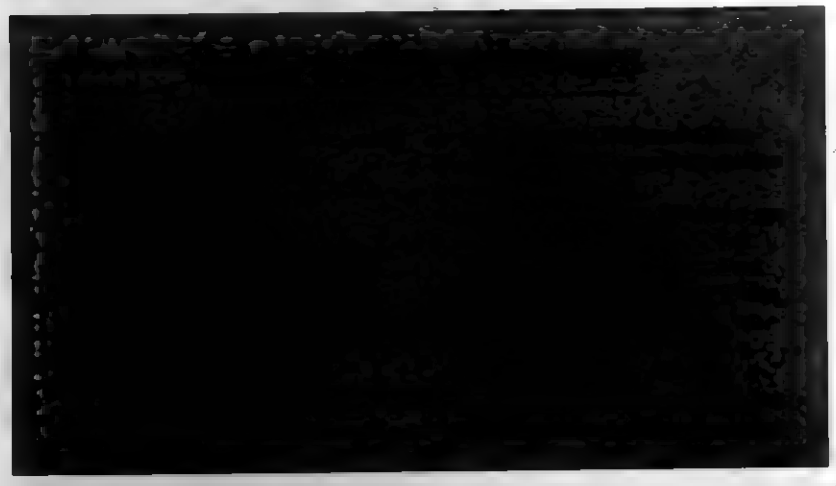
APPC

CONTINUED FROM PAGE 77

cedure calls or Sockets, but the downside of their simplicity is that if you are doing complex interactions, developers have to roll their own interfaces" to handle tasks such as the ones outlined above, Cznbeck said.

However, developments during the past few years from IBM and third parties have addressed most of APPC's drawbacks (see story below). User acceptance has been extremely strong: A 1992 survey by International Data Corp. of 100 to 200 mainframe sites found that 73% of respondents planned to be using APPC applications within the next 12 months.

Madden Services, for example, is extremely pleased with its implementation of APPC as the basis of an order verification system that has OS/2-based workstations bringing down data from multiple IBM Application System/400 hosts. The Chicago-based firm supplies the materials for retail store point-of-sale displays, and its warehouse distribution center handles more than 2,000 calls a day from the field sales force, according to Bob Meyers, the firm's vice president of information systems.



The application melds an InterVoice voice processing platform, RobotOperator, with a CommercialWare order entry and inventory processing system, Oasis, on the OS/2 workstation. A warehouse user on an OS/2 workstation uses the software to enter into an interactive session with an AS/400 database, in which the host verifies each piece of data as it is entered. Such data could include whether the product is valid, what retail account the salesperson is ordering for, when it is to be delivered and the quantity, Meyers said.

Other options nixed

"We couldn't use IBM 3270 protocols for interactive applications like this," Meyers said. He added that the firm considered other options such as Transmission Control Protocol/Internet Protocol and even Apple Computer, Inc.'s Data Access Language. "What we liked about APPC was that InterVoice supported it, handling the OS/2 side." This left Madden's programmers with the comparatively simple job of writing some custom AS/400 code. "We found it extremely easy to integrate with the RPG/400 programs we were writing," Meyers said.

Even better, response time is very good, Meyers said. "We've handled as many as 30 calls simultaneously" without seeing any delay beyond what would be expected on a local system, he added.

Briefs

Remote access inroads

Digital Communications Associates, Inc. and Citrix Systems, Inc. said recently they will form a partnership for fast and secure client/server networking technology for mobile local-area network applications. The joint effort will reportedly combine the "remote node" and "remote control" forms of accessing corporate backbones from the road.

Modem slowdown

Research firm Dataquest, Inc. in San Jose, Calif., predicts that the emerging V.Fast modem standard for doubling current dial-up data rates will not make it as a standard by year's end as planned. Stalling progress are unresolved issues with vendors trying to protect proprietary installed implementations, conflicts over intellectual property rights and licensing procedures and whether products including the standard's many optional features will interoperate with those that do not, according to Dataquest.

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Management interface enters beta testing

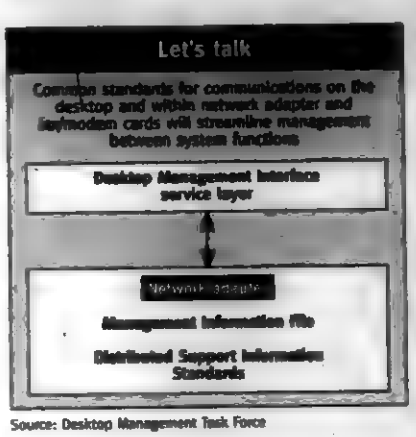
By Michele Dostert

Imagine presiding over a session of the United Nations without the aid of translators. Vendors struggling to build management applications for today's desktop computer applications and devices find themselves in a similar predicament: How can a management application communicate with, say, 40 different network cards, each of which "speaks" its own peculiar language?

The Desktop Management Task Force (DMTF), an industry consortium, is trying to solve the problem by building an industry-standard "management Esperanto" using the Desktop Management Interface (DMI), through which any management applications written to the DMI could manage any DMI-compliant product. The first beta-test code of the new DMI will ship this week to industry vendors.

The beta test is targeted at both sides of the network equation: the developers of network management applications and consoles and the developers of PCs and network peripherals such as fax/modems, video cards, printers and mass-storage devices.

DMI-compliant products will contain Management Information Files (MIF), which will provide agreed-on information, via the DMI, to the application. MIFs are currently being defined by multivendor groups of DMTF members for each class of device, with those for network adapter cards and PC platforms the furthest along.



Source: Desktop Management Task Force

MIFs are being constructed to allow easy implementation on both existing and future products. This means that the network cards and other devices now in use will not have to be discarded in order to build a DMI-compliant network.

"The reason network management applications have been slow in showing up, and of limited use when they do appear, is because there is no agreed-upon set of information or format that manageable devices should support," said Jamie Lewis, an analyst at The Burton Group, a network industry analysis firm in Salt Lake City. "The DMTF solution, if widely supported, will fix that; but it will probably be at least a year until we see product."

The consortium, founded by such heavy hitters as IBM, Intel Corp., Hewlett-Packard Co., Digital Equipment Corp., Microsoft Corp., Novell, Inc., SunConnect and SynOptics Communications, Inc., has more than 300 vendor members, putting considerable clout behind their newly proposed industry standard. DMTF emphasizes that its work will be coordinated with other standards groups and that the DMI was designed to easily map to the Host Resources Management Information Base designed by the Internet Engineering Task Force and the object definitions incorporated in the work of the Distributed Support Information Standards Group (DSIS).

DSIS, a consortium of major systems vendors and integrators, is working toward standards by which service and support vendors can pinpoint problems on network equipment.

Smart wiring hubs

Ungermann-Bass, Inc. has introduced the ASM420, a 24-port Token Ring concentrator.

According to the company, the product comprises 24 ports per concentrator: 22 station ports, a ring-in port and a ring-out port. These provide users with up to 220 managed ports in a single Access/One Enterprise Hub.

The product offers Beacon Avoidance, which is a feature that tests ports for a speed mismatch, and Per-Port Retiming, which is said to reduce jitter by retiming the Token Ring signal as it leaves each port.

An optional Network Early Warning System that functions as a Tier-3 option on the new ASM420 Token Ring Concentrator as well as the existing ASM410 Token Ring Concentrator has also been announced.

Pricing for the ASM420 begins at $2,795. Tier-3 firmware for the ASM420 and ASM410 starts at $295.

▶ *Ungermann-Bass*
3900 Freedom Circle
Santa Clara, Calif. 95052
(408) 496-0111

New Products, *page 82*

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IBM

CONTINUED FROM PAGE 79

Internetworking

U.S. Robotics, Inc. has announced the Enterprise Network Hub and the Transaction Processing Hub.

According to the company, the two internetworking products were designed to solve the problems of network integration by uniting terminal servers, X.25 packet assembler/disassemblers, channel service units/data service units, network interfaces and modems into a single centrally managed chassis while reducing transaction verification times.

The Transaction Processing Hub interfaces with local exchange carrier's services and routes traffic through T1 trunks to local-area network interfaces for transaction processing applications such as point-of-sale.

With the Enterprise Network Hub, organizations with remote locations can put their dial traffic onto T1 lines and route it through a packet-switched network to a host computer at a central site.

Prices for the two products range from $25,000 to $60,000 per chassis.

▶ *U.S. Robotics*
8100 N. McCormick Blvd.
Skokie, Ill. 60076
(708) 982-5010

Network Express, Inc. has announced an extension to its NeXecutive Software to support Internet protocol routing for the local-area network outer network.

The product is called ISDN RouterTM. According to the company, it has the ability to connect one or two Ethernet LANs and can filter and forward data at wire speeds for remote users.

Active LAN users can be connected to various locations by automatically utilizing switched and dedicated lines.

A minimum configuration costs $6,500 and includes an ISDN RouterTM with a single Ethernet adapter and a Basic Rate ISDN adapter for a single line.

▶ *Network Express*
2200 Green Road
Ann Arbor, Mich. 48105
(313) 761-5005

Newport Systems Solutions, Inc. has announced that its LAN2LAN/Multiprotocol Router, working in conjunction with 3Com Corp.'s EtherLink III Parallel Tasking Ethernet Adapter, can sustain a forwarding rate of 14,728 packet/sec. for 64-byte packets.

The product supports four Ethernet local-area network ports and up to 12 full duplex wide-area network ports.

A minimum system software configuration supporting four LAN ports costs $995. WAN software support for up to 12 WAN ports costs $1,395.

▶ *Newport Systems Solutions*
#103
4019 Westerly Place
Newport Beach, Calif. 92660
(714) 752-1511

WAN software

Compression Labs, Inc. has announced the Multipoint 2M, a multipoint control unit that reduces the entry-level costs of a multiple-location videoconferencing system.

According to the company, the Multipoint 2M enables users to conduct video-based conference-call-style meetings among more than two physical locations.

The product is a Standards Plus system that complies with CCITT standards for multipoint videoconferencing and supports video codecs that use T1 data communication lines, fractional T1, Switched 56, Integrated Services Digital Network or private network connections.

Pricing begins at $49,000 for a four-port system of Multipoint 2M.

▶ *Compression Labs*
2860 Junction Ave.
San Jose, Calif. 95134
(408) 435-3000

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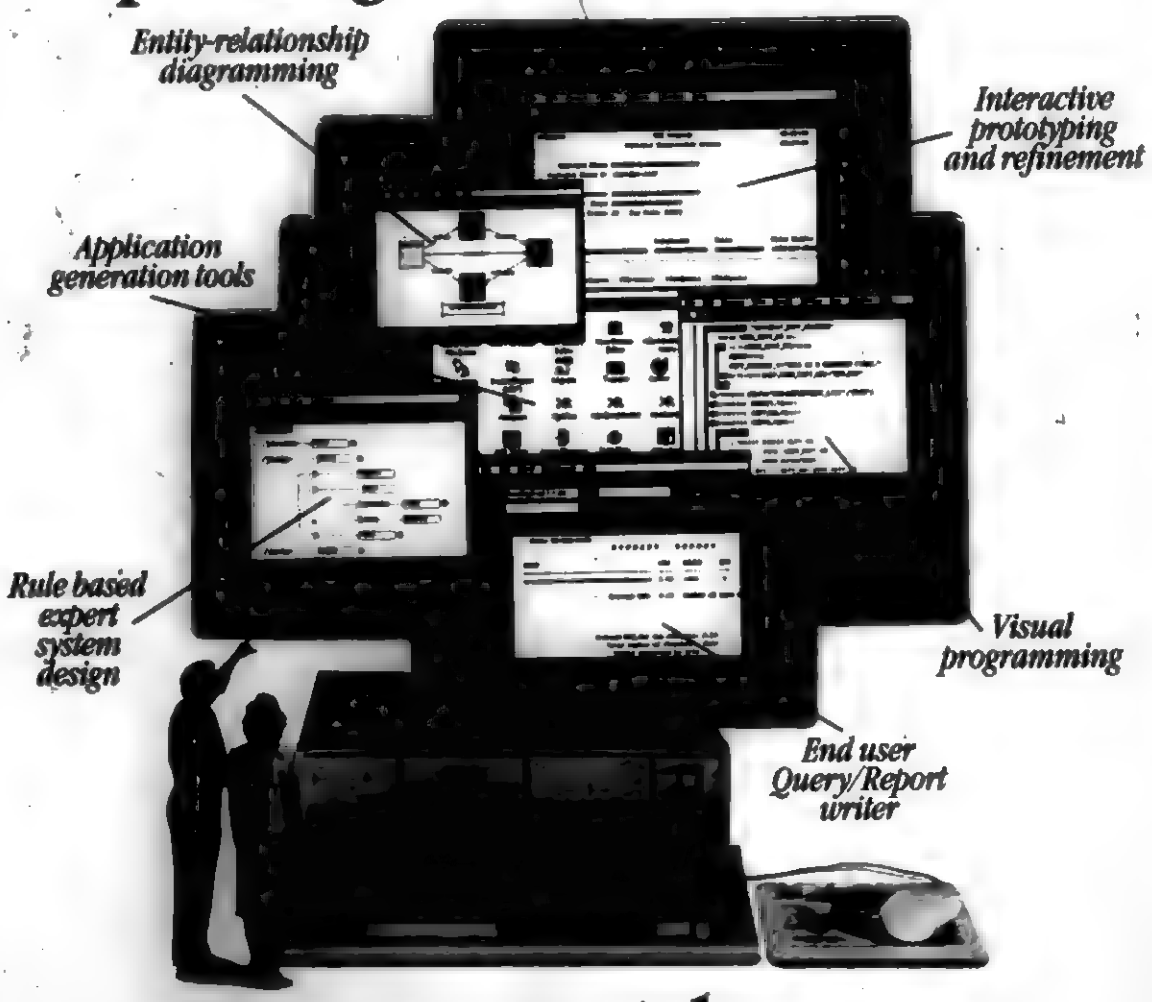

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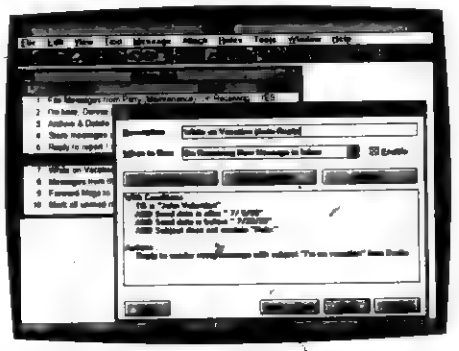

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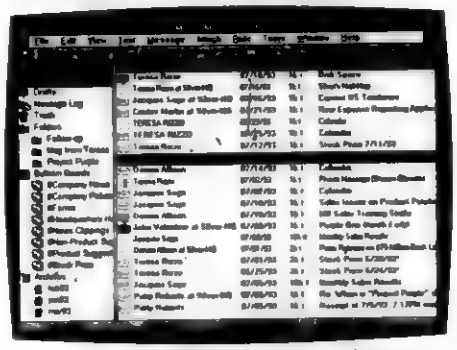

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Computers essential to prosecutors

By Johanna Ambrosio

■ Whether it is New York City or Daytona County in Florida, putting the bad guys behind bars requires basically the same kinds of computer functions. But each locale has adopted a twist that is uniquely its own.

Attorneys in both places use desktop devices to access different databases — 16 in New York, a couple in Daytona — that help get the goods on people accused of crimes: drivers' records, reports of previous criminal activity, bank statements and the like. In Daytona, the attorneys use a centralized Wyse Technology, Inc. Model 9000 minicomputer with 22 terminals attached. In New York, some 750 PCs are attached via a local-area network to city and state mainframes.

Daytona's Jerry Gardner: *"We had been in the [computing] Stone Age"*

The scale of the job is very different in the two places. The District Attorney's Office for New York County in New York City prosecutes 115,000 cases each year in Manhattan alone. The Seventh Judicial Circuit of the State Attorney's Office — which covers four counties in Florida — prosecutes about 50,000 cases a year.

The following is a look at how two law enforcement operations handle similar operations in very different ways.

Daytona County

▶ Until recently, cash-strapped Daytona relied on PCs confiscated from criminals.

"We used anything we could get our hands on," said Jerry Gardner, executive director of the State Attorney's Office for the Seventh Judicial Circuit in Daytona Beach, Fla. "And if the criminals wanted to buy it for us, that was OK. We're not proud."

In fact, it was a seizure of some cash that allowed the Seventh Circuit to purchase its spanking-new Wyse 9000 and 22 terminals for its the Daytona Beach office. With this system, attorneys can coordinate efforts of the circuit's eight offices and 30 police agencies.

"We want to be up to date on everything, and our circuit is just moving into the modern age of computing," Gardner said. "We had been in the Stone Age."

Extreme notification

The first task to be automated was word processing. Under Florida law, people accused of a crime have to be notified of anything to do with their case — every bond hearing, motion to suppress evidence, "everything," Gardner said. "This is an extremely paper-intensive office."

The 20 PCs displaced by the Wyse system have been sent out to the seven smaller offices in the circuit. Within two years, Gardner said, those PCs will be linked together via a LAN and then to the Wyse by modem. By year-end 1994, he added, the number of terminals in the Daytona office should grow to about 62.

Gardner said he chose Wyse because of its good performance, "excellent" price, and because his office can get software that other criminal justice systems designed. For example, he recently installed software for accounting, inventory, subscriptions and budgeting that six other circuits in Florida run.

For his circuit, Gardner said, centralized was the way to go. "You could put all these documents on 40 PCs, but why do that and maintain 40 pieces of equipment when you can only have one?"

Down the road, Gardner said he hopes to tie into external databases from the Wyse system. Some terminals in the office are hooked into a state computer system called the Florida Criminal Information System, but he said he hopes people will be able to tap in right from their desktops.

"We want to give whoever's got a terminal access to all the information they need to do their job," Gardner said.

New York County

▶ Len Rubin, director of MIS in New York, agrees with his Florida counterpart. "The attorneys need to find out all they can about someone, and we can help them present a comprehensive profile of all the public information available," Rubin said.

Back in 1991, Rubin's staff took the first shot at simplifying access to 16 databases in the city and state. This first step was to rewrite a mainframe system called the Adult Justice Information System (AJIS).

"Being legacy, it was not user-friendly," said Joseph Enright, deputy MIS commissioner. "No one was using it because it was too difficult." More than 60 keystrokes, and six different screens, were required to get into the system.

So the information systems department rewrote the system, which remains mainframe-based, with more efficient code and made it a bit easier to use with pop-up windows and other PC-like concepts. Rubin's staff also worked with the staff of the main computer center in New York City to install Candle Corp.'s Supersession product to get log-on procedures down to one password and two menus.

New York's Len Rubin: *Plans graphical front end for easy attorney access to defendant information*

But even though the number of AJIS users has more than doubled because of these measures, not everyone is a user. While easier to access, the various databases all have different requirements for looking up information.

"Some you need a comma after the name, others a period, others nothing," Enright said. "We can't expect attorneys to become experts in all these systems."

The next step will be to write a completely new graphical front end to mask the 3270 emulation package.

"The ideal is that the attorney types in a defendant's name, and then there is a checklist and icons of a car and whatever else you want to know about the person," Rubin said.

Once the appropriate places have been checked off, the system launches the query, searches the mainframe databases and brings back the information to the attorney's PC.

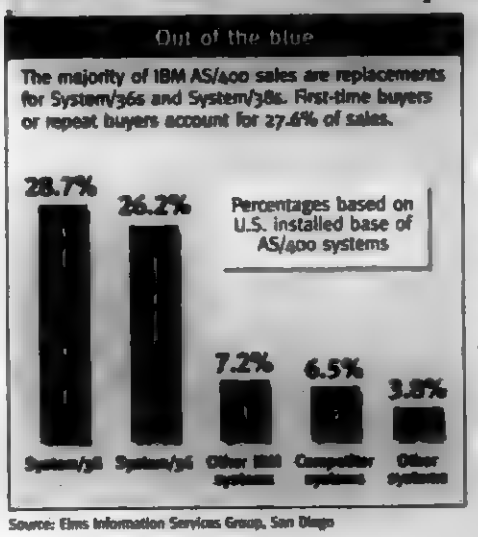
Rubin's staff is in the analysis phase and is defining requirements. He said he expects to be done in about a year. This will happen around the same time they make the move from DOS to Windows, he added. "We're opening up all sorts of information they didn't have before."

AS/400 is under the client/server gun

By Craig Stedman

IBM's Application System/400 midrange computer line turned 5 years old last month, and few would likely deny that it has had quite a run since emerging from the cornfields of Rochester, Minn. With the AS/400 now climbing some hills, though, the future may not be as smooth.

IBM counts 225,000 AS/400 shipments and upgrades since June 1988, and an International Data Corp. user census gives the line a preliminary 22% share of small and medium-size system unit shipments in 1992 — ahead of the total sales of both Digital Equipment Corp. and Hewlett-Packard Co. in those classes.



Source: Elms Information Services Group, San Diego

However, the AS/400 as we know it is reaching the end of its life cycle, and sales growth has stalled as IBM works to migrate the machine to the PowerPC architecture by 1995. AS/400 revenue fell 2% in 1992 and will likely be flat this year, according to IBM. However, the company said profit quotas are still being met.

While the economy gets some of the blame, the AS/400 faces increasing competition from client/server Unix systems that analysts said are generally perceived to be more open.

AS/400, *page 88*

Informed opinions

The following is a sampling of analyst opinions on prospects for the AS/400:

▪ *David Andrews, managing partner at ADM Consulting, Inc. in Cheshire, Conn.*, said he expects relatively flat AS/400 sales until PowerPC-based models become available in 1995, when he foresees "a significant surge" in demand. "For 1995, 1996 and beyond, there's a reason to be optimistic, and things are not that bad until then."

▪ *Nina Lytton, publisher of the "Open Systems Advisor" newsletter in Boston*, said she expects the PowerPC sys-

Informed opinions, *page 88*

School district rethinks open systems course

By Mark Halper
ALEXANDRIA, VA.

What is the driving force behind an information systems shop's technology decisions? "Politics" was the answer last year when the Fairfax County Public Schools school district began drifting toward open systems.

And just as political winds shift, so can the technology decisions that ride upon them. Barely a year after the longtime HP 3000 MPE shop began moving to HP 9000 Unix equipment, a change in IS leadership is causing Fairfax to rethink its decision.

Carl Pittman, an MIS administrator at Fairfax, said the decision a year ago to install a Hewlett-Packard Co. HP 9000 to run a school bus scheduling system for the nation's 10th largest school district was driven largely by one individual: the former assistant superintendent in charge of IS, who left in October.

It was a move with which others in the IS shop disagreed at the time, Pittman said. "When management gets removed from the real world, they make these decisions," Pittman groused.

Swap back

Now that the former chief is gone, Fairfax is considering swapping boards on its new HP 9000 to essentially transform it into a HP 3000 running HP's MPE-IX proprietary operating system, a more open version of the operating system it ran before. Fairfax plans to make a decision within four months, Pittman said.

Pittman noted that the original motivation behind moving to open systems was to save money by leveraging one supplier against another and to gain vendor independence. But the logic was flawed for a number of reasons, he said.

For one, Pittman observed that by building in Posix hooks, HP is slowly adding to MPE many of the benefits of Unix. And more importantly, while the HP 9000 solution appeared on the surface to be less costly than the HP 3000, hidden costs have erased the price advantage, he said.

"If you're going to Unix because of price, then you're shooting yourself in the foot," Pittman said.

One of the mitigating factors has been the amount of training required to make school system employees proficient in Unix. Not only has the training cost Fairfax money, but it has cost the district productivity because workers in training sessions are removed from performing their daily responsibilities.

In addition, moving to HP/UX requires purchasing ancillary software, such as tape management and spooling, which comes standard with HP 3000 MPE-IX systems, Pittman pointed out. And moving to HP/UX in the first place means making a new license expenditure that would not be necessary if the shop continued on the MPE-IX system.

Pittman also alluded to factors other than price that make the transition a rough one. For instance, he claimed that the school district has had support problems with Computer Associates International, Inc., from which it has purchased systems management software — CA's new Unix version of Unicenter.

"It's so new to them that when you ask them a question, often they'll give you the wrong answer," he noted.

As Fairfax ponders whether to end its brief run with Unix, it continues to use the HP 3000 to drive myriad functions including payroll, student attendance, report cards, transcripts, grade point averages, payroll, human resources and library cataloging.

What is Pittman's advice to any MPE shop contemplating a move to Unix? "You better have a really strong reason," he said.

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AS/400

CONTINUED FROM PAGE 87

In response, IBM is trying to bulk up the client/server capabilities of the AS/400, with more details due in September. The company also hopes to address the openness issue by adding Posix support and a faster implementation of the Transmission Control Protocol/Internet Protocol.

Even so, some AS/400 customers said they were concerned that IBM may have trouble moving fast enough to match the features and price/performance of Unix systems as those machines become easier to use and better packaged — currently two of the AS/400's strongest competitive advantages.

Jim Matsey, corporate director of information systems at Reynolds Metals Co. in Richmond, Va., said he is wary of IBM's client/server and openness promises "until they show me a business plan" rather than a marketing one. "I think they're a little late," he said.

Reynolds is considering the AS/400 for future server buys but will also look at IBM's RISC System/6000 Unix line and HP's HP 9000, Matsey said. A new aluminum extrusion plant being built in Indiana will be based solely on HP machines, he noted.

Scott Plumer, project manager for technical support at Gannett Co.'s data center in Silver Spring, Md., said that if the promised AS/400 client/server capabilities "all fall into place in the 1995 time frame, nobody will be able to touch that machine. But that's a lot of things to fall into place."

Plumer said he is particularly concerned about the AS/400's relational database. "That's always been their strength, and now they're three years behind" other vendors in adding advanced features, he said. "If they don't get the database fixed up, they won't grow."

Still lacking on the AS/400, Plumer added, are referential integrity and the ability to store database procedures and to put triggers in place to set them off as desired. Those features are supposed to be added during the next 12 to 18 months, said Dick Kiscaden, client/server solutions manager for IBM's Application Business Systems (ABS) unit.

Demise exaggerated

Other AS/400 customers are less worried. "There are a lot of people who would like to spread dirt on top of that grave, and I think it's highly premature," said Marc Cohn, senior vice president of IS at Enterprise Rent A Car Co. in St. Louis.

Cohn said IBM is "just bouncing back and forth like a Ping-Pong ball" as it tries to serve the different needs of large and small AS/400 accounts.

However, he added that there is "not even a shred of a contest" between Unix and the OS/400 operating system.

Bill Stuek, assistant general manager of marketing for IBM's ABS unit, said AS/400 sales are "doing all right" after falling off in the second half of 1992 and the first quarter of this year.

"I wouldn't say it's all the way back, but we're a lot more comfortable with the way things are tracking than we were during our troubles last year," Stuek said. Analysts said the second quarter should in fact be the best ever for the AS/400 as pent-up demand for the new F Series models could finally be met.

However, even some strong AS/400 backers feel the allure of Unix. Litton Industries, Inc.'s Advanced Circuitry and Inter-Pak Electronics divisions in Springfield, Mo., are featured in a new IBM promotional video and are upgrading from an original AS/400 B50 to an F50.

Sue Cochran, IS manager for the two operations, praised the AS/400's ease of installation and use compared with Unix machines and said the higher up-front price is mitigated over time. But she noted that if Litton was starting from scratch, it "probably" would go with Unix.

Informed

CONTINUED FROM PAGE 87

tems to be "absolute monster" downsizing machines and feels the AS/400's ease of use fits well with smaller firms, although Unix systems are catching up. "One thing outstanding is [IBM's] ability to capitalize on the client/server trend. They're talking it up, but I think it's less far along than some of their strategies."

•*Nili Young, vice president of technology planning at Meta Group, Inc. in Westport, Conn.*, said, "The AS/400 will find its market, but I don't think that market will be anywhere near as big" as the present one due to more low-end competition. While IBM lags in client/server, the AS/400 is "the only non-Unix system" still growing outside the installed base, she said.

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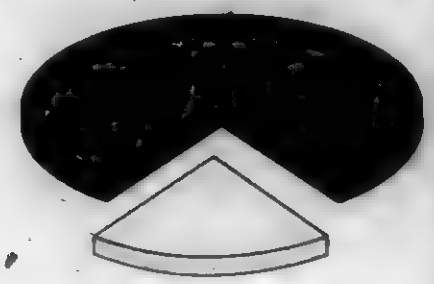

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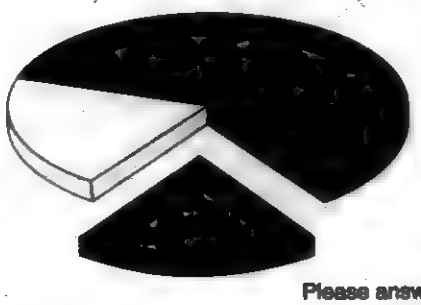

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Chemical Bank taps NCR to standardize branches

By Thomas Hoffman
NEW YORK

■ Chemical Banking Corp. has signed a $32 million contract with NCR Corp. to upgrade and standardize its 385 branches here with NCR's Unix-based System 3000 workstations and servers, as well as NCR's automated teller machines (ATM).

Chemical Bank executives said they expect the standardization effort to provide customers with common products and services at all locations.

In addition, the deal is expected to help the $130 billion (in assets) bank pare maintenance costs on aging hardware and software as it continues to consolidate its branch systems with Manufacturers Hanover Trust Co. following a 1991 merger [CW, July 5].

The contract includes NCR System 3345 servers running Unix System Laboratories, Inc.'s System V Release 4, NCR 3220 teller workstations and NCR System 3350 workstations for customer sales and service representatives. The branch workstations will be connected to a System 3445 server via an IBM Token Ring local-area network. The branch LANs will be linked to a mainframe at Chemical Bank's data processing center in Delaware for access to host data.

So far, the bank has installed systems at 30 branches, with plans to roll out equipment to 16 branches per weekend through October. Former Manufacturers Hanover branches will follow, with the installation at those sites slated for completion by the second quarter of 1994, according to Michael Papantaniou, Chemical Bank vice president of service delivery systems.

Out with the old...

The Unix-based NCR workstations and servers will replace proprietary Digital Equipment Corp. VAXs at Chemical Bank branches and antiquated NCR equipment at Manufacturers Hanover locations, according to Andrew M. Orent, an area vice president at NCR's financial systems division. Papantaniou would not divulge how much money the bank hopes to save in systems maintenance costs.

Papantaniou said the Unix systems will also help Chemical Bank sharply reduce application development cycles for future products and services.

Chemical has also begun piloting NCR's Deposit Processing Module for its ATMs. It was designed to provide a digitized image of checks deposited on ATMs.

Merger brings 400 layoffs

Sterling, Systems Center reorganize units

By Jean S. Bozman
RESTON, VA.

The effects of the merger between Sterling Software, Inc. in Dallas and Systems Center, Inc., based here, came swiftly.

Within hours of the final filing with the Securities and Exchange Commission late last month, 400 employees of the combined 3,200-member work force were terminated and the $390 million merged company's scattered business units were reorganized into four groups, each with four divisions [CW, July 5].

The firm's four business groups are the following:

- The Enterprise Software Group in Woodland Hills, Calif., for systems and application software.
- The Electronic Commerce Group in Columbus, Ohio, for electronic data interchange, electronic-mail and other communications software.
- The Federal Systems Group in Palo Alto, Calif.
- The International Group in London.

The intent of the reorganization is to provide greater efficiency and better direct sales, support and service for users, said Sterling L. Williams, Sterling's chief executive officer. He said many of the 400 layoffs resulted from overlap in administrative functions.

"We're not cutting out major products or major projects," he said, noting that unprofitable projects are being closed down. He declined to identify which projects will be discontinued.

Users of Systems Center's NetMaster and Network Data Mover software should see more products and better support, said Bruce Allen, vice president of services and systems management at Meta Group, Inc. in Westport, Conn.

Funding problems

Systems Center was developing additions to its Solve product line but was unable to market them. "A lot of that effort has been deferred multiple times because of funding problems," Allen said. "Sterling is going to offer the funding to get a lot of those things done and to beef up support."

Many Systems Center user sites provide much of their own support, although round-the-clock telephone support was available. "We seldom call them," said Charles Spadaccini, software services supervisor at Toro Co., the Bloomington, Minn., lawn mower manufacturer.

Toro uses NetMaster as its primary on-line session manager for IBM's CICS and TSO facilities. He said he was informed in an April letter about the pending merger and has not received any further updates.

Briefs

Insurance client/server

Microsoft Corp., Andersen Consulting and Sterling Wentworth Corp. have announced plans to design an integrated client/server platform for life insurance companies. The platform will be called Solutions for Life Insurance Enterprise Computing and will be Windows-based. Andersen will supply expertise in the life insurance field, and Sterling will be the first vendor to release an integrated product based on the platform.

Tape library for Alpha

Digital Equipment Corp. has signed on Odetics, Inc. to develop and manufacture an automated tape library that will use DEC's Digital Linear Tape (DLT) cartridges. DEC will market the library with its midrange Alpha AXP and VAX systems. The library unit is supposed to support up to 280 DLT cartridges, which have a capacity of 10G bytes in regular mode and 20G bytes with 2-to-1 data compression. Shipment is expected within a year, according to DEC. The library will be developed by Odetics subsidiary ATL Products, Inc. in Anaheim, Calif. It will be based on ATL's ACL5480 automated library subsystem, which is also used in a library sold into the IBM Application System/400 market by Storage Technology Corp.'s XL/Datacomp subsidiary.

Fujitsu supercomputer

Fujitsu America, Inc. in San Jose, Calif., is leasing its second supercomputer in the U.S. The VPX260 Model 10 vector processor will be installed this fall at TimeSlice Technology, Inc. in Houston. TimeSlice, which handles supercomputer applications for oil companies, also has a Cray Research, Inc. Y-MP and an NCube 2 32-processor supercomputer, said TimeSlice President Marion Bone. The leased 5 billion floating-point operations per second Fujitsu machine, outfitted with 2G bytes of main memory, would cost $12 million.

Retailers go point of sale

Three retail chains recently announced plans to upgrade or install point-of-sale (POS) systems. The Kroger Co. in Atlanta will provide check acceptance and other services in its supermarkets in Georgia and South Carolina through an agreement with Comdata Corp. in Brentwood, Tenn. Also, Service Merchandise Co. will incorporate electronic signature capture and the ability to process checks and credit cards electronically under a contract with First Financial Management Corp.'s MicroBilt subsidiary. Finally, Sears, Roebuck and Co. will also provide signature capture devices at its POS terminals, also through an agreement with MicroBilt.

Data storage

Memorex Telex has announced the 3937 Disk Array Subsystem, a disk storage product designed for the IBM Application System/400 9406 market.

The Memorex Telex 3937 provides a series of flexible, 9337-compatible direct-access storage device subsystems that can be configured to offer advanced performance and protection options. These include hot-pluggable components, redundant arrays of inexpensive disks Level 5 and a feature called Fast Write Assist that can cache read and write operations.

The Memorex Telex 3937 offers upgrade investment protection, high throughput performance and extensive configuration flexibility, the company reported.

Prices start at $56,000.

▶ *Memorex Telex*
461 S. Milpitas Blvd.
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Software application packages

Coopers & Lybrand has announced the Production and Operation Stability Tool (Post) for MVS-based systems.

Post allows users to assess the stability and control risk of an application system by examining the frequency of changes made to the system and the number of processing abnormal ends that happen during processing.

Post also has the capability to review job execution and abnormal ends such as program errors, operations errors and systems errors, among others. The product can be applied to an MVS-based application and has been used on accounts payable, accounts receivable and other financial systems, the company said. Post is used in conjunction with special services offered by the company.

Prices range from $15,000 to $25,000.

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Application Development

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Windows development

Progress forwards 4GL platform-independent aid

By Melinda-Carol Ballou
BOSTON

Progress Software, Inc. is moving into the Windows-based tools market with Version 7 of the company's fourth-generation language (4GL) tool, announced here at the Progress user conference late last month.

Progress Version 7 runs on Windows and is a platform-independent development tool that allows users to rapidly develop complex applications in client/server, host-based and mixed environments, company officials said.

New features with Version 7 that target client/server operations include an architecture that allows developers to build database-independent applications for deployment with Progress or other relational database management systems.

Also included with Version 7 are graphical, event-driven extensions to the 4GL tool; graphical user interface (GUI) and character-based tool sets; and network-optimized RDBMS performance, officials said.

User applause

Users were enthusiastic about the new version and its ability to generate GUI or character-based applications. Dwight Davis, information systems manager at Johnson Controls, Inc., a $5.6 billion controls company, is using Progress to downsize off a 3090 IBM mainframe.

"We are dealing with cash flow, security, paying and collecting bills, [manufacturing resource planning]. These are applications which are critical to our company," Davis said. "Progress lets us crank out applications faster than anything else we looked at."

Davis said Version 7's User Interface Builder generates a lot of code, reducing tedium and enabling his team to focus on complicated application logic. He also emphasized the value of having a single tool that allows him to simultaneously develop both character-based and GUI applications.

"We just don't have money in the budget to put a GUI-based PC out on everyone's desk yet," Davis said.

Transaction features

Features such as rollback and recovery, referential integrity and, with Version 7, database triggers, enable Davis and also users at Johnson & Johnson to handle applications that are transaction-based.

"We use it to handle our corporate financial information, and you can't get more mission critical than that," said Carro Meacham, assistant director for strategic systems at Johnson & Johnson.

A developer's release for Version 7 will ship in September for Windows and the following Unix operating systems: The Santa Cruz Operation's SCO, Hewlett-Packard Co.'s HP/UX, IBM's AIX and Sun Microsystems, Inc.'s Solaris.

Pricing will range from $1,500 to $4,000, depending on the combination of features chosen.

IBI object tool moves up a Level

By Thomas Hoffman

Information Builders, Inc. recently rolled out Release 3.0 of Level5 Object for Windows, its object-oriented Windows-based application development environment.

Release 3.0 was designed to provide tighter integration between Level5 Object's intelligent engines and any application by using Microsoft Corp.'s Dynamic Data Exchange, Object Linking and Embedding and Dynamic Link Library (DLL) methodologies.

Release 3.0 was designed to help users implement business process automation. The package includes Business Object Paks, a set of DLL modules that enable application developers to customize the object engine's ability to meet specialized application requirements.

SQL interface objects provide access to more than 60 local and remote databases.

Level5 Object Release 3.0 is available now and is priced at $995. Users of previous Level5 Object releases can upgrade to Release 3.0 for $145 and receive the $195 Add-On-Pak for free.

Mix-and-match tools

Firm combines technologies to meet client/server needs

By Michael Vizard
NEW YORK

While the move toward client/server computing has already claimed the careers of many information systems managers and consultants, others are making a living on the cutting edge by combining new technology with old-fashioned planning.

For the folks at Tangent International Computer Consultants, Inc. in New York, developing client/server applications is relatively old hat. The firm uses Unix servers running the Sybase RDBMS from Sybase, Inc. on Unix systems; PC databases from Microsoft Corp. and Software Publishing Corp. in Santa Clara, Calif.; and development tools from PowerSoft Corp.

The trick is knowing which tool to apply when.

Chosen one

For example, Tangent just finished building a prototype of an application that will allow agents at the Reliance Insurance Group to have customers sign electronic contracts that can be transmitted to Software Publishing's Superbase relational database for Windows.

According to Tangent President Daniel Grant, Superbase was used to develop this application because it supports imaging and because the customer needs to be able to manipulate the data locally.

"Superbase works well for applications that don't have to go across the network to get at data. The data has already been brought down into Superbase," Grant said.

But if the customer has an application that requires data access across a network, Tangent is likely to opt for PowerSoft's PowerBuilder development tools to create a client/server application, noted David Cinderella, chief technologist at Tangent.

And if the application requires end users to query data frequently, Grant said Tangent is likely to recommend Microsoft's Access. "As an end-user query tool, [Access'] Wizards are great. But we think Access isn't mature yet, so we need Superbase," Grant said.

"The Visual Basic language in Access still has some big holes in it," Cinderella added. "It's a great Windows application development tool, but I think [users] will get their nose bloody when they try data access."

Vital stats

Tangent International Computer Consultants
Founded: 1974
Employees: 250 worldwide
Business: 2,000 clients in 62 countries make use of its client/server application development skills.

Based on experience with more than 600 clients, most of whom are based in the Wall Street area that surrounds the company's office, the two Tangent executives said it is not the complexity of client/server computing that undoes IS but rather a tendency to forget the fundamentals.

"When [developers] build a Cobol application, the architecture is mapped out before they hit the keyboard. But when PCs are involved, they tend to hit the keyboard without planning the architecture," Cinderella said.

Tangent's Daniel Grant: *Most developers forget to build architectures before plowing into client/server development*

In addition, Grant noted that individual departments within companies tend to build applications independently of IS. However, under the open systems banner, these people are now trying to link applications to corporate IS resources that are based on a completely different set of incompatible applications.

Just browsing

Tangent is helping The Dun & Bradstreet Corp. develop an application that will allow customers to browse D&B credit data that will be downloaded to local servers using the Superbase database from Software Publishing.

"They tend to leave the back end to last and even ignore the delivery mechanisms because the CEO wants an easy-to-use GUI, and the technical issues don't matter," Grant said.

In addition, Grant noted that developers frequently forget that client/server applications need bidirectional communication because data has to be sent up to the server from many different clients.

Grant said he was grateful that most of his business comes from the financial community, which tends to buy new technology regardless of the economic climate. As a result, Tangent tends to be insulated from customer demands to standardize on a particular vendor's product regardless of the technology issues.

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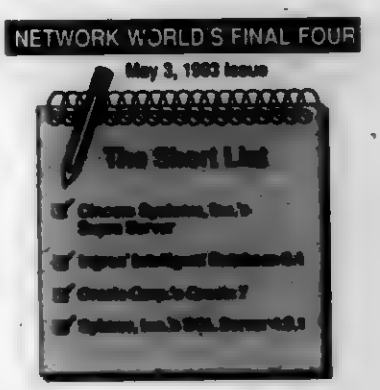

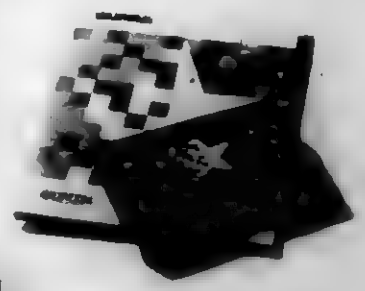

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KnowledgeWare updates ADW, unveils legacy tools

By Melinda-Carol Ballou
ATLANTA

Amid a shuffling of executives and product orientation, KnowledgeWare, Inc. announced updates to several development tools and a product targeting legacy applications.

KnowledgeWare enhanced its Application Development Workbench (ADW) last month with support for Windows, improved database tools and support for Interprocess Communications for applications that use communications protocols such as LU6.2, LU2.0 and Named Pipes.

Company officials said that integration of ADW with ObjectView, an object-oriented development tool the firm acquired earlier this year, is slated for the fall.

"Given the level of investment that we've made in ObjectView and Flashpoint, we're obviously trying to diversify," said Kim Addington, vice president of marketing at KnowledgeWare.

Mainframe migrator

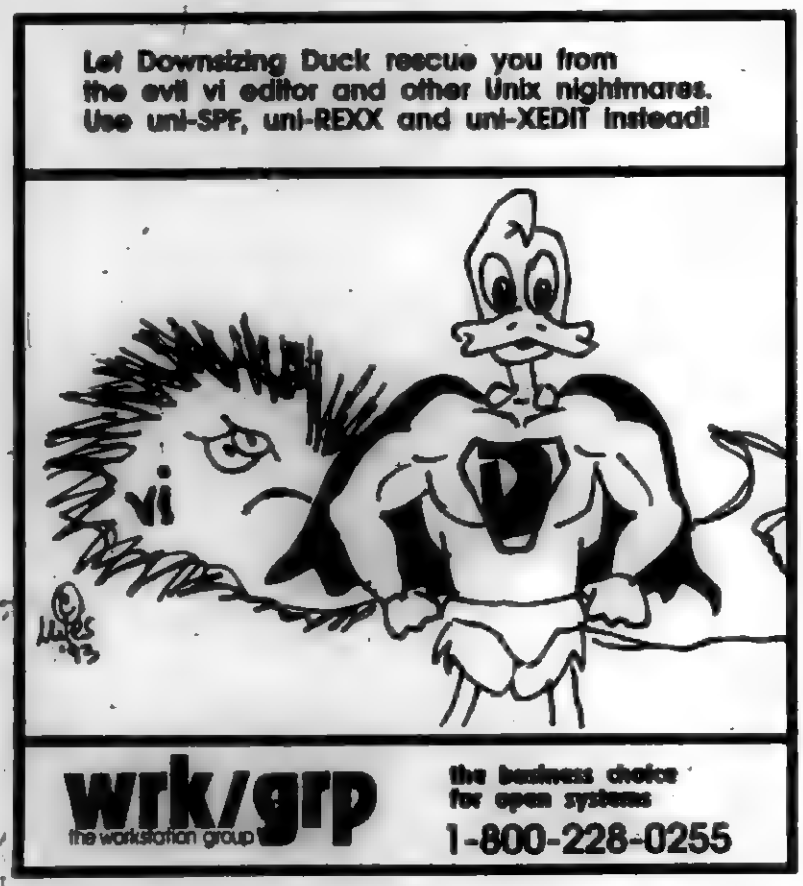
In addition, KnowledgeWare officials announced Legacy Workbench for OS/2 and MVS, a tool to maintain, redesign and migrate mainframe-based systems, along with new versions of ObjectView and the Flashpoint graphical user interface tool. Legacy Workbench has four components: Application Assessment, Program Documentation, Program Restructuring and Graphical Maintenance.

The Graphical Maintenance feature offers views of an application's structure charts, flowcharts of the execution sequence and views of source code. Changes made to one view are reflected in the other views of the software through dynamic links.

Application Assessment measures and graphically depicts the quality of an entire application by applying metrics based on syntax, complexity, structure and errors. Program Documentation provides analysis, measurement and documentation, and Program Restructuring generates functionally equivalent restructured code, the company said. These three components were based on products acquired from Language Technology, Inc. in 1991.

The new version of ObjectView can reside on whichever relational database management system a development team chooses. ObjectView 3.0 will offer check-in and checkout facilities with object-level locking; version control; and audit trails.

ADW pricing starts at $4,050; ObjectView 3.0 pricing starts at $2,799; Legacy is $100,000 for mainframe components plus five workstation licenses; and Flashpoint is priced at $9,500.



Scott Koehler

Anatomy of an object

The term "object" is quite popular these days, showing up in software product literature as often as "beta carotene" is offered up as a magic ingredient in the food industry. Yet many people are unfamiliar with the composition and use of an actual object.

Let's dissect a "real-world" object from the financial services domain and offer some insight into its use.

Consider a mutual fund as that type of real-world thing. A software model can be constructed that will look and behave like its real-world counterpart. Through the process of abstraction, this model, called a class, provides a template for what actual instances (objects) will look like. An object, then, represents an actual holding, such as shares owned in a mutual fund. Figure 1 shows an instance of the class "mutual fund" — 240 shares of the Magellan fund.

Objects are composed of both process and data. The process part includes functions, also known as methods, that respond to various events and provide attribute values. Data defines the state of the object.

For example, a mutual fund object might respond to events such as "buy" or "sell." Users of the object invoke functions in the object when these events occur. These functions alter the internal state of the object accordingly. For example, "sell" accepts an amount to sell and reduces the "number of shares" variable accordingly.

FIGURE 1. Mutual fund object

Process portion
- Buy (Amount)
- Sell (Amount)
- Current price( )
- Current value( )

Data portion
- Name
- Current price
- Number of shares
- Load
- Owner
- Historical prices

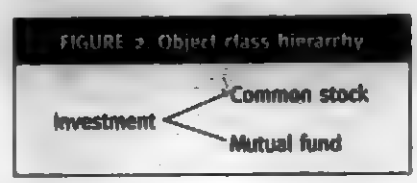
Other functions provide attribute values to users of the object without altering the state of the object. "Current price" communicates a variable, while "current value" provides the value of the investment by multiplying "current price" and "number of shares."

The variables: name, current price, number of shares and load (an up-front fee) define the current state of the object. References to other objects are captured by the "owner" and "historical prices" variables.

Objects can inherit their properties and behavior from more generalized classes. As seen in the class hierarchy depicted in Figure 2, "mutual fund" (a kind of investment) inherits properties and behaviors from the more general "investment." The investment class provides the data and process that are common to investments. In this example, many functions and variables might be defined in the investment class. For example, all investments have a "current price" and "current value."

Inheritance provides a powerful mechanism for sharing code, and thus it results in less need to write and test code. When adding a new class type, much behavior is already provided; only the specific differences are specified.

FIGURE 2. Object class hierarchy



Polymorphism is another property of object orientation. This business-friendly term refers to the ability of an object to supply its own behavior to an operation common to many other objects. For example, the "buy" function for a mutual fund accepts an amount to buy, deducts a load and divides by the "current price" before updating "number of shares." Conversely, buying a "common stock" simply updates the "number of shares." The mutual fund's definition overrides the more generic definition.

Polymorphism allows applications to be generic in nature and eliminates the problem-plagued "if" statements that litter conventional code. For example, an application could "buy" a collection of investments without knowing how to "buy" each one.

The application is more extensible because the addition of a new investment type would not require modification to this application logic.

All data internal to the object is encapsulated: External users of the object are not permitted direct access to the data. Access to "current price" is permitted through a well-defined access function. The load, however, is known only inside the object. This minimizes the ripple effect of changes. For example, the load could be changed from an integer type to a float without affecting any users of the object.

Objects provide an excellent foundation for building complex applications. They behave like their real-world counterparts, share common behavior, promote extensibility, hide their implementation details and facilitate reuse. (And you don't have to eat carrots!)

Koehler is a principal at Koehler Consulting in Holliston, Mass.

OUT-SORCERERS

Black magic or white? When it comes to deciding on outsourcing, IS execs differ sharply on whether consultants can help.

By Mark Halper

With outsourcing, there is no such thing as an easy call.

In a field where sweet dreams of a harmonic partnership can fade to nightmares of payment disputes, hidden costs and personnel surprises, it often makes sense to call in the experts to assist in the decision-making process.

Of course this comfort does not come cheap. Consultant fees can range from a few thousand dollars for a day's work to six-figure charges for a longer term contract. But many information systems executives don't seem to mind. Outsourcing has produced a virtual bonanza for IS management consultants during the last several years.

Yet while most IS shops go the consulting route, there are those that remain staunchly opposed.

Their rationale? If IS directors are going to make the difficult concession that an outsider can run things better, the executives at least want the decision to be their own.

Consider this remark from Don Brilz, applications resource manager at BP Exploration, Inc. in Anchorage, Alaska, which did not use consultants when it decided last year to hire three different outsourcers to run desktop help desk, applications development and telecommunications, while keeping the data center in-house.

"We didn't believe anyone out there knew any more about it than we did," Brilz says. "Consultants are as new to this as anyone. Why should I pay them $1,000 a day to help them learn?"

Navistar International, Inc.'s E. O. Stout, vice president of the information organization, holds a similar, if more toned-down view.

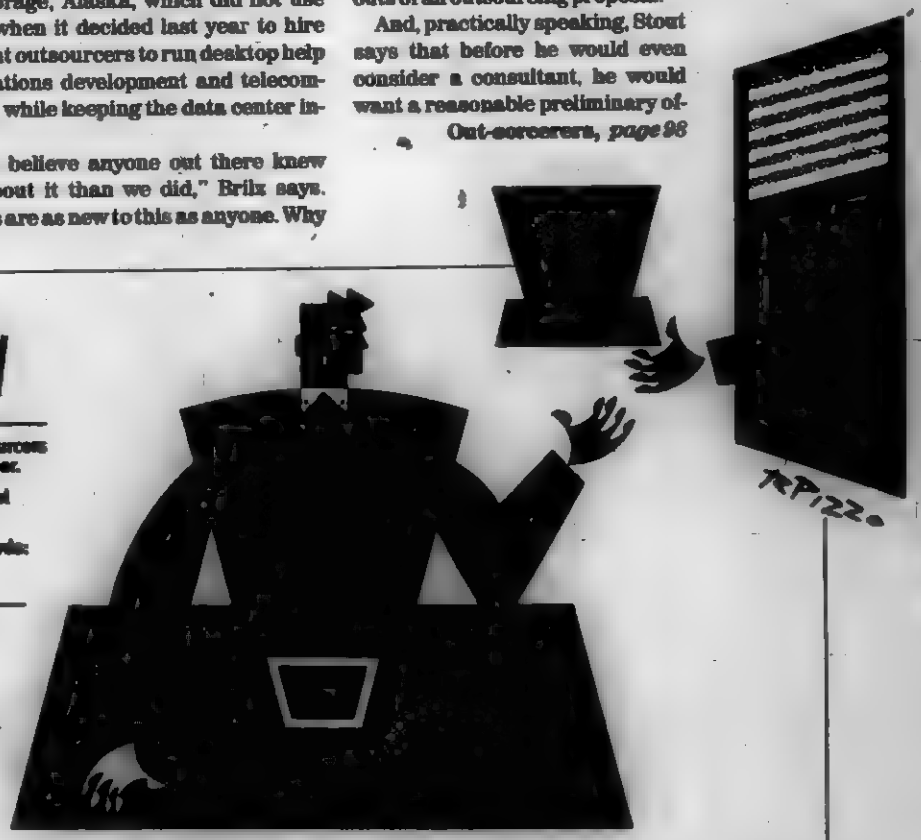
Stout hired a benchmarking firm, Nolan Norton & Co., to measure his operation's productivity when the company decided not to outsource in 1990. However, he did not retain consultants for overall project guidance. Nor is he hiring consultants for the company's ongoing re-evaluation.

His reason is twofold.

First of all, Stout says he is confident in his staff's ability to comprehend the ins and outs of an outsourcing proposal.

And, practically speaking, Stout says that before he would even consider a consultant, he would want a reasonable preliminary of-

Out-sorcerers, *page 98*



Who considers outsourcing and why

CIO

Proactive protection of turf: bringing in outsourcers and showing the world that they aren't cheaper.

Defensive posture: doing it before higher level management does it to you.

Career advancement outside IS or other rewards: "fixing" IS or gaining cash infusion.

CFO

Strictly bottom-line and cash-flow interests.

CEO

Spending too much time on this and wanting to focus on core business.

Status quo disappointment. Being paid to worry about money.

Source: The Yankee Group, Boston

Out-sorcerers

CONTINUED FROM PAGE 97

far from an outsourcing vendor.

Until a vendor can come in and start making a convincing case for saving him 20% of his IS costs, Stout says it's not worth involving a consultant.

"I don't want to waste my time, I don't want to waste their time," he says.

Wanted: outside help

But more often than not, IS directors decide that to negotiate a deal without the advice of professionals well-versed in outsourcing details and nuances would be like going to court without a lawyer.

"The pitfall of outsourcing negotiations can be the contract itself. It's such a complex beast. You're going to want consultants at the contract stage, and you may as well have them from the start," says Harold Hickman, director of data center operations at Northrop Corp., a $6 billion defense contractor that recently began an outsourcing evaluation [CW, June 21].

Besides, Hickman says, outsourcing is not a foregone conclusion at Northrop, and a consultant may be able to help him and the IS department prove to Chief Executive Officer Kent Kresa, who proposed the idea, that internal operations are at least as efficient as any third party.

"It can give you credibility. It's part of the way you can convince your management that you're not out of line," says Hickman, who is in the process of selecting a consultant.

Internal control

Indeed, consultants often can abet an IS shop's efforts to retain control of its operations.

Dale Kutnick, president of Westport, Conn.-based research and consulting firm Meta Group, Inc., says that during the last four years, his outsourcing clients have increasingly tended to keep hold of their operations or to farm out only portions of IS as part of the "selective outsourcing" trend.

Patrick McBride, program director of services and systems management strategies at Meta Group, says selective outsourcing can free systems programmers from mundane operational tasks and let them work on vital operations such as designing the infrastructure for a next-generation architecture.

McBride notes two ways in which outsourcers can outperform an IS shop: on a large-scale operational basis and from the economies of scale they can get from consolidated buying. So, he says, "An operations group that runs a tight ship can usually beat an outsourcer unless the technology [the operations group] is buying is so bleeding edge that they can't get economies of scale."

There are a couple of methods that McBride suggests to test your IS staff's efficiency. First, he says, submit a request for proposal to an outsourcer.

Once you get it, he says, "You can see if you are [financially] in line with their recommendations."

The second thing McBride recommends is getting the advice of a benchmarking company. Companies such as Real Decisions, Inc., Nolan Norton and Compass America, Inc., he says, specialize in measuring an IS shop's efficiency.

Benchmarking played a pivotal role in Toronto-based Bell Canada's decision not to outsource. Bell Canada was already halfway committed to a multifaceted deal with SHL Systemhouse, Inc. under which BCE, Inc., Bell Canada's parent, was to have purchased SHL. Benchmarks run by Real Decisions, however, scotched the deal.

These tests showed that Bell Canada's IS shop was more efficient than had been previously assumed. That in turn caused BCE to lower the purchase offer for SHL Systemhouse, a move that turned into a deal buster, according to Bob White, who at the time was a computer director at Bell Canada.

In fact, Bell Canada subsequently entered the outsourcing business itself by spinning off its data processing operations into a subsidiary called Bell Sigma, Inc., where White now works.

However, Rudy Hirschheim, a University of Houston business professor and outsourcing consultant, says that numbers from benchmarking firms can be malleable.

"The benchmark companies are good at providing the numbers to show whatever you want to show," Hirschheim says.

Benchmarking for efficiency

While the benchmarking firms can test corporate efficiency, sometimes a consultant can help determine the compatibility between a company and its prospective outsourcer.

Consultant Dennis McGuire, chairman of Technology Partners, Inc., notes that the majority of his clients close outsourcing deals, but that's because he specializes in matchmaking.

He says Technology Partners determines up front whether there's good cause for a deal, eliminating cases in which one side or the other is not seriously interested in doing business.

"You don't get married just because you need a date for Saturday night. Likewise, you don't outsource for a problem that's going to disappear in three months," says Robert Rough, chief financial officer at Little Rock, Ark.-based Harvest Foods, which outsources to IBM's Integrated Systems Solutions Corp. ■

The legal force be with you

When a single oversight in a contractual agreement can cost an IS shop dearly in surplus charges down the road, small wonder that IS chiefs often turn to consultants — and lawyers — when negotiating and crafting outsourcing deals.

Experts warn that while outsourcing vendors spout partnership rhetoric, the fact is they are in it to make a buck and will capitalize on unforeseen computing circumstances at a client's site.

Dennis McGuire

"If vendors were smart, they'd stop using the term 'partnership.'"

Consultants, including several who have previously worked with vendors, are mindful of the hidden charges that can appear out of outsourcing's blind alleys and how clients can get lulled into them, especially in an era when outsourcing relations appear to be warming.

"I think the days are gone when a CIO would rather see the Angel of Death or Darth Vader at their door than an EDS representative," observes Gartner Group, Inc. analyst Rita Terdiman, referring to outsourcer Electronic Data Systems Corp. "They'll walk to the moon for you, but if you ask them to do anything that's not in the contract — watch out," she cautions.

Among the conditions that users often overlook in contract negotiations, Terdiman says, are termination, extraordinary business circumstances such as client bankruptcy, and the addition of services.

Rudy Hirschheim, a University of Houston business professor and outsourcing consultant, says he is aware of an outsourcing customer who agreed to such a gross underestimation of computing needs that he now pays more than $1 million a month alone in "above baseline" computing charges.

Hirschheim cautions against seemingly innocuous contractual conditions that can come back to haunt a client, such as "change of character clauses," which can effectively oblige the customer to make large payments to the outsourcer for something as simple as changing word-processing suppliers.

Robert Zahler, a partner at Washington, D.C.-based law firm Shaw, Pittman, Potts & Trowbridge, puts it bluntly.

While relationships with outsourcers "can be collegial," Zahler says, "not one of these relationships is a partnership.

"Partnership is a term [vendors use] to avoid the hard questions. Their interests are separate. If you try to make them the same, you're trying to force a square peg into a round hole," says Zahler, who specializes in negotiating outsourcing deals.

Dennis McGuire, a former EDS manager who now runs his own Houston based-consultancy, Technology Partners, agrees.

Robert Zahler

"Partnership is a term vendors use to avoid the hard questions."

"If vendors were smart, they'd stop using the term 'partnership,'" he says.

Vendors concede that there is money to be made, or at least charged, in unforeseen circumstances.

"If the work load goes up in an unplanned way, you can expect it will cost more," says Harvey Cohen, director of commercial operations for Unisys Corp.'s commercial outsourcing operations. "Outsourcing vendors are not clairvoyant, and they're not precognitive."

With consultants emerging from the woodwork — and often from vendor ranks — outsourcers acknowledge that users are more knowledgeable these days and therefore harder to sell to.

"A lot of consultants have caught on to outsourcing and are educating the users," notes Ron Johanson, manager of systems technology at Integrated Systems Solutions Corp. in Boulder, Colo.

Potential customers "now have a higher understanding of what it takes to consider outsourcing," he says.

—*Mark Halper*

Executive Track

Andrew M. Vignola is the new executive vice president at Great Neck, N.Y.-based **Institutional Group Information Corp.**, a management consulting firm serving the banking industry. Vignola formerly served as senior vice president of the information services group at **The Dime Savings Bank**.

In Atlanta, **Fleet Finance, Inc.** has expanded its information systems staff: **Linda Bubke**, formerly assistant vice president of system services at **Security Pacific Financial Services** in San Diego, is newly aboard as Fleet's assistant vice president of system support. At her new post, Bubke assists in overseeing Fleet's on-line accounting system for loan and legal compliance documents.

The Promus Companies, Inc. in Memphis late last month named **John M. Boushy** to serve as its senior vice president of information technology and corporate marketing. Promus is the parent company of several major hotels and casinos.

Boushy joined the company in 1979 as manager of data processing at Harrah's Atlantic City; since then, he has held systems development and marketing positions at the corporate and brand-name levels, as well as serving for several years as executive assistant to Promus' chairman of the board. In his newly minted position, Boushy's responsibilities will include a focus on implementing hotel information technology strategy and expanding the use of information technology for all Promus holdings.

Herbert Tesser, assistant director and head of research and development at Long Island, N.Y.-based Grumman Data Systems, has been named chairman of the department of computer science and software development at **Marshall University** in Huntington, W. Va. Tesser, who chaired the computer science department at Brooklyn, N.Y.-based Pratt Institute prior to joining Grumman in 1985, will also become co-holder of a Marshall's Arthur and Joan Meyer Weisberg chair of computer science.

Have you or a colleague in the information systems field recently been promoted? *Computerworld* would like to share the news with the rest of the IS community. Please contact Senior Editor Nell Margolis at (800) 343-6474 to pass along the news.

Book Reviews

Technotrends

By Daniel Burrus with Roger Gittines; HarperCollins; Publish date: October 1993; Estimated price: $25

Using an analogy of a card game in which technology has dealt all the players a new hand, Burrus shows how businesspeople must take advantage of the new technological tools that will decide success for the next several decades.

Without knowing the new rules of the game, Burrus hypothesizes that most companies are currently playing high-stakes poker with half a deck. He gives the seven players in his card game 24 new "tool" cards to work with and a set of new rules. Some samplings: Past success is your worst enemy; learn to fail fast; if it works, it's obsolete.

The Twenty-four Hour Society

By Dr. Martin Moore-Ede; Addison Wesley; $22.95

A leading expert on circadian rhythms of alertness and fatigue, Moore-Ede points out that the technological leaps of the late 20th century are in danger of burning out the humans who ostensibly control them. While machines can run around the clock without difficulty, humans cannot. This basic fact almost guarantees errors, no matter how sophisticated the computer system.

Moore-Ede provides a blueprint to build a human-centered society where technology and management are designed to optimize human alertness, performance and reliability.

What Computers Still Can't Do

By Hubert L. Dreyfus; The MIT Press; $13.95

An updated version of his original 1972 manifesto on artificial intelligence, Dreyfus' revision outlines the changes in the field since then and discusses the scope and limits of artificial reason. His main mission is to focus attention beyond computers onto the question of intelligence itself. In the process, we come to understand not only a computer's limitations but also our own.

Enterprise Information Technologies

By Bruce Love; Van Nostrand Reinhold; $35.95

With competitive stakes rising and the advantages of conventional computer automation slipping, companies must look farther afield to gain an edge from their technology.

Author Love picks a variety of ideas and solutions, including real-world prototypes and designs, detailed checklists and a conceptual framework for automating information, the best ways to exploit existing data, a comprehensive systems integration model, the most promising vendor visions, clear guidelines for open systems implementation and promising downsizing paths.

Calendar

JULY 25-JULY 31

All about IBM '93. Aspen, Colo., July 26-28 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Enhancing Performance with CIC Alternatives. New York, July 27 — Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

AUG. 1-AUG. 7

Siggraph '93. Anaheim, Calif., Aug. 1-6 — Contact: Siggraph '93 Conference Management, Clarendon Hills, Ill. (708) 850-7843.

Tools USA 1993. Santa Barbara, Calif., Aug. 2-6 — Contact: Tools Conferences, Santa Barbara, Calif. (805) 685-1006.

Downsizing Expo. Santa Clara, Calif., Aug. 3-5 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

AUG. 8-AUG. 14

Sounds of Change: Emerging Technologies/Reengineering State Government. Nashville, Aug. 9-11 — Contact: National Association of State Information Resource Executives, Lexington, Ky. (606) 231-1970.

AUG. 15-AUG. 21

International Networking Conference '93 (INET). San Francisco, August 17-20 — Contact: Universities Space Research Association, Mountain View, Calif. (415) 390-0317.

Client/Server '93 East. Washington, D.C., Aug. 17-20 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-5717.

AUG. 29-SEPT. 4

Fed Micro '93 CD-ROM and Multimedia Conference and Exposition. Washington, D.C., Aug. 31-Sept. 2 — Contact: Tom Lauterback, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Structured Development Forum. Philadelphia, Aug. 31-Sept. 2 — Contact: Esprit Systems Consulting, Inc., West Chester, Pa. (215) 436-8290.

SEPT. 5-SEPT. 11

Comparapc '93. Las Vegas, Sept. 9-11 — Contact: UNSC Investment Group, Newark, Calif. (510) 657-3418.

SEPT. 12-SEPT. 18

Engineering Document Management Systems. Anaheim, Calif., Sept. 14-16 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 871-6808.

SEPT. 19-SEPT. 25

Document World '93. Hartford, Conn., Sept. 22-23 — Contact: Key Productions, Inc., Hartford, Conn. (203) 247-6363.

SEPT. 26-OCT. 2

OOPSLA '93: Conference on object-oriented programming systems languages and applications (OOPSLA). Washington, D.C., Sept. 26-Oct. 1 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Imaging Expo. New York, Sept. 28-30 — Contact: Comtek International, Wilton, Conn. (203) 834-1122.

OCT. 3-OCT. 9

The Ninth International Congress on Advances in Nonimpact Printing Technologies/Japan Hardcopy '93. Yokohama, Japan, Oct. 4-8 — Contact: The Society for Imaging Science and Technology, Springfield, Va. (703) 642-9090.

OCT. 10-OCT. 16

Design/West. Anaheim, Calif., Oct. 10-12 — Contact: Karl Steidl, Reed Exhibition Cos., Stamford, Conn. (203) 964-0000.

Hypertext '93. Seattle, Oct. 14-18 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

OCT. 17-OCT. 23

C++ World. Dallas, Oct. 18-22 — Contact: SIGS Conferences, New York, N.Y. (212) 274-0640.

OCT. 31-NOV. 6

Seventh International Conference on Design for Manufacturability. Orlando, Fla., Oct. 31-Nov. 4 — Contact: Management Roundtable, Boston, Mass. (617) 232-3090.

Federal Imaging 1993. Washington, D.C., Nov. 2-3 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

NOV. 7-NOV. 13

Share Fall 1993. Long Beach, Calif., Nov. 7-10 — Contact: Share headquarters, Chicago, Ill. (312) 644-6610.

First Annual Pan Am EDI Users Conference and Exhibit. Orlando, Fla., Nov. 8-10 — Contact: EDIA/EDICC Pan Am. Conference Registrar, Alexandria, Va. (703) 838-8042.

Pacific Region DB2 Conference. Sydney, Australia, Nov. 10-12 — Contact: International DB2 Users Group, Chicago, Ill. (312) 527-4777.

FEB. 13-FEB. 15, 1994

SIGDA: Workshop on Field Programmable Gate Arrays. Berkeley, Calif., Feb. 14-15 — Contact: Association For Computing Machinery, New York, N.Y. (212) 944-1318.

MARCH 6-MARCH 12, 1994

PC '94 Show. Sydney, Australia, March 8-11 — Contact: Eileen M. Lavine, Information Services, Inc., Bethesda, Md. (301) 656-2942.

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The CW Guide to
Business-to-Business Communications

MAKE ROOM, EDI

BY JOE PANEPINTO

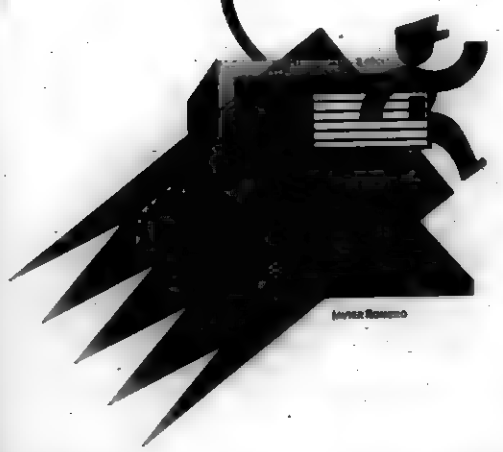
At one time, electronic data interchange (EDI) was the only game in town for exchanging documents electronically. Today, new combinations of voice, fax, electronic mail and transaction processing technology present less formal yet still effective ways to automate business communications. With the universality of the phone and near ubiquity of fax and E-mail, many companies are opting for this more casual cabal of messaging systems.

For instance:

- Business partners can check account balances or shipment status via voice-response and fax-back systems dialing into transaction processing systems.
- Companies can exchange standard and nonstandard EDI documents via E-mail and dial-up systems.
- Users can fax documents by selecting items off their E-mail menu rather than printing them and feeding them into a fax machine.

"People are finding there are lots of alternatives to EDI. Some are even in their own backyard, like E-mail," says Ann Palermo, director of office systems research at International Data Corp., a

EDI, *page 104*



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If all this sounds like a significant enough advancement to you, call us at 1-800-554-4446. We'll send you a free demo disk and a NetWare 4.0 planning guide which includes the easy (honest!) step-by-step upgrade procedure.

yes NetWare

NOVELL. The Past, Present, and Future of Network Computing.

TECH UPDATE

It doesn't take cutting-edge technology to hook up a firm's E-mail system with that of a business partner. But vendors and users are just now starting to understand how E-mail fits into the interbusiness puzzle.

•For many companies, the first step is to link disparate internal systems. Turnkey vendors such as SoftSwitch, Wang Systems, Inc. and Retix Corp. can integrate internal E-mail products and also provide a gateway to X.400 networks. Alternatively, users can purchase a separate gateway for each E-mail system they need to connect. Turnkey solutions generally provide some directory synchronization services, though synchronization remains a labor-intensive process. Vendors are slowly moving toward the X.500 standard for directory services. Historically, the chief disadvantage of such products has been cost. The price is slowly declining, however.

•Many companies are separating their client and back-end mail systems to get access to better back-end management tools. For example, Lotus Development Corp.'s CC:Mail can serve as an end-user interface while connecting to Hewlett-Packard Co.'s OpenMail, says Matt Cain, a program director at Meta Group, Inc. in Westport, Conn.

•The Internet is increasingly serving as a bridge between partners in electronic commerce. For example, the government's EDI program is on the Internet, but it is not sufficiently secure for most business transactions, says Richard Drummond, president of Fort Worth, Texas-based consultancy The Drummond Group.

Derek Slater is an assistant editor at Computerworld.

Getting rid of curled thermal fax paper is probably the most popular fax innovation in office employees' eyes. But vendors have been busy with other improvements:

•Fax/modems

In 1992, voice capability was integrated into the fax/data chip set, allowing users to manage data, voice and fax messages on their desktop PCs. National Semiconductor Corp.'s Tyln 2000 fax/voice/data modem, for example, can convert voice messages to digital form and store them in memory or disk.

In 1993, a binary file transfer protocol for fax transmission was approved, which makes it possible to edit a received fax.

•Fax servers

The greatest advantage of a fax server is its cost efficiency. Brooktrout Technology, Inc. recently increased this efficiency with its intelligent fax router, which can decide the least expensive route.

E-mail is commonly supported by fax servers. This allows an employee to initiate a fax to another company from within his E-mail system. Novell, Inc.'s Messaging Handling System and Microsoft's Message Application Program-

Make room, EDI

CONTINUED FROM PAGE 101

market research firm in Framingham, Mass. "Companies that don't have the resources to implement full-blown EDI are finding that E-mail and fax suit the same purposes."

That realization has spurred an estimated $8 billion "electronic commerce" industry for which vendors have already formed an alliance (the Alliance of Computer-based Telephone Application Suppliers) and decided on an acronym (CTI, for computer/telephone integration) that purport to pull it all together.

For vendors, there's been a beehive's worth of activity aimed at redirecting products to integrate other functions: E-mail vendors are adding fax and voice; voice-response vendors are adding E-mail and fax; PC- and local-area network fax board makers are adding E-mail and voice. Everyone is using the phone lines. Most recently, Microsoft Corp. announced its computer/telephony At Work initiative to pull office machines together under one umbrella.

Users forging ahead

But end-user organizations have not been waiting for splashy announcements. Carolina Freight in Cherryville, N.C., for instance, has a four-piece communications system in place for its business partners (see box below).

"At the time we started to build this system more than a decade ago, there were no products that did everything," says John Rudasill, president of Carrier Computer Services, Inc., the wholly owned information systems subsidiary of Carolina Freight. "We're not about to trash a system that works, but if I were just starting out today, I may look for a product that handles fax, data and voice."

Source: The Yankee Group, Boston

Fulfilling needs such as Rudasill's is exactly what a new generation of companies hopes to do, with what we might call "integrated electronic commerce software." Such companies include Edify Corp., Xcellenet, Inc., Computer Application Services, Inc., Notework Corp., Integrated Systems and Communications, Inc. and Futurus Corp.

These electronic commerce systems make extensive use of existing E-mail and data communication systems as the backbone on which all electronic documents travel.

FAX ON DEMAND

SYNOPTICS

Communications, Inc., an intelligent hub vendor in Santa Clara, Calif.

Via any Touch-Tone telephone, business partners can call an 800 number, enter the ID and then enter the phone number of the closest fax machine to get a status report faxed to that number immediately. The company bases its on-line system on Electronic Workforce software from Edify Corp.

EDI PLUS

CAROLINA FREIGHT,

an $800 million trucking and freight company in Cherryville, N.C.

Agents are given four ways to verify orders, track rates and check on shipments. High-end partners use an ANSI X12 EDI system. Midsize partners use one of two home-grown PC products that dial into the mainframe: One downloads files from a bulletin-board system; the other automatically faxes reports via a Gammalink Corp. PC fax board. Low-end partners get much of the same information using a Touch-Tone phone to dial into a CCS Corp. voice-response unit on a dedicated PC.

Cost savings key

In fact, the technology is less awe-inspiring than the cost savings it can bring. At Louisiana Land & Exploration Co. (LL&E), a diversified petroleum company in New Orleans, what started as a way to transmit invoices in batch turned into a boost to the bottom line.

LL&E uses EMS, an E-mail and work-flow application from Computer Application Services, to integrate E-mail and fax communications with its business partners.

When drilling an oil well, drilling reports and supply requisitions are uploaded daily to LL&E's mainframe via simple file transfer from an IBM PC on its oil rigs. The mainframe sends the information to the regular print spool but with a special tag recognizable to the EMS system. EMS then forwards the reports to either a partner's fax machine or an E-mail box on third-party networks.

"We originally brought in EMS as a niche application for transmitting invoices in batch to our refinery," says Mike Hahn, manager of information services at LL&E. "Eventually, we started using it to mail- and fax-enable other applications."

The system not only cut overhead costs by automating daily correspondence but also allowed the company to get steeper discounts on drilling supplies. Because supply requisitions are uploaded from each rig daily, EMS is able to gather the requisitions into a single large order, which it then faxes to a list of LL&E's suppliers. LL&E then contracts with the lowest bidder.

Lower phone bills

Other companies report unexpected cost savings. World Radio Missionary Fellowship (WRMF) in Colorado Springs integrated much of its fax, E-mail and telephone traffic and cut the costs of communications among its sister stations around the world. WRMF's system is built around an integrated electronic messaging system called Noteworks 2.0 from Noteworks. The company also has a dedicated fax server from Optus, Inc. running on an IBM PC.

Users in the Colorado Springs office can send word processing or spreadsheet documents to the fax server for delivery to sister stations globally. At the same time, users of a DaVinci Systems, Inc. E-mail system at the mission's flagship station in Quito, Ecuador, can address

messages to the fax server for printout in the Colorado Springs office. The result is cheaper communications, according to Dan Shelley, computer operator at the company.

Noteworks also automates phone-message routing in the Colorado Springs office. When a business partner calls, the receptionist opens a preaddressed message form on her Windows PC, fills in the data and gives the message priority status. Noteworks sends it to the recipient, who is notified via an icon and audio beep.

"Using Noteworks, our receptionist can send me a 'flash call' if I am on the phone. It's a marquee-type message that tells me who is waiting," Shelley says.

Futurus' Futurus Team products offer similar E-mail, phone messaging, fax server and workgroup capabilities, as does Xcellenet's RemoteWare family of integrated software tools.

Fax automation

Other companies have realized cost savings from a marriage of transaction processing, fax and phone technologies. SynOptics Communications, Inc., a $250 million Santa Clara, Calif.-based maker of intelligent hubs, has increased its sales 40% by building an automated fax-back order/backlog/sales shipment system with Electronic Workforce work-flow automation software from Edify, according to Sandy Johnson, systems administrator at SynOptics.

Every morning, the Edify software receives backlog reports from The ASK Group, Inc.'s Manman system on the company's Digital Equipment Corp. VAXcluster and faxes backlog status acknowledgments to a predefined list of distributors.

Additional cost savings applications built around Edify include a fax-back or voice-response system that SynOptics distributors can call to retrieve backlog status reports by entering ID and personal ID numbers. Edify converts the Touch-Tone sounds to a transaction request submitted to Manman, then reformats the resulting transaction response and routes it to the appropriate fax machine.

Merged technologies

Even though integrated electronic commerce products are just hitting the market, the line that previously separated the different technologies is forever blurred.

"What we're really talking about is integrating technologies to change the way companies use communication channels and information," says Ron Charnock, chairman of the board of the Alliance of Computer-based Telephone Application Suppliers.

"The benefits, dollar savings and differentiation in the marketplace offered by integrated electronic messaging systems are invaluable," says Jim Burton, president of Computer-Telephone Link, Inc. in Boston. "Companies want to communicate with business partners more seamlessly, and the integration of electronic technologies lets them do it." ■

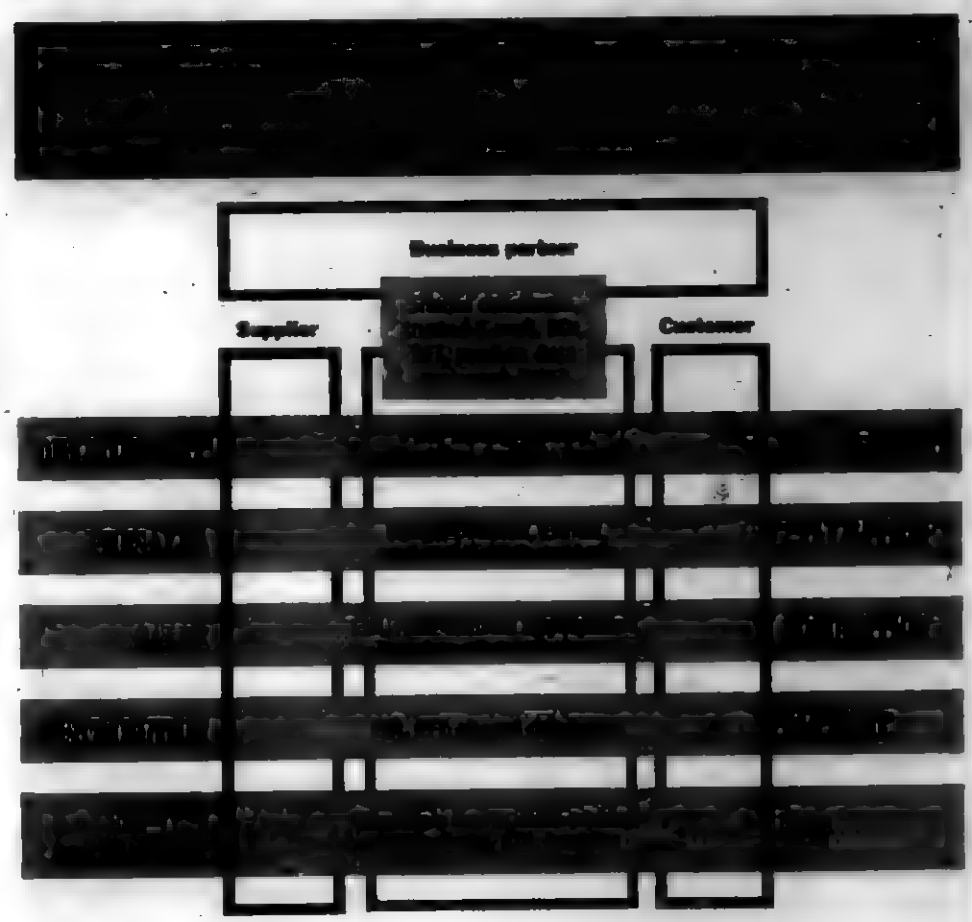
Panepinto is a free-lance writer in Amherst, Mass.

MIXED MEDIA

WRMF,

the Colorado Springs headquarters for a worldwide Christian ministry

Via software from Noteworks Corp., WRMF can communicate with its partners in a number of electronic ways, including internal and external E-mail routing, fax server receipt and transmission and telephone call routing.



Source: Gartner Group, Inc., Stamford, Conn.

ming interface are commonly supported E-mail standards.

Voice is now emerging within fax server products as well. LAN fax server companies, such as OAZ Communications, Inc., Trio and Octus, let all message types be accessed from the same mailbox. For companies with diverse computer platforms, there are now fax servers from Biscom, Inc. and T4 Systems that are compatible with a wide range of environments.

Janet Fugazzotto is a senior market analyst at BIS Strategic Decisions in Norwell, Mass.

Recent announcements will drive down the cost of linking phone systems and voice-response units with PCs and LANs.

Microsoft and Intel are building the Telephone Application Programming Interface to standardize the way PCs control the phone. Novell and AT&T announced in January that they will link NetWare servers and phone switches. The first product will be a NetWare Loadable Module that ties into AT&T's Definity private branch exchange (PBX).

Look for the following applications and functions to find their way into interbusiness communications:

•Departmental servers.

As costs drop, PBX services will shift to departmental solutions, which will interface with PBXs, mainframes and LANs to integrate voice and data.

•Integrated messaging

Integrated messaging at the desktop is one of CTI's major capabilities. The ability to scan, view and listen to any type of message with a GUI is here today. Dialogic Corp. in Parsippany, N.J., is providing the enabling technology to many of the early vendors.

•Information management

It is very easy to group, dissect and analyze call data with CTI. In a customer support department, for instance, you can determine whether your business partners' issues are being handled correctly the first time.

•Caller identification.

The PC can be used to screen calls. Caller ID software is available. You can set the PC to allow only a half-dozen important callers to get through, for instance, while everybody else gets sent to a voice mailbox.

Jim Burton is president of Computer-Telephone Link, a consulting firm in Boston.

EDI is best for sensitive financial transactions among multiple trading partners. These types of communications require formal standards, such as those from the Consultative Committee for International Telephony and Telegraphy and the American National Standards Institute.

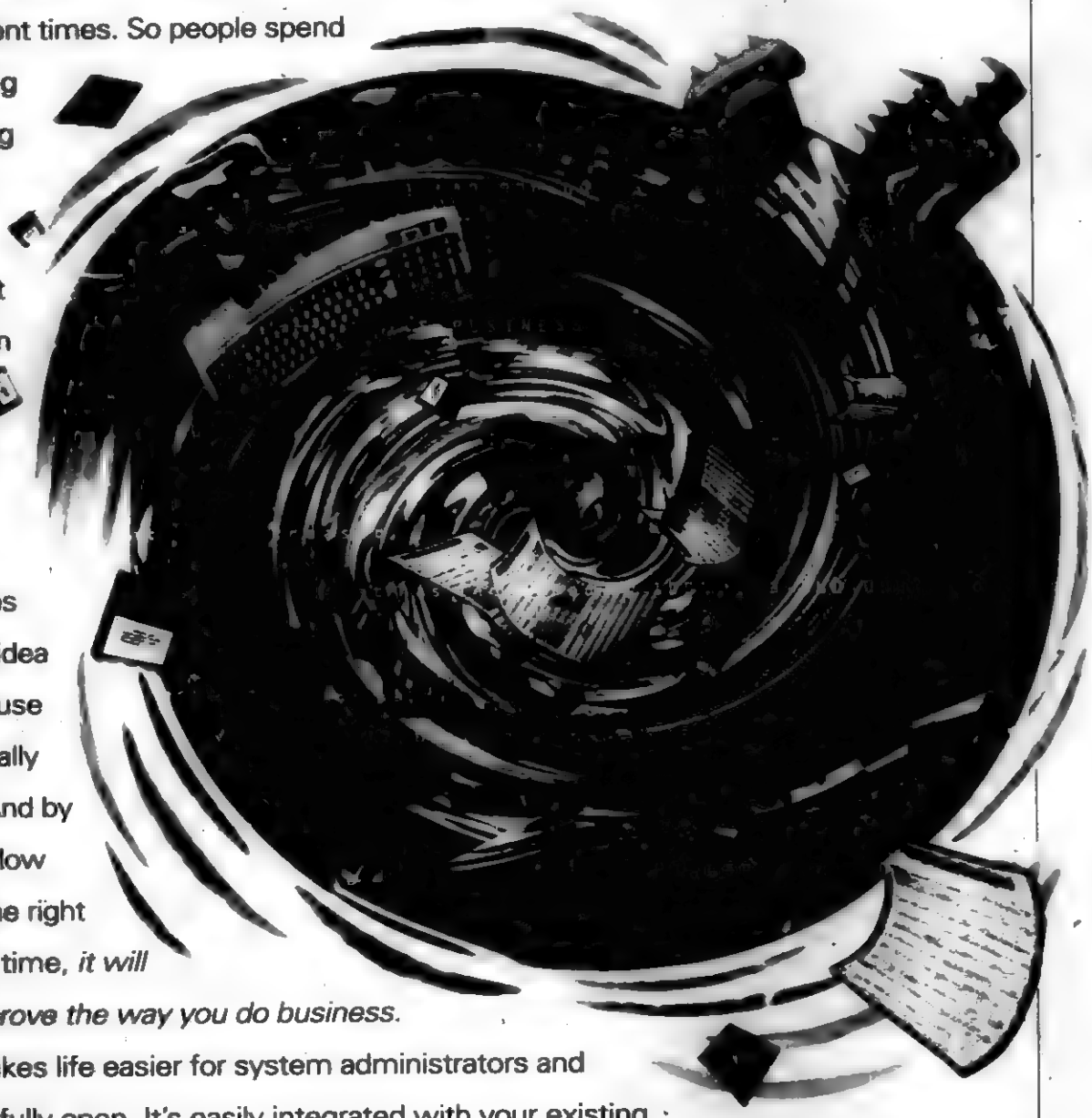
For less sensitive data, such as order-tracking, marketing or rate-checking, companies find that less robust systems suffice. Most notable among these systems are emerging global E-mail networks, such as the Internet and X.400, and commercial systems such as MCI Mail and AT&T EasyLink. — *Joe Panepinto*

XEROX

So, you SAY you don't have a problem with workflow?

Although companies have invested billions of dollars in technology, the hourly output of the average worker has increased by only 1% per year, over the last two decades.

What went wrong? It's largely a matter of different technologies moving in different directions, at different times. So people spend more time thrashing than they do getting work done.



Fortunately, there's a way to get everyone working in sync: InConcert Workflow Management Software, from XSoft.

InConcert goes beyond the typical idea of "software," because it's tailored specifically to your business. And by synchronizing the flow of information to the right people at the right time, *it will fundamentally improve the way you do business.*

InConcert makes life easier for system administrators and users because it's fully open. It's easily integrated with your existing hardware and software and compatible with any database you choose. But more importantly, InConcert is extraordinarily easy to use. Users can complete even the most complex tasks through a simple graphical interface. So they actually enjoy using it.

Curious? We'll send you a free white paper, "Getting the Job Done: A Guide to Workflow Management." **Just call 1-800-626-6775, ext.143.**

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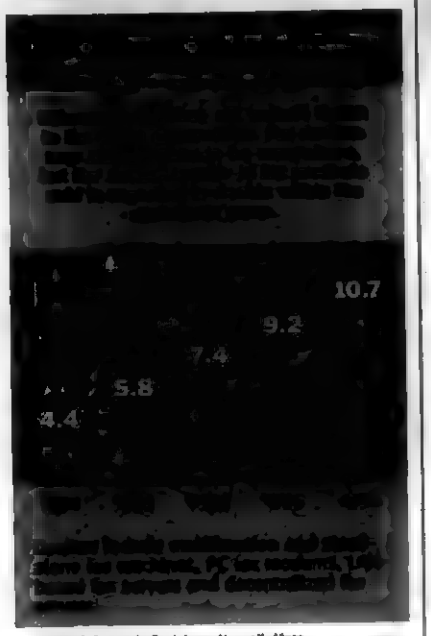
Microsoft not the only one 'At Work'

By Joe Panepinto

You could view the recent Microsoft Corp. At Work announcement as the latest episode in the "Microsoft takes over the world" saga, but truth be told, there's been lots of action in the computer/telephone integration (CTI) arena that didn't first pass through Redmond, Wash.

In case the Microsoft At Work Architecture story isn't familiar, we'll run through it quickly. Last month, Microsoft



Source: BIS Strategic Decisions, Norwell, Mass.

and 60 of its closest business partners announced a new software architecture that will allow easier integration of the whole spectrum of office equipment: telephones, fax machines, copiers, printers, PC fax boards, fax modems and, of course, Windows PCs.

The major components of the architecture are a Microsoft At Work operating system (a real-time multitasking operating system for office devices); Microsoft At Work communications software (which supports Microsoft's Messaging and Telephony application programming interfaces); and Microsoft At Work desktop software for Windows-based PCs. There is also a Microsoft At Work graphical user interface and rendering software.

Coming attractions

Microsoft plans to have applications and system software development kits available for telephony, fax and handheld devices before the end of the year. The whole thrust of the architecture is to create de facto standards to integrate electronic office devices. Ideally for Microsoft, the resulting system (suitable for all forms of electronic commerce) would be controlled from a Windows PC.

That is all fine and good. Microsoft has promised that future releases of Windows will have the Microsoft At Work communications software. And with the enormous installed base of DOS and Windows PCs, anything Microsoft does can have an enormous impact.

However, one of the most graphic examples of CTI may be available this summer, and it doesn't involve Microsoft at all.

Rolm, one of Microsoft's major partners in the Microsoft At Work project, has been hard at work with Apple Computer, Inc. developing NotePhone, a telephone set that will double as a docking station for Apple's soon-to-be-released Newton personal digital assistant, according to Arie Litman, a senior developer at Siemens/Rolm.

The NotePhone offers a peek into what is going on in the telecommunications side of the emerging market for systems that support electronic commerce.

The way Litman tells it, the integration of the NotePhone and Newton turns the handheld Newton into a telephone device, not vice versa. When integrated with the NotePhone, the Newton can send and receive faxes and transmit files. Lotus Development Corp. may even release a version of 1-2-3 for the Newton. The Newton/NotePhone combination is scheduled to ship this summer. ■

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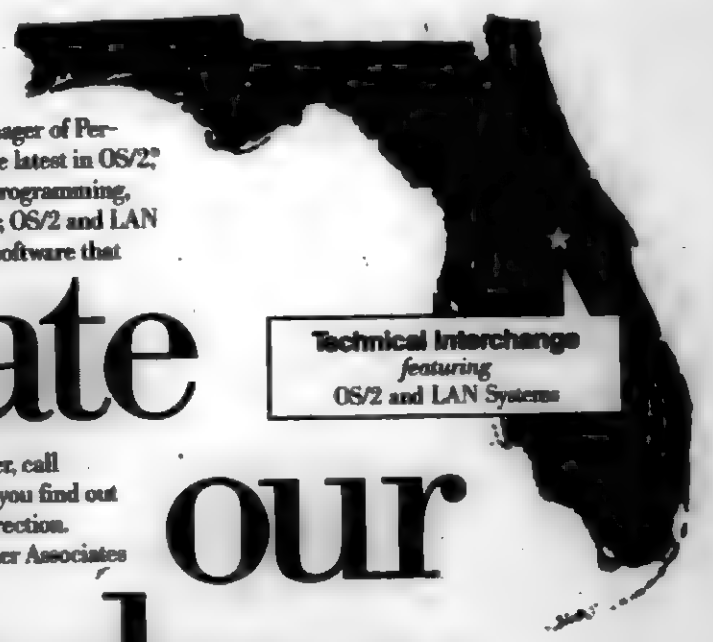

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IBM

Buyers' Scorecard: Harbinger's IntouchEDI gets highest satisfaction score

By Kevin Burden

The paperless office may never be more than an exhibit at Walt Disney World's Epcot center, but EDI's coming of age may clear off at least a portion of some desks.

Increasing acceptance of electronic data interchange (EDI) document structure standards and more powerful desktop computers have made EDI communications attractive and affordable to small and medium-size companies, widening the market for the estimated 50 vendors.

Last year, EDI software vendors tallied $102 million in combined revenue, according to Torrey Byles, EDI/electronic commerce program manager at Input, a consulting firm in Mountain View, Calif.

In a market where almost everyone appears to be considered equal, HarbingerEDI Service's IntouchEDI was the clear winner of the Buyers' Scorecard, posting an overall satisfaction rating of 78. The other three competing packages each scored an overall rating of 75. The packages, which were chosen based on market share leadership, are General Electric Information Services' (GEIS) EDIPC Systems, Sterling Software, Inc.'s Gentran and Supply Tech, Inc.'s STX.

Harbinger's IntouchEDI scored the highest rating in three out of the five categories rated as being the most important features of EDI software. Only GEIS' EDIPC scored higher in both support of multiple trading partners and support for different standards. EDIPC also beat the others in the areas of multiple networks supported and integration capabilities.

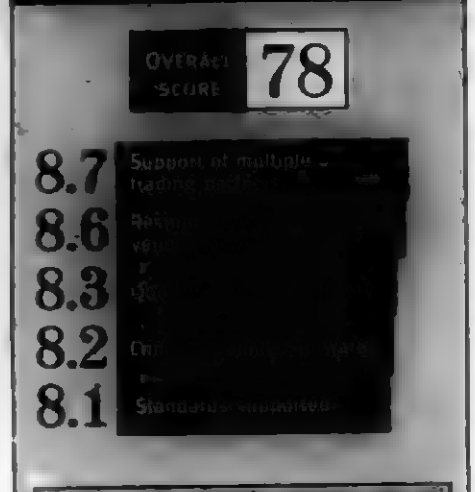
The strengths of Sterling Software's Gentran lie in its compliance checking and the number of standards supported. But its documentation quality scored below that of the others. Coupled with low scores in vendor support and user interface, Gentran users can find themselves in a lengthy learning curve.

Supply Tech's STX, which actually scored an overall satisfaction rating slightly below those of the others before being rounded off, scored enticing marks in the categories considered to be most important to users. Only Harbinger scored higher ratings in support and responsiveness to the user. STX's mapping features also rated superior to the others. The product's major drawbacks, users said, are its documentation and lack of flexibility.

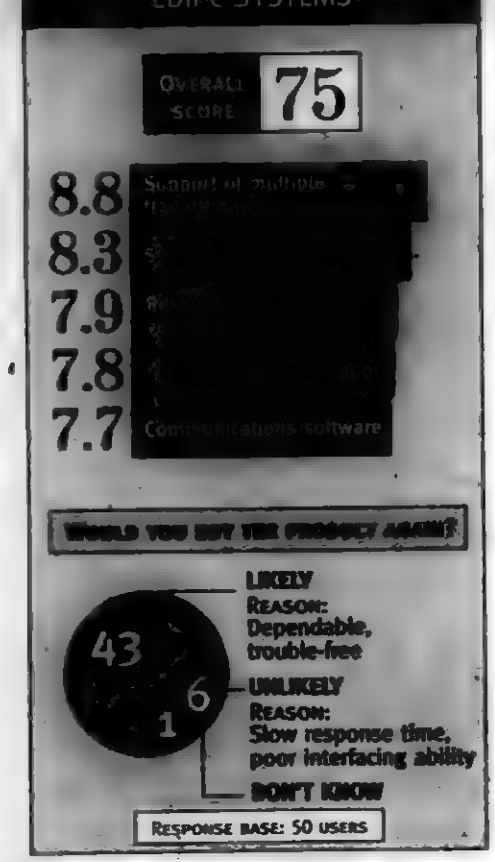
Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on satisfaction with their EDI software in 18 specific categories. All categories were factored into the final scores. The scores for each product in the five most important categories are listed in the charts. ■

COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

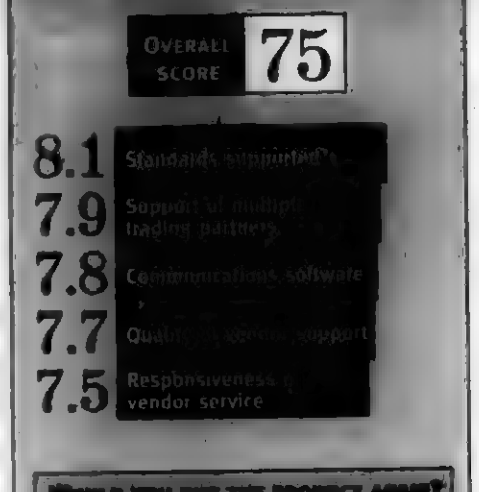
HARBINGEREDI SERVICE'S INTOUCHEDI



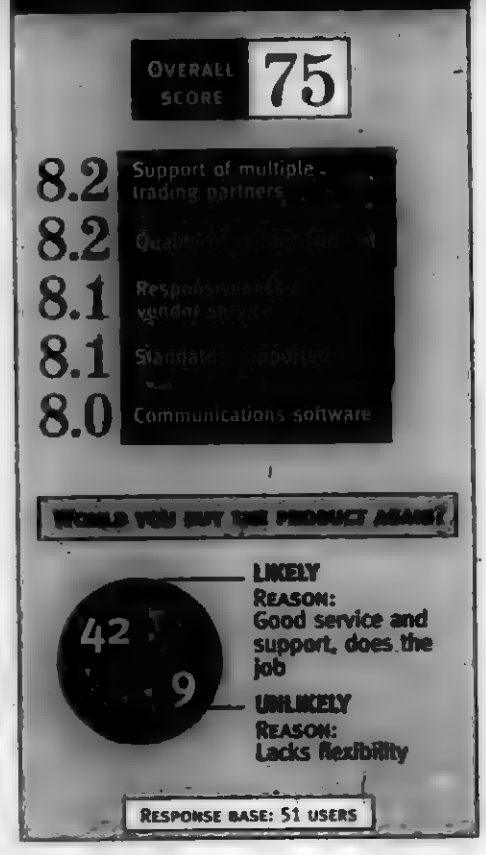
GEIS' EDIPC SYSTEMS



STERLING SOFTWARE'S GENTRAN



SUPPLY TECH'S STX



BUYERS' SCORECARD

User names were obtained from nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 201.

Users rated satisfaction with their installed products and were not asked to compare or rate one product directly against another in the Scorecard.

To compute the overall score for each product, we performed the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers were rounded off where necessary.

Computerworld thanks the following individuals and firms for their assistance in preparing this Buyers' Scorecard: *Computerworld* Database Division; Torrey Byles, Input; Frad Sammet, EDI Spread the Word; Ruth Andersen, EDI Group; and Shahida Sweeney, Phillips Business Information, Inc.

DELL

Lotus' Notes: Ideal for intercompany communications but has support and pricing deficiencies

Notes

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

- **Evaluators said Notes is a unique and viable environment for intercompany communication, although Lotus Development Corp.'s technical support for Notes was substandard.**
- **They also concurred that Notes provides extremely high value as a document-based communications and database environment.**

Originally released by Cambridge, Mass.-based Lotus in 1989, Notes remains the only client/server environment with a dedicated application development language, a replicating document-oriented database and a bevy of communications and administration options.

Such features have come to be noticed as the ideal mechanisms needed to support intercompany communication. Two of the evaluators participating in this Firing Line — the business consulting and the computer consulting firms — were using Notes to distribute proprietary research to their customers. The software development tools company was using Notes to provide ongoing technical support to more than 150 customers, while the insurance company was using it to collect information from external organizations.

The evaluators for this Firing Line were responsible for Notes efforts at their companies and had been using Notes for more than two years. They had collective oversight of more than 11,000 Notes users and 125 servers and exchanged information with more than 220 external companies.

Ease of installation

Notes demands extensive technical knowledge to install, the evaluators said. Network protocols and configuration must be accounted for, and a host of security settings, replication commands and application development options make installation all the more taxing.

Insurance firm: "We didn't anticipate that it was so extensive an environment, and we had to do a lot of work."

Software firm: "Some of the quirks were in keeping with an innovative product in a distributed network environment."

Computer consultant: "Installation takes more time than [we] expected."

Reliability

Reliability was generally good, the evaluators said, but they agreed that Notes should provide better notification of problems, such as a failure to replicate databases. Although they concurred that most problems were due to improper configuration, they said it was not good to have users, rather than the Notes software, notifying them of problems.

Insurance firm: "As traffic and usage increased, we had to work through some issues."

Business consultant: "In light of the effort, it was reasonably reliable."

Computer consultant: "Very few failures, but the lack of failure notification caused some problems."

Performance

Because Notes provides fairly unique features, the evaluators generally agreed that its performance is not a driving issue for their applications.

Software firm: "SQLBase, Oracle and Sybase are far less suitable for the text-driven, remote communications capabilities of Notes."

Computer consultant: "Performance has never been an issue."

Security

With Notes being used for a variety of informational and customer databases, security was a concern for the evaluators. They said security features were generally robust and extensive but required ongoing adjustments as applications and server configurations changed.

Software firm: "Any security problems we've had have been of our own making."

Computer consultant: "There are some holes in the intercorporate security features, while local security is quite good."

Technical support

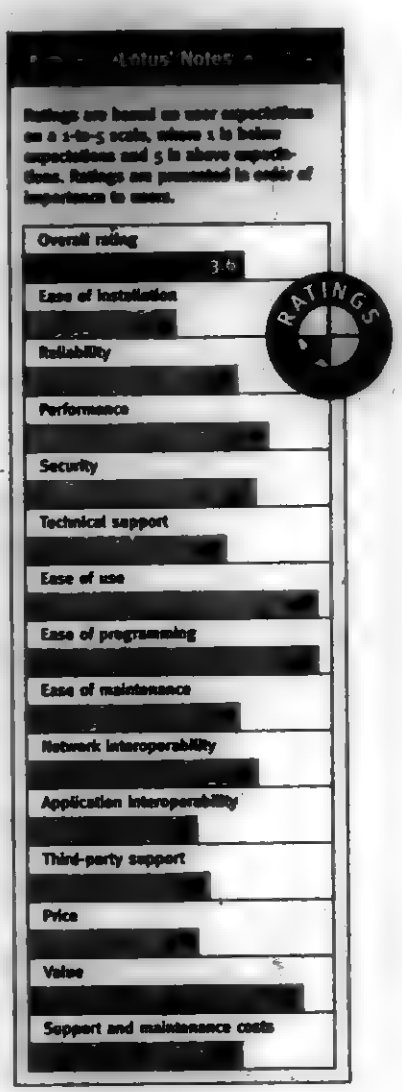
The evaluators all relied primarily on internal Notes experts and other consultants for most technical support and were able to solve most problems on their own. However, some evaluators said Lotus' Notes support organization was unprepared to deal with a number of technical questions.

Insurance firm: Lotus' "hot line support is poor. Our local [consultant] support helps us a lot."

Software firm: "We solve a lot of our own problems."

Computer consultant: "The

Notes, *page 112*

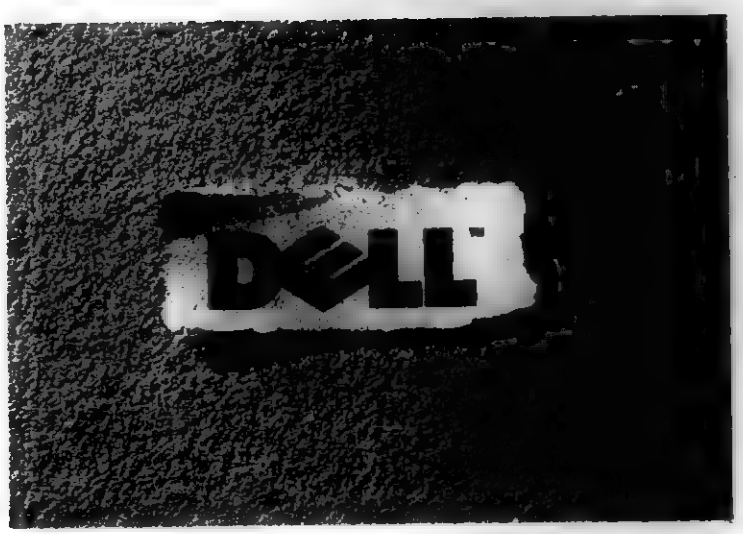


SITE PROFILES

Installation descriptions for users who evaluated Notes

	Insurance firm	Software firm	Business consulting	Computer consulting
Using Notes for	2 YEARS	2.5 YEARS	3+ YEARS	2+ YEARS
Primary applications	RESEARCH, PROBLEM MANAGEMENT	SALES SUPPORT, TRACKING, BULLETIN BOARD	INFORMATION SERVICES, SOFTWARE SUPPORT	INFORMATION SERVICES, CONSULTING
Number of servers	20	6	110	1
Number of internal users	800	500	10,000	15
Number of other organizations involved	9	150	30	50

LEADER.



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CLONE.

IBM PC Co. follows Dell's lead with new support options

By Neal Boudette

Two months after Dell Computer Corp. introduced a menu of user-support options, IBM Personal Computer Co. has followed suit.

IBM's new Customer Protec-

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Evaluators say Lotus' Notes is

easy to use but difficult to install and manage

CONTINUED FROM PAGE 110

product itself requires little tech support. The ability of Lotus to support it is highly questionable."

Ease of use

The evaluators were unanimous in their opinion that Notes is very easy for end users to work with. They said it was not at all difficult for general staffers to create simple Notes applications and that Notes was far easier to use than most client/server systems.

Software firm: "Compared to relational, client/server systems, it's very easy to write applications."

Computer consultant: "The better the application is built, the easier it is for users."

Ease of programming

Compared with other client/server software solutions, such as Visual Basic and SQL Server, or relational database programming tools, Notes is very easy to program, according to the evaluators. The software company evaluator said the Notes API Toolkit, which uses a C language programming interface, was about average for C-based programming tools, offering "no special help" in development.

Insurance firm: "We've taken assistants and secretaries and turned them into Notes programmers."

Business consultant: "For sharing databases, it's easy, but there are some limits to what you can do with Notes forms."

Ease of maintenance

Evaluators gave Notes mixed responses for maintenance. Notes administration, they said, is easy, while upgrading to new versions is difficult.

Insurance firm: "It's pretty easy to develop and, therefore, pretty easy to maintain applications."

Software firm: "The big headaches are solved in Version 3.0 design templates."

Network interoperability

The evaluators had few difficulties working with heterogeneous network protocols. Both in-house and external network connections were fairly easy to implement. Problems were generally resolved with the aid of the internal network support staff, the evaluators said.

Insurance firm: "It was very easy to set up and to get servers communicating, but the SNA support is not as easy as I thought it would be."

Software firm: "Our network is fairly homogeneous, and the in-house staff can handle most of the tough questions."

Application interoperability

Notes supports common data exchange mechanisms such as Dynamic Data Exchange and Object Linking and Embedding. The evaluators said they thought this was a plus for end users. However, they said it was difficult to exchange data with relational databases using SQL.

Insurance firm: "We had to do a lot of coding using the API Toolkit to get information from non-Notes systems."

Computer consultant: "Accessing structured data is nonexistent without API programming."

Third-party support

The evaluators made very little use of third-party training or support. Most support was provided by internal staff and, to a limited degree, contract consultants. The developer said third-party training organizations were needed but had not yet come to fruition.

Business consultant: "The market is still lacking for third-party training."

Computer consultant: "When [third-party organizations] need support from Lotus, they're as stuck as we are."

Price

In the past, Notes demanded a fairly high entry price, exceeding $50,000. Lotus officials maintained that the complexity of Notes demanded the resources and support of larger companies. Today, Notes carries a suggested retail price of $495 for a single client or server license. Still, some evaluators said they thought Notes pricing was higher than that of other Windows applications.

Insurance firm: "Compared to other products, it's very expensive."

Software firm: "We're a Windows shop, and Notes has proven very cost-effective compared to other Windows programs."

Business consultant: "Because we have to charge our external clients [for Notes installations], it's a fairly expensive way to extend our service delivery."

Notes features

- Used in more than 1,500 organizations worldwide, according to Lotus officials.
- Currently supports Windows and OS/2 servers and clients. Macintosh client to be delivered this summer. Unix and NetWare Loadable Module servers to be shipped during the second half of 1993.
- Includes embedded programming and administration tools.
- Notes Release 3, unveiled in March, supports nine network protocols.

Value

The evaluators concurred that Notes provided a range of features and facilities without equal. They said it allowed them to develop applications that would be difficult or impossible to create using conventional tools.

Insurance firm: "It does a lot more than anything else out there."

Computer consultant: "There's absolutely nothing else that could let us do what we're doing with intercorporate communication."

Support and maintenance costs

Evaluators said Notes was less expensive to support than other client/server systems but that it still was not cheap. They said development costs were spread across departments, reducing the cost of a dedicated support staff, and that it was cheaper to maintain than most client/server applications.

Software firm: "Compared to relational systems, it costs less in maintenance, design and programming."

Computer consultant: "To build similar systems [using other alternatives] would require tremendous amounts of support and ongoing maintenance that Notes gives us for free."

Written by senior editor Garry Ray.

Lotus responds

Responses to issues raised in this evaluation were provided by Cliff Connaughton, director of marketing for Lotus' Notes.

•**Technical support:** Our business is supporting client/server technology. As the Notes business continues to grow, we have responded by making ongoing and significant investments in our support offerings. We have invested in people; processes, including problem tracking; and electronic support, including Knowledge Base, fax support, dial-in bulletin board service and CompuServe.

•**API Toolkit support:** Support contracts specific to the Notes API are packaged with the Notes API. The API purchaser is issued a "Prompt ID" for Notes API support, which is a separate support contract from the Notes product support "Prompt ID."

•**Security:** Lotus' Notes security is based on a public/private key encryption and digital signature system designed by the world's leading computer security experts. The Notes replicator uses this authentication protocol when exchanging information with authorized file servers. Lotus' Notes not only has no inherent security holes but also cannot feasibly be breached, even by a determined attack.

•**Pricing:** $495 is a good and fair price for a software product that has demonstrated a 400% customer return on investment. As we release Unix and Novell, Inc. NetWare Loadable Module servers for Notes, we offer improved price/performance and true scalability with high-performance hardware platforms.

•**Windows server:** The new Windows server is targeted for smaller workgroups or new companies just getting started with Notes. It is an intelligent solution for a remote office, small business or department requiring fewer than 10 concurrent users. Initial response has been positive and exceeds our expectations.

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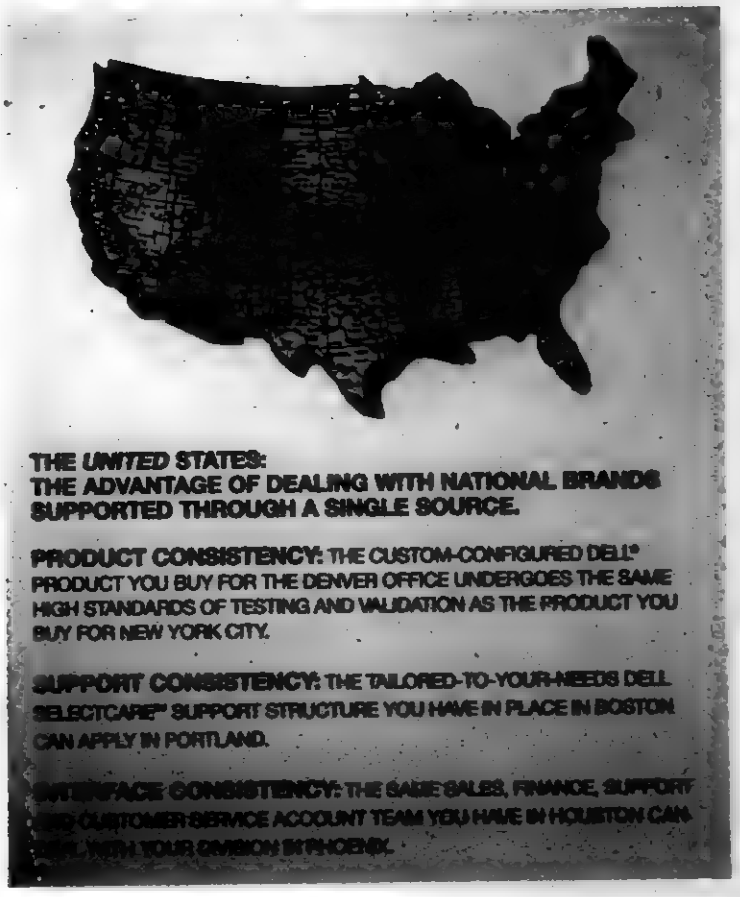

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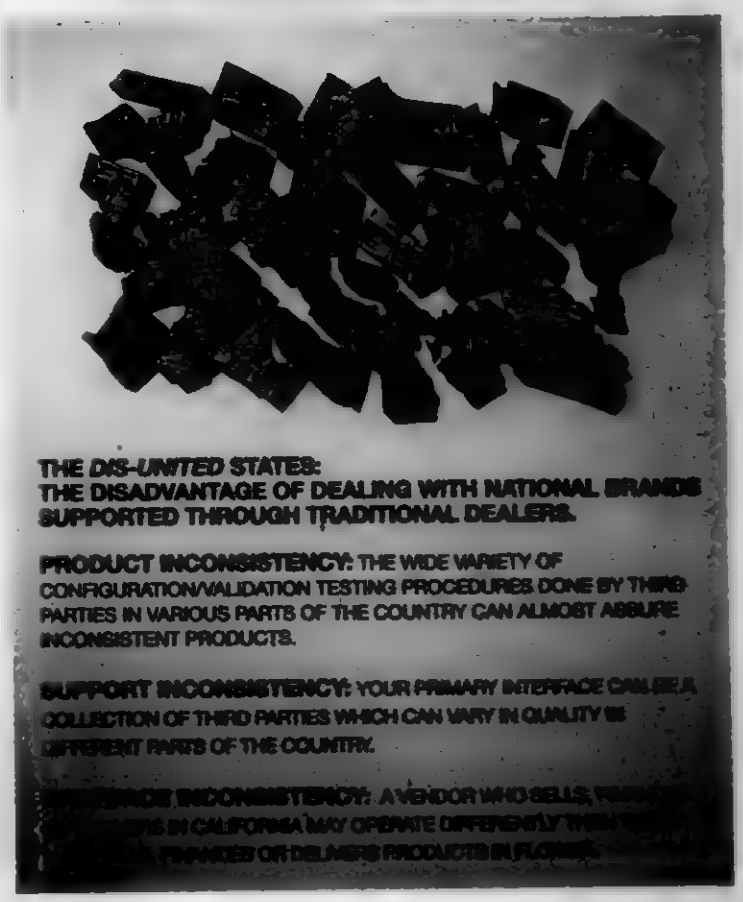

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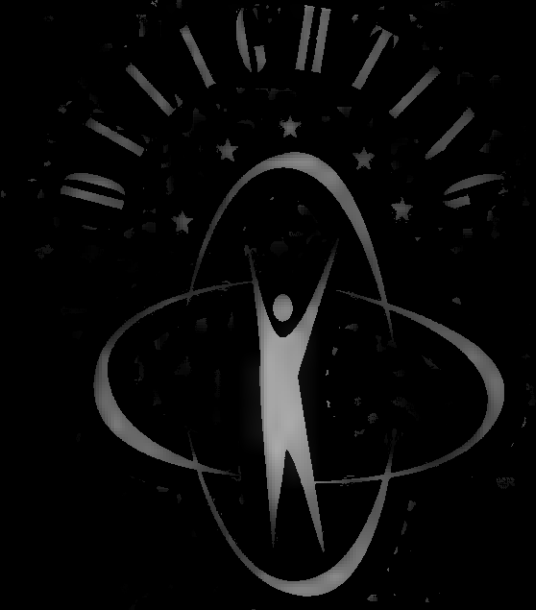

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USERS WANT INTEROPERABILITY.

SHARE

THEY WANT SYSTEM X TO WORK WITH SYSTEM Y.

AND

DATA EXCHANGE STANDARDS, AMONG OTHER ADVANCES,

SHARE

WILL GO A LONG WAY TOWARD MAKING THAT HAPPEN.

ALIKE

BY DAN LYNCH

THE INTEROPERABILITY IDEAL is to make every technology and product compatible (or interoperable) with every other so that the maximum number of users can effortlessly exchange information anywhere in the world.

THE INTEROPERABILITY REALITY is that while we have reached interoperability at a very basic level, we have not yet hit on ubiquitous computing. We are, in fact, creeping toward the global communications village.

Interoperability is the glue that makes products work together. Users want all the pieces to work together so they don't have problems with printing, file transfer, file conversion and file translation. They want vendors to clear up this technical issue so they can get on with their business.

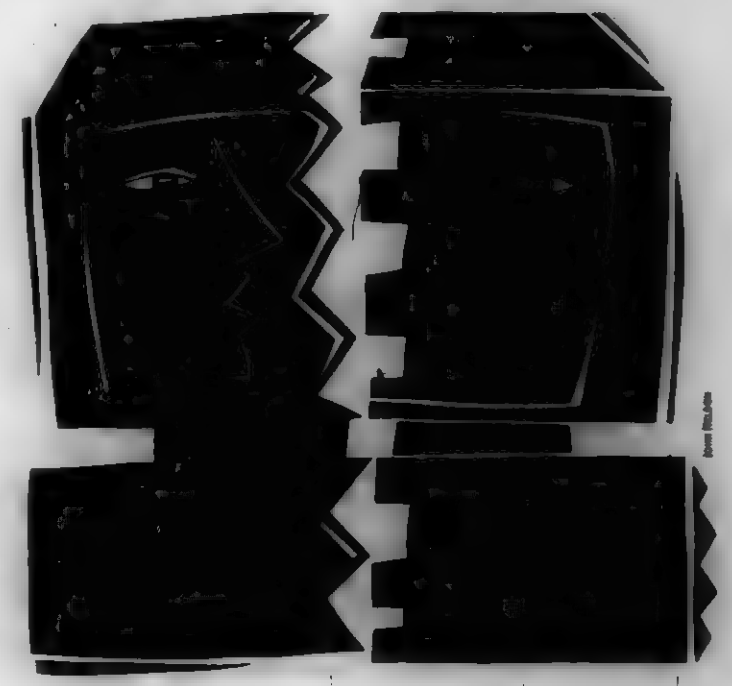
Easier said than done. To date, the great "success" in basic interoperability has been ASCII electronic mail. Through ASCII (a simple set of codes designed for the interchange of information among computers), users can exchange textual information.

Companies such as Nordstrom, Inc. and Du Pont Co. send ASCII messages, through gateways, virtually anywhere in the world via MCI Mail, the Internet, CompuServe and other services.

However, the fact remains that ASCII E-mail, even with its great advantages, is difficult to use across dissimilar platforms. And think about it: Even as I write, E-mail is shifting from being an exchange of pure text to one in which multimedia plays a part. But we are still unable to exchange video, graphics, voice and formatted text anywhere from any system.

What limited interoperability at the ASCII level has managed to do, however, is fuel the fire within users. They refuse to be connectivity hostages any longer and want interoperability at all levels. In my years of talking to thousands of users, I've gathered a list of their demands for more sophisticated options, such as multimedia mail, and products that work together. What they need from vendors is the following:

Interoperability, *page 116*



Lynch is chairman and chief executive officer at the Interop Co., an educational services company in Mountain View, Calif. that sponsors conferences and exhibitions. He is credited by some with coining the term "interoperability."

Interoperability

CONTINUED FROM PAGE 115

USERS NEED STANDARDS THAT WILL ENABLE SEAMLESS INFORMATION EXCHANGE.

For interoperability to mean anything to end users, products must be easy for users to employ, regardless of where the data is going or how it gets there.

Standards to make this possible are in the works in the realm of multimedia mail.

You can't have easy-to-use multimedia mail without definitions for audio and video formats, annotation methods and methods for creating, packaging, presenting and shipping files.

There are two major contenders for the multimedia mail standard:

•**X.400 Message Handling System.** *Industry standard. Standards community-developed. Not yet available.*

X.400 will have the capability to handle various content types (fax, ASCII, sound, color photos, video). It will have components dealing with mail center-to-mail center management. X.400 uses Office Document Architecture (ODA) compound documents as body type, with ODA limited to text, vector and raster graphics.

•**The Multimedia Mail Extension (Mime) to the Simple Mail Transfer Protocol (SMTP).** *De facto standard with 90% of the capabilities of X.400. User-developed (Internet community). Available now.*

Mime has the capability to handle the same content types that X.400 can handle. For mail center-to-mail center management, it depends on its backward compatibility with SMTP. It, too, supports various content types, including ODA, but generalizes to text, compound documents, binary applications, image, audio and video.

I believe Mime will be the key multimedia mail system by 1995.

The reason is that formal standards processes tend to be sluggish, and the X.400 standards process is no exception. To date, it has failed to produce a standard to connect disparate systems. Part of the holdup includes negotiating new service provider agreements.

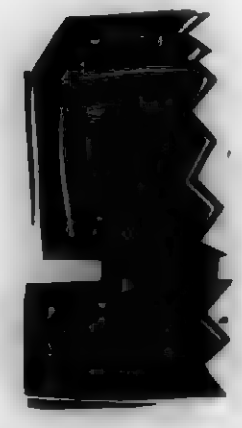
Mime hasn't been held back by a formal process. As a feature enhancement to the existing Internet infrastructure, Mime is essentially running code brought about by a rough consensus.

Internet users and engineers have been able to put Mime right to work.

Even with the tussle among standards continuing, users can expect multimedia mail to be as easy to use as ASCII mail within five to seven years.

USERS NEED APPLICATIONS THAT CAN RECOGNIZE ANY FORMAT, IMMEDIATELY AND TRANSPARENTLY.

How many times have you received a file that is translated into ASCII gibberish or that looks like a student's first program? Users want the ability to seamlessly exchange files that arrive complete and in their original format.



HOW MANY TIMES have you received a file that is translated into ASCII gibberish? Users want the ability to seamlessly exchange files that arrive complete and in their original format.

Some would argue that today's integrated applications enable easy information exchange. For example, Microsoft Corp.'s Works and Borland International, Inc.'s Office give users a suite of business applications (word processor, spreadsheet and database). These integrated applications provide a basic level of interoperability; they can share information.

However, although Borland's Quattro Pro and Microsoft's Excel files can be imported and exported from one environment to another, files created in one environment are not 100% compatible with identical files created in the other environment. So when converting files from one format to another, something gets lost in the translation.

The goal is to enable all related applications to read one another's files without the need for user translation. Such interoperability would require vendors to develop and share common standards for data translation and exchange.

Some environments, namely Windows or Macintosh, may point out a direction in which to head. Applications for these environments are built from the beginning to share common menus and functions as defined in the software developer's kits.

USERS NEED A UNIVERSAL NUMBERING SYSTEM ON THE INTERNET SO DATA CAN BE ROUTED ANYWHERE.

The Internet, which connects 100 countries and a million hosts globally, might be the best bet for the underpinnings of a worldwide data network.

But before such a global network can efficiently serve the masses, it will need to become as efficient as the telephone system.

On the Internet, the only way you can currently get in touch with anyone is if you know the person's address.

There is no central directory of addresses and no on-line operators to assist you. The fact that the Internet is a collaborative user effort rather than a commercial business has hurt it: There is no motivation by any one user to provide such a listing.

Even if a user ventured to take on the task, he would have to overcome some big hurdles. For instance, there is no standard for numeric systems. From company to company, addresses use a different number of alphanumeric characters and even separate those characters in an address differently.

For example, my own address is unique depending on which hat I'm wearing: *diynch @interop.com* or *diynch @interop.the.enterprise.interoperability.event.com*.

There is good news, however. I think that by the year 2000, or soon thereafter, users will get a universal numbering system. This data numbering system will be able to identify all possible communications points in the same way that phone numbers identify an area code, city code, country code and end point (home or office).

AT&T is reportedly already at work on such a numbering system.

.....

Naysayers are claiming that interoperability is taking too long to come. There are politics, too much bureaucracy and not enough deliverables.

In some ways, they're right. But while the sluggish pace can be nerve-racking, I don't think things will stop. I have to agree that interoperability is coming slowly... but it is coming. ■

ONE-STOP INTEROP INFO

DEFINITIONS

- **File Transfer Protocol (FTP)**
  The Internet protocol (and program) used to transfer files among hosts.
- **Internet**
  The largest internetwork in the world, consisting of large national backbone networks and a myriad of regional and local campus networks all over the world.
- **Mail gateway**
  A machine that connects two or more E-mail systems (especially dissimilar mail systems on two different networks) and transfers messages between them. Sometimes the mapping and translation can be quite complex and generally requires a store-and-forward scheme, whereby the message is received from one system completely before it is transmitted to the next system after suitable translations.
- **Simple Mail Transfer Protocol (SMTP)**
  The Internet E-mail protocol.

RELATED READING

- **Data Communications and Interoperability**
  By Richard Markey (Prentice Hall)
- **Distributed Computing, A Practical Synthesis**
  By Amjad Umar (Prentice Hall)
- **Enterprise Networking: Working Together Apart**
  By Ray Grenier and George Metes (Digital Press)
- **The Internet System Handbook**
  By Daniel C. Lynch and Marshall T. Rose (Addison-Wesley Publishing Co.)
- **Internetworking Computer Systems: Interconnecting Networks and Systems**
  By John McConnell (Prentice Hall)
- **Open Systems Handbook**
  By Tom Wheeler (Bantam Books)

What works with what

Talk about getting your arms around an 800-pound gorilla: The Open User Recommended Solutions (OURS) group in New York is in the midst of gathering support for a database that might help information systems managers in search of making interoperability a reality in their companies. The database — entitled "What Works with What," or W4 — will tell users how interoperable a given system is with any other system, says Elaine Bond, OURS founder and senior consultant for The Chase Manhattan Bank NA.

The vision is for users to sit down in front of an easy interface (perhaps a graphical user interface) to determine whether different combinations of vendors' hardware, software and networks work together.

Bond says OURS is acting as the consensus builder, hoping to drive the overall building of the system and data collection to a third party. While no one is set to take on the project, she says a likely candidate might be a vendor or product testing laboratory, with OURS involved as an independent overseer. No matter who ends up taking on the job, she says, OURS will insist on massive user input.

Bond says she expects to have a template built by this fall that will include real product data from at least six vendor companies. — *Larry Bottoli, Dir*

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Computer Careers

DOS developers can do Windows

By Michael Drips

IF YOU PLAN to move from DOS to Windows development, be prepared. Windows contains many advantages from a development standpoint. However, its learning curve is steep. The upside is that with today's tools, you can write simple Windows applications in a month. The downside is that gaining proficiency with the Windows application programming interface (API) to write complex programs will take at least six months of steady experimentation.

It's impossible to list every hurdle you will encounter during this migration, but there are some significant adjustments you can anticipate.

Message-passing dilemma

Although approximately 70% of the Windows environment is written in C and 30% in Assembler, your language options are open. Basic, Pascal, Smalltalk, Fortran and even Cobol can be used to write Windows applications. C, C++ and, to a degree, Microsoft Corp.'s Visual Basic remain the mainstream development languages for the Windows environment.

One problem with using languages other than C, C++ or Visual Basic is discovering ways to deal with the message-passing features of Windows. While C and C++ have no problems dealing with the Windows API, Visual Basic can handle only certain messages from specific APIs. The problem with tapping into the Windows API with any language is trying to decipher the Windows Software Development Kit documentation, which is not well-organized.

Device-independent

In DOS, you have to write code to check on what type of system resources are available, such as CPU and monitor types. This ensures that the appropriate code modules are loaded and your application runs properly on a variety of PC configurations. Particularly problematic has been supporting printers in DOS, but Windows has eliminated this concern.

The new challenge with Windows is not only checking the keyboard for input (like you did in DOS) but also dealing with mouse messages (which some of you have already done in DOS). In DOS, normally you only had one application running and a limited number of possibilities when programming for mouse movement. In Windows, because you can run several programs simultaneously, the number of potential messages that can be received from the mouse (based on where the mouse is clicked and whether it is clicked once or twice) is much greater.

Message-driven programming

DOS developers switching to Windows usually find the concept of message-driven programming easy to understand but difficult to rapidly implement. With more than 500 Windows APIs that can potentially send messages, it is the most difficult part of the learning curve. This is a brand new skill for DOS developers, and while you can use your knowledge of languages, you still have to adapt it to the Windows environment. Fortunately, many good books have been written on the subject (see box above).

Development tools for Windows have taken great strides in the last three years. If you're starting out, two products in particular — Borland International, Inc.'s Turbo C++ Visual Edition and Microsoft's Visual C++ — have shortened the learning curve by relieving developers from having to learn a great deal about the Windows API before writing their first Windows program. These products automatically generate code for all basic Windows features such as parent windows, child windows and dialog boxes.

Drips is a consultant and free-lance writer in Prairie Village, Kan.

Development advantages

- **Windows handles graphics routines:** One dreadful programming area of DOS applications is writing a library of graphics routines to deal with the potential variety of screen resolutions and color palettes. The Windows graphics device interface allows you to create graphics that work on a wide variety of output devices. Via the Windows API, there are many core graphics features — from the primitive to the complex — that allow you to develop graphical displays without a great deal of coding and debugging.
- **Windows provides a consistent user interface:** Unlike DOS, all Windows programs act and feel similar. If you can use one Windows program, you can use them all. A Windows developer certainly has the option to stray from the standard Windows interface, but the development advantage in sticking to it is that the Windows API provides built-in functions to rapidly code the interface.

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Telecom management: Staying ahead of the curve

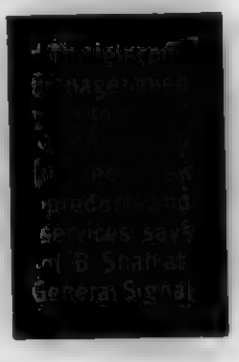
By Candee Wilde

Not so long ago, a telecommunications manager's main concerns were maintaining dial tone and keeping up with adds, moves and changes. Now, keeping up with intersecting and overlapping technologies requires almost nonstop study.

Although telecom managers still deal primarily with managing telephone lines, it is also imperative they understand what is coming across and hooking into those circuits. This requires knowledge of data communications, local-area networks, wide-area networks, voice messaging, voice response, videoconferencing and much more. In fact, at a growing number of companies, a discrete position dealing strictly with telephony no longer exists.

Not only is this position undergoing rapid change, but in some instances, such as other middle management posts, it is also being eliminated. When this happens, the former telecom manager's staff typically reports to another manager in the information systems department, who may suddenly find himself acting as telecom manager, says Frank Schoff, president of Management Recruiters, a Cedar Mountain, N.C.-based placement firm.

If you want to protect your job as much as possible, Schoff suggests your best move is to become as skilled in the area of data telecommunications as you are in the field of telephone systems. In other words, the communication or transport of information is no longer separate from the information processing function. And if telecom managers have formal training in computer sciences or systems management, so much the better, Schoff adds.



J. B. Shah, director of MIS/telecommunications at General Signal Corp. in Santa Clara, Calif., says the telecom manager needs to be continuously trained in new products and services. That challenge would be interesting and rewarding, Shah says, if it weren't for the ongoing need to handle the more mundane problems that crop up almost constantly.

Until several years ago, Shah's job was focused on IS, but as the integration of voice and data gained steam, management of the telecommunications function was added to his responsibilities.

Balancing act

Shah says he finds it very difficult to learn about the technologies that link voice and data communications more closely while coping with the day-to-day firefighting required to maintain a network.

But how do you manage to add knowledge of telecommunications to your IS skills or add data communications skills to a foundation of telephony? Most managers take the usual routes — seminars, conferences and reading — in addition to the 60- to 80-hour work weeks they put in just to keep the network out of trouble. That time commitment pretty much rules out formal education or lengthy seminars for most of them.

Roy E. Smith, manager of telecommunications at Bailey Controls Co. in Wickliffe, Ohio, for instance, has joined the Society for Telecommunications Professionals, which also has vendor members.

"Recently we had a seminar covering how to establish a home workplace for individuals. It showed how what used to be considered major connections between data centers [are] now available for the home worker — having data lines run on the same high-speed circuits as the phone lines," Smith says.

An upcoming seminar offered by this group will cover structured cabling, which has become much more complicated now that the same coaxial cable can carry data traffic as well as voice communications, he says. The requirements for cable installation are much more rigorous for data applications than they are for voice-only use.

More than meets the title

Smith also says he finds it difficult to learn and apply new security technology and install new switches and still "do what I'm supposed to do everyday, handle bills and keep my boss happy." In fact, although Smith's title remains telecom manager, he says that description is no longer accurate.

"It becomes a communications manager, as opposed to a telecom [manager]," Smith says. "Voice and data used to be separate, but today, where is the line?"

Telecom manager Ann Timoney at The Andersons in Maumee, Ohio, says her job now includes not only voice communications but also WAN data communications. "The biggest change is that at one time there was the possibility of division between the voice and data departments," she says. "But now with the need for structured wiring and premise distribution to deport both voice and data, you have to have those two functions merge."

Wilde is a free-lance writer in Easton, Conn.

Skill highlights

The telecom manager's job now requires the following skills:

- Knowledge of data communications, LANs, WANs, voice messaging, voice response and videoconferencing.
- An understanding of the data requirements for developing a WAN link combining voice, computer data and LAN traffic over one circuit.
- The ability to view the problem as part of the MIS team, whether or not the connection is formal.
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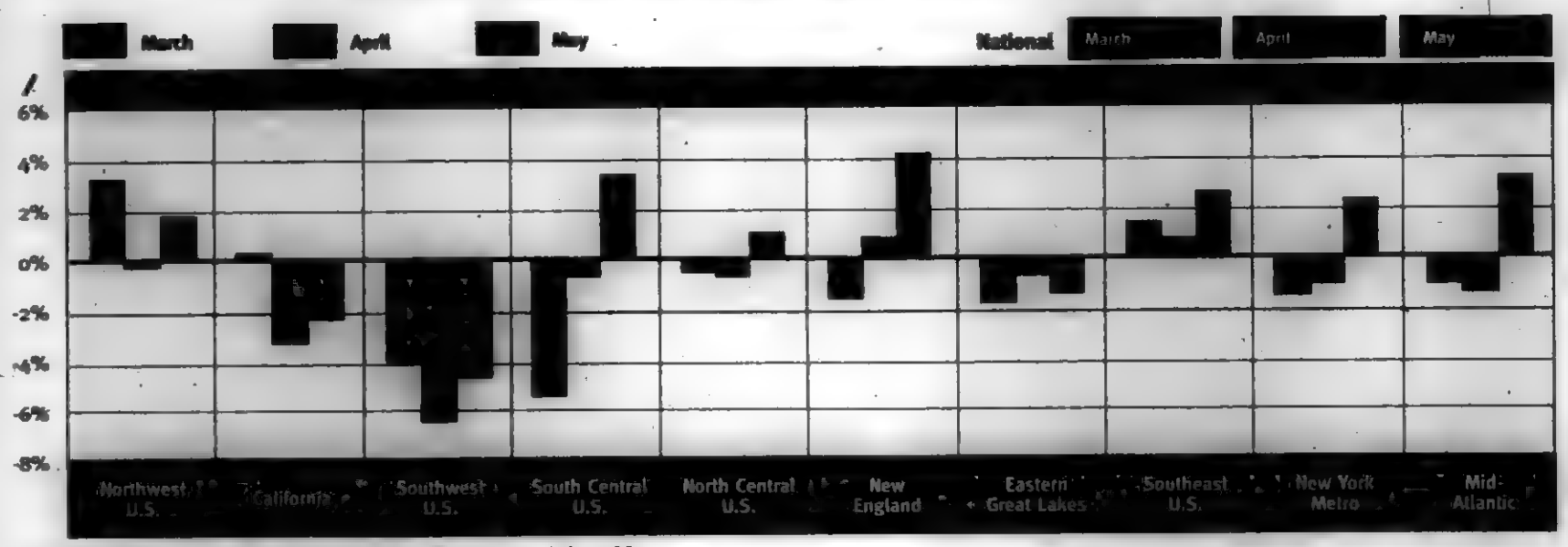

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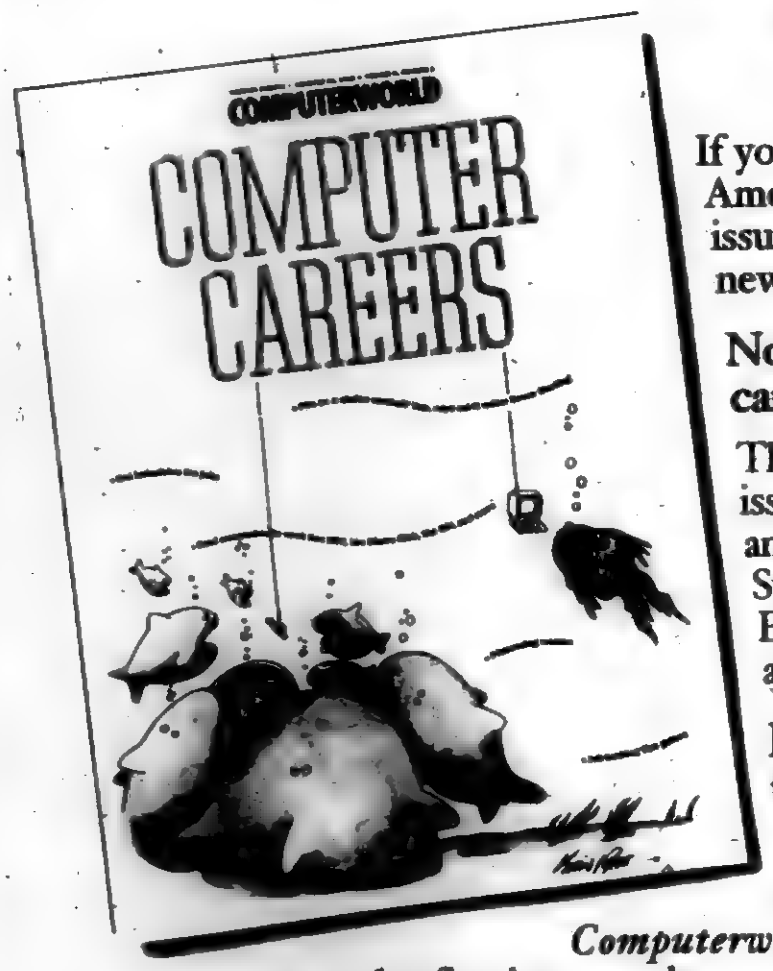

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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!

War of the warranty

By Emily Leinfuss

playing it SAFE

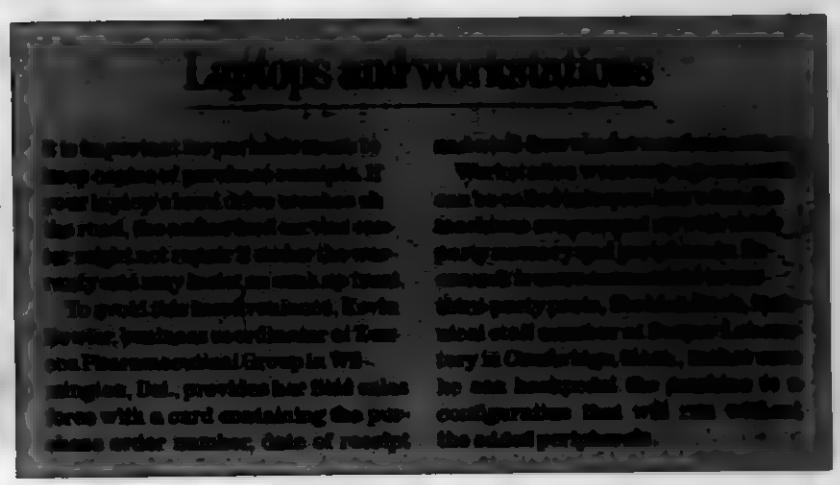
If you're like most people, you probably don't read the fine print on your PC's warranty contract. But breathe easy. In most cases, manufacturers are not out to get you. Many of the circumstances that nullify the warranty can be avoided through common sense. However, mistakes still happen.

THREE MOST COMMON WARRANTY MISTAKES

OPENING THE BOX. Most PC warranty contracts clearly state not to open the computer case and repair the computer yourself. PC users at Zeneca Pharmaceutical Group learned that the hard way when a staff member tried to add another board to fix a problem they were having. In the end, "the fix" caused even more damage, says Kevin Bowler, business coordinator at the Wilmington, Del.-based company. While the vendor replaced the part that originally caused the problems, Zeneca had to pay for the labor. If you've already opened the box and the vendor doesn't notice, Bowler advises to be honest anyway — the vendor might be more accommodating with repairs.

EXPOSING THE PC TO ENVIRONMENTAL HAZARDS. Many warranties warn not to operate the computer in unfavorable environments and to keep dirt and liquids away from the ports on the back panel and keyboard. If these cause physical damage to the machine, they will probably void a warranty, says Rawlen Smith, computer support manager at George Fox College in Newberg, Ore. Smith is authorized by Apple to fix students' machines under warranty but has repaired PCs that were so dusty they were almost not covered under the warranty.

THROWING AWAY THE RECEIPT OF SALE. "Filling out the warranty card isn't nearly as important as keeping the receipt and tracking how long the warranty lasts," says John Farah, manager of PC systems at INCO United States, Inc. in New York. Bowler goes one step further and tapes a folder to the side of the machine containing order numbers and the actual date of the receipt.



A comedy of errors

Just because hardware is serviced under warranty doesn't always mean it will be fixed.

When a major Texas state agency purchased 25 multistation access units for its Token Ring network, no one had any idea that a year later it would end up with 50 nonworking machines from the original vendor, 25 machines that work from a new vendor and a legal dispute on its hands.

The first mistake in this comedy of errors occurred because of a state mandate to purchase on a low-bid basis as opposed to the best solution, says the telecommunications manager in charge. The manager preferred to remain anonymous because of pending litigation. A few weeks after the original 25 machines were installed, the company started to have problems. Five machines were sent back to the vendor, which fixed them and instructed the telecom manager how to fix the rest. He did so, but the same symptoms occurred. This time the vendor sent 25 replacements and the original 25 machines were sent back. The replacements were installed and the same problems occurred. By then, a year had passed, and the machines were no longer covered under warranty.

The manufacturer sent back the original 25 machines, claiming they were all fixed, and said he wanted the 25 replacement machines returned. Past the point of caring, the telecom manager had already purchased 25 machines from a different manufacturer. Currently, he is keeping the 50 machines hostage, and the dispute is in litigation.

Leinfuss is a free-lance writer in Sarasota, Fla.

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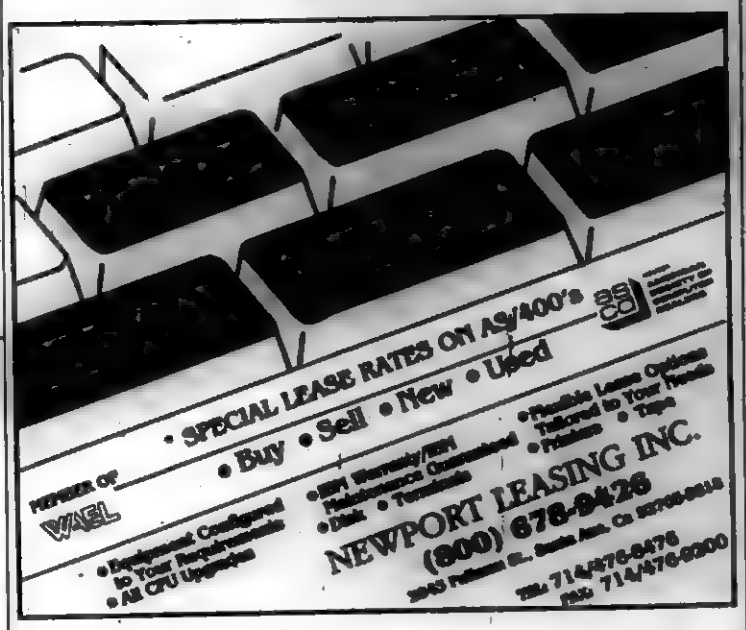

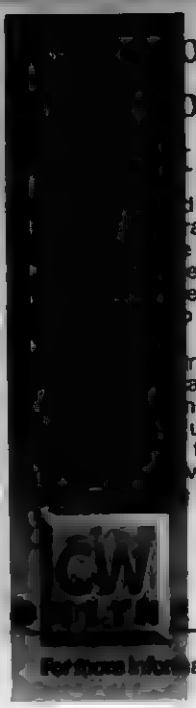

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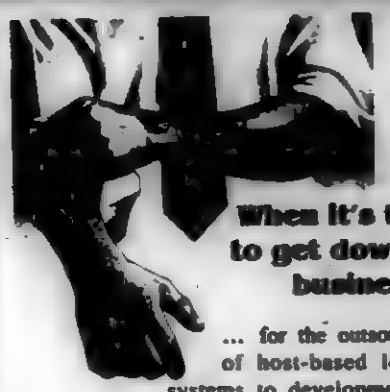

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SOFTWARE FOR SCHOOLS

Matrix Computer Systems, Inc.
Milwaukee, WI ..... (414) 541-3028

SPEECH INTEGRATION

Zeitech, Inc.
Stamford, CT ..... (203) 359-9807

STORAGE MGMT SOFTWARE SVCS

Adept
Riverside, CA ..... (909) 686-7012

TRANSPORTATION SOFTWARE

KCI/The Traffic Manager
Ft. Lauderdale, FL ..... (305) 587-2270

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Open Systems Holdings Corp .(800) 328-2276

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Gainers

Percent

[illegible]	26.5	Lattice Semiconductor (L)	-11.1
Cabot Corp.	20.5	[illegible]	-10.4
Peabody Corp.	15.2	Sequent Computer Sys.	-26.5
NetFrame	14.3	Policy Management Sys.	-26.8
Digital Systems Int'l, Inc.	13.2	Data Race Inc.	-17.4
Frame Technology	13.0	Chips and Technologies	-14.7
Wyner (H)	12.5	Micro Focus	-14.6
Consonant Inc.	12.1	Autodesk Inc. (H)	-12.8

Losers

Dollar

Micro Technology (H)	3.38	Policy Management Sys.	-9.38
Stratus Inc.	3.13	Lattice Semiconductor (L)	-8.25
Cabot Corp.	3.13	Autodesk Inc. (H)	-7.00
Peabody	3.63	Micro Focus	-4.63
Chips&Chips	2.38	Sequent Computer Sys.	-4.50
Compton Corp.	2.50	General Datacomm Indl.	-4.25
Wellfleet Communications	3.38	Lotus Corp.	-4.00
NetFrame	2.13	Cabletron Systems Corp.	-3.25

[redacted]

Computer IPO pace drops off

Computer companies slowed their breakneck race to market in the second quarter, though initial public offerings (IPO) barreled ahead in other industries.

Including all industries, a total of 181 companies went public during the period. The IPOs raised nearly $15 billion in capital, surpassing the first quarter's record by 28%, according to Houston-based investor-relations firm Sommers & Associates, Inc.

Five communications-related IPOs pulled in a total of $446 million, up from two deals worth $48 million in the first quarter. Computer and data processing companies accounted for 18 offerings and raised $409 million, 20% below the total in the first quarter of this year.

More than half of the 18 new computer offerings hit the market in April.

Auspex Systems, Inc. (ASPX) **and The Santa Cruz Operation** (SCOC) **were the largest computer industry offerings, pulling in $80 million apiece with their IPOs. In terms of market reception, however, multimedia game maker 3DO's** (THDO) **IPO was perhaps the most successful (see chart below).**

Sommers & Associates noted that computer companies have raised just less than 5% of the $111.2 billion total capital raised by all IPOs since the beginning of 1991. Financial industry IPOs took the lion's share, earning 49% of the total. Health-related deals were next at 10%.

— Derek Slater

Mixed messages

Investors welcomed some second-quarter IPOs while others got a colder reception. Selected new issues are listed below with their change in share price to date.

Company	IPO date	IPO price	Price 7/7
Cabletron Systems		5	12
BMC Financial		14	19 1/2
Equinox Systems, Inc.		11 1/2	6 1/2
Wang Brand Stratus, Inc.		9 1/2	8 1/4
Intelligent Surveillance Corp.		8	7 1/16
Electronic Retrieval Systems		13	8 3/4
3DO		15	26 3/4
Auspex Systems, Inc.		12	12 1/4
The Santa Cruz Operation		12 1/2	8 3/4

Exch	52-Week High	52-Week Low		July 9 3 PM	Wk Net Change	Wk Pct Change
COMPUTER & OFFICE EQUIPMENTS						
OTC	40.00	9.75	3 COM Corp.	25.63	-1.13	-4.2
NYS	81.00	63.38	American Info Techs Corp.	78.00	-1.63	-2.0
NYS	63.88	40.63	AT&T	61.88	-0.38	-0.6
OTC	4.06	0.75	Abtel Communication Corp.	2.88	-0.25	-8.0
OTC	24.50	10.25	Banyan Systems Inc.	17.50	0.50	2.9
NYS	59.50	44.50	Bell Atlantic Corp. (H)	58.50	0.50	0.9
NYS	57.50	46.75	Bellsouth Corp.	55.25	0.63	1.1
NYS	8.50	3.63	Bolt, Beranek & Newman	7.63	-0.25	-3.2
OTC	18.50	9.50	Broadcast Technology	12.25	-1.50	-10.9
NYS	188.38	48.38	Cabletron Systems	106.00	-1.38	-1.3
OTC	22.75	5.00	Centigram Communications	21.25	-0.25	-1.2
OTC	43.50	19.00	Cincom Corp.	43.50	2.50	6.1
OTC	57.25	22.13	Cisco Systems Inc.	54.50	-0.75	-1.4
OTC	16.38	5.50	Compression Labs Inc.	12.88	-0.63	-4.6
OTC	36.00	13.00	CrossCom	33.75	2.50	8.0
OTC	4.63	1.38	Data Switch Corp.	2.88	0.13	4.5
NYS	19.88	12.38	Digital Comm. Assoc.	13.63	0.50	3.8
OTC	12.75	4.00	Digital Systems Int'l Inc.	5.38	0.63	13.2
OTC	52.00	4.63	DSC Communications (H)	50.63	-0.63	-1.2
OTC	9.50	5.00	Fibronix Int'l Inc.	6.00	0.00	0.0
OTC	24.00	8.75	Filenet Corp.	13.25	1.75	15.2
OTC	4.38	1.50	Gandalf Technologies Inc.	3.00	0.13	4.3
OTC	2.06	0.75	Gateway Communications	1.06	-0.06	-5.5
NYS	15.75	2.88	General Datacomm Inds.	9.75	-4.25	-30.4
ASE	3.75	2.00	Go Video	2.63	0.00	0.0
NYS	37.75	32.13	GTE Corp.	36.50	0.38	1.0
NYS	86.75	62.75	ITT Corp.	85.13	0.00	0.0
OTC	57.88	31.00	MCI Communications Corp. (H)	55.75	-0.88	-1.5
OTC	6.75	2.25	Microcom Inc.	3.06	-0.38	-10.9
OTC	24.25	6.75	Netex Corp.	5.00	0.00	0.0
OTC	19.00	8.00	Network Computing Devices (L)	8.50	0.25	3.0
NYS	15.00	5.38	Network Equipment Tech.	7.00	-0.50	-6.7
OTC	20.13	8.00	Network General	11.38	0.13	1.1
OTC	15.75	8.13	Network Systems Corp.	9.50	0.00	0.0
OTC	49.38	7.50	Newbridge Netwpores Corp. (H)	48.25	0.88	1.8
NYS	46.00	26.13	Northern Telecom Ltd. (L)	26.38	-0.38	-1.4
OTC	35.25	22.50	Novell Inc.	25.75	-0.50	-1.9
NYS	92.50	79.00	Wyner Corp.	91.50	1.25	1.4
OTC	30.00	16.50	Octel Communications Corp.	23.13	0.88	3.9
OTC	6.13	3.38	Penril Data Comm Networks	4.13	0.38	10.0
OTC	30.50	10.25	Pictortel Corp.	24.50	2.00	8.9
OTC	15.25	6.50	Proteon Inc. (L)	4.63	-0.50	-9.8
NYS	35.00	16.09	Scientific Atlanta Inc.	29.50	-2.88	-8.9
NYS	40.75	31.56	Southwestern Bell Corp.	39.25	0.13	0.3
NYS	39.38	21.63	Sprint Corp. (H)	34.00	-0.13	-0.4
OTC	27.00	11.00	Standard Microsystems Corp	16.00	0.00	0.0
OTC	18.50	6.88	Stratacom Inc.	13.13	0.00	0.0
OTC	42.75	10.09	Synoptics Communications	38.25	0.75	2.0
OTC	7.00	3.50	Telebit Corp.	3.50	0.13	3.7
OTC	9.38	2.13	Telematics Int'l Inc.	7.88	0.00	0.0
OTC	25.50	13.50	US Robotics	23.50	0.00	0.0
NYS	47.75	35.25	U S West Inc. (H)	46.88	0.13	0.3
OTC	55.50	14.50	Wellfleet Communications	52.00	2.38	4.8
OTC	16.75	7.25	Xircom	16.75	0.50	3.2
COMPUTER & OFFICE EQUIPMENTS						
OTC	5.56	2.50	Advanced Logic Research	3.88	0.25	6.9
OTC	65.25	37.00	Apple Computer Inc. (L)	37.00	-1.50	-3.9
OTC	24.25	11.25	AST Research Inc.	15.00	0.25	1.7
NYS	10.25	2.50	Commodore Int'l	3.63	0.75	26.1
NYS	61.75	24.50	Compaq Computer Corp.	44.88	-1.25	-4.8
OTC	49.88	16.75	Dell Computer Corp.	18.50	-0.25	-1.3
NYS	89.25	50.25	Newlett Packard Co.	79.13	-0.75	-0.9
NYS	38.50	17.63	Silicon Graphics	37.25	-0.38	-1.0
OTC	61.00	23.38	Sun Microsystems Inc.	30.63	0.38	1.2
NYS	32.38	22.25	Tandy Corp.	29.00	-0.50	-1.7
OTC	7.00	2.75	Zeos International Ltd.	3.25	-0.25	-7.1
COMPUTER SYSTEMS						
ASE	18.38	4.63	Amdahl Corp.	4.88	-0.25	-4.9
NYS	8.75	4.25	Convex Computer	4.75	-0.25	-5.0
OTC	6.13	1.88	Cray Computer	2.88	-0.25	-8.0
NYS	30.88	19.00	Cray Research Inc.	27.00	-0.75	-2.7
NYS	13.88	7.63	Data General Corp.	9.13	-0.13	-1.4
NYS	49.25	30.38	Digital Equipment Corp.	40.25	-0.63	-1.5
NYS	39.25	27.25	Harris Corp. (H)	38.25	0.00	0.0
NYS	100.38	45.88	IBM	46.63	-1.50	-3.1
OTC	22.00	5.50	Kendall Square Research	18.25	-1.00	-5.2
NYS	127.50	83.00	Matsushita Electronics	116.00	-3.25	-2.7
OTC	23.75	8.25	NetFrame	17.00	2.13	14.3
OTC	16.25	9.25	Parallan Computer (H)	15.50	0.50	3.3
OTC	21.00	6.00	Pyramid Technology (H)	20.25	0.00	0.0
OTC	24.00	12.50	Sequent Computer Sys.	12.50	-4.50	-26.5
OTC	8.75	1.38	Sequoia Systems Inc.	2.00	-0.06	-3.1
NYS	48.38	29.50	Stratus Computer Inc.	31.75	-1.13	-3.4
NYS	16.88	9.88	Tandem Computers Inc.	10.38	-1.38	-11.7
OTC	23.50	10.63	TriCord Systems (H)	20.75	-1.00	-4.6
NYS	11.88	7.75	Unisys Corp.	11.88	-0.25	-2.1
SOFTWARE						
OTC	74.00	25.25	Adobe Systems Inc.	59.00	0.00	0.0
OTC	20.75	10.25	Aldus Corp.	14.75	-1.75	-10.6
OTC	14.25	5.50	American Software Inc.	7.63	0.00	0.0
OTC	28.13	9.75	Ask Computer Systems	11.50	0.63	5.7
OTC	56.75	37.00	Autodesk Inc. (H)	47.50	-7.00	-12.8
OTC	13.00	2.50	Bachman Info. Systems	3.19	0.13	4.1
OTC	43.00	32.00	BGS Systems Inc.	37.50	0.50	1.6
OTC	84.13	37.25	BMC Software Inc.	55.88	1.50	2.8
OTC	28.25	17.00	Boole & Babbage	24.00	-1.50	-5.9
OTC	49.00	17.50	Borland Int'l Inc.	21.50	0.00	0.0
OTC	5.38	3.00	CE Software	3.25	-0.25	-7.1
ASE	32.63	6.50	Cheyenne Software Inc. (H)	32.63	0.75	2.4
OTC	19.50	8.25	ChipSoft	9.50	-0.75	-7.3
OTC	9.13	5.63	Cognos Inc.	8.25	0.75	10.0
NYS	31.38	11.25	Computer Associates	29.63	0.88	3.0
NYS	12.38	2.75	Computervision Corp.	3.38	0.00	0.0
OTC	34.25	19.25	Compuware Corp.	26.00	-1.50	-5.5
OTC	14.75	5.75	Comshare Inc.	6.75	0.75	12.5
OTC	18.63	10.75	Corel Corp.	18.63	3.13	20.2
OTC	15.25	5.00	Easel Corp.	7.00	0.13	1.8
OTC	25.25	12.00	4th Dimension	18.50	-0.13	-0.7
OTC	19.50	5.25	Frame Technology	6.50	0.75	13.0
OTC	19.00	8.38	Group I Software (L)	8.50	0.00	0.0
OTC	35.25	18.75	Gupta	18.75	0.50	2.7
OTC	8.88	3.88	Hogan Systems Inc.	8.88	0.75	9.2
OTC	25.75	11.25	IMRS	19.75	0.00	0.0
OTC	38.00	21.00	Information Resources	34.38	-0.75	-2.1
OTC	27.25	6.06	Informix Corp. (H)	25.50	-0.50	-1.9
OTC	16.75	8.88	Intergraph Corp.	9.63	0.13	1.3

Exch	52-Week High	52-Week Low		July 9 3 PM	Wk Net Change	Wk Pct Change
OTC	13.63	6.38	Interleaf Inc. (L)	7.00	-0.25	-3.4
OTC	18.00	5.50	Intersolv Inc.	7.50	-0.75	-9.2
OTC	16.00	7.75	Knowledgeware Inc.	11.50	-0.50	-4.2
OTC	56.75	26.00	Legent Corp.	30.75	-4.00	-11.5
OTC	37.00	14.75	Lotus Development	34.75	1.50	4.5
OTC	23.00	6.50	MathSoft	8.75	-0.75	-7.9
OTC	23.25	5.25	McAfee Associates	5.88	-0.75	-4.1
OTC	11.63	1.88	Meca Software	5.63	-0.50	-8.2
OTC	12.00	5.25	Mentor Graphics	9.50	-0.63	-6.2
OTC	46.00	27.00	Micro Focus	27.00	-4.63	-14.6
OTC	14.50	4.38	Micrografx Inc.	5.50	-0.25	-4.3
OTC	90.00	68.00	Microsoft Corp.	84.63	-2.63	-3.0
OTC	51.75	15.75	Oracle Corp. (H)	48.88	-0.88	-1.8
OTC	34.25	15.88	Parametric Technology	34.25	2.00	6.2
OTC	40.50	22.50	Peoplesoft	30.25	-0.50	-1.6
OTC	7.13	3.50	Phoenix Technologies	5.13	0.13	2.5
OTC	40.00	22.00	Powersoft	31.25	2.63	9.2
OTC	41.50	17.00	Platinum Software	24.13	-0.88	-3.5
OTC	25.00	11.25	Platinum Technology	11.88	0.00	0.0
OTC	61.50	32.25	Progress Software Corp.	44.50	-1.50	-3.3
OTC	7.38	2.56	Quarterdeck Office Sys.	3.06	-0.19	-5.8
OTC	30.25	14.25	Rainbow Technologies Inc. (H)	30.25	1.50	5.2
OTC	9.13	4.00	Rasterops	9.13	0.00	0.0
OTC	12.25	4.00	Rasterops	12.25	0.50	4.3
OTC	15.25	3.63	Ross Systems	14.88	-1.00	-3.9
OTC	27.50	9.63	Sapiens Intl. Corp. N.V.	26.00	-0.13	-1.9
OTC	14.50	5.88	Software Publishing Corp. (L)	6.50	-0.13	-1.9
OTC	12.00	2.00	Software Toolworks Inc.	10.75	0.75	7.5
OTC	3.13	0.75	Spinnaker Software	1.25	-0.13	-9.1
OTC	12.75	3.25	State of the Art	8.50	0.75	9.7
NYS	24.63	15.00	Sterling Software Inc.	19.00	-1.00	-5.0
OTC	21.50	8.00	Struct. Dynamics Research	15.13	-0.75	-4.7
OTC	76.50	22.75	Sybase Inc.	75.00	3.13	4.3
OTC	33.75	5.88	Symantec Corp.	12.13	-0.50	-4.0
NYS	12.50	5.25	Systems Center Inc.	10.25	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	18.50	-1.50	-7.5
OTC	6.38	2.75	Teknic Corp.	3.25	0.25	8.3
OTC	22.75	9.13	Viewlogic Systems	18.75	0.88	4.9
OTC	23.50	6.50	Walker Interactive Systems (L)	7.25	0.25	3.6
OTC	3.19	1.38	Worldstar	1.47	-0.06	-4.0
SEMICONDUCTORS						
NYS	32.88	8.38	Advanced Micro Devices	24.75	1.00	4.2
NYS	21.38	9.38	Analog Devices Inc.	19.63	-0.25	-1.3
OTC	26.38	7.63	Atmel Corp. (H)	26.38	0.75	2.9
OTC	6.25	2.75	Chips and Technologies	3.63	-0.63	-14.7
OTC	39.75	13.00	Cirrus Logic	16.00	-1.25	-7.2
NYS	14.88	7.88	Cypress Semiconductor Corp (H)	14.25	0.00	0.0
NYS	16.13	8.88	Dallas Semiconductor	14.75	-0.25	-1.7
NYS	60.63	27.13	Intel Corp.	55.88	1.88	3.5
NYS	16.25	4.88	LSI Logic Corp. (H)	13.88	0.38	2.8
OTC	22.16	10.41	Lattice Semiconductor (L)	18.25	-8.25	-31.1
NYS	41.75	13.63	Micron Technology (H)	41.75	1.38	3.4
NYS	88.63	38.88	Motorola Inc.	86.00	0.38	0.4
NYS	16.63	8.75	National Semiconductor	16.00	0.00	0.0
OTC	16.50	6.50	Sierra Semiconductor	6.88	-0.13	-1.8
OTC	47.00	22.25	SynOptys (H)	44.50	-0.38	-0.8
NYS	72.38	36.75	Texas Instruments	69.75	0.88	1.3
OTC	11.00	6.00	VLSI Technology (H)	10.88	0.38	3.6
OTC	12.38	2.13	Weitek (H)	12.38	1.38	12.5
ASE	9.63	3.63	Western Digital Corp.	3.88	0.00	0.0
OTC	39.25	14.50	Xilinx	37.75	-0.75	-1.9
OTC	93.00	13.84	Zilog Inc.	25.50	-0.75	-2.9
PERIPHERALS AND SUBSYSTEMS						
OTC	40.25	12.88	American Power Conversion	37.88	-0.13	-0.3
OTC	20.16	13.84	Banctec Inc.	19.25	1.75	10.0
OTC	18.00	5.00	Cambex Corp.	5.00	-0.25	-4.8
ASE	18.38	5.38	Countrybooks Corp. (L)	5.50	0.00	0.0
NYS	25.50	9.00	Conner Peripherals	10.00	0.00	0.0
OTC	38.50	10.75	Creative Technologies Inc.	28.50	-0.75	-2.6
OTC	30.75	14.25	Data Race Inc.	14.25	-3.00	-17.4
ASE	17.00	4.75	Dataram Corp.	8.50	-0.38	-4.2
NYS	22.75	5.06	EMC Corp. (H)	21.63	-0.13	-0.6
OTC	19.50	5.38	Emulex Corp.	6.38	-0.25	-3.8
OTC	19.00	13.25	Evans & Sutherland	15.63	0.13	0.8
OTC	33.00	8.63	Exabyte	9.63	-0.50	-4.9
OTC	28.75	7.09	Intelligent Info. Systems	27.00	0.75	2.9
OTC	8.88	3.75	Iomega Corp.	4.13	0.25	6.5
OTC	21.25	5.75	IPL Systems Inc.	7.50	-0.25	-3.2
OTC	24.00	11.75	Komag Inc.	16.00	-0.63	-3.8
OTC	19.63	5.75	Maxtor Corp.	6.13	-0.38	-5.8
OTC	11.25	5.75	Micropolis Corp.	6.25	-0.13	-2.0
NYS	117.00	96.75	3M Corp	107.38	-0.63	-0.6
OTC	7.75	4.00	Printronix Inc.	7.25	0.38	5.5
NYS	17.25	6.88	QMS Inc.	8.00	-0.13	-1.5
OTC	17.88	9.75	Quantum Corp.	10.38	-0.88	-7.8
OTC	12.75	3.13	Radius Inc.	4.00	0.25	6.7
NYS	16.50	7.63	Recognition Equipment	13.25	-1.00	-7.0
OTC	13.88	3.75	Rexon Inc. (L)	4.13	-0.25	-5.7
OTC	22.38	12.00	Seagate Technology	15.63	-0.75	-4.6
NYS	45.00	18.00	Storage Technology	38.88	-1.13	-2.8
NYS	27.88	17.63	Tektronix Inc.	25.13	-0.75	-2.9
NYS	89.88	70.13	Xerox Corp.	76.88	-1.00	-1.3
SERVICES						
OTC	23.75	14.25	American Mgmt. Systems	18.25	-0.63	-3.3
NYS	4.75	2.38	Abacomp Inc.	2.38	0.00	0.0
OTC	35.75	16.25	Analysts Int'l	29.50	0.00	0.0
NYS	56.13	40.50	Auto Data Processing	47.38	-1.50	-3.1
NYS	17.25	11.97	Ceridian Corp.	14.63	0.13	0.9
NYS	17.38	13.13	Comdisco Inc.	14.63	0.25	1.7
OTC	8.25	4.50	Computer Horizons	7.38	0.13	1.7
NYS	84.75	57.00	Computer Sciences (H)	82.38	-1.50	-1.8
NYS	9.25	6.50	Computer Task Group	7.88	0.38	5.0
NYS	40.50	22.00	CompUSA Inc.	27.25	-0.75	-2.7
OTC	14.25	6.00	Corporate Software	10.00	-1.25	-11.1
OTC	19.25	7.38	Egghead Discount Software	7.88	-0.38	-4.5
NYS	35.88	25.25	General Motors E (EDS)	28.38	-0.13	-0.4
OTC	35.50	9.75	Inacom Corp.	22.50	2.00	9.8
OTC	15.38	7.25	Intelligent Electronics	13.63	0.63	4.8
OTC	13.00	6.63	Merisel	12.75	0.25	2.0
OTC	16.50	5.75	Microage Inc.	15.00	0.75	5.3
OTC	43.00	23.00	Paychex	41.75	0.88	2.1
NYS	87.25	26.75	Policy Management Sys.	26.75	-9.38	-26.0
NYS	38.75	18.88	Reynolds and Reynolds (H)	38.75	1.00	2.6
OTC	17.25	11.00	SEI Corp. (L)	17.25	1.25	7.8
OTC	24.38	17.75	Shared Medical Systems	23.38	-0.63	-2.5
OTC	12.63	5.75	SHL Systemhouse	10.75	0.75	7.5
OTC	30.75	19.00	Software Spectrum Inc. (H)	29.00	-1.00	-3.3
OTC	33.75	23.25	Sungard Data Systems	31.63	1.38	4.5
NYS	6.38	1.13	Ultimate Corp.	3.50	0.13	3.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

Tandem expects loss

Tandem Computers, Inc. last week said it expects to report a loss for its third fiscal quarter. The company cited worldwide economic weakness and lackluster demand for its current generation of products. The Cupertino, Calif., company said it plans to detail restructuring plans on July 28 after disclosing its financial results. The restructuring aims to cut costs before the release of a new generation of low-cost, reduced instruction set computing-based systems.

Intergraph sees red

Intergraph Corp. said it expects to post a second-quarter loss. Revenue for the period is expected to be in the $248 million to $253 million range, compared with $289 million in last year's comparable quarter. The workstation maker cited its ongoing product transition and weak European and federal markets for its woes.

AMD posts gain

Citing gains in its non-X86 business, Advanced Micro Devices, Inc. posted second-quarter net profits of $64 million, a 55% increase from the same period last year. Revenue in the period grew 17% to $409 million, the Sunnyvale, Calif., chip maker said.

SHORT TAKES Novell, Inc. has completed its acquisition of Fluent, Inc. for $17.5 million (CW, July 5).... Sequent Computer Systems, Inc. expects to break even in the second quarter on revenue of about $80 million — results that would be below analysts' expectations.... Restructuring Proteon, Inc. expects to report a second-quarter loss, on revenue below the first quarter's $27.7 million.... Interleaf, Inc. has acquired Avalanche Development Co., a Boulder, Colo., provider of document analysis and conversion technology and services, for $5.5 million in cash.

HP poised for run at PC leaders

Low-cost product line, competitors' shipping woes spur company's growth

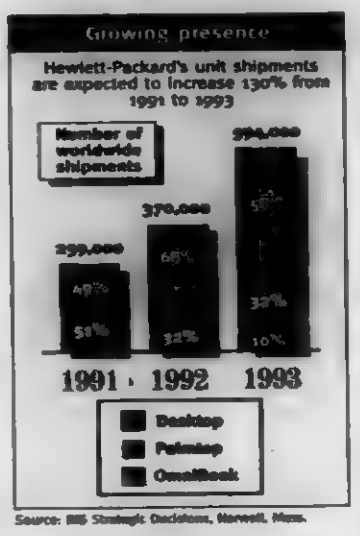
By Michael Fitzgerald
PALO ALTO, CALIF.

A surging Hewlett-Packard Co. has taken advantage of the difficulties facing the major PC players and is positioning itself for an extended run at the top. A new line of low-cost PCs may be the last piece in its puzzle.

A longtime member of the "other" category in the PC business, HP saw triple-digit unit shipment growth in the worldwide PC market between the first half of 1992 and the first half of 1993.

Given HP's relatively small installed base, shipment growth has yet to translate into a meaningful market share increase, however. HP accounted for a 1.2% sliver of the 30.3 million PCs shipped worldwide in 1991, according to Computer Intelligence/Infocorp. HP is expected to inch its share up to 1.6% of the 41 million PCs projected to sell by the end of this year.

Driving its growth are repeated price cuts that brought its traditionally overpriced PCs in line with the market and nimble, perhaps lucky, avoidance of the backlogs that have plagued the IBM PC Co. and Compaq Computer Corp., industry observers agreed.



Source: BIS Strategic Decisions, Norwell, Mass.

Serious contender

While HP's overall share of the PC market remains small, Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass., said HP has a solid shot at becoming one of the 10 largest PC makers by year's end. Typically, few vendors register even 1% of the bitterly competitive PC market.

The "new" HP has joined the raft of vendors that now promise new products every six months and vow to continue to aggressively add new features and keep prices competitive.

To keep the price cuts coming, Robert Frankenberg, vice president and general manager of HP's personal information products group, has reduced costs by cutting one-third of the group's employees and radically restructuring its supplier relationships, to "buy parts like a $20 billion electronics company, rather than a $1 billion PC player," he said.

The cost cuts have helped HP to start making a decent profit in PCs for the first time, insiders said.

"Everyone's always known you could trust HP and their PCs were well-built, but the missing ingredient was price," said Bruce Stephen, director of PC hardware and pricing research at International Data Corp. (IDC) in Framingham, Mass.

Sometimes No. 3

Stephen and other analysts credit HP for finally leveraging its loyalty to the dealer channel and the huge business its printer group does through resellers. At some resellers, HP is among the three best-selling brands. The firm has become the PC maker recommended when Compaq or IBM cannot deliver product, analysts said.

"They were extremely well-positioned for the boom time in the PC market," Stephen said.

In the last two months, HP has overhauled its server line, its high-end desktops and its portable product line and recently added the Vectra VL, a line of low-cost PCs. HP officials think the VL line will give the company a boost.

"We're thinking that will be our retro rocket for the rest of 1993," said Tom Buiocchi, marketing manager of HP's PC division in Grenoble, France. Buiocchi said HP estimates that Compaq's low-end Prolinea line accounts for as much as 60% of Compaq's sales, and HP thinks the VL will boost its own sales by 50%.

Analysts, however, reserved judgment on the VL's success.

"They're billing it as the Prolinea Killer, but HP doesn't have the same distribution channel Compaq does," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. He said HP will have to expand its distribution channels to match Compaq's success with Prolinea, and HP has so far steadfastly stood by the dealer channel.

While the VL line, which starts at $1,250, was introduced in a market in which price wars seem to have abated, Frankenberg predicted those battles will soon be renewed. His model for a PC company is one able to compete in a market where prices "are the same as a portable color television set — $300 to $500."

Most analysts, and Frankenberg's competitors, think such a price range is highly unlikely.

Stephen said he believes HP will continue to do well in the market until late 1994, when IDC expects a PC market slowdown that will kill off a number of marginal PC makers. While HP appears unlikely to be among them, its ability to achieve its stated goal of making the Top 5 PC makers worldwide by 1995 remains a question mark.

Analysts said HP's lack of a true notebook will hurt it in reaching this goal, much as a poor notebook strategy has crimped Dell Computer Corp.'s growth.

At a glance

HP's new VL line uses limited configurations to keep pricing low. The products are based on either the 25-MHz 486SX, 33-MHz 486DX or 33/66-MHz DX2 processor and come with a 20M-byte or 240M-byte hard drive. They carry a three-year warranty and sell for $1,250 to $2,359.

Unique tack

Hewlett-Packard has helped itself grow by ignoring the popular wisdom that PCs are commodities, according to Robert Frankenberg, vice president and general manager of HP's personal information products group.

"We [PC makers] talked ourselves into being a commodity a little too early," he said. "There are lots of needs we aren't addressing well — for instance, communications and access to data — and as long as those exist, there are ways to differentiate."

Those needs have helped define a strategy of "pervasive computing," which HP is using to put itself in gear in the PC market.

So far, this strategy has led HP to basically center its PC strategy around its calculator-like 95LX and 100LX personal organizer. A key differentiator in both is built-in wireless communications capabilities such as infrared, which HP is now building into some models of its desktop PCs. HP has acknowledged working on software that can easily synchronize data between a portable machine and a desktop.

Frankenberg also said that as part of its strategy, HP is negotiating with information service providers to give users on-line access to a variety of consumer services. However, he said these were not likely to appear until sometime in 1994. — *Michael Fitzgerald*

Wysiwyg

Did you know...

John V. Roach, chairman and CEO at Tandy Corp., was once an IS manager? He started his Tandy career in 1967 as general manager of computer services.

What you have lusted for in your heart

IBM and *Playboy* magazine announced an agreement to publish 30 years of *Playboy* interviews on CD-ROM.

Documentation hell

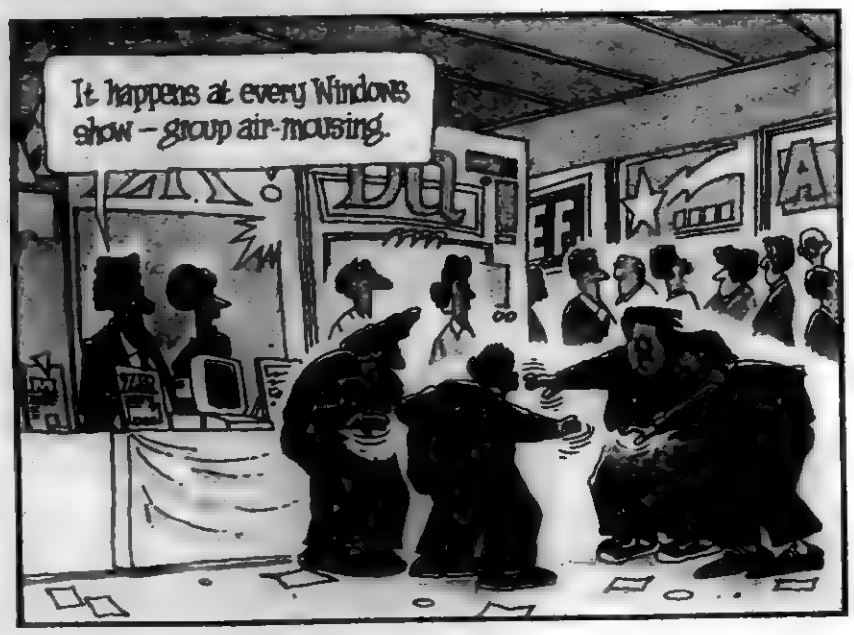
A group of experienced and fed up professional writers is holding a contest for the Worst Manual of the Year. Send your best example of the worst to Worst Manual of the Year, c/o The Communications Circle, 918 La Senda, N.W., Albuquerque, N.M. 87107. Monster manuals must be received by Halloween.

Great Names

Andrew Prophet
President
AP Research (a computer industry forecasting company in Cupertino, Calif.)

What's the worst lie you've ever told your boss or users about the system? We'd like to know. Phone Lory Dix at (800) 343-6474 ext. 236, MCI Mail 594-8011 or CompuServe them to 594-8011 or 76537,2413.

The 5th Wave *by* Rich Tennant



InsideLines

Nominal partners

Plans to put Gupta development tools in front of Computer Associates' mainframe-based software will be scrapped this week by the two companies, sources close to Gupta said last week. Meanwhile, CA is planning to ship out with a client/server version of CA-Realia, likely next month, another source said. The revamped package — designed to [illegible] existing Cobol applications — is said to have at least some object-oriented components.

Net advantage

IBM Vice President Allen Hancock will officially kick off the vendor's Asynchronous Transfer Mode (ATM) networking strategy, which is expected to include software for allowing popular LAN protocols such as TCP/IP, and to mention IBM's own Advanced Peer-to-Peer Networking, to access high-speed ATM networks [CW, June 14].

Changing his tune?

Borland Chief Executive Officer Philippe Kahn is promising to raise the price of Paradox for Windows, which is currently offered at $299.95. According to Kahn, heated cat-fight Windows database ads are underground, and the battle for market share with Microsoft will not last long. Raising the price of Paradox for Windows will give Borland room to [illegible] version of Paradox that does not [illegible] [CW, June 21].

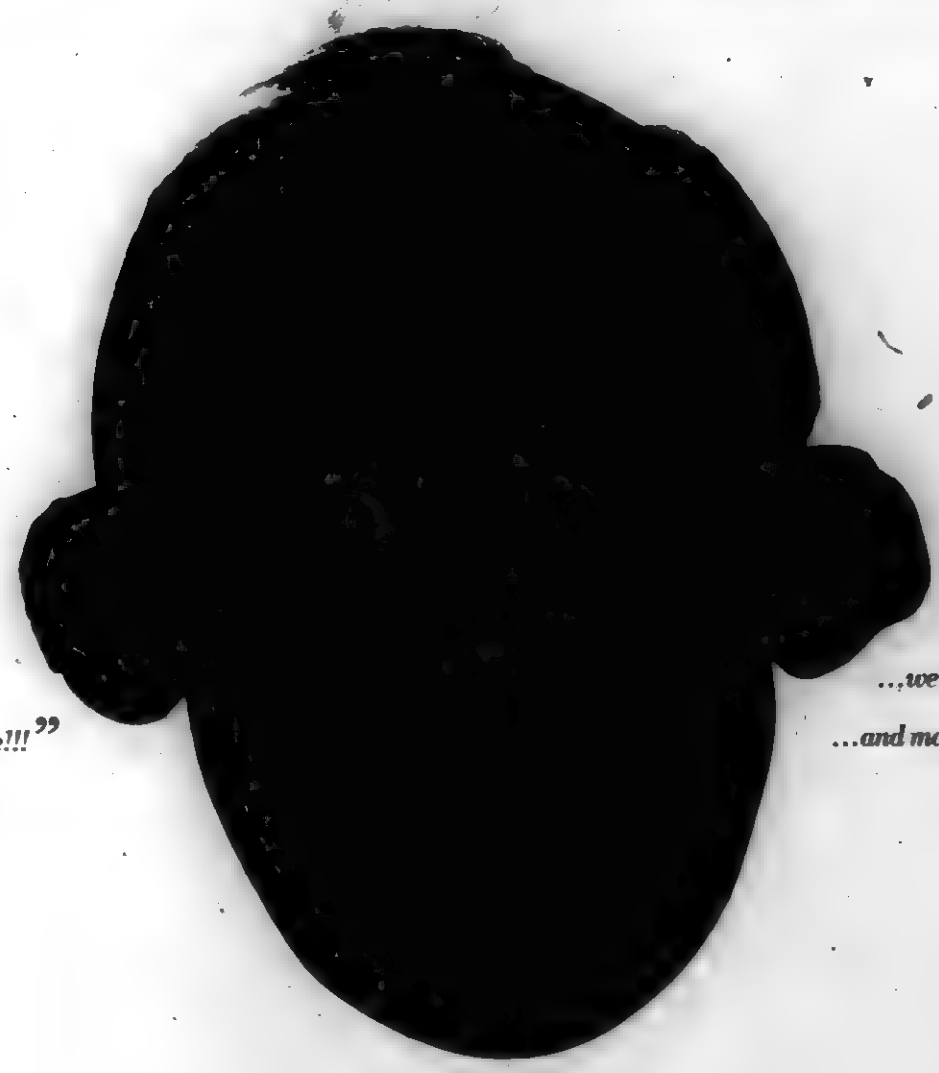
Talk about hell

According to a [illegible] Corel Corp.'s CorelDraw! 3.0 application is such a hot product that many customers find spending time on the [illegible] to be challenging. The Canadian graphics [illegible] of this problem, and other CorelDraw users contacted said they find and load disk problems. But it's something to watch as CorelDraw! [illegible].

Tiny but deadly bite?

With industry analysts and vendor VP still not committing to provide the [illegible] promised by ultrasmall Hewlett-Packard Co. systems to develop a [illegible] Precision Architecture-RISC fault-tolerant systems, Stratus is [illegible] about its competitive. This might [illegible] Stratus' [illegible] for the changes [illegible] that would [illegible] the [illegible] [illegible] [illegible]

Diagnosis: *Acute Demanditis*



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COMPUTERWORLD

Novell pushes out quick fix to 4.0 woes

Cheaper, more stable NetWare 3.11 may be stalling migration

By Michele Doetert
PROVO, UTAH

■ Ten weeks after Novell, Inc. delivered its long-awaited NetWare 4.0 to mixed reviews, the company has brought out enhancements aimed at improving the network operating system's performance. The enhancements also ease development of network management applications.

Possibly because users are not flocking to NetWare 4.0, the release of NetWare 4.01 could be the fastest NetWare fix ever. It took Novell more than a year-and-a-half after shipping NetWare 3.0 to get all the bugs out and produce a stable product with NetWare v3.11, according to Craig Burton, president of The Burton Group, a Salt Lake City market research firm.

Migration to NetWare 4.0 has been slow and problematic.

An official from NetWare reseller and systems integrator Application Systems Group in Stoneham, Mass., said he believes that while 4.0 is strategic, v3.11 is the benchmark today. "It will take a year to a year-and-a-half before 4.0 passes 3.0 as the implementation standard," predicted Drew Finnie, the firm's technology adviser.

To speed that migration, NetWare 4.01 contains fixes to both the NetWare Directory Services and the problem-laden Virtual Loadable Module client software for DOS and Windows — two major sticking points with NetWare 4.0 evaluators.

Novell officials claimed that NetWare 4.0 sales are right on target.

Novell, *page 14*

Tandem line taking RISC on Mips chips

By Jean S. Bozman
CUPERTINO, CALIF.

Looking to shake the doldrums, Tandem Computers, Inc. is expected tomorrow to revamp its flagship line of fault-tolerant computers, repositioning them as RISC-based Unix-compatible servers.

The introduction of the new line, called Himalaya, caps a four-year effort to open up the proprietary, fault-tolerant Guardian operating system, said Bill Heil, vice president of Tandem product marketing and product management.

But industry analysts said Tandem has moved too slowly on Unix, losing valuable time in migrating its user base away from Guardian. Some large Tandem sites said last week they were more interested in the prospect of falling prices for complex instruction set computing processors than in buying Unix RISC systems anytime soon.

One reason is that many longtime Tandem shops are still not convinced of the reliability of Unix-based transaction processing systems.

Tandem's move comes just a week before the $2 billion

Tandem, *page 8*

Faster 486 could overlap Pentium

By Michael Fitzgerald
SANTA CLARA, CALIF.

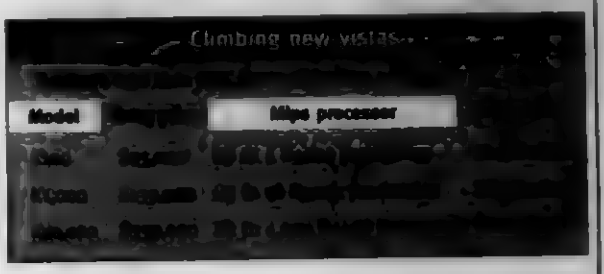
Pentium is taking a temporary backseat at Intel Corp. in favor of a revved-up version of the 1486, which is due out in the fourth quarter, sources close to the firm said.

The DX3 processor is expected to give near-Pentium performance at significantly lower costs (see chart page 20), the sources said. This will make the DX3, not Pentium, Intel's high-volume, high-performance chip through the first half of 1994. For current applications, Pentium will not give significant performance boosts over the DX3 until recompiled 32-bit software appears.

Price cuts expected

The sources said Intel is looking to price the 33-MHz/100-MHz chip near the $500 mark and will cut prices on the DX2 line when the DX3 is announced. Systems based on the 33/100-MHz DX3 could come in at close to current DX2 prices, which start at less than $2,500, according to sources at PC makers. Users could look for these chips to arrive as early as late this year, de-

Faster 486, *page 20*

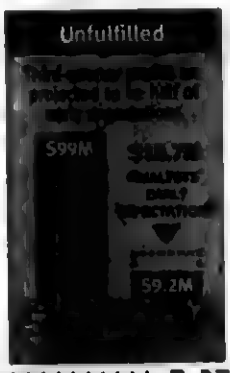


Service, product gripes force Legent to fine-tune strategy after Goal merger

By Gary H. Anthes
VIENNA, VA.

■ Almost one year after acquiring Goal Systems International, Inc., Legent Corp. is showing signs of some indigestion.

The company's new-license revenue is trailing expectations, its stock price has been bludgeoned, and a clique of users is claiming that service has slipped.



Some customers, especially those from the Goal side of the merger, also said they fear they will be left in the lurch as Legent merges its two systems management software product lines.

Most of the customers interviewed last week who had complaints said Legent had not done a good job of keeping them informed of the company's plans and progress.

Echoing that consensus, Legent President and Chief Executive Officer John Burton said the tradi-

Legent, *page 12*

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SUPER CIOS

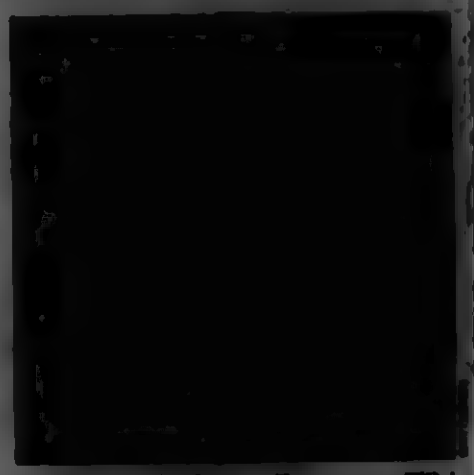
Who makes the big bucks?

By Rosemary Cafasso

In 1982, James Marston was a vice president of data processing at AMR Corp., earning about $75,000 a year.

In 1992, his compensation package as chief information officer at American President Cos. in Oakland, Calif., was more than 10 times that amount when bonuses and the sale of stock from corporate programs were included.

Marston's story is not that unusual anymore. Several industry surveys show average compensation for CIOs



American President's James Marston says CIOs' salaries are driven by 'the CEO's attitude'

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July 19, 1993

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■ **Tandem** is expected to announce that it is cutting overhead by basing its Guardian line on Mips RISC chips. *Page 1*

■ The basis of the next generation of PCs may not be Pentium but an unannounced high-end **Intel** 486 chip. *Page 1*

■ **IBM** charts a comprehensive ATM course. Initial user reaction: "Show me." *Page 4*

■ IS departments in Des Moines, Iowa, struggle to keep systems up as floodwaters wash over the state capital and the region. *Page 6*

■ **Frustrated Informix users** look for proof that the vendor has rid its tech support of longtime problems. *Page 7*

■ **IBM** replaces its RS/6000 Model 340 with a powerful desktop model and slashes peripherals prices. *Page 8*

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■ **Banyan**'s communications server, to be released this week, will improve the link between IBM SNA and Banyan Vines networks. *Page 15*

■ **WordPerfect** makes a drive to capture a piece of fast-growing market for presentation graphics for Windows. *Page 16*

Ron Wilson

Quality improvement efforts *depend heavily on IS-driven changes. Bruce Spekhals is IS chief at the Ritz Carlton, where IS efforts helped the company win the Baldrige Award.* **Page 89**

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■ **National laboratories** are turning to peaceable pursuits, and that's very good news for some commercial users. *Page 28*

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■ **The Frame Relay Forum** devises technology that instructs routers and other network devices on how to perform tasks the same way. *Page 59*

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Executive Briefing

Not all CIOs earn stratospheric compensation, but many are proving themselves indispensable, especially in the quality arena. At the Ritz-Carlton (see photo) and building materials supplier Granite Rock Co., IS improvements in standards and data collection helped bag the Baldrige. *Page 89.* **And IS execs in the Des Moines, Iowa, area are more than earning their pay, trying to cope with a situation beyond the scope of any disaster plan — a city under water.** *Page 6*

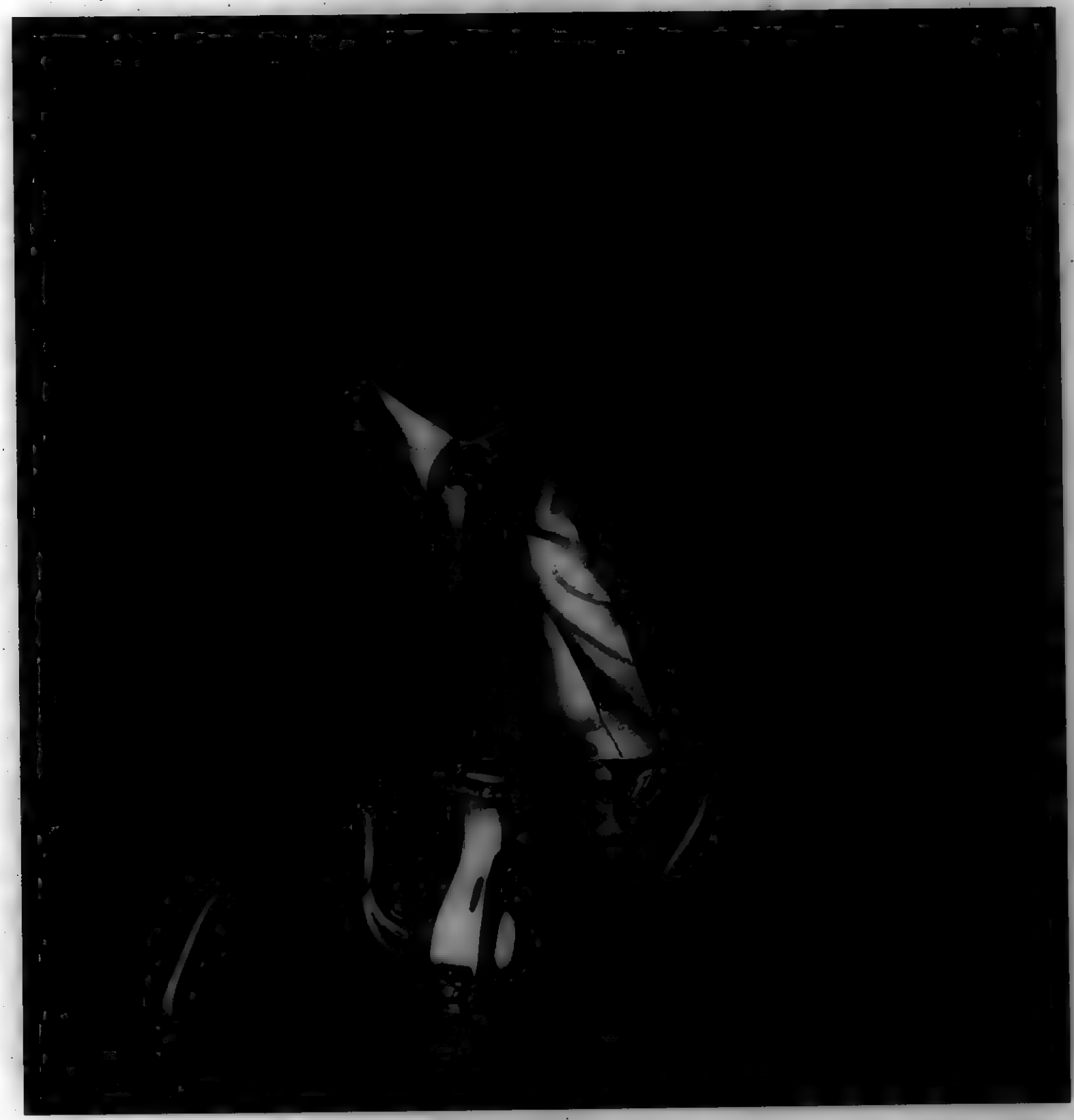
A wave of another kind will soon hit IS, predicts Charles Babcock. Vastly more powerful PC systems with networking and client/server capabilities are going to place escalating demands on IS organizations, especially as more novices are logged on. *Page 37.* And Esther Dyson sees a major challenge shaping up in the need to make training more accessible and continuous through on-line performance support. *Page 23*

Compatibility and interoperability are the most pressing issues on many users' minds. Some are consolidating E-mail systems to avoid being swamped by compatibility and directory problems. *Page 59*

Positive news on the interoperability/integration front: The Frame Relay Forum's success in getting members to agree to a common way to wrap data communications protocols *(Page 59)*, and the emergence of an active third-party community to serve the market for integrated, multivendor network management. *Page 64.*

Not so great news: Those who've been looking forward to using 100M bit/sec. Ethernet to relieve server congestion and ease distribution of large databases and image files may have to choose between competing standards. *Page 4*

The spirit of experimentation lives: Despite persistent problems with bureaucracy and red tape at national laboratories, progress is being made in fostering collaboration between these labs and private industry. Los Alamos is a leader with its Computational Testbed for Industry. Gillette is an active partner. *Page 28.* Tandy is doing some testing of its own — employing wireless, pen-based, portable point-of-sale systems to eliminate checkout lines in its Incredible Universe superstores. *Page 44.* Denver International Airport provides a model of large-scale use of redundant fiber-optic cabling. *Page 64*



"When we decided to downsize, I was pleasantly surprised to see that CA's a leading AS/400 software vendor. The fact that they offer the leading AS/400 manufacturing and warehouse software made it much easier for us. It's always better to go with somebody you already know and trust."

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Network data transfer

Fast Ethernet on duel course

By Lynda Radosevich

Users warily eyed last week's submission of two competing proposals for fast Ethernet, noting that similar but dueling standards could cause confusion and slow down migration to the 100M bit/sec. network technology.

"It could be good, depending upon what kind of flexibility you get, but more likely it will just be confusing," said Ken Hitt, a communications consultant at a major New England insurance firm.

Users said they were considering 100M bit/sec. Ethernet to widen networking pipes for applications including large database file transfers and image file transfers and to relieve congestion at busy servers. Faced with high-speed options such as Fiber Distributed Data Interface and emerging Asynchronous Transfer Mode, fast Ethernet's familiarity is appealing, they said.

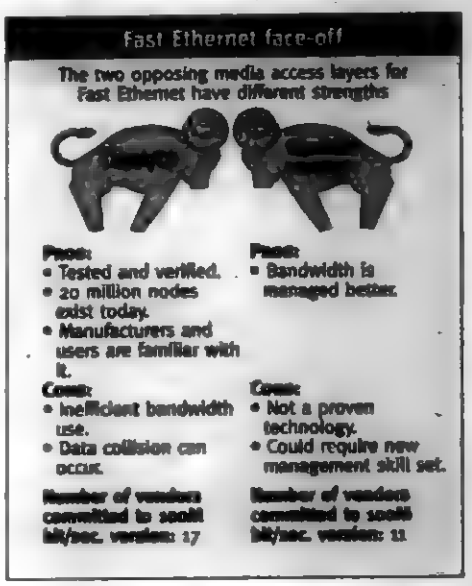
However, the competing proposals for 100M bit/sec. Ethernet will end up in different committees within the Institute of Electrical and Electronics Engineers, Inc., a move that would bring both to standards-status faster but would confer the Ethernet title to just the carrier sense multiple access/collision detection (CSMA/CD) proposal, said Charlie Robbins, director of communications research at Aberdeen Group in Boston.

That possibility has confirmed fears that vendors will not join behind one standard but will establish competing 100M bit/sec. Ethernet-type products.

Many observers said piloting two more Ethernet technologies on top of all the other options is too much. "It's getting to the point where you have to be a lawyer, run a testing lab and be an educator," in addition to being an information manager, Robbins said.

The main difference between the competing proposals lies in the media access control (MAC) layer of the Ethernet protocol (see chart). The first proposal, supported by 3Com Corp., Cabletron Systems, Inc., Grand Junction Networks, Inc. and 14 other companies, retains and "scales up" Ethernet's CSMA/CD MAC layer. This is the closest to traditional Ethernet and the method that users with limited technical staffs find more appealing.

For now, it is also the proposal with the most vendor support, a fact that also draws users. "Even if there is a technology that is a little bit better, I'll go where the other sheep are going because I've gotten burned before" by technology that lost favor among vendors, said LeAlian Estrem, a local-area network administrator at Capeule Environmental Engineering, Inc. in St. Paul, Minn.



The second proposal, headed by Hewlett-Packard Co. and AT&T and backed by Ungermann-Bass, Inc. and Proteon, Inc., departs from Ethernet's MAC by employing a method closer to Token Ring's token passing. This eliminates the potential for collisions of data packets but removes the familiarity factor.

Also, that departure draws questions as to how well the HP/AT&T proposal would "bridge" to 10M bit/sec. Ethernet. Bridging existing Ethernet to high-speed CSMA/CD versions will be straightforward because only one parameter is changed. "It is less clear with the HP solution how straightforward it will be" because all parameters but the Ethernet frame are changed, said John Payne, president of JLP Associates, a consultancy in San Jose, Calif.

Other differences include types of cabling supported. The HP proposal calls for four pairs of voice- or data-grade unshielded twisted-pair cable because it uses a "quartet" of signaling technologies that sends data on two wires and receives data on another two.

This requirement could hamper deployment of the HP technology. While more than a third of 116 companies recently surveyed had four or more pairs of voice-grade unshielded twisted-pair running to the desktop, many were using the cables for other purposes.

Wiring requirements for the CSMA/CD proposal have not been hammered out yet, but some vendors in that camp are leaning toward supporting a minimum configuration of two pairs of voice-grade unshielded twisted pair.

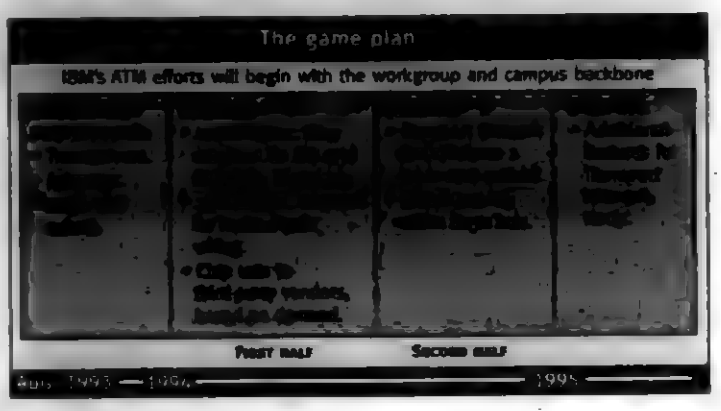
IBM hopes 'open' ATM will turn networking tide

By Joanie M. Wexler
NEW YORK

In a fresh attempt to run with the networking pack, IBM last week outlined a soup-to-nuts approach to delivering Asynchronous Transfer Mode (ATM) technology and migrating users to it gracefully.

ATM is an emerging high-speed technology for both local- and wide-area networking. Users are banking on it as a lasting next-generation network largely because of its ability to handle scalable speeds and efficiently bundle a mix of data, voice and video.

IBM's bet-the-business ATM product plan runs the low- to high-end gamut: chips, adapter cards, a switching module for its 8260 smart wiring hub co-designed with Chipcom Corp. and a wide-area ATM switch for both builders of private ATM backbones and carriers [CW, June 14].



Most observers agree that ATM represents IBM's big chance to recoup some business after missing windows of opportunity with key networking products such as multiprotocol routers and hubs.

"They've realized that in the last five years they've lost the networking battle; this is an opportunity for them to get back in the game," said Graham Morrison, a network design project leader at Blue Cross/Blue Shield of Connecticut, a large IBM system shop evaluating ATM products from IBM and others.

Morrison, who uses primarily Cabletron Systems, Inc. gear in his internetwork, said he has no problem with IBM's strategy as articulated but is concerned that IBM does not have an established track record as a network vendor. IBM also "charges dearly" to send staff out to help solve problems, he said, "which is why there is no IBM in my network today."

IBM has made "a lot of architectural announcements resulting in late products that weren't up to par," said Paul Callahan, senior analyst at Forrester Research, Inc. in Cambridge, Mass. "ATM is very important to them."

IBM's sweeping plan includes a few proprietary twists that some view as another myopic IBM ploy to control a chunk of technology in an era of openness. Others, however, point out that all vendors must innovate to compete.

For example, "every vendor with an ATM switch has to develop its own way for switches to talk to each other and to be managed," said David Passmore, a vice president at Gartner Group, Inc. in Stamford, Conn.

A key IBM "extra" includes its Broadband Network Services software architecture, designed to handle as-yet missing interoperability and congestion control functions in ATM networks.

The architecture came about because the ATM Forum, an unofficial standards body, "has done a fair amount of work on things like access, but there is no standard for one ATM node to talk to another," said Ellen Hancock, IBM Networking Systems' senior vice president and general manager.

IBM is also pairing ATM with a proprietary feature it calls Packet Transfer Mode (PTM) on a wide-area switch slated to ship in 1995 (see chart). The combined functions will allow the switch to evaluate incoming traffic and decide which mode of transport — ATM cells or PTM packets — is more appropriate given the traffic's characteristics, said William A. Bernstein, an IBM senior technical staff member

For example, if a transmission is mostly data, PTM will accept it, reformat it into variable-length packets sized according to the traffic type and "blast it through a high-speed network," he said.

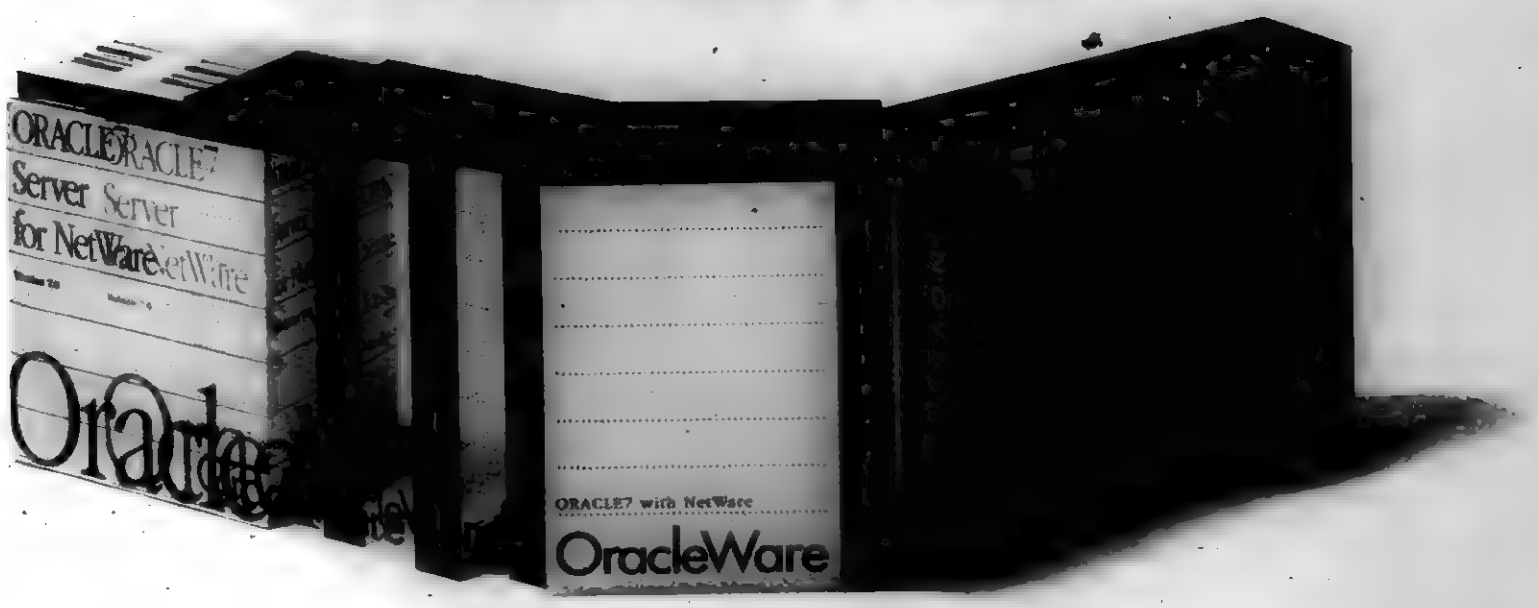
Speed considerations

Migratory innovations IBM has planned include under-100M bit/sec. adapter cards that run on unshielded twisted-pair wiring. Today, the ATM Forum is focused on 100M bit/sec.-and-up speeds over fiber.

ATM shopper Sam Schuler, communications strategy manager at Texas Instruments, Inc., said that "the closer you get to the workstation, the more important the media supported by the cards becomes." This is because many firms already have fiber in their backbones or have compelling financial reasons to install it there, he said.

All IBM ATM endeavors will go through the forum, Bernstein said. "We have learned our lesson with SNA: It was proprietary. With APPN, we tried to have a little of both. This one is going to be open."

ANNOUNCING A MAJOR STEP FORWARD IN ENTERPRISE-WIDE COMPUTING.



THE RIGHTSIZING CHALLENGE

In theory exploiting the economies of networked PC's while continuing to extract value from older larger systems is relatively straightforward.
In practice it is not. For a start, no single vendor can provide the optimal integrated software solution for managing information from the mainframe to the desktop. While distributed computing makes data readily accessible, it also accelerates the movement of data around the enterprise magnifying the level of complexity. And when a problem arises, figuring out which vendor to call can be a nightmare.

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News Shorts

Apple losses exceed expectations

Apple Computer, Inc. last week said expenses related to a recent corporatewide restructuring contributed to a third-quarter net loss of $188.3 million. The company took a charge of $320.9 million for cost reductions and layoffs of 2,500 employees. The size of the write-off and weakness of operating profit surprised some analysts. Revenue for the quarter ended June 25 was $1.66 billion, a 7% increase over the comparable period last year. Macintosh computer shipments were up 20% compared with the third quarter a year ago, Apple officials said. Apple also consolidated operations into five business units.

Drugstore chain signs with ISSC

IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary last week won a 10-year deal to migrate Clearwater, Fla.-based drugstore chain Jack Eckerd Corp. to a companywide client/server architecture. ISSC will gradually migrate operations, including point-of-sale systems, to a distributed platform during the next four years. The deal is valued at $320 million to $440 million.

Novell merges SNMP, NetWare worlds

Novell, Inc. last week released Version 2.0 of its NetWare Management System (NMS) software developer's kit, which contains interfaces that allow developers to build applications that manage NetWare environments but run on Unix-based Simple Network Management Protocol (SNMP) platforms. The NMS console has always been able to receive alarms from other SNMP-manageable devices.

AST rationalizes Tandy acquisitions

AST Research, Inc. said that positioning itself for the future is costing it today. The company expects its purchase of Tandy Corp. subsidiaries TE Electronics, Inc. and Grid Systems Corp. to cause it to lose an unspecified sum for fiscal 1993, which ended July 5. The company finalized the purchase last week, paying $16 million in cash up front, with up to $160 million more due on a three-year promissory note. Analysts said it is unclear whether AST can count on maintaining Tandy's market share. They said AST's real gain is Tandy's manufacturing operations, which will double AST's capacity and give it a plant in Europe.

A Unix triad forms

Amdahl Corp. said last week that it will work with Fujitsu Ltd. and ICL PLC to develop a common Unix computing environment. The effort was designed to ensure that Unix applications can run, without change, on all three vendors' machines by late 1994. Amdahl, which is partly owned by Fujitsu, sells the UTS Unix operating system for mainframes. UTS is based on Unix System V, Release 4, as is Fujitsu's UXP Unix. Fujitsu also owns 80% of ICL, which sells its DRS/NX desktop, midrange and mainframe Unix systems in Europe.

SHORT TAKES Joining a long list of consulting firms, Inference Corp., a software tools and consulting services company, last week said it is getting into the reengineering business with a practice headed by Robert Friedenberg, vice president of the company's consulting group.... Ottawa-based SHL Systemhouse Ltd. last week bought Nidak Associates, Inc., a 7-year-old privately held Toronto-based client/server and open systems services firm.... Computer Associates International, Inc. announced plans to port its CA-Unicenter systems management family of packages to the UnixWare operating environment.

More news shorts, *page 16*

Data dowsed in Midwest floods

Hot sites key to emergency recovery; long hours become norm

By Ellis Booker
DES MOINES, IOWA

This city's computers expired July 11 at around 6 a.m. after 8 feet of water filled the sub-basement of one of the capital's two main administrative centers. The resulting disruption to electrical power necessitated the shutdown of an IBM mainframe, the terminal network and the private-branch exchange located on the second floor.

"No one could have predicted that a river would swallow our Des Moines building," said DICO MIS manager Gary Smith. "You can try to anticipate all the contingencies, but you still need a way to restore service if a disaster strikes."

As of last Thursday afternoon, the mainframe was still down. "We didn't have a disaster recovery plan," said Jack Rich, administrator of data processing.

That was a familiar refrain heard throughout the flood-ravaged Midwest last week after unrelenting rains caused the Missouri and Mississippi rivers and their tributaries to overflow their banks, disrupting life throughout an eight-state region.

It was the worst flooding to wrack data centers since the Chicago flood of 1992.

Planning for an information systems disaster, observers said, rarely envisions a situation in which an entire city's infrastructure — like Des Moines' — comes to a halt.

"Our plans didn't anticipate the city being dropped," noted Terry Marksberry, chief information officer at Meredith Corp., an $800 million diversified media company and publisher of *Ladies' Home Journal* and *Better Homes and Gardens* that is based here.

Water shortage?

Ironically, the city's loss of drinking water was a key problem for data centers across Des Moines, according to a number of users. While many sites had brought in generators or were using restored commercial power early in the week, the lack of water meant many data centers could not cool off their mainframes.

One of two flood-related disaster declarations received last week by Comdisco, Inc., a disaster recovery services firm based in Rosemont, Ill., came from a financial services company that was unable to cool its computer equipment for that very reason.

The customer flew in on a chartered jet along with 1,000 pounds of computer tape, checked into Comdisco's Wood Dale, Ill., hot site at 5:30 p.m. Sunday and was back in full production by Monday morning.

Meanwhile, Comdisco competitor SunGard Recovery Services, Inc. in Wayne, Pa., also reported that two Des Moines customers, a bank and an insurance company, had declared disasters on Sunday and moved into recovery sites at SunGard's Atlanta and Chicago recovery centers, respectively. The insurance company moved back to Des Moines on Monday, after commercial power was restored.

In Minneapolis, an IBM Business Recovery Services hot site welcomed the IBM Application System/400-based applications of DICO Corp., a Des Moines maker of wheels and tires.

At least one Comdisco customer in Des Moines stayed put by devising a novel solution to the water problem.

"We put in a child's wading pool and used a pump to spray the compressors," said Lloyd Peterson, second vice president of information services at Principal Financial Group, an insurance concern and one of the state's largest companies.

Both the IBM Enterprise System/9000-class mainframes in Principal Financial's two downtown buildings were back in production and running at normal transaction capacity by Monday morning. "As far as our [terminal] users are concerned, it's business as usual here," Peterson said.

Hard days night

Still, the company's 1,000-person IS staff, divided into shifts of 250 to 300 people, was working overtime early in the crisis, putting in 24- to 36-hour shifts.

Long hours were also the story at Meredith. "Everyone is working 20-hour days," Marksberry said. Shifting its Sun Microsystems, Inc. server network — featuring Cisco Systems, Inc. routers and Cabletron Systems, Inc. hubs — to the remote location took a day, and Meredith was back on-line by Tuesday.

In addition, Meredith employees were able to telecommute from home into the server's outsourced mainframe, which is operated in Boulder, Colo. Usually, Meredith has 900 to 1,000 PCs and 250 Macintosh computers on its corporate network.

"It's not pretty, but it's working," Marksberry said.

Down to the wire-less

After last week's flooding knocked out the phone switch for Des Moines and drowned the police department's mainframe, communications prospects looked very bad indeed, said Sgt. Tim Cunningham.

To make matters worse, President Clinton visited the city, an event that "strained my very limited resources," said Cunningham, who is the police department's chief of staff.

The department lost regional phone company US West Inc.'s eight emergency phone lines and had the use of some radio channels, but had been provided with emergency communications. That left no good way for the 19 communities surrounding the affected parts of the city and southwest to reach officers, to get the information they needed to make decisions.

In stepped wireless electronic mail as the answer to Cunningham's SOS. RAM Mobile Data sent the department 10 packages that included Hewlett-Packard Co. 100LX handheld computers, Ericsson GE Mobile Communications, Inc. wireless modems and RadioMail Corp. software for RAM Mobile Data's wireless packet data networks.

The department was just distributing the E-mail devices at press time, but Cunningham said the additional mode of communication, which is impervious to water, would be invaluable, especially for sending longer reports on water-level and levee conditions.

—*Lynnda Radosevich*

Informix users say support still lacking

By Kim S. Nash
SAN JOSE, CALIF.

Informix Software, Inc. users sought proof last week that the vendor has cleaned up support problems such as erratic bug fixes, unacceptable response time and inadequate technical advice.

A few dozen of the users participating in the second annual user conference here vented frustrations and offered suggestions for getting the company's support organization on track during a two-hour open forum with Informix executives. Although Informix revamped customer service in August 1992, users reported little relief from problems that have dogged the company for years.

Several users said they were impressed that Informix was open to shoot-from-the-hip feedback about problems, but they were skeptical that the company could address all their concerns quickly.

"We canceled a $30,000-per-year support contract because we weren't getting anything from the technician that we couldn't do ourselves," said one user who requested anonymity.

"I'll be honest with you. We have a lot of problems yet to solve, but we're putting measures in place and have been for about a year," Jim Hendrickson, Informix vice president of customer services, told the group. "But, yes, we have a ways to go in some areas," he added.

The remedies range from separate maintenance releases to a bulletin board service to the establishment of a focused support group.

Finding fixes

Users interviewed at the conference said they were most concerned with bug fixes for the Informix OnLine and SE databases and various Informix tools. "I wish that instead of holding seminars talking about all the features to be included in products that aren't even out yet, they would get to work on bug patches," a longtime OnLine customer said.

Hendrickson told forum attendees that he is doing just that. The next major bug patches for Informix OnLine 4.1 and 5.0 are due out by December, called 4.12 and 5.02, respectively. Until then, users can get emergency patches from Informix if the problems are severe enough to crash applications. Other users have relied on word-of-mouth help from fellow Informix customers or resellers.

Release 5.02 will contain fixes for 120 bugs, Hendrickson said. "We're getting close to a stable offering of [Informix OnLine] 5.0," he said, adding that he anticipates having to distribute just one more maintenance patch.

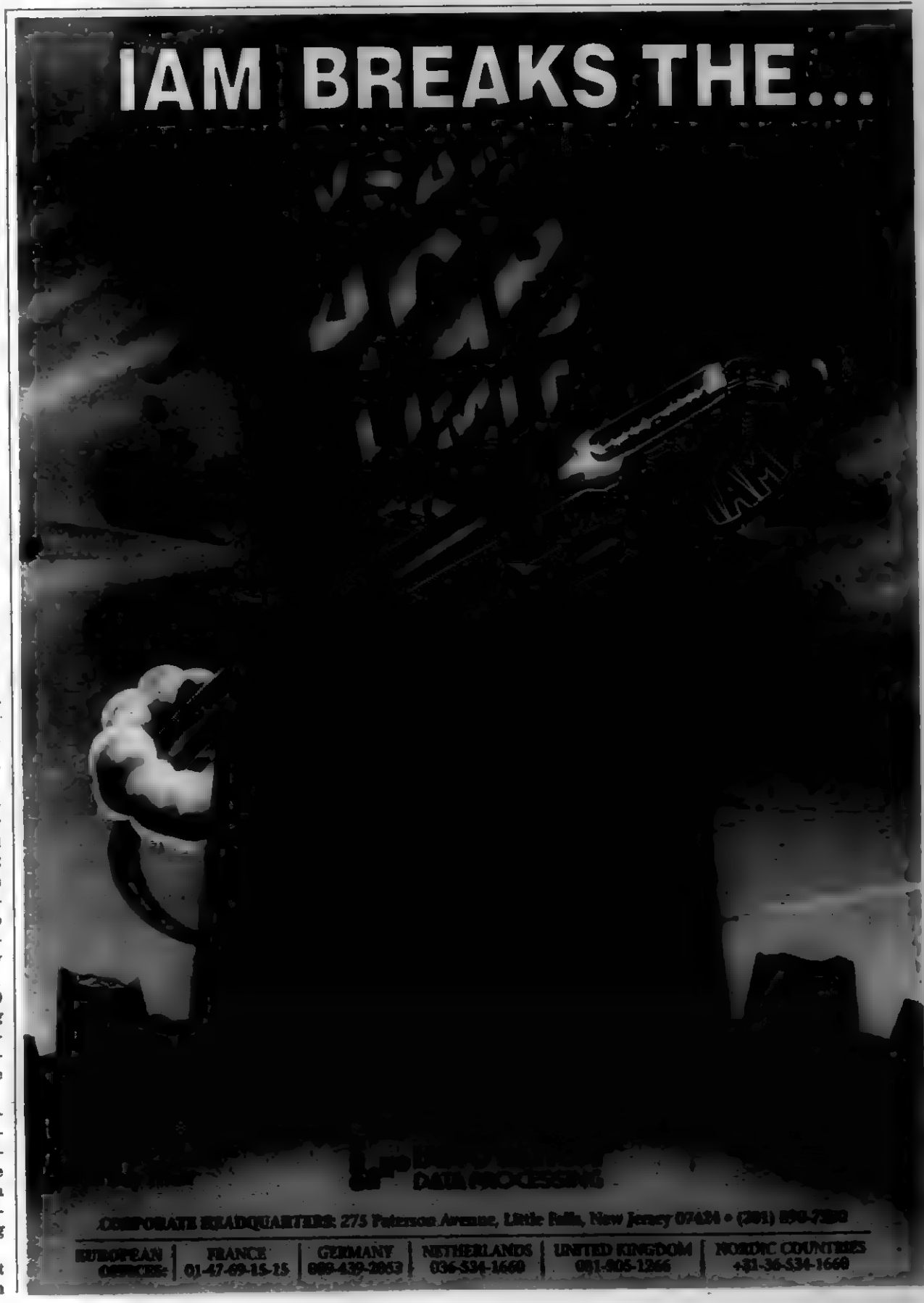
However, Informix application development tools are a different story. Hendrickson said he is not as far along in addressing bugs in development tools as he is in database engines. "We're still a ways away," Hendrickson acknowledged. An eight-member team is working on fixes for Informix-4GL, he said.

Repairing every bug in every product is "incredibly expensive," Hendrickson said. "But now that we're out of a dark hole, we can ... see what's left and decide whether it makes sense for us to do from a business point of view."

Among the changes Hendrickson has made are the following:

- InformixLink, a bulletin board service, is the formal mechanism for notifying users of bugs. PCs or Macintoshes can access the service 24 hours a day, but users of Informix's lower level support plans do not have access to the entire database of bugs. That access costs $500 more than the price of basic support plans.
- Technical support people have been split into layers of expertise, with routine calls going to a 50-engineer hub in Lenexa, Kan., and more intricate problems tackled by special three-person teams at headquarters in Menlo Park, Calif.
- More focused quality assurance processes during the product development cycle, instead of quick tests after the product is built.

Not all users have seen problems. Midwest Securities Trust Co. built a Unix-based customer service application without encountering a single bug, said John Dynkowski, manager of emerging technology.



IBM tweaks AIX, RS/6000 servers

By Jean S. Bozman
WHITE PLAINS, N.Y.

IBM continues to tinker with its RISC System/6000 Unix server lineup. Last week it announced a high-end unit, price cuts on its current high-end servers and related peripherals and the addition of several AIX modules.

Server price cuts ranged from 13% to 16% on high-end Models 97B, 98B and 590; prices on RS/6000 peripherals were trimmed 20% to 34%.

The latest adjustments to the RS/6000 line followed two major upgrades in February and May, which produced 16 new RS/6000 models.

"IBM is still a hot-and-heavy contender in the world of workstations as servers," said Rikki Kirzner, a principal analyst at Dataquest, Inc. in San Jose, Calif. She added that the most recent tinkering provides a price/performance increase designed to help IBM stay competitive.

IBM's new Series 300 Model 34H unit (see chart) replaces the 18-month-old Model 340.

Low-end server

IBM PowerStation/PowerServer (Series 300 Model 34H)

From: $13,000

Available: Aug. 6, 1993

Includes:
- 41.6-MHz processor
- 16M to 256M bytes main memory
- 400M bytes to 4G bytes internal storage

Meanwhile, IBM released AIX 3.2.4, which the company said contains enhancements that should greatly reduce installation time and ease maintenance of distributed AIX systems.

"It's a big step in the right direction for what users want," said Dave Smith, a Unix analyst at International Data Corp. in Framingham, Mass.

Several AIX modules supporting distributed processing were released. They include the following:

- AIX CICS/6000, which was announced last September, will channel transactions between IBM mainframes and Unix workstations.
- AIX/DCE Threads/6000 facility was designed to handle multiple client requests for the same Unix server.
- AIX DCE Version 1.2 is IBM's first implementation of the distributed file services feature of the Open Software Foundation's Distributed Computing Environment. It will allow users to share files across an enterprise network.

Key to success

Users said the AIX enhancements were key to the successful operation of distributed RS/6000 systems. "They're going through some of the issues of managing this diverse and spread-out computing environment," said Robert Benmosche, executive vice president of administration, operations and systems at PaineWebber, Inc. in Lincoln Harbor, N.J. "The more we can make this [environment] seamless and robust, the less difficult it will be to operate." PaineWebber is installing some 500 RS/6000 servers nationwide for application trading purposes.

Industry observers said the AIX ease-of-use enhancements are a sign that IBM is heeding users' complaints about excessive downtime due to installation of software upgrades and maintenance releases. "AIX can take many, many hours to install, but they've pared it down," said Terry Shannon, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "They recognized it needs to be easy, particularly in response to [Sunsoft, Inc.'s] Solaris, which has about a 45-minute install."

Installing AIX upgrades has become time-consuming, some users said. "It [AIX] installs pretty quickly if you have a new processor," said Roy Dodd, MIS manager at The Good Guys, Inc., a West Coast electronics equipment chain in Brisbane, Calif., which uses several IBM RS/6000 servers.

SGI brings high-end graphics to masses

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Silicon Graphics, Inc. (SGI) last week unveiled the Indy, its first attempt at a mass-market version of its graphics workstations.

The workstation, which features on-line videoconferencing and a graphical user interface, is set to compete against low-end Sun Microsystems, Inc. graphics machines and high-end Apple Computer, Inc. Macintoshes used for publishing and multimedia applications.

Besides the base Indy model, other family members include a low-end unit that costs $7,495 and comes with a 340M-byte disk drive, 16M bytes of memory and a 16-in. monitor, and a high-end unit for $15,495 that features a 100-MHz chip, 16M bytes of memory, a 540M-byte disk drive and a 16-in. monitor.

Indy's low price is a dramatic departure for SGI, which just introduced low-cost Indigo workstations for $18,000 [CW, July 12]. An entry-level Iris Indigo unit costs $7,000.

"They've been the technological leader in graphics, but they've been content to concentrate on the high-end graphics market," said Harry Conover, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "Their prices [had] put them out of reach of the 2-D graphics and CAD/CAM market."

The new Indy hardware, Conover said, will be a tough competitor in terms of both price and performance with low-end Sun, Hewlett-Packard Co. and IBM RISC System/6000 workstations.

Indy workstation

Base price: $5,000 Available: Third quarter 1993

Features:
- Diskless configuration includes Mips R4000 chip.
- 16M bytes of main memory.
- Lightweight color video camera made by Teleview Research in Palo Alto, Calif.
- 25-in. color monitor.
- 24-bit color graphics, keyboard and mouse.
- Disk and upgrade options could boost price to nearly $8,000, industry analysts said.

Some observers said they see Indy as a wedge to gain market share from another strong competitor in the graphics market — Apple, which is due to introduce its PowerPC by 1994.

"A lot of graphic artists are hoping to move from the Apple Quadra to the PowerPC, so SGI is making a preemptive strike there," said Tony Bove, a publishing and multimedia software analyst who edits the "Inside Report on New Media" in Gualala, Calif. Due to their unfamiliarity with using Unix commands, Bove said, such users have found SGI workstations difficult to operate. But SGI said Indy's new icon-based interface will hide the Unix command line.

Applications software is another concern. "There's no doubt the SGI graphic engine is excellent," said Paul McGuckin, an analyst at Gartner Group, Inc. in Stamford, Conn., who questioned the availability of compatible shrink-wrapped applications. SGI said about 1,300 SGI-compatible applications can run on the machine, along with a Windows emulator from Insignia Solutions, Inc. and a Macintosh software translator from Quorum Software, Inc.

Tandem line

CONTINUED FROM PAGE 1

firm plans to detail a restructuring plan [CW, July 12]. The company said it expects to post a loss for its third fiscal quarter.

Early last year, slow sales and a 5% growth rate forced Tandem to restructure; it reduced its work force by 6%. The company said it could not comment on its latest restructuring plan until July 28.

The newly restructured Tandem, which builds fault-tolerant systems used in banks and telephone companies, will base all its systems on Mips Technologies, Inc. reduced instruction set computing (RISC) chips. That will reduce its overhead, which should boost profits, Tandem said.

However, Tandem will continue to sell its non-RISC Cyclones, once priced at more than $1 million, Heil said. Tandem introduced its first CLX/R and Cyclone/R RISC servers in October 1991.

One immediate payoff from the new RISC systems has been substantial discounting of the Cyclone systems, users said.

New York's Coffee, Sugar & Cocoa Exchange just bought six Cyclone models for roughly what it paid for two Cyclones in 1990, said Patrick L. Gambaro, senior vice president of system floor operations at the exchange. Discounting of the Cyclones may be linked to Tandem's desire to clear the decks for the new machines, he said.

"We think Tandem is trying to promote the new products and to do it quickly, to try to turn the company around," Gambaro said.

Keeping it in mind

Some users said they liked Tandem's strategy to move to open systems, but they have no immediate plans to buy the new NonStop Himalaya design.

"Our current plan is to continue to utilize the resources we have, but we are looking at the opportunity to migrate to open systems platforms," said Don Karmazin, vice president of information systems at the Chicago Board of Trade, which has eight Tandem VLX systems. "It will certainly be something to be considered."

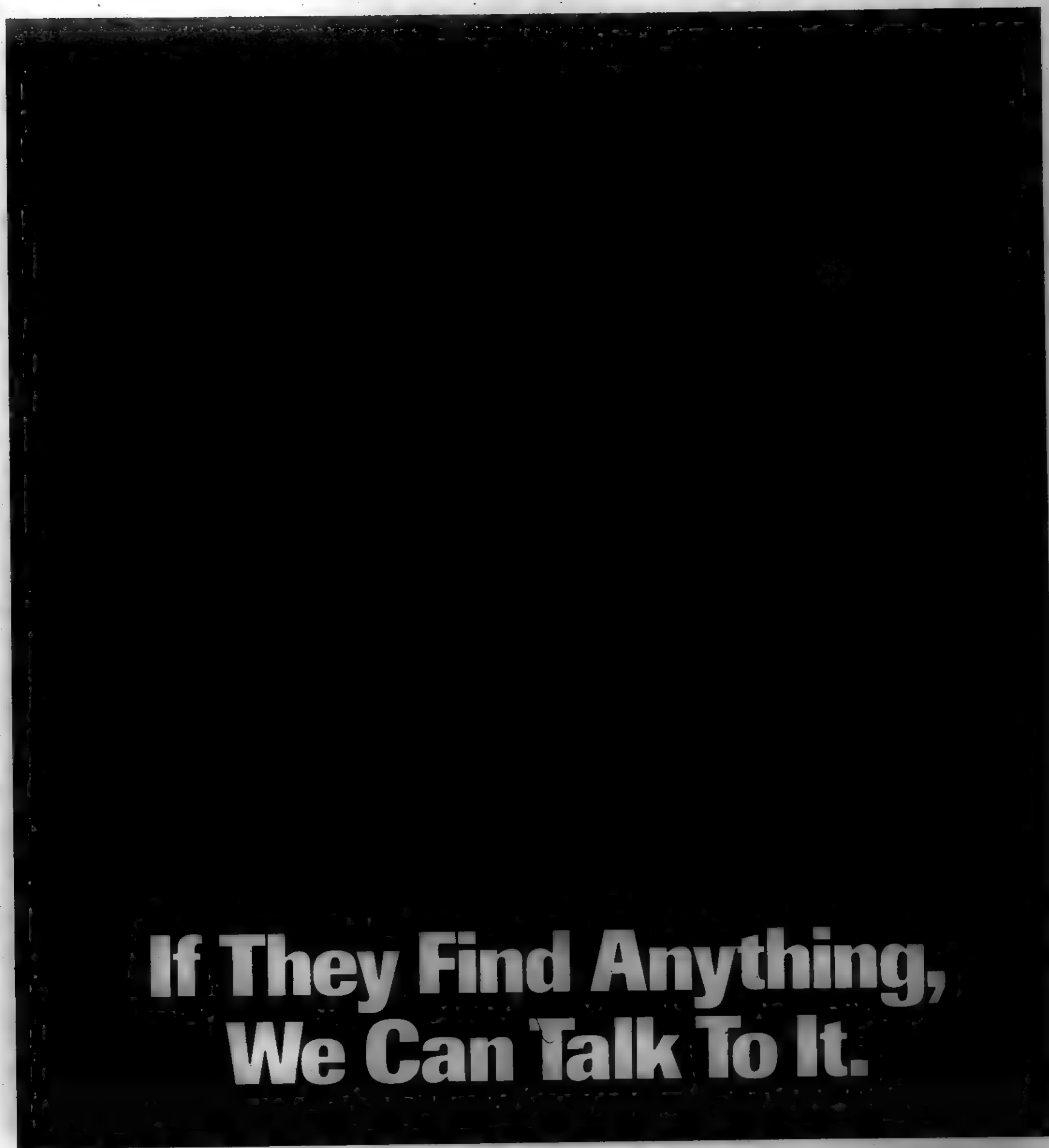
Tandem's Himalaya boxes will range from low-end $25,000 data servers to a massively parallel system with a base price of $339,000. At the same time, Tandem is giving users the option of placing either a Guardian or Posix "personality" on top of the basic fault-tolerant Guardian operating system.

"The personality adapts the application to the transaction service, which is our underlying technology in the [Guardian] kernel," Heil explained. In time, Guardian will only have "open" personalities, he said, but Tandem's only Unix System V Release 4-based system will continue to be its Integrity line of Unix RISC systems.

A separate Tandem partnership with Unix System Laboratories, Inc. (USL) will develop a version of USL's Tuxedo on-line transaction processing monitor optimized for massively parallel servers and fault tolerance. That software code should be available in late 1994, Heil said. A Posix developer's kit is set to ship in December.

Tandem's solution may not be all-Unix yet, but it is headed in that direction, analysts said.

"It's a building-block approach to provide what amounts to a fairly comprehensive Unix environment, but one that still has a Tandem flavor," said George Weiss, vice president of Gartner Group, Inc.'s midrange computing strategies service in Stamford, Conn.



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Windows NT client first piece to solve 32-bit puzzle

By Michael Vizard
REDMOND, WASH.

While information systems directors await the fall shipment of NT Advanced Server, developers said this month's expected delivery of Microsoft Corp.'s NT client will be the first stable 32-bit platform capable of building next-generation Windows applications.

Although Microsoft has shipped 50,000 Win32 development kits, developers have generally been waiting for Microsoft to provide a stable platform on which they can really hammer out the intricacies involved in creating 32-bit applications, said Bill Cornfield, president of the Windows Support Group, a systems developer in New York.

"I'm bullish on NT as a technology, but real life is real life, and Microsoft has to start delivering something other than merchandising," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H.

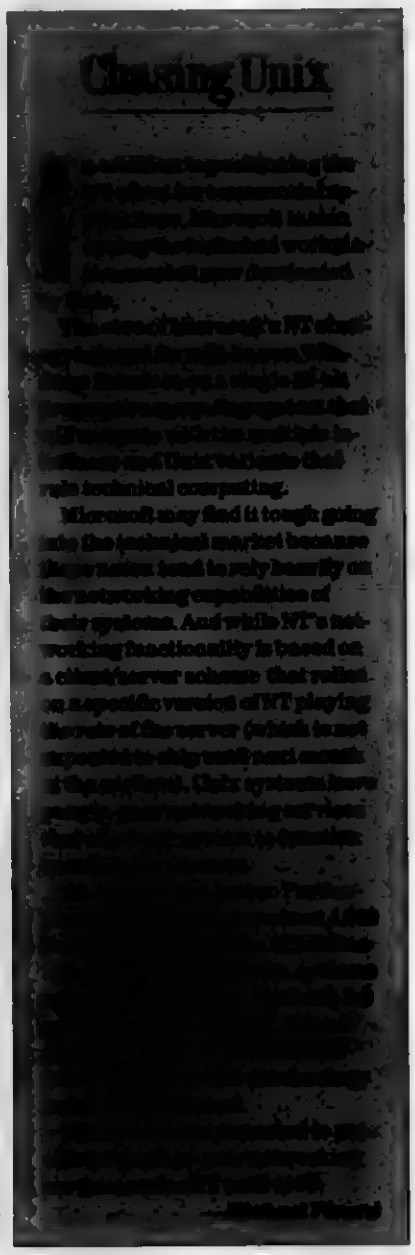
According to Cornfield, his organization will make use of the NT client to create native NT applications that will run primarily on the server, with some of those applications also running on NT clients. In addition, Cornfield said he views the NT client as a platform for developing 32-bit applications that will run on Windows 4.0, also known as Chicago, which is due sometime next year.

On the fence

As yet, Cornfield said it is too early for him to tell whether his organization will lean toward NT clients or Windows 4.0 clients, but Dunkle maintained that because NT "consumes a horrendous amount of system resources," most sites will opt to deploy 32-bit applications on Windows 4.0 clients [CW, June 28].

"I'm sitting here running NT on a Dell 66-MHz 80486. It takes up about 125M bytes of disk space, which on this system leaves me with 16M bytes of free memory space," Dunkle said.

Because of these issues, Dunkle said developers are currently "cooling their heels on NT" while they wait to get a look at Chicago. "The road to Cairo may actually be through Chicago rather than NT," he said.



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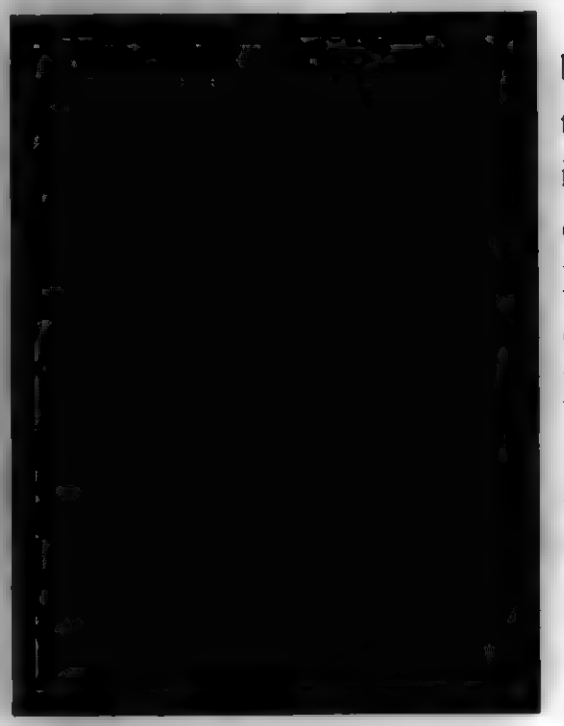

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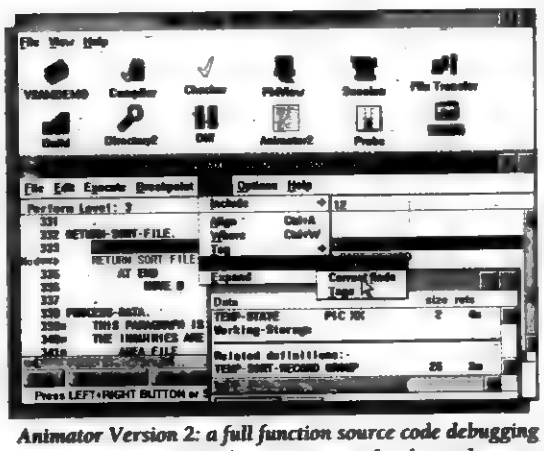

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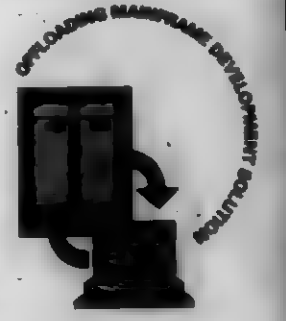

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Service, product gripes force Legent to fine-tune

CONTINUED FROM PAGE 1

tionally mainframe-centric company had erred in not better publicizing its strategy and architecture for non-MVS platforms. He said Legent will reveal by the end of September "a very clear template" for its role in distributed computing in terms of "architecture, product deliverables, mergers, acquisitions and affiliations."

Burton also blamed a revenue shortfall on a shift in focus by the sales force that had inadvertently neglected smaller customers (see story below).

Legent CEO John Burton *acknowledged that a clearer product strategy is needed*

Despite Burton's admissions, other users said they remain completely satisfied with Legent's service and are confident it is making the right product moves for the future.

Merger results

Still, the merger has had some unforeseen and unfortunate by-products. Legent recently decided to abandon development of OPS/View, a PC-based product for consolidating MVS message traffic from multiple systems into a single intelligent display. OPS/View was in use at a number of beta-test sites.

Suzanne M. Nicastro, vice president of Legent's Data Center Management group, said Legent decided not to complete development of OPS/View, which Goal had started before the merger, because its capabilities would ultimately be in the new "superset" automation workstation product.

Sarah Reinemeyer, supervisor of systems engineering at Texaco, Inc., and a beta-test user of OPS/View, said she was counting on it to allow remote management of MVS data centers from a local-area network. She said she cannot wait for the superset product. "We are going to go and get somebody else's product, and Legent is missing the market," she said.

Doalen Ruffin, automation project leader at Tandy Corp. and a user of the Goal OPS products, said he is worried he will lose capabilities when the superset products appear. "Back and forth, back and forth, we seem to get conflicting stories from Legent about their product plans," he said.

On the day after the Legent/Goal merger became final last August, Legent announced a plan for developing "superset" products in two areas — automated operations and output management — incorporating the best features of similar products from Legent and Goal. Legent said it would bring out new releases of the separate Legent and Goal products in 1993, then introduce superset products 12 to 24 months later [CW, Aug. 17, 1992].

Superset commitment

Nicastro said last week the company has not backed away from its commitment to give users a smooth migration path to the superset products while ensuring no loss of existing capabilities.

She said that although some release dates have been moved back, that has been offset by the fact that the releases will contain more features than had originally been planned. To overcome past communications shortcomings, Legent recently sent customers the first of a planned series of progress reports on the superset products, Nicastro said.

Support gap

A number of users said technical support for the Goal automated operations product line had slipped since the merger. "Support is not as good [or quick] as it used to be," said Earl Harper, senior automation analyst at Visa International, Inc.

"With Goal, technical support was never the best, but now they don't seem to have a personal interest anymore," Ruffin said. When he called a technical support supervisor to complain about poor service, he had to leave three messages over a 10-day period before his call was returned, he said.

Reinemeyer, who is also chairwoman of OPSXchange, the national Legent user group for OPS, said she had been told Legent would not promise to resolve all customer problems with OPS unless they were deemed serious. "I don't recall that happening before, but it's been happening more and more during the past six months," she said.

David Boast, Legent's vice president for client services, strongly disputed the claim that support for OPS out of the company's Woodland Hills, Calif., office had slipped. He said detailed reports that track statistics such as problem-resolution times and number of outstanding problems showed no deterioration in the past 12 months.

Customers on the Legent side of the Legent/Goal merger appeared happier with service. "Service is their strong point," said Nathan Gillison, operations software specialist at South Trust Data Services, the data processing arm of South Trust Corp. in Birmingham, Ala. He said response to trouble calls is usually "right then and there, even if the problem is not critical."

South Trust uses AutoMate/XC and AutoMate/MVS — automated systems operations products from the Legent side of the house — and plans to become a beta-test user for the superset PC product. Gillison said he is completely satisfied with what he has heard from Legent about its product development plans.

"Legent has always made me happy. If I had something that was not quite right, they made it right. I don't trust software companies in general, but over the years Legent has earned my trust," Gillison said.

Boast disputed several customer views that support for the OPS products had been reduced. "The OPS [Goal] and Automate [Legent] support staffs have both been maintained since the merger," he said. "They are the same teams, have the same managers, the same locations and same phone numbers."

In addition, Boast said, Legent had improved service in a number of ways, including extending call hours and implementing a faster process for complaints.

Up and down

Not working

- Synergies from the Legent/Goal merger (the "superset" products) have not yet emerged. Some users are confused about company's direction.
- Some Goal products — tape management and backup/recovery for MVS — had to be reworked.
- Legent is late with some products, such as a software distribution tool.
- Sales force has focused on customers' "big picture," not individual products, resulting in some missed sales.

Working

- Company is profitable, has ample reserves and low debt.
- Several major product development efforts are completed or nearing completion.
- Software for systems management is expected to be a booming market.

Hard lesson learned

Even many loyal Legent customers gave the company a mixed report card last week, but Wall Street was not forgiving, knocking 43% off the company's share price in the two days following an earnings report that disappointed analysts.

John Burton, Legent president and CEO, said the market overreacted. He added that analysts were misinformed if they thought the company's sales force was doing [bad things] to Legent's business.

Supposedly [Legent is] focusing on the wrong things [and] not developing new products. Legent's customers [disagree]. Many of them have told us that they are very pleased with the new releases they have received.

Burton also said Legent is working to improve its service and support. He said the company has set up a "war room" to handle requests for a single high-level Legent management who could help [customers] with any problems they have.

Burton said Legent is also working to improve its marketing strategies.

"The downside was we didn't have enough people educating the technical levels where people would use one or two of our products in day-to-day technical activities," Burton said.

"The mainframe market is slowing down, and Legent hasn't laid out an architecture or a coherent strategy for the PC-LAN-Unix area, other than bits and pieces," said Dale Kutnick, president and research director of Meta Group, Inc. in Westport, Conn. "That is still missing, while their major competitor [Computer Associates International, Inc.] has articulated that."

According to Kutnick, Legent is strong financially. He predicted it will pull out of the doldrums in the next quarter or two as it resources customers and investors feel it is on the right track.

— Gary H. Anthes

Portable document format bows

By Michael Vizard

ALAMEDA, CALIF.

Farallon Computing, Inc. plans to launch an assault against Adobe Systems, Inc. with this week's release of a portable document file format that is linked with TrueType fonts developed by Microsoft Corp. and Apple Computer, Inc.

Called Replica, the Farallon file format works primarily with applications that use TrueType fonts. It was designed to allow users to send documents that can be viewed on any Windows or Macintosh system. This technology is a counter punch to the Acrobat portable document file format delivered last month by Mountain View, Calif.-based Adobe [CW, June 14].

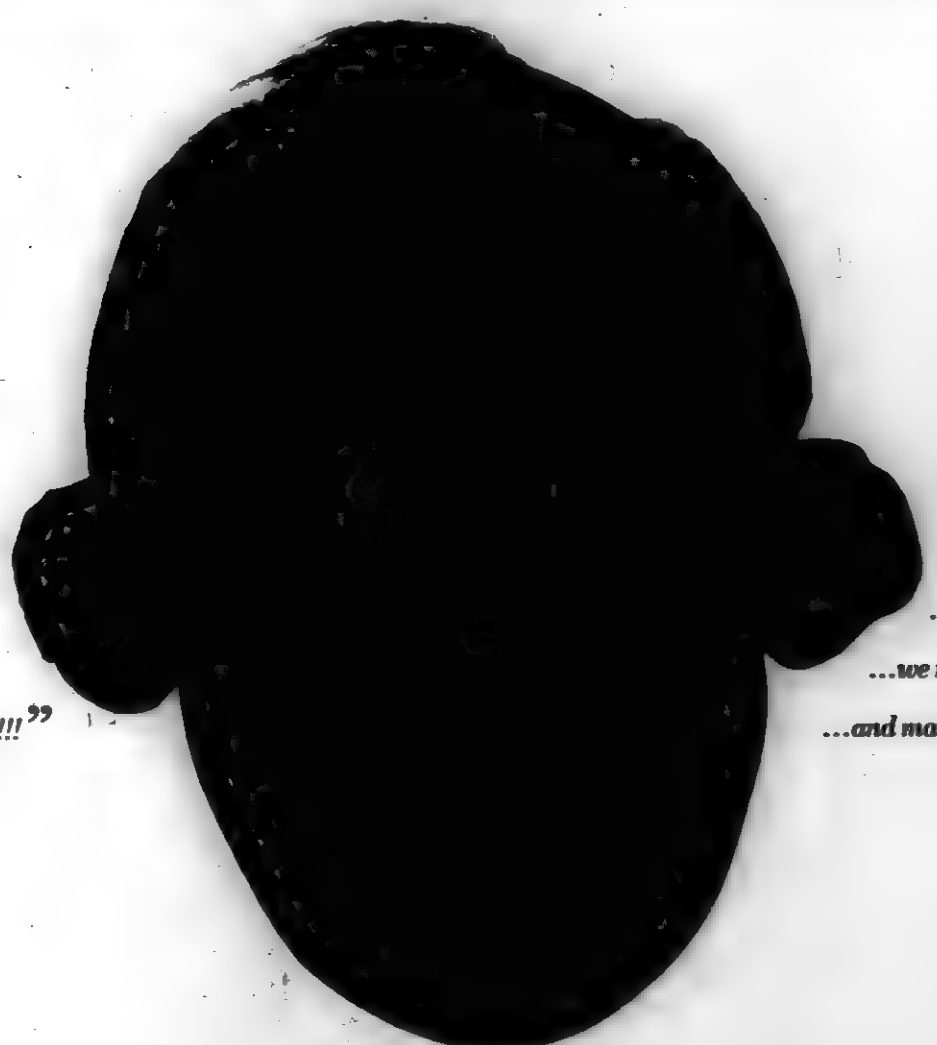
Replica, however, differs from Acrobat in one key area. Acrobat requires sites to have a copy of Acrobat Exchange software, which converts a file into a portable file format, and each user who wishes to access those files must have a copy of Acrobat Viewer.

In contrast, Farallon's approach gives users the option of creating a portable document using Replica Creator and then shipping a copy of its Replica Viewer software along with that document. This eliminates the need for each user to have a copy of a viewer installed on his desktop.

Farallon said it will be able to compete against Adobe because most business users today are using the TrueType fonts that come bundled with their applications.

In contrast, Adobe executives said Acrobat works with both Adobe and TrueType fonts. In addition, they noted that Acrobat currently works across Windows and Macintosh platforms, with support for DOS and Unix due later this year. Farallon's Replica is currently available for Windows, but the Macintosh implementation will not be available until the fourth quarter.

Diagnosis: *Acute Demanditis*



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UnixWare, NetWare blend questioned

By Melinda-Carol Ballou
SANTA CLARA, CALIF.

While Novell, Inc. touts an alliance with Cygnus Support as a means to help unite UnixWare and NetWare, there is some skepticism in the industry about its ability to do so.

Announced here last week, the agreement with Cygnus to deliver Gnu Not Unix (GNU) Unix-based tools for cross-platform development of NetWare Loadable Modules (NLM), as expected, underscores Novell's drive into the operating system wars with Microsoft Corp.

Through the technology alliance, the two companies will enhance the Unix-based GNU C and C++ language development tools, including compilers and assemblers and a source-level debugger. Plans are to ship an NLM software developer's tool kit by the second quarter of 1994, officials from both companies said.

The alliance will not only bring popular Unix tools to NetWare, offering a consistent development environment, but it will also bolster Novell's work to integrate UnixWare and NetWare, officials said.

Cygnus offers a single compiler that will allow the NLMs to run across 80386-based PCs, Sun Microsystems, Inc.'s SPARCstations and Digital Equipment Corp.'s Alpha and Hewlett-Packard Co.'s Precision Architecture-RISC workstations. The compiler is implemented as a front end that is language-specific and will ultimately support Fortran and Ada in addition to C and C++, officials said.

"Ninety percent of the compiler's code is common across platforms; the [remaining] machine-specific code is compiled into specific binary images," Cygnus President Michael Tiemann said. "In the case of processor-independent NetWare, there will be four separate binaries, each of which will be hosted on UnixWare and will generate code for a specific platform."

At the API

Novell will begin its integration work for Unix and NetWare at the application programming interface level, according to Willie Tejada, director of developer relations at Novell. "Most commonly, people ask us, 'When will I be able to author an application that can run in both NetWare and UnixWare as an NLM?' " he said.

He added that the biggest challenges in uniting two such dissimilar environments include surmounting different execution models and operating subsystems. "We want to provide integration without devaluing either [UnixWare or NetWare], and Cygnus will provide us with the [cross-compilation] tools to help do that," Tejada said.

Industry analysts, however, were skeptical about Novell's ability to unite the operating environments. "Both operating systems have entirely different characteristics.... NetWare is unprotected and has no [comparable features such as] paging. There's no way that you can take [a Unix application] and design it and have it run well under NetWare without an enormous number of changes," said Rich Finkelstein, president of Performance Computing, Inc., a consultancy in Chicago.

Distributed networks

Novell leads client/server security effort

By Thomas Hoffman
NEW YORK

■ Coding to customer demands for mainframe-level security in distributed network environments, Novell, Inc. is leading a group of vendors and users to bring international standards compliance to its NetWare 4.0 network operating system and related products.

NetWare compliance with the European Commercial Licensed Evaluation Facilities E2 and the National Computer Security Center C2 evaluation processes and standards will take 12 to 24 months, respectively. C2 includes identification and authentication, discretionary access control, audit and object-reuse functions. E2 is the European corollary.

Novell's effort is called Trusted Network Computing Environment (TNCE). It will consist of a suite of security software under development by third parties, such as Raxco, Inc., Cordant, Inc. and Semaphore Communications Corp., that comply with the C2 and E2 standards.

"Just the fact that you have Novell spearheading a large group addresses some big holes in network security," said Robert Kane, a computer security expert at Intrusion Detection, Inc. in New York.

Nearly all of the dozen or so vendors that have endorsed TNCE — including AT&T and Computer Associates International, Inc. — offer NetWare-compliant security tools. However, certification of a suite of network security packages will for the first time allow these technologies to interoperate with one another.

Customers would be able to pick and choose between packages in the TNCE suite to best meet their organization's network security needs. And unlike other security offerings that provide only partial network protection, the Novell TNCE suite will encompass the entire network, including workstations, servers and all other components.

"It's a 'Good Housekeeping Seal of Approval' on a product set more than anything else," noted Kurt Seibert, CA's senior vice president of strategic business alliances.

The waiting game

Users said they would likely wait until TNCE products emerge before entrusting mission-critical data to insecure local-area networks.

"We're planning to implement EDI for electronic trading [on a Novell network], but we won't do it until the technology [security] is there," said Brian R. Gladman, a procurement executive at the UK's Ministry of Defence.

Robert Young, Novell's vice president of marketing for NetWare systems, said pricing for the C2- and E2-certified NetWare products would be consistent with current price structures for NetWare and attached products.

NetWare pushes out quick 4.0 fix

CONTINUED FROM PAGE 1

noting they expect NetWare 4.0 to make up 15% of NetWare revenue in fiscal 1993. Novell shipped more than $40 million worth of NetWare 4.0 in the first quarter, said Darrell Miller, Novell's executive vice president.

Users cautious

However, resellers and distributors said the product has been slow to move off the shelf. "Users are studying it, but there's not a lot of serious interest in installing it," said Dudley Larus, a marketing manager at Syntrex Technologies, Inc., a nationwide systems integrator based in Valley Forge, Pa.

Larus and Finnie said users are cautious. "Many people running mission-critical applications just will not go to 4.0 until it has been pounded on for a year," Larus said.

Source: The Burton Group, Salt Lake City

Many users said the new fixes and enhancements are not enough to overcome a reluctance to spend money and disrupt local-area network environments.

"I'm reluctant to upgrade for two reasons: First, NetWare 4.0 is expensive [$15,695 for a 250-user version], and second, I've spent two years getting my NetWare 3.11 LAN up to 99.9% reliability, and I'm leery of screwing that up," said Patrick Carney, director of information systems at Asea, Brown, Boveri in North Brunswick, N.J.

The major enhancements to NetWare 4.01 center on NDS, which now has faster synchronization, greater scalability, better internetworking support and self-repairing capabilities.

However, NDS is still not backward-compatible with the server-centric, bindery-based user and directory structure found in NetWare 2.x and 3.x. So network managers must either upgrade all their servers to 4.0 at once or struggle with two completely different user management schemes.

Finnie insisted that complete interoperability does exist today. What Novell has yet to do, he explained, is to hook enough services into the bindery service to enable users to view the network as one entity rather than as individual servers. As a result, network administration under 4.0 is somewhat limited today, he added.

While Novell promises to provide tighter bindery/directory integration in future releases, many impatient users are looking at Banyan Systems, Inc.'s Enterprise Network Services (ENS) for NetWare as an interim solution [CW, July 12].

"ENS will run across both NetWare 3.x and 4.x; so many users, who want global directory but are leery of upgrading, are putting ENS on their 3.x networks now, figuring that it will ease their eventual upgrade to 4.0," said John Krick, an analyst at DataPro Information Services in Delran, N.J.

Included in NetWare 4.01 are new versions of the VLM, which Novell touted as a more powerful client that could be custom-configured and loaded into high memory.

User gripes

Users have complained vociferously on CompuServe bulletin boards about poor performance, corrupted data and unstable drive mappings in NetWare 4.0's VLMs — problems Novell says is fixed in the VLMs shipped with NetWare 4.01.

NetWare 4.01 also contains support for OS/2 graphics and a five-user version of Novell's NetWare for Macintosh 4.0 product.

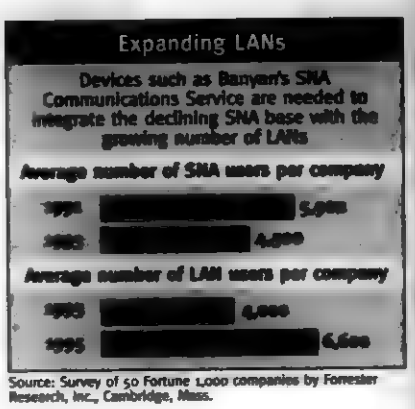
NetWare 4.01 will automatically ship to registered NetWare 4.0 customers. Because it is not backward-compatible with 4.0, Novell officials urge users to upgrade all servers simultaneously.

Banyan improves SNA links

By Lynda Radosevich
WESTBORO, MASS.

Banyan Systems, Inc. this week will expand client support for software that allows users running terminal emulation on its Vines networks to access IBM hosts.

SNA Communications Service, client and server software based on technology from Digital Communications Associates, Inc. (DCA), provides 3270 emulation capabilities to PCs running DOS, Windows and OS/2. Client software that works on Macintosh computers will ship in the first quarter of 1994, and support for Microsoft Corp.'s Windows NT will follow at an unspecified date, a Banyan official said.



Source: Survey of 50 Fortune 1,000 companies by Forrester Research, Inc., Cambridge, Mass.

The SNA Communications Service is also integrated with Banyan network services, such as the StreetTalk directory and security and management features.

The server software is a big improvement over an earlier Systems Network Architecture (SNA) gateway from Banyan that supported only DOS clients, said Richard Schaefer, vice president of client/server technical services at Shawmut Bank in Hartford, Conn.

The bank uses the server to give access to data in three IBM 3090 mainframes to roughly 1,000 Vines end users on multiple platforms.

"The main benefits are faster file transfers and more users supported per server," Schaefer said.

Also, the SNA Communications Service helps Shawmut link IBM resources to the Vines' StreetTalk directory so end users can access SNA sessions using standard Vines commands.

The server software resides on Vines for The Santa Cruz Operation SCO Unix server and includes support for SNA protocols and development tools, including Advanced Program-to-Program Communications (APPC) and DCA's Universal Communications Architecture.

Shawmut is using APPC and the Banyan communication server with Legent Corp.'s X.Com LU6.2 client software to build an application that automates file transfers and distributes software. Neither the previous Banyan gateway nor DCA's Vines-to-SNA gateway would let him do that, Schaefer said.

Pricing starts at $2,995 for server software and $2,795 for 10 client workstations.

Server games

SNA Communications Service puts Banyan on a par with Microsoft Corp.

Microsoft already leverages DCA's terminal-emulation technology to link multiple clients to its LAN Manager terminal-emulation server, said Todd Dagres, an analyst at The Yankee Group in Boston.

However, Microsoft plans to step ahead by moving its SNA server to the Windows NT platform three months after NT's expected late summer ship date. The server will feature advanced security features that are built into NT [CW, April 12].

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News Shorts

Kaleida's changing CEOs

Kaleida Labs, Inc. appointed Michael Braun, a 20-year IBM veteran, to succeed Nat Goldhaber as president and chief executive officer of the Mountain View, Calif.-based firm. Goldhaber will remain as co-chairman of the board, while Robert Carberry, president of IBM's Fireworks Partners, will continue as Kaleida's other co-chairman. Goldhaber, a former venture capitalist, indicated his days at Kaleida might be numbered, saying he is looking into creating start-ups that use some of Kaleida's emerging technologies. Kaleida is trying to create cross-platform multimedia products using its ScriptX scripting technology.

HP rings up net management system

Hewlett-Packard Co. this week will ink a deal with **Bell Canada** to help develop a Unix-based network management system for the Canadian telecommunications giant. The $1.5 million job calls for HP's Professional Services Organization to develop and implement a network control center based on the HP 9000 Series 800 minicomputer. Separately, HP has disclosed an agreement to bundle **BGS Systems, Inc.**'s Best/1 capacity management tools with its own Performance Collection Software.

Feds lift CSC unit bidding ban

Computer Sciences Corp. (CSC) late last week agreed to pay $2.1 million to the **Department of Justice** and the **Environmental Protection Agency** (EPA) to resolve allegations that it had overcharged the EPA in the 3-year-old technical and operational services contract. The settlement lifts the federal government's suspension of CSC's Applied Technology Division, clearing the way for that unit to again bid on government contracts. The action eliminates lingering questions that incumbent CSC would have been ineligible to compete again for the Air Force's Eastern Range Technical Services megacontract, which was due to be awarded after press time last Friday.

Development jump starts from Oracle

Oracle Corp. announced Oracle Industries, a combination of consulting, development tools and business models geared toward specific vertical industries. Initial targets include utilities, oil, higher education and pharmaceuticals. The combination products save users between 20% and 40% of the work of re-engineering and building large systems, Oracle claimed. Programs for financial services and other areas are in the works.

Wireless users to test RF phone services

MCI Communications Co. and **Northern Telecom, Inc.** said they will team, starting next month, on a 90-day trial of personal communications services using radio frequency technology. Participants in the Richardson, Texas, and Washington, D.C., areas will test wireless phone services that let them answer, route or screen calls and allow them to conference colleagues.

SHORT TAKES **Fujitsu Ltd.** has decided against buying a license to use the latest versions of IBM system software. This represents the first time in the almost-decade-long legal wrangle between the two companies that Fujitsu has not bought rights to IBM software.... **Epoch Systems, Inc.** in Westboro, Mass., said it is porting its backup, file migration and volume and library management software to HP's line of Unix computers.... **Hitachi Ltd.** said it will incorporate HP's SoftBench Unix-based application development framework into its computer-aided software engineering products.

Desktop graphics heat up

WordPerfect ups ante vs. Software Publishing, Microsoft

By Michael Vizard
OREM, UTAH

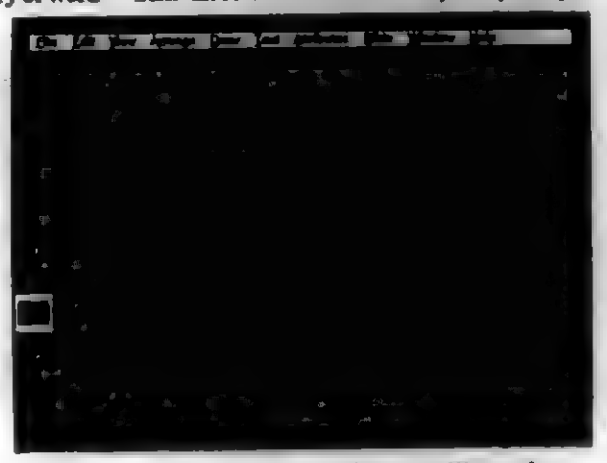
WordPerfect Corp. served notice with last week's delivery of WordPerfect Presentations 2.0 for Windows that it is finally set to do battle for its piece of the highly contentious presentation graphics software market.

With the arrival of its first presentation graphics package for Windows, WordPerfect is now poised to make a play for the fastest growing segment of the Windows software market (see chart below). Driving this growth is the fact that presentation graphics packages are substantially easier to use in a Windows environment than they are on DOS platforms.

However, this surging market has already been targeted by market leaders such as Microsoft Corp., Lotus Development Corp. and Software Publishing Corp. To compete, WordPerfect intends to leverage the tighter file compatibility between its presentation graphics package and its widely used namesake word processor.

In addition, WordPerfect will rely heavily on features that are more often found in drawing packages such as CorelDraw from Corel Corp. For example, WordPerfect Presentations 2.0 offers a full bitmap editor and an autotrace capability that converts files into vector images, which are high-end drawing features that are not currently found in other presentation graphics packages.

WordPerfect is also bundling a scanner with WordPerfect Presentations at no extra charge for the next three months. Other major features include support for Microsoft's Object Linking and Embedding 1.0, support for still video images and CD-ROM sound.



WordPerfect Presentations 2.0 *has a bitmap editor and an autotrace capability that converts files into vector images*

WordPerfect users, meanwhile, reported that file compatibility between the Windows and DOS versions of presentation graphics packages, which WordPerfect provides, ranks highest on their list of priorities.

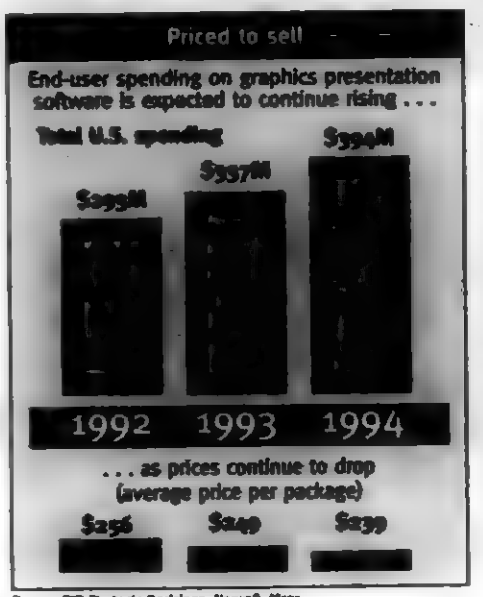
"The WordPerfect strategy seems to be to make DOS and Windows look similar," said Sherman Robinson, a senior economist at the Council of Economic Advisors in Washington, D.C. "Since I'm forced to go back and forth across platforms a lot, it's nice to have a product like Presentations."

Because WordPerfect Presentations supports multiple spreadsheet formats, it is also easier to move spreadsheet files into the WordPerfect graphics package than it is to move other packages, Robinson added.

But while WordPerfect has made a strong entry into this market, the company's Achilles' heel in selling graphics software remains its lack of a true suite offering to combat Lotus and Microsoft. Software Publishing, which is the dominant supplier of presentation graphics packages in the DOS market with its Harvard Graphics package, faces a similar problem.

"Suites are so popular today that WordPerfect may not have enough leverage. We estimate that one out of every two sales of Microsoft's PowerPoint package is tied to its suite," said Bill Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

In the long run, Henning said he expects that WordPerfect will ultimately make a reasonable showing in this market by leveraging its word processing customers. But he said he doubts Software Publishing's ability to compete in the long term after failing to respond quickly to Microsoft's initial launch of PowerPoint under Windows.



Source: BIS Strategic Decisions, Norwell, Mass.

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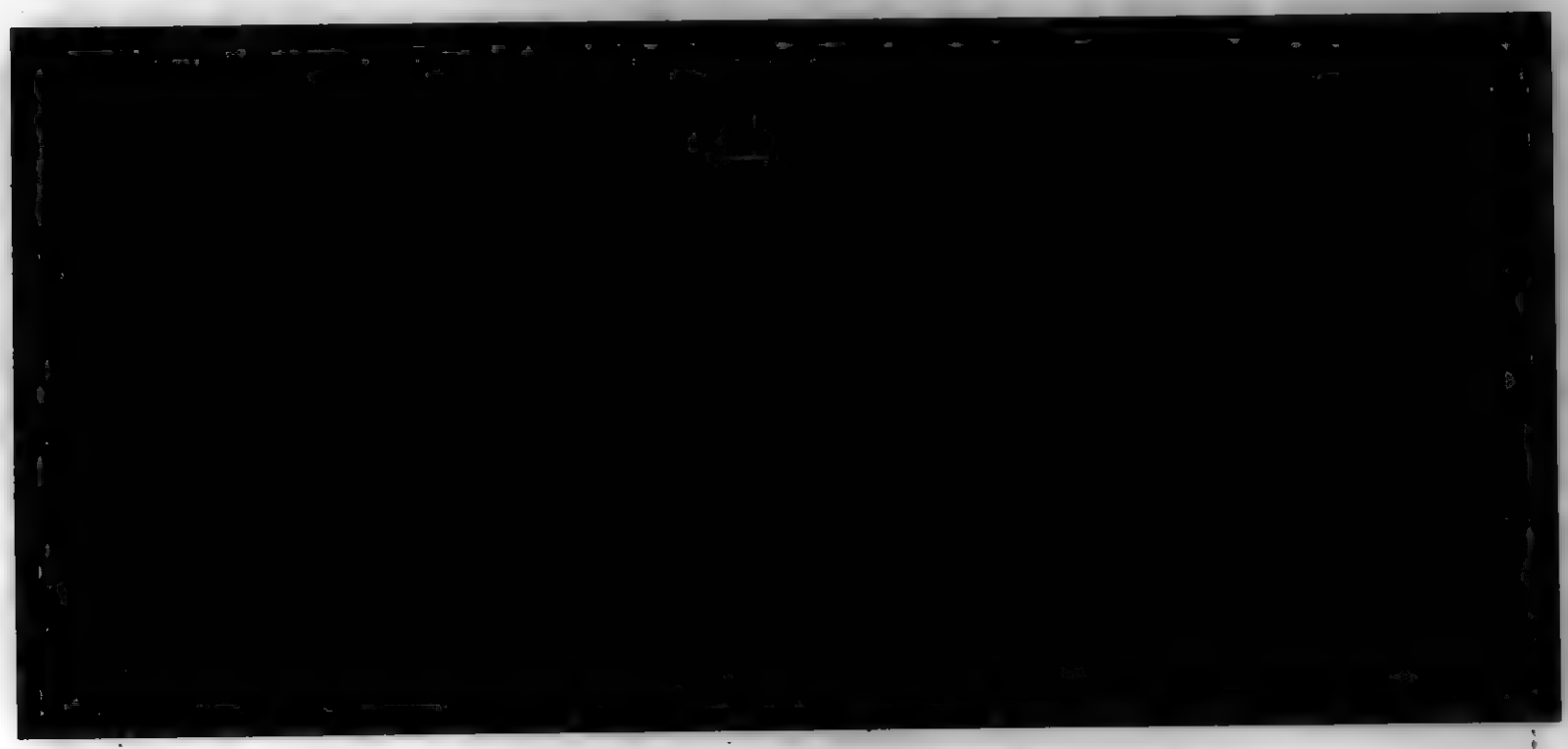

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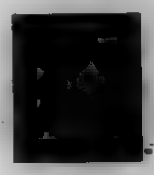

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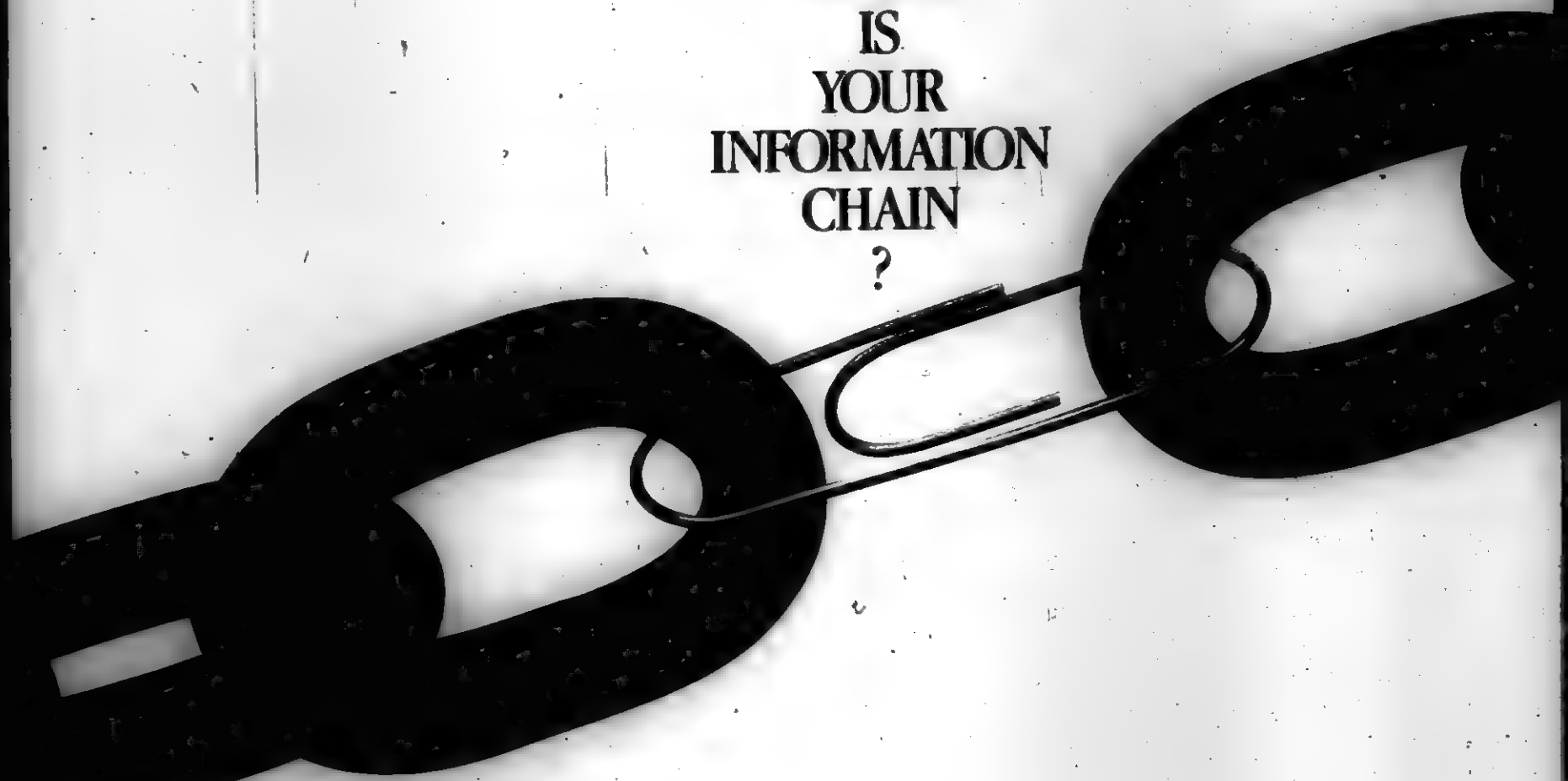

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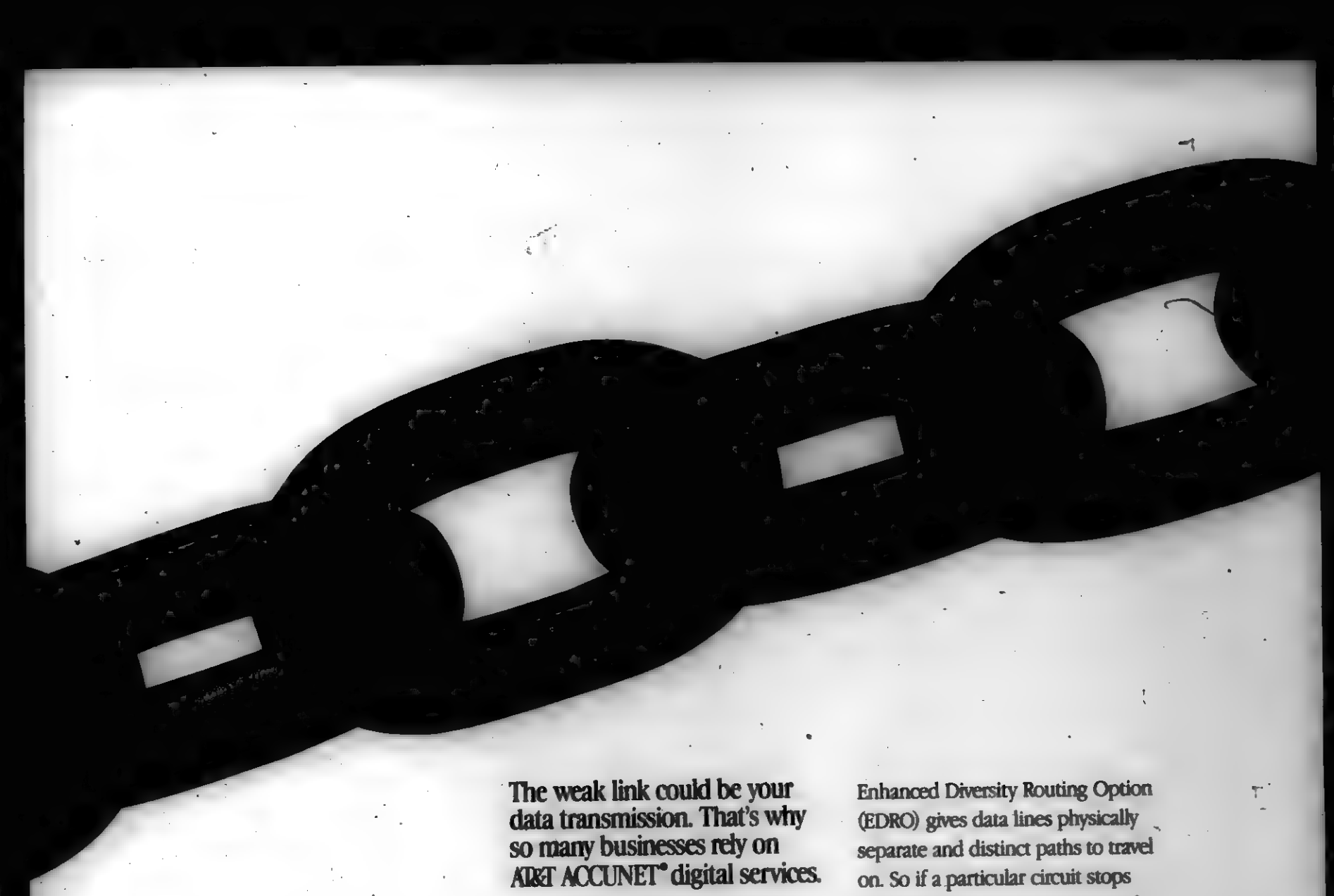

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Faster 486 could overlap Pentium

CONTINUED FROM PAGE 1

pending on Intel's announcement schedule.

Analysts said corporate users will initially shun Pentium systems in favor of DX3-based ones because of price/performance considerations and Pentium's slow production ramp.

"A chip like a DX3 would make a lot of competitive sense for Intel, and it would probably mean that there would be a new generation of machines slipped in between DX2 and Pentium," said Dean McCarron, analyst at Micro Design Resources, Inc. in Scottsdale, Ariz.

At least one user contacted said the DX3 would mean more to his company than Pentium. "We've almost ignored Pentium, but this we might be interested in, depending on its price," said William I. Lodge, a project leader at The Turner Corp., a multinational construction company in New York.

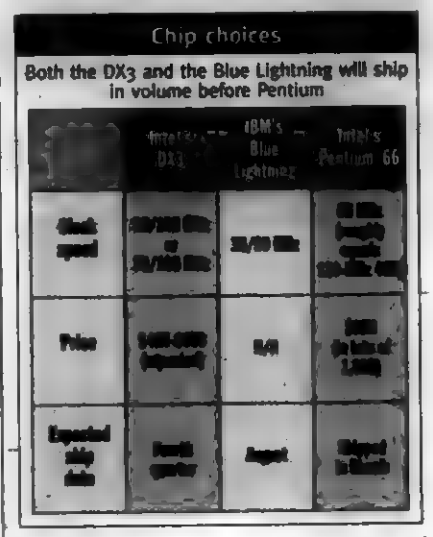
Lodge said the DX3 would be particularly interesting as an OverDrive upgrade because it would give better performance than the DX2 chips.

Sources described two versions of the DX3: One chip, targeted primarily at the portable market, is set to run at 25 MHz externally and 75 MHz internally, while the other will run at 33 MHz externally and have a 100-MHz core. The clock-tripler with the 100-MHz core would outperform anything in Intel's line except Pentium. Sources also said that by changing a single pin on the 33/100-MHz DX3, Intel can also sell it as a DX2 that runs at 50 MHz externally and 100 MHz internally. This will give vendors who have designed for the less popular 50-MHz 486DX systems a boost for their lines.

An Intel spokeswoman refused to confirm details but said, "people can expect additional members of the 486 family that will achieve higher performance — and there are lots of ways of [doing that]."

Shooting the gap

Intel needs the new part because IBM, Advanced Micro Devices, Inc. (AMD) and Cyrix Corp. are all aiming for the hole in Intel's product line that falls between the 66-MHz DX2 and the 60-MHz and 66-MHz low-end Pentiums it has announced. Sources said IBM will ship its 33/100-MHz Blue Lightning in August, and AMD and Cyrix are expected to have clock-doublers out in the fourth quarter, before Pentium can ship in volume.



While sources at various hardware makers said Pentium is ramping up ahead of schedule, they do not expect it will be in volume production until near the end of the first half of 1994. In the meantime, these vendors will need to counter IBM's clock-tripler, headed for the Personal System/2 line and the Ambra clone brand, expected in the U.S. in August.

Still, Intel may have to surrender a quarter to IBM and the others, as sources said it may be backing away from plans to ship the new parts in the fourth quarter.

"It's looking lately like they're going to slip into the first quarter of next year," said an executive at one hardware company who asked not to be named.

Moving to the 100-MHz-core DX2 and DX3 processors will require little redesign for system makers, sources said. The parts will fit into the same slot as a 33-MHz 486 or a 50-MHz 486DX, so vendors can simply sub these into their current system designs.

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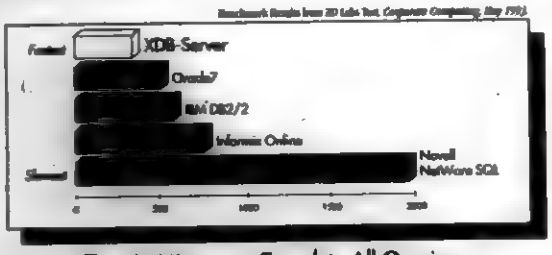

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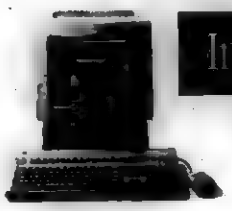

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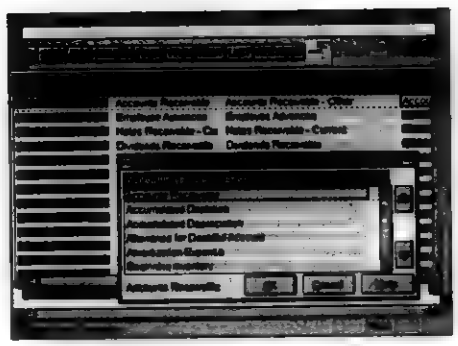

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Midrange computers

IBM to upgrade AS/400 storage

By Craig Stedman

IBM plans this fall to address the performance and upgrade issues surrounding its 9337 direct-access storage device (DASD) that have prompted some Application System/400 customers to look more closely at competing storage vendors.

IBM's Adstar storage subsidiary confirmed last week that it will add memory-based write-caching capabilities to the 9337 in an attempt to boost the DASD unit's I/O throughput, which many analysts and users view as relatively slow. Several competitors already offer such caching on their products.

Duane Dueker, Adstar's director of midrange and low-end storage subsystems, indicated that write caching will be built into new 9337 models configurable with up to 16 half-height, 3½-in. disk drives, up from seven full-height drives.

However, the new controllers needed to do write caching will also be offered as upgrades to all existing 9337 models, Dueker said. IBM also will lay out plans this fall for making future controllers and I/O processors available on an upgrade basis, he added.

Until now, IBM has generally required full box swaps to get new controllers and I/O processors, Dueker acknowledged. That is becoming less acceptable to users, especially because rival storage vendors such as EMC Corp., Memorex Telex N.V. and IPL Systems, Inc. have already introduced or promised upgradable plug-compatible products.

"We've been real reluctant to buy 9337s because of the upgrade problem," said John Waetzig, operations manager at Hills Pet Nutrition, Inc. in Topeka, Kan.

Michael Bangs, vice president of information systems at Scholastic, Inc. in Lyndhurst, N.J., added that the upgrade issue "absolutely" played a role in a recent decision to buy AS/400 DASD units from IPL rather than IBM.

Kevin Beam, director of research at Reliability Ratings, Inc., a Needham, Mass., performance rating company, said rival vendors have focused on taking away high-end upgrade business from IBM. "If you're IBM and you see AS/400 revenues flattening out, you take your upgrades much more seriously," he noted.

IBM still plans to require box swaps for changing disk drives, despite moves by IPL and Memorex Telex to support in-box drive upgrades, Dueker said. Upgrading drives "is a sell tactic, but I question how valid that is," he added.

Falling behind

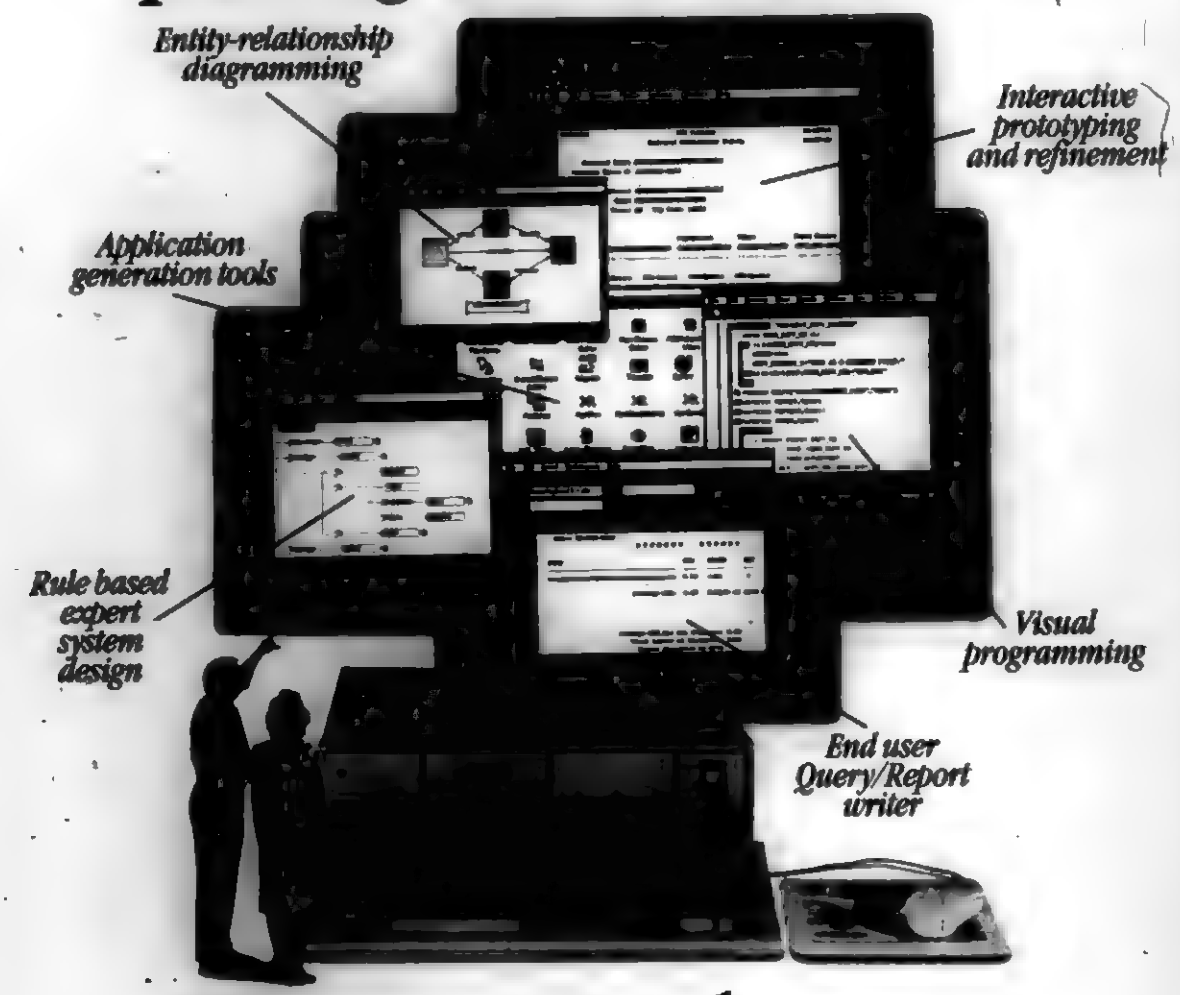
The 9337's I/O performance also has been an issue for some AS/400 accounts. Waetzig said Hills was "seeing some long access times" on its 9337s until IBM supplied an operating system fix with some caching support. A 9336-compatible Memorex Telex subsystem bought in April is still "considerably" outperforming the 9337, he added.

Marc Cohn, senior vice president of IS at Enterprise Rent A Car Co. in St. Louis, has not had problems with the more than 200G bytes worth of 9337s he currently has in place. But Cohn said he expects the 9337 to be "outstripped in terms of processor speed" now that Enterprise is upgrading from the AS/400 E95 to the newer F95.

Adding memory-based write caching to the 9337 "is one of the ways to move the performance along," Cohn said. However, he added that while he waits for IBM to make its move, he is keeping "a relatively open playing field" for his next DASD purchase, due within 90 days.

IBM offers disk-based caching for redundant arrays of inexpensive disks (RAID) versions of the 9337, but Dueker said the memory approach should provide "much better performance" and will work on both RAID and non-RAID models. The change will also open up an eighth slot for data drives, he added.

"Wow, that's what I call pushing the boundaries..."



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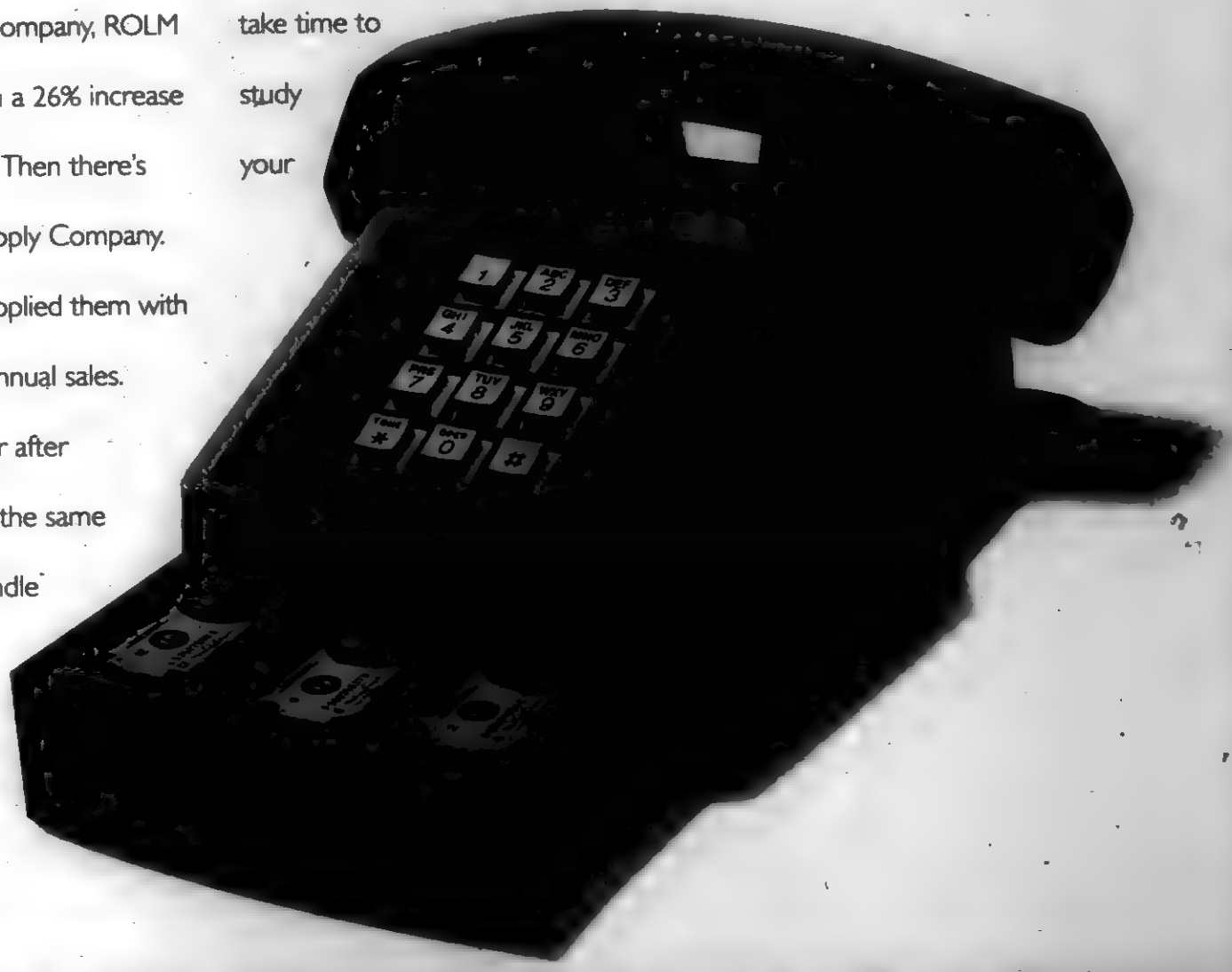

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A labor of labs

In a post-Cold War age, national labs struggle to broaden commercial appeal

By Gary H. Anthes

If you think about high-performance computing at Los Alamos National Laboratory, you might well imagine a supercomputer modeling airflows around an atomic bomb as it sails across the New Mexico desert. But for Gillette Co., the lab is a place to model the flow of human skin under the latest experimental razor.

Gillette, which went to Los Alamos to use its high-performance computer systems and to tap into its expertise in materials, is one of a number of firms that have discovered a gold mine of hardware, software and technical smarts at the national laboratories, which spend some $600 million annually on information technology.

Support for the computer industry by the U.S. Department of Energy's (DOE) national labs is not a recent phenomenon. Los Alamos helped IBM develop the 7030 "Stretch" computer in 1956, thereby laying much of the architectural foundation for the fabulously successful 360 line of mainframes, and without patronage from the labs the U.S. supercomputer industry would scarcely exist.

Peacetime panic

But since the end of the Cold War, the labs' efforts to transfer technology to the private sector have taken on a zeal bordering on desperation. Taxpayers and congressmen are wondering what the labs are going to do with $6 billion a year now that developing H-bombs has gone out of style. And a number of parties are scrambling to redefine the labs' mission in a way that will boost U.S. technological competitiveness while creating private-sector jobs.

Some observers insist you cannot beat swords into plowshares at the national labs, saying that missions, cultures, time frames and technologies do not mesh with those in the private sector (see story at right). They argue that the labs should be allowed to atrophy gracefully in the face of shrinking budgets or should be "privatized."

Craig Fields, chairman and chief executive officer of Microelectronics and Computer Technology Corp., the Austin, Texas-based consortium for research and development in information technology, said some of the efforts to reshape the labs put the cart before the horse. "It's like saying, 'I have this 14-in., insulated Phillips screwdriver; what can I do with it?' instead of saying, 'I'm trying to build a house; what tools do I need?' "

Fields said the role of the labs should be driven by a national technology plan that uses the labs appropriately, not by a laboratory plan concocted to ensure survival of the facilities.

Fields offered two ideas for getting technology out of the labs and into the commercial world:

•The labs could spawn small, highly focused enterprises that would serve as technology suppliers to larger companies.

•The labs could also form consortia with groups of companies in which the parties would share costs but the firms would control the funds provided by the government. Such a consortium would be devoted to relatively difficult, long-term efforts such as developing technology for flat-panel displays.

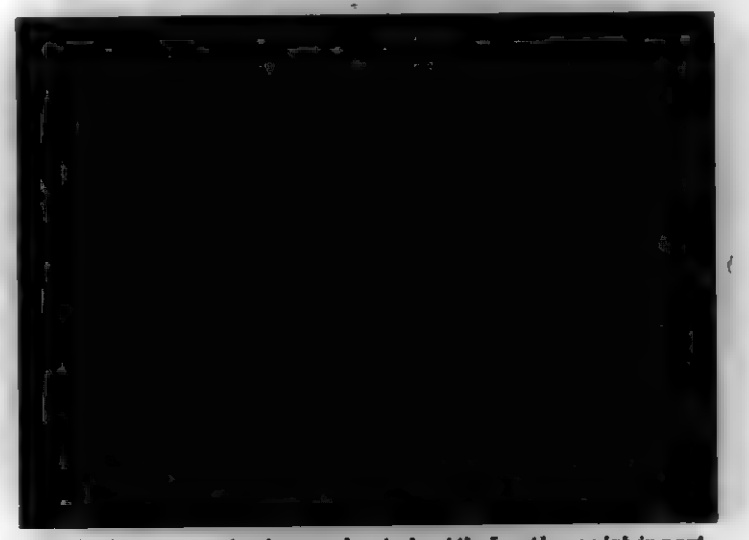
While there is much commercially relevant technology at the labs, and while the labs are earnestly trying to inject it into commerce, computer firms have been inhibited from approaching the labs by contract marathons that can take longer to complete than the life cycle of products the firms are trying to develop.

Digital Equipment Corp. just signed an agreement with Los Alamos under which the two will jointly develop a "farm" of Alpha workstations to solve large, parallel computational problems.

"It's a god-awful process because of the incredible bureaucracy and the centralized management and micro-management by DOE," said a laboratory official who asked not to be named.

In response to that frustration, the computer industry through the Computer Systems Policy Project last year worked with the DOE to craft a model cooperative research and development agreement (CRADA) intended to grease the skids for joint deals.

The model CRADA has been a limited success so far, said John R. DeMember, manager of federal research and development at Digital Equipment Corp. He said it shortened the time it took to get the Alpha workstation farm project going from about 20 months to five months. Unfortunately, DEC had to work with the DOE for 18 months before the CRADA process even kicked in.



Fuel injection *is one technology under study at the Los Alamos lab in partnership with private-sector companies*

Local control

Now, industry and the laboratories are urging that more control over technology transfer be put directly in the hands of laboratory directors, getting Washington out of the loop. In addition, the DOE is working on a revision of CRADA that it says will further streamline contracting.

In the meantime, Los Alamos has begun a promising program called the Computational Testbed for Industry (CTI), which is locally controlled and can get laboratory/industry collaborations going in as little as a week.

Gillette is a CTI user, as is an oil company that came to Los Alamos to use the lab's massively parallel CM-5 supercomputer from Thinking Machines Corp. The oil company also taps into the lab's expertise in I/O management and algorithm development, said Bruce Wienke, CTI director.

David Nelson, associate director of energy research for scientific computing at DOE, said that in the past, industry benefits from joint work with the labs often fell out as an accidental by-product.

"We can't afford to do that anymore, and we don't think it's appropriate," Nelson said. "The mode now is to work with the vendor with the aim that laboratory software will go into the vendor's products."

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> *–PC Computing 6/93*

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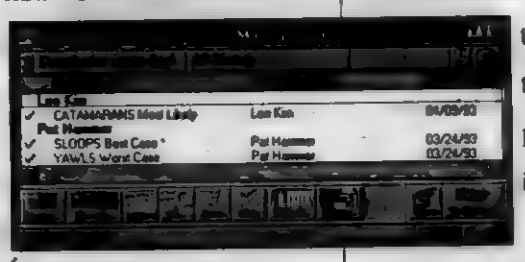

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> *It (Version Manager) also makes Microsoft Corp.'s Scenario Manager in Excel 4.0 look like a toy by comparison.*
> *–PC Week 5/3*

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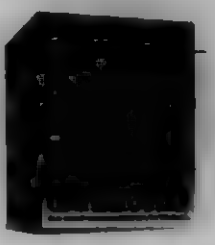

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Quick isn't dirty

There are probably some situations where structured methods are the best way to approach software development. I just haven't seen any lately.

Everywhere I go these days, development groups are churning out multiple iterations of application designs, spurning anything that smacks of a structured framework.

"I don't care whether we use pencil and paper or crayons and drawing tablets . . . whatever works," one IS exec told me recently. In fact, his developers use Visual Basic to develop multiple prototypes *and* eventually build finished applications. A lot of people think this product is nothing more than a toy, he said, but it gets the job done. And it lets the real experts (the system users) feel like experts.

Structured methods just don't work, according to this manager: "None of that bears any relation to the way things are done today."

The way things are done today is fast, cheap and with the maximum amount of reality-checking along the way.

There are a couple of nice side benefits for IS in working this way. One is that the intended recipients of the system get to see, through all the back-and-forthing, that this translation of actions into code really is a creative process. Another benefit is that you get to develop in small, manageable, budgetable pieces.

Large systems projects have always been difficult, if not downright impossible to estimate; there are just too many variables involved. Of course everyone always hears your rough estimate as a hard figure, which means you're on the hook when something happens to bump the project over budget. And something always does happen; it's some kind of law of computer science.

Of course, even with iterative prototyping you still have to sit in budget meetings and come up with estimates that may or may not be accurate to within four figures. What is different, though, is that you know you won't be spending all the budgeted money just for requirements and you know the half-year mark won't roll around with nothing concrete to show. At the very least, you'll have some very nice wall art and, more likely, you'll actually have something up and running. Best of all, you'll have your job.

In case you've dismissed the fellow above as an aberration, let me tell you about another — the IS director of a privately held Midwestern hardware retailer. This man hasn't had his job all that long, but he's already an old-timer compared with his two predecessors, both of whom lasted three to four months.

What was their problem? These men were by-the-book sorts who analyzed and calculated every move, he says. They were not the type of managers who would have felt comfortable prototyping applications on Paradox or Quattro Pro. They weren't "entrepreneurial." Nowadays, there's hardly a more damning description . . . except maybe "structured."

Joanne Kelleher

Joanne Kelleher, *Features editor*

'Lite' approach

Regarding "IS group forms to compare processes" [CW, July 5]: If the comments contained in this article are characteristic of our industry, they portray a frightening commitment to benchmarking "lite."

Of the many kinds of benchmarking, the two described in the article are among the less productive. Any firm needs to be aware of how its operations compare to others in terms of cost and revenue. And benchmarking processes among competitors are a useful way to stay on top of the state of the practice in your industry. However, benchmarking that really delivers is based on a company's realization that some particular process is crucial to its customers. From that springs the creativity it takes to go beyond "round up the usual suspects" and reach outside to find a brand new way to look at that process. That's the kind of benchmarking that pays off.

The "lite" approaches (costs and in-industry process benchmarking) are necessary but not sufficient to identify and bring about major change. And a danger is that they can easily provide excuses for delaying or for not making improvements.

Mac Patrick
Benicia, Calif.

Wanted: c/s tools

My kingdom for a good wrench!

Or a good set of client/server security administration and reporting tools. Now I may sound like one of the proverbial wolves howling into the wind on some Southwest desert basin, but I get the feeling there are going to be lots of "us wolves" out there looking for some client/server sheep to kill in the near future.

All those security issues the industry had 40 years to resolve in the mainframe world seem destined to be resolved in a fraction of that time in the client/server world. This is probably going to result in a confusing, disjointed "cluster influx."

I have taken the leap of faith and jumped into the client/server direction a firm has chosen. We are primarily a Microsoft Corp./Sybase, Inc. SQL and OS/2 shop with windows on our workstations. I administer the database access security for all our client/server applications. We use some primitive ad hoc reporting tools, and we do some C coding ourselves. However, overall we do not have any enterprisewide security administration or reporting tools.

What I need is a set of tools that will cover all the servers and all the databases on those servers. I'm not asking for much. I see all these nice-looking GUI applications with the pretty pictures for the users to select from. Why can't I have one?

Kevin P. Keneffe
Houston Lighting & Power
Houston

Accountant's view

One thing is readily understood from your article "Faster product cycles at odds with accounting rules" [CW, June 7]: You do not have a clue about accountants and what they do. This kind of article only serves to reinforce the view that those in information technology cannot see anything beyond their terminal screens.

Accountants are at the forefront when trying to attach realistic values and life spans to assets. Various methods, including some that made adjustments for inflation, have been mooted during the past 20 years, but all have flaws and no method has gained universal acceptance.

The article does have a point, however. The irony is that it is not the bean counters who are the culprits; it is company management that wishes to spread costs over lengthy periods — usually when faced with a board concerned about the effect of volatile profits on the share price. The accountant is then told to forget realistic depreciation schedules for the good of the company, the shareholders and, of course, the president and sundry vice presidents — the very same people whom you quote as complaining about accountants.

A. D. Rankin
Hong Kong

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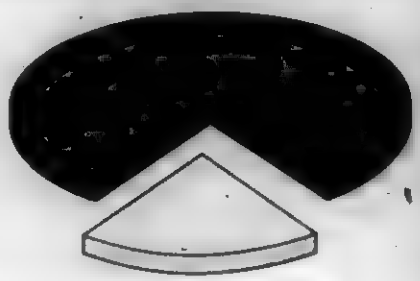

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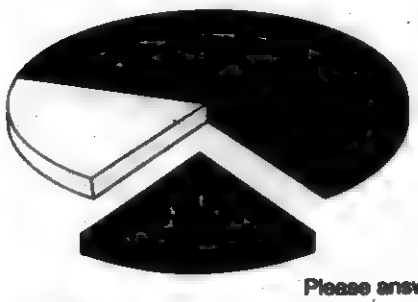

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Please don't take my keyboard away

Michael Cohn

Something very dangerous is going on here, and only a handful of us have noticed. Keyboard users are quietly becoming an endangered species.

It started innocently enough with the touch screen. But when pen-based systems showed up, I became suspicious. Now there's voice recognition, palmtops and even handhelds with no keys at all!

So let me go on record: No one's going to take my keyboard away.

Computer manufacturers are off-track. Keyboards aren't coffee filters, and no newfangled notion can replace the clicking I've known all my IS life.

People *need* keyboards. First of all, they make you *sound* busy. "I'll have to call you back, Boss, [click click click] I've got my nose pressed firmly to the grindstone." Over the phone, no one can tell if you're typing an eight-page memo or just resting your elbow on the backspace key.

Keyboards are also the perfect place to put things. They're a great spot to leave an envelope and even better for little yellow stickers that say "Harry, meet me for lunch at Big Ed's."

Think of the confusion if we didn't have keyboards. You're buying a plane ticket. Or you're renting a car. What if the lady behind the counter used voice recognition? You'd never know when she was talking to you:

"Return!"

"Saturday, June 19."

"No, sir. I was talking to the computer. Home!"

It could be a nightmare. Everyone would get frustrated, and you'd probably wind up getting the Taurus with the broken radio.

I've got nothing against efficiency. If there's a better way, I say use it. The mouse caught on OK, right? People point and click like the dickens. But I'm really not much for pointing and clicking. I can't even point and click with a camera and have several shots of people's feet to prove it.

I admit, some folks hate to type. The hunt-and-peckers gleefully await the keyboard's demise. But if we give up our keyboards, we give up our souls.

The keyboard is the final frontier, our last chance to touch and feel technology. The keyboard is warm and friendly. It moves and responds to our gentle touch. Who wants to touch the screen with a boring stylus? Or with your little finger? Pinky technology? It's embarrassing.

Don't tell me a computer can recognize my writing. Don't ask me to communicate with a computer the size of a TV remote. You'll feel the same way, especially when you lose thousands of dollars in computer equipment between the cushions of your family room couch.

Someday there will be better, faster and easier ways to get into your computer. But not for me. If it ain't broke, don't fix it. Shoot your mouse. Pass on palmtops. The keyboard has always been a foolproof way to use a computer. Let's keep it that way.

Cohn and his keyboard share an office in Atlanta.

Just-in-time training

OPEN MIND *by* Esther Dyson

In the world at large, conventional wisdom is switching from the capital-equipment model of investing to the continuous improvement model. Instead of doing a needs analysis, buying some equipment, using it until it's worn out and starting over again, you are continually assessing your needs, buying stuff, improving it and changing as you go. In the systems world, the equivalent notion is that re-engineering never stops. It's not something you go through once every five years but something you do continually.

Yet with people, we're still in the capital-equipment mode. Draw up a job requisition, hire someone, train him and let him grow on the job. Then start over with more requisitions.

This picture is a little exaggerated, but generally training is considered an event rather than a continuous process.

With this as background, let's take a look at the notion of performance support — sometimes known as just-in-time training.

Technically, performance support looks like easy database and context-sensitive on-line documentation. The tools to build this system are the same ones used for on-line support, data access, content-based retrieval, multimedia displays and friendly user interfaces. What's different is the content and the approach.

The distinction is subtle, but the impact can be huge. On-line performance support encourages people to think about their jobs as they work rather than simply assisting them with computer tasks. Moreover, they keep learning as they perform their jobs, rather than in discrete classes.

Performance support allows new procedures, insights and knowledge to be shared throughout the company, rather than kept by a few. In fact, it can be a groupware application: Performance support content can come from other workers as well as from management. It need not — should not — be rigid and fixed (although there should be someone to vet it so that misinformation is not spread).

Here's a scenario, courtesy of performance-support wizard Gloria Gery:

Juan calls the Add-a-Card hot line in a huff. He has just been told that his payment is overdue and he's annoyed. He wants to cancel the card. Alice, a new Add-a-Card operator, takes the call. She doesn't know Juan, of course, but he's already screaming at her. "I charge $12,000 a month, and you lousy people . . ."

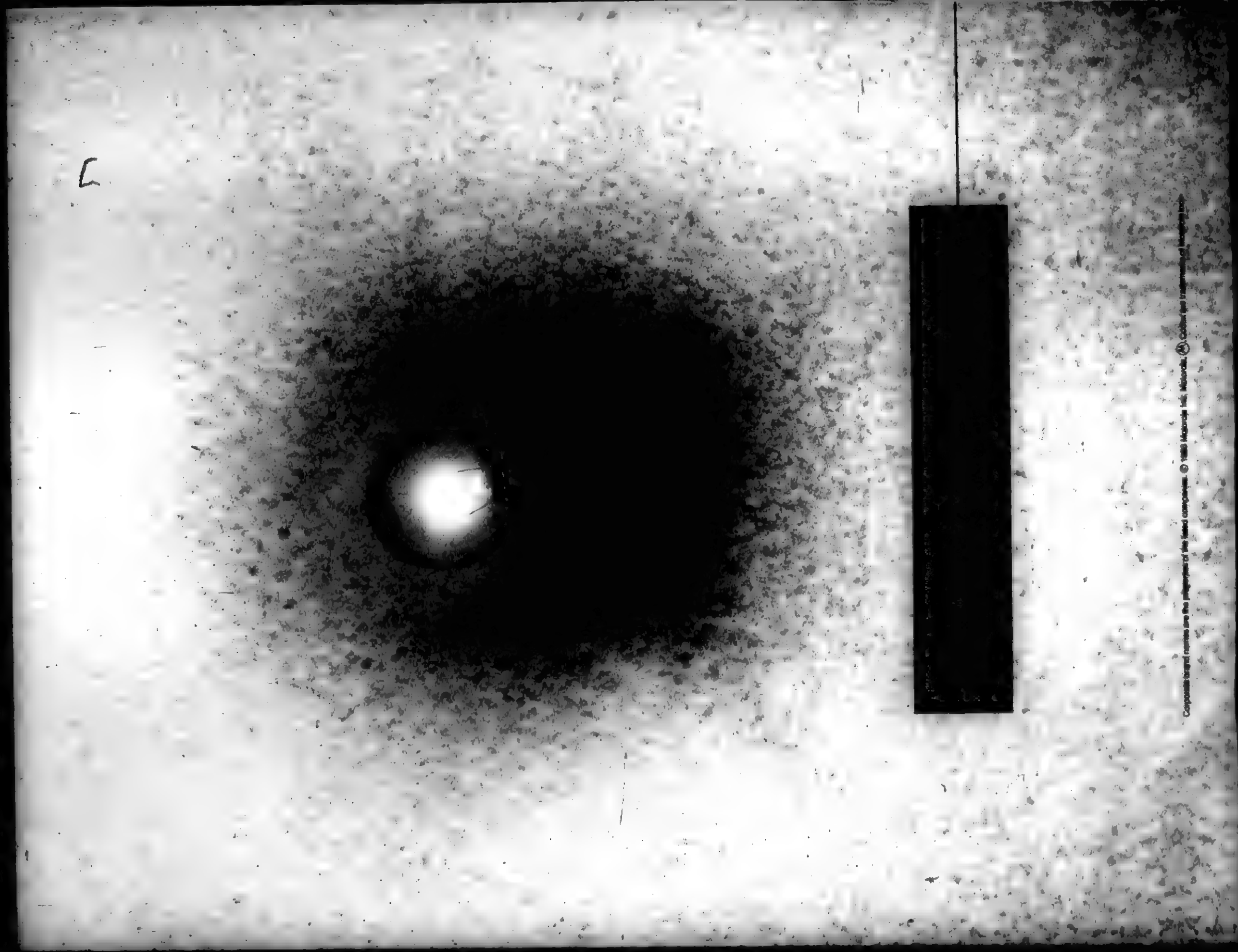
Does he really charge $12,000 a month? (Alice herself earns $12,000 a year.) Does he normally pay promptly, as he claims? Good data capture and display could quickly show Alice the answers. Better yet, an expert system could answer the questions: Is this customer profitable to us? Should we try to keep him or get him to pay up and then . . . good riddance?

But what Alice needs is not so much an answer, but a *strategy*. It's up to her to handle Juan, but the system — performance support — can give her guidance on her goal.

This system doesn't insult her intelligence by giving her a script to read, but it lets her feel in control by knowing what her company is trying to accomplish: Keep Juan or lose him.

Like Alice's job, many jobs are changing, or have heavy turnover, and encompass a wide range of tasks and information that no single person can learn in full. It's not worthwhile to train people completely; rather, performance support equips them to learn as needed. Some tasks occur so rarely that they're not worth learning, but it's handy to have the requisite support available.

Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets in Eastern Europe.



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Charles Babcock

The next PC wave

If you are waiting for the influx of PCs into your shop to abate so you can catch up on your LAN and database server work, forget it. Not only is last year's explosion of PC sales continuing, but the PCs being installed are also adding huge capabilities to the desktop.

As more and more 386, 486 and Pentium systems appear on desktops, they lay the groundwork for linking distant elements of the organization as surely as ties added to the transcontinental railroad. An irresistible framework is being put in place for client/server computing.

Egil Juliussen, who publishes the *Computer Industry Almanac*, has been tracking PC sales. He projects that 33 million Intel-based 80386, I486 and Pentium units will ship worldwide this year, one-third of them in the U.S.

Nine years ago, 33 million units represented the entire installed base of PCs.

Some observers think 33 million is too low. That figure is based on end-user purchases as tracked by Storeboard and Computer Intelligence, which watch key retailers.

Daniel Kleaken, an analyst at Robertson Stephens & Co. in San Francisco, uses a supply-side model that tracks shipments of Intel-family microprocessors produced by Intel, Advanced Micro Devices, Cyrix, IBM and Texas Instruments. He said he believes 46 million PCs will ship in 1993 based on the CPU numbers. If you add in Macintoshes, the figure goes to 50 million, which puts the rate of PC purchasing two years ahead of most market researchers' projections, Kleaken notes.

Escalating demands

Not only are PCs rapidly spreading throughout the business world and home offices, but their networking and client/server capabilities also far surpass those of their stand-alone forebears. "The installed base is shifting rapidly," with 8088s, 8086s and 80286s being replaced by I486 machines, Juliussen says.

Five years ago, 8088s, 8086s and 80286s represented 84% of all MS-DOS PCs. By the end of 1993, most of these PCs will have been replaced in commercial environments, with 91% of the installed base made up of 386, 486 and Pentium computers. Juliussen predicts that 60% will be 486-level machines (1% will be Pentiums).

Nearly everyone will have a computer capable of mounting a GUI, a 32-bit operating system and powerful applications. This lowers the threshold at which newcomers learn to run a computer. It increases the number of applications they use, building traffic on the network.

It is no longer an accomplishment to get a workgroup hooked together on a LAN. The current demand is for the interconnection of LANs, frequently of dissimilar design, and gaining access to the WAN. At the same time, demand builds for the distribution of data over the interconnected LANs; and data administrators must implement server database systems, plotting their control points, user privileges and security measures in the process.

In effect, client/server systems are being implemented at an accelerated pace, whether or not IS is ready.

To do it right, a contingent of IS personnel must be committed to work with these PC technologies and build an infrastructure that enables them to work with corporate systems, navigating many treacherous reefs in the process.

A second opinion: Microsoft Chairman Bill Gates has been quoted as saying Windows NT is a form of Unix. Tony Parkhill, marketing vice president of Silicon Valley Software in San Mateo, Calif., a maker of tools and compilers for both Unix and NT, says, "We know it not to be."

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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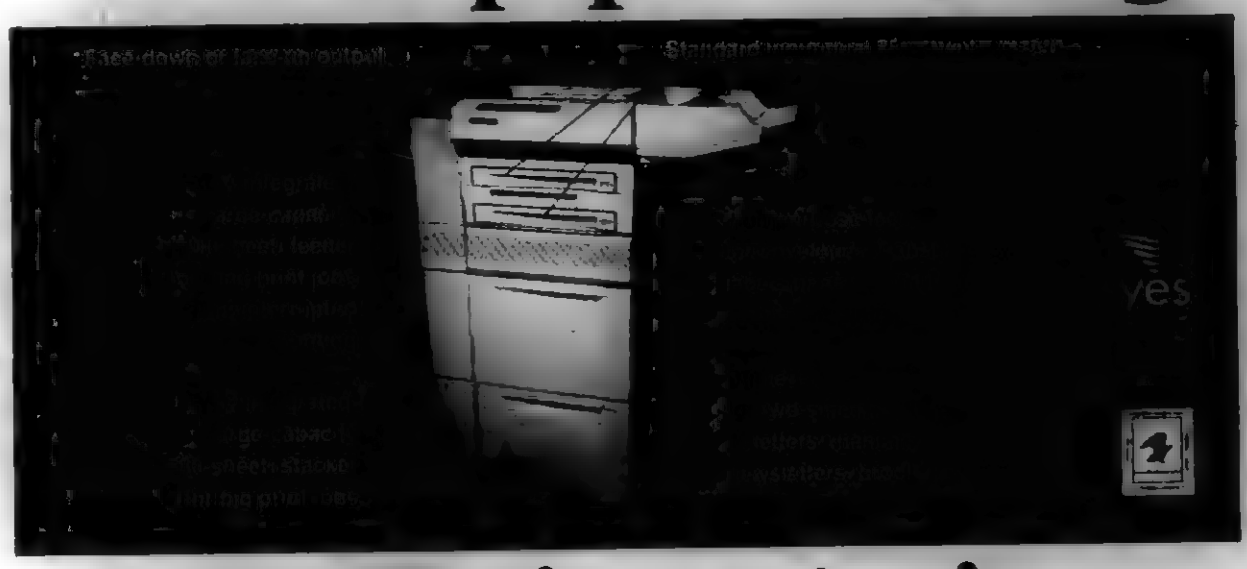

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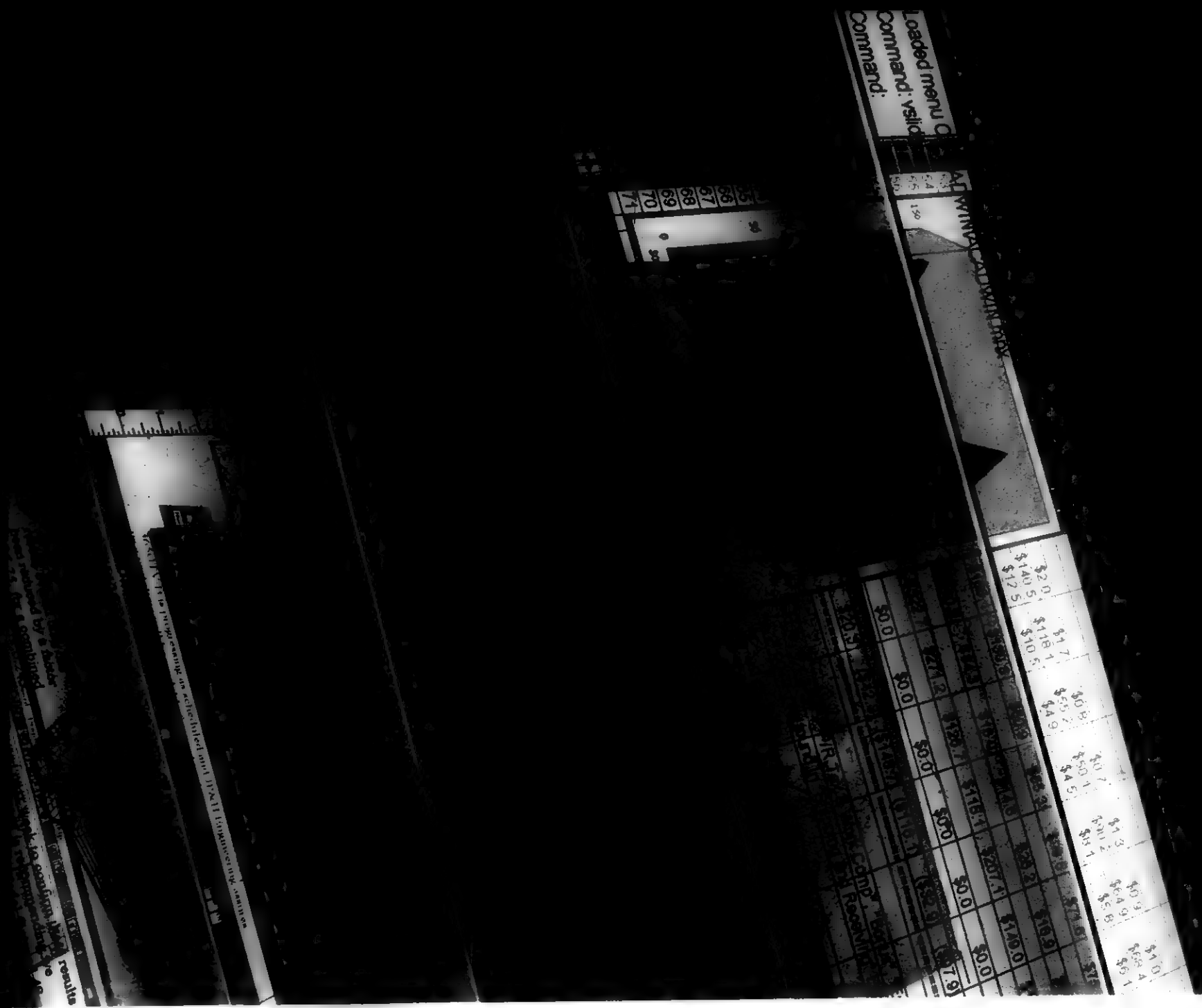

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Portable computing

Macintosh Duo draws kudos, caution

By James Daly
CUPERTINO, CALIF.

Where's the most valuable chunk of real estate around? Midtown Manhattan? The French Riviera? The folks at Apple Computer, Inc. think it might be a lot closer to home. They think it could be your desktop.

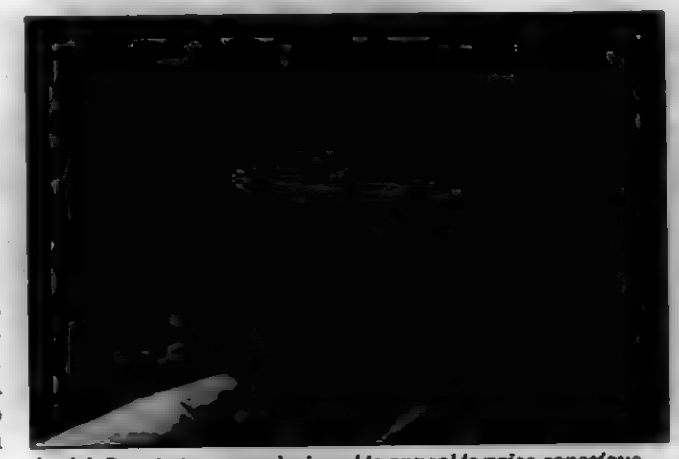
Last October, Apple introduced the Macintosh Duo system, a convertible model that offers both the power of a desktop PC and the flexibility of a notebook system. After nine months of using both the Model 210 and 230, Duo system users give both machines generally high marks, with some caveats.

"It's basically a very fine machine, but [there are] a few rough spots," said Mike Veaudry, partner and national director of systems at Ernst & Young in Toronto.

The $1,839 Model 210 and the $2,299 Model 230 let users insert — or dock — a PowerBook Duo portable into a desktop station that is connected to a full-size monitor as well as a variety of peripherals and network resources.

The idea is not new: NEC Corp. created the idea several years back and companies such as Compaq Computer Corp., IBM, Toshiba America Information Systems, Inc. and Zenith Data Systems have checked in with similar dockable systems.

It is a trend that is likely to continue. The Business Research Group reported that it expects the portable's use to grow dramatically during the next five years.



Apple's Duo strategy *was designed to appeal to price-conscious businesses such as real estate*

Despite those forecasts, Apple officials acknowledged that sales of the convertible Duo systems have not taken off as they first envisioned. "It was a bit of a slow start," said Peter Fletcher, worldwide product manager for Apple's portables division.

Like many Apple models, the Duo was bedeviled by an initial scarcity of product. Both models were hard to come by at first, and the Duo's docking mechanism was not available in quantity for up to two months after the

Duo, *page 44*

Memory management? Depends on your needs

By Christopher Lindquist

It seems everyone is helping you lose your memory these days. Just when you thought your PC was safe, someone comes along (can you say Microsoft Corp.?) and starts suggesting that you add virus protection, data compression and even delete protection to the already cramped conventional memory on your system. What to do?

MS-DOS 6.0 does include MemMaker, its own memory management utility, but it only works with MS-DOS 6.0. And some reports could lead you to believe that the Microsoft product is not exactly the epitome of memory management art. It will do the job, but could it be done better?

The answer is yes.

Both Quarterdeck Office Systems, Inc. and Qualitas, Inc. have released Version 7.0 of their respective memory managers. (In truth, Quarterdeck is on Version 7.01, which fixes several minor bugs in the original release.) And besides freeing up more memory, the Quarterdeck Expanded Memory Manager (QEMM) and Qualitas' 386/MAX offer several features that should appeal to power users.

Testing the products consisted of starting with "unmanaged" MS-DOS 6.0 configurations on a pair of 80386-based PCs: one with DoubleSpace data compression and the other without. Each system had a variety of resident programs and drivers — mouse, network, virus filter — in addition to the normal system files such as COMMAND.COM.

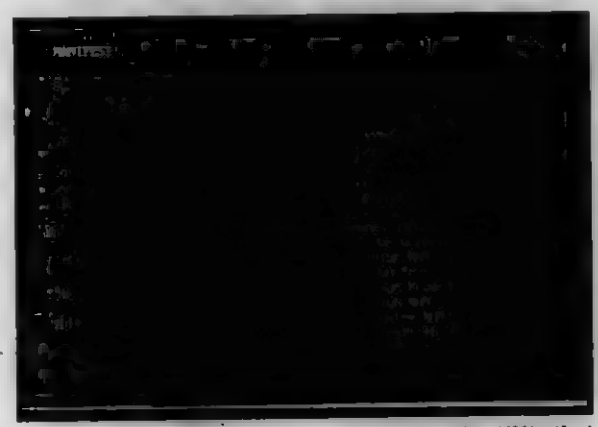
Each memory management product comes with the facility to do a relatively unattended installation that requires little more than hitting the Enter key a few times. All the products also claim to be easy to use, so the default installation and management procedure was selected for each. All three installed and optimized flawlessly, with no need to "hand tune" any operation.

After installing and optimizing each product, we compared the results.

Up to 632K bytes

Is MemMaker as poor at retrieving memory as its detractors say? No, at least not for the average user who does not want to play with memory addresses. On the machine without data compression, my basic configuration left me with a 596K-byte "largest executable program size," a figure small enough to possibly cause problems with some applications. Running MemMaker brought the total up to 613K bytes, as it loaded some device drivers high. 386/MAX performed even better, using its ExtraDOS technology to move more of DOS high and recover 625K bytes. However, QEMM outdid them both, bringing the system 632K bytes of free conventional memory.

QEMM shone even brighter on the system with data compression. The DoubleSpace device drivers chew up some 45K bytes of conventional memory, which neither MemMaker nor 386/MAX was able to recover. QEMM's Stealth DoubleSpace feature was able to recover most of this, leaving the system with 624K bytes of free conventional memory compared with 558K bytes with MemMaker and 575K bytes with 386/MAX.



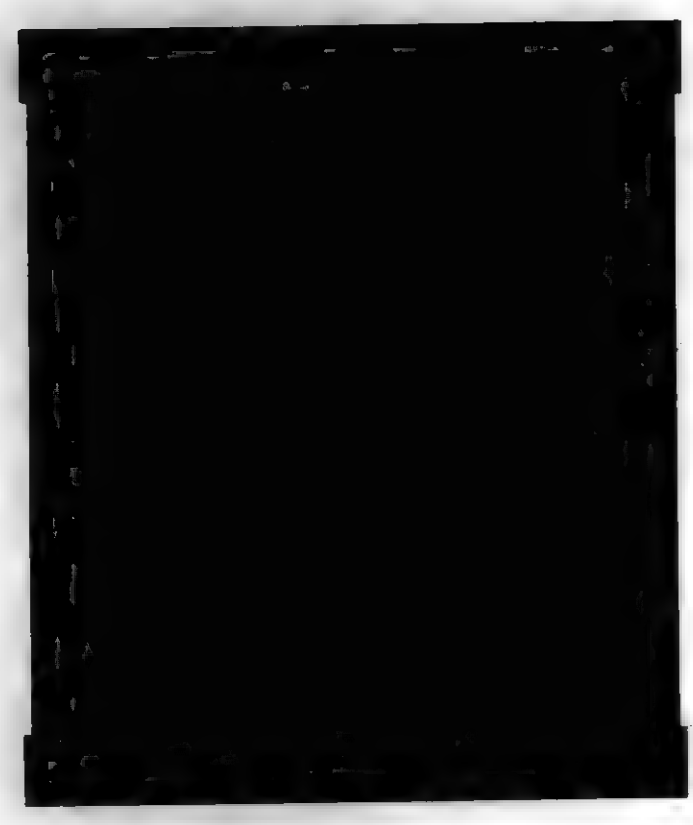
QEMM's Manifest feature *is a memory-diagnosis utility that Quarterdeck Office Systems hopes appeals to power users*

This does not mean you should immediately purchase QEMM 7.0 for all your systems, of course. For many users, MemMaker will suffice — and it comes free with MS-DOS 6.0. Secondly, memory management is something of a black art: What works on one machine may not work on another, depending on your hardware and software configuration. The only way to really know how much memory each of these products will recover for you is to try them.

Finally, QEMM and 386/MAX come with other utilities and features that may be compelling, particularly to more advanced users. Both can use video random-access memory to increase the size of DOS sessions under Windows. Each also includes extensive Help files, memory management tips and configuration editors to help the more experienced user tweak the last bit of free memory out of a system or work around conflicts. QEMM comes with Manifest, a full-featured memory diagnosis utility. 386/MAX also includes a memory utility, ASQ, as well as a memory tester and a .PIF editor for maximizing DOS sessions under Windows.

For average users without serious memory-shortage problems, MemMaker is certainly the most cost-effective technique if you own MS-DOS 6.0. But for other DOS versions or systems where memory is crucial and at a premium, QEMM 7.0 and 386/MAX are worth the price.

QEMM 7.0 and 386/MAX are available now for a retail price of $99.95 each. Blue-MAX, the IBM Personal System/2 version of the product, lists for $125.



Christopher Lindquist

Sharing litigious chatter

Is it libel or slander if you say it on a bulletin board system? I've seen several comments on the boards recently that a civil lawyer would have to love. These are the types of things that if you said them on TV you'd be spending some time in court defending yourself. It's different on a BBS, isn't it? We just say these things as if we were involved in a face-to-face argument — but we aren't.

A CompuServe user spouting about the moral deficiencies of some technical support representative isn't just talking to the rep, he's talking to anyone who happens to "turn on" the forum. And some of these forums may be more popular than your nightly news.

Think I'm kidding? Go to the Polaris forum on CompuServe. You'll see message subjects the likes of "Fraud" and "Class action lawsuit now" along with messages from users requesting their money back, complaining about more than a few bugs and looking for reviews of personal information managers other than Packrat 5.0, Polaris' product.

Oh, and one user noted that Polaris has a contract that will put some 30,000 copies of Packrat into the hands of a government agency. As the user said, "Heavens, what will they do about servicing those folks if [Packrat 5.0] is a stinker?" The vast majority of reports indicate that it is, so I wish the Polaris people luck.

Things have been a lot quieter in the big iron forums. The "Mainframe" BBS conferences still aren't seeing a lot of traffic. One "VMer" even responded that he was spending most of his time using AIX these days, "but at least it's got an IBM logo on it," he said.

Some Internet users are beginning to post various benchmarks for the new hardware out there, including the Alpha-based DEC 3000 line and the Hewlett-Packard HP 9000/735. There's nothing conclusive yet (as if benchmarks can ever be conclusive), but users generally agree they outperform most of the hardware on the market, with a slight edge for the HP boxes.

Several users noted that their Silicon Graphics R4000-based machines equaled or outperformed both the HP and DEC lines in real-world testing. But I'll leave that sort of thing to the experts.

The "experts" on the boards are beginning to come up with a consensus on MS-DOS 6.0's DoubleSpace data compression: It can cause problems. That sure isn't big news, but now that it seems to be settling into the buyers' psyches, we'll see if Microsoft can maintain those startling upgrade version sales figures. Stac Electronics and other vendors seem more than happy to kick Microsoft where it hurts these days, too (you may have seen the "Open letter to Microsoft" ads). But one user summed up the situation as such: "BlunderDome: Two vendors enter, one vendor leaves, dirty tricks encouraged. Bleh. Buy a bigger disk."

If you must use compression, maybe you should take a look at DOSPR6.ZIP on the IBMSYS forum of CompuServe. Touchstone Software has an interesting story to tell about how MS-DOS 6.0's Format command resets disk sectors marked as "bad" by other packages to "good" again (even if they are not), which can lead to corrupted compressed disks. And they're supplying (for free) an interesting hard disk diagnosis utility to help make sure your system can take DoubleSpace's pressure. (Whoops, bad pun. Sorry. Won't happen again.)

Improper use of disk caching was supposed to be one of the more common problem sources with the new MS-DOS, so Microsoft is now offering SmartDrive 4.2, a more "conservative" — and lower performance — version of the disk cache utility. Those of us who would rather be conservative can pick up the new version on CompuServe by downloading the conveniently named (and easy to remember) file S14191.ZIP in the Microsoft Software Library (GO MSL).

Some OS/2 2.0 users on CompuServe have been complaining about the cost of the upgrade to OS/2 2.1 (the lowest price seems to be $79 minus a $30 rebate for registered Version 2.0 owners). One customer said he'd continue working with Windows NT because IBM hadn't seemed to "learn its lesson" about pricing. A happy OS/2 2.1 upgrader responded by quoting a "probable" $275 street price for Windows NT — and $150 per call to the Microsoft 900 number for support. As he said, "If you think NT is a better deal than a $55 OS/2 2.1 upgrade, go for it." We'll just have to see how many actually do.

Tagline: "Every normal man must be tempted at times to spit on his hands, hoist the black flag and begin slitting throats." —*H. L. Mencken*

Have a favorite forum, BBS or service that you think others might find useful? Send it via the Internet to chrisl@netcom.com; CompuServe with 72360,2005; or MCI through 549-8464. I'll try to list some of the more interesting ones in future columns.

Lindquist is a *Computerworld* West Coast correspondent.

Corporate Software swaps its help desk software

By Michael Vizard
CANTON, MASS.

Corporate Software, Inc. has switched its allegiance from a DOS-based help desk package developed in the UK to a Windows-based package developed by Hammersly Technology Partners, Inc. in San Francisco.

Under terms of the deal, Corporate Software has assumed exclusive marketing rights for the Utopia PC help desk, which was designed to help information systems shops set up their own help desks for Windows applications.

The help desk market is currently valued at about $60 million by Gartner Group, with annual growth expected to be more than 100% through the 1997-98 time frame.

According to Carter J. Lusher, project director for PC research at Gartner Group, Inc. in Stamford, Conn., the increasing number of applications that users are adopting under Windows, combined with the drive to keep the number of IS people on staff to a minimum, is pushing companies to adopt help desk software that maintains a record of specific problems.

"Under DOS, people were using 3½ applications on average. Under Windows that number is up to 7.9. And IS can't throw bodies at supporting these applications anymore," Lusher said.

By being able to access historical records and related technical manuals, IS shops can deploy front-line support staff who draw on this data to resolve problems, while other IS personnel focus on developing applications and other traditional IS services.

Error-tracking

For example, Medtronic, Inc., a manufacturer of medical devices in Minneapolis, has deployed the Utopia help desk in addition to four people who track and resolve problems across 2,000 PCs.

"Before Utopia, our support was based on paper memos and pagers," said Kathy Miller, Medtronic information center supervisor.

Currently, Utopia consists of three modules that log and track problems, keep an inventory of hardware and software and keep track of training classes.

Prior to signing the pact with Hammersly, Corporate Software had sold about 100 licenses of Quetzal, a DOS-based help desk developed by WorkGroup Systems Ltd. in the UK.

Unlimited-use server pricing for Utopia starts at $7,900. Concurrent user pricing ranges from $395 to $995.

Peripherals

QMS, Inc. has introduced the QMS ColorScript Laser 1000, a desktop color laser printer.

The QMS ColorScript Laser 1000 is based on QMS' Crown technology and delivers accurate renditions of color and monochrome images and text, either separately or on the same page. It uses a toner-based laser technology to generate output that does not fade or flake. The printer is said to provide language compatibility, fast throughput, ease of use and extensive connectivity.

The QMS ColorScript Laser 1000 costs $12,499.

▶ *QMS*
One Magnum Pass
Mobile, Ala. 36689
(205) 633-4300

New Media Corp. has introduced its mid-range performance Personal Computer Memory Card International Association (PCMCIA) Small Computer Systems Interface (SCSI) card for multimedia applications on laptop and subnotebook computers. The product fits into an industry-standard PCMCIA card slot that is included in most laptops.

The adapter connects to any peripheral that has a SCSI port through a cable from the PCMCIA card.

The product costs $199.

▶ *New Media*
Irvine Spectrum
Building B101
15375 Barranca Pkwy.
Irvine, Calif. 92718
(714) 453-0100

Application packages

RSA Data Security, Inc. and Datamedia Corp. have introduced SECUREXchange, a Windows-based encryption product that uses the patented RSA Public Key Cryptosystem.

According to the firm, the product provides DOS or Windows electronic-mail users with the benefits of the RSA algorithm for protection of sensitive files.

Based on RSA's TIPEM and BSAFE 2.0 tool kits, SECUREXchange was designed specifically to secure existing E-mail installations, giving users both advanced encryption and authentication features.

Prices range from $995 for a 25-user license to $19,995 for a 1,000-user license.

▶ *RSA Data Security*
100 Marine Pkwy.
Redwood City, Calif. 94065
(415) 595-8782

Tandy superstores turn to wireless

Retailer experiments with pen-based system to eliminate long check-out lines, use of shopping carts

By Michael Fitzgerald
FORT WORTH, TEXAS

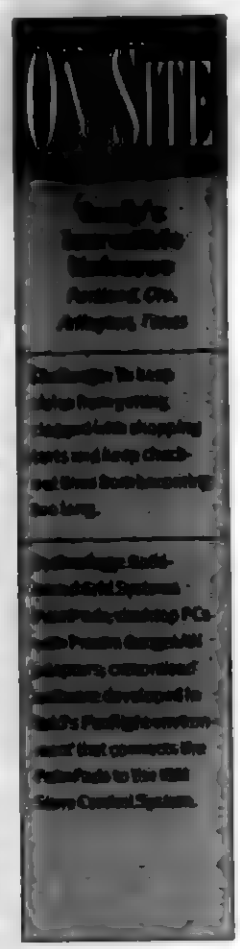
Tandy Corp.'s massive new electronics concept store, Incredible Universe, presented a big problem to the company: how to handle the hordes it anticipated would flock to a 200,000 sq ft retail outlet.

Tandy officials decided to conduct a little experiment for their big new store: install wireless, pen-based, portable point-of-sale (POS) systems. The system may yield a new trend in retailing — the end of the check-out line.

The two Incredible Universe stores, in Arlington, Texas, and Portland, Ore. — others are under construction in Dallas and Miami — equal a small shopping mall in size and sell everything from radios to refrigerators.

Because Tandy expects the stores to draw large numbers of shoppers, it wanted to find a way to both remove shopping carts from store aisles and reduce lines at check-out counters.

The portable system "allows us to have all the different [products] we have — 15,000, not including movies and music," said Rich Hollander, vice president of Incredible Universe. "We couldn't manage that inventory without our system. It also gives us a lower cost of running the store."



Hollander declined to say how much Tandy spent to build its system, other than to say the total was "substantial."

A team of engineers from Tandy, Grid Systems Corp. and IBM developed an automated order and delivery system using Grid's PenRight software environment, and PalmPad pen computers using radio frequency communications. The system had to serve as both a portable POS system and a way to update inventory. The system also contains product warranty information, options such as how the product could be delivered and up-to-the-minute access to the customer's purchases.

Portable purchase

The PalmPads — 80 per store — connect to three Intel Corp.-based PCs equipped with a Proxim, Inc. RangeLAN receiver. The PCs in turn connect to the store's IBM Store Control System, which runs on an Application System/400. To record a sale, a sales representative will use a "membership" card that all shoppers receive when they walk in the door.

To make a purchase, a shopper presents the card to a sales rep, who runs a bar-code reader attached to the PalmPad over the card and then scans the bar code reader over the UPC on the desired item. Pricing, inventory status, options and service options, as well as delivery schedules, then appear on the PalmPad screen.

When customers finish shopping, they take their cards to the cash registers in the front of the store and pay for their goods. Hollander said that despite drawing 1 million customers to its two stores in less than 10 months, "there really aren't any lines at the register." He said the wireless system has reduced the payment process to less than a minute, compared with four to six minutes at other stores.

Shoppers either pick up their goods at the store or have them delivered to their homes, depending on what option they selected when they purchased the items.

Sales reps will use *pen-based systems that can scan bar codes and supply customers with up-to-date information on purchasing options*

Macintosh Duo

CONTINUED FROM PAGE 41

machines were announced.

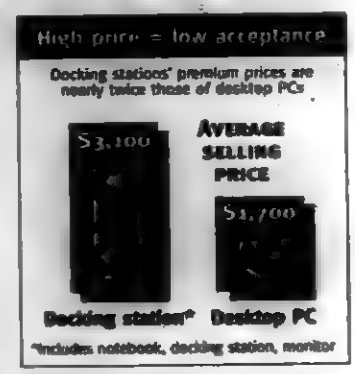
At the heart of the Duo system is the PowerBook Duo notebook computer, a modified version of the popular PowerBook portable. Users said the stripped-down Duo version has both advantages (weighs slightly more than 4 pounds, as opposed to almost 7 pounds for the full PowerBook) and disadvantages (does not have a floppy disk drive).

Docking up

After mobile users return to their desks, they insert the PowerBook Duo into the Duo Dock, which can be connected to a large color display, full-size keyboard, mouse and available printers. But here is the rub. Users need to haul around the 1-pound portable MiniDock if they want to connect their PowerBook Duo to a printer or floppy drive while on the road. "It's a bit of a pain," Veaudry said.

Veaudry has been using the Duo system with his 15-member programming and development staff, which is currently working on both IBM and Apple development. "Rather than a multiplicity of machines, we wanted them to use one," he said.

Fletcher said Apple hopes to target the Duos at price-conscious businesses such as real estate offices. "One office could buy 10 docking stations and 30 notebooks as a way of spreading around the cost of the system," he explained.



Managers who are supervising newly Duo-equipped employees have discovered that they had to give normally desk-bound users lessons in the security of portables. Laptop computers are on the move in a lot of places these days, but not always in the hands of their owners.

Early Duo adopters have complained that the PowerBook Duo's keyboard is slightly different from the keyboard of the desktop machine, forcing users to make mental adjustments.

Another concern: The passive-matrix quality of the screen on the PowerBook Duo is also not as good as the regular Duo. A new Duo model featuring an active-matrix color display is planned for the fall, Apple analysts said.

Buy now

In a move perhaps designed to ensure that large corporate sites do not postpone their purchases of existing Duo systems, Apple will also provide an upgrade path to the color model, Fletcher said. There will also be an upgrade to current Duo Docks to accommodate the slightly thicker color Duo.

On the plus side, the Duo System gets high marks for the PowerLatch docking technology, so users do not need to connect any cables when switching from desktop computing to notebook computing.

Other docking systems require users to reconnect cumbersome cables and reconfigure start-up files every time they want to use their notebook in the docking station.

PC price wars spur more Macintosh cuts

Apple began another round of Macintosh price slashing last week with reductions of up to 31% on the sticker prices of many desktop, portable and server computers.

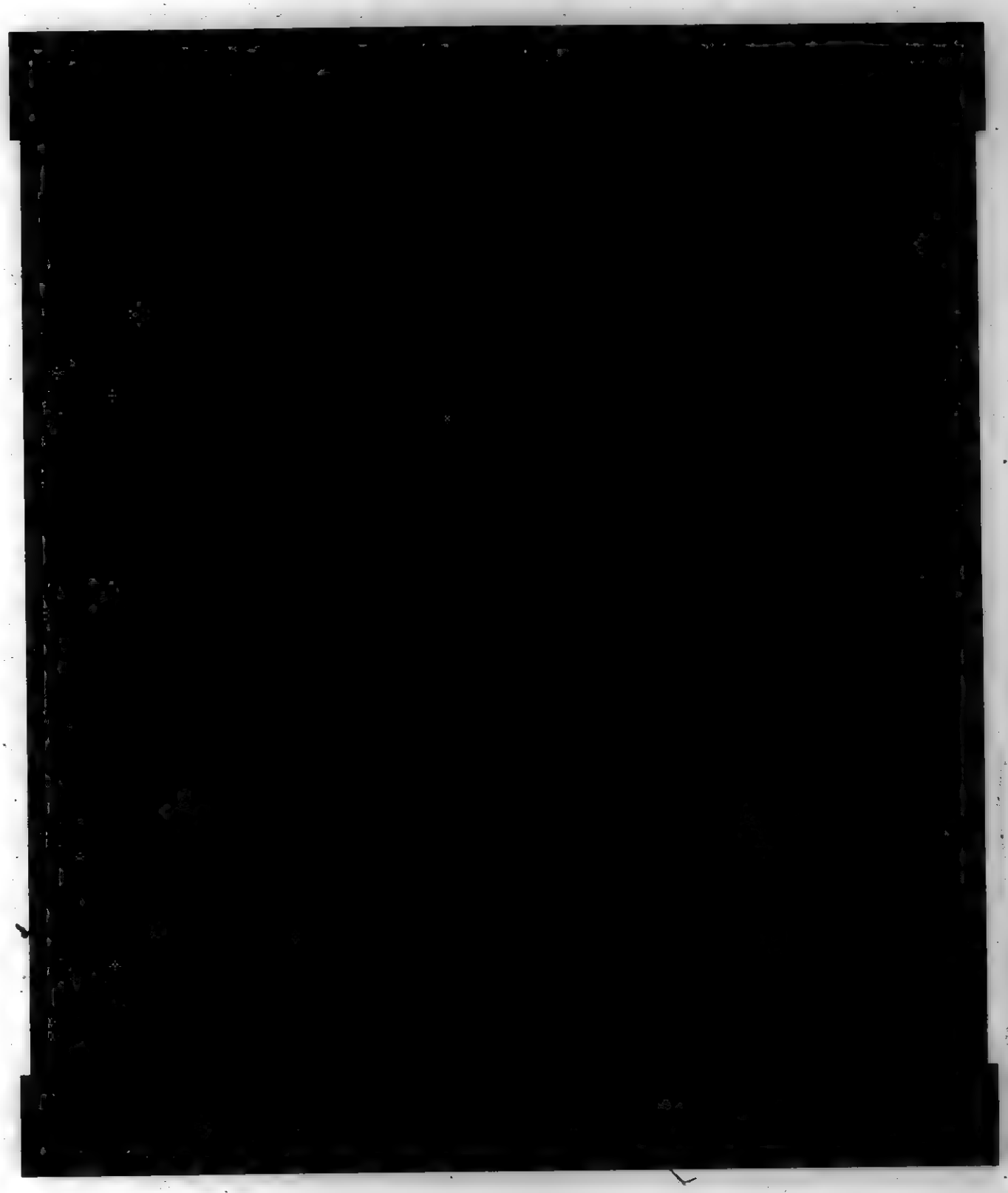
The moves come as Apple struggles to get the price of its Macintosh PC in line with the fiercely competitive market for IBM PC clones.

On the high end, the entry-level version of the Macintosh Workgroup Server 95 system was cut 20% to $6,089. The starting price for the Quadra 950 was likewise reduced 29% to $3,999. The portable PowerBook 165C was the biggest beneficiary of the price cuts: One model was slashed 31% to $2,339. Prices are effective through Sept. 20.

In addition, Apple kicked off a "Performa payback" rebate promotion, offering rebates of $100 to $200 to customers who purchase one of the five Performa models.

Analysts, however, said they expect Apple to cut prices even further. Despite the new round of reductions, Apple's Quadra machines still cost $200 to $600 more than competing IBM-compatible models, according to Computer Intelligence (CI) in La Jolla, Calif. Some of the PowerBooks still cost as much as $300 more than similarly equipped portables, CI said.

— *James Daly*



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Multiprocessing systems

IBM server to compete against AS/400

By Michael Fitzgerald
SOMERS, N.Y.

IBM PC Co. officials have promised to address some shortfalls in the company's server strategy by the end of this year. It will do so by offering multiprocessing PC servers it claims will compete no-holds-barred against the Application System/400 and other large system stalwarts for IBM.

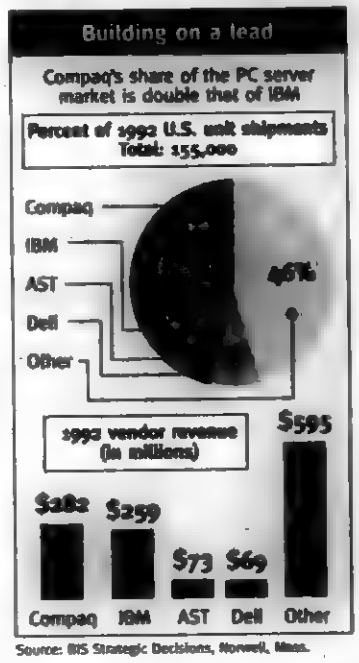
IBM, which looked well-positioned to attack such a market after its alliance with Parallan Computer, Inc. last year, has largely stood by and watched as other vendors, notably Compaq Computer Corp., have taken the lead there.

IBM's sluggish approach to the market means it faces a challenge of winning back customers who think of other PC vendors when it comes to client/server or have been lured to Unix.

The PC Co.'s strategy has been to position its high-end Server 195 and 295 boxes — the single and dual-processor systems it gained in its deal with Parallan — as boxes that have server management capabilities and built-in resilience to handle client/server projects.

However, at least one user questioned whether Parallan can help IBM, or vice versa. "Inasmuch as the Parallan is the most problematic box we've ever had, I'm not optimistic that IBM can make it a mission-critical server," said George Roukas, director of computer services at a Fortune 50 financial services company.

Roukas said he was looking seriously at Unix-based servers.



Source: IDS Strategic Decisions, Norwell, Mass.

Golden goose

"We recognize we have a problem with visibility in the client/server market," said David B. Saxby, general manager of server systems at the PC Co.

"If you look at our technology and our heritage, there's a golden egg sitting on the ground waiting for us to pick it up, but if you look at reality, it seems like that golden egg is way up on the beanstalk," he said.

In order to reverse that situation, Saxby said the PC Co. needs to improve its relationships with value-added resellers, integrators and software makers, as well as push its technology forward to gain some visibility.

In addition, Saxby said, the PC Co. in the second half of the year will push vigorously into this market, building "high-capacity, scalable, fault-resilient servers that will replace the AS/400 or mainframes."

Signs of the PC Co.'s server future came at PC Expo in New York, where it demonstrated a Model 95 with built-in redundant arrays of inexpensive disks, the first "tower"-type of PC server with such capabilities. It also demonstrated a print-server attachment that sent data at a blazing 2M byte/sec. through the parallel port.

Model year

IBM's four server lines — the Model 85, Model 95, Model 195 and Model 295 — will probably make up a separate brand by year's end.

And among some of IBM's expected moves will be faster processors, such as 60- and 66-MHz Intel Corp. Pentiums in the Model 95, 195 and 295, as well as clock-tripling chips from IBM, sources said.

The high-end line now supports only two processors, and support for additional processors is also expected.

Taking on Compaq

These changes will represent the PC Co.'s first concerted efforts to articulate how it will compete with market leader Compaq in the PC server market. The PC Co. should deliver its new products around the time of Compaq's fall announcements [CW, June 14].

Analysts said the PC Co.'s move comes as the market is still developing, meaning it should be able to make itself into a serious competitor.

"There's room in the market for both companies and probably others as well," said John O. Dunkle, president of Work-Group Technologies, Inc., a market researcher in Hampton, N.H.

Saxby also said the PC Co. is working on strategic relationships with vendors such as Novell, Inc. and developing better system management software and other performance features.

Positive feedback

Saxby's statements pleased some users.

"We're really happy to see IBM getting involved with this, and I hope it means a commitment to the high end of the server market," said W. B. Soper, manager of information services at Chevron Canada Ltd. Chevron uses two Parallan boxes, and Soper said the PC Co.'s plan to enhance the Server 295 was "great news."

In addition to working on strategic alliances, shoring up its service and bolstering its technology, the PC Co. will likely make some marketing moves, such as splitting the Personal System/2 line into separate brands for desktops and servers.

"We already have begun to think of the server line as different than the desktop, so it's on its way to becoming another brand," said Michael Coleman, the PC Co.'s vice president of marketing and brand management.

Software boosts data access

PC applications gain link to mainframe data

By Michael Vizard
SANTA CLARA, CALIF.

■ Edify Corp. has extended its automatic information-retrieval software to PC applications as part of an effort to allow PC applications to access data stored on mainframe and midrange systems.

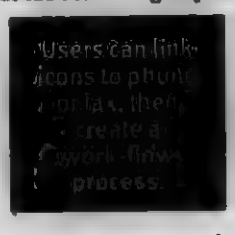
The Electronic Workforce software comprises a series of agents written in C++ language. The agents allow users to automate structured work-flow processes by clicking on certain icons that represent specific functions encapsulated as an object.

As a result, users can click on an icon that represents the answer function and then link that icon to either a phone or fax. From that point, users can link those functions to a series of other icons to create a work-flow process that will follow a predefined decision tree.

With Release 2.2 of Electronic Workforce, Edify has incorporated support for PC applications by adding Dynamic Link Libraries that can be used to call a variety of application programming interfaces as part of a specific work-flow process. As a result, users will, for example, be able to query a specific database and have those reports automatically put into a specific spreadsheet format using either electronic mail, fax transmissions, SQL or remote procedure calls.

"Corporations have lots of people whose sole job is to cut and paste reports from databases into spreadsheets. Those people are in trouble," said John Faig, an industry analyst at Meta Group, Inc. in Westport, Conn.

For example, Applied Materials, Inc., a Santa Clara, Calif.-based manufacturer of large equipment used to make microprocessors, has adopted Electronic Workforce to automate many of the routine processes in its human resources department. These include providing information on insurance and 401K programs.



Dial-in service

To accomplish this, Applied Materials has deployed an Intel Corp. 1486-based PC running OS/2 with 32M bytes of memory and a 1G-byte disk. Employees dial into this server and initiate an action using a Touch-Tone phone. The Edify software then polls a human resources application by Collier-Jackson, Inc. that runs on a server from Hewlett-Packard Co.

Previously, Applied Materials had to support these requests by processing paper forms. "We figure it saves us having two people spend two weeks processing this data every quarter," said Ray Moore, manager of domestic compensation.

"We figure that most people are spending anywhere from 10% to 50% of their time finding data, packaging it up and sending it out to somebody. We think we can automate that entire process," Edify President Jeffrey Crowe added.

In general, Faig said automating work-flow processes is an emerging field, but he said Meta Group expects the technology to be used more extensively as it matures.

"There's not a lot being done in terms of work-flow automation, but people are going to get tired of running the same standard reports every day," Faig said.

Pricing for Electronic Workforce 2.2, which is currently available, starts at $10,000.

Client management

Microcom adds support to LANlord

By Michele Doetert

Microcom, Inc., a Norwood, Mass.-based vendor of client management software for local-area networks, has added support for new platforms, as well as improved remote control and multiserver support, to its flagship product.

In addition to the Novell, Inc. NetWare LANs that it previously supported, LANlord 2.0 can now provide centralized management of DOS and Windows clients on IBM's LAN Server, Microsoft Corp.'s LAN Manager and other NetBIOS-compatible networks. It features a wide range of desktop management applications, such as software metering, PC inventory, virus detection and configuration information, which are all launchable from a single Windows interface. The product, shipping now, starts at $2,495 for a 50-user license.

New support for multiple LANlord servers allows for centralized management of desktops across multiserver, enterprisewide networks. A new Simple Network Management Protocol (SNMP) proxy agent will allow LANlord 2.0 to report to SNMP-capable management consoles, such as Hewlett-Packard Co.'s OpenView or Sun Microsystems, Inc.'s SunNet Manager. LANlord 2.0 can also be launched from within Novell's Network Management System.

Remote control

LANlord 2.0 now provides automatic alert-forwarding capabilities that the vendor said support all prominent messaging formats, as well as electronic paging. Microcom has also added integrated remote control, based on its Carbon Copy for Windows product, to LANlord 2.0.

Beta-test users said they were impressed with LANlord 2.0's remote control capacity. "LANlord's ability to edit files remotely will be a major asset to our help desk technicians," said Don Meyers, a systems analyst at Morgan Keegan & Co., a brokerage firm in Memphis.

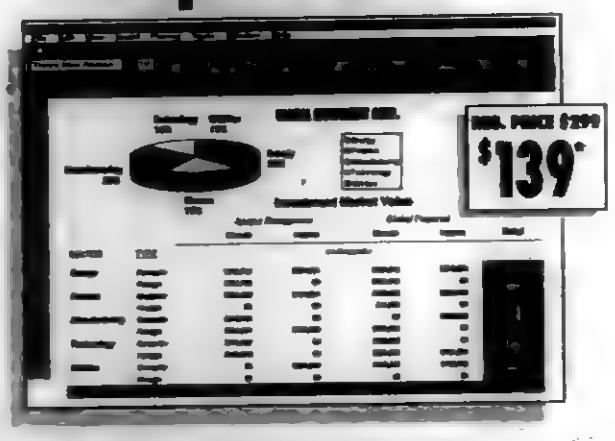
"LANlord lets our technicians verify remote configurations and modify user system files remotely, in the background, without interrupting our users," said Thomas Winbush, a technical support manager at Plaza Savings and Loan in Santa Ana, Calif.

Too close for comfort

The LAN-based desktop management arena in which LANlord competes has become even more crowded lately, with Saber Software Corp. and Intel Corp.'s networking division, releasing desktop management products in the last six months.

To boost its presence, Microcom signed an agreement with IBM whereby the two companies will cooperate in integrating LANlord into IBM's LAN NetView Manage distributed management platform. Under the agreement, Microcom will develop a new LANlord NV product, which will use IBM's Presentation Manager graphical user interface and support OS/2, as well as DOS and Windows workstations. The new OS/2-based product is expected to ship late this year.

ReportSmith



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Reach cements licensing deal to strengthen work-flow focus

Pact provides access to electronic-mail software

By Michael Vizard
SUNNYVALE, CALIF.

As part of an effort to concentrate its activities on work-flow software, Reach Software Corp. has signed a pact with CE Software, Inc. in Des Moines, Iowa, under which Reach will license its electronic-mail software for Windows clients running Novell, Inc.'s NetWare operating system.

According to Reach Chief Operating Officer Kim Peyser, the deal makes sense for both companies because Reach needs to focus on developing work-flow software that will work across multiple environments, while CE Software will use Reach's technology to develop a Windows version of its QuickMail for Novell's Message Handling Services.

Bundle deal

Reach also recently signed a separate marketing deal with Watermark Software Inc. in Burlington, Mass., under which Reach will bundle Watermark imaging software with its WorkMan work-flow software.

"Our heritage is primarily work flow, and the price per seat of E-mail packages is coming down, so it makes sense for us to partner with CE Software. And they needed a Windows E-mail package that supports MHS," Peyser said.

Under terms of the deal, both Reach and CE Software, which is one of the leading providers of E-mail software on Macintosh systems, will work together to add support for electronic forms, rules-based routing, calendaring and scheduling, and imaging on top of QuickMail.

As a result, CE Software will focus on enhancing QuickMail, while promoting Reach's WorkMan software as a work-flow solution that will be enhanced by "time-centric" services, which will be jointly developed by Reach and CE Software, according to CE Software President Ford Goodman.

These features should be available in the next major release of QuickMail, which is due in the next year, Peyser said.

"We're basically going to provide the same feature set that you would see in Beyond Mail or CC:Mail," Peyser said.

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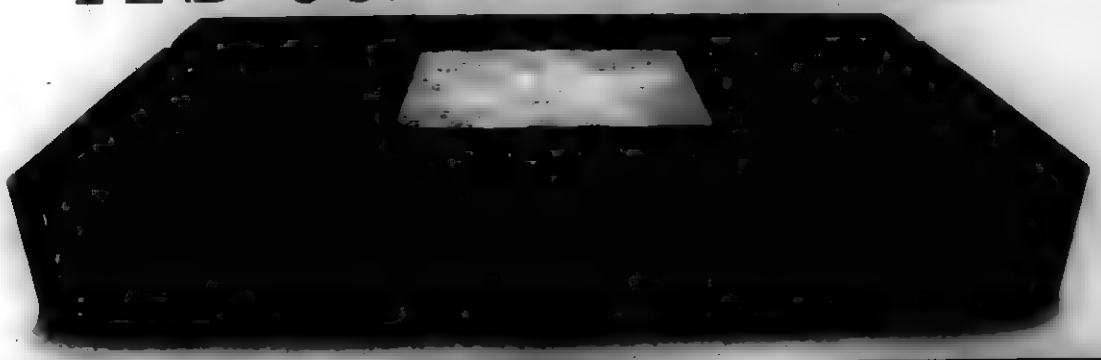

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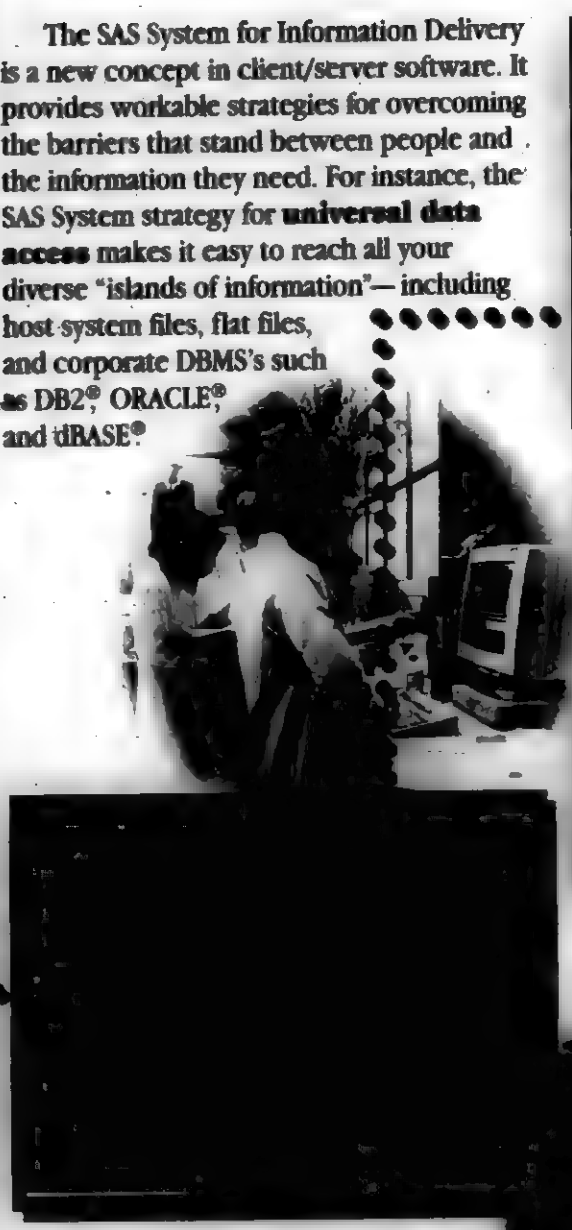

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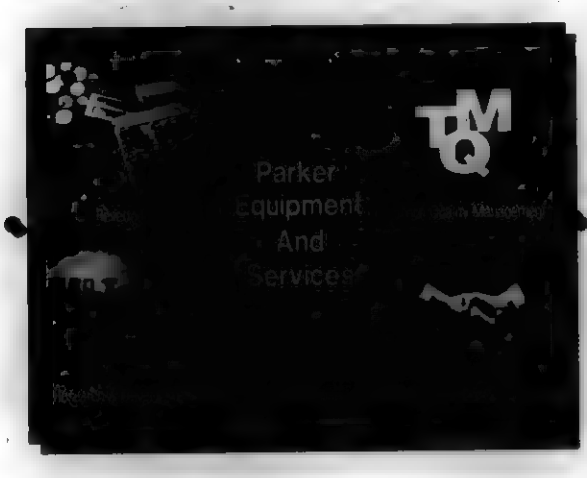

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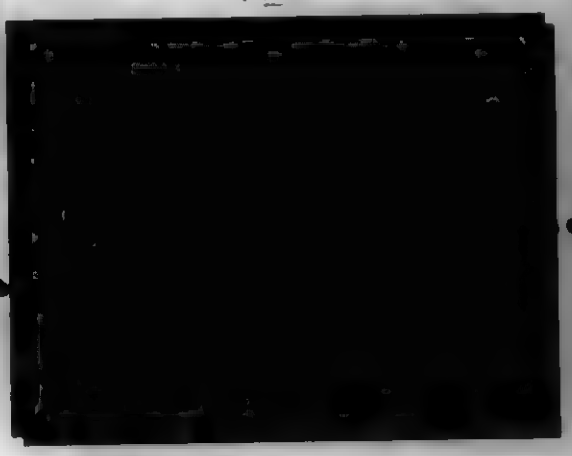

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Minicartridge storage

Demand high for low-cost tape backup

By Stephen P. Klett Jr.

Corporate mandates to "do more with less," coupled with rapid capacity expansion on the desktop, have kicked off a dramatic increase in demand for low-cost tape backup, especially for minicartridge tape drives.

According to a report from Peripheral Strategies, Inc., a market research firm in Santa Barbara, Calif., 3.5 million tape drives, including 5¼-in. data cartridge, 3½-in. minicartridge and 3½-in. data cassette, will ship in the U.S. in 1993. Of these, 2.5 million will be minicartridge drives, which marks a 60% increase over last year.

Minicartridge sales represented roughly 75% of all tape storage units sold in the PC, PC-LAN and midrange markets during the last year, according to the report. The majority of minicartridge units being sold are 120M- to 250M-byte units, which start at about $200.

Price is the No. 1 factor driving sales, according to Dennis Casey, an analyst at Peripheral Strategies. Casey said minicartridge drives are being bought primarily for use as high-capacity storage for a single PC or as low-end storage for small workgroups.

"Minicartridge has pushed into the real affordable range for individual PCs," Casey said. "For storage in this price/performance range, there really aren't any other choices right now."

Minicartridge drives top out at approximately 700M bytes of storage capacity for roughly $1,700, data cartridge drives at 2G bytes for $4,000 and data cassette drives at 600M bytes for $2,500.

Speed considerations

While price is a primary factor spurring his company's use of minicartridge drives, Joseph Trickey, PC coordinator at Stratton-Cheeseman Management Co. in East Lansing, Mich., said speed is also important. "The cost/dependability ratio is such that we really like [minicartridge] backup... but it's also faster than using disk, which means less time is spent accessing data, which translates into money," Trickey said.

Stratton-Cheeseman uses a mix of about 20 internal and external minicartridge tape drives from Mountain Network Solutions, Inc. and Colorado Memory Systems, Inc. in the 40M- to 120M-byte range to support approximately 80 IBM PC users.

Trickey said they bought two drives last year, and he is pushing for more. "We have found them to be very successful. ... They produce more secure backup than diskettes."

In addition to price, Peripheral Strategies said, the following factors are also driving tape drive growth:

- Explosion in capacity demands caused by new high-capacity applications running on Windows.
- Windows' instability with various programs/revisions, which has exacerbated the need for backup.
- Aggressive pricing on minicartridge drives. Casey said vendors such as Colorado Memory Systems and Archive Technology, Inc. have announced 30% to 40% price cuts during the past six months.
- Development of potential new markets in the Americas, Europe and Asia.

Peripheral Strategies estimated that tape-drive shipments will peak at 5.4 million in 1995 before gradually tapering off.

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Modems

Best Data Products, Inc. and CompuServe, Inc. have introduced the "Gold Bundle," a high-speed modem package that combines a CompuServe Information Service Introductory Membership Kit in its new Windows format, with Best Data's 14.4K bit/sec. fax/modems.

Features for the product include free technical support, a communication and fax software program for both Windows and DOS and a lifetime warranty option.

The internal version of The Gold Bundle costs $289, and the external version costs $329.

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Storage

Advanced Digital Information Corp. (ADIC) has announced the Storage Docking System, a Small Computer Systems Interface (SCSI)-based storage system that was designed in two-, four- and six-bay configurations.

According to the company, the system offers users on-site configuration of high-speed disk and digital audiotape drives for network storage needs.

Enclosures for the system are ready for front loading of carrier-mounted ADIC SCSI drives and include SCSI buses and power supplies. SDS is available for Unix, OS/2 and Novell, Inc. NetWare operating environments.

Pricing for the two-, four- and six-bay units are $750, $1,150 and $1,550, respectively.

▶ *ADIC*
14737 NE 87th St.
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(206) 881-8004

Legacy Storage Systems, Inc. has announced the Legacy SmartArray, a product that is part of the company's disk array family.

According to the company, Legacy SmartArray can accommodate up to nine half-height disks configured as a redundant arrays of inexpensive disks (RAID) Level 0, 1 or 5 disk array, with a total storage capacity of up to 12.6G bytes. Visual messages and audible alarms are provided to indicate power supply, storage device or fan failures, and abnormal temperature fluctuations are reported by temperature sensors.

Prices start at $7,460.

▶ *Legacy Storage Systems*
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(508) 435-4700

Micro-to-host

Server Technology, Inc. has released the Remote Power On/Off+ AUX, a telephone-activated remote power control product that detects incoming telephone calls and turns on power for remote host PCs.

According to the company, the product enables users of remote control software to have access to remote home/office PCs that are not kept running 24 hours a day. Three operational modes are offered: the Remote Power Switch Mode, the AUX Port Mode and the Reboot Mode.

Selectable features such as On Hook Delay Time and Power On Ring Count are also provided. The product is compatible with all standard modems and PC systems and with a variety of communication software, the company said.

The Remote Power On/Off + AUX unit comes equipped with a companion intelligent Power Module and cables; it costs $169.95.

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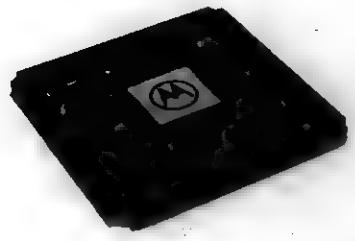

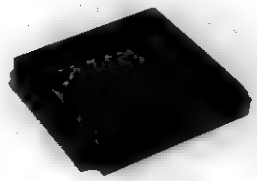

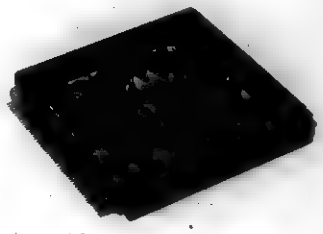

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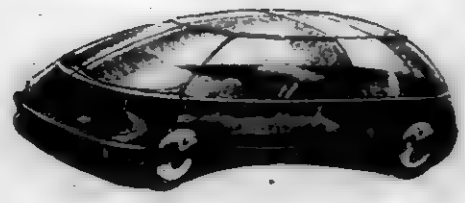

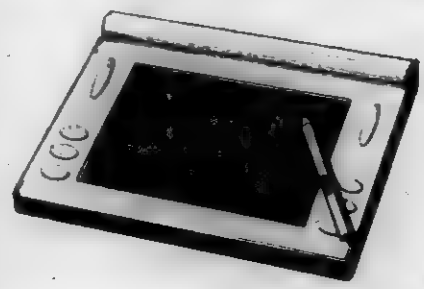

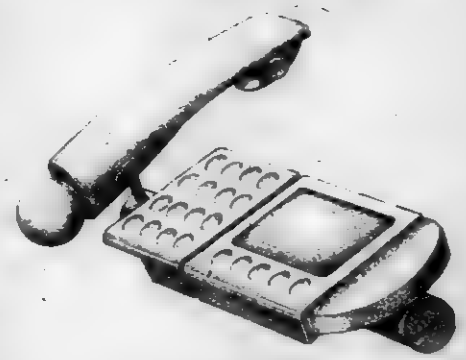

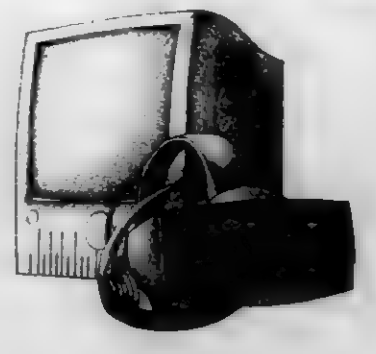

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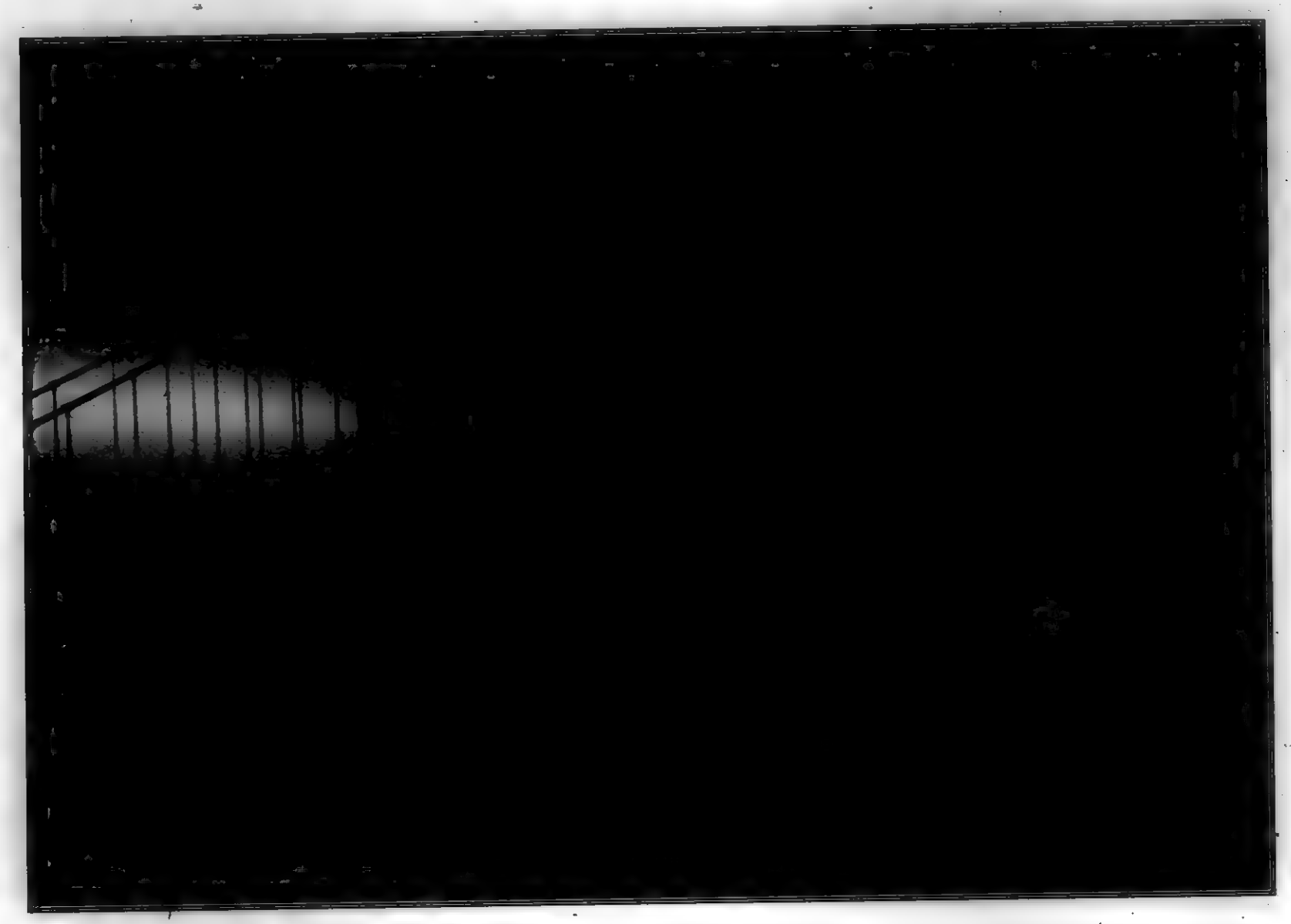

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Forum agrees on frame-relay scheme

By Joanie M. Wexler

The Frame Relay Forum has placed a significant feather in the networking industry's interoperability cap. The forum will soon announce that its members, which include most carriers and router, front-end processor and wide-area data switch vendors, have come to terms on a common way to wrap data communications protocols into a frame-relay packet.

The consensus means that any vendor's network equipment using the scheme can interoperate with any other compliant device over a frame-relay network, explained Alan Taffel, Frame Relay Forum president and vice president of marketing at Alcatel Data Networks in Reston, Va. The agreement should translate into products incorporating the common technology later this year, he said.

Frame relay is a young wide-area network technology optimized for data by combining the efficient statistical multiplexing and port-sharing capabilities of X.25 technology with the high speeds of time-division multiplexing. Frame relay, which can be used in both private or public networks, has about 290 companies subscribing to public services today, according to Vertical Systems Group, a consultancy in Dedham, Mass.

In a region

Frame relay looks to be growing in popularity. Late last month, for example, regional Bell telephone company US West Advanced Communications Services said it has more than 60 users deployed via 32 frame-relay nodes. The firm said it has ordered frame-relay access and connections for some of the 14 states in its region.

Proprietary ways

To date, different vendors have used their own methods of packaging protocols such as Novell, Inc. IPX, Internet Protocol, IBM Systems Network Architecture and Digital Equipment Corp. DECnet in frame-relay "envelopes." Performing these functions in a standard way will open the door to communications among the different devices, a development that will likely benefit carriers and user firms building private frame-relay networks the most. Firms subscribing to a public service can simply let the carrier worry about equipment compatibility.

The forum's common technology will also yield better data-transfer performance to user companies running multiple protocols but using just one vendor's equipment, according to Taffel. This is because the forum's agreement also includes a mechanism for identifying which protocol is contained within a given frame, he said.

Today, even if a frame-relay user runs the same vendor's router at each end of a link, the router has no way of knowing what protocol is in the frame, he said.

"This leads to a tremendous amount of overhead in the router to determine what protocol [is in the frame]" before processing the data and forwarding the packet to its local destination.

Users narrow E-mail product lineup

Firms struggle with cost, complexity of supporting disparate systems

By Lynda Radosevich

Peter Donaghy, manager of information systems at Hughes Aircraft Co., did not know that electronic mail would evolve into a strategic tool. Faced with end users who wanted to send E-mail from independently sprouted local-area networks to other end users on different systems, his IS department tied together 10 different E-mail systems using translation software called "gateways."

Now Donaghy is wrestling with a system that is too complex, and therefore, expensive, hard to manage and less than perfectly reliable. Although new E-mail integration products are being announced almost weekly, Donaghy hopes to alleviate integration problems, in part, by consolidating 10 E-mail systems into three, he said.

E-mail is cheaper

The cost to send a two-page letter by typical methods is:

E-MAIL	$.26
U.S. MAIL	$3.30
FAX	$9.74
COURIER	$12.80

Other costs include materials such as paper and thermal paper, processing and labor costs; fax transmission costs are included but not fax hardware and maintenance.

E-mail costs include hardware and software but not network (LAN or wide-area) costs.

Source: Creative Network Strategies, Inc., Palo Alto, Calif.

Hughes is typical of large companies that linked together disparate E-mail systems that can include established host systems and grass-roots-grown LAN E-mail. In a May 1993 survey of 341 companies by the *Computerworld* Database Division, 50% of the respondents said they were supporting more than one E-mail platform, and 53% of those said they have already connected the disparate systems.

To lower costs and ease system complexity, many of these users are now taking a more formal approach to migrating from host to LAN mail, in part by narrowing the products used.

Since "the biggest cost of LAN E-mail is servicing so many packages, many managers are looking to give their end users one to two choices, rather than a dozen," said Walter Ulrich, a consultant at Arthur D. Little, Inc.'s Los Angeles office.

The move is sparred by the desire to reduce support costs, which comprise the main burden of running multiple LAN E-mail platforms, Ulrich said. For example, a firm with six E-mail systems and 10,000 users in eight units requires a staff of 12 people vs. two for a mature host environment, he said.

Those people are needed to handle translation software and hardware, upgrade E-mail software, assist in fixing major problems, service directories and administer overall operations. With salaries ranging from $40,000 to $80,000, the cost of the extra IS support adds up quickly.

Other factors behind the consolidation efforts are the difficulties in maintaining and synchronizing directories and monitoring message delivery.

For example, Chevron Corp. supports 16 types of E-mail on host, Unix and LAN platforms, each with separate management domains. Most management tools are implemented at the application level and are not integrated, so error diagnosis and recovery is difficult at best, said Marion Weller, senior system analyst for E-mail at Chevron Information Technology Co. in San Ramon, Calif. To circumvent this, Weller said he hopes to reduce the number of platforms supported.

Other issues driving consolidation include the difficulty of dealing with different addressing schemes and finding mail-enabled applications such as group schedulers that work across the different systems, IS managers said.

Rather than linking together existing platforms and then consolidating from there, some companies plan to ease integration conflicts by migrating all users to one new platform.

Edward Bradt, project leader at Eli Lilly and Co. in Indianapolis said his company has five different E-mail platforms, including host and LAN systems, but he has no plans to "bridge" the LAN E-mail. Rather, as he moves the company to distributed messaging, he plans to standardize his 22,000 E-mail users on minicomputer-based distributed E-mail using Digital Equipment Corp.'s Mailworks software. The minicomputers can support between 1,500 and 2,000 users per server rather than the 75 to 100 supported by a typical LAN server, which will reduce the number of servers requiring support.

Gateway proliferation

E-mail gateways let users of different brands of E-mail exchange messages by performing the protocol conversion between the applications. E-mail integration servers let users connect more than two types of E-mail by receiving mail from an incoming gateway, converting messages to an intermediate format (often X.400), then sending messages out to the appropriate outbound gateways. E-mail integration vendors include the following:

- **Alisa Systems, Inc.** in Pasadena, Calif.: Proprietary software and E-mail integration software for DEC VAXs.
- **DEC** in Maynard, Mass.: Mailbus software based on X.400 for VAXs.
- **Hewlett-Packard Co.** in Palo Alto, Calif.: HP OpenMail, X.400-based integration software for Unix-based systems.
- **Isocor** in San Francisco: Isoplex X.400-based messaging software for DOS PCs and Unix-based reduced instruction set computing (RISC) platforms.
- **OSIware, Inc.** in Burnaby, British Columbia: X.400-based integration software for PC servers and various Unix-based workstations.
- **Retix** in Santa Monica, Calif.: OpenMessaging Solution, integration software based on the X.400 protocol for PC servers and Unix workstations.
- **SoftSwitch, Inc.** in Wayne, Pa.: SoftSwitch Central, which is IBM mainframe-based, and EMX, an X.400 switch on Unix platforms.
- **Wingra Technologies, Inc.** in Madison, Wis.: Proprietary E-mail integration software for DEC VAX VMS computers.
- **WorldTalk Corp.** in Los Gatos, Calif.: WorldTalk 400 for HP RISC machines.

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Tangram points in client/server direction

By Elisabeth Horwitt
RALEIGH, N.C.

With an eye on the needs of downsizing corporations, Tangram Systems, Inc. is launching a client/server version of its host-based software distribution, asset management and data collection software, according to Steve Knekes, vice president of technology at the company.

Tangram will continue to use an IBM mainframe as the central control point for updating software and distributing data down to PCs on local-area networks, Knekes said. However, new software will enable popular LAN systems, such as Novell, Inc.'s NetWare, to communicate directly with the mainframe to download the data or software and then distribute it to clients.

Follow-on announcements will put LAN administrators on LAN workstations more directly in control of software distribution and the management of LAN assets, Knekes said. The client/server software will run in familiar LAN environments so that LAN administrators can control and manage the system without becoming mainframe experts, he added.

Tangram's strategic move to the client/server environment was a key reason behind the company's recent decision to take back the worldwide marketing rights to AM:PM from Systems Center, Inc., Knekes said. Systems Center acquired those rights in September 1992.

Systems Center, which was acquired last month by Sterling Software, Inc., seems to be in a state of flux over what to do with its mainframe-based network and system management product, Net/Master, Knekes said. While Systems Center was giving Tangram the worldwide market exposure it wanted, "We decided they would not provide the focus we want" on the client/server market, he added.

Tangram is now looking for partners, but more from a technology than a marketing point of view.

Briefs

Brokerage firm net

A dozen Wall Street brokerage firms, including Merrill Lynch & Co., Salomon Brothers, Inc., and Morgan Stanley Group, Inc., have agreed to link to a new electronic trading network called the Intermarket Trading Network. The new network, developed by Merrin Financial, Inc., was designed to allow brokerage firms and money managers to execute trades and update all clearing and trade processing systems simultaneously.

T3 speeds on Internet

Internet access service provider Performance Systems International, Inc. (PSI) said last week it is upgrading its links in the Northeast from T1 to T3 speeds with the capability to run Asynchronous Transfer Mode (ATM) traffic. ATM traffic is voice, data, image or video formatted appropriately for time-sensitive applications. The initial rollout between Washington, D.C., and New York is slated to take place this month and next month. ATM switches for the PSI network are being supplied by start-up Cascade Communications, Inc.

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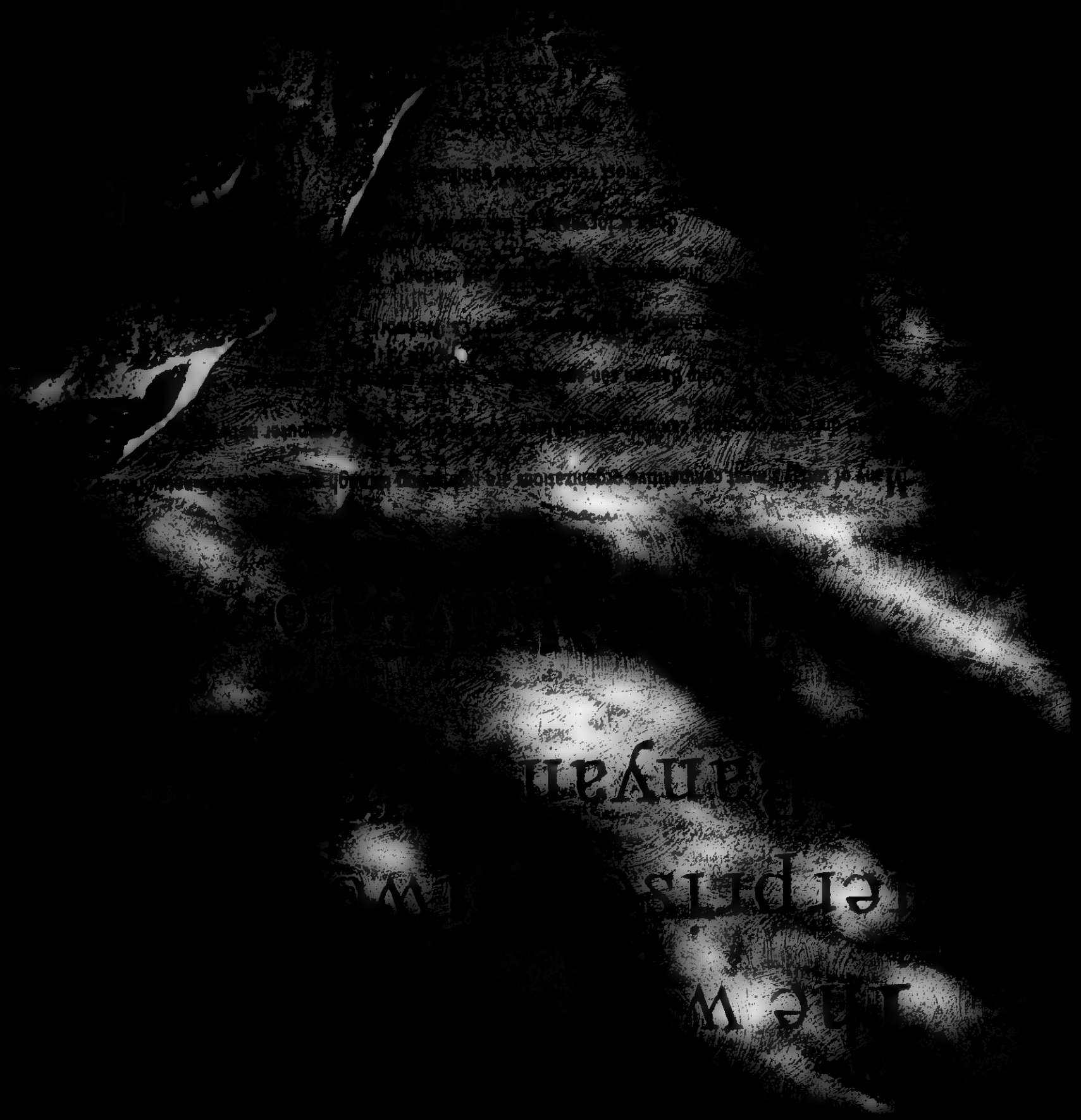


Fiber to make skies over new airport more friendly

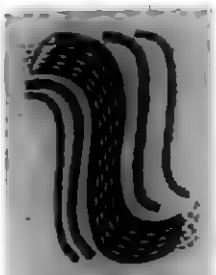
By Joanie M. Wexler
DENVER

■ The first new major airport to be built in this country in 23 years is relying on more than a million feet of redundant fiber-optic cabling to haul critical air traffic control information around an area larger than the state of Rhode Island.

The Denver International Airport, scheduled to open in December with the goal of becoming a springboard to the Pacific Rim, is slated to have its Racal-Datacom, Inc. Premnet 5000 backbone in place at the end of next month, according to Chuck Krone, vice president of Chicago-based Midwest Corp., the prime fiber contractor on the huge Federal Aviation Administration (FAA) project.

The Premnet boxes — of which there will ultimately be 70 in the Denver installation and 12 in another FAA backbone endeavor at Los Angeles International Airport — collect voice and data from a variety of sources such as on-runway lighting systems and weather sensors, as well as voice from the telephone network and radio channels. The multiplexers merge this traffic onto Premnet's high-speed (100M bit/sec.) fiber link and transport it to the control tower, Krone said (see diagram).

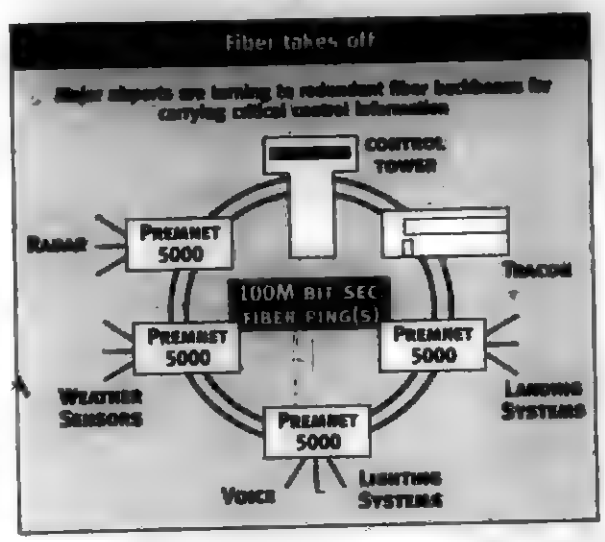
The consolidated information ensures that air traffic controllers have a total picture of airport activity and equipment status so they can keep airplane takeoffs and landings running like clockwork. In fact, thanks to automation, Denver is slated to become the first airport where three planes can land simultaneously in zero visibility, Krone said.



Not the only game

Racal-Datacom competitors in the fiber multiplexer arena include Fibermux Corp. in Chatsworth, Calif., and Fibronics International, Inc. in Hyannis, Mass. The vendors' boxes allow users to go beyond the capabilities of FDDI — albeit in a proprietary fashion — to add terminal, voice and other traffic to LAN communications, yet still derive the speed and redundancy benefits of the 100M bit/sec. dual, counter-rotating ring architecture.

Like industry-standard Fiber Distributed Data Interface (FDDI) networks, Racal's Premnet sports a dual, counter-rotating ring architecture for redundancy: If fiber is cut, communication loops over to the other cable and resumes in the other direction. However, FDDI transports local-area network traffic only, and airports such as Denver and Los Angeles International consolidate more types of traffic than just the LAN variety.



Safety first

A spokesman for the Los Angeles project stressed the reliability of choosing the 64-channel Premnet backbone, which allows users to allocate specified amounts of bandwidth to certain applications. "We have to have something 100% safe from day one. We're playing with people's lives, and there is no such thing as 'half-safe,'" said Mickey Finn, a former FAA lead project engineer on the Los Angeles project.

Finn estimated that about $350,000 of the project's $2.5 million cost is going for the Premnet upgrade from Racal Omnimux 3200s, which are copper-based multiplexers that will be recycled to "other, lower-density airports."

At Denver International, a pair of Premnet boxes on each of the airport's 12 runways will collect information and feed it into the control tower. Meanwhile, Larus transmitters/receivers dispersed across the airport will carry communications between the tower and airplanes.

From the control tower at Denver, that intercommunication is dumped onto an ITT/Alcatel Synchronous Optical Network (Sonet) fiber network and delivered to a Terminal Radar Control Approach Facility (Tracon) 2½ miles away, which serves other airports, said Paul Poirier, a consultant to the Denver project and project engineer at The Volpe Center, an arm of the U.S. Department of Transportation in Cambridge, Mass.

Sonet is an emerging standard for a fiber-based communications "highway" that carries a variety of network services at speeds that will eventually aggregate into the multiple-gigabit/sec. range. Poirier said the FAA chose Sonet for the airport-to-Tracon link because it will eventually become the standard basis for the public telecommunications network.

Tracon monitors all planes in the immediate area, he explained. Sonet does not play a role at Los Angeles because the control tower and Tracon — which scopes a 60-mile radius — are both on the Premnet backbone, Finn said.

Network management

Rmon, NetView 6000 ranges increase

By Elisabeth Horwitt

While major vendors are providing the broad strokes of the integrated, multivendor network management picture, a feisty band of small third parties has been filling in some important functional details. Two cases in point: recent introductions that extend the range of the Remote Network Monitoring (Rmon) protocol and IBM's NetView/6000.

Technically Elite Concepts, Inc. in Hermosa Beach, Calif., has announced Rmon Plus, which is said to extend the Simple Network Management Protocol (SNMP) local-area network monitoring standard to manage enterprisewide LAN-to-LAN connections.

Rmon is an SNMP management information base that sits on LAN devices, such as network interface cards and routers, and collects data on traffic and error levels for analysis on an SNMP management system. However, the current Rmon is limited in that it handles only the data link layer of network interactions, according to Russell Dietz, vice president of systems development at Technically Elite Concepts.

This means that while Rmon can monitor interactions between two devices on the LAN, when the two devices are on different LANs, Rmon only shows device A speaking to its local router, Dietz said. The ability to trace the interaction between different LAN devices all the way across the internetwork is missing.

Rmon Plus is said to fill in that gap in the SNMP standard by providing RMon systems with the ability to monitor and diagnose protocols at the network link layer, such as Internet Protocol (IP), Dietz said. "With our product you can see device A on one LAN talking to device B on another LAN via the router."

Rmon Plus is said to fill the gap in the SNMP standard by providing Rmon systems with the ability to monitor and diagnose protocols at the network link level.

One main use for the product is in pinpointing the origin of broadcast storms, which saturate the internetwork bandwidth when one or more devices tries to find other devices around the enterprise. With ordinary Rmon, it is hard to trace broadcast messages to a particular device or interaction once the messages are flooding the internetwork, Dietz said. In contrast, Rmon Plus can show the origination point, what created the original message and the sequence of events between router and end station, he added.

The vendor plans to propose Rmon Plus as a standard to the Internet Engineering Task Force by the end of August.

Coming out this fall will be a suite of applications geared to making it easier for less technical users to make use of Rmon Plus, Dietz said. The current product requires a user to be "mildly sophisticated" in the ins and outs of LAN protocols.

Shipping now, Rmon Plus currently monitors IP, Novell, Inc.'s IPX and Digital Equipment Corp.'s DECnet Phase IV protocols. Support for Apple Computer, Inc.'s AppleTalk and Banyan Systems, Inc.'s Vines is scheduled for the fall.

Rmon Plus is priced at $3,995, including a proprietary, 1960-based hardware platform and 4M bytes of memory.

NetView expander

Diederich & Associates, Inc. in South Pasadena, Calif., meanwhile, has announced NetScript/6000, which is said to enable IBM's SNMP-based network management system, NetView/6000, to manage a variety of non-SNMP and non-Systems Network Architecture devices. Prewritten scripts expand the RISC System/6000-based network management platform's management range to include the following:

- DEC, Tandem Computers, Inc. and Unisys Corp. hosts and IBM's Application System/400.
- Multiplexers and switches from vendors such as Network Equipment Technologies, Inc., Ascom Timeplex, Inc., Infotron Systems Corp. and Data Switch Corp.
- Wellfleet Communications, Inc. routers.

The product is fully integrated with the graphical user interface and functions of NetView/6000, Diederich said.

Available now, an entry-level system is priced at between $5,000 and $7,000, depending on whether it includes IBM host NetView support.

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Human resources: Client/server guinea pig

HR acts as a test bed for new technology, but good results do not necessarily translate to other areas

closet Client/server OK

By Kim S. Nash

Human resources departments are a test bed for many prepackaged client/server software installations, but good results there may not necessarily translate into success in other areas.

Historically, HR departments have been virtually ignored by corporate information systems, according to users and analysts. Now, with off-the-shelf client/server packages available and proven — at least more so than applications in other departments — HR managers are eager to get their hands on new technologies.

IS groups, meanwhile, see HR users as guinea pigs for grander client/server schemes.

Chevron Corp., for example, is methodically plowing through client/server project after client/server project in an attempt to move as far away from the mainframe as possible in HR, finance and other departments, according to Jay Stright, manager of Chevron's HR operations and employee services unit. "As long as all goes well in HR, we'll keep on going," Stright said.

Vendors such as PeopleSoft, Inc., Oracle Corp. and Cyborg Systems, Inc. have offered client/server applications for HR for at least three years, while other areas such as manufacturing and accounting are just beginning to see similar off-the-shelf products.

At Eli Lilly and Co., HR has gained prestige and serves as a model of sorts for other departments getting into distributed computing, said Greg Reynolds, manager of HR IS development.

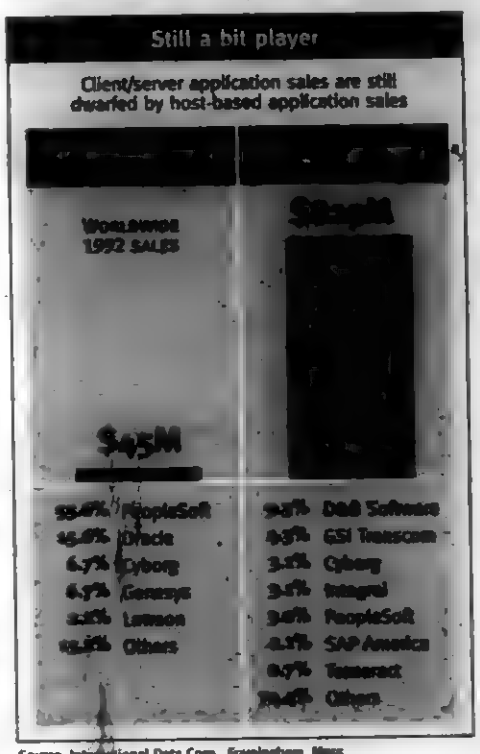
However, some observers warn that doing client/server in relatively contained areas, such as HR, may defeat the purpose of moving to client/server in the first place.

For example, although financial applications in the client/server model are available from companies such as Oracle and SAP America, Inc., the IS people who make decisions for the accounting department are often not the same folks who choose HR software, said Dick Dionne-Keay, an analyst at Summit Strategies in Boston.

That means that "islands" of client/server can crop up.

"HR is, in some instances, cutting itself off from the rest of the company again," said Brian Summer, worldwide director at the Software Intelligence Group, Andersen Consulting's

Human resources, *page 70*



Source: International Data Corp., Framingham, Mass.

At a glance

Some shops prefer to cordon off payroll tasks from the rest of HR processing, contracting with third-party specialists such as Automatic Data Processing, Inc. or Paychex. "You don't have to bother keeping up on ever-changing tax laws that way," notes Lisbeth Green, president of the American Payroll Association in New York.

AS/400 developers eye Unix

By Craig Stedman

Several of the leading application software vendors for IBM's Application System/400 computers have caught the open systems bug in what some analysts view as another sign of the market changes that are making the AS/400's future less certain than its first five years were.

Systems Software Associates, Inc. (SSA), Marcam Corp. and Synon, Inc. all recently made moves into the Unix market or laid out plans to do so. Each has been AS/400-centric, but with AS/400 sales flattening out, the firms are looking elsewhere for growth.

"I'm looking much more at [Unix] for growth than to the AS/400," said Andre Boisvert, vice president of marketing at Larkspur, Calif.-based Synon. "I have to add multiple platforms, and customers are wanting to go to open systems."

"Everybody realizes the market is shifting," added Larry Ford, chairman and chief executive officer of SSA in Chicago. He added that he expects continued increases in SSA's AS/400-related revenue, but said it is "impossible to predict" whether that system will remain the company's leading platform during the long term.

Likewise, Boisvert said he believes the large AS/400 installed base still leaves "lots of market opportunities to feed off of for a long time." But he noted that Synon essentially "hit a wall" in the $50 million to $60 million revenue range as a pure AS/400 software vendor.

Myron Kerstedder, vice president of the midrange computing strategies service at

AS/400, *page 70*

Beyond the AS/400

Open systems product and shipment plans of formerly AS/400-only software vendors

COMPANY	PRODUCT	PLATFORMS	SCHEDULE
System Software Associates, Inc., Chicago	Business Planning and Control System/Advanced Solution (BPCS/AS)	RS/6000, AS/400, HP 9000	March/April 1994 for sales order management functions; rest unspecified
Marcam Corp., Newton, Mass.	Mapics XP	RS/6000, HP 9000, VAX, Alpha AXP, DOS Windows, OS/2, DOS LANs	Acquired in June 1993; available now

HR lineup

D&B Software and Computer Associates International, Inc. recently announced their first client/server HR modules: HR Stream Flex Benefits and CA-HRISMA, respectively.

CA-HRISMA's price of a flat $66,000 per module — no tiered or per-user pricing — is a departure for CA, acknowledged Carl Hartman, HR product marketing manager. The stance is an attempt to undercut established player PeopleSoft, which charges more than $100,000 per module, Hartman said.

The first CA-HRISMA components — payroll, personnel and benefits — are scheduled to ship in 1994's first quarter, he said.

HR Stream Flex Benefits is the first of three pieces of an HR line designed to be integrated with D&B's Financial Stream series. The product is in beta testing; base price is $88,000.

Integral's InPower series is notable for its imaging abilities, said Summit Strategies analyst Dick Dionne-Keay. InPower was designed to let users scan their own internal forms into the application, a feature unavailable in HR software, he said.

InPower replaces HR-1, Integral's local-area network HR product that is character-based. The first iteration, a version using Gupta Corp.'s SQLBase relational database running on either IBM OS/2 or Novell, Inc. NetWare, is shipping. Prices start at $50,000 for a five-user NetWare system.

Versions for IBM AIX and Hewlett-Packard Co.'s HP-UX are planned for later this year, said Jeff Comport, Integral's vice president of strategic planning.

Oracle plans to upgrade its entire series of HR, financial and manufacturing applications this year, with general availability expected for the fall.

A payroll module that has been selling in the UK is due out this year in the U.S., said Chris Roon, director of strategic alliances for applications marketing. Tightly integrated Oracle packages require Oracle's relational database.

— Kim S. Nash

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Wang ports boost open strategy

By Craig Stedman
LOWELL, MASS.

■ Wang Laboratories, Inc. began shipping its Open/image imaging software on Hewlett-Packard Co.'s HP 9000 servers last month, saying it expected to finally deliver a promised work-flow package for the HP line and IBM's RISC System/6000 platform this fall.

Wang, which is trying to turn itself into an open software and services vendor, is also working on porting Open/image to run on Microsoft Corp. Windows NT servers by the second quarter of 1994, with other products following later, said Joseph Tucci, Wang's president and chief executive officer.

Open/workflow will ship simultaneously for the HP 9000 and the RS/6000, probably in October, Tucci said. Open/profound, which catalogs and retrieves multiple types of documents with images, is also due this fall.

At a glance

Projected breakdown of Wang's revenue by business for fiscal '94:
Open systems: 30%
LANs: 15%
VS service: 40%
VS line: 15%

Both products will complete Wang's initial open software portfolio, according to the company.

Wang and analysts said Open/workflow, in particular, is being counted on to flesh out the product line beyond the imaging area, where sales growth has been slow.

Wang's imaging revenue fell back below $100 million in fiscal 1993, said Donald Casey, Wang's chief development officer. Imaging remains the company's core technology but is no longer seen "as a sort of stand-alone system," he added.

"Nobody is going to get rich on just imaging alone," agreed Michael Goulde, senior consultant at Patricia Seybold's Office Computing Group in Boston. But, he added, Wang is "talking about enough other things to build off of that," such as Open/workflow.

However, Goulde said other products are now becoming available "that compete effectively with what Wang has." Mike Howard, vice president and office systems service director at Gartner Group, Inc. in Stamford, Conn., added that Wang is late in getting the Open/workflow product to market.

For some VS accounts, Wang's tardiness has made it harder to justify staying with the company. "The software they have was way ahead a year ago but there's more competition now, and the longer it takes to get it out the door, the more there will be," said Ramsay Millar, director of MIS at the British Columbia Tourism and Culture Department in Victoria, British Columbia. Millar shifted most of his information systems functions to Sun Microsystems, Inc. hardware earlier this year.

However, John DaSilva, manager of systems development and database administration at the Gas Research Institute in Chicago, said he views Wang's imaging experience as an advantage in the developing image-based office productivity environment.

Sales of Open/image and the other open software packages are now small, Tucci noted, but he said 80 open systems orders have been booked since Wang filed its reorganization plan in March. "Really, the world's paid attention to us only the last few months," he said.

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Human resources

CONTINUED FROM PAGE 67

market research arm.

The problem is magnified by the fact that discrete client/server programs for manufacturing plants are even scarcer than financial products. "I'm not sure you're going to see people standardize on one or two [client/server software] vendors for all three areas," said Kurt Basler, manager of payroll and HR IS at Transco Energy Corp. in Houston.

Although that might make IS more complicated, according to Basler, users will have to adjust. "It's a new world out there and sure, there will be growing pains with it, but we're just going to have to do it," he said. Transco plans to install Integral, Inc.'s just-announced InPower HR system this month.

Integrating HR, finance and manufacturing across a company in the manner an ideal client/server setup calls for "is just impossible right now," Summer agreed.

The client/server applications market is fiercely competitive now, as distributed computing models begin to take hold. More vendors are popping up every day, and mainframe software makers are porting their systems to Unix and slapping on a client/server label, Summer said.

"The people who write all these packages have to incorporate other vendors' tools to hope to make it," he said, adding that a few vendors have the right idea, even if they are currently considered laggards.

For example, Dun and Bradstreet Software's Stream systems, few modules of which are now shipping, have hooks into third-party electronic-mail packages and provide tools to help users reorganize work-flow processes, D&B said.

AS/400 future

CONTINUED FROM PAGE 67

Gartner Group, Inc., a consultancy in Stamford, Conn., said the moves by the software vendors pose at least short- and medium-term problems for IBM since the AS/400 is not yet seen as an open system.

IBM is working to change that by adding Posix support and a better implementation of the Transmission Control Protocol/Internet Protocol, "but the [software vendors] are going in that direction much more quickly than IBM can," Kerstedder said. "For a period of time, the AS/400 sits there by itself."

He said it may take IBM at least three years to fully transition the AS/400 into the open systems space. The machine is not going to disappear, he said, "but the stellar performance of its first five years is certainly going to slow down."

However, Nina Lytton, publisher of the "Open Systems Advisor" newsletter in Boston, has a more positive view. The availability of software on other platforms should assure AS/400 users that they are not locked into that system, Litton said. "There's more competition, but every cloud has a silver lining."

As part of their open systems plans, both SSA and Synon said that over time they will make full application development environments available for use on networked PCs, as an alternative to their AS/400 tools. "The future of development is PC- and LAN-based," Ford said.

Synon will continue to enhance its AS/400-based Synon/2E development tools, Boisvert said. "But I also have to be smart enough to put my plan together for the next generation."

Synon's object-oriented LAN-based product also may use underlying technology from Hewlett-Packard Co. or Microsoft Corp., rather than continuing with the IBM technology used in Synon/2E, Boisvert added. "No longer is Synon just blindly IBM," he said.

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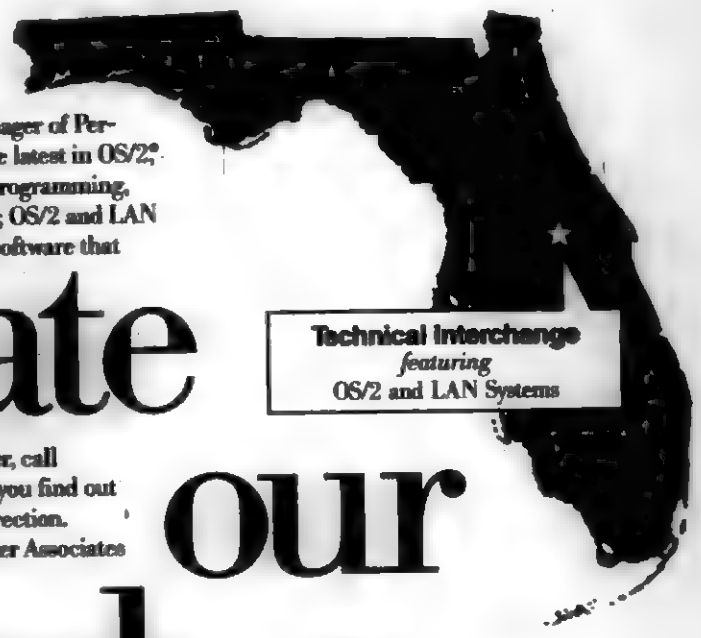

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[redacted]

Utilities

Cybermation, Inc. has introduced Version 4 Release 3.0 of its Execution Scheduling Processor (ESP), automated job scheduling and work-load management software for IBM MVS data centers.

According to the company, ESP automates the execution of simple and complex job streams, verifying that all requirements, including conditional ones, are met.

Enquiry and reporting facilities, updating and real-time control are offered with ESP. Improved job monitoring, increased resource management and enhanced security are new to this release.

Prices start at $43,500.

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Toronto, Ontario L5R 0G4
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Phoenix Software International has introduced (E)JES 2.1, an MVS mainframe software product.

According to the company, (E)JES is a Spool Display Search Facility front end for JESS installations. Release 2.1 features the ability to make global or local operations totally seamless. It offers additional sorting capabilities, the ability to create commands and security enhancements.

Prices range from $15,000 to $41,000.

▶ *Phoenix Software*
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Power supplies

Deltec Electronics Corp. has announced the Advanced Battery Management (ABM) capability.

According to the company, the product was designed to reduce the frequency of battery replacements in uninterruptible power supplies (UPS).

ABM's charging cycle is offered in three levels: fast charging, slow charging and no charging. These capabilities are incorporated into Deltec's PowerRite Pro family of UPS, which protect stand-alone PCs, workstations, local-area network file servers, network nodes and sensitive electronic information against faulty power, the company reported.

Models are available in 400VA, 1000VA, 1440VA, 1920VA and 2200VA capacities.

Pricing for the PowerRite Pro begins at $449.

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Software application packages

Jobscope Corp. has introduced Jobscopejr, a scaled-down version of its IBM Application System/400-based Jobscope management information software for order-driven manufacturing and service businesses.

Manufacturing management capabilities offered with Jobscopejr include job costing, order entry, engineering, purchasing/receiving, financial reporting and inventory control.

Jobscopejr can also perform job cost accounting, standard bills of material/routing, production bills of material/routing and estimating, quote and proposal management, according to the company.

The five-user, 10-user and 15-user Jobscopejr systems cost $54,000, $69,000 and $85,000, respectively.

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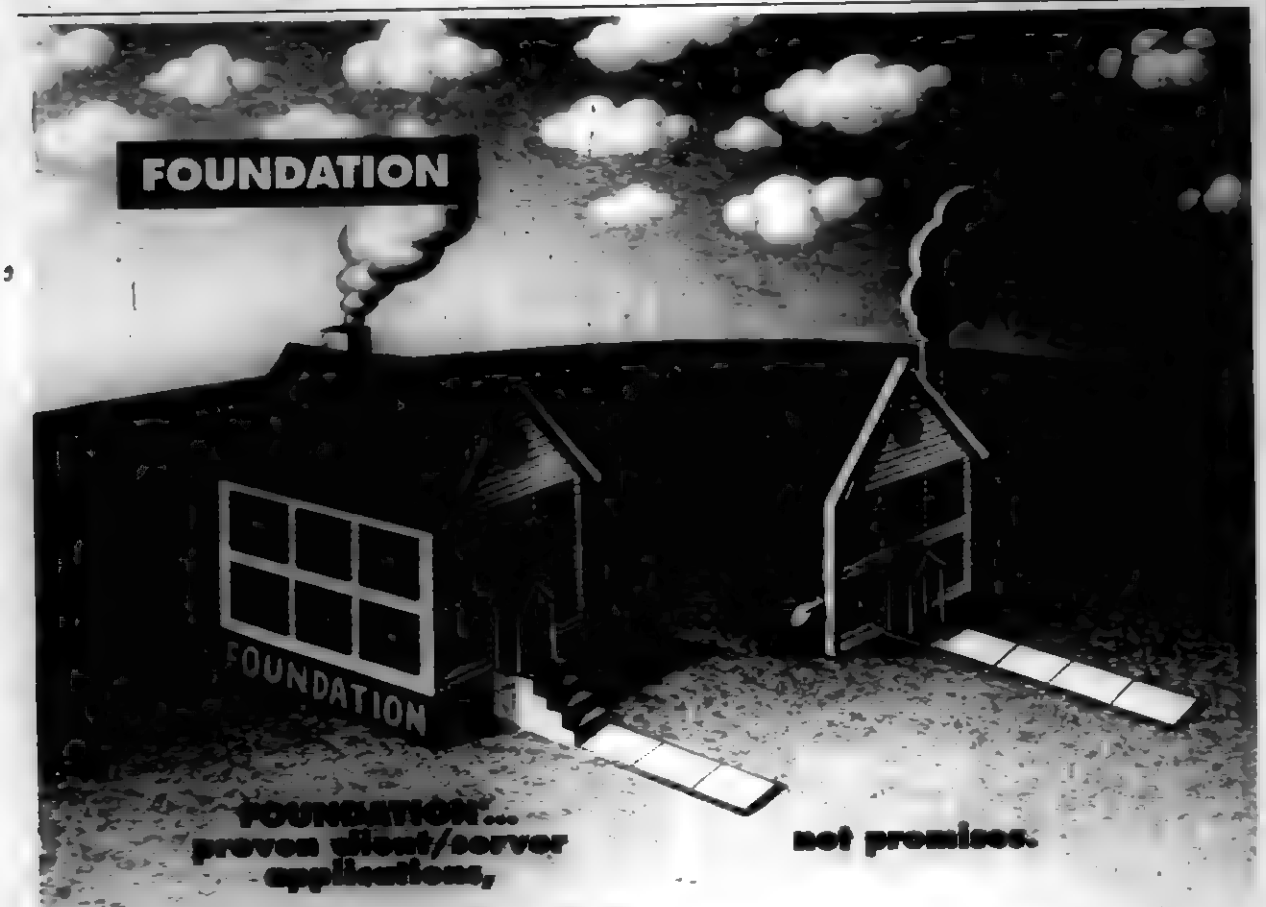

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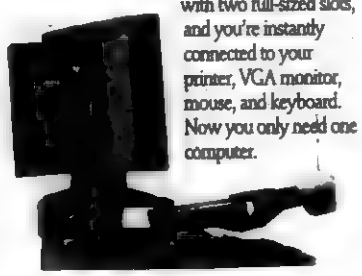

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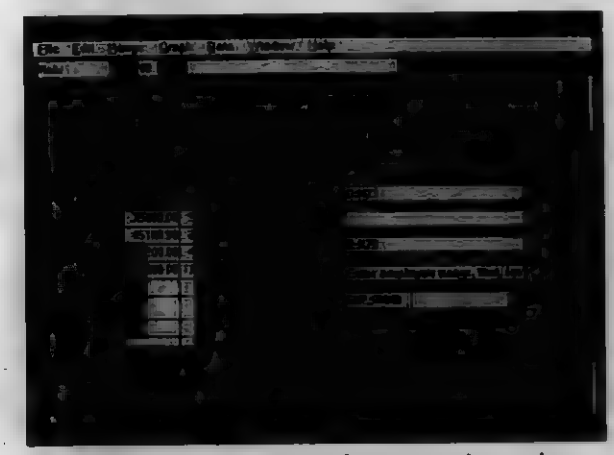
Baler Software to introduce development tool for Windows

By Michael Vizard and Melinda-Carol Ballou
ROLLING MEADOWS, ILL.

Baler Software Corp. plans to deliver this fall a Windows version of its spreadsheet-based development tool that allows users to create applications that can be deployed on other systems using the standard "@" commands that come with most spreadsheet packages.



Visual Baler 1.0 *provides a visual programming environment on top of standard spreadsheets*

Visual Baler 1.0 will give users a visual programming interface for creating applications on top of Excel from Microsoft Corp., 1-2-3 from Lotus Development Corp. or Quattro Pro from Borland International, Inc. Once created, these stand-alone applications can be run on any Windows system, regardless of whether the system is running a spreadsheet.

Although Visual Baler 1.0 is still in the alpha-testing stage, end users said they are looking forward to a major jump in capabilities in the new environment.

Specifically, Roy Hubbard, manager of chiller conversion and retrofit services at York International Corp. in York, Pa., a supplier of air-conditioning systems for office buildings, said he is impressed by the promised three-dimensional capabilities and the improved memory management functions that are promised with Visual Baler.

Hubbard said he has to run Baler for DOS under expanded memory. The Windows version of Baler will take advantage of the memory management services in Windows to run faster and more efficiently.

Hubbard said he intends to upgrade an application that York uses to analyze the costs of upgrading air-conditioning systems from which York is removing environmentally harmful chlorofluorocarbons.

"The reason we first got involved with Baler is because I wanted to create an application and send it out without having to have all our offices own spreadsheet software," Hubbard said.

Full of features

Visual Baler also allows users to import existing worksheets, which are created with programs such as 1-2-3, to slash development time. And it includes tools such as automatic Help file creation not found in many spreadsheets. Also included are a project manager, spreadsheet editor, debugger, Microsoft Help compiler

Baler, *page 78*

Object technology

OMG strives to create on-line object brokerage

By Jean S. Bozman

Objects for sale! Objects for sale!

If you were to walk down America's information highway in the year 1996, it is very likely that you would hear that refrain, industry analysts predicted.

Once the world has enough objects to trade, it will do so electronically, vendors and analysts agreed. The hottest debate is not over *whether* object bazaars will emerge; but rather it is over how much users should pay and how the revenue should be collected.

Share and share alike

"Most of us in object technology believe objects are the best hope we've ever had for the software component industry," said David Taylor, president of Enterprise Engines, Inc., a Redwood City, Calif., firm that consults on business analysis and application design.

"Every company should not have to reinvent the wheel to be able to assemble software, rather than having to 'build it from scratch," he said.

Yet that is exactly what users have had to do: American Airlines built an object-oriented command-and-control system at Dallas/Fort Worth Airport, and Tampa, Fla.-based Kash 'n Karry Food Stores, Inc. built its own C++-based retailing applications.

Although software vendors have built their own object class libraries for user interfaces and network management systems, a relatively small number of object class libraries are available.

But if the notion of an object-oriented version of a Sears, Roebuck and Co. catalog is appealing to many users, several formidable challenges must first be met: creating a common object "syntax" for a common language and "semantics" for common meaning.

Otherwise, C++ objects will not be able to talk to ParcPlace Systems, Inc.'s SmallTalk or Digitalk, Inc. objects, said Taylor, who has authored textbooks on objects.

The Object Management Group's (OMG) Common Object Request Broker Architecture standard will help solve that problem, Taylor said. Beyond that standard, an object-trading infrastructure must be created, perhaps modeled on electronic bulletin boards or store catalogs, he said.

Obstacles to face

John Rymer, an analyst at the Patricia Seybold Office Computing Group in Boston, predicted, however, there will still be vendor

Object brokerage, *page 79*

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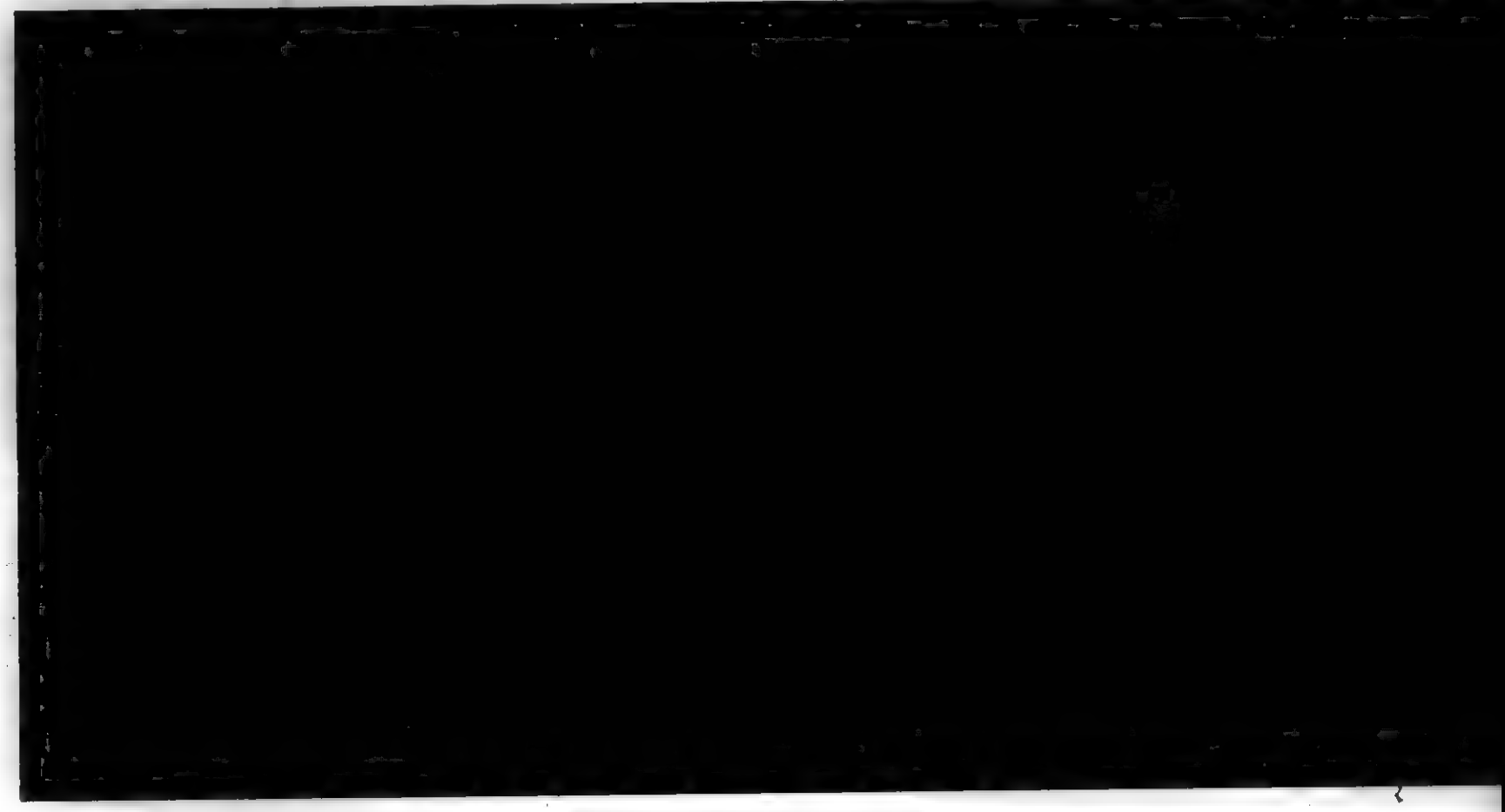

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Rational rolls out Ada environment

By Gary H. Anthes
SANTA CLARA, CALIF.

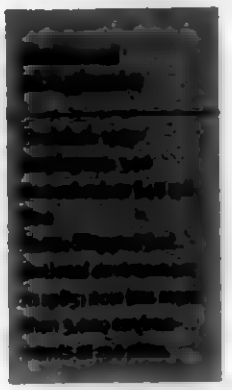
Rational introduced its next-generation Ada development environment, an open-system implementation that no longer requires the use of Rational's proprietary hardware.

The Ada software engineering environment, called Apex, can run on IBM's Unix-based RISC System/6000s as well as on Rational's R1000 minicomputers. Later this year, Apex will be available for Sun Microsystems, Inc. Scalable Processor Architecture computers.

Apex enables editing, program browsing, compilation, debugging, configuration management and version control. It is suited for team use, Rational said.

IBM Federal Systems Co. is using the earlier version of the development environment on Rational hardware to develop real-time air traffic control software for the Federal Aviation Administration (FAA), which is expected to require more than 2 million lines of Ada code. It is also developing parts of the system directly on RS/6000s — where the application programs will run — using IBM's Ada compiler.

IBM is now testing the new Rational Apex directly on RS/6000s to gauge the impact of a possible change in development approach in the middle of the huge project. "Rational is a wonderful environment for developing large amounts of code," said Hope Walker, manager of system development environments. "It has very high productivity, excellent debugging capabilities and having that available to us on the RS/6000 is what we're looking for."



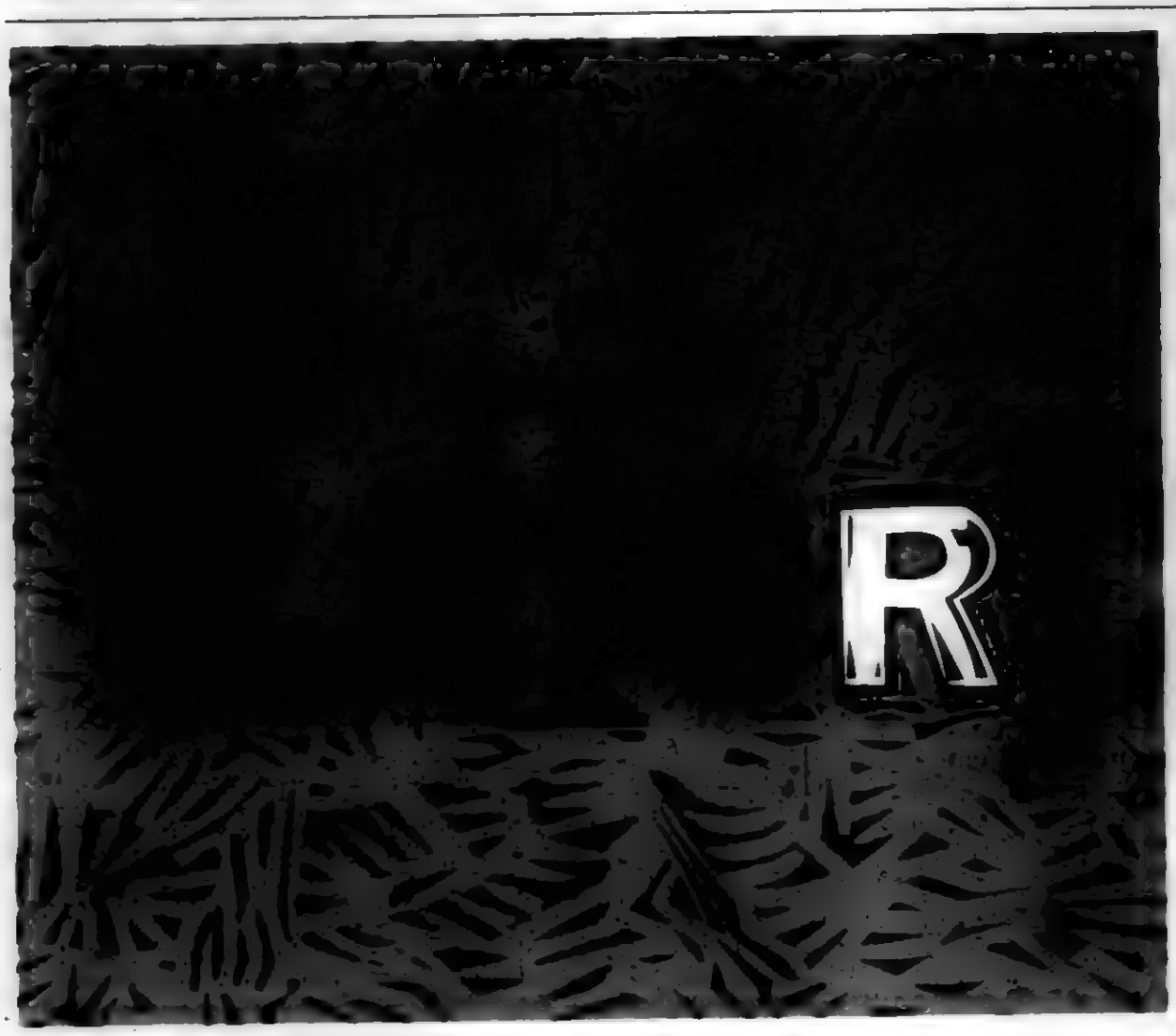
"Our developers had to learn two environments — Rational and RS/6000," said IBM's Tom Trueman, support systems program manager for the FAA's Advanced Automation System. "They had to port code over and get it compiled with a different compiler and get it debugged again."

"Now they can learn one hardware environment and one operating system, and Rational is a set of tools that our people are already familiar with. That makes it very attractive," he said.

Apex features include the following:

- The product uses the Open Software Foundation's Motif tool kit for menus, dialog boxes, customizing options and the like.
- In a process called "persistent intermediate representation" Apex maintains a permanent, detailed file of information about users' software in an object-oriented repository.
- "Optimal recompilation" allows automatic recompilation of lines of source code affected by changes elsewhere without having to recompile entire source files.

Apex is priced at $21,000 per user.



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Baler app tool

CONTINUED FROM PAGE 75

and distribution file optimizer. It provides an application framework so that users do not need to write routines such as "file open" and "save" or code data structures or menu systems.

Specifically, Visual Baler is made up of workbooks with tabbed pages that represent separate sheets in a 3-D spreadsheet.

After the application is completed, users can bind the application into a distributable application. It offers a forms layer so that spreadsheet objects and Windows controls can be combined to create input screens.

Visual Baler is expected to ship in September and will be priced at $495, including a royalty-free distribution kit.

Neuron Data broadens tool base

By Melinda-Carol Ballou

Neuron Data, Inc. is announcing this week Smart Elements, an object-oriented development environment for creating knowledge-based applications with graphical user interfaces (GUI).

"Smart Elements extends the continuum of the application development environment to bring in business logic and business modeling," said Alain Rappaport, president of Neuron Data.

Smart Elements bundles Neuron Data's Nexpert object development tool with a cross-platform GUI design capability. These two elements are united by an extensible script language that lets developers define the behavior of the application interface and link screen elements to application objects.

Making a profit

Neuron Data posted pretax profits of 16% for the fiscal year ended in March, with 27% growth in revenue during the previous year.

Using Smart Elements, developers can more rapidly and easily build graphical knowledge-based systems that are portable across platforms, the company said.

Message make-over

New with this combination of products are improved messaging capabilities that allow developers to attach methods to classes and objects. This enables easier reuse of code and maintenance as well as faster development, officials said. Users are able to broadcast parameterized messages to multiple objects and internal or external methods as well as multiple inheritance paths.

Smart Elements also features a graphical network browsing and monitoring facility, which allows developers to review the broadcast process visually.

Smart Elements builds on Neuron Data's announcement last month of a client/server tools strategy. At that time, the company announced a Data Elements Architecture that consists of GUI tools, data access rules and object tools that are linked via three integration layers.

The integration layers consist of a visual editor, a message-based script language (which is also used with Smart Elements) and third-generation language programming facilities.

Smart Elements is priced at $5,000 and will be shipping this month for the Macintosh, Hewlett-Packard Co.'s 9000 series, Sun Microsystems, Inc.'s SPARCstation, Digital Equipment Corp.'s RISC/Ultrix, IBM's RISC System/6000 and Silicon Graphics, Inc.'s workstations.

Netlogic targets developers with common macro language

By Melinda-Carol Ballou
NEW YORK

While Microsoft Corp. pursues a proprietary strategy with its Visual Basic macro language [CW, June 28], Netlogic, Inc. is shipping ProMacro, which specifically targets application developers and independent software vendors.

ProMacro will allow software companies to provide a utility that users can employ to create their own enhancements to software products.

ProMacro is a superset of Basic, and it offers integration of a full range of Basic operations, functions and data types. Its built-in macro language can automate users' routine tasks, customize interfaces or enhance integration with other products, company officials said.

Embedding ProMacro into code generally requires adding 10 function calls or fewer to source code, Netlogic officials said.

"The need to do this is indicative of an industry trend toward more customizable, off-the-shelf applications," said Michael St. Hippolyte, executive vice president at Netlogic.

Made of modules

ProMacro is modular in structure, and its front end consists of an integrated source code editor and debugger. The back end consists of two modules: a compiler and a runtime engine.

The modularity of ProMacro's design gives developers the flexibility to incorporate ProMacro into their applications, company officials said.

ProMacro is compatible with the core syntax of Microsoft's Visual Basic and offers support for the Windows user interface as well as access to Windows Graphic Device Interface to display bitmaps and text and to draw shapes. In addition, it supports Dynamic Data Exchange and allows access to Dynamic Link Libraries. Developers can also extend the Basic interface by adding new keywords.

St. Hippolyte differentiated ProMacro from Microsoft's macro language.

"Ours targets more of internal Basic to provide specialized capabilities to customize and automate applications, and Microsoft's handles more of the external functions to glue applications together," he said.

"We're all moving toward an object-oriented future, where the real use of a macro language will be to hold different applications and objects together and to customize products so that what end users ultimately see is different than what came out of the box [originally]."

Netlogic will also ship an end-user development tool this fall. Dubbed Cezanne, it will compete in the Visual Basic market, offering an object-oriented, rapid application development environment.

Cezanne will be priced at $495, and ProMacro is priced at $49,500 for an unlimited-use license.

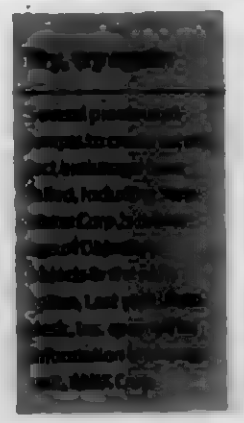
Object brokerage

CONTINUED FROM PAGE 75

spheres of influence in the object world, including object classes from Microsoft Corp., Borland International, Inc. and IBM.

Payment is another obstacle. Some have suggested a pay-as-you-go arrangement, with an object utility that summarizes per-use charges. However, collecting information on software use, perhaps through metered charges, is problematic. Another way would be to distribute objects electronically for a onetime software license fee, as is done for today's shrink-wrapped software.

At last month's Object World, the OMG proposed an on-line object brokerage that would electronically distribute objects ranging from screen widgets to industrial-strength applications. That proposed brokerage has been approved by the 24-member OMG board, but its format has not been finalized.



However, OMG Chief Technology Officer Richard Soley said existing on-line information services may provide a home for the OMG object brokerage as early as this fall.

"We're hoping that it will improve the economics of software development," said Sam Greenblatt, chief technology officer at Candle Corp. in Santa Monica, Calif., an OMG member. "The main reason this whole thing was put together was that object technology's going to stall unless there's a way to improve the economics and to attract a growing audience to it."

Greenblatt said the goal of the OMG brokerage is to have 2,000 active subscribers" by 1995. The object brokerage is intended to create more demand for object-oriented software, he said.

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The SAS/C C++ Development System is an indispensable tool for migrating existing C++ applications developed in other environments. Applications built on UNIX workstations and PCs can be ported to the mainframe with minimal effort. As a result, your workstation becomes an effective platform for mainframe applications development.

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To learn more about the pluses of C++ programming with the SAS/C C++ Development System, simply call or fax us today.

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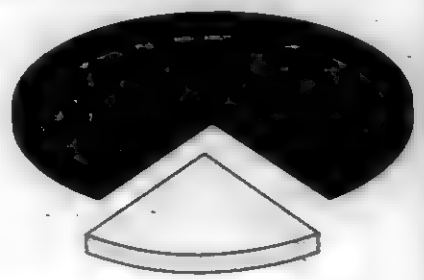

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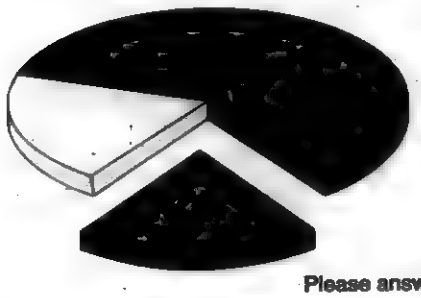

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Application development tools

Semaphore has introduced Atriom, an interactive graphics object-modeling tool designed for creating, browsing and managing object-oriented applications.

Developed for users with C++ language programming and object technology, Atriom offers drawing capabilities that capture complex designs such as object modeling.

According to the company, the tool can read existing programs and can display a detailed graphical representation of their component parts and their interrelationships.

Atriom costs $795.

▶ *Semaphore*
800 Turnpike St.
North Andover, Mass. 01845
(508) 794-3366

CenterLine Software, Inc. and Visual Edge Software Ltd. have announced ViewCenter for Motif.

The product is based on UIM/X 2.5, Visual Edge's graphical user interface (GUI) builder and includes integration with CenterLine's CodeCenter and ObjectCenter Unix programming environments.

With ViewCenter for Motif, users can interactively create, test, modify and generate code for the user interface portion of their applications, the firms said.

Support for Release 1.2 of Motif is provided, and reusable GUI objects can be created because ViewCenter for Motif generates C++ user interface code and GUI-class object components.

The product costs $2,995.

▶ *CenterLine Software*
10 Fawcett St.
Cambridge, Mass. 02138
(617) 498-3000

Intelligent Environments, Inc. has announced SQL/Workbench Version 2.1, a development tool.

According to the company, the product provides high-performance static SQL capabilities for client/server applications hobbled by poorly performing dynamic SQL.

The product offers a mix of multithreaded static SQL, high-level team programming and maintenance facilities and a language-independent architecture.

Version 2.1 can be used to deliver static SQL access plans for IBM's Systems Application Architecture databases and adds optimized tuning for IBM's Distributed Database Connection Services/2 and DB2, the company said.

Licenses cost $8,400.

▶ *Intelligent Environments*
2 Highwood Drive
Tewksbury, Mass. 01876
(508) 640-1080

Languages

Liant Software Corp. has announced RM/Cobol-85 for Windows.

According to the company, the product lets users run existing RM/Cobol-85 applications under Windows without recompiling or changing any existing code.

RM/Cobol-85 for Windows takes advantage of Windows features such as mouse-driven operation, a graphical user interface and pop-up windows.

Highly portable Cobol applications can be deployed among Windows, Unix, DOS and OS/2, which are the other platforms that Liant supports.

RM/Cobol also features more than 85 predefined buttons and a customizable tool bar.

RM/Cobol-85 for Windows costs $199.

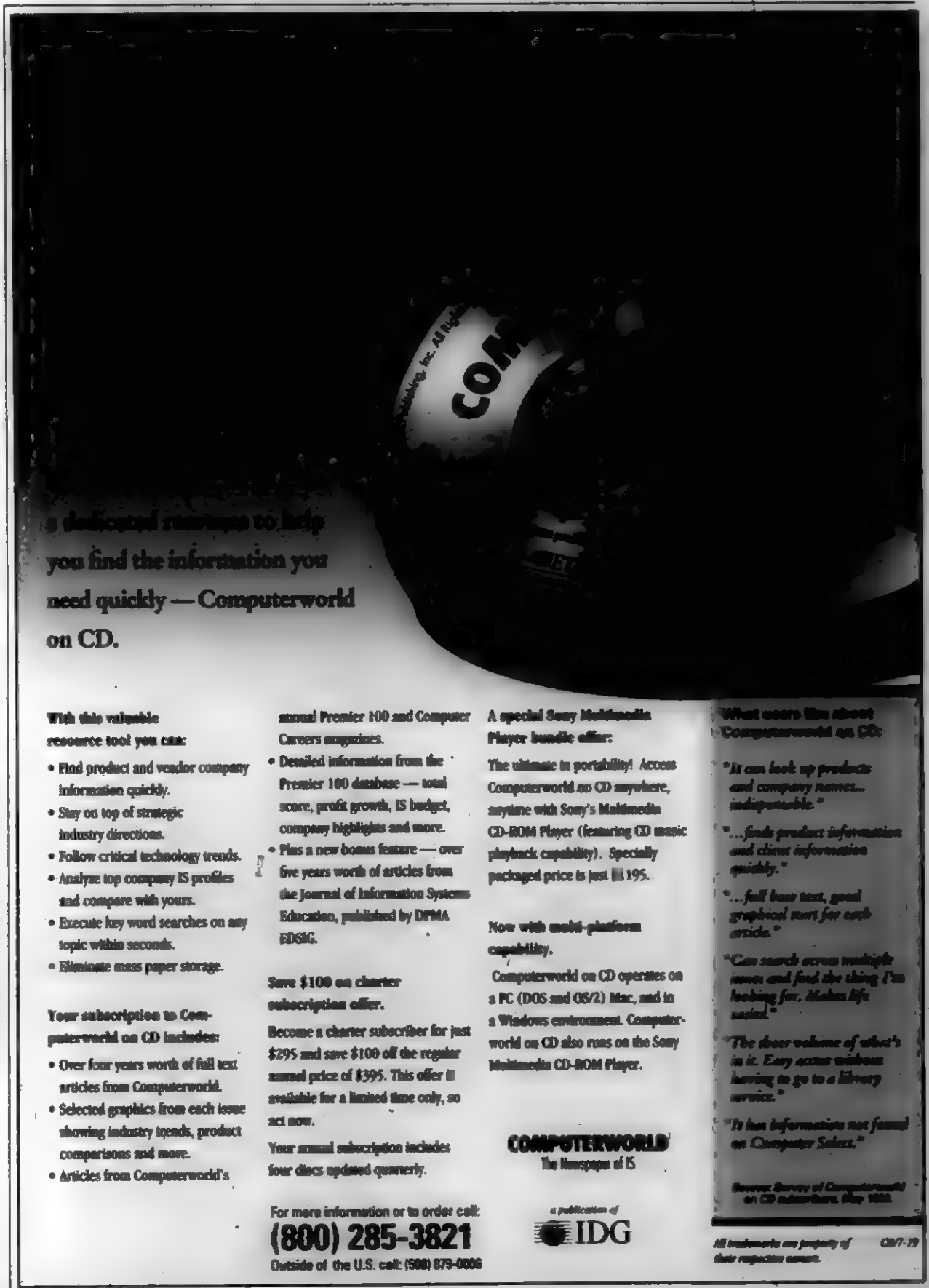
▶ *Liant Software*
Suite 4300
8911 North Capital of Texas Highway
Austin, Texas 78759
(512) 343-1010

Ergodic Systems, Inc. has announced Version 4.5 of the Macro Spitbol, a high-performance string language based on the Snobol4 language.

According to the company, the product is used for file and data conversion, pattern-matching and sorting and retrieval.

A complete package of license, media and documentation for any Digital Equipment Corp. VAXstation costs $395.

▶ *Ergodic Systems*
23666-A Birtcher Drive
El Toro, Calif. 92630
(714) 380-9719



The Salary Spectrum of Top CIOs:

CIO COMPANY	TOTAL PACKAGE	ANNUAL		
[redacted]	[redacted]	[redacted]	[redacted]	$16,964
[redacted]	$703,084	$339,262	$250,000	
[redacted]	[redacted]	[redacted]	$161,575	$1,668
[redacted]	$559,103	$343,750		
[redacted]	[redacted]	$280,000	$203,000	
Charles Brandon, Phillips Petroleum Co.	$414,000	$307,000	$98,180	
Michael Reschen, The Kroger Co.	[redacted]	$208,827	$75,000	$41,860

A few notes about the data: The executives selected for the compensation chart are a sample based on publicly available compensation reports from 1992 proxy statements. An executive's long-term compensation is included to show his annual total compensation, although he is not actually taking home, in cash, those amounts. **Restricted stock awards** are granted in a dollar amount on an annual basis and then are vested over a period of years as an executive continues at the company. **Stock options** are granted in a similar fashion. The **Other long-term compensation** can represent the sale of restricted stock or payouts from other corporate incentive programs. James Marston, for instance, received $94,500 in 1992 from the sale of restricted stock he had been granted in the 1980s.

CONTINUED FROM PAGE 1

in various industries has steadily climbed in the last several years and now ranges from $76,000 to $155,000.

But an expanding group of high-powered CIOs are leaving those numbers in the dust. Based on interviews with information systems executives, recruiters and industry observers, the world of CIO compensation is splitting into two tiers.

The lower tier consists of a large number of CIOs who reflect the industry averages. On top of that, however, rests a smaller, but growing, top tier where compensation in the $500,000-plus range is becoming the norm.

SUPER CIO$

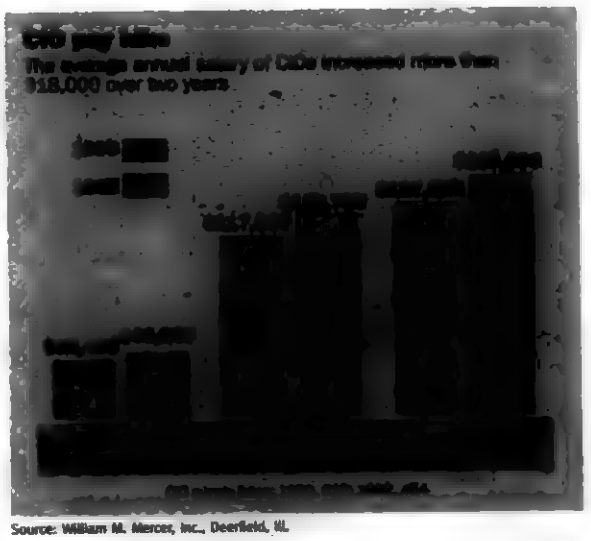
Increasingly, these top-tier CIOs are receiving stock option deals, signing bonuses, annual bonuses and other perks, all of which can exceed more than 100% of their base pay.

"I'll take their salaries," quipped Edward Perlin, president of Edward Perlin Associates, Inc. in New York, a compensation and benefits consulting firm that has been tracking CIO pay at a small number of large corporations for 10 years. His surveys have included companies such as Aetna Life and Casualty Co., American Express Co., BankAmerica Corp., Bank of New York, The Chase Manhattan Bank NA, Chemical Banking Corp., Morgan Stanley & Co., PaineWebber, Inc. and Salomon Brothers, Inc. In 1993, the average cash compensation — which excludes long-term compensation of stock-related payments — at 17 top firms was just above $400,000. Perlin estimates that three or four of the CIOs earned more than $1 million when long-term compensation was included.

Then there's Ron Ponder, who made a name for himself at Federal Express Corp. and just last month jumped to AT&T from rival Sprint Corp., where he was CIO for a little more than a year. He was not in Perlin's survey, but the 1992 Sprint proxy statement shows that the CIO's total package, including long-term compensation and a onetime bonus, topped $2 million.

A Sprint spokesman said Ponder will actually forfeit a major chunk of that compensation because he resigned before July 6, 1993. AT&T will not say what it was willing to pay Ponder to come on board, and Ponder was not available for comment.

Just three years ago, DuWayne Peterson, then IS chief at Merrill Lynch & Co. and now an independent consultant, was one of the most talked-about executives in the industry because of his million-dollar compensation package. Peterson said CIO compensation continues to improve because the IS chief's job is seen more as an "executive-level" position. And he speculates that at least "a handful" of



Source: William M. Mercer, Inc., Deerfield, Ill.

1992 CIO Compensation

LONG-TERM			MISCELLANEOUS COMPENSATION
$875,000			$887,250
$110,000	22,000		$3,822
	5,310	$84,600	$17,389
$156,125	5,000	$25,000	$34,228
	3,877		$26,182
			$8,820
	12,500		$7,336

Companies typically do not detail other annual compensation amounts. But they often include such items as relocation expenses. And the miscellaneous compensation category is intended to cover a variety of smaller payouts, with the exception of Ron Ponder, the former CIO at Sprint who was recently named CIO at AT&T. Ponder's miscellaneous compensation includes an $887,250 signing bonus when he joined Sprint, and the remainder covered his moving expenses. (One other note about Ponder: What he will actually realize from Sprint is far less than $2.2 million, based on the terms of his employment contract outlined in the 1992 proxy statement. For instance, the contract specified that Ponder repay his signing bonus, minus tax withholding, if he resigned before July 6, 1993, which he did.)

CIOs, mainly at financial securities firms, are making more than $1 million now.

Today, as Ponder and other top IS chiefs demonstrate, many more CIOs are playing in the big leagues. Industry observers say this top tier of well-paid IS executives has been created by several factors. The more a company considers IS critical to its success, the more the IS chief's compensation will reflect that. Consequently, CIOs at major corporations, particularly those companies that live and die by their information systems, are compensated handsomely.

Perlin says the front-runners in compensation are typically from the financial services industries, with brokerage houses, banks and insurance companies leading the way. But more recently, this trend "is spreading more to other industries, too," Perlin adds.

"The CEO's attitude" toward IS is a big factor in how the CIO is paid, Marston says. And some recruiters agree.

"The ability for a CIO to get to the hallowed executive officer is often a function of how the president perceives [the position]," said Beverly Lieberman, president of Halbrecht Lieberman Associates, Inc., a recruitment firm in Stamford, Conn.

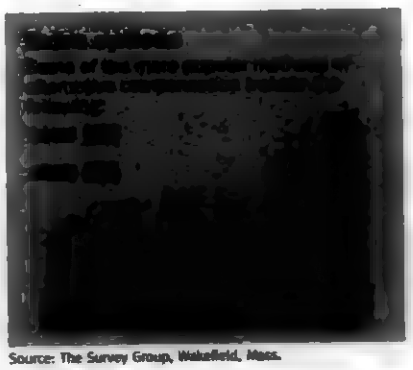
Other observers say the high-risk nature of the job is bumping up the size of today's paychecks. With turnover so high — Deloitte & Touche estimated 1992's CIO turnover rate was 17.5%, a 20% jump from 1991 — companies are often willing to compensate well if they believe they've landed a solid executive.

Jay Gaines, president of the recruitment firm Jay Gaines & Co. in New York, says that when it comes to CIOs, "there have been failures and disappointments. So, hiring a really excellent CIO is a very difficult task. In the senior levels, it is put at a premium."

Gaines says his research shows that compensation at major financial services companies, excluding long-term and deferred compensation, ranges between $300,000 and $500,000.

Jay Ward, vice president and chief operating officer at KeyCorp., a bank-holding company in Albany, N.Y., says he believes the turnover rate has changed the compensation game as well.

"The average life in a position tends to be about four or five years," says Ward, whose total compensation package in 1992 topped $500,000. "Salaries are high-



Source: The Survey Group, Wakefield, Mass.

er because every time you go out to get someone new, you have to pay more."

Another factor, observers say, is the maturing of the IS industry, where more CIOs today have well-known track records and can command big bucks.

In addition to the financial rewards, these top-tier CIOs are typically key players on the executive team. Michael Simmons, executive vice president and CIO at Bank of Boston Corp.; Max Hopper, CIO at AMR; and Charles Bowerman, CIO at Phillips Petroleum Co. all rank within the Top 5 executives at their companies.

In the top tier, the rewards are big, but the downside can be significant. Along with fatter paychecks, executives and recruiters say an increasing percentage of total compensation is coming from payments other than base salary.

The big bucks can come from bonuses tied to corporate profits and individual performance rewards. But the more income derived from at-risk compensation, the more likely an executive could take a big financial hit.

The risks, though, are apparently worth it to many of the big players.

"I don't have any complaints," Ward says, "You have fun doing things; you don't worry about the dollars. I've been lucky. I've got a good boss, too." ■

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Protecting DASD at AS/400 Si

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Mirroring has rapidly become the most dominant method for protecting DASD at AS/400 sites. As disk prices continue to decline and users demand higher performance storage subsystems, mirroring's popularity is expected to increase dramatically.

The AS/400's unique storage architecture uses single-level addressability of all storage. Storage can be accessed transparently, creating the appearance (to a programmer) that main memory and secondary storage are a contiguous address space. The fundamental problem with AS/400 storage, however, is that disk files are striped in blocks across multiple disk spindles. If a disk fails, the user loses access to all striped files associated with the data on that device and must refresh the entire DASD farm from tape with data that may not be current.

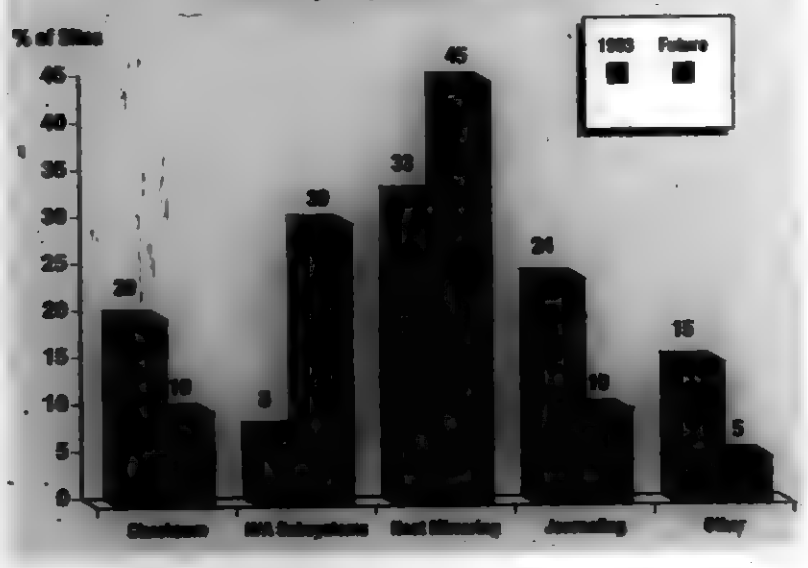
IBM has introduced several features designed to address the drawbacks of single-level storage. In addition to host software that predicts device failures, IBM offers journaling, which stores database changes to a specified disk and allows recovery from the last tape backup. The AS/400 also touts three other features used to avoid catastrophic device failures:

- Checksum protection
- Disk mirroring
- High-availability (H/A) DASD subsystems

Figure 1

Mirroring Is Favored at AS/400 Sites

DASD Protection Method
Most Frequently Used at AS/400 Sites



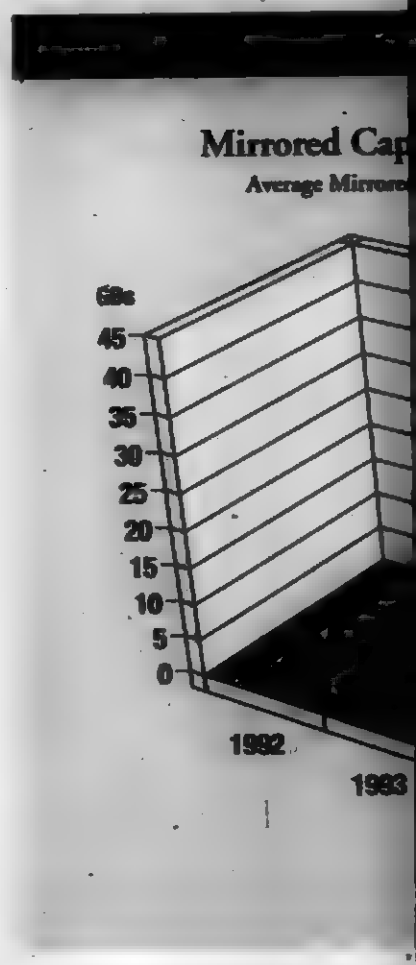
Checksum

Checksum protection constructs "sets" of disk drives and creates redundant data (stored on disk as parity information) by using a logical exclusive-OR (XOR) operation on all the devices in a set. The XOR of all the devices, called the Checksum, can be used to rebuild data if a device (or sector) is unreadable.

Checksum has several drawbacks. Failed disk devices must be replaced manually to initiate recovery. Updates to data are overhead-intensive and hinder performance. Checksum requires more main memory, thus increasing costs. Notably, the system is inoperable during recovery.

Mirroring

Disk mirroring is typically performed through host software that, when activated, groups disk units into "mirrored pairs" and maintains exact copies of each disk volume. If a disk unit fails, the system can continue operation by accessing the other drive in the pair. The AS/400 implements a mirroring system that dynamically selects a "mate" device by choosing a disk that demonstrates the best availability characteristics (i.e., the device is on a separate bus, I/O processor, or I/O controller) in an attempt to minimize single points of failure.



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tes: Mirroring Takes the Lead

M C Corporation

Due to rapidly falling disk prices and the increased need for high availability, disk mirroring is on the rise at AS/400 sites (see Figure 1). Not only are more sites mirroring, but customers are increasing the amount of data being mirrored (see Figure 2).

High-Availability DASD Subsystems

High-availability DASD subsystems incorporate various levels of redundancy within the disk subsystem. Their price increases as levels of protection increase. Disk devices, controllers, cache memories, fans, power, and even microcode – all candidates for failure within a subsystem – may require protection.

High-availability subsystems commonly use RAID 5 to protect head disk assemblies. Like Checksum, RAID 5 uses parity information to secure data in the event of a failure. RAID 5's advantage is that it offers DASD protection with less CPU and memory overhead than Checksum and protects storage with less disk capacity than is required for mirroring.

RAID 5's biggest drawback is poor write performance due to its "Write Penalty," incurred by the need to conduct four operations during a write. "Write Assist" techniques such as the Write Assist Device (on IBM's 9337) or write caching can compensate for the RAID 5 write penalty. These techniques add costs to the subsystem and can somewhat offset RAID 5's pricing advantages relative to mirroring. In general, the more effective the write assist technology (i.e., the higher the performance), the more costly the subsystem will be.

Figure 2

cities Are on the Rise

GBs Installed at AS/400 Sites

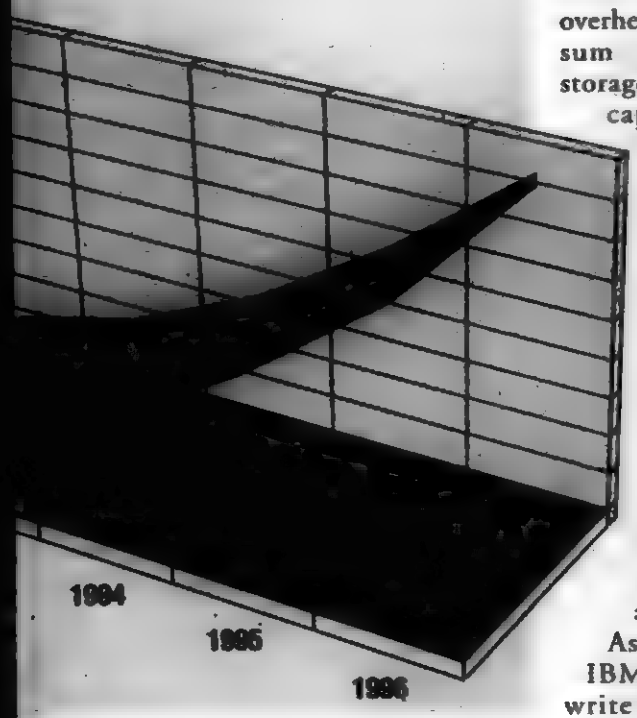

Table 1

Advantages and Drawbacks of AS/400 DASD Protection Method

Method	Advantages	Drawbacks
Checksum	Lower disk overhead than mirroring	Memory and CPU hog Poor update performance Recovery hangs system
High-availability subsystems	Lower disk overhead than mirroring	Poor update performance
Host mirroring	Good read performance Instant recovery of data Increased fault tolerance	Need 2X disk capacity
Journaling	Simple, inexpensive	Recovery from tape

Conclusions

Selecting the right DASD protection method involves trade-offs. Users need products that meet diverse performance, cost, and protection requirements. High-availability DASD subsystems will continue to evolve and improve, particularly in the area of better write cache techniques. Their popularity and market penetration will also increase. Nonetheless, these subsystems are likely to coexist with host mirroring for several years. Furthermore, standalone subsystems will never deliver the fault-tolerance levels of mirroring, which can extend its protection beyond the subsystem and into CPU resources.

– David Vellante,
Senior Vice President,
International Data Corporation

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Raymond L. Manganelli

Define 're-engineer'

During the past three years, U.S. companies have faced an unprecedented number of competitive challenges. And the future promises more of the same. To survive, companies must make drastic changes in the way they do business.

That's why a growing number of senior executives are attempting to boost productivity, quality, customer service and efficiency — all at the same time — by fundamentally redefining what employees do and how they do it. When implemented correctly, this approach to organizational improvement — known as business process re-engineering — produces breakthrough gains in process performance.

Too often, however, re-engineering programs fail to achieve such gains. The problem with these programs is that they are poorly defined and too time-consuming to satisfy most senior executives' needs.

Poor definition

Viewed by many as a euphemism for "downsizing," "restructuring" or "automating," the term re-engineering is too imprecisely defined to meet many of its stated objectives.

In a recent national survey of 121 senior executives conducted by my company, Gateway Management Consulting, Inc., 54% of the senior executives responding said they have an incorrect understanding of what the term re-engineering means.

When asked to define the term, these executives provided answers such as "technology changes" and "cost reduction." While business process re-engineering often impacts technology, products and costs, it involves the redesign of an entire business process — for example, work flows, policies, procedures, information systems, external interfaces and organizational structures.

Of those executives who say they do understand what the term means, many still mismanage their re-engineering programs by failing to consider the issue of timing.

In its survey, Gateway found that 59% of the respondents need to see the results of their re-engineering programs in one year or less, and 91% in two years or less. Yet the average re-engineering program today takes between three and five years to produce meaningful results.

Until the business community arrives at a precise definition of what re-engineering is and devises a methodology for achieving rapid results, re-engineering will produce little more than marginal gains in business performance.

The distortions

The primary source of executive confusion is inflated expectations. Many re-engineering gurus promise executives a tenfold improvement in overall business performance — a goal that is unachievable for most organizations. No matter what a company's ailment — shrinking profits, rising costs, dissatisfied customers, declining market share — these gurus are peddling re-engineering as the miracle cure.

This approach distorts organizational priorities in three critical ways. First, it causes executives to forego vital, value-added re-engineering projects in favor of projects yielding a promised 80% reduction in cost. Second, it encourages the wrong companies to re-engineer.

Typically, companies in need of 80% cost savings are candidates for financial restructuring or crisis management, not re-engineering.

Third, it causes the right companies to re-engineer incorrectly. Often, the only way to achieve savings of enormous magnitude is to slash head count, relocate operations and freeze capital investment. That isn't re-engineering. It's demolishing your current business.

The CIO's role

In many cases, the CIO reinforces these distortions by limiting the focus to cost-reduction opportunities. For the CIO, the challenge is to stay within the information systems budget while continuing to meet user needs — a challenge that places a strong emphasis on cost.

According to a second national survey conducted by Gateway and answered by 251 CIOs, the information officer's top priority is cost — more important than flexibility, service, availability and user satisfaction by a wide margin.

By focusing too narrowly on cost rather than on overall process performance, however, many CIOs transform re-engineering programs into enterprise-level expense reduction exercises.

To qualify as re-engineering — and produce dramatic results — an improvement program must enhance quality, increase revenue *and* optimize costs.

The real potential

I believe that a viable approach for achieving these goals is "rapid re-engi-

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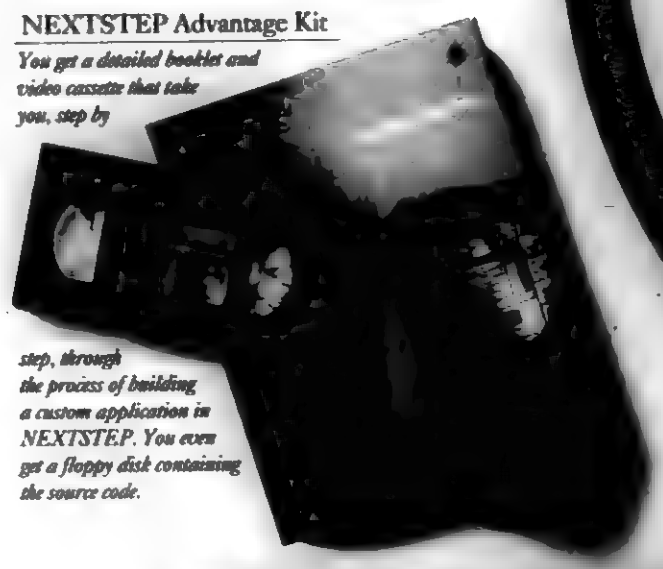

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neering" — a modular re-engineering tool designated to identify and implement opportunities for substantive performance improvement with a one-year return on investment. Rapid re-engineering is a five-stage program:

- **Stage 1: Preparation.** Mobilize, organize and energize the people who will perform the re-engineering project.
- **Stage 2: Identification.** Develop a customer-oriented process model of the business.
- **Stage 3: Vision.** Select processes to re-engineer and formulate redesign options capable of achieving breakthrough performance. While redesigns may be enabled by technology, they should not be driven by information systems capabilities.
- **Stage 4: Solution.** Define the technical and organizational requirements for the new process and develop detailed implementation plans.
- **Stage 5: Transformation.** Implement your re-engineering plans.

This five-stage methodology helps companies realize rapid, high-impact improvements in strategic areas of their business.

In one case, rapid re-engineering was used to help a manufacturer boost efficiency by 70% and accuracy in its order-fulfillment process by 100%. This process, which originally involved 63 cumbersome steps, was streamlined to 23 value-added steps. Within one year, profits had risen dramatically, market share had grown, and customer satisfaction was at an all-time high.

The commitment

Achieving such results requires enterprise-level commitment, management expertise and a great deal of work. To date, too few organizations have been willing or able to meet these requirements. Seduced by unrealistic expectations and a thirst for cost cutting, many CEOs and CIOs have crippled their organizations with massive restructurings and layoffs.

In an environment of rapidly changing technologies, treacherous competition and escalating customer demands, only the strongest companies will survive. Most re-engineering programs, as practiced today, weaken organizations rather than strengthen them.

Despite inflated promises of 80% improvement, these programs deliver too little, too late — at too high a cost. Rapid re-engineering is a more attractive option. It helps companies get back on their feet quickly and cost-effectively and strengthens them to compete in today's challenging economy.

Mangonelli is the president and chief executive officer of Gateway Management Consulting, a New York consulting firm.

Calendar

AUG. 1-AUG. 7

Siggraph '93. Anaheim, Calif., Aug. 1-6 — Contact: Siggraph '93 Conference Management, Clarendon Hills, Ill. (708) 850-7843.

Tools USA 1993. Santa Barbara, Calif., Aug. 2-5 — Contact: Tools Conferences, Santa Barbara, Calif. (805) 695-1006.

Downsizing Expo. Santa Clara, Calif., Aug. 3-5 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

AUG. 8-AUG. 14

Sounds of Change: Emerging Technologies/Re-engineering State Government. Nashville, Aug. 8-11 — Contact: National Association of State Information Resource Executives, Lexington, Ky. (606) 231-1970.

AUG. 15-AUG. 21

Share Summer 1993 Meeting. Washington, D.C., Aug. 15-20 — Contact: Share headquarters, Chicago, Ill. (312) 644-6610.

International Networking Conference '93 (INET). San Francisco, Aug. 17-20 — Contact: Universities Space Research Association, Mountain View, Calif. (415) 390-0317.

Client/Server '93 East. Washington, D.C., Aug. 17-20 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-5717.

AUG. 22-AUG. 28

Interop '93. San Francisco, Aug. 23-27 — Contact: Interop Co., Mountain View, Calif. (415) 941-3399.

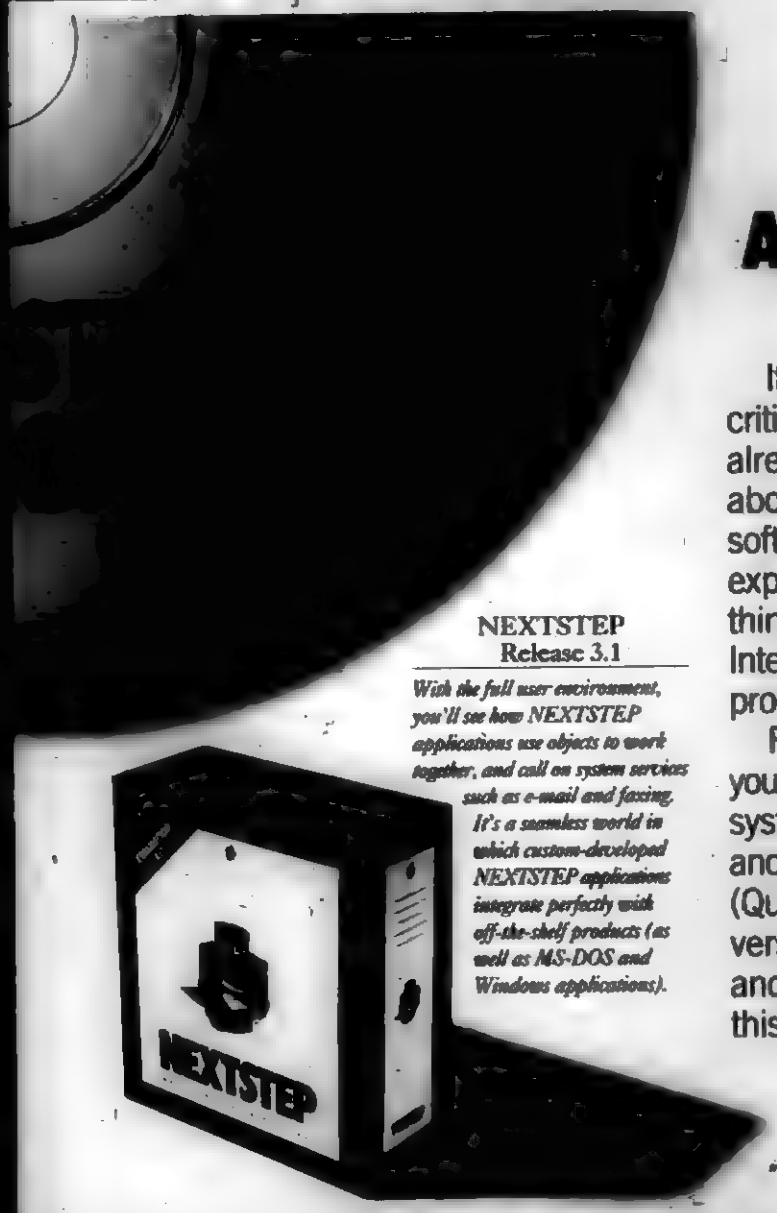
AUG. 29-SEPT. 4

Fed Micro '93 CD-ROM and Multimedia Conference and Exposition. Washington, D.C., Aug. 31-Sept. 2 — Contact: Tom Lauterback, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Structured Development Forum. Philadelphia, Aug. 31-Sept. 2 — Contact: Espirit Systems Consulting, Inc., West Chester, Pa. (215) 436-8220.

SEPT. 5-SEPT. 11

Comdex/Fall '93. Las Vegas, Sept. 9-11 — Contact: UNSC Investment Group, Newark, Calif. (510) 657-3416.



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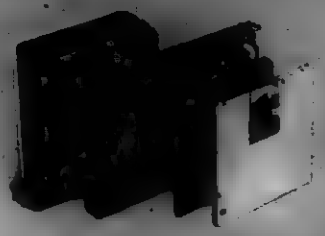

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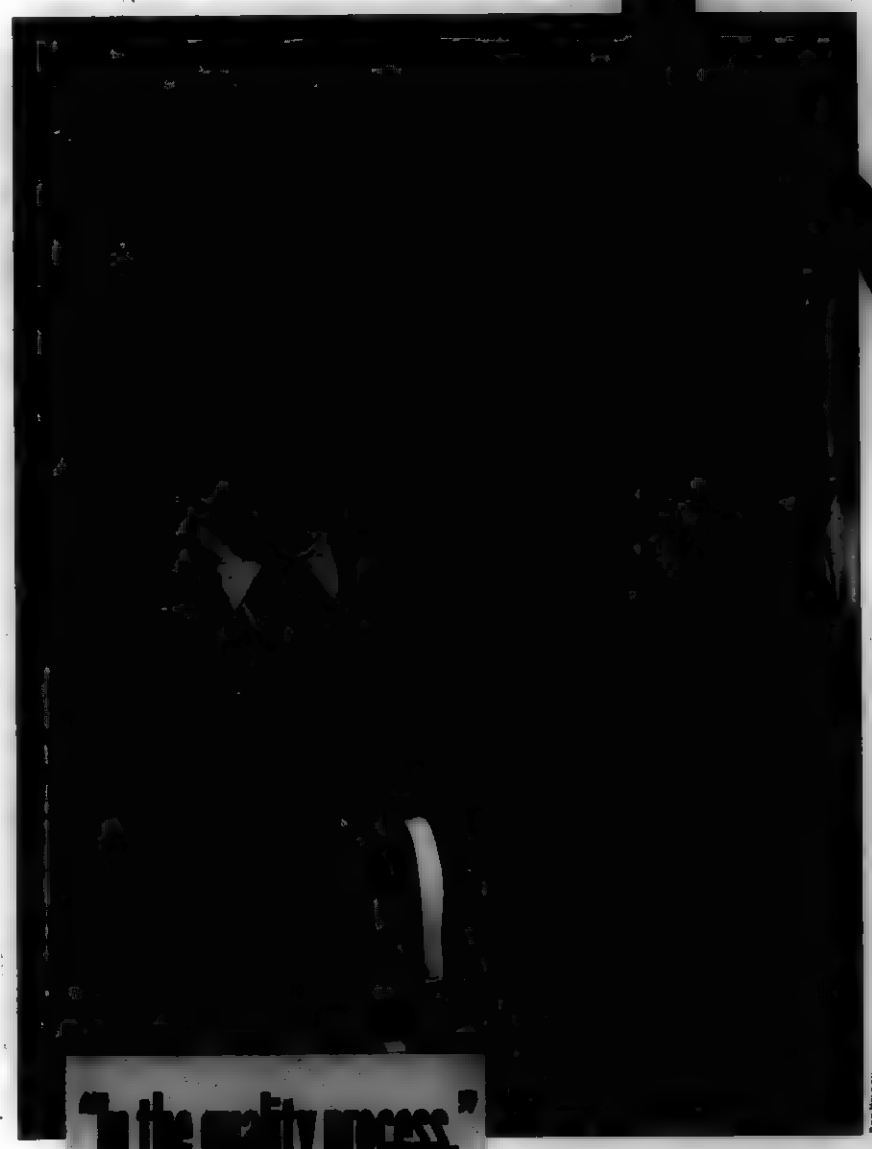
QUALITY CONSCIOUS

Is your company going after a quality prize such as Malcolm Baldrige or Class A manufacturing? IS chiefs from companies such as Ritz-Carlton and ICI Films say be prepared to overhaul systems, act as a standard-bearer or spruce up current data-gathering methods.

BY JULIA KING



Ross Nelson

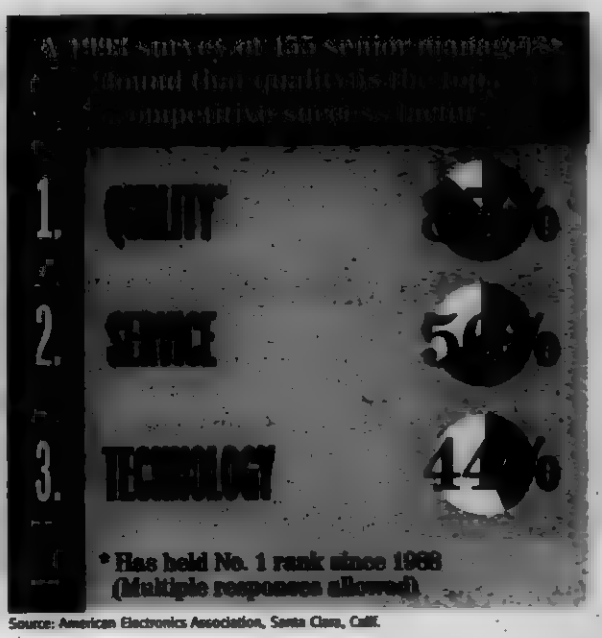
"In the quality process," Bruce Speckhals says, "IS is a facilitator."

He should know. First as controller, then as vice president of information systems at Ritz-Carlton Co., Speckhals and the IS group were integral to the Ritz's becoming only the second service company ever (Federal Express Corp. was the first) to win the prestigious Malcolm Baldrige National Quality Award. It did so in 1992.

The technology that put it over the top is a unique guest-recognition system that places guest preference information on-line for all employees. The system depends on information feeds about guests gathered from all Ritz employees and inputted into networked PCs. Because all employees have access to guests' likes and dislikes, the thinking goes, the hotel has been able to offer customers great service (see story page 91).

But, Speckhals and other IS chiefs involved in quality efforts say, hard-

Quality conscious, *page 90*



Source: American Electronics Association, Santa Clara, Calif.

Quality conscious

CONTINUED FROM PAGE 89

ware and software alone aren't likely to cure a company's quality problems. Just as important is IS' skill to gather and feed back data throughout the quality process. This information can be used to measure a company's progress against recognized quality standards such as the Baldrige criteria.

As the move to quality certification explodes — a 1993 American Electronics Association (AEA) survey of 455 top executives revealed that 92% of their companies are currently using either Baldrige or the ISO 9000 criteria for quality assessment — the spotlight will turn increasingly on IS. Exactly what kind and how much of an effort IS departments have to make to help their companies meet quality standards differs at each company, from ripping out old systems to overseeing data gathering (see box at right). But most companies agree on one thing: IS plays a pivotal part in helping them pass quality muster.

An AEA survey of 455 executives found that so... visit other companies to help identify superior quality practices.

Integration issues

At Wilmington, Del.-based Du Pont Merck Pharmaceutical Co., a $900 million drug manufacturer, IS' main challenges in its quest for quality were to create software-based interfaces between in-place corporate systems and manufacturing resource planning (MRP) II software. It also had to train employees how to use the integrated system in accordance with MRP II techniques and procedures.

The company was shooting for the Class A quality designation, which goes to manufacturing companies that use MRP II to boost quality and productivity and cut costs.

To be certified Class A, manufacturers must, among other things, reduce inventories by 30% or more, improve customer service by 15%, show an overall productivity gain of at least 15% and reduce costs by a minimum of 20%.

"We took the approach not to spend money on new hardware and software, but to put our money and effort into user training, system interfaces and operations support," says Wayne Lerner, director of business resource planning at the company. Du Pont Merck today is a Class A company.

Meanwhile, at Ritz-Carlton, which neither owns nor operates any hardware or software, IS acts as a manager in the quality process, coordinating the work of third-party providers that custom-develop and operate all of the hotel company's applications.

"My major responsibility is developing and overseeing guidelines and making sure all of our hotels follow certain standards," Speckhals explains.

At the other end of the spectrum are companies such as ICI Films, Inc., a $1 billion manufacturer of film for the laminate and packaging industries, whose IS department put in a completely new MRP II software system to facilitate the company's transition to a Class A manufacturing operation.

Documenting achievements such as reduced inventories and costs, improved customer service and productivity gains is clearly a data-intensive process, notes David Hamilton, IS manager on ICI's Class A project. This, he says, may be why some managers at the company kept handing off quality issues to IS, expecting Hamilton's IS team to play the leading role rather than a supporting one in the arduous Class A certification process.

"It was attractive to many people on the business side to punt to IS, have us fix all their problems with systems and just make their problems go away," Hamilton says. "But this doesn't work with MRP II or Class A because what Class A measures is how well all business processes work together."

Ultimately, representatives from manufacturing, finance and customer service joined Hamilton on a cross-functional team charged with framing what Hamilton describes as "a high-level blueprint" of how various ICI departments and facilities needed to work together to meet Class A quality criteria.

"We walked through the business processes step by step and would either change, adjust or blow up as we went," he says.

In order for ICI's polymer plant in Fayetteville, N.C. — certified Class A in February — and its Hopewell, Va.-based film plant to exchange data more efficiently, Hamilton's IS team installed new MRP II software from Cincom Systems, Inc.

The IS team, which fluctuated in size from 16 to 38 members, also developed custom software interfaces between the Cincom system and other in-place inventory control systems.

In addition, IS was responsible for training more than 1,000 employees on how to use the system, an undertaking Hamilton describes as "a monstrous coordination effort."

IS' role in the quality project did not go unnoticed on the business side. "The MRP II system has been a very information technology-intensive project," says J. C. Rubiano, an ICI business planning process manager. "It allowed us to better learn how to change our processes and procedures."

PARTIAL SYSTEMS OVERHAUL. Update interfaces and provide operations support and other tweaks to ensure that systems feed back proper information and support quality efforts.

FULL SYSTEMS OVERHAUL. Replace old systems with new for tracking and gathering data for better reporting.

TRAINING. Make sure everyone uses systems correctly as poor use doesn't translate into poor information.

OVERSIGHT. Set new standards for system use and ensure that everyone knows what quality goals the company is trying to achieve.

Unlike separate PC-based systems previously in place at the two plants, the multisite, mainframe-based Cincom system enables the facilities to exchange material requirements and production data, which is entered into the system by virtually all workers.

"We can plug into what the Hopewell plant needs, then plan more accurately what we need to do in Fayetteville," Rubiano notes.

"Thanks to that kind of visibility, our baseline of 24 million pounds of inventory has dropped to 12 million pounds," he says.

Hard times ahead

Dee Emsley-Miller, project leader of pharmaceutical support systems at Du Pont Merck, confirms that implementing an MRP II software system — and using it properly to meet quality goals — is indeed an information technology-intensive process.

That's why she advises other IS support people just starting out to "prepare not to take any time off or vacations."

For Emsley-Miller, the main IS challenge was creating software interfaces between custom corporate applications running on a Hewlett-Packard Co. HP 3000 computer in Wilmington and Dun & Bradstreet Software AMAPS MRP II package, which was running on another HP 3000 at a plant in Puerto Rico.

Additionally, Emsley-Miller needed to set up communications links with a third facility in Garden City, N.Y., which needed to exchange information with both the Puerto Rico and Wilmington sites.

"Our whole focus was to take what we already had and make it work," she says.

As it turned out, "all of the software worked well on its own," Emsley-Miller says, "but we continue to run into problems constantly in getting things to talk to each other."

FYI BOX

Where to go for quality certification information

Malcolm Baldrige National Quality Award
The National Institute of Standards and Technology
Office of Quality Programs
(301) 975-2036
Provides award criteria information

Office of Quality Programs
(301) 975-2036
Has listing of awards given by state government

American Electronics Association
(408) 987-4200
Publishes "The Road Map to Total Quality Commitment"

ISO 9000
The National Institute of Standards and Technology
(301) 975-4031
Publishes "Questions and Answers on Quality, the ISO 9000 Standard Series, Quality System Registration and Related Issues"

Class A certification
(Decides expansive and quality use of MRP II)
Gray Research
(806) 776-9211

R. D. Garwood, Inc.
(800) 241-6353
Provides information on certification

Software Quality Committee
American Software Association
(703) 522-5055
Publishes guides for ISO compliance

American Society for Quality Control
Registrar Accreditation Board
(414) 272-8575

Individual state quality awards
The National Institute of Standards and Technology

AEA ISO 9000 Resource List
American Electronics Association
(408) 987-4200

YES, SIR, AT YOUR SERVICE!

Ten people are tapping their feet in the morning checkout line at the Ritz-Carlton Hotel. All 10 have either a plane to catch or an appointment to keep, and they are getting more irritable by the minute.

The frazzled front desk clerk telephones hotel controller Bruce Speckhals, who is meeting with other Ritz-Carlton executives in an upstairs conference room. Within minutes, Speckhals and the other executives are in the lobby, pouring hot coffee and freshly squeezed orange juice in an effort to appease angry guests waiting in line.

But the next week, and sometimes as soon as the next day, the same scene would repeat itself.

Looking back on those mornings of several years ago, Speckhals, now vice president of IS at the Atlanta-based luxury hotel company, recalls how "we were always attacking the wrong thing." Without adequate information, including data on reservations and preferred checkout times, hotel managers and staff worked from crisis to crisis, without ever getting to the root of the problems, he says.

Today, thanks to Reserve, a companywide custom on-line reservation system furnished through Covia, United Airline's global communications network, Ritz management knows beforehand when a guest will arrive and check out, and they can plan front desk staffing and other services accordingly.

Moreover, if a guest has been to any one of the 28 Ritz-Carlton hotels at least once before, the staff also knows things like whether he or she prefers chardonnay or champagne, and how to press a business suit to the guest's liking.

This kind of information about customers' preferences is collected by bellmen, desk clerks, waiters and other staffers. "They write down things they overhear in elevators or comments dropped at checkout time," says Candace Zimmerman, corporate director of reservations. The hotel also conducts surveys. Data-entry clerks enter all this information on guest preferences into hotel-based PCs, which are linked over the Covia network.

Ritz-Carlton IS chief Bruce Speckhals: 'We were always attacking the wrong thing.'

Like reservation data, information in the "guest recognition system," a custom application developed for the hotel by Covia, is available to all hotel personnel.

"The idea is that if a guest wants *The Pittsburgh Press* in his room wherever he goes, or if he wants rocks in his pillow, the next time he stays with us, he won't have to express that desire," Speckhals says.

"What we're trying to do is create a mystique that suggests to guests that they will never have to ask for anything," Zimmerman says.

This is one reason why, after almost two years of work on the project, Du Pont Merck has decided to pull the AMAPS system, custom interfaces and existing business applications, replacing them with System Software Associates' Business Planning Control System software.

"It's progress, I guess," Emsley-Miller says of the pharmaceutical company's decision.

But as Lerner sees it, the IS department's work on the AMAPS system has not been a wasted effort.

"Had IS not implemented MRP II systems using AMAPS, moving to the SSA system would have been a total shock," he says. "As it is, it will now just be a transition."

Also, Lerner notes that thanks in part to IS' implementation of the MRP II software — as imperfect as it was — Du Pont Merck has "reduced inventories substantially, eliminated warehouse space and eliminated back orders that were due to process problems."

Proper information

Investing in the wrong information system was the very thing Granite Rock Co. wanted to avoid in 1986 when it started tracking customer preferences as a means to improving quality. The quality standard it chose was the Baldrige Award, which it won six years later in 1992.

"When you first make the decision to focus on quality, you really don't know what information you need to do that. And because you don't know, you have the potential to drive IS people nuts if you start in on a system," says Bruce Woolpert, president and chief executive officer of the Watsonville, Calif., building materials supplier.

That's why seven years ago Granite Rock decided to equip its employees with PCs to collect data on customers and their preferences of spreadsheet programs.

"The PCs gave us the flexibility to start tracking information right away," Woolpert explains. It also freed up Granite Rock's IS staff to work on GraniteXpress, the company's automated teller machine-like system for loading building materials onto trucks.

Using GraniteXpress, a truck driver inserts the equivalent of a credit card into a terminal, keys in the type and amount of material he wants, then proceeds to the loading facility where the truck is filled over an electronic scale.

The service, which operates 24 hours a day, has reduced the time a trucker spends at the quarry to nine minutes. Before GraniteXpress, it took 24 minutes.

According to IS manager Chuck Mason, the programmer/analyst dedicated to the GraniteXpress project "lived at the quarry location day and night." Her job, he says, was not to write custom code — a task that was done by an outside engineering firm — but to understand exactly how the whole system worked. This way, the company's seven-person IS department could support the system once it was completed.

GraniteXpress is just one of several information technology-intensive projects that helped Granite Rock win the Baldrige Award, according to Woolpert. During the past few years, the company also has invested substantially in computer-controlled processing equipment. Given its widespread use of statistical process control, Granite Rock can assure customers that its products exceed specifications, he notes. Its concrete products, for example, consistently exceed the industry performance specification by a factor of 100.

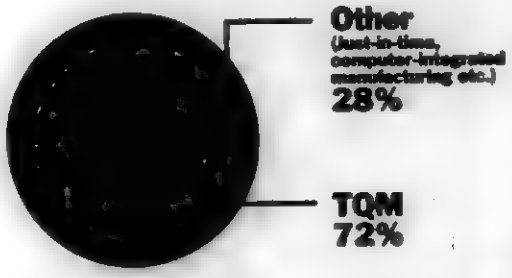
Mason says IS' primary role throughout the quality process has been gathering data from these various processors and delivering it back to the rest of the organization. For IS at Granite Rock, the true value of the Baldrige is as a yardstick.

"I don't look at the Baldrige as a win but as a measure I can use to see where our company stands against the rest of the world," Woolpert says. ■

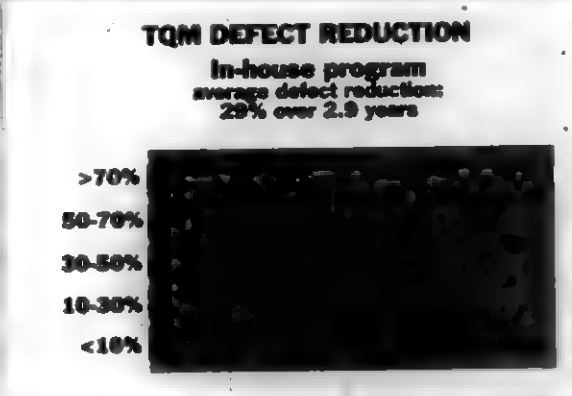
King is a free-lance writer based in Ridley Park, Pa.

Point of low return?

While companies pick Total Quality Management (TQM) as their top quality program . . .



. . . most are seeing only moderate improvements in terms of defect reductions



Base: 405 senior business managers

Source: American Electronics Association, Santa Clara, Calif.

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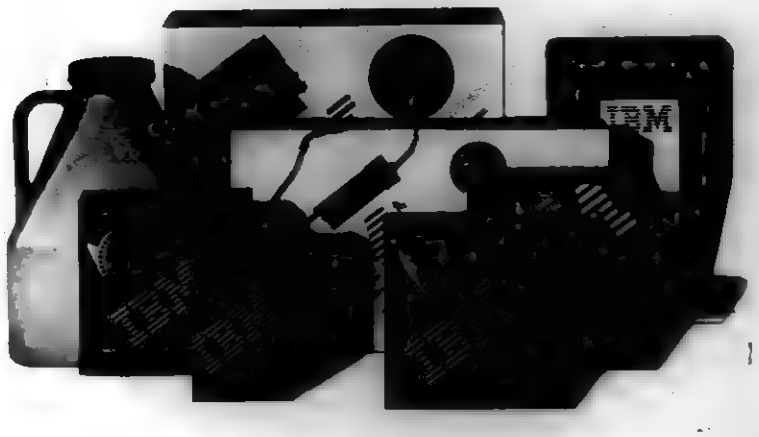

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Network operating systems: A must for most

By Leslie Goff

IT'S NO LONGER A good time to pick up local-area network operating system skills — it's a critical time. Learning a LAN operating system may not garner you an immediate raise or promotion, but experts say a thorough understanding of how data and applications flow over a network and how to manage a LAN operating system environment is essential for long-term career survival.

"Everyone in IS must become LAN-literate," says Larry DeBoever at DeBoever Architectures, a network consulting firm in Acton, Mass. Information systems professionals should be able to handle tasks ranging from the control of user access and authorization to server tuning and configuration and a variety of tasks in between. "It will just be expected," DeBoever adds. "We don't pay mechanics more to work on new cars, but they learn how because if they don't, they'll find themselves on the street."

Opportunity exists for individuals with working knowledge of one or more LAN operating systems at almost any large company, but telecommunications, health care and public utilities are emerging as hotbeds of development activity, requiring expertise in programming distributed applications and network management. Companies in these industries — all of which are facing major changes from deregulation to managed health care — are struggling to keep costs down and service up.

Opportunities galore

Cheryl Hetrick Ball, a senior industry analyst in client/server applications service at the Business Research Group in Newton, Mass., says she believes this opens up IS job opportunities both in and out of the "glass house." As IS decentralizes, departmental business analysts will need a LAN operating system background for applications programming, and the centralized IS organization will provide LAN management expertise.

Titles and responsibilities for individuals with LAN applications programming and management skills are evolving and have more to do with how a company is organized and the background of the staff member than with status or prestige.

"The people doing the hiring are struggling with the titles themselves," DeBoever says. "'LAN administrator' can be someone with rudimentary LAN skills, like adding and deleting users. It can also mean superweenie technojock. Don't focus on job titles. Look for anything that suggests systems integration or networking."

At this point, companies are moving so rapidly toward distributed computing that anyone with some LAN programming or systems management experience can profit from learning one or more LAN operating systems. Novell, Inc.'s NetWare leads the market with an estimated 65% to 70% share, followed by Microsoft Corp.'s LAN Manager, IBM's OS/2 LAN Server and Banyan Systems, Inc.'s Vines. Demand is greatest for NetWare experience, but don't let that deter you, says Kathy Anderson, manager of network systems development at Sprint Corp. in Kansas City, Mo. "Most people can cross from one environment to another," she says.

Hot pursuit

In fact, since Novell released NetWare 4.0, which employs global naming services, IS departments have been actively seeking candidates with Vines experience, notes Matt Cain, workgroup computing strategies program director at Meta Group, Inc., a consultancy in Westport, Conn.

Global naming services, incorporated into Vines from its beginning, enable users to transparently access data and applications anywhere on a wide-area network just by logging on to a LAN. Writing a comprehensive global naming scheme requires programmers and network managers to understand the hierarchical model of the organization, Cain notes.

IS staff members cannot slide by on LAN operating system experience alone, however. Phillip R. Pecora, a senior network engineer at Busch Entertainment Corp. in St. Louis, stresses that a repertoire should also include connectivity experience, familiarity with other operating systems and a knowledge of database management systems.

Goff is a free-lance writer in New York.

Career booster

Learning a LAN operating system may not increase your pay right away, but it will keep your career humming.

Acquiring such skills will position you to jump to another company, which observers agree is the best way these days to improve your status.

Titles that require these skills vary from Certified Network Engineer to LAN administrator, with responsibilities such as overseeing and managing LANs and WANs and developing distributed database applications and end-user support.

Depending on experience and salary history, salaries range from $35,000 for entry-level programmers to $60,000 for network managers and project leaders, according to IS professionals and help-wanted ads.

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Easing into client/server

By David A. Kelly

HOW DID KEVIN Fleischood, systems engineer at Sabre Technology Group, a unit of AMR Corp., go from programming in IMS PL/1 to developing client/server applications? He did it gradually. First he learned how to use PCs on his own at home, and then he took classes in C language and Unix. Finally he polished those skills as part of a team developing a client/server replacement for Sabre's Integrated Capacity Planning System (ICAPS).

AMR's Kevin Fleischood *took advantage of company-sponsored training*

Fleischood spent 15 years programming mainframes, working primarily in MVS using CICS Cobol to develop financial, accounting and payroll applications. He joined AMR in 1984, and four years ago he was named project manager for ICAPS, which replaced Sabre's 15-year-old IMS PL/1 ISPF/Dialog Manager airline-scheduling application that was falling apart.

ICAPS is a Unix-based system written in C and Oracle Corp.'s Oracle 6.31 under the Open Software Foundation's Motif graphical user interface (GUI). It uses RISC-OS from Mips Computer Systems, Inc. and runs on 70 million instructions per second workstations.

Fleischood purchased a PC and got familiar with it at home. He learned Windows and Boriand International, Inc.'s C++ and made sure he knew the intricacies of DOS. He read through the manuals, went through the programming examples and experimented by altering them slightly and testing. According to Fleischood, it took six months of technical reading and experimentation on his PC before he felt really comfortable with the PC environment.

Making contacts

Fleischood then took advantage of company-sponsored training. "We went through four different week-long classes, Beginning C and Unix, and then Intermediate C and Unix." Because he was unable to find a satisfactory Motif (an X Window System tool GUI) training course, Fleischood and his team members were forced to learn Motif from books and by going to shows and making contacts. "We had to learn a lot on our own," he says.

Fleischood found that not only was the environment different, so was the programming. "Programming C is quite different from mainframe PL/1 programming. In C you have to be concerned about such things as memory management and GUI issues. For example, in the IMS and CICS character world, you have only one state to a screen, while in Windows you have multiple processes talking to each other, and you have to keep track of many different states."

Fleischood says he feels the biggest challenge in converting is learning how to program in the Windows environment. "At first your C programs will be inefficient," Fleischood says, "C is much more complex than older languages." Another large challenge was learning how to properly and efficiently use remote procedure calls and the network file system.

Fleischood says he is comfortable with his conversion to client/server and says others can make the change.

"When you're starting out, get a PC and try out some current products. Team up with someone who knows the client/server area. Knowledge transfer is key."

Kelly is a client/server and systems integration consultant in West Newton, Mass.

Lessons learned

We enrolled a few information systems experts to examine Kevin Fleischood's transition from mainframe to PC programmer and add their own suggestions for others facing a similar requirement.

▶ Lee Ann Hunstein, senior analyst at Joseph McCall & Co. in Atlanta: "I would recommend the way he did it. Get in on a project where the company is converting from a mainframe platform that you know to a client/server platform.

Another approach to take is to get in on a smaller, less critical project, instead of a mission-critical application.

"Or he could have joined a consultancy that does both mainframe and client/server consulting. He might have had to spend some time on just mainframe consulting to prove himself, but tonight have knowledge in client/server."

▶ Steve Sharp, manager of technical support at Sharp Electronics Corp. in Chicago: "You may try to make the transition a little more slowly by developing your applications at a time. If you have that luxury."

▶ Robert Wiener, IS supervisor at Aquarium Co. in Lewisburg, Mo.: "Try to exploit the knowledge of previous users by attending user groups. You might be able to find someone you can use as a mentor.

"If you're getting into Unix, you might be able to tap into the broad Unix culture by using the Internet.

"You might also be able to find a PC-based training package, such as one for Unix system administration, to get familiar with some pieces of the client/server world."

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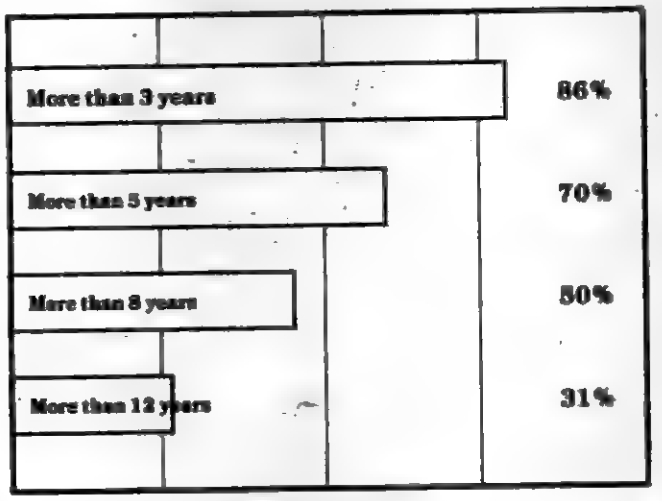

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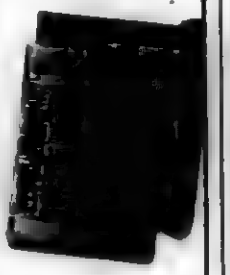

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SYSTEMS ANALYST (REF. #26983) to analyze, design, develop & implement comp s/ware for clients' EDP systems; incl: design & develop business info Directory; incl. study & analyze functional req; design & develop on-line & batch process; testing; installation & user training, & providing tech support for overall design for apps using IBM 3090, MVS/ESA, DB2, SQL, QMF, C/370, SCLM, ISPF/PDF, INSPECT, REXX, JCL & TSO. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. of exp. in related occp in lieu of req. education & exp. REL EXP: s/ ware development, & use of IBM 3090 under MVS environt; ISPF/PDF, DB2, QMF, JCL & SQL. Pay is $34,000/yr. 40 hr/wk.

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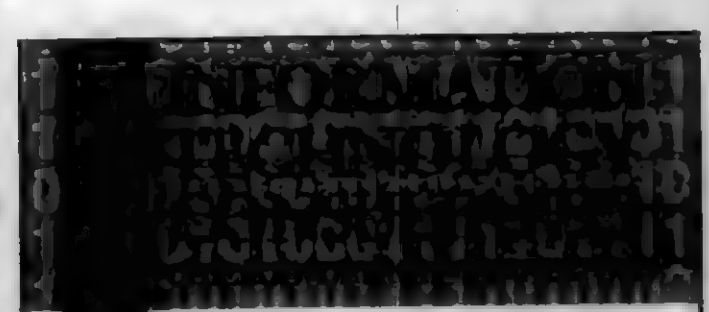
Please send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202 & indicate Ref #. Employer Paid Ad.



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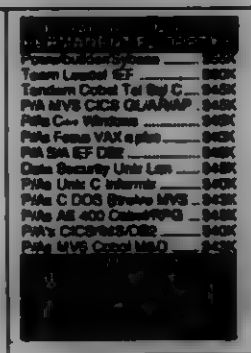

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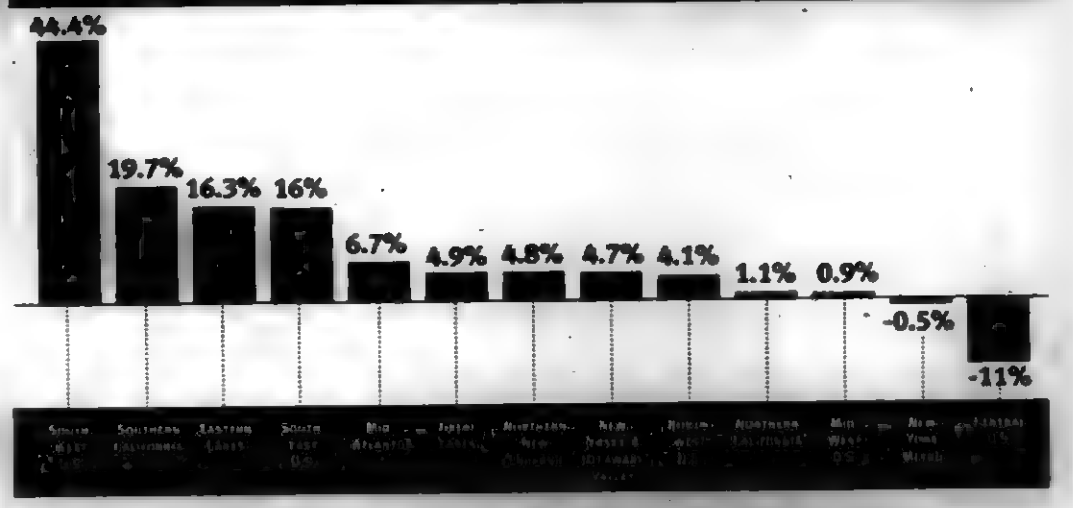


CorpTech, a directory publisher based in Woburn, Mass., tracks America's 35,000 technology manufacturers. This survey relates to the 24,585 tracked firms with less than 1,000 employees.

Hot data? Hot site

By Sheryl Kay

WHAT BEGAN IN 1979 as a relatively elitist solution to disaster recovery — the hot site, an operationally ready, alternate computing facility — has now become the most commonly called-for plan among the majority of technology-dependent companies.

This is due, in part, to new competitors entering a maturing vendor market, says Jeff Marinstein, president of Contingency Planning Research in Jericho, N.Y. Subsequently, the cost of such services has become far more affordable.

Ten years ago, the average monthly cost for a mainframe hot site contract ranged from $15,000 to $20,000. Today, similar services may only cost $3,000 to $4,000 per month. Some sites do exceed $100,000 for monthly contracts, Marinstein says, but these are very rare and often involve dedicated hot sites.

The decision to retain a hot site is not hardware- or software-specific; rather it is based on business economics. "When all other options expose your business to unacceptable levels of risk, including lost opportunity costs," Marinstein observes, "hot sites are appropriate."

To evaluate recovery options, experts suggest conducting a business-impact analysis to determine when the loss of each application would become critical. This study, says David Denmark, senior technical analyst at GTE Data Services in Temple Terrace, Fla., is essential to determining how much backup is required.

The analysis, which can be done in-house or by outside specialists, looks at business functions and the user community. A good way to start, says Ray Small, program director at Gartner Group, Inc. in Stamford, Conn., is by asking each user how their job would be affected if they could not do a certain task on a specific system, such as the number of phone calls they would miss or the revenue lost.

Some companies, such as GAB Business Services, Inc. in Parsippany, N.J., have determined that contracting for the minimum configuration required is most cost-effective.

"If we find we need more resources into a disaster," explains John Nones, director of operations, "they are available to us, all, of course, at a charge."

Mainly mainframes

If your company depends mostly on mainframes, you're in good shape. According to a Gartner Group survey of 240 Fortune 500 companies, 95% have a recovery plan in place for mainframe computing; only 29% have one for voice networks and 27% for PCs. In fact, few hot sites are actually geared for local-area networks and PCs.

For example, Judith Spencer, manager of quality assurance and disaster recovery coordinator at the Board of Trading Clearing Corp. in Chicago, spent two weeks at her company's hot site during the recent Chicago floods. Due to the firm's preparation and its vendor's flexibility, its systems were up in six hours. However, weaknesses in the PC contingency plan were exposed. Fortunately, the company's key systems are not PC-driven, but its PC recovery plan is currently being upgraded.

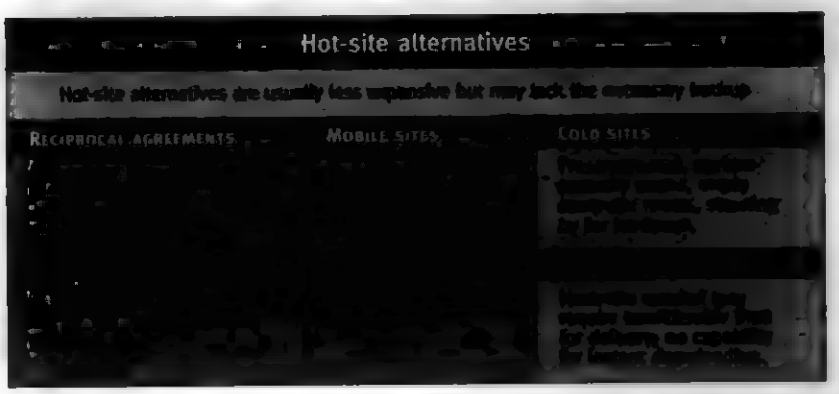
When you've narrowed down the selection, a vendor's client base should be made available, particularly if the clients are in the same geographic region. "The good news is that you share the expenses of maintaining a ready facility with several other companies," Denmark says. "The bad news is that if several of them have been hit by the same disaster, you will all be competing for a limited amount of locally available hot site space."

Typically, vendors assign space on a first-come, first-served basis. When space at one site is gone, ideally, users are assigned hot sites at backup locations, both regionally and nationally.

Kay is a free-lance writer based in Tampa, Fla.

Negotiate the contract

- Hot site contracts are almost always long-term — about five years — so be sure you know what you want. Vendors may attempt to affix heavy financial penalties for early cancellation.
- Pay attention to the terms regarding price increases, upgrades, fees, renewal and termination clauses and self-perpetuating contracts; they can be automatically renewed without at least six months prior notice from the user or can be renewed at the date of technical changes for the original contract length.
- Contracts should stipulate how many tests are allowed per year (at least two is recommended), as well as testing procedures and the plan for alternate sites.



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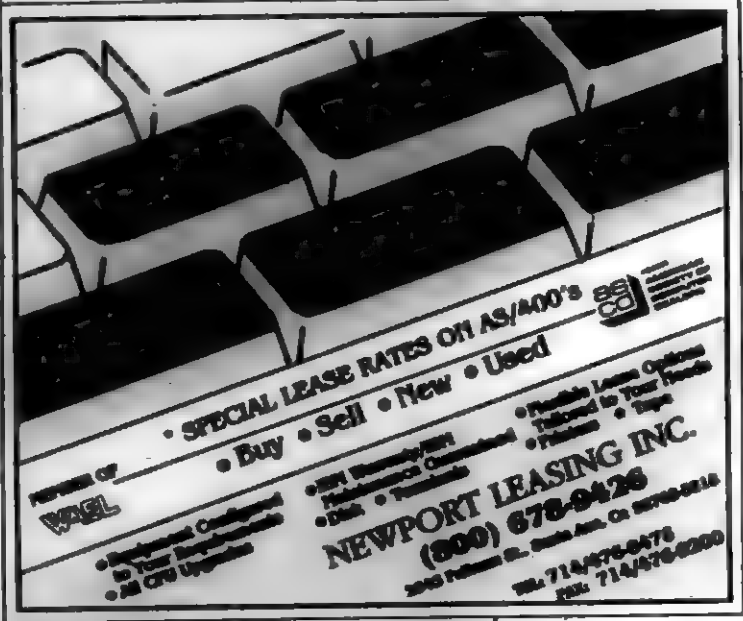

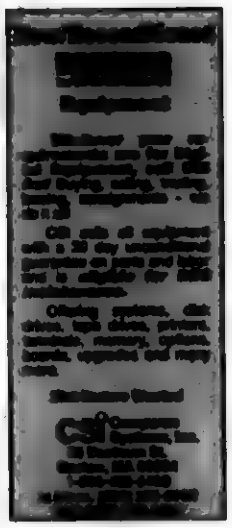

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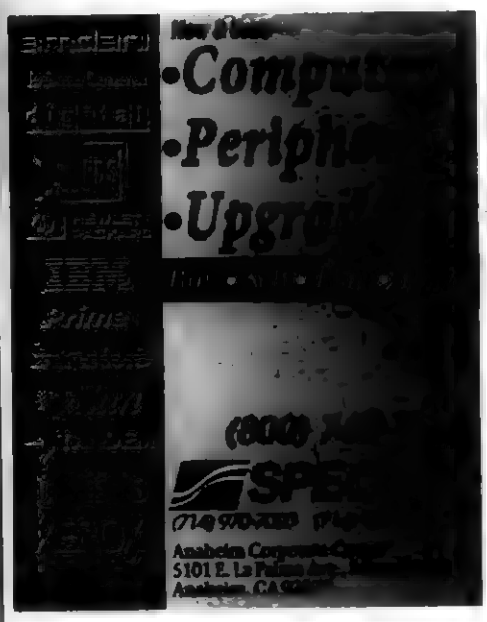

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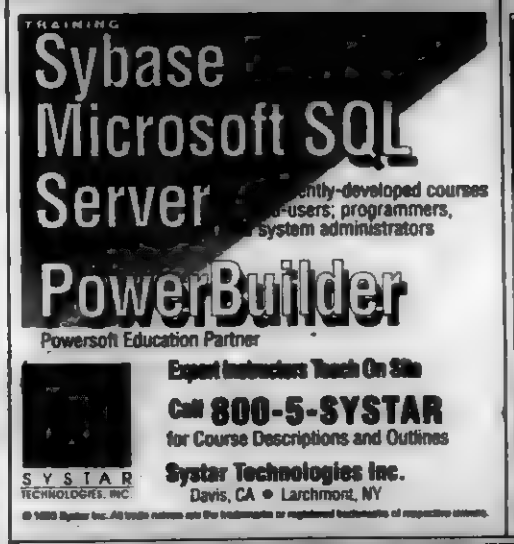

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Gainers

Percent

[illegible]	15.5
[illegible]	10.3
[illegible]	27.5
[illegible]	19.6
[illegible]	17.6
[illegible]	17.5
[illegible]	14.7
[illegible]	14.7

Legent Corp. (L)	-47.2
Meridian Inc. (H)	-34.7
MathSoft	-31.4
Apple Computer Inc. (L)	-25.7
Symbase Technology	-24.4
Pictureтel Corp.	-20.4
Informix Corp.	-18.6
Walker Interactive Systems	-17.2

Dollar

[illegible]	4.25
[illegible]	4.13
[illegible]	3.13
[illegible]	3.88
[illegible]	3.88
[illegible]	2.88
[illegible]	3.75
[illegible]	2.75

Legent Corp. (L)	-14.50
Apple Computer Inc. (L)	-9.88
Symbase Technology	-9.50
Cabletron Systems (H)	-7.00
Synoptics Communications	-6.25
Adaptec Systems Inc.	-5.25
Pictureтel Corp.	-5.00
Autodesk Corp.	-4.88

[illegible]

EDA opportunities

The electronic design automation (EDA) software field periodically undergoes quantum technology leaps that can leave the stocks of once-prosperous vendors straggling behind. Meanwhile, the shares of smaller companies with cutting-edge EDA products can rocket up.

Such a shift — from circuit-level computer-aided design to gate-level engineering in the early 1980s — displaced market leaders Calma, Applicon and Computervision. In their stead, Cadence Design Systems, Inc. (CDN) and Mentor Graphics Corp. (MENT) rose to prominence, according to Peter Schleider at Wessels, Arnold & Henderson.

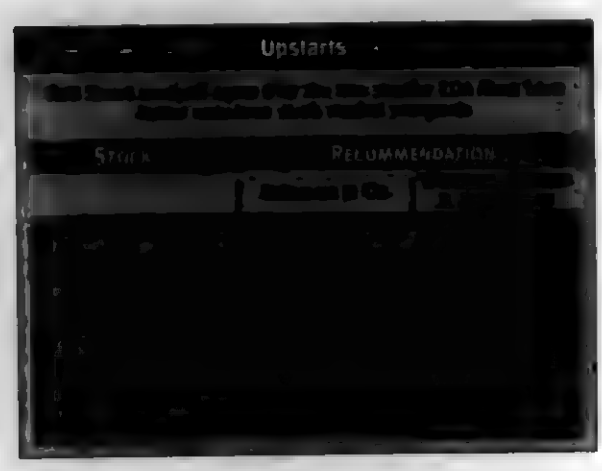
Now the move to a still more sophisticated level of design, third-generation EDA software, threatens to bump Cadence and Mentor Graphics in favor of newer, nimbler firms: Synopsys, Inc. (SNPS) and ViewLogic Systems, Inc. (VIEW).

As recently as 1991, Synopsys was only a tenth the size of Cadence and Mentor Graphics. However, analysts said they expect Synopsys to become the dominant EDA software supplier during the next several years.

ViewLogic features a refreshed product line, and the company has positioned itself well in growth markets with recent acquisitions, according to Needham & Co. analyst Raj Rajaratnam. The stock values of ViewLogic and Synopsys should continue their recent climbs, analysts said.

Cadence and Mentor Graphics both suffered revenue declines in 1992. Analysts agreed that the companies have a chance to revive their flagging fortunes but must introduce strong top-down design tools to do so. Schleider and Rajaratnam each recommended holding those two stocks until concrete evidence of a turnaround emerges.

—Derek Slater



Exch	52-Week High	52-Week Low		July 16 3 PM	Wk Net Change	Wk Pct Change
[illegible]						
OTC	40.00	9.88	3 COM Corp.	22.50	-3.13	-12.2
NYS	81.00	63.38	American Info Techs Corp.	78.38	0.38	0.5
NYS	63.88	40.63	AT&T	63.25	1.38	2.2
OTC	4.06	0.75	Arvel Communication Corp.	2.94	0.06	2.2
OTC	24.50	10.25	Banyan Systems Inc.	18.00	0.50	2.9
NYS	59.50	44.50	Bell Atlantic Corp.	57.25	-1.25	-2.1
NYS	57.50	46.75	BellSouth Corp.	56.00	0.75	1.4
NYS	8.50	3.63	Bolt, Beranek & Newman	7.88	0.25	3.3
OTC	18.50	9.50	Brooktrout Technology	13.13	0.88	7.1
NYS	109.00	50.63	Cabletron Systems (H)	99.00	-7.00	-6.6
OTC	23.00	5.00	Centigram Communications (H)	22.38	1.13	5.3
OTC	50.50	19.00	Chipcom Corp. (H)	43.75	0.25	0.6
OTC	57.25	22.13	Cisco Systems Inc.	49.75	-4.75	-8.7
OTC	16.38	5.50	Compression Labs Inc.	12.38	-0.50	-3.9
OTC	36.00	13.00	CrossComm	31.25	-2.50	-7.4
OTC	4.63	1.38	Data Switch Corp.	2.88	0.00	0.0
NYS	19.88	12.38	Digital Comm. Assoc.	14.00	0.38	2.8
OTC	12.75	4.00	Digital Systems Int'l Inc.	4.75	-0.63	-11.6
OTC	53.38	5.00	DSC Communications (H)	50.75	0.13	0.2
OTC	9.50	5.00	Fibronic Int'l Inc.	5.75	-0.25	-4.2
OTC	24.00	8.75	Fibronics Int'l Inc.	12.50	-0.75	-5.7
OTC	4.38	1.50	Gandalf Technologies Inc.	2.88	-0.13	-4.2
OTC	2.06	0.88	Gateway Communications	1.06	0.00	0.0
NYS	15.75	2.88	General Datacomm Inds.	8.75	-1.00	-10.3
ASE	3.75	2.00	Go Video	2.56	-0.06	-2.4
NYS	37.75	32.38	GTE Corp.	37.00	0.50	1.4
NYS	87.75	62.75	ITT Corp. (H)	87.75	2.63	3.1
OTC	57.88	28.13	MCI Communications Corp. (H)	28.13	0.25	0.9
OTC	6.50	2.00	Microcom Inc.	2.00	-1.06	-34.7
OTC	24.25	4.75	Netrix Corp.	5.00	0.00	0.0
OTC	19.00	7.50	Network Computing Devices (L)	7.50	-1.00	-11.8
NYS	15.00	5.38	Network Equipment Tech.	8.38	1.38	19.6
OTC	20.13	8.00	Network General	11.38	0.00	0.0
OTC	15.75	8.13	Network Systems Corp.	8.63	-0.88	-9.2
OTC	50.88	7.50	Newbridge Networks Corp. (H)	48.00	-0.25	-0.5
NYS	46.00	25.50	Northern Telecom Ltd.	25.50	-0.88	-3.3
OTC	35.25	22.50	Novell Inc.	23.25	-2.50	-9.7
NYS	92.50	79.00	Nynex Corp.	91.50	0.00	0.0
OTC	30.00	14.50	Octel Communications Corp.	22.63	-0.50	-2.2
OTC	6.13	3.38	Perrll Data Comm Networks	3.88	-0.25	-6.1
OTC	30.50	10.25	Picturetel Corp.	19.50	-5.00	-20.4
OTC	15.25	3.63	Proteon Inc. (L)	3.88	-0.75	-16.2
NYS	35.00	16.09	Scientific Atlanta Inc.	31.00	1.50	5.1
NYS	40.75	31.75	Southwestern Bell Corp.	40.13	0.88	2.3
NYS	35.38	21.63	Sprint Corp.	33.75	-0.25	-0.7
OTC	27.00	11.00	Standard Microsystems Corp	15.38	-0.63	-3.9
OTC	18.50	6.88	Stratacom Inc.	13.00	-0.13	-1.0
OTC	42.75	10.69	Synoptics Communications	32.00	-6.25	-16.3
OTC	7.00	3.06	Telebit Corp.	3.06	-0.44	-12.5
OTC	9.38	2.13	Telematics Int'l Inc.	7.75	-0.13	-1.6
OTC	25.50	14.00	US Robotics	23.13	-0.38	-1.6
NYS	47.75	35.25	U S West Inc.	46.00	-0.88	-1.9
OTC	55.50	15.38	Wellfleet Communications	48.25	-3.75	-7.2
OTC	16.75	7.25	Xircom	15.75	-0.50	-3.1
[illegible]						
OTC	5.56	2.50	Advanced Logic Research	3.50	-0.38	-9.7
OTC	66.25	27.50	Apple Computer Inc. (L)	27.50	-9.50	-25.7
OTC	24.25	11.25	AST Research Inc.	13.75	-1.25	-8.3
NYS	10.25	2.50	Commodore Int'l	3.50	-0.13	-3.4
NYS	61.75	24.50	Compaq Computer Corp.	43.50	-1.38	-3.1
OTC	49.88	13.50	Dell Computer Corp. (L)	15.88	-2.63	-14.2
NYS	89.25	50.25	Hewlett Packard Co.	76.00	-3.13	-3.9
NYS	39.25	17.63	Silicon Graphics (H)	37.88	0.63	1.7
OTC	61.00	23.38	Sun Microsystems Inc.	28.75	-1.88	-6.1
NYS	32.38	22.25	Tandy Corp.	29.00	0.00	0.0
OTC	7.00	2.75	Zeos International Ltd.	3.13	-0.13	-3.8
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ASE	17.63	4.63	Amdahl Corp.	5.00	0.13	2.6
NYS	8.75	4.25	Convex Computer	4.88	0.13	2.6
OTC	6.13	1.88	Cray Computer	2.63	-0.25	-8.7
NYS	30.88	19.00	Cray Research Inc.	27.13	0.13	0.5
NYS	13.88	7.63	Data General Corp.	9.13	0.00	0.0
NYS	49.25	30.38	Digital Equipment Corp.	39.38	-0.88	-2.2
NYS	39.25	27.25	Harris Corp.	38.25	0.00	0.0
NYS	95.50	45.63	IBM	45.63	-1.00	-2.1
OTC	22.00	5.50	Kendall Square Research	18.38	0.13	0.7
NYS	127.50	83.00	Matsushita Electronics	119.00	3.00	2.6
OTC	23.75	8.25	NetFrame	17.50	0.50	2.9
OTC	16.25	9.25	Parallan Computer	15.50	0.00	0.0
OTC	21.00	6.00	Pyramid Technology	19.50	-0.75	-3.7
OTC	24.00	11.25	Sequent Computer Sys. (L)	12.50	0.00	0.0
OTC	8.75	1.38	Sequoia Systems Inc.	1.94	-0.06	-3.1
NYS	48.38	29.50	Stratus Computer Inc.	30.50	-1.25	-3.9
NYS	16.88	9.63	Tandem Computers Inc. (L)	10.00	-0.38	-3.6
OTC	23.50	10.63	TriCord Systems	21.75	1.00	4.8
NYS	13.88	7.75	Unisys Corp.	11.50	-0.38	-3.2
[illegible]						
OTC	74.00	25.25	Adobe Systems Inc.	53.75	-5.25	-8.9
OTC	20.75	10.25	Aldus Corp.	13.75	-1.00	-6.8
OTC	14.25	5.50	American Software Inc.	7.25	-0.38	-4.9
OTC	28.13	10.00	Ask Computer Systems	10.75	-0.75	-6.5
OTC	56.75	37.00	Autodesk Inc.	44.50	-3.00	-6.3
OTC	12.00	2.50	Bachman Info. Systems	2.75	-0.44	-13.7
OTC	43.00	31.75	BGS Systems Inc.	31.75	-0.75	-2.3
OTC	84.13	38.75	BMC Software Inc.	51.50	-4.38	-7.8
OTC	28.25	17.00	Boole & Babbage	24.25	0.25	1.0
OTC	49.00	17.50	Borland Int'l, Inc.	20.50	-1.00	-4.7
OTC	5.38	3.00	CE Software	3.50	0.25	7.7
ASE	34.88	6.50	Cheyenne Software Inc. (H)	31.63	-1.00	-3.1
OTC	19.50	8.25	ChipSoft	9.00	-0.50	-5.3
OTC	9.13	5.63	Cognos Inc.	8.25	0.00	0.0
NYS	31.38	11.25	Computer Associates	28.50	-1.13	-3.8
NYS	12.38	2.75	Computervision Corp.	3.25	-0.13	-3.7
OTC	34.25	19.25	Compuware Corp.	26.50	0.50	1.9
OTC	14.75	5.75	Conshare Inc.	6.50	-0.25	-3.7
OTC	19.13	10.75	Corel Corp. (H)	17.25	-1.38	-7.4
OTC	15.25	5.00	Easel Corp.	6.13	-0.88	-12.5
OTC	25.25	12.00	4th Dimension	20.25	1.75	9.5
OTC	19.50	5.25	Frame Technology	6.75	0.25	3.8
OTC	19.00	8.38	Group I Software	10.00	1.50	17.6
OTC	35.25	14.50	Gupta (L)	21.50	2.75	14.7
OTC	9.00	4.00	Hogan Systems Inc. (H)	8.50	-0.38	-4.2
OTC	25.75	11.25	HMRS	19.00	-0.75	-3.8
OTC	38.00	21.00	Information Resources	35.00	0.63	1.8
OTC	27.25	7.19	Informix Corp.	20.75	-4.75	-18.6
OTC	16.75	8.75	Intergraph Corp. (L)	9.38	-0.25	-2.6

Exch	52-Week High	52-Week Low		July 16 3 PM	Wk Net Change	Wk Pct Change
OTC	13.63	6.25	Interleaf Inc. (L)	6.25	-0.75	-10.7
OTC	18.00	9.50	Intersolv Inc.	6.75	-0.75	-10.0
OTC	16.00	7.75	Knowledgeware Inc.	11.75	0.25	2.2
OTC	54.75	15.50	Legent Corp. (L)	16.25	-14.50	-47.2
OTC	37.00	14.75	Lotus Development	35.25	0.50	1.4
OTC	23.00	6.00	MathSoft	6.00	-2.75	-31.4
OTC	23.25	5.25	McAfee Associates	5.75	-0.13	-2.1
OTC	11.63	1.88	Meca Software	6.00	0.38	6.7
OTC	12.00	5.25	Mentor Graphics	9.38	-0.13	-1.8
OTC	46.00	26.63	Micro Focus (L)	27.63	0.63	2.3
OTC	13.25	4.38	Microgram a Inc.	6.25	0.75	13.6
OTC	98.00	68.00	Microsoft Corp.	81.38	-3.25	-3.8
OTC	51.75	15.75	Oracle Corp.	45.88	-3.00	-6.1
OTC	37.00	16.50	Parametric Technology (H)	33.88	-0.38	-1.1
OTC	40.50	22.50	PeopleSoft	31.75	1.50	5.0
OTC	7.13	3.50	Phoenix Technologies	5.38	0.25	4.9
OTC	40.00	22.00	Powersoft	32.25	1.00	3.2
OTC	41.50	17.00	Platinum Software	25.00	0.88	3.6
OTC	25.00	10.75	Platinum Technology (L)	12.50	0.63	5.3
OTC	61.50	32.25	Progress Software Corp.	44.50	0.00	0.0
OTC	7.38	2.56	Quarterdeck Office Sys.	2.63	-0.44	-14.3
OTC	31.00	14.25	Rainbow Technologies Inc.	31.00	0.75	2.5
OTC	12.25	4.00	Rasterops	8.38	-0.75	-8.2
OTC	13.25	3.63	Ross Systems	10.75	-1.50	-12.2
OTC	27.50	9.63	Sapiens Intl. Corp. N.V.	24.88	0.00	0.0
OTC	14.50	5.88	Software Publishing Corp.	6.88	0.38	5.8
OTC	12.00	2.38	Software Toolworks Inc.	11.00	0.25	2.3
OTC	2.00	0.75	Spinnaker Software	1.31	0.06	5.0
OTC	12.75	3.25	State of the Art	11.50	3.00	35.3
NYS	24.63	15.00	Sterling Software Inc.	21.38	2.38	12.5
OTC	21.50	8.00	Structural Dynamics Research	19.25	4.13	27.3
OTC	77.50	29.75	Symbase Inc. (H)	72.00	-3.00	-4.0
OTC	32.88	5.88	Symantec Corp.	11.75	-0.38	-3.1
NYS	12.50	5.25	Systems Center Inc.	10.25	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	18.75	0.25	1.4
OTC	6.38	3.75	Telelogic Corp.	3.81	0.56	17.3
OTC	22.75	9.13	Viewlogic Systems	19.50	0.75	4.0
OTC	23.50	6.00	Walker Interactive Systems	6.00	-1.25	-17.2
OTC	3.19	1.38	Wordstar	1.50	0.03	2.1
[illegible]						
NYS	32.88	8.38	Advanced Micro Devices	23.00	-1.75	-7.1
NYS	22.00	9.38	Analog Devices Inc. (H)	21.38	1.75	8.9
OTC	27.88	7.63	Atmel Corp. (H)	24.50	-1.88	-7.1
OTC	5.75	2.75	Chips and Technologies	4.00	0.38	10.5
OTC	39.75	13.00	Cirrus Logic	16.50	0.50	3.1
NYS	15.00	7.88	Cypress Semiconductor Corp (H)	14.50	0.25	1.8
NYS	16.13	8.88	Dallas Semiconductor	15.50	0.75	5.1
OTC	60.63	27.13	Intel Corp	51.00	-4.88	-8.7
NYS	16.75	6.88	LSI Logic Corp. (H)	14.00	0.13	0.8
OTC	22.16	10.61	Lattice Semiconductor	18.50	0.25	1.4
NYS	44.63	13.75	Micron Technology (H)	40.88	-0.88	-2.1
NYS	90.63	60.56	Motorola Inc. (H)	87.25	1.25	1.5
NYS	17.25	9.00	National Semiconductor (H)	16.50	0.50	3.1
OTC	15.75	6.50	Sierra Semiconductor	6.63	-0.25	-3.6
OTC	47.00	22.25	SynOptics	61.75	-3.75	-6.2
NYS	76.50	36.75	Texas Instruments (H)	72.50	2.75	3.9
OTC	11.75	6.00	VLSI Technology (H)	10.63	-0.25	-2.3
OTC	12.63	2.50	Weitek (H)	10.75	-1.63	-13.1
ASE	9.63	3.63	Western Digital Corp.	3.88	0.00	0.0
OTC	39.25	14.50	Xilinx	38.25	0.50	1.3
OTC	33.00	13.84	Zilog Inc.	26.25	0.75	2.9
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OTC	60.25	13.00	American Power Conversion	36.50	-1.38	-3.6
OTC	20.16	13.84	Banctec Inc.	18.00	-1.25	-6.5
OTC	18.00	4.75	Cambex Corp. (L)	4.75	-0.25	-5.0
ASE	18.38	5.38	Cognitronics Corp.	5.75	0.25	4.5
NYS	25.50	9.00	Conner Peripherals	9.88	-0.13	-1.3
OTC	38.50	10.75	Creative Technologies Inc.	30.13	1.63	5.7
OTC	30.75	11.00	Data Race Inc. (L)	12.00	-2.25	-15.8
ASE	17.00	6.75	Datapoint Corp.	9.13	0.63	7.4
NYS	74.75	5.06	EMC Corp. (H)	24.75	3.13	14.5
OTC	10.50	5.38	Emulex Corp.	6.88	0.50	7.8
OTC	19.00	13.25	Evans & Sutherland	15.25	-0.38	-2.4
OTC	33.00	7.50	Exabyte (L)	8.50	-1.13	-11.7
OTC	28.75	7.09	Intelligent Info. Systems	26.00	-1.00	-3.7
OTC	8.88	3.75	Iomega Corp.	4.06	-0.06	-1.5
OTC	19.50	5.75	IPL Systems Inc.	8.75	1.25	16.7
OTC	24.00	12.50	Komag Inc.	15.38	-0.63	-3.9
OTC	19.63	5.75	Maxtor Corp.	5.75	-0.38	-6.1
OTC	11.25	5.75	Micropolis Corp.	6.38	0.13	2.0
NYS	117.00	97.00	3M Corp	110.75	2.88	2.7
OTC	7.75	4.00	Printronix Inc.	7.13	-0.13	-1.7
NYS	17.25	6.88	QMS Inc.	8.00	0.00	0.0
OTC	17.88	9.50	Quantum Corp. (L)	10.13	-0.25	-2.4
OTC	11.88	3.13	Radius Inc.	4.00	0.00	0.0
NYS	16.50	7.63	Recognition Equipment	13.13	-0.13	-0.9
OTC	13.88	3.75	Reton Inc.	4.25	0.13	3.0
OTC	22.38	12.00	Seagate Technology	17.75	2.13	13.6
NYS	45.00	18.00	Storage Technology	29.38	-9.50	-24.4
NYS	27.88	17.63	Tektronix Inc.	26.38	1.25	5.0
NYS	88.88	70.13	Xerox Corp.	74.63	-2.25	-2.9
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OTC	23.75	14.88	American Mgmt. Systems	18.63	0.38	2.1
NYS	4.75	2.38	Anacomp Inc.	2.63	-0.25	-8.7
OTC	35.25	16.25	Analysts Int'l	29.00	-0.50	-1.7
NYS	56.13	40.50	Auto Data Processing	48.75	1.38	2.9
NYS	17.25	12.19	Canadian Corp.	14.63	0.00	0.0
NYS	17.38	13.13	Condisco Inc.	15.13	0.50	3.4
OTC	8.25	4.50	Computer Horizons	7.75	0.38	5.1
NYS	84.75	57.00	Computer Sciences	84.50	2.13	2.6
NYS	9.25	6.50	Computer Task Group	6.63	-1.25	-15.9
NYS	40.50	22.00	CompUSA Inc.	25.25	-2.00	-7.3
OTC	14.25	6.00	Corporate Software	11.00	1.00	10.0
OTC	19.25	7.38	Egghead Discount Software	7.88	0.00	0.0
NYS	95.88	25.25	General Motors E (EDS)	28.13	-0.25	-0.9
OTC	29.50	10.00	Inacom Corp.	21.75	-0.75	-3.3
OTC	15.38	7.25	Intelligent Electronics	15.00	1.38	10.1
OTC	13.13	6.63	Merisel (H)	12.50	-0.25	-2.0
OTC	19.50	5.75	Microage Inc. (H)	19.25	4.75	28.3
OTC	63.00	23.25	Paychex	62.50	0.75	1.2
NYS	87.25	25.25	Policy Management Sys. (L)	29.13	2.38	8.9
NYS	41.38	19.88	Reynolds and Reynolds (H)	40.50	1.75	4.5
OTC	17.25	11.00	SEI Corp. (H)	17.00	-0.25	-1.4
OTC	24.38	17.75	Shared Medical Systems	21.75	-1.63	-7.0
OTC	12.63	5.75	SHL Systemhouse	10.63	-0.13	-1.2
OTC	30.75	19.00	Software Spectrum Inc.	29.75	0.75	2.6
OTC	33.75	23.25	Sungard Data Systems	33.50	1.88	5.9
NYS	4.38	1.13	Ultimate Corp.	3.38	-0.12	-3.6

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Briefs

Intel results boom

Citing growing 1486 and Pentium chip sales, Intel Corp. last week posted second-quarter net profit of $566.5 million, a 167% increase from the same period last year. Revenue grew 61% to $2.13 billion, according to the Santa Clara, Calif., company. Intel earned $1.07 billion in the first half of the year, exceeding 1992's total earnings, on revenue of $4.15 billion.

Earnings rise

Motorola, Inc. reported second-quarter earnings of $224 million, a 56% increase from the comparable period last year. Revenue grew 18% to $3.9 billion, fueled by increases in semiconductor, communications and systems sales, the Schaumburg, Ill., firm said.

StorageTek sees red

Continuing delays of its key disk array subsystem and softness in European business caused Storage Technology Corp. to incur a $1.3 billion second-quarter loss. The Louisville, Colo., storage vendor earned $6.8 million in the corresponding period last year. Revenue for the second quarter dropped 8% to $355.1 million, the company said.

SHORT TAKES Digital Communications Associates, Inc. in Alpharetta, Ga., said it posted a $7.2 million fiscal fourth-quarter loss on revenue of $64 million. . . . Comdex Corp. in Waltham, Mass., suffered a fiscal third-quarter loss of $5 million on revenue of $10.6 million. . . . Chipcom Corp. in Southboro, Mass., reported second-quarter earnings of $3.2 million, a 62% increase from the year-earlier period, on revenue of $35.7 million, a 92% hike over last year. . . . Xyplex, Inc. in Boxboro, Mass., earned $2.4 million in its second fiscal quarter on revenue of $19.4 million, increases of 33% and 44%, respectively, over last year, according to the company.

Dell to post first loss

Blames weak overseas market, expansion costs

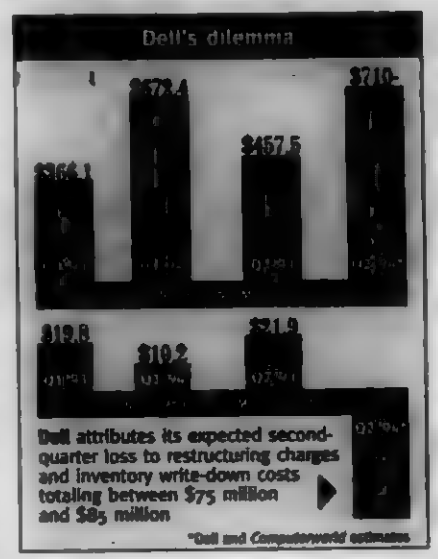
By Michael Fitzgerald
AUSTIN, TEXAS

■ Like a would-be Atlas, Dell Computer Corp. continues to stagger under the weight of its effort to become a first-tier vendor. Last week, the stumbling vendor said it will post its first-ever loss when its current fiscal quarter ends Aug. 1.

Though a Dell spokeswoman said the company expects to see sales reach $710 million to $730 million for the quarter — a 55% to 60% rise from the year-earlier quarter — it expects to lose between $1.65 and $1.85 a share. While the company did not specify a dollar figure, it has roughly 40 million shares outstanding, which suggests a loss in the $66 million to $74 million range.

It appears, then, that the company could have eked out a small operating profit, had it not decided to take an estimated $75 million to $85 million restructuring charge. The loss could cause Dell to default on some of its bank loans, the company said.

Dell blamed its woes on an ambitious international expansion plan coupled with a weakening market overseas, its lack of competitive notebook computers and problems with inventory and supply tracking and control [CW, June 21]. Analysts said



Dell's lean management structure has left the firm unable to handle its rapid growth, but it appears to be addressing this.

"The degree [of the loss] is a slight surprise, but something was going to drop because the type of growth they went through was not sustainable," said Kimball Brown, an analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. "They should be fine down the road."

The company has created a number of new positions this year, filled largely by outsiders, in an effort to revamp its corporate structure to deal with its problems and help position it for future growth.

Joel Kocher, Dell's president of sales, acknowledged recently at an informal press reception at PC Expo in New York that Dell is struggling to handle its growth, and it is working to change its corporate structure to allow it to reach $5 billion in sales by 1996. Dell expects sales to total $3 billion this year.

Dell does not plan any layoffs, but it expects to have some 50 fewer jobs in Europe after it revamps its international organization, the spokeswoman said.

What the future holds

Analysts said the key to Dell's future is how well it executes its restructuring efforts, which will include a revamp of its notebook effort. Kocher said at the reception that Dell would not relabel notebooks to supplement its current offerings, but sources suggested that Dell is considering selling other vendors' notebooks. Dell refused to comment on this possibility.

"Fundamentally, [Dell] seems to be sound; they're just making corrections other vendors have made," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass. Stephen warned that for Dell, the coming loss might take some luster off what had been a shooting star, and that "a market slowdown could damage Dell's growth prospects."

Statistical analysis software

MathSoft acquires firm to gain Windows entry

By Michael Vizard
CAMBRIDGE, MASS.

Looking to leverage sales of its MathCAD mathematical calculation software, MathSoft, Inc. has acquired Statistical Sciences, Inc. (StatSci), a provider of statistical analysis software in Seattle.

Valued at as much as $6.6 million under terms of the deal, the acquisition positions MathSoft against SAS Institute, Inc. in Cary, N.C., and SPSS, Inc. in Chicago, both of which currently dominate the statistical analysis software field.

To pay for the acquisition, MathSoft will part with $3.5 million in cash and 348,000 shares of stock. In addition, MathSoft may pay up to an additional $1 million in cash or stocks, depending on the performance of the StatSci division during the next two years.

As a result of this acquisition and other marketing programs, MathSoft said last week that it expects to post a loss for its fourth quarter and fiscal year ended June 30. MathSoft posted revenue of $11.5 million in fiscal 1992, and analysts said they anticipate the company will have revenue of $25 million for fiscal 1993.

Not all or nothing

"There will definitely be competition with companies like SAS, but MathSoft doesn't need for this product to have $100 million in revenues for the acquisition to be successful," said Clare Gillen, an industry analyst at International Data Corp.

According to David Blohm, MathSoft chief executive officer, there is a tremendous amount of overlap between MathCAD customers and the installed base of statistical analysis software.

To take advantage of this, MathSoft intends to focus on making the StatSci software easier to use in a Windows environment.

"We believe that statistical analysis software customers are moving from mainframe-oriented products to interactive software that runs on increasingly more powerful desktop systems," added StatSci general manager Matthew Schiltz.

StatSci software is currently available on Windows, DOS and Unix platforms.

For example, the Veteran's Administration Medical Center in East Orange, N.J., uses StatSci's S-Plus software because it can look at subsets of data in greater depth, according to Dr. Walter Tapp, a biomedical researcher at the center.

Tapp said he uses S-Plus to analyze joint movements, which involves an overwhelming number of data looks and data points.

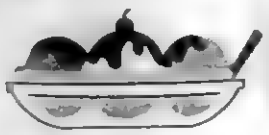
"StatSci tends to be on the cutting edge of statistics algorithms. The time it would take to normally look at a specific joint movement is monumental, but they have sophisticated data exploration capabilities that allow you to do a lot of hypothesis testing on specific data points," Tapp said.

Wysiwyg

What was your very first JOB?

David Mahoney, chairman and CEO of Banyan Systems, Inc., started a painting business in high school. The money from that business helped pay for his college tuition. He went on to earn his degree in biology, which led him to his first job as an engineering assistant at MIT Lincoln Labs. He worked with the solid state physics group doing "X-ray crystallagraphic analysis"; all of the analysis and data collection was done on a computer. That piqued his interest in computer technology.

Steve Ballmer, executive vice president of sales and support at Microsoft Corp., first worked at Procter & Gamble, where he was responsible for marketing a "coldsnap" freezer dessert maker. The product died in test marketing, but he learned about selling packaged food products though grocery stores.



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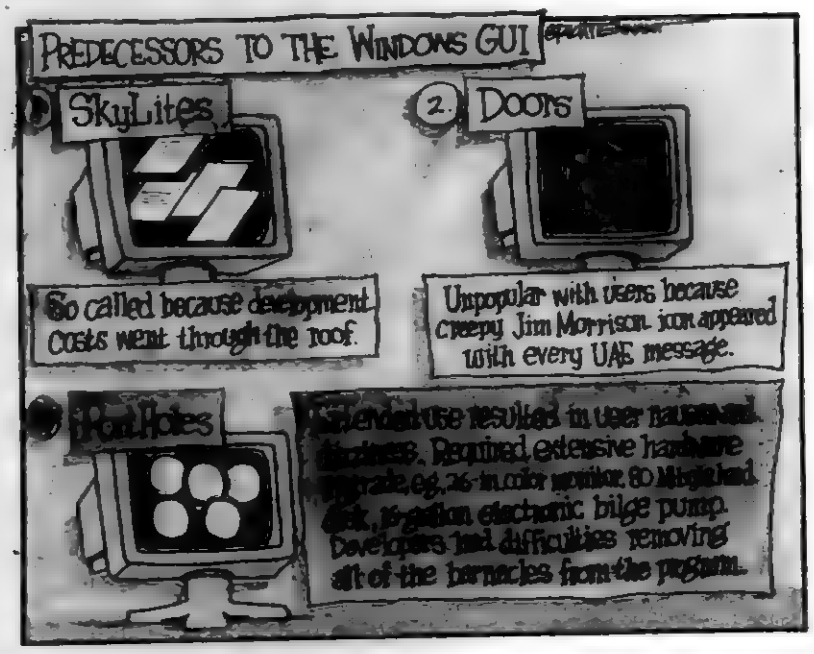
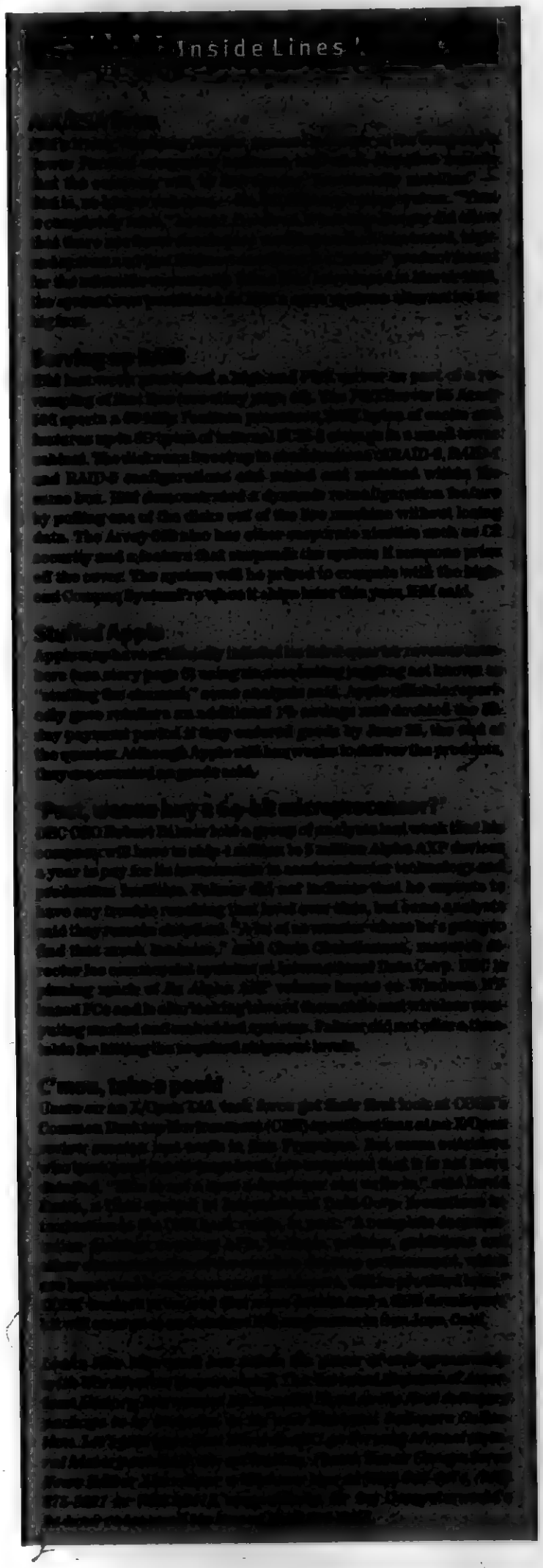
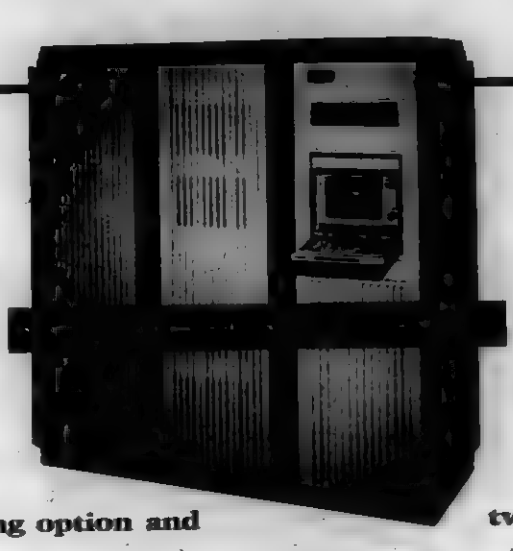
The 5th Wave *by* Rich Tennant



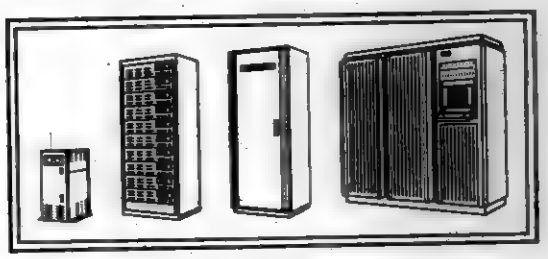


There's one little word that can strike terror into the hearts and minds of Information Services professionals everywhere: downtime. But thanks to the new Symmetrix 5500 from EMC, it's one word you can virtually banish from your vocabulary.

If your data is mission critical, it's critical you read this ad.



You see, the Symmetrix 5500 ICDA™ is designed with redundant hardware components, proactive maintenance features, a full mirroring option and the ability to repair or upgrade the system with no loss of uptime. In short, Symmetrix 5500 brings continuous operation to mission critical sites that need access to data 24 hours a day, seven days a week.



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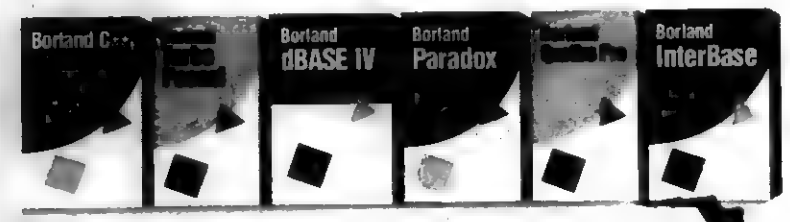

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COMPUTERWORLD

OLE must mature to win over corporate developers

By Michael Vizard
REDMOND, WASH.

■ The complexities of developing applications based on Microsoft Corp.'s Object Linking and Embedding 2.0 protocol are leaving corporate developers somewhat disenchanted.

Specifically, corporate developers say that while they recognize OLE 2.0 as an important technology, the current OLE 2.0 specification is not yet stable. Moreover, the number of service calls that are required to link applications makes creating OLE applications a challenge developers can defer until a later date.

Independent developers working with OLE 2.0 say today's pain will pay off tomorrow. See page 8.

"I used it for a little while but then set it aside because it doesn't seem to be a stable environment. Making your application an OLE client isn't all that difficult, but the number of setup calls required for an OLE server is astronomical," said Roger Spitzig, a systems engineer at Mutual Life Assurance Company of Canada in Waterloo, Ontario.

Lockheed Missile and Space Co. looked at OLE because Microsoft is pushing it, systems engineer Ken Foster said.

"But it carries too much overhead with it. You have to treat everything as an object," he said.

As a result of these and other issues, information systems shops are not likely to see the benefits of

OLE, *page 8*

IBM flicks on Taligent

Plan calls for layering object-oriented services over OS/2

By Michael Vizard
SOMERS, N.Y.

The first tangible fruits of the Taligent object-oriented operating system, which is jointly funded by IBM and Apple Computer, Inc., will be integrated into OS/2 by the end of the year, IBM said last week.

Rather than wait until 1996 for a complete native implementation of Taligent, IBM is pursuing a course that calls for layering object services developed for Taligent on top of OS/2 and other operating systems.

The first set of Taligent object services, which IBM is calling Frameworks, will go into beta testing by the end of this year, with delivery scheduled for the middle of next year, said D. Ann Ostrom, IBM's Taligent brand manager.

Portable power

IBM is also developing a portable version of OS/2, under the code name StarBase, that will run on RISC platforms, with availability on PowerPC platforms scheduled for the first quarter of 1994. The initial beta-test program, which will take place in a number of phases, is scheduled to begin later this summer [CW, Feb 8].

Meanwhile, analysts said they expect Apple to follow a similar course by layering Taligent services on top of its System 7 operating system. "They'd better if they want to keep up," said Peter Kastner, a vice president at Aberdeen Group, a consultancy in Boston.

"Our surveys show that IS believes [object-oriented] does have significant benefit, with mainstream implementations due in one to three years. So Taligent is right on the money: Get the code out this year and have a product next year," he added.

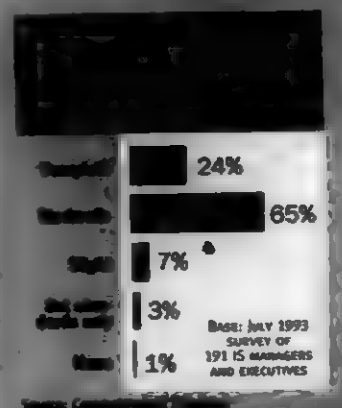
IBM, *page 16*

MANAGEMENT ISSUES

Shadow spending haunts IS

Hidden outlays by users swell corporate technology budgets

By Mitch Betts



They have titles such as director of market research or financial analysis or strategic planning or corporate intelligence or engineering.

But chief information officers are more likely to call them "loose cannons," the folks who build or buy information systems outside the systems department's control.

They ignore corporate technology standards and dis-

Shadow spending, page 82

NetWare 4.0 migration

Going global: A tough move

By Elisabeth Horwitt
PROVO, UTAH

Early users of Novell, Inc.'s NetWare 4.0 are still six to 12 months away from moving out of pilot-test mode. But their reasons have less to do with early-release glitches — which they said are much less fearsome than have been reported — and far more to do with learning how to navigate the uncharted territories of enterprise-oriented NetWare.

"You essentially have to throw out what you knew about NetWare 3.11" when dealing with 4.0, explained Robin McCubbin, a network planning analyst at National Grocers Co., which is in the directory design stage of its NetWare 4.0 implementation. "If you try to take what you have today and manipulate around the differences, you'll get in trouble. What you have to do is start from scratch with what you think an enterprise operating system should be and then migrate to that."

"I have some clients looking at NetWare 4.0 but holding off, less because of fear that it will be un-

NetWare 4.0, *page 14*

DEC revamp eludes users

By Craig Stedman
MAYNARD, MASS.

In his first year managing Digital Equipment Corp., Robert Palmer has proved he can field. However, the question remains: Can he hit?

Customers and analysts will be looking for an answer to that question during the next 12 months, when the corporate make-over put in place by Palmer is expected to take firm hold. At that point, they said, the changes can start to be assessed in terms of their impact on the company's business.

How would you rate Palmer in his first year?

AVERAGE RATING
3.4
1 3 5
(5 is excellent and 1 is poor)

Source: *Computerworld* Database Division, Framingham, Mass.

For now, Palmer gets credit for bringing DEC back to the verge of at least one quarter of profitability and for trying to revitalize its operations. However, most of the more than a dozen users interviewed last week — and a majority of the 128 information systems executives surveyed by the *Computerworld* Database Division — said they have yet to see any benefits from the changes he has made.

"If you look at it from a user per-

DEC, *page 12*

He's ba-a-ck!

When E. F. Codd wrote his RDBMS rules, all hell broke loose. His new target: analytical processing tools. Page 88

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KATHERINE LAMBERT

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Executive Briefing

Analysts and DEC customers will be watching during the next 12 months to see whether the changes that CEO Robert Palmer has made in his first year will result in a real turnaround. Palmer gets credit for bringing DEC back to the verge of profitability and trying to revitalize its operations, but users say they have yet to see any tangible improvement in the company's sales organization. *Page 1*

Smart CIOs who see user departments going their own way will try to become internal consultants to these renegade business units in order to track their spending and nudge them in the direction of corporate technology standards and disciplines. *Pages 1 and 66*

The news on the FTC monopoly investigation of Microsoft was no news. The commission deadlocked for the second time on deciding whether to take action, leading Microsoft to say the investigation is dead and rivals to call for Justice Department involvement. *Pages 4 and 32*

On the product side, Microsoft got mixed feedback. Corporate developers say they like the idea of OLE but are reluctant to tackle OLE's complexities. Users say they are glad to see Windows NT arrive this week, but it may be years before they know how important NT will be. *Pages 1 and 8*

The new push is not on executive information systems (EIS) but rather on information systems for everyone, as EIS vendors seek to carve out a larger niche for business analysis software. It's all part of the growing demand for immediate access and analysis of data. *Page 73.* Users rate Pilot Software's Lightship at the top for overall satisfaction. *Page 80.* Greater access to on-line analytical processing should sharpen corporate decision-making. *Page 87*

Plumbers and TV repairmen do a better job of delivering quality and standing behind their work than do many "professional" software developers. It's time for IS to deliver the kind of service they'd demand from anyone else. *Page 33.* Speaking of quality, many developers are reluctant to do software testing because it is demoralizing to find their own failures. *Page 63*

Hyatt Hotels had planned on a total reservation system revamp. But faced with a shortage of bits that met their hardware and budget requirements, Hyatt officials opted for a short-term fix. *Page 55*

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Shortfall on DRAM chips may up tags

By Michael Fitzgerald

Dynamic random-access memory (DRAM) chip shortages are rearing their ugly heads, with spot prices on the DRAM market rising as much as 50% following an explosion in a Japanese resin factory earlier this month.

The shortages actually started some time ago [CW, June 7], but prices were relatively stable until last week, when the market suddenly reacted to the July 4 explosion of a Sumitomo Chemical Co. resin plant. Sumitomo supplied about half of the world's resin.

"Prices have sky-rocketed," said Mike Moahayedi, president of Simple Technology, Inc., a RAM upgrade vendor in Santa Ana, Calif.

The overall effect will hit home hardest with small vendors that do not have long-term contracts with DRAM manufacturers.

"Extra DRAM will go to the big players with cash," said Kimball Brown, an analyst at Computer Intelligence/Infocorp.

Still, the situation is unpredictable, and some said DRAM shortages could end by September.

"We don't see it having a short-term impact, and we still think things will be fine by September," said Boris Elisman, product marketing and programs manager at Hewlett-Packard Co.'s desktop PC group. Elisman said HP was qualifying additional DRAM suppliers as a precautionary measure.

Corrections

• Because of a reporting error, Storage Technology Corp.'s second-quarter earnings were published incorrectly in the July 19 issue. The company posted net income of $1.3 million in the period.

• Because of a reporting error, a story in the July 12 issue on database testing incorrectly stated that no major database vendor has yet run TPC-C benchmarks. Informix Software, Inc. has published TPC-C results for the latest version of Informix OnLine on Unix machines from Hewlett-Packard Co., IBM, NCR Corp. and Unisys Corp.

Slowdown in PC growth may oust some vendors

By Michael Fitzgerald

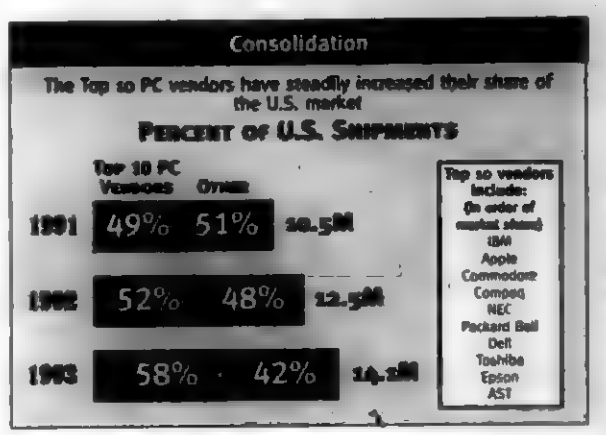
A fundamental split into the PC "haves" and "have-nots" already under way is expected to accelerate because of an anticipated sharp drop-off in volume growth in the year's second half. Such activity is also expected to feed an ongoing industry consolidation.

The potential for a shakeout means information systems managers should tread carefully as they consider PC purchases in the next 12 to 18 months, analysts warned.

"It's a career-limiting move to pick a vendor that doesn't succeed," said Leslie Fiering, an analyst at Gartner Group, Inc.'s Santa Clara, Calif., office. She pointed out that not only does the supplier go out of business, but replacement parts and technical assistance may also go by the wayside.

"You don't want to base your business on some vendor that's going to float away," agreed Glenn Sandusky, chief information officer at Aon Specialty Group, a subsidiary of Aon Corp. in Chicago. "Standardization on a vendor that will be out there for a long time saves headaches, and a manufacturer is more inclined to help you if they see some loyalty to their product."

Still, there are plenty of voices that insist PCs do not deserve more than commodity status. "I would say that PCs are enough of a commodity that if [our vendors] did go under, we would be able to get parts and the like," said Richard Jungbluth, air quality engineer in charge of technology implementation at South Coast Air Quality Management District in Diamond Bar, Calif.



Source: InfoCorp, Santa Clara, Calif.

So far, the issue has not been a major one. While a number of PC makers have run into trouble and some mail-order houses have expired, few name vendors have gone out of business.

But as the market leaders continue to roll out low-priced lines, analysts said they believe a shakeout looms.

"I'm more convinced than ever that lower volumes will be the rule in the second half, which, coupled with the DRAM shortage, should accelerate the fallout of shaky players," said Kimball Brown, an analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. Dynamic random-access memory chip shortages, reported earlier [CW, June 7], look to have worsened recently (see story at left).

Joining the crowd

Other vendors are jockeying for position, looking to join the haves instead of the have-nots. Haves will likely get first access to components and better pricing, and the quest has been one of building market share. However, Dell Computer Corp. blamed its first-ever loss in part on its successful effort to acquire market share [CW, July 19].

Moreover, market pressures are leading to strange bedfellows:

• Dell, for instance, has met with AST Research, Inc. and NEC Corp., among others, in an effort to plug the gap in its notebook line, sources said. Dell's volume needs caused both companies to reject Dell's approaches, despite its offer to let them keep their brand names on the products, sources said.

• Longtime Top 5 volume vendor Tandy Corp. spun off its computer operations and later sold them to AST.

• Zenith Data Systems' parent, Groupe Bull, Inc., bought a stake in Packard Bell Electronics, Inc., which will give Zenith a way to add both distribution channels and product lines.

FTC decides not to decide (yet)

Microsoft receives temporary reprieve

By Christopher Lindquist

Twice was not enough for the Federal Trade Commission (FTC), which deadlocked once again in a vote last week to determine what action, if any, to take in its three-year antitrust investigation of Microsoft Corp.

The same nondecision was reached a year ago when the commissioners voted 2-2, with one abstention owing to a conflict of interest. At least three commissioners must agree before any action is taken.

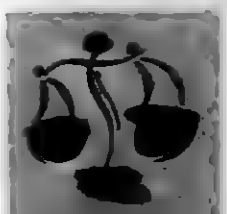
The FTC's gridlock and a statement from Microsoft have fueled speculation that the FTC investigation is dead. Sources inside Microsoft indicated the company had been told by the FTC that the case would be dropped in 30 days. Sources close to the FTC said nothing will happen "for several weeks" but indicated that the FTC will make a formal announcement soon. The FTC, meanwhile, refused to comment.

Reaction to the situation ranged from a satisfied sigh of relief from Microsoft to anger and disappointment from competitors to a request from a pair of U.S. senators that the U.S. Department of Justice get involved.

"Microsoft has maintained from the beginning that it competes in an honest and ethical manner and has not violated antitrust laws," William Neukom, vice president of law and corporate affairs at Microsoft, said in a written statement. A company spokeswoman added that Microsoft considered the vote to be positive, even though a deadlock does not equal closure.

Alternate point of view

Microsoft competitor Novell, Inc. had a slightly different perspective. "The truth of the matter is that the FTC staff, after having conducted a lengthy investigation, recommended affirmative legal action against certain monopolistic practices engaged in by Microsoft," responded David Bradford, vice president and general counsel at Novell.



Where it could go from here

George Cary, trial attorney at Bro... Phleger & Harrison in San Francisco, said the following options remain open:

- The attorneys involved in the investigation could construct a more "palatable" case and submit it for a third vote.
- The Justice Department could drop it or handle the ...
- The commissioners could simply vote to drop the case entirely.
- Competitors could file private lawsuits against Microsoft.

He said those practices included CPU licensing practices, exclusive contracts, creating incompatibilities with other products and preannouncement of products "that have chilled other products in the market."

Novell has reportedly been quietly lobbying the FTC to act against Microsoft while also soliciting support in the industry for a class-action suit should the FTC fail to act.

Despite its disappointment, Novell is less willing to cede the battle than other industry observers. First, Bradford said Novell was "leaving open" its option to file a private lawsuit against Microsoft should the government not act. Second, he claimed that the FTC deadlocked not only on a vote of whether to take action but also on a second vote to close the investigation.

Bradford said Sen. Howard Metzenbaum (D-Ohio), chairman of the Senate subcommittee on antitrust monopolies and business rights, and Sen. Orrin Hatch (R-Utah) have asked that the Justice Department step in.

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News Shorts

Apple sued over business forecasts

Apple Computer, Inc. reported last week that a lawsuit has been filed against the company and against certain officers and directors, alleging federal securities law violations related to statements Apple made about its business prospects and outlook for earnings growth. The *Rovner v. Sculley* lawsuit, brought on behalf of all purchasers of Apple common stock between Oct. 15, 1992, and July 15, 1993, was filed July 21 in U.S. District Court for the Northern District of California.

Word 6.0 addresses user requests

Microsoft Corp. executives last week said the forthcoming Release 6.0 of its Word word processing package will address more than 1,000 user requests and incorporate data gathered from 2,500 users across 400 different accounts. Also last week, Microsoft shipped Version 5.1 of Word for the Macintosh.

Informix profits jump 33%

Informix Software, Inc.'s profits topped $12 million for the fiscal second quarter, up 33% over the same period last year. Sales jumped 40% to $84.3 million from $60.3 million in 1992, the company said. Chief Executive Officer Phil White credited cuts in distribution costs for boosting operating margins to 22% for the quarter, compared with 18% last year.

Tandem boosts RISC performance 30%

Tandem Computers, Inc. in Cupertino, Calif., unveiled its revamped NonStop Himalaya line of reduced instruction set computing (RISC)-based fault-tolerant computers last week, as expected [CW, July 19]. Tandem optimized its NonStop operating system for RISC, boosting low-end and midrange performance up to 30% and price/performance up to 60%.

HP licenses Sun's Wabi technology

Hewlett-Packard Co. said last week that it has licensed **Sun Microsystems, Inc.**'s Wabi interface technology, which allows Windows applications to run under Unix. HP paid Sun's SunSelect division for its license but did not set the amount or the method of pricing the Wabi option for its HP 9000 Series 700 Unix workstations.

AST's Grid subsidiary now separate line

AST Research, Inc. said it will position its new Grid Systems Corp. subsidiary as a separate product line, retaining its pen-based, notebook and desktop systems. AST will work with its resellers to add the Grid line to their lists and provide continued direct service to Grid's current large customers but will discontinue Grid's direct sales business.

SHORT TAKES **Unify Corp.** unbundled its application development tools from the Unify 2000 relational database, setting base prices at $3,495 and $995, respectively.... **SunSoft, Inc.** has released a $295 tool kit that supports the **Open Software Foundation**'s OSF/Motif graphical user interface on Sun's Solaris 2.2 operating system.... **Intersolv, Inc.**'s application generator now supports **Oracle Corp.** and **Sybase, Inc.** databases in addition to IBM's DB2.... **Computerland Corp.** announced Companion, a new warranty upgrade program for its customers that was designed to beef up on-site service offerings from vendors.... **Boole & Babbage, Inc.** in Sunnyvale, Calif., is expected to announce this week that **IBM** will use its ProSMS storage management software to help users migrate to IBM's System Managed Storage architecture.

More news shorts, *page 16*

Shared dish saves cash

Retailers use VSAT for credit-card transactions, inventory tracking

By Kim S. Nash

Several large retail chains, including Waldenbooks and Gantos, Inc., finished pilots this month of a shared satellite network they said saves money by splitting equipment and upkeep costs. Even better, the satellite system is less expensive than dedicated, leased lines but just as fast, according to early users.

Involved in the pilot program were several members of the New York-based retail consortium Specnet, which seeks to leverage the collective buying power of members to win special discounts from hardware and software makers. Tested were programs for approving credit-card purchases and managing inventory via shared satellite systems installed atop shopping malls by Hughes Network Systems, Inc.

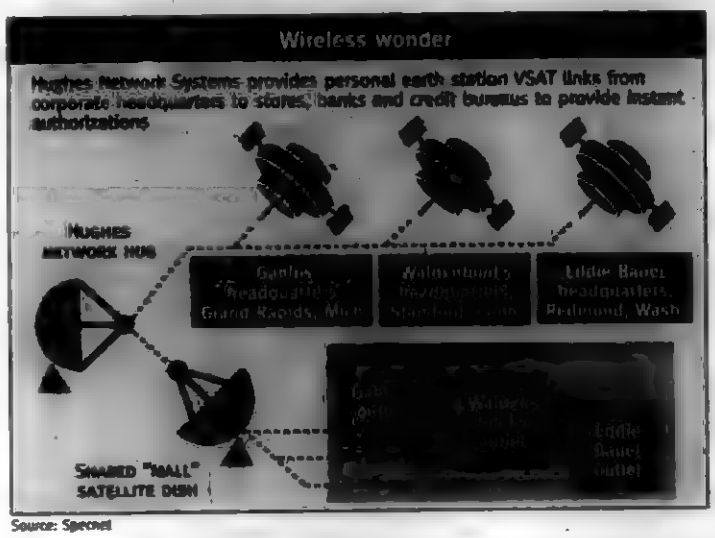
The process lets users avoid increasingly crowded and more expensive telecommunications setups, without shelling out large sums to buy their own satellite equipment.

Fast as leased lines

Shared very small-aperture terminal (VSAT) "gives us the same response time as leased lines but at a fraction of the cost," said Dave Rogers, MIS director at Gantos, a Grand Rapids, Mich.-based women's clothier.

Under the plan, data is sent from individual stores at a mall to a community satellite dish on the roof, then to a receiving Hughes hub. VSAT traffic, which can be a mix of data, audio and video, is then directed to either the retailer's home office or a credit bureau (see chart).

Gantos tested the plan for a week at a large outlet in Pittsburgh, and plans are in the works to roll out the system to its 157 stores. Rogers estimated the satellite will save Gantos 60% over leased lines.



Source: Specnet

However, the cost of the plan varies because each retailer must negotiate its own deal with Hughes. To participate, retailers must belong to Specnet and the National Retail Federation in New York, which charges an annual membership fee ranging from $95 to $25,000, depending on annual sales.

Users pay monthly charges to Hughes based on use and do not have to make capital expenditures for the equipment. The more stores sharing a dish, the lower the monthly costs are for all, according to Jack Brill, Specnet general manager.

VSAT is one of three major programs that have grown out of Specnet's mission to save money. Other strength-in-numbers options from Specnet are electronic data interchange with Hughes and Sterling Software, Inc. and a long-distance calling plan with MCI Communications Corp.

A key benefit of VSAT is the speed of satellite communications. Store clerks can move customers along more quickly because response time is cut in half versus the time involved with dial-up services. A typical 800-number call takes between 25 and 30 seconds to complete, while a satellite transaction is done in 12 to 15 seconds, Brill said.

Brill took over the top slot at Specnet in January, following the defection of former general manager Dick Faul to Retex, a start-up rival consortium that broke away from Specnet last year (see story below).

Consortia divided

Notorious for cutthroat rivalry, retailers compete even when they team up.

For example, Retex is a retail consortium borne of unhappy defectors from the older Specnet consortium. The purpose of both consortia is simple: Band together to persuade hardware and software makers to cut deals on goods and services for the groups, which team up to buy in bulk.

However, Retex members went off on their own last year because managers at Specnet and the National Retail Federation, which oversees Specnet, did not fairly distribute money saved as a result of those deals, claimed Fred Morsheimer, MIS director at Trader Joe's Co.

"We left things at a handshake, which maybe we shouldn't have done," Morsheimer said. Retex founders decided to lay down explicit terms when they broke off from Specnet, hiring a lawyer to draw up legal contracts.

The trouble stemmed from a series of "misunderstandings" about what member benefits would be, said Jack Brill, who took over as Specnet general manager in January. Brill declined to elaborate further, saying he was not present for much of the ruckus. "I just want to move forward," he said.

—Kim S. Nash

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3	3	FORD MOTOR Dearborn
4	4	INTL. BUSINESS MA
5	5	GENERAL ELECTR
6	6	MOBIL Fairfax,
7	7	PHILIP MO
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Users mull Windows NT parts

By Christopher Lindquist

Microsoft Corp.'s Windows NT is still on track to go into production this week, but while corporate customers are pleased to see the long-overdue operating system finally suiting up to hit the streets, there are still questions about how well its clothes fit and how quickly it will come into style.

Sources indicated that despite the hoopla when Windows NT ships, it will take some time, perhaps years, before it works its way onto desktops in any number. Microsoft's own projections place Windows NT sales at around 1 million in the first 12 months of shipping — hardly stellar performance by Microsoft standards.

Who needs it?

Users indicated there are still questions about who really needs to run Windows NT as opposed to Windows 3.1. "It's more robust, but you're paying for it with a bigger hardware demand," said Jim Lisiak, PC specialist at Chevron Corp. He also noted that Windows NT's emulation of DOS and Windows 3.X applications is still a concern that could prevent mass migration to Windows NT.

For its part, Microsoft seems to agree — a dramatic change from the early discussions of Windows NT as a replacement for Windows 3.X. "Most users are and should remain on [Windows] 3.1 or the derivations," said Mike Maples, executive vice president of the Worldwide Products Group at Microsoft. "If you don't know the reasons to put NT on, then you probably shouldn't."

For many users, Windows NT client is not the most vital component. Instead, Windows NT Advanced Server, due to ship 30 days after Windows NT itself, will be the key.

"For us the [Advanced Server] version is certainly more important," said Art Beckman, manager of information technology services at Pacific Gas & Electric in San Francisco. He said there was no pressing reason for his company to move to Windows NT on the desktop. However, PG&E is investigating whether Windows NT Advanced Server's remote access and administration capabilities would help reduce costs by allowing for centralized network management.

Other users agreed that while the NT client will allow them to begin deployment and development on some technical and power-user desktops, Advanced Server, with its remote access, centralized management and fault-tolerant features, is where their interests truly lay.

"The NT Server is a lot more important to us than the client at this point," said Bill Cornfield, president of the Windows Support Group in New York. The Advanced Server version of SQL Server greatly outperforms the OS/2 version, he said, adding that his consultancy would be moving from OS/2 to Windows NT servers by year's end. "When a Rolls Royce is available, why drive a Chevy. It's no contest."

Too early?

While Microsoft said Advanced Server is still scheduled to ship within 30 days of Windows NT, some observers expressed doubt it will be 100% ready in its first incarnation. And one customer at a financial institution said that while he expected Windows NT Advanced Server to ship on time to save face for Microsoft, he believed it would be in a "lighter" version than planned.

In particular, users and analysts noted that the most recent beta testing of Advanced Server still has less-than-perfect Transmission Control Protocol/Internet Protocol support and that Novell, Inc.'s NetWare requester, which will still be in beta testing when Windows NT ships, is not yet up to par, making NT somewhat difficult to use on a NetWare network.

Microsoft boosts consulting unit

By Christopher Lindquist

It's not just your software — it's you.

That's the new credo being promoted by Microsoft Corp.'s Consulting Services Division [CW, May 24]. In a bid aimed at both corporate and commercial Windows developers, the group recently announced several programs aimed at helping developers re-engineer not only their products but also their companies.

The consultancy was expanded in response to requests from both corporate and commercial customers who wanted a hand navigating through the downsizing maze.

"The debate isn't if [we should downsize] anymore, it's when and how," said Bob McDowell, Microsoft's vice president of consulting services.

These new programs will enable Microsoft Consulting Services to provide expertise in areas such as designing work spaces for programmers and determining what applications can and should be downsized. As a result of this new focus, Consulting Services will increase its referrals to third parties for actual development and support while concentrating on early aspects such as prototyping.

Microsoft will go one step further for its "Solution Providers" or third-party partners. It will offer business consulting services designed to mold small and medium vendors in the Microsoft image. "We've learned some lessons here," McDowell said.

OLE 2.0

CONTINUED FROM PAGE 1

tightly integrated Windows applications for quite some time. Instead, their developers are slowly digesting the object-oriented programming techniques that are required to create them.

And some developers said they will continue to work with existing technologies. For example, Lockheed considered integrating OLE with an existing real-time data acquisition program but has decided to stay with Microsoft's existing Dynamic Data Exchange facility, which allows Windows applications to share data via a low-level application programming interface (API).

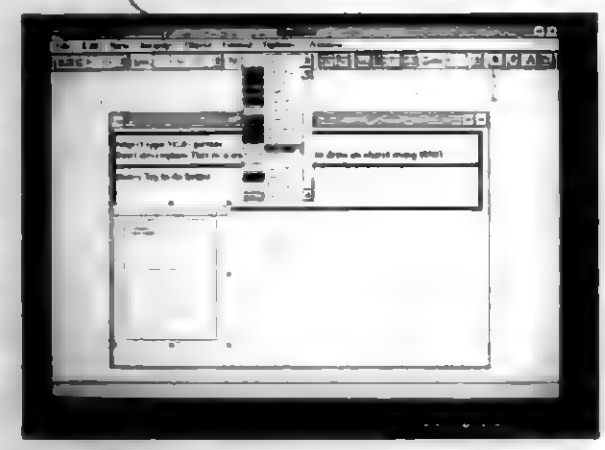
"We don't plan to start working with OLE 2.0 until it gets fleshed out. It's not a hard-and-fast standard yet," said David Cinderella, chief technologist at Tangent International Computer Consultants, Inc. in New York.

Developers also fear that OLE applications will not be compatible with one another because OLE is not well-defined and there are so many OLE exceptions to consider.

"They need a single OLE 2.0 API stack. It isn't really plug-and-play compatible," Cinderella said.

Developers who have played with the initial release of OLE 2.0 report that IS shops seeking to add OLE support into applications will have to restructure those applications into a series of discrete services that can then be easily linked to object services.

"To really use it, you have to change the way you do application development, so people are being a little cautious about using it," said Noah Ross, director of technology at Cap Gemini USA, a systems integrator in New York.



OLE 2.0 allows *users to invoke another application*

Microsoft executives said they are not that surprised by the reaction of corporate developers.

"OLE is quite a major shift in terms of programming. You have to remember that what you're really dealing with is half an object-oriented operating system," said Allistair Banks, manager of integration services for Microsoft's developer's relations group.

The initial OLE 2.0 implementation was designed to give developers who need access to low-level system calls lots of services, Banks said. "The higher level tools that would make OLE easier to work with for corporate developers don't exist yet," he added. Banks said he expects to see some of these tools arrive within the coming year.

For example, Banks noted that while Microsoft has delivered Visual Basic 3.0 with OLE support, that implementation only supports OLE containers and an OLE automation facility that allows a macro to control multiple applications. "The OLE server calls are not in Visual Basic yet," Banks said.

As such, developers can create Windows applications that can share a common macro language using OLE, but they cannot create server applications that call those services.

Despite their initial reluctance, however, developers generally agreed that they will probably move to OLE in the end.

Worth the pain

Corporate developers may not be rolling out the red carpet for OLE 2.0, but independent software vendors are plowing ahead, despite the difficulties.

Driven by the need to keep pace with object-oriented systems expected to become mainstream sometime after 1995, independent software vendors say the pain involved with OLE 2.0 today will pay off tomorrow.

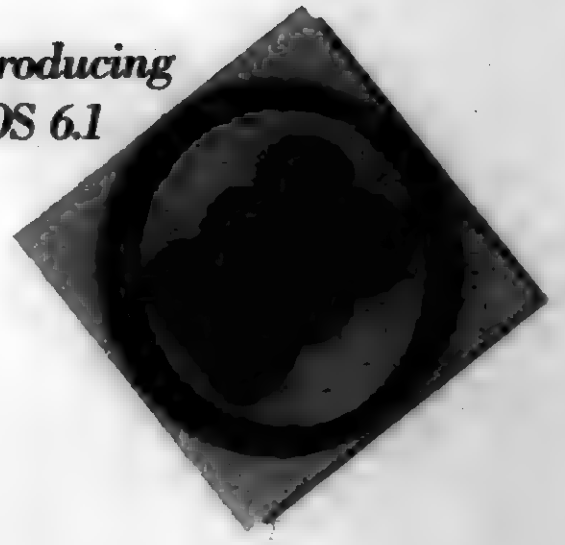
"We call OLE 2.0 the 'apps from hell,'" said John Chua, president of Future Labs, Inc., a developer of desktop conferencing software in Cupertino, Calif., that uses OLE to link applications.

But that is not holding back Chua or other developers. "OLE is not just adding new features to an application, it's a new programming model. The gains that can be made from this are incredible," added Jack Ozzie, a consulting engineer at Iris Associates, the Westford, Mass.-based developer of Lotus' Notes groupware environment.

To meet the challenge of OLE, Ozzie said he expects independent software vendors will need two full-time developers just to work on adding OLE 2.0 support.

"Microsoft did a good job on the architecture, but you have to be careful," Ozzie said. — *Michael Vizard*

Introducing PC DOS 6.1



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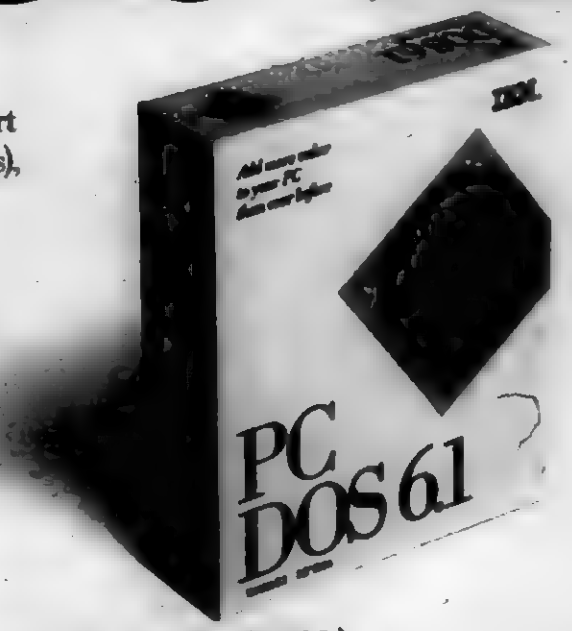

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Newton's next hurdle: Sales

Apple execs seek to lure corporate customers

By James Daly

After dazzling hard-boiled analysts and skeptical preview audiences with the technological sparkle of its Newton family of personal digital assistants (PDA), Apple Computer, Inc. now faces its toughest challenge: selling the darn things.

"Apple has to prove to corporate customers that the Newton is not just a handy stand-alone gadget but something that can change the way they do business," said Pieter Hartsook, editor of "The Hartsook Letter" in Alameda, Calif.

The first member of the Newton family to ship will be the handheld MessagePad, an executive organizer about the size of a thin videocassette that will be unveiled next Monday. It includes software that can read printed notes and then automatically add an appointment to a calendar, dial a phone or send a fax, Apple officials said. An entry-level MessagePad will start at around $700. As many as four more models are expected to debut in the next several months.

Early indications are that MessagePad will face an uphill battle in securing corporate customers. "I doubt that it's going to sweep our company off its feet," said Brandon Shults, a programmer/analyst at Trader Joe's Co. in South Pasadena, Calif.

A must-have?

MessagePad's success will hinge on Apple's ability to convince users that they cannot live without its "anytime, anywhere" capabilities. That could be a tough sell in a land where corporate information systems budgets have tightened considerably in the past two years. "I'm more interested in putting full-fledged workstations on desks than getting the Newton in the hands of users," said Steven Erde, director of academic computing at Cornell University Medical College in New York.

Apple must also prove that it can not only provide an adequate supply of the MessagePad but also support products such as application development tools, synchronization products and communications capabilities.

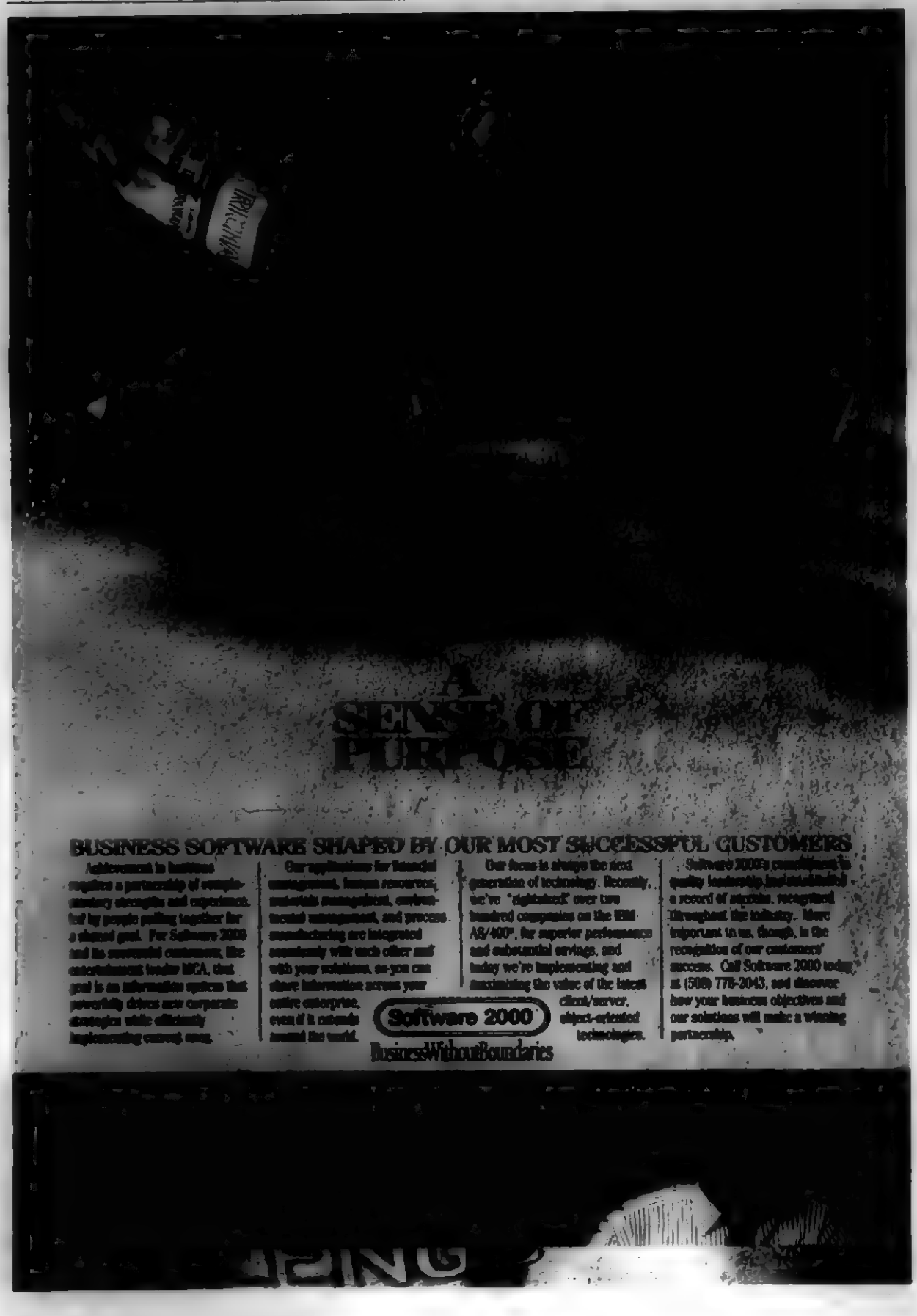
Although supplies of the MessagePad could be limited at first, Apple insiders said a furious last-minute production ramp-up could make several thousand of the machines available at next week's MacWorld in Boston. Shortly thereafter, it should appear on retailers' shelves.

To promote wide market acceptance, Apple has announced the Newton Connection Kit, which enables the transfer, backup and updating of information between a Newton and a PC or Macintosh. PowerPC connectivity is also expected to be added when Apple ships its first PowerPC-based Macintosh early next year.

If these pieces fall into place, the MessagePad could be scooped up. Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle, said he eventually hopes to outfit grocery clerks with PDAs.

With PDA-equipped stockers patrolling the aisles of 350 grocery stores, hot-dog buns that sell out on Friday evening can be replenished and waiting on the shelves for the Saturday afternoon barbecue crowd. "Just-in-time inventory would no longer be something we dream about but something that we employ every day," Lester said.

Such communicative abilities will be key to the success or failure of Newton. Gaston Bastiaens, vice president at Apple's Personal Interactive Electronics Division, said Newton users will automatically get access to Apple On-line Information Services.



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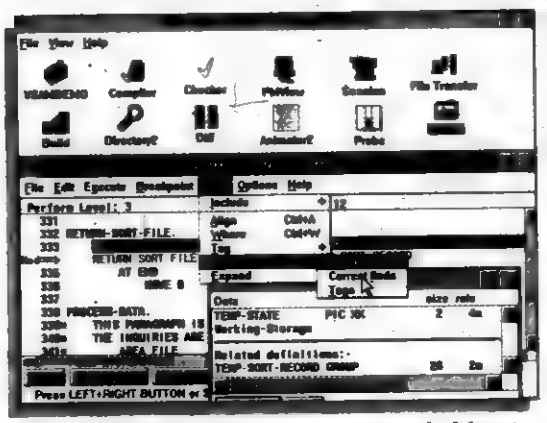

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DEC revamp eludes users

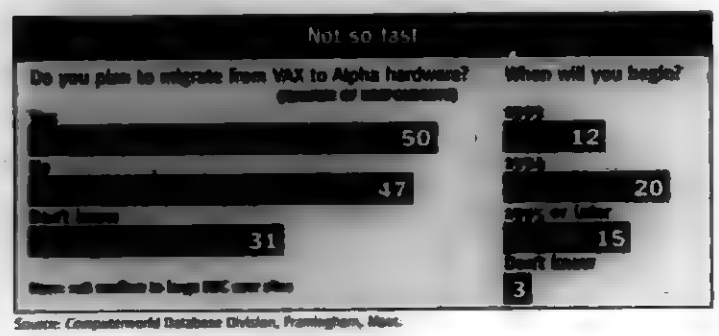
CONTINUED FROM PAGE 1

spective, I guess I can't say I've seen anything tangible from his first year," said George Kerns, assistant vice president of cellular information management operations at GTE Telecommunications Products and Services in Atlanta.

Some users said DEC's sales organization, openly acknowledged by Palmer as a major weak spot, has actually gotten worse during the restructuring process because of work-force reductions that have forced remaining sales employees to take on more accounts.

Meanwhile, DEC's improving financial performance is expected to result this week in the report of a profit of roughly $100 million for the fourth quarter of fiscal 1993 — ending a string of six straight losses. But those gains are still being achieved through cost-cutting, not revenue growth, analysts said.

As a result, a profitable quarter would be seen as a positive step, but only a first one. "You can't look at just one quarter," said Judith Hurwitz, president of Hurwitz Consulting, Inc. in Newton, Mass.



Source: Computerworld Database Division, Framingham, Mass.

Slim growth forecast

DEC said it hopes revenue will grow in fiscal 1994, but most analysts project a slim uptick at best because of uncertainty over when the Alpha AXP architecture will kick in as a major contributor. Many said they expect a dip back into the red in the first fiscal quarter because of seasonal slowness.

For the longer term, many analysts and customers are still waiting for Palmer to lay out a clear corporate strategy for competing against the likes of Hewlett-Packard Co. and Sun Microsystems, Inc., two companies that have specifically targeted DEC's customer base.

"He's clearly an effective internal manager," said David Moschella, vice president of worldwide research at International Data Corp., a market research firm in Framingham, Mass. "What's missing is a clear sense of what areas are really going to drive Digital and [from] where the revenue growth will emerge."

"I just don't know if DEC is really ready to compete, for example, to push Alpha vs. Intel," said David Foss, section leader for scientific systems at Glidden Co. in Strongsville, Ohio.

Palmer was not available for comment last week. Edward Lucente, DEC's new vice president of worldwide sales and marketing, said the company has completed a strategic blueprint oriented around Alpha and client/server networked computing. "The plans are in place, and the execution is the only thing ahead of us," he said.

The strategy was detailed to DEC sales managers early this month and will start to be made public in the next few weeks, Lucente added. He declined to provide details but said it "positions our operating systems, our software frameworks and how we're going to use those."

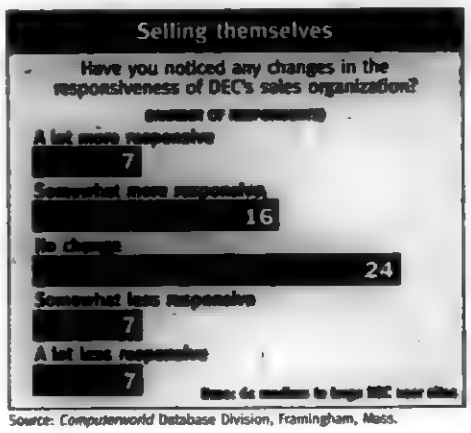
Clearly, most observers view DEC more charitably than they did before last July when Palmer was named to replace founder Kenneth H. Olsen as president and chief executive officer. Palmer officially took over in October, although even Olsen has said the change was effective immediately.

"There seems to be a bit of a sense of direction, whereas before there wasn't," said Ed Homko, systems manager at the Dr Pepper Co./The Seven-Up Co. in Dallas.

"He's got the company at least looking like it can turn around," added Steve Ruger, MIS manager at Smith Industries Ltd. in Malvern, Pa.

However, whether Palmer's accelerated downsizing of DEC and his attempt to turn it into a more focused and responsive company will produce a successful end result is far from clear, in part because many users are still not convinced that the reorganization has yielded a new and improved DEC.

"A lot of the things we customers have been screaming about still haven't changed," said Matt Holdrege, senior network specialist at PacifiCare Health Systems, Inc. in Cypress, Calif. The sales force and maintenance contracts administration remain major problems, he said.



Source: Computerworld Database Division, Framingham, Mass.

From bad to worse

Some users said they think things have even worsened. "The culture change they're going through is creating a lot of confusion, and it's hurting their sales and marketing support," said Randall Gannaway, data center director at FMC Corp. in Chicago.

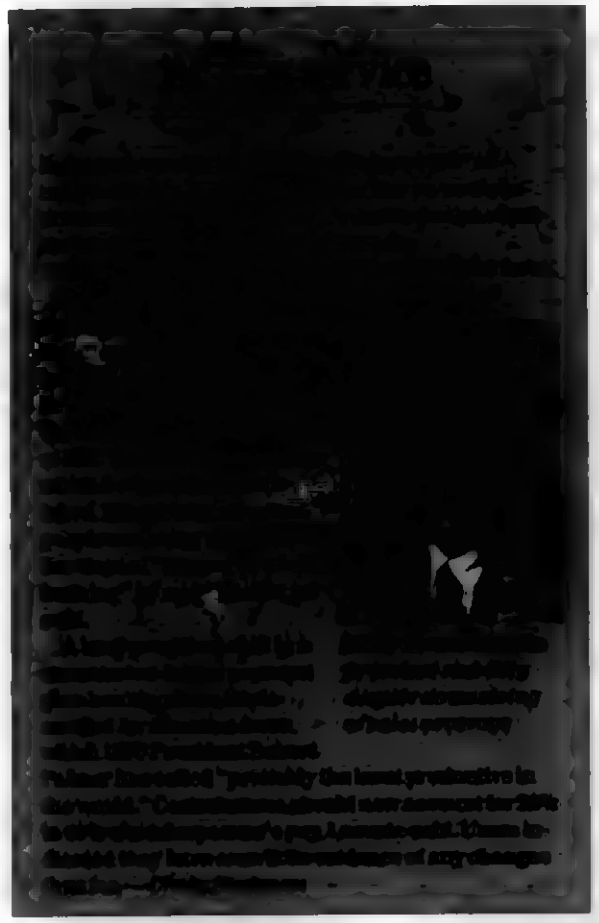
"The salespeople are spread a lot thinner than they were before," noted Frank Brake, director of international operations for technology business development at Newport News Shipbuilding and Drydock Co. in Newport News, Va. "Whether that means we've lost anything is arguable, but we have noticed a significant decrease in attention."

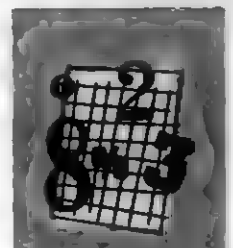
"I think they got rid of some of the babies with the bath water" during the layoff process, added Larry Stiefvater, research principal at the Kraft General Foods Research Technology Center in Glenview, Ill.

The sales reorganization was completed earlier this month, Lucente said. He promised "maximum stability" from now on and said the sales force should be "far more able to articulate DEC's strategy and its product and technical strengths" by October, thanks to a planned "forced-march education" process.

Lucente said he could not give a definite answer on the impact of the downsizing on sales coverage. DEC has enough workers to handle major customers, "but we need to improve our coverage on smaller accounts," where it now will rely mainly on resellers, he added.

People will be looking for the effects of the sales changes — and the other moves made on Palmer's watch — to start emerging in the next 12 months. "Last year was mostly cleanup and behind the scenes," Kerns said. "This next year will be the true test of the people he's brought in and the strategies he's put in place."





Spread too thin?

DEC describes its support for multiple operating systems as a strength, but others are not so sure. "The world typically wants a company to focus on one thing," said Marc Schulman, president of Technology Strategies Group, a consultancy in Stamford, Conn. Evan Ingvar Petursson, vice president and chief information officer at McCaw Cellular Communications, Inc. in Kirkland, Wash., and a strong backer of DEC, said customers "may end up being confused" in a couple years as OpenVMS, OSF/1 and Microsoft Corp.'s Windows NT start to offer similar functionality.

Palmer's gains and pains

Robert Palmer takes credit for meeting a range of commitments as head of DEC, and analysts and customers grant him that credit. However, they said more still needs to be done.

Accomplishments:
- New product and customer business units in place.
- Senior management replenished with outside hires.
- Research and development costs cut 18%.
- Work force reduced by 20,000-plus since last July.
- Losses reduced; Q4 profit expected.
- Sales commission plan in effect.

Still needed:
- Revenue growth.
- Clear corporate strategy.
- Sales force shift from hardware to solution selling.
- Meet Alpha AXP layered software rollout targets.
- Full internal acceptance of new policies.

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Low-cost, low-speed SMDS due

Bellcore hopes to up user response to any-to-any data service

By Elisabeth Horwitt
RED BANK, N.J.

Seeking to jump-start a stalled Switched Multimegabit Data Service (SMDS) market, Bell Communications Research is offering a way for sites with lower bandwidth requirements and smaller telecommunications budgets to take advantage of the high-speed network service.

At least one local and one long-distance carrier plan to offer such a service based on Bellcore's specification by year's end.

Bellcore, a local-exchange carrier research organization, also released a specification by which frame-relay users can gain access to users on an SMDS network.

Bellcore created SMDS in the mid-1980s as a way for its Bell operating company (BOC) owners to provide any-to-any dial-up services for high-speed data applications as they now do for voice.

"We chose SMDS primarily for its flexibility in speeds and the fact that it is more cost-effective than leased-line connections," said Jim McCabe, data networks subsystems manager for the numerical aerodynamic simulation program at NASA Ames Research Center. While frame relay goes up to 1.5M bit/sec., SMDS supports 1.5M- and 34M-bit/sec. rates, with several increments in between.

The other major benefit of SMDS is that the carrier takes care of providing and supporting the network infrastructure, McCabe said. With a T1 or frame-relay circuit, moving or adding a site means tearing down or putting in new circuits, while with SMDS, "you just change [the carrier service] from one location to another."

The BOCs, which once staunchly championed the service against its rival broadband data standard, frame relay, are now supporting the two services as complementary. For companies that have fairly stable connections between sites, frame relay is fine, while SMDS targets companies that are continually adding sites and connections, BOC spokespeople said.

One major problem is the lack of SMDS support from long-distance carriers, limiting the range of the service to within a BOC local access and transport area. With the exception of MCI Communications Corp., which now offers SMDS on a limited basis, no major long-distance carrier has firm SMDS plans.

SMDS targets local-area network-to-LAN connections and industries that are reaching out electronically to their customers, suppliers and partners, such as the medical field, discrete parts manufacturers, the aerospace industry and real estate, carrier spokespeople said. It also makes sense for research, academic and engineering communities that demand ever-faster links for cooperative computing.

But so far, SMDS has failed to take off, partly because it remains a local BOC service with no long-distance connections and partly because it is a premium service for groups that can cost-justify links at T1 speeds or higher, said Rosemary Cochran, a principal at Vertical Systems Group.

A report that Dedham, Mass.-based Vertical Systems released last February said SMDS revenue in 1992 was negligible and will only hit $4.1 million in 1993.

Bellcore's new spec promises to bring SMDS within reach of firms that want SMDS' flexible, carrier-maintained connections without having to pay for T1 access lines and special equipment.

According to Vertical Systems, fewer than 2,000 U.S. organizations had requirements for data-only transport at speeds of 1.5M and 45M bit/sec., while more than 60,000 require data transport of between 9.6K and 1.5M bit/sec.

Users can access the lower-rate SMDS from any router that supports the Digital Exchange Interface (DXI), a digital networking standard supported by all leading router vendors except Cisco Systems, Inc. Cisco will provide DXI with its next software release this fall, a company spokesman said.

MCI, Ameritech Corp. and BellSouth Corp. are among the carriers that have low-speed SMDS plans for this year or next year.

Broadband nets battle on

The following compares features of two leading broadband networking technologies:

SMDS: Connectionless switched service that connects any two users on the fly:
- Public service only.
- Speed: 1.5M to 34M bit/sec.; 56K bit/sec. to come.
- Availability: Most local carriers; MCI plans service by year's end.
- Monthly cost, 1.5M bit/sec. service (BellSouth): $495/month plus cost of a T1 dedicated line.

Frame relay: Connection-oriented; must be set up in advance.
- Public and private networks supported.
- Speed: 56K to 1.5M bit/sec.; 45M bit/sec. to come.
- Availability: Most major local and long-distance carriers.
- Monthly cost, 1.5M bit/sec. service (BellSouth): $435 plus cost of T1 access line; 56K bit/sec. service (BellSouth): $129 plus cost of 56K bit/sec. access line.

NetWare 4.0

CONTINUED FROM PAGE 1

stable than because it is so different," agreed Rick Smith, principal consultant at Synergy Computing, a Del Mar, Calif., value-added reseller (VAR).

Network administrators said they are most challenged by the very thing many users have been badgering Novell to provide: a global directory that enables multiple NetWare servers to be managed and accessed as a single enterprisewide system. They said they want to implement NetWare Directory Services, a treelike structure for accessing users and computing resources across the enterprise. But they said it would take awhile to add the right structure for their needs.

"I think directory services is the only thing that's inherently difficult in 4.0," said Lorie Moukias, project leader at Hoechst Celanese Corp. "It's taken a bit more coordination of our company as a whole than we're used to doing."

For example, one difficult issue was whether to organize the directory by business units or geographic regions "so that people in New Jersey don't have to log onto a server in Texas to be authenticated" to access a particular resource, Moukias said.

The simplest solution, growing the tree out of a company's organization chart, definitely does not work for everyone, Smith said. "How many companies' directory structure matches their organizational structure?"

All for NetWare

Novell has been porting key NetWare Loadable Modules for NetWare 4.0.

Products available now:	By month's end:
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•NetWare SQL	•NetWare host print
•Global MHS	•NetWare SAA links
•NetWare Btrieve	•Flex IP

National Grocers decided on a directory structure that puts very large groups of users in the same domain and counts on them to control access to their own files and resources, McCubbin said. Pigeonholing users into domains goes against the firm's policy of "making all network resources available to everybody."

Avoiding the need to update the directory every time an employee moves to a new department, which happens about once a day in National Grocers' organization of 1,000 users, is also desirable, McCubbin said.

The recently announced NetWare 4.01 is said to repair several of the first release's glitches [CW, July 19], including a lack of synchronization across multiple directories. But early implementors of 4.0 will find limited respite because 4.01 is incompatible with the earlier version, said Glenn Fund, president of the Greater Boston Novell Users Group and principal research specialist at a large New England defense electronics contractor.

Despite these problems, some users emphasized that the glitches are minor compared with the benefits of moving from server-centric to enterprise-oriented NetWare. But the majority of NetWare users said they were content to watch from the sidelines. More than one user balked at implementing the first version of a major new release.

"I am aging my 4.0 like a fine bottle of wine, putting it in the [networking operating system] cellar until it turns into 4.01 and then 4.1," Fund said.

In the works . . .

The following features requested by NetWare users are in the offing, according to vendor sources:

- Novell NetWare 4.1, which is not another glitch fix, but rather an extension of the network operating system's global directory functions to Unix and host environments, according to one VAR source. Delivery is expected by year's end, probably at Comdex/Fall '93 in November, sources said.
- Key NetWare Loadable Modules, particularly for third-party tape backup systems. Cheyenne Software, Inc. now supports 4.0 with its Arcserve product; Legato Systems, Inc. plans to ship its 4.0 version in September.
- The full range of drivers for network peripherals; Fiber Distributed Data Interface (FDDI) drivers are still missing. Novell has promised more FDDI drivers soon but did not say when.
- Better ongoing support and faster notification of new enhancements from Novell. — *Elisabeth Horwitt*

Vines gets wireless options

Users can now link hard-to-reach places over NCR's WaveLAN network

By Lynda Radosevich
DAYTON, OHIO

A wireless "cabling" option was opened up last week to users of Banyan Systems, Inc.'s Vines network operating system. Banyan and NCR Corp. rolled out drivers that let Vines operate over NCR's wireless WaveLAN networks.

The wireless choice should appeal to managers who need to set up Vines networks in hard-to-cable places, Banyan and NCR spokespeople said.

"We certainly welcome Banyan integrating wireless technology into the suite, but I'd be cautious about using it until I'd seen good test cases of [WaveLAN] interoperating with Vines," said Jackson Shaw, president of the Association of Banyan Users International.

Wireless realm

The top vendors in the nascent wireless LAN market in 1992 were NCR with 30.3% of the market and Motorola, Inc. with 18.2%, according to International Data Corp.

To meet that need, Banyan will demonstrate WaveLAN at its executive briefing center in Westboro, Mass., and NCR will train Banyan resellers.

David L. Blair, a computer resource coordinator at the communications college of the University of Illinois, said he plans to use the technology to connect four end users in a makeshift office to a wired Vines server across the street.

Costly connection

Blair said he will spend $2,000 to $3,000, not including the bridging computer, to connect the four users to the wired network. Other options, such as cabling the little-used building, could cost as much as $25,000.

"The thing that puts the rub in the work is that those people might be moving back into the main building," Blair said.

In tests, Blair said the 2M bit/sec. wireless data transfer speeds, which are slower than Ethernet's hypothetical 10M bit/sec. speeds, did not noticeably slow down operations. That is because Ethernet typically operates at around 5M bit/sec. in real environments, so the speed difference is not as great as it seems, according to Blair.

WaveLAN uses spread-spectrum radio frequency in the 902- to 928-MHz range. Paging systems often use the same "space," but Blair said he avoids interference by turning the WaveLAN antennae horizontally.

Drivers for running Vines over WaveLAN are available from Banyan and will be included in the next release of Vines, which is expected in the next few months. The WaveLAN adapter cards and antennae will be sold by Banyan resellers for $695 for AT bus and Micro Channel Architecture computers and portables with Personal Computer Memory Card International Association slots.

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News Shorts

Clinton, Gore view high-wire(less) act

President Clinton, Vice President Al Gore and Secretary of Commerce Ron Brown viewed a series of demonstrations of wireless data technologies set up at the White House last week. The event was intended to drum up support for the president's economic plan, which includes a proposal to transfer, by competitive bids, 200 MHz of radio spectrum from the government to the private sector for use in commercial wireless services. Clinton said such a move would reduce the deficit by $7.2 billion and create 300,000 jobs.

EMC buys into client/server

Building momentum to enter the client/server market in 1994, disk drive vendor EMC Corp. last week said it will acquire Epoch Systems, Inc., a client/server data management systems and software vendor in Westboro, Mass. A spokesman at EMC in Hopkinton, Mass., said the deal was being financed with 4.75 million shares of EMC stock, currently valued at $24.75 per share. Epoch will become a wholly owned subsidiary of EMC, and the acquisition will not affect Epoch's current business, the spokesman said.

CA shipping new accounting modules

Computer Associates International, Inc. has begun shipping updated accounts receivable and accounts payable modules in Version 6.1 of its ACCPAC Plus Accounting package. New features include enhanced invoice entry, check reconciliation and multicurrency capabilities. The accounts receivable and accounts payable modules are available for $795 each, with upgrades available to registered users for $199 each.

Apple to make multimedia moves

Apple Computer, Inc. will attempt to light a fire under the lukewarm multimedia market this week with the introduction of the Quadra 840 AV and Centris 660 AV, new models sporting built-in CD-ROM drives, speech-recognition and video-teleconferencing abilities. Analysts said the new models are an attempt to capture psychological mind share for multimedia, which is expected to get another boost in the spring when Apple comes out with Macintoshes based on the PowerPC reduced instruction set computing chip. The company's Quicktime multimedia development group, however, reportedly took a shot last week when three senior engineers and a consulting engineer left to form a new company that will concentrate on creating multimedia games, Apple insiders said.

SHORT TAKES Lotus Development Corp. last week acquired its fourth consulting firm in the last year: UK-based Database Management Sciences, is a 30-person organization that has developed a proprietary methodology for implementing client/server systems.... AT&T shifted Robert Kavner, group executive responsible for AT&T's communications products, to executive vice president and chief executive officer of the Multimedia Products and Services Group. In addition, the company hired former Wang Laboratories, Inc. CEO Richard Miller as chief financial officer.... Digital Equipment Corp.'s PC business unit has named former JWP, inc. executive Harold Copperman as vice president of U.S. sales and marketing.... Former DEC and Hewlett-Packard Co. executive Kurt Friedrich is joining Tandem Computers, Inc. as a senior vice president and general manager of the systems development group.... Dialogic Corp. in Parsippany, N.J., has formed a technical workgroup to define a special application programming interface for automatic speech recognition software and hardware.

D&B expands client/server

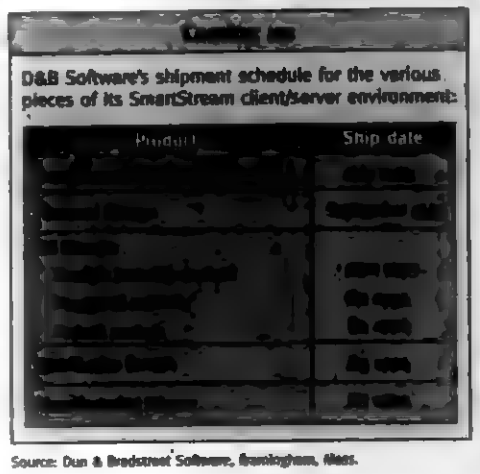
Decision Support 2.0 to ship by month's end; Financial app to come

By Craig Stedman
FRAMINGHAM, MASS.

Two years after Dun & Bradstreet Software began talking up client/server, it is finally on the verge of fleshing out a product line that it hopes will jump-start stalled revenue and keep the company's huge mainframe user base in the fold.

D&B Software last week set plans for shipping a second release of its SmartStream Decision Support package by the end of this month. The company also plans in September to deliver Financial Stream, the first of four planned SmartStream application suites.

Both products received mostly positive reports from beta-test users last week. Human resources, distribution and manufacturing products are still to come in 1994.



D&B Software's shipment schedule for the various pieces of its SmartStream client/server environment.

Source: Dun & Bradstreet Software, Framingham, Mass.

Payback time

Hank Holland, D&B Software president and chief executive officer, said he expects to start seeing a revenue payback from the client/server investment in the SmartStream family this year. However, The Dun & Bradstreet Corp. said the software unit's 1993 sales will still likely be "down moderately" from last year.

D&B Software is building workflow capabilities into SmartStream for managing business processes. It is integrating so-called "best of breed" software from Microsoft Corp., Sybase, Inc. and other firms into its products.

Jennifer Scholz, a software analyst at International Data Corp. here, said D&B Software's integrated approach sets it up as "a kind of one-stop solution," although providing seamless integration "is a challenge."

Tony Percy, vice president of software management strategies at Gartner Group, Inc., a consultancy in Stamford, Conn., said SmartStream "looks like quite a strong offering now," with good functionality and performance, following a "rather muted" first step last July with SmartStream Decision Support 1.0.

That product was meant "more or less to orient early adopters" to client/ server, Holland said. He said he expects more from Decision Support 2.0, which adds query and reporting capabilities based on Microsoft's Access database, plus middleware for moving mainframe data to the Sybase SQL Server relational database used in SmartStream.

Meanwhile, Financial Stream 1.0 will include general ledger, fixed asset and accounts payable functions. Both packages will run on OS/2 servers and Unix systems from Hewlett-Packard Co. and Data General Corp.; short-term 20%-off pricing for 25 users starts at $100,000 for Decision Support 2.0 and $225,000 for Financial Stream.

Federal Express Corp. in Memphis plans to use Financial Stream to manage its fixed assets and is satisfied with beta-test results thus far. "We haven't seen anything from a fixed-assets perspective that the system won't be able to handle," said John Hendershot, tax resources and planning manager.

Fedex, which has more than 600,000 asset records, chose Financial Stream over Oracle Corp.'s financial programs, Hendershot said. He said he expects to save $1 million in annual property taxes right off the bat, recouping the cost of the software in a year.

The company is also testing the general ledger and accounts payable portions of Financial Stream, but it has not committed to use those because of "functional issues" that it is still trying to resolve, noted David Klimetz, manager of corporate systems development at Fedex.

Enron Corp. in Houston has also had good results so far with Decision Support 2.0, which is being used by 30 employees, said Greg Lewis, manager of financial systems services. Altogether, Enron has 150 workers doing ad hoc reporting, and those 30 are more satisfied than the remaining 120 following installation of the software, he noted.

IBM flicks on Taligent switch

CONTINUED FROM PAGE 1

The key piece everyone is waiting for, Kastner added, is the arrival of a distributed object standard, which is expected to be provided by the Common Object Request Broker Architecture specification that the Object Management Group is currently working on.

Ostrom said IBM has yet to determine exactly what features will be in the initial Frameworks. IBM's overall goal is to provide a migration to Taligent not only from OS/2 but also from DOS and AIX by layering a series of Taligent frameworks on top of its existing operating systems.

"We're going to provide a collection of frameworks on top of existing procedural services that will provide developers with a smooth migration to a native Taligent environment," Ostrom said.

Similar in scope

The IBM strategy mirrors Microsoft Corp.'s plans to layer object-oriented services created under its forthcoming Cairo program on top of its Windows and Windows NT environments.

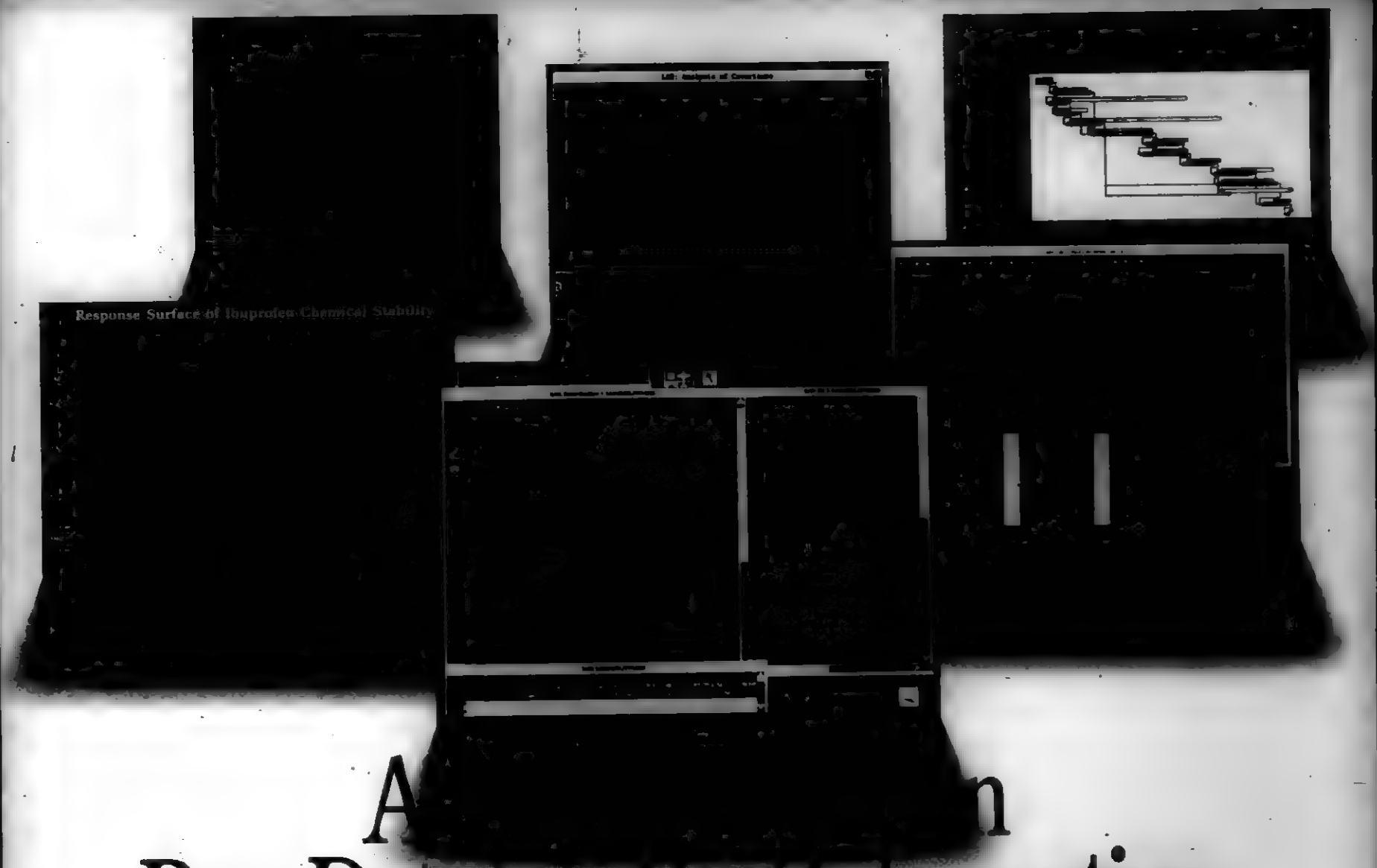
Whether IBM succeeds in its race to compete with Microsoft for dominance of the next generation of computing will depend heavily on how well it can leverage recently made alliances with Novell, Inc., WordPerfect Corp., Borland International, Inc. and Apple [CW, July 5].

"Microsoft's dominance of the desktop does not translate into an ability to create all the object standards for enterprise computing," said Curt Monash, editor of "The Monash Software Letter" in New York.

"The most important thing for software developers is to start building applications that can easily evolve to object-oriented architectures," he said.

In the meantime, IS shops appear to be waiting to see which object-oriented technologies will become major standards.

"We're basically waiting on the sidelines," said David Chan, director of technical standards at the Equitable Life Assurance Society in New York.



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Cellular nets to ride analog voice lines

By Ellis Booker

After more than a year of work, a group of cellular carriers last week released Version 1.0 of Cellular Digital Packet Data (CDPD), a specification for sending data packets over unused channels in an analog cellular network.

The specification was announced last April by nine cellular companies and IBM, which pioneered the approach [CW, April 27]. The technology calls for a hardware/software overlay network on an existing cellular system, which is a way of leveraging the cellular industry's existing $10 billion infrastructure investment.

Although a modem can send data over a circuit-switched, analog cellular system today, this has not been a popular application for users. Only 1% to 2% of cellular phones sold today are used for data applications, according to Herschel Shosteck Associates Ltd., a cellular telephone market research firm in Silver Spring, Md.

But "given it has a ubiquitous infrastructure, we think cellular will be, without question, a major player," said company President Herschel Shosteck, who remains skeptical that data services will grow, as some have predicted, to 30% of all cellular traffic.

The infrastructure technology is not a big deal, according to Roberta Wiggins, assistant director of the recently formed wireless/mobile communications practice at The Yankee Group, a consultancy in Boston. "What is a big issue is coordination and connectivity between carriers," she said.

Until the carriers put in place uniform and linked network management and billing systems, customers desiring a nationwide data-over-cellular network will still need a good deal of customization.

Large customers on record as being interested in data-over-cellular in general and CDPD in particular include Sears, Roebuck & Co. in Chicago and Electronic Data Systems Corp. in Dallas.

Custom system

Last May, United Parcel Service, Inc. (UPS) in Mahwah, N.J., announced it would invest $150 million to deploy a nationwide, data-over-cellular system for its vehicle fleet. The customized network, which involved four cellular providers, gave UPS the "ubiquitous" coverage it demanded. At the time, the parcel delivery giant said it could not afford to wait until CDPD-type services became commercially available.

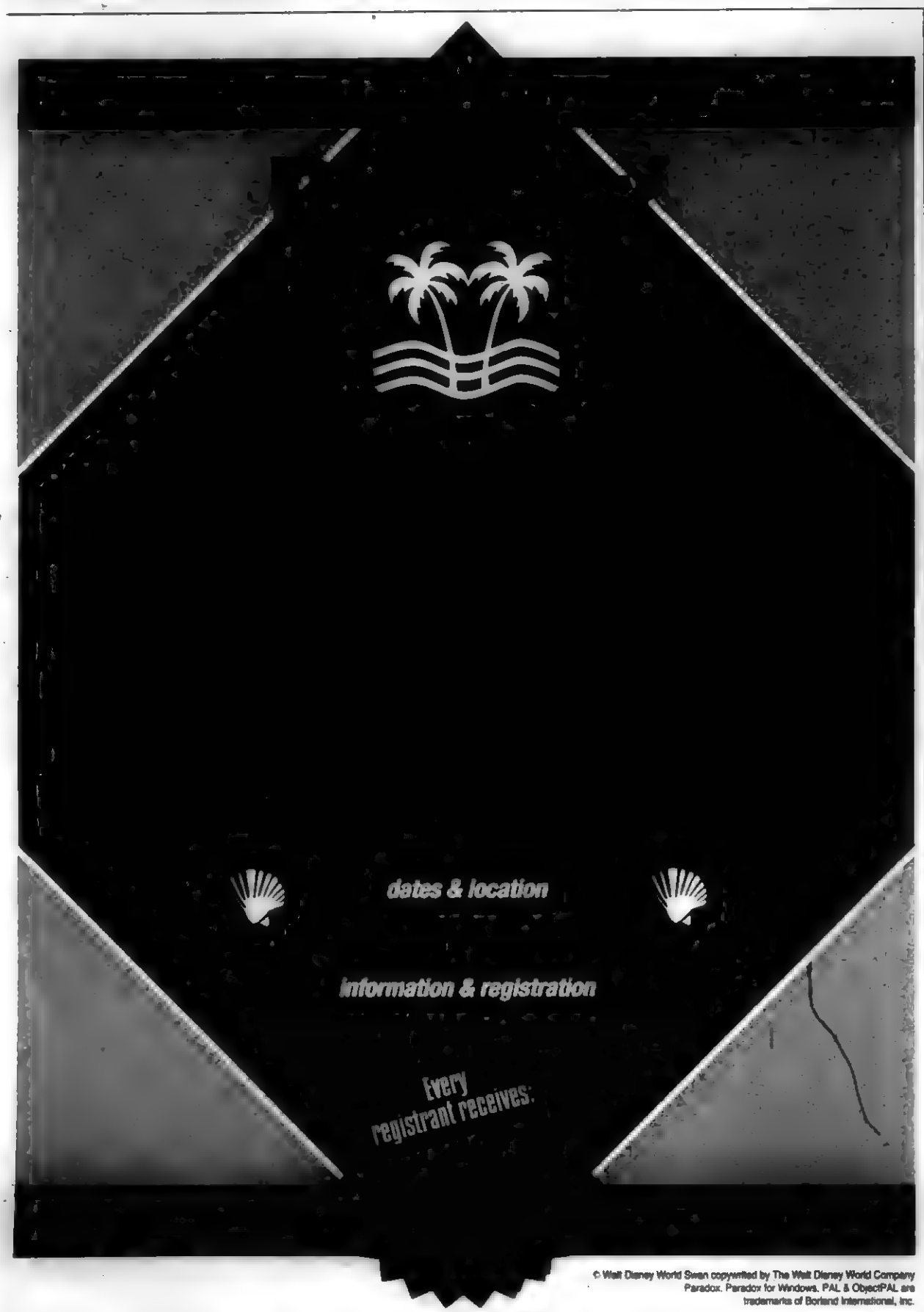
UPS executives were unavailable for comment last week, but several sources close to the company indicated that UPS has said it is considering some form of migration to CDPD services in the future.

For its CDPD deployment, McCaw Cellular Communications, Inc. plans to have the technology in some markets this fall and in all markets by the second quarter of 1994.

This schedule is less aggressive than statements made a year ago, when McCaw officials suggested CDPD-based services would be ready early in 1992.

Commercial services had to be pushed back when the CDPD specification underwent some key design changes, such as making it compatible with the Transmission Control Protocol/Internet Protocol standard, a McCaw spokesman explained.

Supporting the initiative are five regional Bell operating companies — excluding BellSouth Corp. and US West — and network equipment makers AT&T, Motorola, Inc. and Hughes Corp.



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Sun to enter X terminal arena

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Sun Microsystems, Inc. is expected to bow to user requests by unveiling an X Window System terminal of its own design this week.

The introduction, expected widely by industry analysts, would reverse Sun's long-held position that it did not need to sell X terminals — and would make Sun the last major Unix workstation player to offer them. Industry analysts said they expect the X terminal to be presented as part of a broader client/server strategy aimed at gaining more commercial information systems sites for the company.

Sun's apparent turnabout on X terminals was attributed to competitive pressure. "Strategically, they haven't really believed in it," said Laura Conigliaro, a computer industry analyst at Prudential Securities, Inc. in New York. "Their belief was that they could really push workstation prices down significantly enough to close the gap with X terminals."

But X terminals' lower price tags made them the Unix equivalent of the traditional host terminal connected to a mainframe, she said. All of Sun's competitors, including IBM, Digital Equipment Corp. and Hewlett-Packard Co., offer them.

Sun's X terminals are aimed primarily at HP, which has been successful in presenting its Unix servers as mainframe alternatives, said Robert Herwick, managing director of technology research at Hambrecht & Quist, Inc. in San Francisco.

Not a bandwagon

Not every large Sun site is interested in X terminals. Several with big Sun workstation purchases pending said last week they preferred not to comment. Others said they did not need the new X terminals. "We've been shying away from X terminals," said Bill Niemi, director of distributed systems at Fidelity Investments in Boston. "There are issues surrounding the amount of network traffic associated with X terminals vs. the cost savings."

For some large sites, the lack of a Sun X terminal may have prompted the purchase of Unix workstations from other vendors.

"There's an interest on the part of the user to minimize the number of vendors they deal with," noted Jeffry Canin, an analyst at Salomon Brothers, Inc. in San Francisco.

Sun had evaluated whether to buy or build the X terminal and opted to build a unit that looks like a low-end SPARCclassic, Canin said. Though the details were unclear, he said he believes the new X terminal can be upgraded in place to a full-fledged workstation with additional hardware, including a disk drive.

Some users anticipate multimedia applications, possibly even on-line videoconferencing with X terminals. Toward that end, Sun recently demonstrated some video software it plans to ship by year's end. HP's Shared/X option for its X terminals supports real-time videoconferencing at 30 frame/sec., according to HP officials.

X marks the spot

A survey conducted in January by International Data Corp. found that 22% of 150 Unix sites surveyed used X terminals. Worldwide demand is estimated at several hundred million dollars annually.

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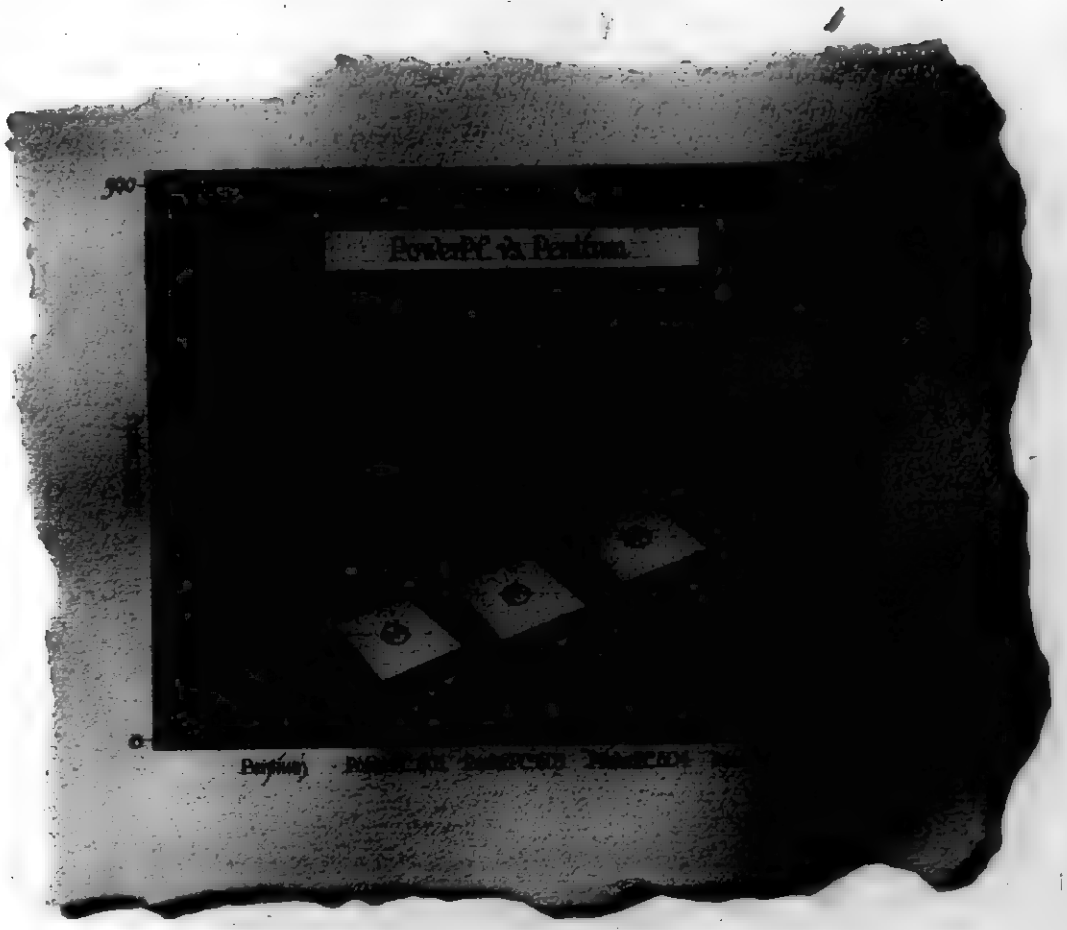

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Life-saving data sharing

Development of electronic patient records paves road to automated health care

By Nell Margolis

When Bob Daniels was rushed to his hospital's emergency room in the middle of a heart attack, critical data about his cardiac history made it to Bob's bedside even before he did.

And the information systems-enabled flow of information that was key in saving his life did not stop there.

With no more time and effort than it takes to get money from an automated teller machine, Daniels' authorization information and medical records were zapped into the hospital's computer system via a "smart card" — a wafer-thin card containing a microprocessor packed with memory.

Through interactive video conferencing integrated with voice-mail, electronic mail and a raft of imaging technologies, specialists inside and outside the hospital consulted on Daniels' case.

With electronic pens, Daniels' doctor updated his records with observations that were immediately available to the electronically corralled medical team via X Window System workstations.

Eleven hours later, Daniels was out of danger. He was the beneficiary of a rapidly orchestrated and highly informed response by a team of professionals and a slew of machines that analyzed his problem and authorized his care in less time than it takes some patients to see a doctor for the first time.

Paramount to such an automated health care facility, experts agree, lies the electronic patient record: a detailed but readily accessible computer-based inventory of every medical event in a patient's life. Such a record would contain critical information such as allergies, family traits and tendencies, as well as data from previous medical encounters. Its proponents say it would allow medical practitioners to avoid costly and inefficient — e.g., redundant — tests and catastrophic mistakes.

Bob Daniels is fictional, but the technology that saved his life is not.

In an on-line video consultation from the operating room, *two physicians view and compare a patient's cardiac status with historical tests*

In fact, Hewlett-Packard Co. — one of the many technology vendors racing to aim products at the white-hot health care market — whipped up the Daniels' story as one of several intended to give health care practitioners and analysts a glimpse of the technology-aided hospital of the near future.

How close is that future? Conservative estimates from health care and IS experts target the end of the decade; more aggressive predictions range from "tomorrow" to three years down the road.

"The technologies are here today," notes Stewart Morick, a partner at Price Waterhouse who specializes in health care technology. "From an interoperability perspective, they may still be in the distant future."

Similarly, an integration gap that keeps the full-tilt electronic patient record at bay could take years to breach, according to HP Labs program director Paul Tang, who sits on the board of the Computer-based Patient Records Institute, a nonprofit organization based in Chicago dedicated to accelerating the advent of the electronic record. "It's hard to overemphasize the need for [communication format] standards," Tang said. "Until we can communicate in terms that all parties understand, we can't communicate."

At the University of Washington Medical Centers in Seattle, for instance, "We've probably got 50% to 60% of an electronic medical record already spinning around on disk drives" somewhere within the organization, said IS Director Mark Gargett — "if only I could get at it . . ."

Other obstacles cited by industry observers and practitioners include storage limitations and legal barriers. In 13 states, Tang noted, electronic records do not satisfy the legal requirements for medical record-keeping.

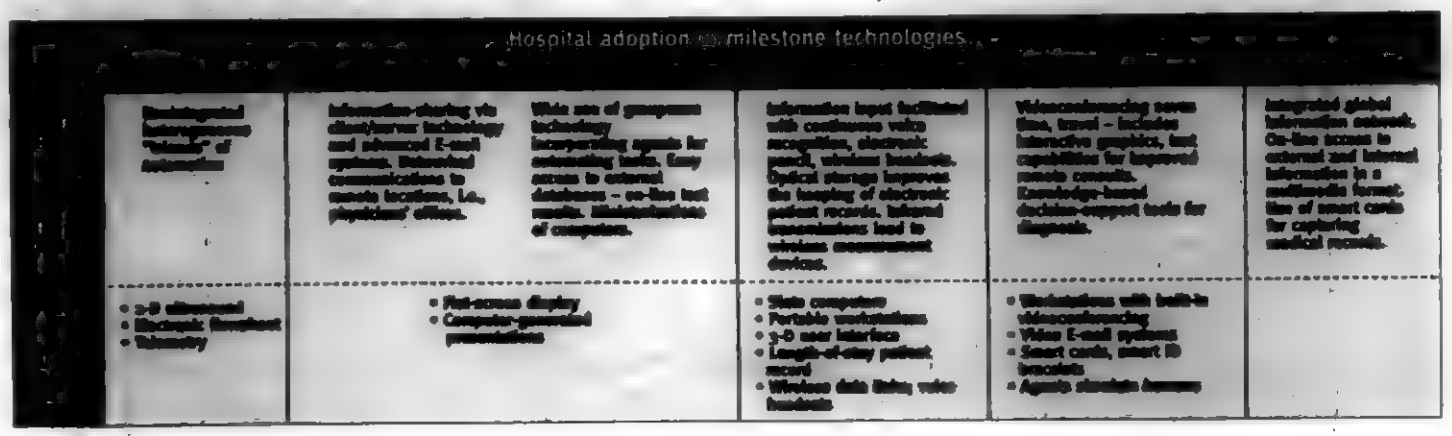
In addition, said Irwin Goverman, chief information officer at Seattle-based Group Health Cooperative, "We haven't really figured out what we ought to be asking of all this information we're beginning to gather." Powerful knowledge-based tools tailored to converting fuzzy data into coherent information would be a big step in the right direction, Goverman said. "But that's probably three to five years out. We're still at the stage of perfuming the pig by making the interface better."

Barriers breaking

But there is good news. For instance, user resistance — often cited as a major barrier to the implementation of network-based technologies — is basically a moot point in the electronic patient record context. A generation of nurses and physicians who grew up with desktop technology, Goverman noted, will better tolerate this advanced technology graft than their senior peers.

In addition, Tang said, every barrier that currently exists is under attack by at least one orchestrated movement. Whether spurred by the imminence of federal health care reform or by the spiraling costs and dwindling quality that have plagued the U.S. medical scene for years, players on all sides of the issue are acting with unusual immediacy.

Perhaps the best news, Tang noted, is that the electronic medical record is not a zero-sum game. While few have it, many are working toward it — and every effort improves the quality of medical care and breeds cost savings.



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Instead of investing in mainframes, Spalding looked for a better way to manage its growing business. A way that would make the 115-year-old sporting goods company more responsive to customer demands around the world and save money at the same time.

So HP developed a networked solution built around powerful HP 3000 Business Systems in a dozen data centers and distribution hubs worldwide. This gives Spalding instant global access to management information, helping them react quickly to changing consumer needs, and deliver products faster.

To learn more, call 1-800-637-7740, Ext. 7460 for our free video, *Strategic Computing*, starring some on-the-ball business leaders. It shows why you might want to rethink your company's game plan.

Think again.

HEWLETT PACKARD

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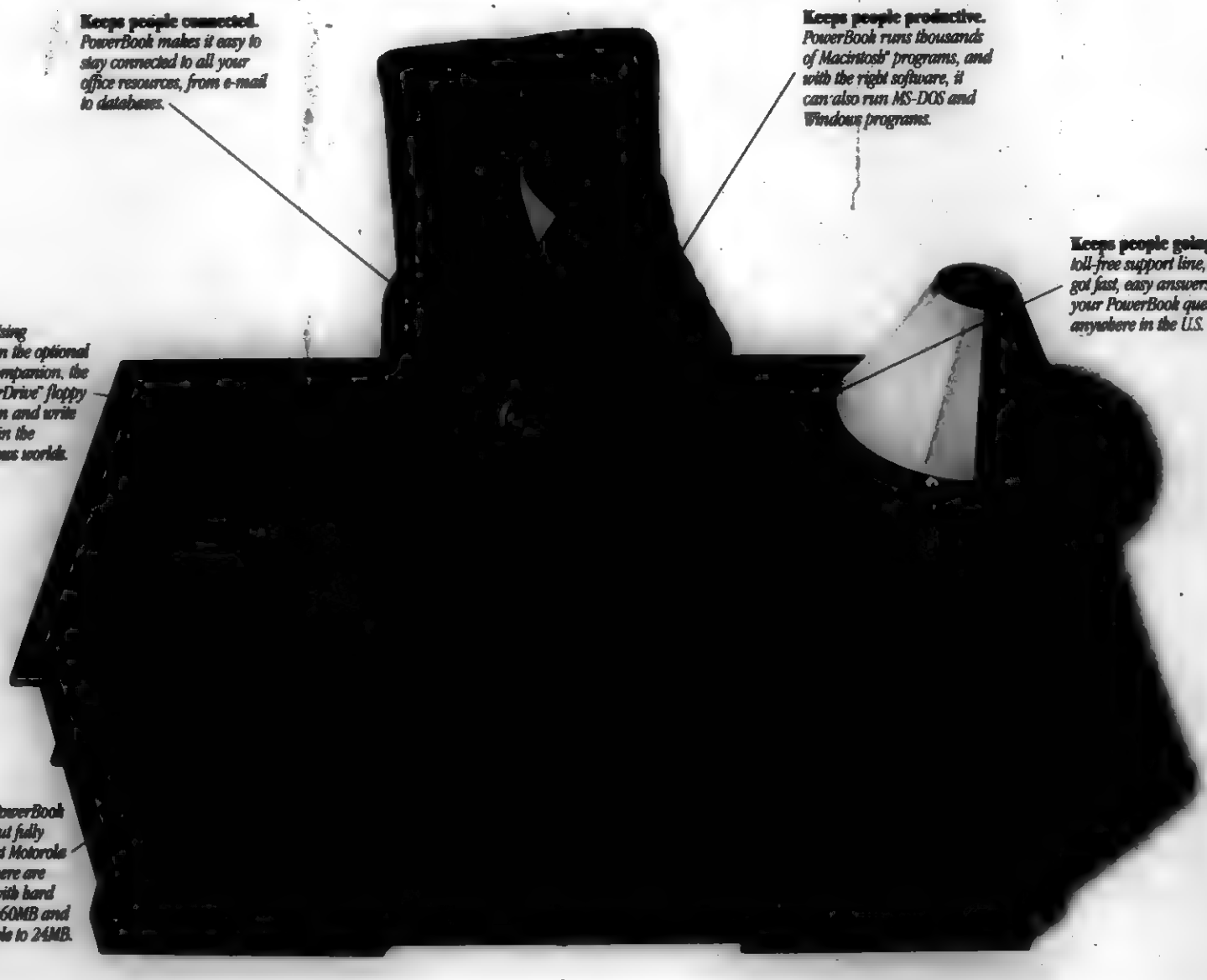
Why PowerBook is popular with people in upper management.



Keeps people connected. *PowerBook makes it easy to stay connected to all your office resources, from e-mail to databases.*

Keeps people productive. *PowerBook runs thousands of Macintosh® programs, and with the right software, it can also run MS-DOS and Windows programs.*

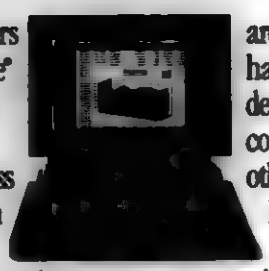
Keeps people going. *With our toll-free support line, you've got fast, easy answers to all of your PowerBook questions, anywhere in the U.S.*

Ready to share. *Using software provided in the optional PowerBook/DOS Companion, the built-in Apple SuperDrive™ floppy drive can read from and write to disks formatted in the MS-DOS and Windows worlds.*

Desktop power. *PowerBook is light and slim, but fully powered. With a fast Motorola 68030 processor, there are models available with hard disk storage up to 160MB and memory expandable to 24MB.*

With hundreds of notebook computers to choose from, business has made Apple® PowerBook™ computers the best-selling notebooks in the country.

That's because managers and business leaders like yourself often approach such decisions with one searing question: "Which one can make our people more productive?"



PowerBook is built upon the premise that people are most effective in their jobs when they have the best tools to communicate. So it's designed to give people a fast, simple way to connect to the office and share data with other computers (including those running MS-DOS and Windows).

Because it has been designed to work so intuitively, PowerBook just makes life generally easier for users. Which in turn substantially eases the burden carried by your computer support staff.

With such a wide range of PowerBook models, you can give all your people full-featured notebook computers that meet their needs. Or you can choose the PowerBook Duo™ System, which transforms from an expandable desktop computer into a 4.2-pound notebook—giving users the best of both worlds.

It's the kind of performance that managers like to see in their companies. As well as in their briefcases.

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Why PowerBook is popular with people in middle seats.

Perfectly comfortable. *With its built-in palm rest and centered trackball, PowerBook is more comfortable to use than any other notebook.*

Ready to help. *We have a toll-free repair line to assist you in securing the fastest possible service for your PowerBook computers, if it's ever needed.*

Flexible choices. *No matter what your needs are, there's a PowerBook with your name on it. Including our affordable new 145B and our newest color models, the powerful 165c and 180c.*

Desktop-compatible. *The optional PowerBook/DOS Companion™ kit makes it easy to work with the MS-DOS and Windows files, printers and monitors you already have. So your investments keep working.*

Ready to connect. *PowerBook has ports for easy connections to external modems and hard disks. And everything you need to share files and printers is built in.*

PowerBook is not only popular with the people who buy their companies' computers, it's also popular with the people who use them. Not just in planes, trains, cars and ferries, but in clients' offices, branch offices and home offices.

That's because PowerBook isn't just a smaller version of a desktop computer system. It's designed specifically to make life easier for people whose jobs tend to take them outside the confines of the office.

PowerBook is a full-featured computer, so it can run all of today's most advanced applications—yet it weighs as little as 4.2 pounds.

Its award-winning design makes it comfortable to use just about anywhere you happen to be.

And unlike the complicated layers of software in notebook computers running Windows, PowerBook seamlessly integrates hardware and software.

But most important, PowerBook makes it easier for people to be productive wherever their business takes them. With AppleTalk® Remote Access and an optional internal fax/modem, users can tie into the office network to access e-mail and servers. Or send and receive faxes.

It's the kind of power that can make people more productive, even when they end up in the occasional middle seat.

The power to be your best.™ Apple

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FTzzzzz

Will someone please wake me when this silly FTC investigation is over?

The Federal Trade Commission, which has been considering some kind of antitrust action against Microsoft for about two years, decided again last week not to decide. The FTC has been deadlocked in a 2-2 vote since February, and all indications are that it can't make any decision. In the meantime, the media-feeding frenzy continues, and the few who care about the outcome of the case are left to read between the lines of what little information has leaked out.

Let's face it: There is no foundation for an antitrust suit against Microsoft. The company's competitors are making that evident even as they posture and bluster in public that something must be done to stop the steamroller from Redmond. Microsoft had the good fortune to be handed a virtual monopoly on first-generation operating systems by antitrust veteran IBM 12 years ago. It has done a good job of maintaining that dominance through shrewd business decisions, not predatory pricing. Users have had their choice of operating systems for a long time; and be realistic about costs: Someone who bought a $3,000 computer isn't going to balk at paying $60 for someone else's operating system.

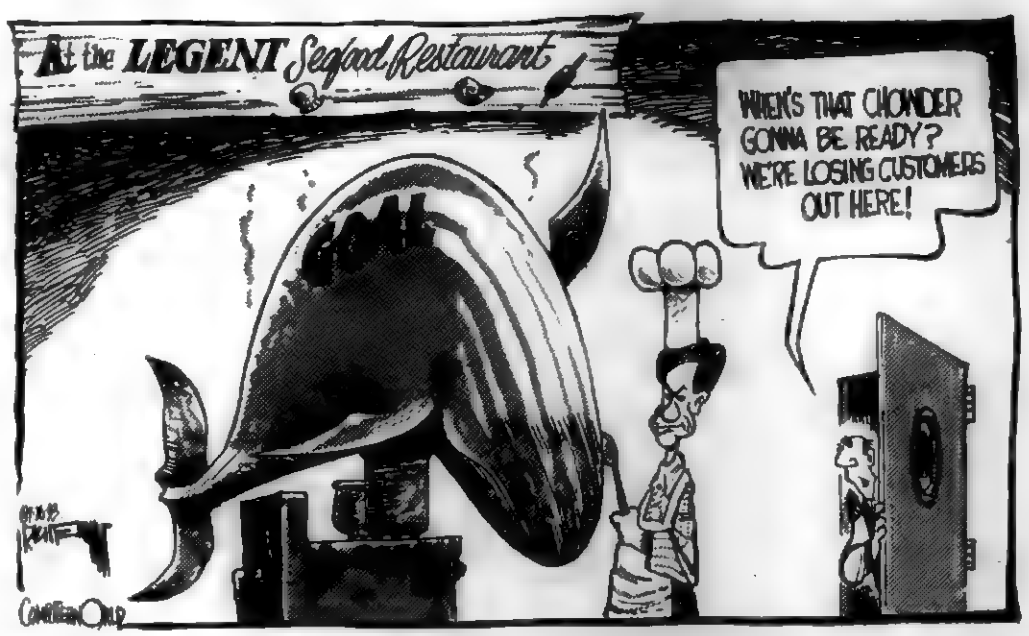
The industry complains about anticompetitive behavior, but it shoots its own case in the head. Every time IBM sends out a press release saying that it's sold another million copies of OS/2, it weakens the argument that Microsoft has a stranglehold on the desktop. Lotus' Smartsuite 2.0 is a terrific product. How could it be so good if Microsoft had an unfair advantage in Windows development? And even Microsoft's most vociferous critics admit that the 32-bit desktop operating system market is wide open, with no player claiming a clear advantage. No monopoly there.

The critics would like to see Microsoft's systems and applications businesses split in two or have Windows source code put into the public domain. That will never happen as long as those same critics can keep creating good products and make healthy profits with the information Microsoft gives them. And most will grudgingly admit that the information they get is pretty good. Every time I see software executives driving Porsches or flying first-class, I wonder how they can legitimately carp about anticompetitive behavior.

Finally, what about consumers? Any realistic antitrust claim has to rest on evidence that buyers face fewer choices or higher prices as the consequence of a monopoly. And in the Windows market, that just ain't the case. The *Data Sources* catalog lists more than 3,800 Windows applications—just 63 of them are from Microsoft. Moreover, PC users have recently delighted in a price war that has given them unprecedented value for the dollar. And when the *Computerworld* Database Division asked a group of IS managers last week whether an FTC ruling against Microsoft would affect their buying plans, 90% said "No."

That's the final word on the Microsoft case. This FTC investigation is a waste of time.

Paul Gillin, *Editor*



Is what you see what you get?

A recent article about the new HP OmniBook portable computer ["HP slims portable to under 5 pounds," CW, June 14] was accompanied by a picture that has been altered so the computer appears to be much smaller than its published dimensions.

The woman's hand appears grotesquely large, and she somehow manages to grasp a 8.4-in.-wide computer easily between her thumb and forefinger. Try it; an NBA basketball player would have trouble.

Showing products in a favorable light is to be expected. Altering the product or picture to fictional dimensions is, in my opinion, fraud.

I respect HP products, but the marketing people at HP should be called to task for this trick. *Computerworld* should either have not published the picture or, better yet, have brought it to your readers' attention.

John Cantlin
Plainfield, Ill.

Graphics should be gender-blind

I was angered that your paper would use a graphic depicted as "male" ["Getting it together," CW, June 21]. Each manager depicted in the graphic was shown with a tie. This smacks of sex discrimination.

A dress or tie is irrelevant to the purpose of the article. It would have been better to show a graphic without any symbolic gender association, so men and women could both feel the article was speaking to them. As far as I'm concerned, this article was addressed to men.

Lately, I've been noticing the male pronoun used all the time in stories and articles that describe people in this business. I'm tired of that. I would like to see the word "she" used more often in your reporting.

Pamela J. Steele
New York, N.Y.

Three cheers for revamped page 2

Thank you for returning to a useful table of contents.

As for the trade-off between comprehensive vs. easy-to-read . . . forget easy-to-read. If I want easy-to-read, I'll look at the headlines on page 1.

What I really need is something that is quicker than flipping every page but will still avoid my missing an important article.

Computerworld contains so much information it is sometimes difficult to find those pieces that I must read. And with very little time, I fear I may not find some crucial article.

George Pajari
West Vancouver, British Columbia

Sense of security

"Insecurity complex" [CW, June 21] gave some good advice. Clearly, treating departing workers with respect, canceling all access privileges and ensuring return of company property are good to do.

However, something that is often overlooked is the security benefit of cross-training and practice among staff.

By having staff rotate responsibilities you incur some additional short-term expense in training, but you minimize the impact of the sudden loss of any single staff member. This includes minimizing the ability of any one staff member to leave time bombs behind.

One client had been reticent to discharge an employee who had responsibility for a general ledger for a subsidiary. The client wisely waited until our team installed a new general ledger before discharging him.

Sure enough, the old system refused to work afterward (when it was no longer needed). The client was off the hook but would have been better served had others seen what that employee was doing and deterred him from laying the time bomb in the first place.

William R. Patterson
Consultant
Stratford, N.J.

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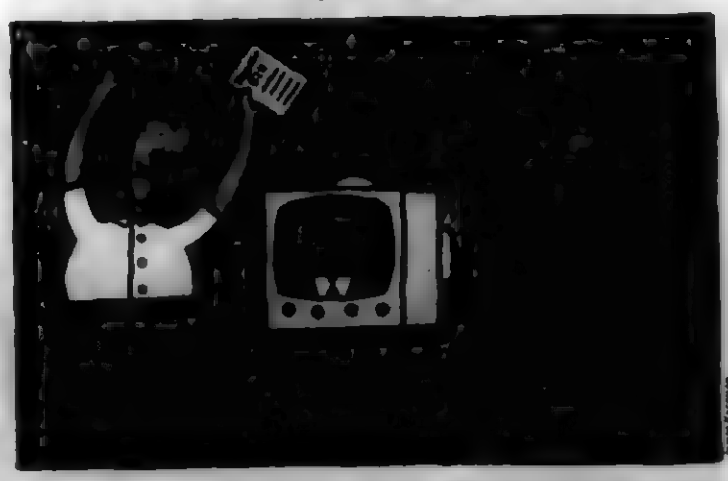
'Do unto others' applies to us, too

Larry D. Runge



For the sake of a point, let me run a scenario by you.

Suppose, right in the middle of the *Letterman* show, your television turns Dave's face pistachio green, and no matter how much you mess with the controls you can't get the color right. You call a TV repairman. He comes out, pulls the back off the set, fiddles around inside while he smokes a couple of Camels, then replaces something electronic.

He closes up your set, charges you $200 and then leaves. You turn the set on and (Can you believe it?) you still have the same !*&%?@ problem! Outraged, you call the shop. They send the repairman back. He repeats his ritual, except this time he manages to correct the problem. Only now there's another problem — he wants another $200.

In righteous indignation, you refuse. He should have fixed it right when you paid him the first time. He shouts about having to come out a second time and spend additional time twiddling with your set. Refusing to listen to further insolence, you grab him by the collar and throw him bodily through the front door.

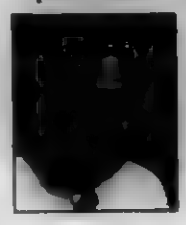
It takes gall to demand payment to redo work that wasn't done correctly the first time. However, those of us in the software world do it to our customers every single day of the week.

The results of a study presented at the Star '93 conference on software quality, held in Monterey, Calif., earlier this year, showed that more than half of all software applications are delivered with bugs in them — bugs that would have been found had the software been tested thoroughly.

I was reminded of a statement made a few years ago by an otherwise intelligent and rational programmer. When presented with evidence that he obviously hadn't tested his program at all, he said, "It's not my job to test it. I just write the code. It's the user's job to test it."

We are truly professional in every sense of the word, yet all too often, we don't bring the professionalism that mechanics, plumbers and TV repairmen (or most of them, anyway) apply to their trades. If they botch a job, they redo it on their own time. If we botch a job, we say, "We're not going to to start that new system next week. We've run into problems on the current project, and we'll have to delay the new one until we get the old one straightened out."

What we *should* say if we code a program wrong, design it wrong or mismanage its development is: "I'm ashamed to say this, but we didn't do this job correctly. We're going to proceed with the new project, but we're going to work evenings and weekends — at no charge, of course — to fix the old one."



When is the last time anyone in your shop said something like that? Think about it.

Runge is chief information officer at Wheels, Inc. in Des Plaines, Ill.

The false promise of objects

FIRE WATCH *by* John Gantz

I actually saw this teaser on the cover of a PC trade magazine: "Objects Promise One-Click Processing."

Gimme a break.

I'm an avid fan of the kind of point and click I get with my Macintosh. And I do believe Windows 3.1 offers a quantum leap over DOS — as long as you don't mind a quantum leap in hardware requirements and programming complexity. But I have my doubts about reaching the promise of objects in this decade.

> The details of building applications with reusable code are stunningly complex.

The sales pitch for objects sounds a lot like what we heard in the 1970s about structured programming. And didn't we learn the hard way the difference between promise and reality? Structured programming worked if it was done right. But it was impossible to do right.

Objects are alluring. Applications programming becomes a matter of linking objects with some sort of point-and-click utility — with no need to learn obtuse programming languages and with previously debugged objects acting as the core building blocks. It's the concept of putting together custom programs from off-the-shelf parts.

In a microcosm, objects work nicely, as programmers using Next, Inc.'s NextStep development environment have found out and as programmers using Taligent's tools will find out someday. And lots of smart people and companies are aboard the objects bandwagon.

The Object Management Group is busy setting standards. Hewlett-Packard is thinking of becoming a partner with IBM in Taligent; IBM, Apple, Microsoft, Novell and Sun are all working on object-oriented programming interfaces and operating system extensions. IBM, HP and Sun are actually sharing object technology — so someday objects will be portable. And on its own, IBM will soon release a distributed version of the System Object Model found in OS/2. Then, objects can pass over networks.

All of that is great, but it's the larger picture I'm worried about.

In the last several months, I've talked to IS managers about their migration plans to new computing styles, and while they mouth the "O" word, they also complain about how hard it is to get their programmers into the object mode of thinking. Many of those with OS/2 liked the System Object Model in theory but lacked the skills to put it into practice.

And in a research effort last year to gauge the size of the market for reusable software — of which objects represent the epitome — I learned that the details of building applications with reusable code are stunningly complex: Do you build an application with lots of little objects or with a few big ones? Do you use third-party objects? If so, how do you know they've been tested and debugged sufficiently? How do you maintain program quality? The questions go on and on.

There are no design rules or standard part sizes and functions here, and there are no numbering or CAD systems with built-in simulation and validation routines.

In the end, I think programming using objects will be just as arcane as Cobol programming or the writing of 1,000-line Lotus macros. It will have all sorts of hidden costs and issues, ranging from liability for objects that fail to documentation and customization. The best performance will come from proprietary objects, as it does from current software, and building programs will remain the puzzle it has always been.

One-click programming? Not a chance.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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Charles Babcock

Power play

Can the PowerPC spawn a line of PCs capable of competing with the long-dominant Intel line?

There are a number of innovations in the PowerPC architecture that indicate it can.

It's hard to conceive of anything that would look like an attractive alternative to an IS manager, who has already had to jockey between the MS-DOS/Windows users and the Macintosh crowd. Instead of adding to the confusion, the PowerPC is going to help rationalize the mix.

For one thing, the future Macintosh line will be based on it, so the System 7 operating system and applications will not be new ingredients. For another, at a minimum PowerPCs will run both Macintosh and Unix software and offer both the Macintosh and X Window System graphical interfaces. If you are a user of Macintosh application services, you will be able to run Macintosh and Unix programs concurrently.

Third, it is likely that Windows NT will be ported to the PowerPC, which will make the vast catalog of DOS and Windows applications available to it as well. With these capabilities, it need only be price-competitive with Intel boxes to have a chance, but, given a lower CPU cost, it may undersell the Pentium crowd.

The PowerPC is the offspring of the IBM/Apple/Motorola alliance that is, to everyone's surprise, on schedule in delivering microprocessors to its participants. To create the PowerPC, IBM moved its successful RS/6000 workstation RISC chip design into the hands of a joint Motorola/IBM design team, which pared back its instruction set and extended it to 64 bits.

The processor reflects its workstation roots; it will match the Intel Pentium in integer performance, but it is expected to outshine Pentium by a 2-to-1 margin in floating-point performance. This will allow for faster execution of scientific calculations and some spreadsheet programs, along with better execution of animated graphics and video sequences.

The IBM/Motorola team has put this performance on a 12mm chip compared with Pentium's 26.4mm. Motorola is using tighter circuitry than Intel and makes the chip with an advanced IBM manufacturing process that uses an extra layer of metal on the chip to carry connector paths to the surrounding pin package.

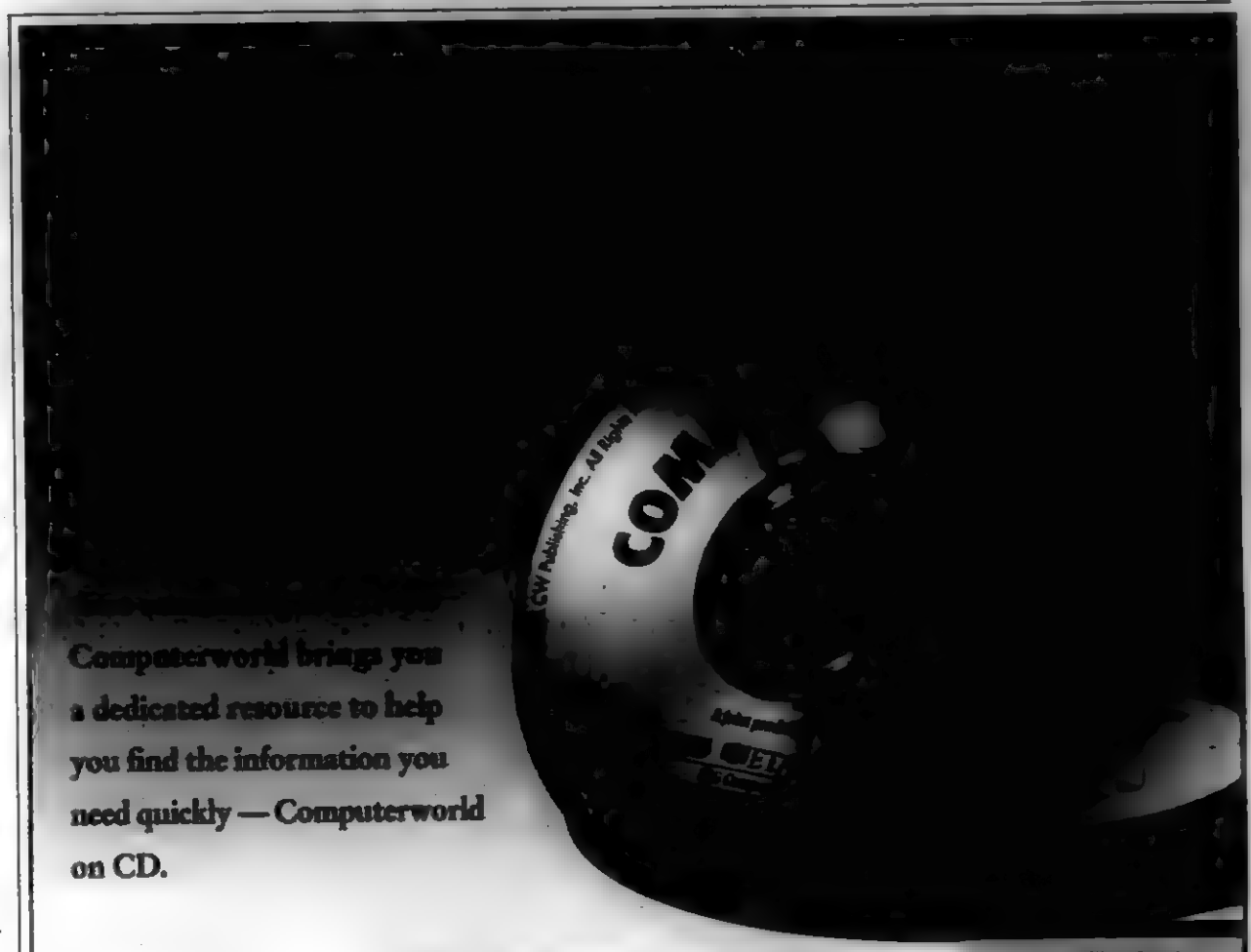
Pentium enjoys an advantage in number of transistors, with 3.1 million compared with 2.8 million, but the PowerPC's lower number reflects the simpler circuitry of a RISC vs. CISC design. Pentium's higher number of transistors includes a mix of CMOS and bipolar transistors. Bipolar transistors run both faster and hotter, which means Pentium at 160 degrees runs 50 degrees hotter than an Intel 1486. If tucked into the tight spaces of today's plastic laptops, the Pentium would yield some Chernobyl-esque effects.

There are other challengers to Intel's desktop reign. One is DEC's Alpha, a remarkable computer design backed up by DEC's manufacturing skills. But too many system designers and software developers are unsure how it fits into the desktop world. For the time being, Alpha is a wannabe rather than a contender.

How serious is IBM about creating a competitor to the Intel family when its Intel-based PC business is one of its few thriving divisions? The answer, I think, lies in the fact that the PowerPC will undermine Microsoft's dominance of the desktop, a goal that IBM cherishes as much as selling more Intel-based PCs.

IBM has quietly set up the Power Personal Systems Division to push the PowerPC. Its alliance with Apple assures PowerPC designers a 10% to 12% share of the desktop market, and in a few years it will be clear IBM and its allies were serious about carving out a larger chunk.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.



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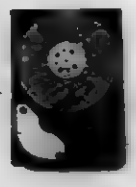

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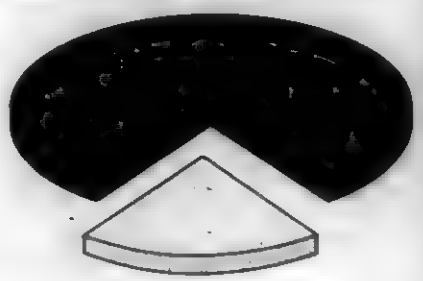

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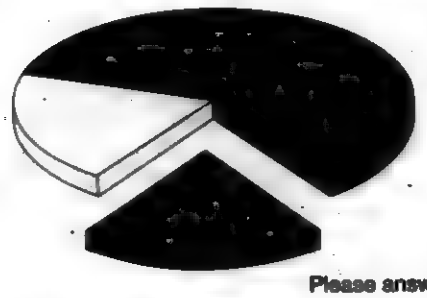

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Christopher Lindquist

Microsoft, get it together

Sometimes you can have too many clients. Microsoft is proving that. Windows 3.1, Windows for Workgroups, Windows NT Standard Edition, Chicago — all are potential client operating systems during the course of the next six to 12 months. The question for IS shops is, "Which one do you use?"

For now the choice is pretty simple. The vast majority of users are on and will continue to work with Windows 3.1. Windows for Workgroups has made a few narrow inroads, but it's hardly the volume leader some Microsoft execs were predicting when it shipped.

Future confusion

Things get a lot murkier if you look out over the next few months, however. Windows NT Standard Edition is slated to be on the shelves come August. The updated Windows for Workgroups should appear shortly thereafter. And Chicago (or Windows 4.0) should ship early next year.

At that point, staying on Windows 3.1 may hurt you in later moves toward Windows NT or Cairo. Windows for Workgroups is being groomed as the current best soul mate for Windows NT, with networking features that still fit on a normal 4M-byte machine and allow easy connectivity to Windows NT workstations and servers.

That's fine. So you should move to Windows for Workgroups if you're going to be working with Windows NT in any depth on your network, right? Well, maybe not. Chicago is coming down the road shortly, too. If you believe Microsoft, it will have the networking functionality of Windows for Workgroups and add preemptive multitasking and multithreading capabilities — and still fit in 4M bytes. That being the case, you should wait for Chicago rather than make a move six months after installing Windows for Workgroups, right?

Hungry giant

That's not what Microsoft wants. Reports are filtering out that Microsoft is doing some serious research into what it has to do to Windows for Workgroups to entice customers before Chicago becomes real, including adding fax support and other features right into the base operating system. Microsoft wants a revenue stream from Windows for Workgroups, and apparently it is going to do whatever it takes to get it.

What some large customers say it *should* do, however, is kill off Windows for Workgroups as

Lindquist, *page 39*

Network security

Users ask for single log-ons

By James Daly

Information systems directors who manage a mixed-platform distributed environment are probably also managing a lot of other things — user confusion about IDs, passwords, log-on sequences and access privileges.

The painful paradox of computer security is that its complexity can sometimes become one of the biggest risks. This is particularly true when electronically slaloming through a complex interconnected environment. The more environments a user needs to access, the more IDs and passwords he must remember. As passwords change, the user's ability to remember and manage multiple passwords — and thus manage security — shrinks.

"You can have the best system in the world, but if everyone is pasting their passwords and log-on sequences on the side of their terminal it doesn't mean very much," said Peter Wild, electronic data processing audit manager at Melville Corp. in Rye, N.Y.

Worthwhile sacrifices

IS technicians who feel they do not want to sacrifice security to simplify it are now turning to a technology moving into mass release: single sign-on.

End users frustrated with an inefficient multiple password approach to computer access have found the single sign-on approach to be a breezy way to travel through various networks and gateways using only a single password.

Single sign-on controls access to the systems on the network through a trusted point of entry. After authenticating the user, the single sign-on utility automates the log-ons to environments that have multiple layers of security. Access is done with little or no subsequent user intervention. The user only needs to remember one user ID and password.

But there is a downside. The key issue in a single sign-on utility is ensuring that the initial sign-on is secure. Unless this can be guaranteed, the entire network is at risk.

Client/server solution

Despite that hazard, single sign-on is a solution many users said could become a key part of crafting a distributed client/server environment. "What we'd like to do is duplicate the type of security we have on a mainframe, but in a mixed environment we've found that's very, very difficult," said Tom DeWald, manager of technical development at Mastercard International, Inc. in St. Louis.

At Melville, two divisions of the $10 billion holding company of retail chains such as Marshalls, Inc. and CVS are currently involved in a single sign-on pilot project using Mergent International, Inc.'s Single Sign-On/Data Access Control (SSO/DACS). "We like the simplicity of

Single log-ons, *page 38*

Single sign-on should meet the following requirements:

Security: It should be implemented as part of overall security and needs to coexist with and leverage other identification and authentication databases on the network.
Flexibility: It should be customizable for multiple security levels and support multiple user ID and password configurations.
Data encryption: There should be no way sensitive information can be extracted for malicious purposes from single sign-on programs or files.
Productivity: It should encourage user productivity and efficiency, not impede paths to data.

Compaq mulls strategy for new desktop line

By Michael Fitzgerald

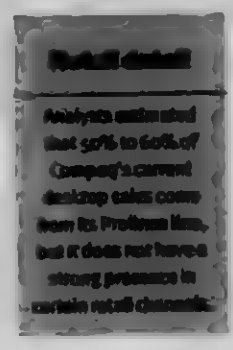
Compaq Computer Corp. continues to try to find the right brand strategy to expand its distribution without worsening its backlogs, and it will add a new brand of desktop PCs in the near future, according to Ross Cooley, Compaq's senior vice president of North American sales.

Cooley discussed Compaq's coming low-end desktop line at the recent PC Expo trade show in New York. Compaq first talked publicly about the line in February [CW, Feb. 15] and expected to announce it during the first half of the year. Problems with its existing lines forced Compaq to delay expansion until its growth was under more control. Sources suggested Compaq will introduce the new line in September.

Earlier, Cooley said the new line would fit beneath Compaq's current low-end desktop line, the Prolinea.

Now, though, Compaq's thinking is that "below Prolinea is quicksand," Cooley said. He said the new line, as yet unnamed, would likely be similar to the Prolinea in terms of configurations and features but would be targeted toward the small office/home office market, a high-growth market where Compaq has not established a strong presence.

Ross Cooley: *New line will be similar to Prolinea systems*



"What little presence they've got there is Prolinea, but really they only have a couple of models in a lot of those retail locations," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. Giusto said he expects the new line to compete with IBM PC Co.'s Ambra clone line, which sources said will appear in the U.S. in August.

The PC Co. sells Ambra in Europe and Canada. The product was designed to be a low-end clone buster, and it does not carry the IBM logo.

How to differentiate

Cooley said the major differences between the new brand and Prolinea would probably be distribution channels and software bundles. For instance, the new line might feature a software-based version of the Encyclopedia Britannica or an auto-answer phone utility. Cooley said CD-ROM drives were a likely option for these systems, as well.

Though Compaq thinks these new machines will have little appeal to its major corporate customers, Cooley said the company will preview the boxes for major accounts in August.

"We're doing some what-iffing here, but if there's a strong response, we could create a corporate version of the box, though we think Prolinea is the deal for those customers," Cooley said.

Single log-ons

CONTINUED FROM PAGE 37

the concept," Wild noted.

Single sign-on products work in a variety of ways. SSO/DACS uses a scripting language to automate the process of ID gathering. Once SSO/DACS is installed on a workstation, it learns each user's ID and password for each environment accessed and pulls them up as needed.

Password request

Fifth Generation Systems, Inc.'s Secure Access Facility for the Enterprise (SAFE) uses a slightly different approach. SAFE creates a restricted access "security kernel" on each PC. This password contains, in encrypted form, all the usual passwords, IDs, log-on sequences and authorizations required to access individual systems.

When users try to attach to a particular system, SAFE prompts them for their single, simple password, checks their access privileges for that system and if they are authorized, logs them on. Managers can create and distribute security kernels from a centralized location, and users can update the kernel to change minicomputer, mainframe and network passwords as required by existing security procedures.

The fundamental method of implementing a single sign-on utility is to work in conjunction with the native operating system facilities, such as the log-on program and the user authentication mechanism.

This provides many benefits, including eliminating the dicey issue of continued compatibility with future releases of multiple operating systems. Managers said it is also the easiest on end users. "We need to have better access to information wherever it exists, not make our users jump through hoops to get to it," said Ray Mueller, president of Management Information Support, Inc. in Lakewood, Colo., which serves as a data processing department for a series of restaurants throughout the country.

A second method involves replacing the native operating facilities with a proprietary mechanism that comes into play each time a user tries to log-on or change user identity. This method, however, could lead to at least temporary consternation from users who run into unfamiliar log-on territory.

Network administrators may also find single sign-on useful in their password management responsibilities. Most single sign-on products automate the process of prompting users to establish new passwords when previous ones expire. The program then stores the new, encrypted password in its database for later use.

Briefs

Intel out from under

The Federal Trade Commission gave Intel Corp. a clean bill of health recently, deciding to close its two-year monopoly investigation of the company without taking action.

NEC autograph system

NEC Technologies, Inc. introduced the VersaPad, a souped-up, renamed version of its UltraLite Autograph system. It now has an 80M-byte hard disk, can support up to 20M bytes of random-access memory and has Communication Intelligence Corp.'s Handwriter Recognition System bundled with it. It also has local-bus video. The VersaPad costs $2,999.

Chip technology licensed

Intel said it would license a chip upgrade technology from the Acer Group. Intel got a license for Acer's ChipUp CPU chip upgrade technology and the right to sub-license it to other hardware manufacturers.

Marketing to Go

Go Corp. will now handle marketing, support and distribution of PenTops and PenCentral networking technologies, which are owned by Sun Microsystems, Inc. subsidiary SunSelect.

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Financial lineup extended to EIS

By Michael Vizard
STAMFORD, CONN.

IMRS, Inc. has enhanced the integration of its executive information system (EIS) for Windows with its financial accounting software to enable end users to analyze financial data drawn from a variety of financial accounting packages.

Called OnTrack for Hyperion, the system is a companion product to IMRS' Hyperion software, which was designed to consolidate financial data taken from a variety of general ledger packages.

For example, Esco Corp. in Portland, Ore., a provider of heavy equipment for the mining, construction and forestry industries, has adopted OnTrack to give its executives the ability to analyze results taken from the more than 11 general ledger packages that are used to track the company's operations in 16 countries.

The EIS package is necessary because while Hyperion provides the means for rolling up data into a central resource, end users still require tools to access that data.

"Hyperion consolidates the financial data, but it still requires a trained user to access that data, which kind of rules out the executive group," said Gary Ogier, corporate financial planning manager at Esco.

Choose a view

According to Ogier, once a month, Esco rolls up data taken from transaction-based general ledger packages into Hyperion, which serves as the company's worldwide general ledger package for consolidated results. Ogier then determines how each executive wants to view that data and configures OnTrack for Hyperion accordingly.

"The nice thing about OnTrack is that it can also be configured to get data from sources outside of Hyperion," Ogier said.

Other features of the EIS package include the ability to support multidimensional views of data and several administrative services for building screens and navigation techniques.

OnTrack for Hyperion is available now. Pricing starts at $35,000 for 10 users.

Lindquist

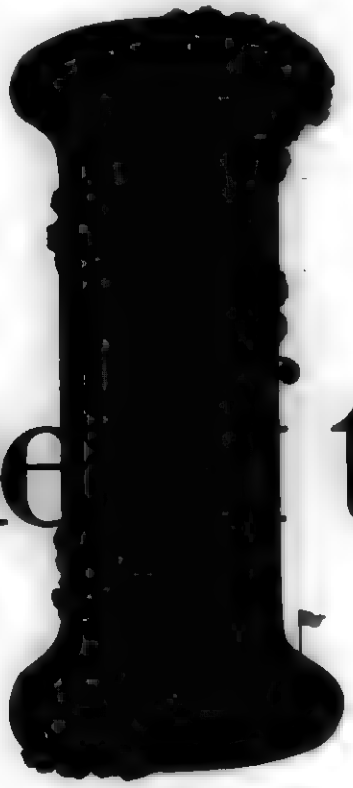
CONTINUED FROM PAGE 37

a product line to limit the confusion. Then it should ship "Snowball," (the Windows for Workgroups beta-test code name) as an upgrade to Windows 3.1 at an upgrade price. Make it simple to either treat Windows as a stand-alone package or as a networked one, but don't make it two product lines. There are discussions along these lines going on inside Microsoft, but reports indicate that Windows for Workgroups is here to stay — at least until Chicago.

Microsoft also needs to be totally up front about Chicago — what it will and won't do and when it will be available. Users will not want to jump from Windows 3.1 to Windows for Workgroups and then to Chicago all within nine to 12 months. That sort of hopecotch costs money.

If Microsoft does not do something to clear the air around its product line, it could become a victim of its own marketing as nervous customers freeze Windows purchases until they are sure of what's coming next. And stockholders and customers don't like companies that fall prey to their own marketing.

Lindquist is a *Computerworld* West Coast correspondent.



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Software suites

Freelance Graphics the right one at Pepsi

By Michael Vizard
SOMERS, N.Y.

While software suites are easily the dominant factor affecting purchases of PC application software, the mere fact that an information systems organization has standardized on a particular suite may not be enough to prevent end users from effectively lobbying IS to support other packages.

Take, for example, the department managers at Pepsi-Cola Co. where Microsoft Corp. applications for Windows have dominated since Pepsi decided to standardize on Microsoft Office.

However, while the majority of the users at Pepsi have adopted Microsoft applications, at least two departments managed to get IS to expand the list of products it supports to include the Freelance Graphics presentation graphics package from Lotus Development Corp., even though Microsoft Office comes bundled with the PowerPoint presentation graphics package.

On the move

Prior to moving to Windows, the de facto presentation graphics package at Pepsi was Harvard Graphics for DOS from Software Publishing Corp. However, when Software Publishing failed to make a smooth transition to Windows, Pepsi began migrating to Microsoft's PowerPoint and Lotus' Freelance Graphics packages.

The folks in Pepsi's market research and finance departments persuaded IS to expand the list of applications they would support to include Freelance Graphics.

"The company came to recognize that while it endorsed Microsoft Office, some clusters of departments have different needs," said Tony Gleicher, a brands research manager at Pepsi.

Gleicher said he favors Freelance Graphics because it is substantially easier to use than other presentation graphics software packages.

"Freelance works more seamlessly with other data because it has an easy-to-use importing structure, and you can basically dream up what you want and execute it," Gleicher said.

In fact, Gleicher said users at Pepsi who have PowerPoint tend to use their presentation graphics packages more frequently than Freelance Graphics users. "A lot of PowerPoint boxes are sitting on shelves," Gleicher said.

However, the fact that some 50 to 60 people within Pepsi are using Freelance Graphics is not likely to push Microsoft out the door.

"Excel and Word are the big horses around here, and I'm sure Microsoft is working on PowerPoint," Gleicher said.

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Macintosh products

Optima Technology Corp. has announced Version 1.6 of DeskTape.

The product is a software package that allows Macintosh users with compatible tape systems, but without the full installation of DeskTape, to access information on DeskTape-formatted digital audio tape and 8mm cartridges.

The software enables Small Computer Systems Interface-2 tape devices to mount as a hierarchical file structure volume on Apple Computer, Inc. desktops, according to the company.

DeskTape software can be used in a variety of applications such as near-line storage. Users can also view movies and still photos, open files and print documents directly from tape.

DeskTape Version 1.6 costs $495.

▶ *Optima Technology*
17526 Von Karman
Irvine, Calif. 92714
(714) 476-0515

Database management

Alpha Software Corp. has introduced Alpha Four Version 3.0, relational database software.

Version 3.0 offers increased power and ease of use for nonprogrammers.

According to the company, enhanced interactive development tools are provided, and key features include the ability to design screens with scrolling windows that display data from linked databases, the ability to enter/edit data in multiple database files from a single data-entry screen and real-time posting of data to external database files during data entry, among others.

A single-user version of Alpha Four Version 3.0 costs $495; the networkable multiuser version is priced at $595.

▶ *Alpha Software*
168 Middlesex Tnpk.
Burlington, Mass. 01803
(617) 229-2924

Systems

EyeTel Technologies, Inc. has introduced Tel-Eye-Vision.

Tel-Eye-Vision allows users to send, receive and annotate both still-video pictures or computer-generated images on-screen during a phone conversation.

The product also has the ability to produce full-motion, full-color videoconferences over high-speed data lines or local-area networks, the company reported.

Tel-Eye-Vision prices range from $495 to $10,000.

▶ *EyeTel Technologies*
206-267 West Esplanade
North Vancouver, B.C.
V7M 1A5
(604) 984-2522

Peripherals

Seagate Technology, Inc. has announced the 3½-in. ST3655, a 540M-byte low-profile hard drive.

The ST3655 is said to have a 12 msec average seek time and uses a 256K-byte multisegmented adaptive cache.

According to the company, a 4,500-rpm spindle rotation speed provides an average latency of 6.67 msec. Advanced features such as spindle synchronization for array implementation are also offered.

The ST3655 provides the necessary I/O performance for multiuser, multimedia and multitasking environments on high-end platforms, the company said.

Single-unit quantities for the AT model cost $775; the price for the Fast Small Computer Systems Interface-2 model is $825.

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Groupware

Conferencing goes on-line

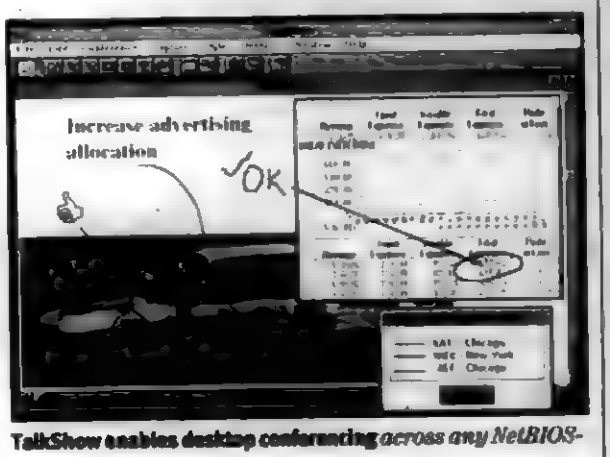
By Michael Vizard
CUPERTINO, CALIF.

Future Labs, Inc. is out to become a player in the emerging groupware market with an offering that interactively links Windows or DOS applications across a network.

Dubbed TalkShow, the desktop conferencing software was designed to allow users to make comments using a pen interface, or change data in an application via a keyboard, and automatically have that change reflected on a user's screen across a network.

This approach differs from traditional groupware offerings such as Notes from Lotus Development Corp., which requires users to close a file before they can ship it to users across the network.

TalkShow is the second groupware offering to target the document conferencing arena in the last six months. Earlier this year, Fujitsu Industry Networks, Inc. in Stamford, Conn., launched an offering called Desktop Conferencing [CW, May 3].



TalkShow enables desktop conferencing *across any NetBIOS-compatible network*

Not necessarily NetWare

TalkShow differs from the Fujitsu software, which requires each user to be on a Novell, Inc. NetWare network because it supports any NetBIOS-compatible network and can be used across modem and Integrated Services Digital Network lines.

"You can initiate a discussion across a network and then bring someone else into that same discussion using a modem," said Future Labs President John Chua. TalkShow also supports Version 1.0 of the Object Linking and Embedding protocol so each user is not required to have a copy of, for example, a spreadsheet to participate in a conference.

However, the Fujitsu offering allows one user to hand over control of the conference to another user to update a remote file.

In addition, Fujitsu claims that its offering sports a more real-time update process for exchanging data, whereas the Future Lab software requires users to update a file and then send a new copy of that file out to other users.

One of the first sites to adopt TalkShow was Electronic Pen, Inc., a design agency in San Mateo, Calif. President Sandy Dhuyvetter said her company uses TalkShow to allow customers to view files on-line and work collaboratively to adjust artwork, rather than faxing low-quality copies or shipping work by overnight express services. "With TalkShow, it was basically love at first site," Dhuyvetter said.

TalkShow requires 4M bytes of memory and is priced at $199.

Informix retools

Promises to better communicate its plans

By Kim S. Nash
MENLO PARK, CALIF.

Informix Software, Inc. let user group attendees in on short- and long-term product plans recently. In broad strokes, the database maker plans to answer user demand for Windows-based tools while cleaning up unpredictable product cycles.

Starting next year, the company plans to put itself on "release trains," a dependable schedule of yearly product blitzes. Informix's historic drips-and-drabs method of releasing new or updated software throughout the year made planning lengthy projects tough for users, said Phil White, chief executive. "This should make things easier," White said.

Products discontinued

Also designed to streamline the buying process is Informix's plan to fold two products into the On-Line 6.0 database engine. Informix-Star and Informix-Net functions will be part of OnLine 6.0 when it ships at year's end. This differs from the approach of rivals such as Oracle Corp., which sells different versions of an engine equipped with different features for varying prices.

With Informix, "not every customer will use every function," White explained, "but they know what they're getting for the price."

A notable feature of OnLine 6.0 is its ability to reconfigure data storage on the fly. For example, when users are removed from a network, the database will automatically reallocate newly freed memory for other tasks. Traditionally, this is a separate, manual process.

Parallel universe

Informix recently demonstrated parallel database technology using OnLine running on multiprocessors from Sequent Computer Systems, Inc., which is helping Informix build the product.

"We like the overall direction Informix is going in and the changes they're putting in place," said John Dynkowski, manager of emerging technologies at Midwest Securities Trust Co. in Chicago. The company recently went live with a Unix-based customer service application that Informix and Hewlett-Packard Co. helped build. Informix "was very responsive," Dynkowski said.

On the tools front, HyperScript and Informix-4GL 4.1 for Windows are supposed to ship by the end of 1993. 4GL++, a graphical object-oriented tool, will ship within 12 months and is being tested now, officials said.

All tools going forward will support Microsoft Corp.'s Open Database Connectivity, Apple Comput-

Informix, *page 44*

Secondary storage can be automated

By Stephen P. Klett Jr.

Analysts estimate that nearly 70% of files on a typical network lie in cobwebs, ignored for months and sometimes years at a time. However, regardless of how often they use them, users want and demand instant access to *all* files on the network, which can create a major headache for systems administrators.

In an attempt to alleviate this headache, Palindrome Corp.'s latest release of its Network Archivist software combines archiving and hierarchical storage management (HSM) capabilities in the same prescription.

Network Archivist NLM 3.0, slated to ship this week, includes support for juke-boxes and optical drives and provides HSM capabilities such as the ability to automatically archive data to secondary storage devices.

The core ingredient of the Network Archivist architecture is rules-based expert systems software that tracks individual files rather than tape directories. File activity records are maintained in a relational database that tracks the migration of files to tape and records when and where they are stored. Files are automatically copied and sent to secondary storage devices and deleted from the server once its capacity hits a high-water mark set by the systems administrator.

Catalyst

IDC analyst Stan Corker predicted that HSM software will spark a dramatic increase in storage management hardware sales. He said only 2,700 tape autoloaders were sold in 1992, which he expects to jump to 56,200 by 1996.

Network Archivist runs as a NetWare Loadable Module (NLM) on Novell, Inc. NetWare-based local-area networks. A base configuration supporting 2G bytes of capacity and including a copy of Palindrome's File Manager software costs $1,695. Capacity can be expanded through the purchase of additional copies of the File Manager software for $795. Upgrades are available to registered users of previous Network Archivist versions for $395.

Palindrome spokesmen said the company would add more HSM features into Network Archivist 4.0, which is slated to debut in October and will include support for Novell's Storage Management Services.

Network Archivist 3.0 is only the second HSM product for PC networks to debut. Conner Peripherals, Inc. was first to market with its Conner HSM for NetWare-based LANs [CW, July 12], which shipped at the beginning of this month. However, Stan Corker, a storage analyst at International Data Corp. in San Diego, said he expects other storage vendors to come out with HSM products by the end of next month.

Far and away

While Network Archivist and HSM have similar goals, Corker said they are at opposite ends of the spectrum right now. "Conner HSM lacks network backup features, while Network Archivist is really known as a network backup product. Eventually, the two will overlap."

Palindrome and Conner are ahead of user demand for HSM at the moment, Corker said, but he expects that to pick up next year as users become aware of the benefits of HSM.

"Right now, the early adopter of HSM on PCs is mostly Fortune 500 companies that are largely run by the MIS attitude of 'we've done it on mainframes, now we'll do it on PCs,'" Corker said.

Forms processing heats up

By Lynda Radosevich

The arrival of several new players in the market has expanded user options for PC-based forms processing. NCR Corp. said recently it will sell forms software and services starting next month, and IBM recently demonstrated forms technology that should ripen by next year.

Forms processing fills less sophisticated administrative processing needs, such as getting travel requests approved, and complements higher end systems such as electronic data interchange, said Krystyna Filistowicz, a principal at Dataquest, Inc. in San Jose, Calif.

Other companies developing forms software for PCs include Microsoft Corp. and Lotus Development Corp. An offering from WordPerfect Corp. is in final testing and will be announced very soon, according to beta-test users.

NCR's package, called Liberty, combines forms development and end-user software from Delrina Corp. and communications software for AT&T's EasyLink global messaging service.

Support for EasyLink means users can send forms over AT&T's wireless cellular network, if needed. Customers can also opt for NCR hardware, installation, service and support.

"A lot of companies are circulating forms internally. This lets them do it between companies," said Randy Popson, manager of NCR's electronic forms group.

The forms software can also be tied to NCR's recently announced ProcessIt routing engine to add automatic workflow capabilities. Delrina is already well-established in the forms market, meaning the main value NCR could add is the robust forms-routing engine, users said.

NCR's Liberty will cost $1,000 for design software and $199 for single-user packs. Support and routing engine software are sold separately, and costs vary by options.

Meanwhile, at PC Expo last month, IBM demonstrated forms technology for OS/2, Windows, Macintosh and Application System/400 machines. Lotus' CC:Mail acted as the messaging engine. The technology that was demonstrated was limited because it did not link into back-end databases and did not allow users to scan in existing forms — features supported by existing forms packages. However, IBM stressed that it is early in the development cycle. IBM also has tentative plans to support Microsoft's mail engine with its forms software.

Informix retools

CONTINUED FROM PAGE 43

er, Inc.'s Data Access Language and SQL Access standards.

Although all future Informix tools will continue to support Unix and the Open Software Foundation's (OSF) Motif graphical user interface, Windows will be the first port from now on, officials said. "Our tools will be more Windows- and NT-based over time," White said. He estimated that a year from now NT products will bring in about 10% of Informix's sales.

However, because the success or failure of Windows NT as a high-level server operating system is impossible to predict, Informix is porting only its SE departmental-class engine to NT for now. Plans for a Windows NT edition of OnLine are up in the air.

Technical support prices are likely to rise in 1994, said Tim Shetler, vice president of product marketing. Price tags, which are now a percentage of the cost of the database engine, will be changed to "reflect the complexity of the service," Shetler said. He declined to give specifics but suggested that current prices are not high enough to cover Informix's costs. The company has revamped support during the past year [CW, July 19].

Officials gave users other snippets, including the following:

•There are no plans to make a graphical version of Informix-SQL, a character-based development tool used for building tables, forms and schema. Doing so would infringe on territory covered by Wingz, a windows painter that uses Informix's HyperScript language. Informix plans to migrate Wingz users to HyperScript tools, said Ron Bower, director of product marketing.

•Informix will not depend on NetWare Loadable Modules (NLM) to propel the company further into Novell, Inc. shops; instead it will focus more on Novell's UnixWare operating system, White said. However, an Informix NLM will continue to be available.

•The issue of systems administration tools that users need for large-scale client/server setups remains unresolved. Informix, like other database makers, is aware of the dearth of nitty-gritty tools such as capacity planners and distributed data management products, Shetler said.

However, like some rivals, Informix has no plans to build those utilities by itself. It will rely on budding standards to pave the rocky ground, including work by the OSF (on the Distributed Computing Environment), Tivoli Systems, Inc. and Hewlett-Packard Co., among others, Shetler said.

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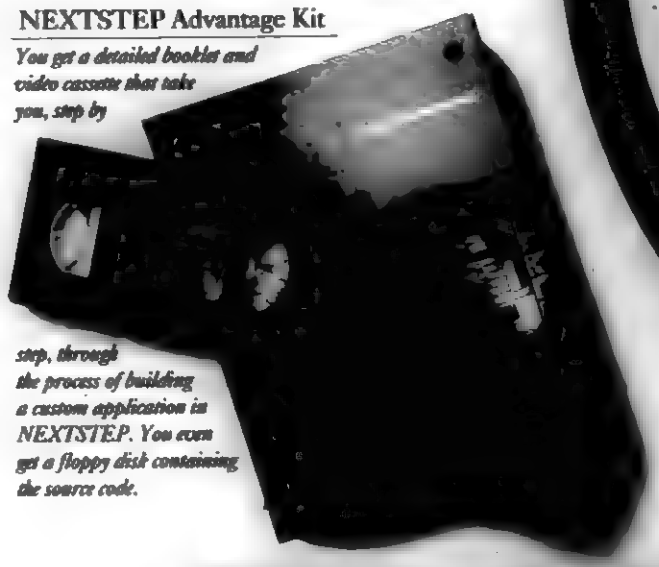

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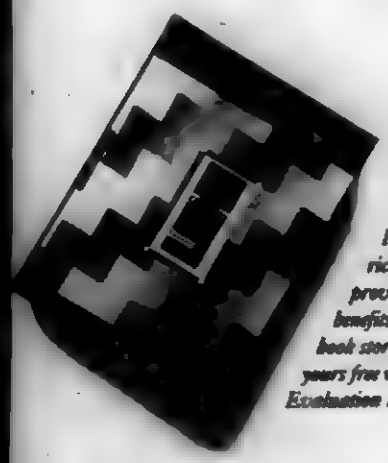

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File servers

NEC Technologies, Inc. has introduced the Express/II Series of second-generation file servers.

The series includes the ST family of Intel Corp. I486 and Pentium processor-based systems and the LT family of single- and dual-CPU Pentium processor-based systems, the company said.

The ST family uses a small tower case plus an NEC system board containing the CPU with a 256K-byte cache, a dedicated Small Computer Systems Interface processor based on Motorola, Inc.'s 68K-bit family, 32- or 64-bit local bus graphics and systems memory. The LT family offers 16K-byte, superscaler write-back cache, accompanied by a 64-bit memory data path to provide maximum CPU performance.

The Express/II ST family prices range from $2,500 to $7,500. Prices for the LT family range from $6,500 to $15,000.

▶ *NEC Technologies*
1414 Massachusetts Ave.
Boxboro, Mass. 01719
(508) 264-8000

Workstations

NCR Corp. has introduced the NCR System 3230 Local Bus, an entry-level workstation.

The product comes in five processor configurations and features 4M bytes of random-access memory, expandable to 32M bytes; three storage bays; three AT-bus slots; two serial ports; one parallel port; one mouse port; 1G-byte maximum internal disk storage; support for 16.8 million colors; bundles with MS-DOS 6.0 and Windows 3.1 and more.

Pricing for the NCR System 3230 Local Bus starts at $1,215.

▶ *NCR*
1700 S. Patterson Blvd.
Dayton, Ohio 45479
(513) 445-5000

Unix

Mobius Computer Corp. has introduced a line of Unix-based, multiuser business systems based on Intel Corp.'s 80X86 processor family.

The Protege M Series consists of three models: the P425IM, the P433IM and the P466ETM. Each is based on open systems standards and offers users a choice of The Santa Cruz Operation (SCO) Unix, SCO Open Desktop, SunSoft, Inc.'s Interactive Unix or Univel's UnixWare preconfigured to users' specifications.

The P425IM is an entry-level system that can handle from four to 16 users and costs $1,399. Model P433IM is an entry-level system that handles from eight to 48 users and costs $1,859. The P466ETM is a midlevel system that is capable of handling 96 users, up to a total of 128 serial devices and costs $3,999.

▶ *Mobius Computer*
Suite 312
5627 Stoneridge Drive
Pleasonton, Calif. 94588
(510) 460-5252

LAN hardware

Standard Microsystems Corp. (SMC) has announced the EtherCard Elite Ultra with SimulTasking, a line of 16-bit Ethernet local-area network adapters.

Features for the Elite Ultra line include an installation utility called Exstart, a Simple Network Management Protocol agent, a 20% increase in performance over SMC's previous generation adapters, driver compatibility with SMC adapters, plus a lifetime warranty.

A single card costs $129.

▶ *Standard Microsystems*
80 Arkay Drive
Hauppauge, N.Y. 11788
(516) 435-6255

Cabling

John Fluke Manufacturing Co. has introduced the 652 LAN CableMeter, a cable testing, verification and certification tool to be used with local-area networks.

Features for the 652 include a 20-MHz measurement range, which enables it to certify 16M bit/sec. Token Ring cabling. Increased memory capacity, longer battery life and a backlit screen are also provided.

The 652 LAN CableMeter costs $2,395.

▶ *John Fluke Manufacturing*
6920 C Way Blvd.
Everett, Wash. 98203
(206) 347-6100

Storage

Advanced Software Concepts has released NetArchive 1.1, a distributed hierarchical storage management product.

NetArchive 1.1 frees up disk space on networked workstations by automatically migrating files that match user-configured criteria from the workstation to mass-storage devices, the company said.

A suite of hierarchical storage management capabilities such as storage system backup, transparent file migration and automatic restore are provided.

A minimum server site license starts at $6,000, and a NetArchive client site license costs $1,100 per operating system.

▶ *Advanced Software Concepts*
Suite 205
2430 Vineyard Ave.
Escondido, Calif. 92029
(619) 737-9544

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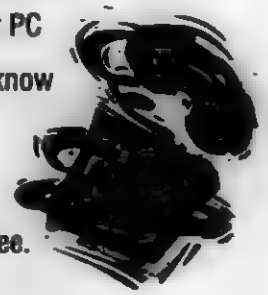

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Wiring schemes

Users weigh copper vs. fiber options

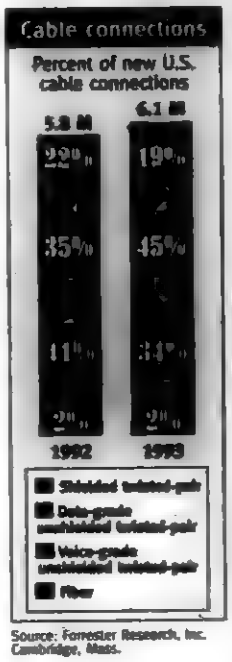
By Lynda Radosevich

With an eye on the future of high-speed networking, the Jet Propulsion Laboratory is upgrading the wiring in the older buildings on its Pasadena, Calif., campus with data-grade, unshielded twisted-pair cable linked to a fiber "backbone."

The lab represents what observers said is a growing trend. Increasingly, users rewiring a building, updating their wiring or building new networks are turning to Category 5 (data-grade) unshielded twisted pair to support current traffic and future high-speed networks. Either Category 5 copper or fiber cabling serve as the backbone. Other common options for cabling to the desktop include Category 3 unshielded twisted pair (see box far right) and shielded twisted pair.

Like other organizations installing Category 5 cabling, the lab's information managers are considering Fiber Distributed Data Interface over unshielded twisted-pair, Asynchronous Transfer Mode (ATM) and 100M bit/sec. Ethernet networks for high-bandwidth applications, and they see unshielded twisted pair as the way to go.

"Based on what's available today and what we'll need for the next five to 10 years, [unshielded twisted pair] to the desktop is good for us because it's cheaper than fiber and will support high-speed networks," said Ted Su, network engineer.



Source: Forrester Research, Inc. Cambridge, Mass.

Common base

A May 1993 survey of 116 companies that use Ethernet and range in employee head count from 100 to 370,000 found that Category 5 deployment will increase from an installed base of 16% today to 46% in two years. Also, 83% of the companies surveyed have Category 5 as a corporate standard, said John Payne, president of JPL Associates, a consultancy in San Jose, Calif.

Bucking the trend, however, are some users who said that copper cabling's ability to support the still-faster networks expected in the future is too uncertain. In order to build the groundwork for whatever may come, they are installing fiber to all users' desktops.

For example, Valley Insurance Co. installed 20 km of fiber cabling to 250 end nodes in its Albany, Ore., headquarters and its Sacramento, Calif., office to support 16M bit/sec. Token Ring now and ATM networks in the future.

The insurance company said it needs wide pipes to the desktop to transport electronic images, which are replacing paper documents in the work-flow process. In the near future, the company would like to allow desktop video-conferencing so that it could "train end users by video at their desks," said Brad Wilber, a project coordinator at Valley Insurance.

Because few vendors have actually been able to load Category 5 copper cabling with 100M bit/sec. worth of data, users said they do not feel secure about copper's future. However, they see no end to fiber's capabilities.

Wilber said installing the fiber was roughly 30% more expensive than Category 5 copper, the Token Ring adapter cards for fiber were more expensive than those for copper, and the installation was more complicated.

However, the benefits of longevity, lower maintenance and higher security meant that the extra costs were justified. "There is no crosstalk when wires cross under a fluorescent light, and you can't tap into it as you can with copper," Wilber said.

To help mitigate costs, the insurance company left the old cable in place and plotted a more efficient cabling plan for workers' cubicles. Four strands of fiber for data traffic and four pairs of copper cabling for voice, modem and intercom traffic run from wiring closets through the space between the floor's dropped ceiling and the real ceiling. The wires then run down through poles and into cubicles. Rather than wiring to the bottom of a cubicle, the company terminates the cables at desk level.

Terminating the cabling at the desktop level "saved us 8 feet per drop, plus users can read the address [on the termination plate], and the people doing the installation were more comfortable," Wilber said.

Method of savings

Some users are finding a new method to install fiber cabling. Called "blown" fiber, the method involves installing a fiber cabling conduit, then using a gun-like device and nitrogen gas to propel the fiber through the conduit.

For instance, the Naval Air Systems Command's headquarters in Arlington, Va., used the blown method to install fiber cabling at four of its buildings. While the costs to install the conduit were the same as using traditional methods, the Navy realized roughly 30% savings in total costs because of the ease of installation, said Commander Craig Luigart, director of information systems.

The blown method installed the cable at about 45 ft/min., or down seven floors in about 3½ minutes, rather than half a day typically needed to install the same amount, he said.

Because the method is new, the Navy ran into unanticipated problems, including getting the cable stuck in the conduit's too tight turns and jamming the cable into spliced areas. However, the vendor, Sumitono Electric Fiber Optic Corp. in Raleigh, N.C., fixed the problems by limiting the diameter of the turns and improving the splicing techniques, Luigart said.

Wiring wisdom

Copper unshielded twisted-pair cabling is ranked by the Electronic Industries Association/Telecommunication Industries Association to perform well enough to support voice (Categories 1 and 2), 10M bit/sec. data rates (Category 3), 20M bit/sec. data rates (Category 4) and 100M bit/sec. data rates (Category 5).

The price of end-to-end cabling includes about 50% labor, 35% to 40% media and components and 10% to 15% "glue parts," according to John Powers, principle at Powers & Co. in Chelmsford Mass.

The price difference between Category 3 and Category 5 cabling is about 5%, and shielded twisted-pair costs about 20% more than Category 5 unshielded twisted-pair, according to Mod-Tap, a cabling manufacturer in Harvard, Mass. Exact pricing variables include labor rates, location, termination equipment and distances between nodes and wiring closets.

'Scalable' Ethernet leads LAN switch moves

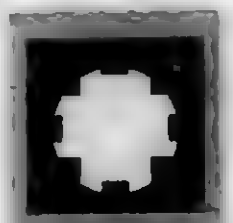
By Joanie M. Wexler

■ The local-area network switch market has barely come up for air in its aggressive mission to tide bandwidth-seeking users over until ultra high-speed communications networks kick in.

During this month alone, Lannet, Inc., Alantec and Synernetics, Inc. have honed their switches in ways that better accommodate emerging multimedia applications, enterprise network monitoring and existing cabling investments.

Huntington Beach, Calif.-based Lannet, for example, began shipping its multimedia-oriented hub, LANswitch, which it demonstrated at the Communication Networks Conference and Exposition, or ComNet '93 trade show, in February.

The high-speed switch automatically prioritizes delay-sensitive voice and video traffic and will eventually house switching modules for all LAN types, said Avi Fogel, Lannet president.


Shula Navon

Forrester Research, Inc. predicts that LAN switching will represent the future of the hub business for the next four years.

For example, the company will ship in September the switch's "10Base-TV" (Ethernet over unshielded twisted pair) module. A 10Base-TV prototype carried full-motion video at the ComNet demo.

LANswitch modules supporting high-speed LANs, such as Fiber Distributed Data Interface (FDDI), Asynchronous Transfer Mode and "fast" (100M bit/sec.) Ethernet, will ship sometime in 1994, Fogel said. However, he did not say when the Token Ring version would ship.

With LANswitch, "Lannet has figured out that users want incremental, cheap bandwidth," said Paul Callahan, a senior analyst at consulting and research firm Forrester Research, Inc. in Cambridge, Mass. "Lannet is giving them something between $125 per port for shared Ethernet and $700 a port for switched Ethernet," today's average costs for the respective technologies.

The 10Base-TV modules will dedicate a full 1.25M bit/sec. to each user for about $250 a port, 2.5M bit/sec. for about $365 a port and a full 10M bit/sec. for about

'Scalable' Ethernet, *page 50*

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James Daly

In the name of worldwide security

Stamp of approval... A group of European IS security experts are busily putting together a commercial accreditation program that may become a model for security compliance throughout the world.

Gary Hardy at Deloitte & Touche's London office said at a recent conference that the European Commission would define standards for minimum acceptable information technology security requirements. With scores of important financial and business decisions communicated electronically each minute, the need for assurances that a specific information system meets its assigned security objectives is critical, Hardy said.

Accreditation would be done by an independent authority, who would review both internal systems and those connected to other systems, Hardy noted. The accreditation would provide a mechanism for giving independent assurance that a specific operational information system meets its security objectives.

The proposed European model is a five-stage plan that includes tailoring the accreditation to the specific system; collecting documents and checking for completeness; a technical review and testing of controls at the level of assurance (low, medium or high) sought from an organization; a report that summarizes those review results; and planning for re-accreditation.

This is one issue that won't go away. As the world's vital information systems grow increasingly more interconnected, the issue of system security will grow exponentially.

No more pencils, no more books... Summer is prime hacker season, top security experts say. It's the period when high school and college students have a lot of time on their hands to reach out and start tinkering with various communications networks and information systems throughout the world. Be on your guard.

Friends in high places... A government spokesman has confirmed that an obscure bulletin board run by the Treasury Department's Bureau of Public Debt has helped computer hackers commit electronic sabotage.

The Automated Information System bulletin board had been established to tell treasury officials how to guard their computer networks. Instead, it became a favorite electronic parking lot for those looking to use the same information for pernicious effects, according to spokesman Peter Hollenbach.

The information has since been erased, but before it was eradicated, at least 1,000 calls from outsiders were placed to the board in the past year, Hollenbach added.

Tip and tricks... Here's an interesting suggestion from the folks at San Francisco's Computer Security Institute. Toner powder, which is found in most laser printers and photocopiers, can be removed from the surface of paper using correction tape. Unlike inks that impregnate the fibers of the paper, the toner only sits on the surface. Pernicious alteration is a snap. For sensitive documents, use an impact printer with inked fabric ribbons or a fixative similar to those used by artists to protect charcoal drawings.

Daly is a *Computerworld* West Coast senior correspondent.

Sniffer moves to internetwork

By Elisabeth Horwitt
MENLO PARK, CALIF.

Network General Corp. has announced the availability of its Sniffer Internetwork Server, which brings expert system-based analysis to troubleshooting high-speed internetwork links.

Sniffer Internetwork Server, the latest addition to the vendor's Distributed Sniffer Systems family, is said to decode local-area network traffic over 1.5M and 2.048M-bit/sec. leased lines, frame relay and X.25 circuits. Reportedly, expert system software proactively detects incipient trouble spots before they become big problems.

The Expert software automatically identifies common network problems such as slow file transfers, misconfigured routers and broadcast storms, Network General said. The software is said to automatically learn network configurations, connections, device names and routing paths in real time and interpret the data in order to provide network managers with useful information.

A centralized SniffMaster Console can provide the user with an overview of multiple internetwork links, each equipped with its Internetwork Server.

The Sniffer server can analyze more than 140 LAN protocols over leased-line Half Duplex Link Control, frame relay and X.25 segments at all seven layers of the Open Systems Interconnect model.

According to Network General, the server can decode the proprietary frame formats used by popular internetworking vendors such as Cisco Sytems, Inc., Wellfleet Communications, Inc., Proteon, Inc., IBM and Banyan Systems, Inc.

Sniffer Internetwork Servers are based on 1486, 25-MHz NEC Corp. units. Pricing is $8,495 for the Ethernet version and $9,495 for the Token Ring verison.

Nynex adds standards to Allink

By Elisabeth Horwitt
WHITE PLAINS, N.Y.

The latest release of Nynex Allink Co.'s Allink Operations Coordinator makes good on a promise to provide a more standards-based, open orientation for the proprietary network management platform.

Allink is a Unix-based product that is said to use artificial intelligence to monitor status, consolidate information and diagnose and troubleshoot problems in multivendor voice and data networks.

Version 3.0 of the product works with Sun Microsystems, Inc.'s SunNet Manager and Hewlett-Packard Co.'s OpenView, two leading Simple Network Management Protocol-based network management platforms. Allink collects management data from 50 platforms, including IBM's NetView, that are geared to managing specific types of networks.

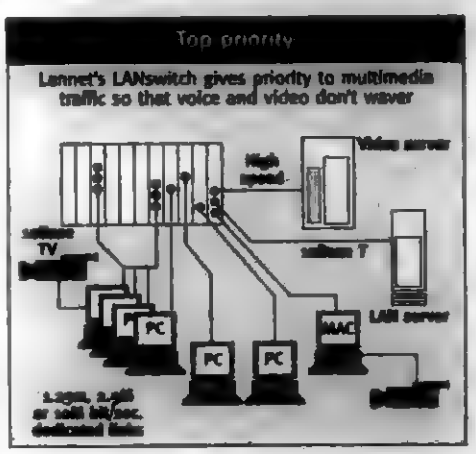
Also provided with the new release is a rule-based editor, a Motif-based system that is said to enable users to develop, customize and modify the rules that govern the display and processing of incoming alarms and events.

'Scalable' Ethernet leads moves

CONTINUED FROM PAGE 47

$637 a port, Lannet said — all sufficient speeds, when guaranteed, for video.

Users likely to be interested in the technology, Callahan said, are firms such as advertising agencies and video production houses, for which multimedia is an everyday business. In addition, Lotus Development Corp. has "been working closely with Lannet" to use LANswitch as a vehicle for integrating video with its Notes groupware package, said Christopher Herot, director of advanced technology for Lotus' Notes team.



Monitoring help

On the management side, last week Ethernet- and FDDI-oriented PowerHub switch maker Alantec bundled a feature it calls Port Monitoring into its latest software release. The feature allows users to plug any Ethernet protocol analyzer into a single PowerHub port and collectively monitor all Ethernet and FDDI segments across an entire internetwork, said Yancy Lind, director of marketing at the San Jose, Calif., firm.

Port Monitoring is an alternative to carrying protocol analyzers around to each LAN segment or installing pricey industry-standard Remote Monitoring agents on every LAN segment, Lind said. For monitoring FDDI, the PowerHub translates FDDI packets to Ethernet packets.

Alantec customer Ken Hays, a network administrator at Florida State University in Tallahassee, said that while the centralized orientation of Port Monitoring "may be desirable," users should take into consideration how loaded their networks are before further saturating them with protocol-analysis traffic.

Also, "if there's a lot of activity on the [100M bit/sec.] FDDI, how is it going to fit on a [10M bit/sec.] Ethernet port?" Hays wondered.

Lind responded with a recommendation that users doing heavy monitoring configure their networks with a separate Ethernet dedicated to that traffic to keep the rest of the internetwork uncluttered. "And if you're running lots of FDDI, this won't replace the need for an FDDI analyzer," he acknowledged.

Meanwhile, Alantec's main competitor in the Ethernet/FDDI switching hub market, North Billerica, Mass.-based Synernetics, said it will ship in December a wiring module supporting shared FDDI-over-copper LANs for its LANplex 5000 hub. The $862- to $1,479-per-port module allows end stations on Category 5 unshielded twisted-pair wire to communicate through the hub at 100M bit/sec.

The bandwidth, however, is shared, not switched, as is the hub's Ethernet communications, explained Dave Tolwinski, vice president of marketing. This renders the per-port price for 100M bit/sec. desktop speeds less expensive than Synernetics' $1,500- to $1,700-per-port switched Ethernet prices. The Ethernet end stations communicate over three internal 100M bit/sec. FDDIs in the LANplex hub.

The Choice Is *YOURS*

When It Comes to Database Technology,

Digital Provides You with *Freedom to Choose*

By Gareth Tooke, Manager
Database Partners Program

The world of computing is becoming increasingly open. And businesses aren't looking back. In fact, they're looking ahead — and demanding more.

You don't want to be locked into any technology component that you can't change, including your platform and your operating system. It's no surprise that your database is also a significant and key component of the solution you're looking for.

In selecting a database, you have made your requirements known.

- Many businesses operate one or more database technologies across their IT infrastructure. Therefore, you need to be sure that the database products you purchase will interoperate and integrate with your existing IT environment.
- You want to be able to change database technology when and if the need arises.
- Most important, you want to ensure that the technology you acquire takes full advantage of your particular computing environment.

In short, you're asking for freedom, flexibility, and maximum performance.

To that end, Digital has joined forces with industry-leading database vendors such as Informix, Ingres, Oracle, Progress, and Sybase to architect the very best solutions for your business needs.

Digital's Database Partners Program Enhances Database Technologies for Your IT Environment

Imagine high-performance, distributed database technology that's well-integrated with the information technology you purchase today. Then imagine using this technology to access information from anywhere in your company — quickly and reliably.

Digital's Database Partners Program is making this scenario a reality. And our customers have played a significant role. You let us know which database technologies were critical for your business, and we, in turn, developed the technology and business partnerships with key vendors to optimize your choices.

The program follows a basic premise. It tightly couples Digital's and our partner's capabilities — resulting in an optimized technology set. And, it's successful because we've established one place where our partners link directly to our development organizations, receive assistance in handling business needs, and participate in programs to promote these new enhanced product sets.

So, how do you benefit? By bringing all these together in one location, Digital, along with our partners, can produce optimum sets of solutions for your business — a vast portfolio of solutions that gives you the freedom to pick and choose according to your specific business needs.

Digital's Database Partners Are Looking to the Power of Alpha AXP Technology

Gone is the classic definition of a database as a repository for data on only one computer system. If you want to distribute different databases safely across many systems — within your office building or across the ocean — this choice is now available.

With all the downsizing, rightsizing, and reengineering of applications going on in the business world, it's a trend that has caught on. It's called open client/server computing. Open because the technology components are interchangeable and interoperable; client/server because computing is being distributed across a whole range and size of platforms. And popular because of its flexibility and cost-efficiency.

Today, database technologies are designed to run in many environments. What's more, Digital's database partners are taking advantage of Alpha AXP power by offering products on a range of Alpha AXP systems — from PCs running Windows NT to mainframes running OpenVMS or OSF/1.

In fact, using standard benchmarks — both in the uniprocessor and multiprocessor categories — Digital has broken all records by teaming the Alpha AXP platform with database enabling technologies.

Digital's 64-bit RISC architecture provides for huge memory addressing — enabling databases that typically had to reside on a disk to reside now in main memory. Since the slowest part of any transaction is disk I/O, this has enormous implications for the speed at which these databases function.

Currently, we're working with our key database partners to optimize the Alpha AXP architecture for database technologies. This effort will give our customers even more freedom to:

- Distribute across multiple platforms
- Distribute across fewer platforms that are multiprocessor-based for higher performance and improved availability
- Cluster applications and technologies together for improved availability.

Customers have been asking Digital for help to create solutions that include database products from Informix, Ingres, Oracle, Progress, and Sybase. We've responded with enhanced partnerships to help you solve your business problems.

Ultimately, within your client/server environment, you can implement servers that are optimized for specific business requirements.

For information on integrated solutions from Digital and our third-party database partners, call:

Johanna Chuang at Informix Software, Inc.: 617-273-0600

Jeanne Elrod at Ingres Corporation: 510-748-2542

The Oracle Corporation information HOTLINE: 415-345-5267

Jeri Batina at Progress Software Corporation: 617-280-4930

Dwight Chen at Sybase, Inc.: 510-596-3500 ■

PUTTING IMAGINATION TO WORK

Imagine the freedom to choose from a range of technology options. digital

The GOOD WORD on Alpha AXP Technology

Digital's Database Partners Have *Plenty to Say*

Jerry Baker, Senior Vice President
Product Line Divisions
Oracle Corporation

Oracle Corporation believes that Digital's new Alpha AXP architecture has the potential to become an industry-leading open system platform. The powerful combination of ORACLE on Alpha AXP systems further strengthens our position as the leading provider of corporate OLTP solutions.

David Pearlstein, Vice President
Worldwide Operations
Sybase, Inc.

With Alpha AXP technology, Digital is becoming a leader in delivering high-performance, commercial 64-bit systems. The combined Sybase and Alpha AXP solutions will become a premier performance combination for enterprise-wide client/server solutions.

Informix has set ambitious goals for technical advancement and we expect the Alpha AXP architecture to contribute significantly to these goals.

Gilber Wai, Vice President
Product Development
Informix Software, Inc.

Marc DiMarzio, Vice President
Product Marketing
Ingres Corporation

Ingres' support for the Alpha AXP architecture builds on our long-standing relationship with Digital. We feel this architecture will be a key component of open systems client/server architectures in the future.

PROGRESS, combined with the scalable architecture and strong price/performance of Digital's Alpha AXP systems, gives application developers the power and flexibility to rapidly build and deploy client/server-based mission-critical applications. Users of Digital's Alpha AXP systems will have access to thousands of commercially available applications based on PROGRESS — giving users transparent application deployment and interoperability across a wide range of platforms.

John Wark, Vice President
Marketing and Development
Progress Software

Over 2,500 Alpha AXP Applications Shipping Now

FREE Catalog Gives You the Full Story

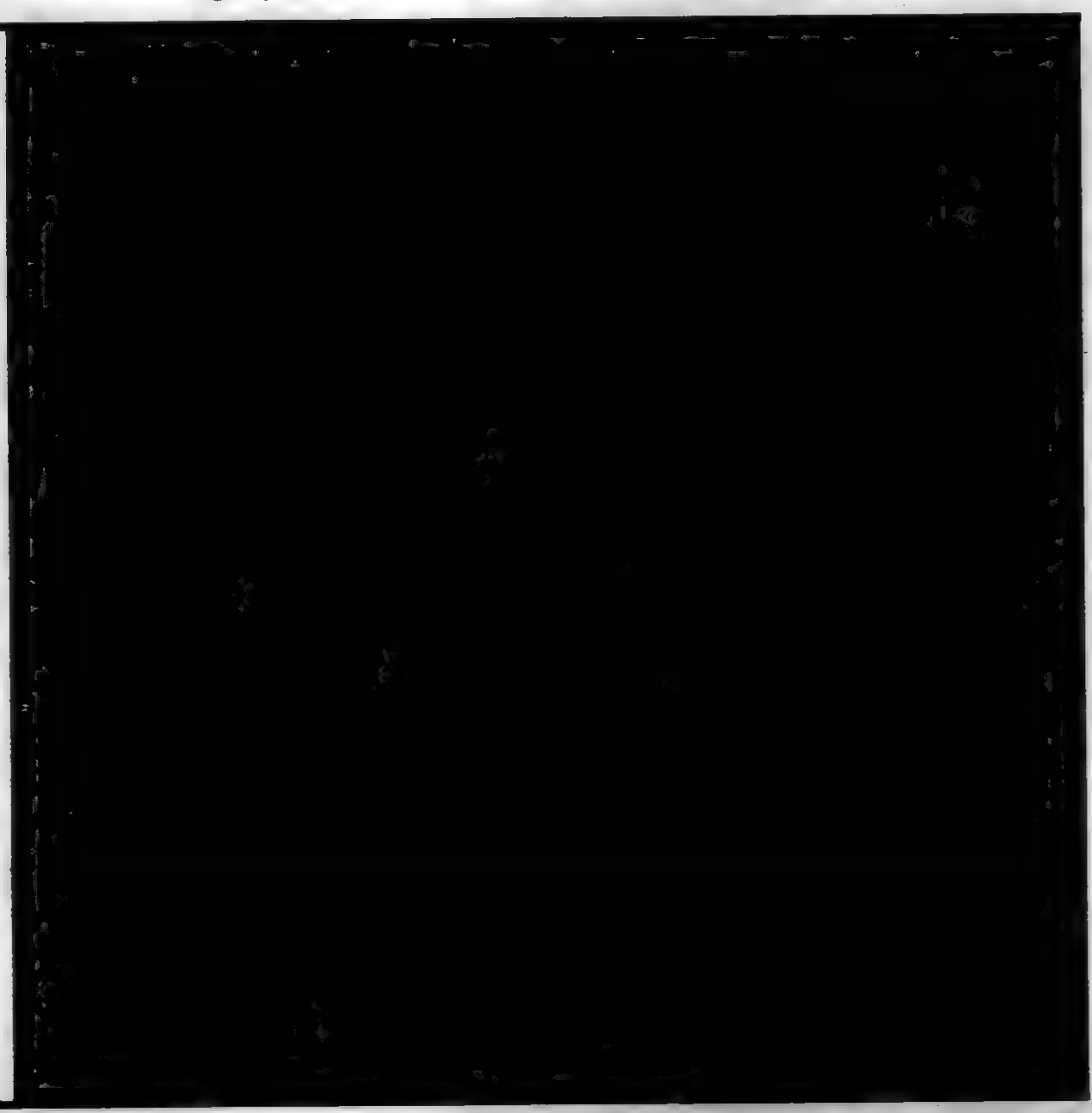
If you've been looking for the right application to run on your Alpha AXP system, your search is over.

Since announcing the first Alpha AXP systems in 1992, Digital and its software partners have ported more than 3,000 applications to the OSF/1 and OpenVMS Alpha AXP operating systems. More than 2,500 of these applications are shipping right now. You'll find the most popular software products in every category, including office systems, databases, software development tools, and engineering applications.

And now it's easier than ever to find out exactly what's available. You are one phone call away from receiving Digital's "Alpha AXP Software and Applications Catalog" — a free publication that provides you with address, contact, and shipping information on Alpha AXP application software.

Here's a sampling of some of the industry-leading applications shipping today. But this is just a small portion of what's available. In fact, applications are being added at a rate of hundreds per month.

To get your FREE "Alpha AXP Software and Applications Catalog" (part number EC-J2294-10), call 800-332-4636 and reference ext. 20. ■



Imagine the best solutions for your business needs.

Digital's Family of Solid State Disks Keeps Getting BETTER AND BETTER

NEW PRODUCTS, NEW FUNCTIONALITY, GREAT PRICES

You've heard about the many features of Digital's solid state disk, including:

- Lightning-fast I/O speed
- The ability to plug and play just like magnetic disks
- Unparalleled availability features such as redundant components
- Nonvolatile storage — Digital's solid state disks offer an integrated Data Retention System that protects data against loss in case of power failure.

But there's a few things you may not have heard. Digital is making it easier than ever for you to take advantage of our storage products — by adding SCSI solid state disk to the family, by increasing ESE50 solid state disk functionality, and by reducing prices on selected models.

Meet Digital's Open, High-Performance SCSI Solid State Disk

Digital's solid state disks provide the highest I/O performance for businesses requiring immediate application response time. At up to 100 times faster than magnetic disks, the access time of solid state disks:

- Increases user productivity
- Accelerates time-to-market in development environments
- Increases the throughput of revenue-producing applications.

Specifically, if you're making the switch to SCSI devices, if openness is a key issue for your business, and if price plays a major role in your selection of a solid state disk, Digital's newest SCSI solid state disk is the best high-performance storage solution for your computing environment.

The latest addition to Digital's family of storage products, the SCSI solid state disk is a 5.25-inch device that "plugs and plays" in HSC and StorageWorks enclosures, our family of modular storage subsystems. It's as easy to implement as a magnetic disk and requires no software rewrites or operational changes.

Most important, because our SCSI device supports the SCSI 2 common command set, you can build an architecture that is truly open.

Support for OpenVMS, OpenVMS AXP, and OSF/1 is provided, allowing implementation on systems ranging from standalone to clustered.

What about price? Digital's SCSI device has the best entry-level cost among our family of solid state disk products.

SCSI Solid State Disk	Price
EZ41R-AA (107 MB)	$14,900
EZ54R-AA (428 MB)	$50,000

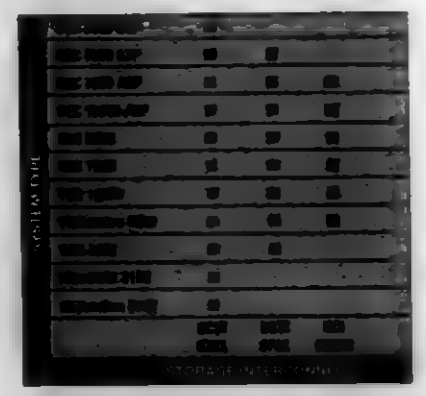
ESE50 Solid State Disk: More Functionality at Less Cost

Easy to use and easy to implement, the ESE50 solid state disk is easily a price/performance leader — now more than ever. What's more, you pay less for more.

Now, the entire family of ESE50 solid state disks — including the ESE50 1-gigabyte model — boasts an integrated Data Retention System.

By automatically writing data from the solid state disk DRAM to the integrated hard disk during a power outage, the 1-GB ESE50 creates safe, secure, nonvolatile storage for your most critical and valuable data.

In short, the 1-GB ESE50 solid state disk provides you with the highest capacity in the smallest form factor — with the highest availability and performance.



When it comes to solid state disk options, Digital delivers solutions that cover a wide range of computing systems — from VAX to Alpha AXP systems.

What's new in solid state disks? Plenty.

Find out about the SCSI solid state disk — the newest member of Digital's solid state disk family. And get the latest word on the increased functionality and reduced cost of our ESE50 product line.

You've heard about the increased functionality; now take a look at the savings:

Order #	Old Price	New Price
ESE50-BA/BB (600 MB)	$130,000	$105,000
ESE50-CA (120 MB to 600 MB Field Upgrade)	$110,000	$80,000
ESE50-DA/DB (1 GB)	$180,000	$135,000

To order Digital's solid state disk devices, call 800-DIGITAL (800-344-4825), press 1, and reference BDW. For technical assistance, press 2 and reference ext. 77W. ■

From Coexistence to Migration: Digital Gives Wang Customers A WEALTH OF OPTIONS

As a Wang user, you display some critical wants and needs. You need to protect your existing investment in technology. But, you want the freedom to expand to other operating systems at your own pace. At a time when your choices seem increasingly limited, Digital hands you options. We have the solutions that are right for your Wang migration. All you do is pick and choose.

On Ports and Existing Hardware Maintenance

As many technology suppliers downsize, rightsize, or change the scope of their business, you may be left wondering whom to turn to for parts or service for your existing hardware. Digital makes Wang parts readily available through partnerships with more than 30 third-party Wang manufacturers.

In addition, Digital is a member of the Wang Independent Dealers Association. Through this association, we've cultivated a number of third-party relationships to ensure that your maintenance needs will be met — through a single point of contact and at a competitive price.

On Coexistence

You can't get from point A to point B overnight. It's just not that easy. That's why Digital offers a staged migration approach — one that lets you carry out your technology migration in phases, without burdening your staff.

YOU KNOW YOUR BUSINESS BETTER THAN ANYBODY ELSE. IN TERMS OF TECHNOLOGY, YOU KNOW WHERE YOU WANT TO GO. BUT YOU NEED HELP GETTING THERE. THAT'S WHERE DIGITAL COMES IN. FROM COEXISTENCE TO MIGRATION SOLUTIONS, WE OFFER EXACTLY WHAT YOU NEED TO ACHIEVE A SUCCESSFUL, EFFICIENT FUTURE.

When you choose to add Digital equipment to your existing Wang system, our expert consulting team can help. We can provide services, including remote login from Wang-to-Digital and Digital-to-Wang, file transfer between systems, and mail directory updates between Wang OFFICE and Digital ALL-IN-1, ccMail, TeamLinks, and other mail systems.

The Wang/Digital Coexistence plan offers the tools that allow you to run industry-specific applications along with applications in the areas of office automation, finance/payroll, imaging, and customer/personnel records. Our wide range of business partnerships lets us offer all this and more.

For instance, through a business partner, Digital has created a coexistence tool for PACE, Wang's proprietary database. This tool will allow PACE users to coexist with industry-standard databases (such as ORACLE, Ingres, and Rdb) and convert when the time is right.

On Migration Services

The "freedom to choose" is one of the major benefits provided by Digital's migration services. You choose the platform — any platform, including PC LANs, OSF/1, OpenVMS, SCO UNIX, MS-DOS, or Apple Macintosh. We'll help you get there with our [illegible] site consultation, project management, software and tools.

For information on Digital's Wang migration solutions, call [illegible] and reference ext. 75S. ■

PUTTING IMAGINATION TO WORK

d i g i t a l

Imagining a Cleaner, GREENER Tomorrow

TODAY, DIGITAL TAKES AN INDUSTRY LEADERSHIP ROLE IN PRESERVING AND PROTECTING THE ENVIRONMENT

DIGITAL'S COMMITMENT TO THE ENVIRONMENT grows out of our company's culture. Back in 1974, Digital named the environment as a key area of corporate responsibility. Since then, we've taken a strong stance in creating and implementing an environmental policy and a broad range of programs aimed at preserving the Earth and protecting its inhabitants.

Earth Vision: A Way of Doing Business

Earth Vision, Digital's corporate environmental health and safety policy, provides the guiding principles for all initiatives.

In brief, this policy states that Digital will conduct its business in a manner that conserves the environment and protects the safety and health not only of its employees, but also of its suppliers, partners, and customers, as well as the greater community. Our environmental protection programs focus on key areas such as:

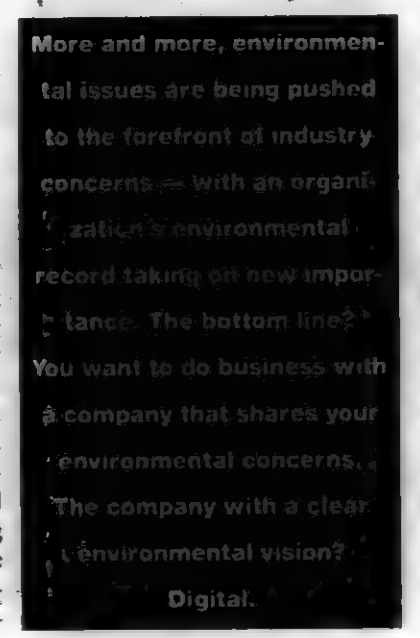
- Ozone layer protection
- Waste management
- Risk control assessment
- Natural resource management
- Infrastructure/asset management
- Geographic-based decision making.

Eliminating Chlorofluorocarbons and Ozone-Depleting Substances

It's one thing to talk about environmental issues. It's another to back up the talk with definitive action. Digital has taken such action, not only in terms of the environmental solutions we offer in the marketplace as the only computer company with a dedicated Environment/GIS Market Segment Group, but also in our own company-wide compliance programs — the effects of which reach far beyond Digital.

As a member of the Industry Cooperative for Ozone Layer Protection (ICOLP), an international organization promoting the elimination of chlorofluorocarbons (CFCs), Digital has become an active participant in this effort. Eighteen months ahead of schedule, we have succeeded in eliminating the use of ozone-depleting substances (ODS) — including CFCs — from our worldwide manufacturing operations. Nearly ODS-free in our manufacturing, engineering, and service operations, Digital plans to eliminate all remaining ODS by the end of 1993.

How is Digital reaching its goals? Through innovation and implementation. For example, we've developed a technique that uses water instead of CFCs to clean sophisticated circuit boards. Plus, this technology has been made freely available to any manufacturing firm worldwide via ICOLP.



Technology in Support of the Environment

Digital's products and information technology are increasingly being used to support the search for exemplary solutions to local, national, and global environmental problems. We support many ongoing U.S. environmental projects — including Sequoia 2000 and the Geographic Environmental Modeling System (GEMS) project — through financial resources, computer hardware donations, and engineering expertise.

In addition, our Environment/GIS Market Segment Group encompasses a wide range of multimedia solutions and projects related to water quality and protection. Among these are a monitoring system on the Po River in Italy and a pollution monitoring and alarm system on the Rhine River in Germany. Other solutions include continuous and fugitive emissions monitoring, natural resource management, and transportation planning and management.

An Environmental Legacy

Digital's Earth Vision policy provides a framework to ensure that our own operations and activities are meeting the highest of environmental standards.

We extend this vision through cooperative efforts, environmental education, technology sharing, our own leadership roles in ICOLP and the Global Environmental Management Initiative (GEMI), our endorsement of the International Chamber of Commerce's "Business Charter for Sustainable Development/Principles of Environmental Management," and through many other programs and initiatives that help to create a safer, healthier environment locally and globally.

For a FREE video entitled "From Where We Stand: Digital's Earth Vision" plus information on Digital's environmental/GIS solutions, call 800-321-9486. ■

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PUTTING IMAGINATION TO WORK

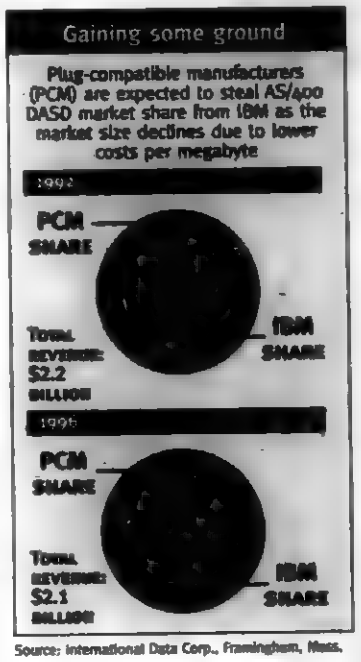
RAID captures AS/400

Lower cost seen as key to growing market share

By Craig Stedman

Redundant arrays of inexpensive disks (RAID) technology appears well on its way to taking over as the dominant storage technology for Application System/400 computers, although some large AS/400 users said they still see value in the more expensive disk-mirroring approach.

Nine months after IBM started shipping RAID versions of its 9337 direct-access storage device (DASD) for the AS/400, about 30% of 9337 shipments and roughly 50% of incoming orders are for RAID models, according to Duane Dueker, director of mid-range and low-end storage subsystems at IBM's Adstar storage subsidiary.



Source: International Data Corp., Framingham, Mass.

Tuning the strategy

IBM expects the RAID share to keep growing at a fast clip and is keying its AS/400 storage strategy to that technology, Dueker said. "We want to get it way over 50%," he said. "We'd love to drive it to 75% or more." That level could be reached next year, he indicated.

Users, analysts and competing vendors mostly seconded IBM's market view. The AS/400's single-level storage format, in which files are split among multiple disk drives, virtually demands some sort of built-in protection against disk failures, and RAID is seen by industry observers as a cheaper way of getting that protection than full-scale mirroring.

"There's a lunatic fringe of users whose needs are so high that they need full mirroring, but that's a declining percentage because mirroring is so expensive," said David Andrews, managing partner at ADM Consulting, Inc. in Cheshire, Conn. RAID is now "the normal option we recommend to our clients," he added.

Big business

IPL Systems, Inc., which just added RAID models to its AS/400 DASD line this month, expects them to bring in half of its business by the fourth quarter of this year, said George Mele, director of product marketing at the Waltham, Mass., company.

"Mirroring gives more protection, but RAID comes at 50% less cost," he noted.

Seth Traub, RAID/storage market analyst at International Data Corp. (IDC) in Framingham, Mass., voiced a dissenting view. RAID already accounts for 25% to 30% of 9337 sales, Traub said, but a recent IDC survey of major AS/400 users showed enough support for mirroring that he expects RAID to "lose in the AS/400 market."

RAID, *page 57*

Hyatt picks upgrade as stopgap move

By Mark Halper
CHICAGO

Hyatt Hotels Corp., which four months ago was considering a reservation systems overhaul tantamount to a home owner purchasing a bigger abode, has instead settled on a few room enlargements, at least for now.

Hyatt's Gordon Kerr: *'We went back to square one'*

Rather than replacing the five aging Pyramid Technology Corp.-made AT&T 7000 boxes that drive the company's Spirit reservation system with bigger and faster systems, Hyatt has decided to upgrade two of the five machines with faster processors.

Million-dollar savings

By doing so, Hyatt is spending about one-third of what it had originally planned to shell out for the improvements — about $500,000 instead of $1.5 million, according to Gordon Kerr, senior vice president of MIS at the hotel chain.

"It's clearly a stopgap," Kerr readily acknowledged. "But it gets us to where we want to be now."

Hyatt needs the extra horsepower because it is more than doubling the number of reservations handled by the central system, from about 2.5 million to 6 million annually (CW, March 22).

Kerr said he decided on the temporary measure when only one of four bidding vendors, Pyramid, registered proposals that Hyatt deemed suitable and in its $1 million to $1.5 million price range.

Hewlett-Packard Co., Unisys Corp. and NCR Corp. also bid. HP and Unisys both proposed solutions costing more than $2 million, and NCR at the time did not have a box powerful enough for the job, Kerr said.

"We went back to square one and reexamined some of our fundamental assumptions," Kerr said. "Often, you can't figure out what questions to ask until after you've gone through an evaluation."

What Hyatt concluded upon reexamination was simply that it did not have to replace all five systems — or any of them — to handle its quantum processing leap.

Key to its new way of thinking was its realization that it did not need the full, real-time backup that one of its AT&T 7000s was

Hyatt, *page 58*

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AIX/ESA niche narrows IBM's Unix lineup

By Johanna Ambrosio

IBM will continue to enhance its mainframe Unix-based operating system, managers said, although future releases will be provided based on customers' needs instead of a predetermined schedule.

With this move, IBM has acknowledged the niche nature of the mainframe Unix market, saying that this operating system has been better accepted by high-end scientific and technical users than by the broader commercial community. When IBM first introduced AIX/ESA two years ago, it was positioned as the company's answer to users wanting a large-scale open systems solution, including a "data server for general-purpose computing," according to a press release. That has not come to pass.

Promises fulfilled

Instead, "we're finishing up a new release [of AIX/ESA], and this satisfies what we had promised and what we had been asked for by customers," said Irving Wladawsky-Berger, general manager of IBM's Power Parallel group, which develops AIX/ESA. "After that, we will be much more selective about enhancements." Most mainframe operating systems are enhanced every 12 months.

But from now on, Wladawsky-Berger said, "what additional functions we do is dependent on the market." With a niche product such as AIX/ESA, "we are close enough to the customers that we can do this rather than putting out a general release," he added.

At the same time, he acknowledged that the number of developers working on AIX/ESA has been cut almost in half, to about 125 people. This is due to "increased efficiencies" as well as to finishing up the new release, Wladawsky-Berger said. Version 2.2 of the product will include parallel Fortran support, among other features, he added.

Vendor apathy

Users, for their part, seemed accepting. "We've certainly been seeing signs that IBM would possibly not develop this environment extensively," said Robert Gallagher, director of information technology services at Rensselaer-Polytechnic Institute in Troy, N.Y. "Third-party vendors have not seemed enthusiastic about porting their products to AIX/ESA."

Nevertheless, Gallagher said, "AIX/ESA is a considerable improvement over AIX/370," IBM's precursor host Unix operating system, which did not run natively. "It is more stable and has modified or eliminated a number of deficiencies in AIX/370."

For those commercial customers wanting open systems, IBM managers said, a Posix-to-MVS interface will be available in March 1994. Posix is a set of IEEE standards. The interface is being beta-tested now at a handful of user sites, IBM managers said.

"We are providing both AIX/ESA and MVS/Posix because they address different customer sets," Wladawsky-Berger said.

Briefs

Unix minicomputers

Kronos AS/400 package

Time-accounting software vendor Kronos, Inc. has acquired the technology and selected assets of Computer Recovery, Inc., which makes a time-accounting package for IBM's Application System/400 computers. During the past year, Kronos has been moving beyond its original DOS base to support higher level server platforms; it previously introduced software for Digital Equipment Corp.'s VAX line and several Unix systems.

CA ships Unicenter for HP

Computer Associates International, Inc. said it has shipped 2,000 copies of its CA-Unicenter systems management software to Hewlett-Packard Co. as part of HP's recently announced bundled promotion for its Unix minicomputers

Unix Maestro

Unison-Tymlabs, Inc. in Sunnyvale, Calif., has ported its Maestro systems management software to Unix, the $15 million firm said last week. Until now, Maestro ran on HP's HP 3000 systems running the MPE/IX operating system. Initially, Maestro for Unix will be available for HP/UX systems only, but versions for IBM's RISC System/6000 and NCR Corp.'s NCR 3000 series are scheduled to ship in October. Prices start at $2,000, but range to more than $20,000, depending on computer power, the firm said.

Storage capture

Storage Technology Corp. has acquired Sceptre Corp., an Ann Arbor, Mich., vendor of software that manages cartridges in open systems environments. Terms were not disclosed.

Railroads reroute

Data centers prove crucial to skirting floods

By Ellis Booker

One ripple from the continuing Midwest flood has been its impact on the nation's railroad system, which sends a quarter of its traffic through the affected states.

Fortunately, railroads have been able to weather the crisis — and keep delays to a minimum — thanks to highly automated, centralized traffic centers. From these facilities, railroad dispatchers watching computerized maps can monitor the whereabouts of trains and cargo and can detect outages along stretches of track.

Because of these systems, along with thousands of railway workers on the ground, U.S. railroads have been able to reroute their traffic, often sharing another company's track to get around submerged tracks.

According to the Association of American Railroads in Washington, D.C., the nation's five leading companies have managed to maintain shipments and keep delays below 24 hours.

Changing times

"If this [flood] had happened 20 years ago, it would have taken a minimum of four times as many people to coordinate the movement of all the trains," said Dan Steinhoff, the director of central train dispatch at Union Pacific Railroad in Omaha.

Union Pacific, Steinhoff said, was able to reroute its own trains and absorb the additional, temporary traffic of other railroads without adding a single staff member to the 35-person day crew in its state-of-the-art control center in Omaha.

During the worst flooding, Union Pacific's rails were carrying the traffic of six different railroads, doubling its usual capacity to 30 trains in one 24-hour period.

Union Pacific and several other lines sent traffic hundreds of miles away from the usual routes to avoid the floods, which soaked an eight-state region.

Systems in place

The railroads' transportation control systems are not new. In Union Pacific's case, the original system was put into production in 1972. "It's what you might consider a legacy system," Steinhoff said. "It doesn't have a [graphical user] interface, but it does the job well."

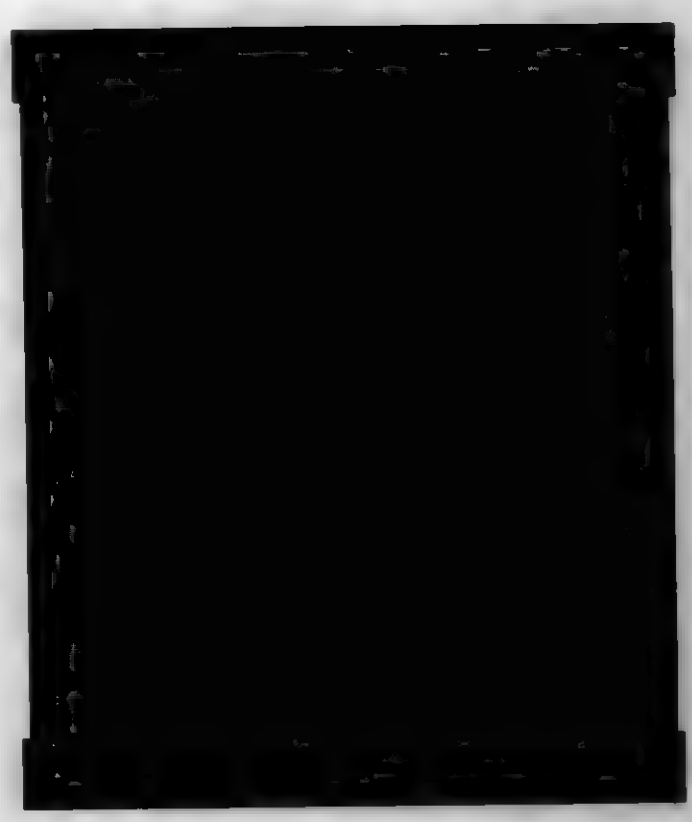
The control center uses a plethora of Digital Equipment Corp. VAX systems and attached terminals. The host databases, maintained in two data centers in Omaha, contain IBM, Amdahl Corp. and Hitachi Data Systems Corp. mainframes.

Still, communication among railroads that wished to share track often came down to a phone call.

Although some of the most advanced information systems applications inside individual railroads involve expert systems that recommend rerouting trains, these systems have not been linked across companies.

The railroads do, however, have access to a nationwide electronic data interchange (EDI) clearinghouse, operated by Railinc, an 11-year-old, for-profit subsidiary of the Association of American Railroads.

Railinc provides the North American EDI network, as well as some centralized database services used by 175 railroads and 50 major shippers.



RAID

CONTINUED FROM PAGE 55

Mirroring costs are "pretty comparable" to RAID when vendor discounts are applied, Traub added.

Hesitant users

Some users are indeed wary of RAID and remain willing to pay extra to get the better performance and reliability that mirroring typically provides because of its multiple caches and more complete duplication down to the power supply and controller levels.

"We keep talking about RAID, but it's not on our six-month horizon," said John Waetzig, operations manager at Hills Pet Nutrition, Inc. in Topeka, Kan. "There are performance questions that we have not got concrete answers on that keep us from getting real excited about it."

Marc Cohn, senior vice president of information systems at Enterprise Rent A Car Co. in St. Louis, is also sticking with mirroring for his across-the-counter applications. "Mirroring is still by far the strongest solution," he said. "Yeah, it is more expensive, but you kind of get what you pay for."

However, Cohn added that he may turn to RAID for corporate modeling and other noncustomer functions "where robustness is not so important." The 75% market share prediction for RAID sounds reasonable given its lower cost, he said, and other users agreed.

"We're satisfied [RAID] can do the job," said Michael Bangs, vice president of IS at Scholastic, Inc. in Lyndhurst, N.J., which is putting in RAID units that it bought from IPL. "There's a slight vulnerability in comparison to mirroring, but we think the cost benefit is worth it."

Roger Finoli, manager of planning and technology at Dominion Textile, Inc. in Montreal, also cited RAID's cost break and said performance "is not that much of an issue" on the subsystems Dominion has installed thus far. "In two to three years, everything here should be RAID," he added.

Utilities

Boole & Babbage, Inc. has announced the availability of IMS Management Facilities (IMF) Version 2.8 and AutoOperator Version 2.1.3., which help users manage the overall IMS environment and take advantage of new capabilities in IBM's IMS/ESA 4.1.

The IMF product line is incorporated into MainView for IMS, which provides advanced capabilities for automated management of IMS throughput and availability, according to the company.

Product components provide detailed applications analysis, performance analysis and tuning and detailed transaction accounting data.

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Individual components of IMF are priced from $9,800. AutoOperator is priced from $15,600.

▶ *Boole & Babbage*
510 Oakmead Pkwy.
Sunnyvale, Calif. 94086
(408) 735-9550

Generic Software, Inc. has announced Oak Help Manager, a utility for IBM's Application System/400.

According to the company, Oak Help Manager makes windows-based Help text easy to create and maintain.

It enables users to develop User Interface Manager Help text and offers many features, including the ability to create Help text for subfiles and display files, commands and program menus and calculate Help area start/end positions.

The product is Systems Application Architecture-compliant and offers a full-screen text editor with more than 28 commands and a spell checker with a 78,000+ word spelling dictionary.

Oak Help Manager costs $995 per CPU for all AS/400 models.

▶ *Generic Software*
986 Madison Ave.
Madison, Miss. 39110
(601) 853-1189

Power supplies

Para Systems, Inc. has announced the Minuteman Alliance 500 and 750, uninterruptible power supplies (UPS) that provide an automatic voltage boost.

According to the company, the products have LEDs that show voltage boost, AC normal, inverter mode (accessing batteries) and fault.

When the UPS is in the inverter mode, an audible alarm sounds every 10 seconds and switches to once every second at low battery warning, the company said. The UPSs can protect against commercial power problems such as overload in AC and DC mode, brownouts, blackouts and spikes.

The Minuteman Alliance 500 and 750 UPSs cost $299 and $429, respectively.

▶ *Para Systems*
1455 LeMay Drive
Carrollton, Texas 75007
(214) 446-7363

Hyatt upgrade

CONTINUED FROM PAGE 55

handling. "We asked ourselves how many times we had to actually use that over the last two-and-a-half years, and the answer was 'zero'," Kerr said.

So Hyatt is taking full backup functions off the machine that had been handling that duty and will continue to use that machine for a sales database.

The company also decided that two of the three front ends in the five-box scheme could continue to run as they have been. Those machines, a communications box and a development box, will remain untouched.

Hyatt is upgrading the third front-end unit, a reporting machine to which Hyatt is adding limited backup functions to replace the full-blown backup that the sales database machine had performed.

Finally, Hyatt is also upgrading the central reservation box.

Kerr said the central box will run the same number of processors, 12, but Hyatt is installing faster versions. The machine will run Mips Technologies, Inc.'s R3000 processors, rated at 32 million instructions per second (MIPS) each, instead of the proprietary processors it had been running at 11 MIPS.

Hyatt is expanding the number of processors in the reporting/backup box from three to six.

The two upgraded boxes will run the new version of Pyramid's Unix, called DCOSX. The three untouched boxes will continue to run Pyramid's older OSX.

But, to twist the old adage, the more things change, the more they change. Kerr said he still expects to make a leap to larger systems, in about two years. At that time, he anticipates the company will be pushing the limits of the machines he is *not* now upgrading.

And he noted that with Unix hardware prices dropping by about 25% to 30% a year, he expects the upgrade to be more financially palatable at that point.

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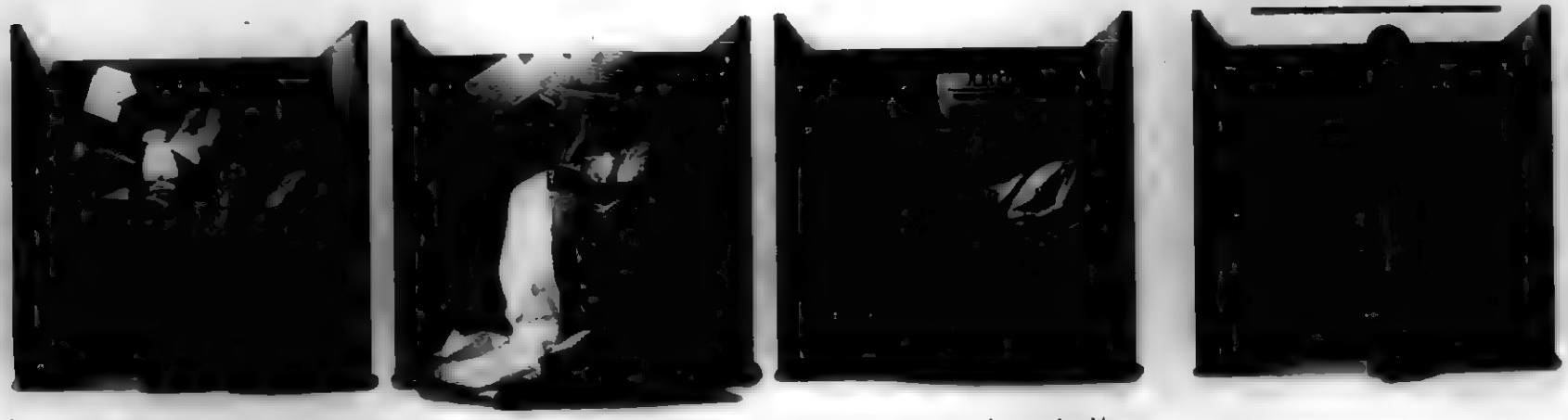

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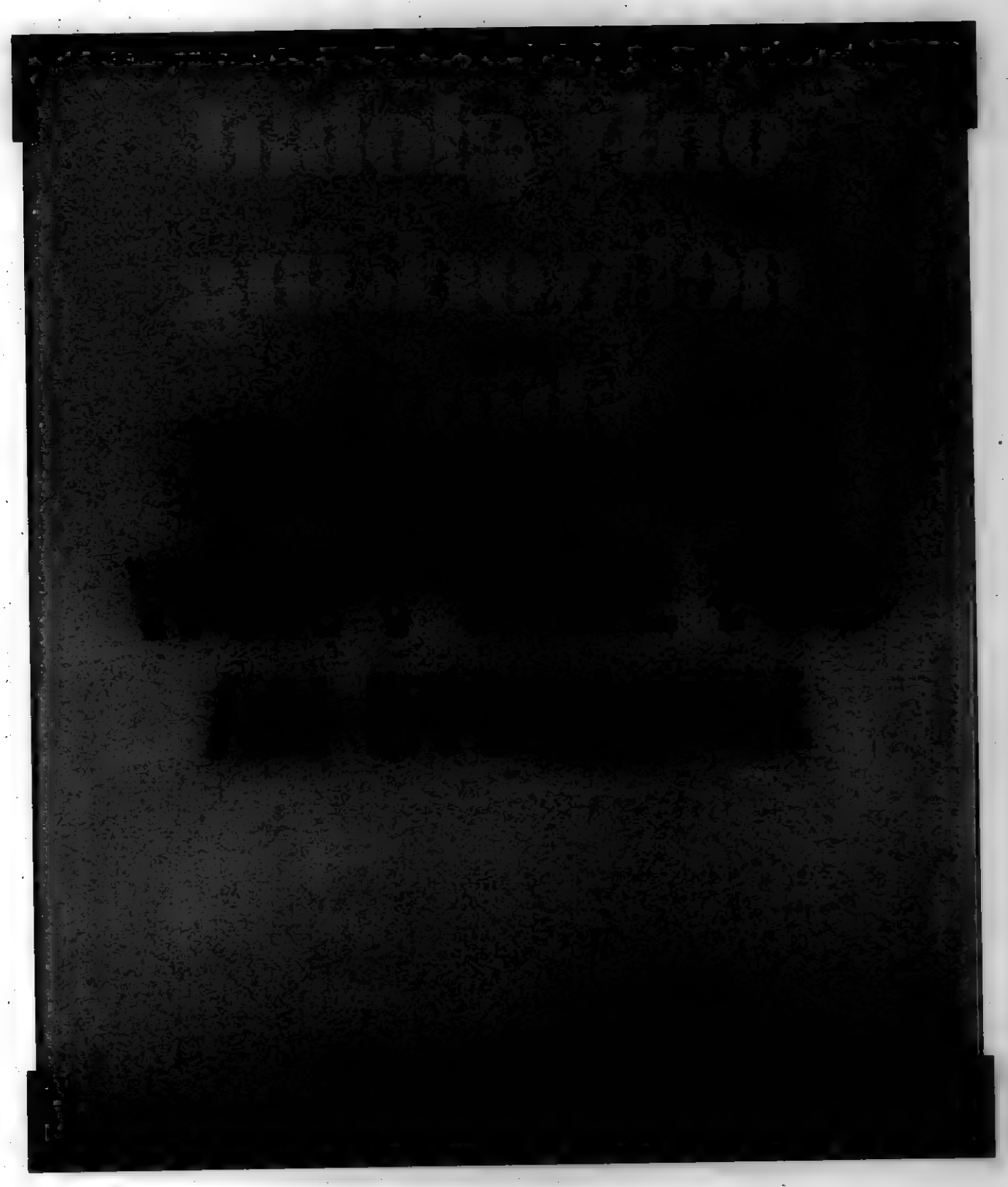

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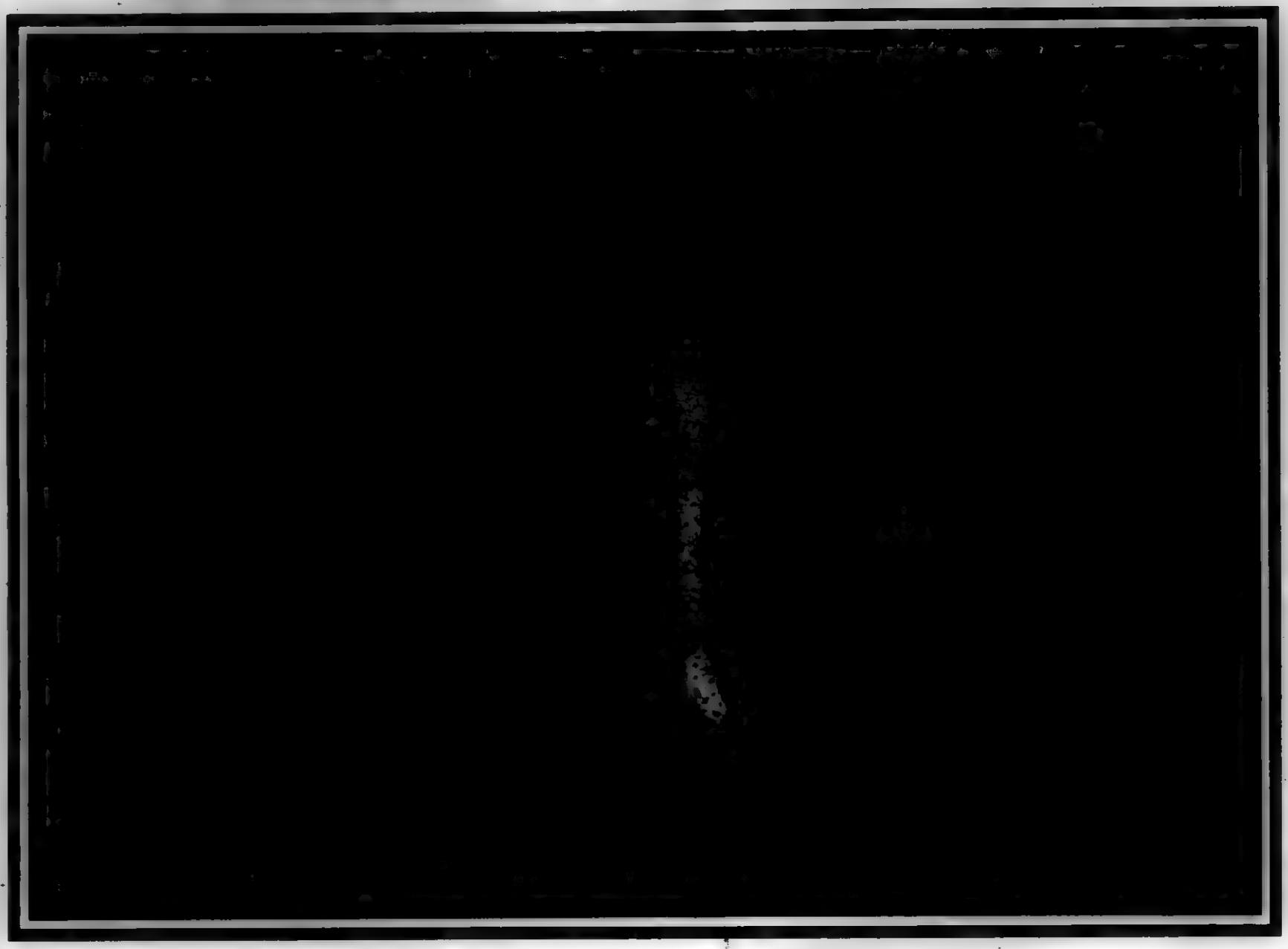

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Quality assurance

Software testing hits bottom of 'to do' list

By Mitch Betts
ARLINGTON, VA.

Testing application software for quality assurance is tedious, time-consuming and usually put off until the last moment, if it is done at all.

In fact, software testing is usually the first thing jettisoned when application developers rush to meet a deadline, according to attendees and speakers at a conference here last month.

The risk of not testing, of course, is that bugs in the software will ruin a mission-critical application or even endanger public safety. So why is something so important so neglected?

The reason may be partly psychological, according to a paper presented by Dorothy R. Graham, an independent software testing consultant and president of Grove Consultants in Macclesfield, Cheshire, UK.

Graham said testing is the black sheep of software engineering because "we are looking for something we don't really want to find," namely, errors.

The purpose of testing is to provide confidence that the system works correctly, but that requires looking for defects, and finding defects destroys confidence, she said. So, the paradox of software testing is that "the best way to build confidence is to try and destroy it."

If no errors are found, it is human nature to assume the software has no errors, but it is much more likely the testing was poor, Graham noted (see chart).

"To be honest, we don't really want to succeed at finding defects because we never meant to put them in in the first place," she said.

So, why do software errors occur? Graham said many mistakes are caused by the limits of human short-term memory, which "is like a pushdown stack which lets things fall off the bottom when too many things come in at the top."

When debugging, Graham said, errors can occur because "we tend to solve the problem we conquered last week instead of fully understanding this week's subtly different problem. This contributes to the high percentage of fixes which cause new errors."

Extra eyes

If you proofread your own work, you spot only 30% of your errors. That is why independent testers are essential for good software testing. Without them, you are guaranteed to leave in 70% of errors.
The most effective approach to testing is to have multiple techniques, people (especially users), test data and testing tools.

Different view

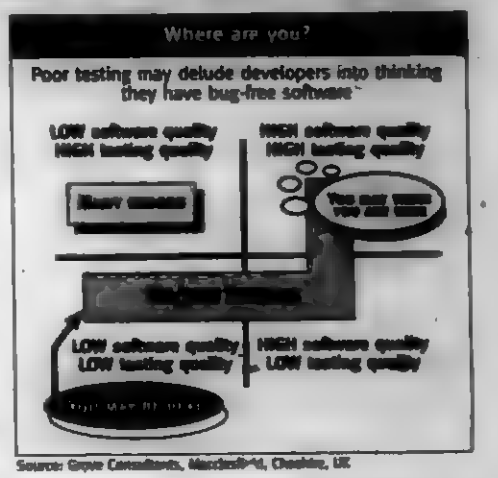
Application developers also find that the number of software errors increases sharply once end users begin testing the system. Because users and developers have a completely different point of view, users find errors that developers would never dream of testing, Graham said.

Errors are inevitable whenever humans create software, she said, so it is counterproductive to lecture or penalize people for making unintentional errors. That only produces more guilt and an incentive to hide the errors.

By approaching errors in a blame-free, egoless fashion, developers are free to "bring the errors out into the open in a positive, healthy atmosphere," she said.

This does not mean errors should be taken lightly or ignored, she hastened to add. Discipline should be used on those who fail to use the error-reducing mechanisms that have been provided, Graham said.

Testers also have an obligation to rid the system of confusing interfaces and other design defects that could lead to "human errors," Graham said.



Source: Grove Consultants, Macclesfield, Cheshire, UK

An end to tedium

A new breed of PC-based software has hit the market, making software testing a bit less tedious.

AccuWare, Inc. in Pittsburgh recently introduced AccuTest regression testing software, which makes it easier to construct and maintain a test database. Regression testing requires running hundreds of test cases through a target application to spot errors and then retesting them whenever a change is made.

AccuTest allows testers to create a visual model of the target application, much like rapid prototyping, without programming. When the application changes, screens or fields can be added, deleted or dragged to a new location. Because AccuTest uses relational database technology, all test cases applicable to a field also change automatically, thus eliminating the tedious process of manually editing each test case.

Mark Limbach, AccuWare's president, added that AccuTest makes it easier to start testing earlier in the development life cycle because the visual model of the application can be quickly updated along the way.

"When quality assurance is part of the development process, you can recognize problems at an earlier stage when they are easier and less costly to fix," he said.

— *Mitch Betts*

Users eye Visual C++

By Christopher Lindquist

■ Microsoft Corp. has announced that a prerelease copy of Visual C++ for Windows NT will be sent to the 70,000 registered owners of the Win32 Software Development Kit.

The new release of Visual C++ will be a complete 32-bit development environment, according to Microsoft. It will also include the 32-bit Microsoft Foundation Class Version 2.0.

Developers using the product will be able to produce Win32 and Win32s applications directly under Windows NT. Win16 and DOS applications can be written, but compiling the program will require the 16-bit Visual C++ for Windows, which must be purchased separately.

However, for 32-bit developers, the product includes a number of features, including AppWizards and ClassWizards for quick program creation, optimizations for Intel Corp. 1486 and Pentium processors, a debugger with support for multiple threads, the Spy++ analysis tool for locating thread, process and window information and complete on-line documentation.

The final version of Visual C++ for Windows NT is slated for release within 90 days after the release of Windows NT. Prerelease users of Visual C++ for Windows NT will receive an offer to upgrade to the retail version for $99.

The suggested retail price of Visual C++ will be $500. Printed documentation will be priced separately at $99 per set.

Sybase to offer multimedia visual development tool

Release links object-oriented databases/RDBMSs

By Melinda-Carol Ballou
EMERYVILLE, CALIF.

Presaging a major push into the tools arena this fall, Sybase, Inc. earlier this month announced Release 2.0 of GainMomentum, its object-oriented, multimedia application development tool that now offers visual tools for integration with Sybase SQL Server, DB2 and Oracle Corp.'s relational database management systems.

The key advantage of GainMomentum, according to company officials, is its ability to create applications that combine multiple data types, such as audio, video, graphics and text, with data from SQL databases. This is accomplished through links between GainMomentum's object-oriented database (originally based on the Objectivity database) and the RDBMSs. In a single environment, developers can create, edit and link multimedia objects, script application behavior, build training and Help systems and deploy runtime applications across heterogeneous client/server platforms, officials said. Also included with this version of the product are extensions to Gain-

Sybase, *page 65*

There's a wide spectrum of UNIX systems. But only an expert can blend them into your business picture.

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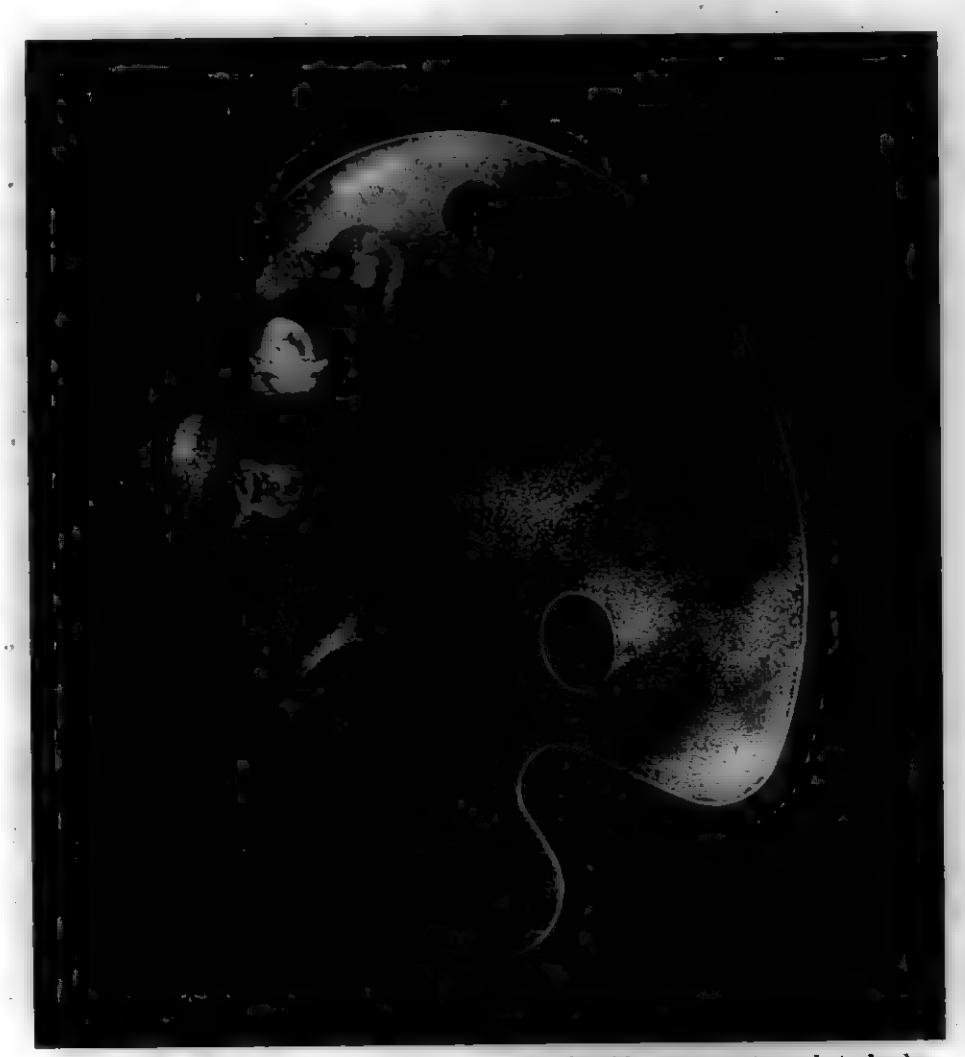
What's more, our Communications Access Processor (CAP) enables your SNA network and 3270 terminals—for the first time—to cost-effectively access UNIX, introducing the advantages of UNIX to any environment. Says the Aberdeen Group: "We recommend that CAP technology be evaluated by customers attempting to contain costs, protect existing investments in SNA networks, and take advantage of new UNIX platform opportunities."



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Ada systems

Cadre ships latest release of Teamwork

By Melinda-Carol Ballou
PROVIDENCE, R.I.

Cadre Technologies, Inc. is now shipping Release 5.0 of Teamwork, the company's software development tools. The latest version provides for SQL generation and better automation, and it complements Cadre's ObjectTeam object-oriented tools, which became available last month, company officials said.

This version of Teamwork/Ada offers graphical design and code generation for Ada systems, as well as Ada diagram generator improvements for reverse-engineering, support for arrows below context diagrams, improved subprogram reference capabilities and better code generation for task-entry families, officials said.

Teamwork/SIM 2.0 better supports dynamic verification and debugging of real-time structured specification models. This lets users verify the behavior of an application and estimate the capabilities and performance of software design models, officials said. Teamwork/SIM 2.0 is also easier to use, with more trace file options and error log information, a control panel that is less arcane and simulation attributes that are easier to set up, they added.

Teamwork/IM SQL now replaces Teamwork/IM for information modeling and database design. It gives Teamwork the ability to generate both SQL and SQL Data Definition Language from entity relationship diagrams for relational database management systems from Oracle Corp. and Sybase, Inc., among others. Automated assistance with the layout of entity relationship diagrams is provided with the new release.

This version of Teamwork also offers DocConnect — the ability to create Teamwork specifications and design documents within Interleaf, Inc.'s desktop publishing system. This tool interactively pulls Teamwork objects into the document and supports automatic updates.

Managing made easier

The new version of Teamwork/Access, an application programming interface for accessing objects in the Teamwork database, allows industry-standard or customer-specific configuration management systems to work with Teamwork's own configuration management system. In this way, developers can manage Teamwork objects within existing environments.

Teamwork 5.0 can also be integrated with ObjectTeam, which began shipping last month. ObjectTeam automates Rumbaugh Object Modeling Technique and Shlaer-Mellor methodology for object-oriented analysis and design. It generates C++, Ada and SQL code and supports a range of object-oriented databases.

Teamwork 5.0 is now available for Sun Microsystems, Inc.'s SunOS and Solaris for SPARCstations. It will ship for Hewlett-Packard Co.'s, IBM's and Digital Equipment Corp.'s Ultrix workstations in the third quarter of this year. Pricing for a typical Teamwork configuration starts at $8,500.

Sybase offers development tool

CONTINUED FROM PAGE 63

Momentum's fourth-generation language-based scripting language for dynamically linking C and C++ libraries at runtime.

Top choices

The Interactive Multimedia Association is seeking a standard language for multimedia development and is considering GainMomentum's GAIL Extension Language and IBM/Apple Computer, Inc.'s Kaleida as contenders.

Flexibility lauded

Industry analysts praised the flexibility of the tool and its ability to develop applications that access both object-oriented complex data and traditional data on RDBMSs.

"The great benefit of multimedia is that it makes information more accessible, and that's how Sybase is positioning GainMomentum — as part of an overall strategy," said Judith Hurwitz, president of Hurwitz Consulting in Wellesley, Mass. "It makes the development and reuse of software and graphical formats much easier." However, GainMomentum will require administration and management of at least two databases, which has its drawbacks, analysts said

"This also highlights the limitations of RDBMSs. Sybase is saying very explicitly that RDBMSs are not good for storing certain types of data," said Richard Finkelstein, president of Performance Computing, a Chicago consulting firm. "Now the question is whether companies are going to have to expect to deal with multiple database servers — object-oriented and relational — or whether the capabilities can be merged into one, which is what users want."

He added that this lends credence to companies such as UniSQL, which offers a single, relational database designed from the ground up to handle object-oriented extensions. "You can't just tag object-oriented features on to a relational database. Sybase has shown that to be true," he said.

GainMomentum 2.0 will ship on Sun Microsystems, Inc. SPARCstations and IBM AIX and Hewlett-Packard Co. HP/UX workstations during the third quarter. The product will ship for Microsoft Corp.'s Windows NT and also Digital Equipment Corp.'s Alpha-based OSF/1 and Open VMS platforms next year, the company said. Prices start at $10,000 for single-developer licenses.

GainMomentum 2.0 can create *applications that combine multiple data types — audio, video, graphics and text — with data from SQL databases*

Sun offers PCTE link

By Melinda-Carol Ballou
MOUNTAIN VIEW, CALIF.

Sun Microsystems Computer Corp. and Emeraude announced that Emeraude's next version of its Portable Common Tool Environment (PCTE) will incorporate SunSoft, Inc.'s ToolTalk software for communication between applications. This will be the first PCTE-based development environment that allows current development tools to coexist with emerging object-based technologies on Sun workstations.

Support of Emeraude's PCTE implementation will allow ToolTalk users to address large- to medium-grain data integration in distributed computer-aided software engineering (CASE) environments, while letting them move toward the finer-grained object-oriented approach of the Object Management Group.

PCTE is a standard framework for providing control integration between different CASE tools.

The new Sunsoft/Emeraude product will be demonstrated at the PCTE '93 conference later this year.

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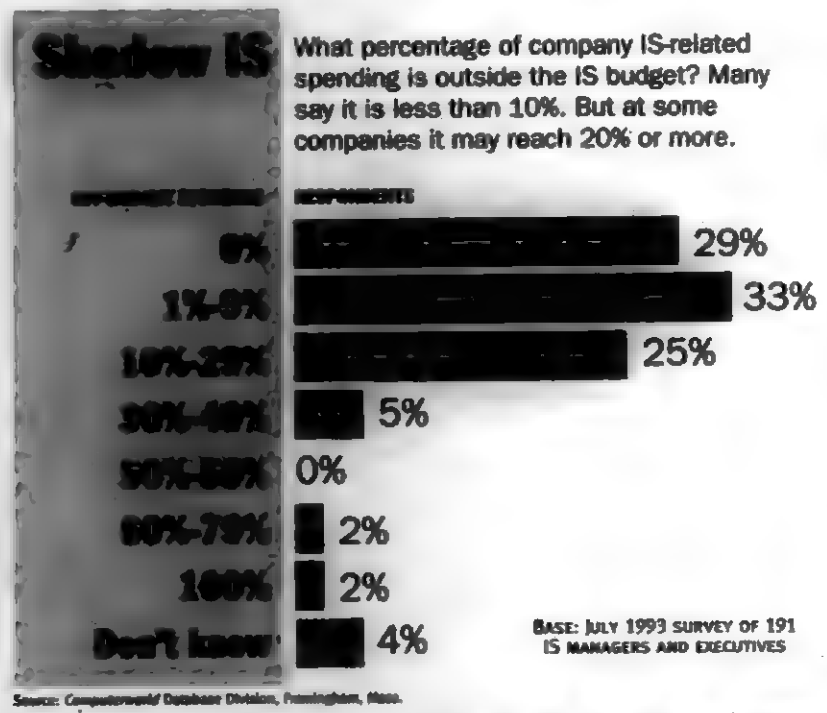
Shadow spending haunts IS

Continued from page 1

ciplines like backup and security. They also make it tough for CIOs to get a complete budget or inventory for all of the company's information technology assets.

"I would be hard-pressed to tell you how much we spend on PCs ... and that makes it difficult to make projections of how much traffic we'll have on the network," notes Jens Pedersen, vice president of IS at Great-West Life Assurance Co. in Englewood, Colo.



Faced with pockets of anarchy, some IS executives might throw up their hands in despair or scheme to regain tight-fisted control. However, savvy CIOs say the better approach is to build relationships with the anarchists so the IS department can monitor and influence the technology decisions that go on in the shadows.

By becoming helpful consultants to the renegade business units, "we in IS get a seat at the table, but we have to promise not to slow things up," says Terry Dwyer, vice president of IS at Waverly, Inc., a printing and publishing company in Baltimore.

Perception in the shadows

The first step is to recognize that the shadow IS groups exist.

The amount of off-budget IS spending varies greatly from company to company, but on average it amounts to 15% to 20% of a company's total IS expenditures and goes as high as 60% at some companies, according to IS budget guru Michael Erbschloe, vice president at Computer Economics, Inc. in Carlsbad, Calif.

Those estimates are confirmed by *Computerworld*'s own survey of 191 IS managers (see chart this page). It shows that off-budget spending is less than 10% at most companies, but one quarter of the respondents say it falls in the range of 10% to 29% of total techno-spending. Interestingly, 4% of those surveyed had no idea how much spending goes on in the shadows.

So, if the official IS department budget accounts for, say, 80% of the company's total outlays for information technology, where is the rest of the money going?

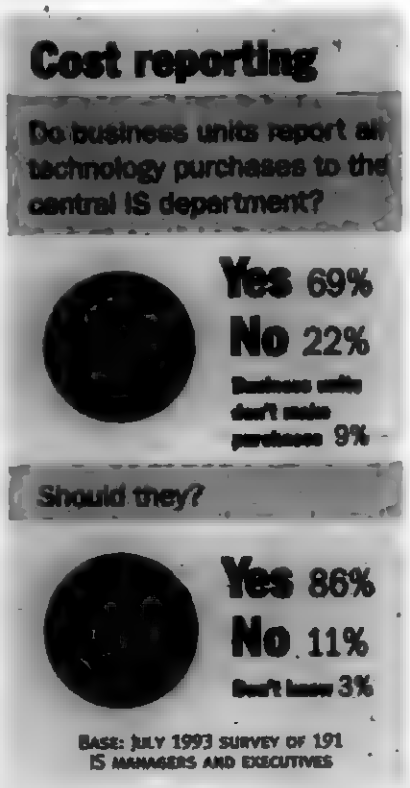
Anecdotal evidence suggests the big off-budget spenders are departments that have a technical orientation, such as engineering, or have an estranged relationship with the central IS group, such as marketing.

Marketing or strategic planning staffs, for example, may decide to build a "competitive intelligence" system with little or no involvement from the IS department. In fact, Michael Pincus, president of Real World Intelligence, Inc. in Friday Harbor, Wash., advises his clients not to get the IS department involved.

Pincus says competitive intelligence systems can be built faster without the hassle of clearing everything through the IS department, which tends to be inward-focused, distracted by other projects and unfamiliar with intelligence systems. The systems Pincus builds typically cost $50,000 for a small company and $100,000 for large companies.

Similarly, the financial "rocket scientists" on Wall Street, who use sophisticated workstations to make million-dollar stock trades, usually build their own systems and hire a small support staff.

"CIOs can't stifle that because the traders' leverage is huge. Their investment strategies are worth millions of dollars to the company, so you can't tell them not to buy a new workstation or neural network or new feeds of data," says consultant Donald B. Brout, president of Quality Technology Decisions, Inc. in New York.



Duplication problems

Occidental Petroleum Corp. in Los Angeles has two main enclaves of uncontrolled IS spending. One is the engineering department and the other is a small, politically powerful staff office that supports the most senior executives, says Steve Huffman, corporate director of MIS.

"The most irritating thing is that they have their own intradepartment technology gurus, and they do things that either duplicate what we're doing or run counter to what we're doing," Huffman says.

That makes it tough to enforce corporatewide technology standards, which are intended to foster systems integration, support and information sharing.

Often a user department, such as engineering, will fall in love with a product that is ideal for that department but is not ideal for achieving data integration across all departments, says Jim Sutter, vice president and general manager at the IS unit of Rockwell International Corp. in Seal Beach, Calif.

"That's the trade-off — and when you don't control it, you have to negotiate what's best for the company," he says, adding that the IS department will win some battles and lose others.

Another problem is that the shadow IS groups may neglect traditional IS disciplines such as data integrity, backup and security. Eventually that will change, Sutter says, either when better automated tools are developed to handle the

STORY

Today's CIOs are faced not only with hidden spending for hardware and software but also with the hidden "soft" costs of end-user computing.

For example, how do you account for the fact that the assistant marketing director (and resident power user) spends half a day writing macros and getting other PC users unstuck?

While PC hardware costs are decreasing, the hidden costs more than make up the difference and can push total spending up to $20,000 per PC, according to a 1992 study conducted by Nolan, Norton & Co., a consultancy in Boston.

Spending for the technology and official information systems support ranges from $2,000 to $5,500 per PC. But hidden costs such as "peer support time" can add an extra $6,000 to $15,000 per PC, the study found.

The hidden costs of support, training, maintenance and administration are likely to be even higher in the brave new world of client/server computing, Meta Group, Inc. in Westport, Conn., figures direct hardware and software costs make up only 31% of the cost of client/server systems. In fact, Meta Group estimates soft costs will represent 40% to 50% of client/server life cycle costs by 1997.

That helps to explain why companies moving to a client/server architecture — known for its immature technology and management tools — are turning to the central IS department for better oversight of the new, complex systems. In a recent *Computerworld* Database Division survey of 117 companies, 43% said responsibility for client/server computing has shifted to a central IS manager [CW, June 7].

— *Mitch Betts*

chores or when the business units experience some data disasters.

Finally, there is the accounting problem. As more and more business units take on the task of buying PCs, workstations and local-area networks, a CIO may find it difficult to compile figures on the company's total technology expenditures and assets.

Sometimes business units within the same company use inconsistent accounting classifications, or they manipulate the accounts so that PC purchases may wind up in a catch-all category such as "office supplies," according to Erbechloe.

When it comes to tracking costs and assets, Erbechloe says, "Most companies manage their truck and car fleets better than they manage their information technology assets."

The *Computerworld* survey shows that 16% of IS managers do not have an inventory of all technology assets, and 22% say the business units do not report their technology purchases to the IS department.

The irony is that just as chief executive officers are asking for more hard data on technology payoffs, IS executives are in the awkward position of having less information about costs and benefits.

"Now we don't know either one. We're losing the numerator and the denominator" for cost-benefit calculations, laments Jerry Kanter, executive director at the Center for Information Management Studies at Babson College in Wellesley, Mass.

Advice offered

So, what can a CIO do about the shadow IS groups? CIOs who have dealt with the issue offer the following advice:

•Lobby for a good accounting system that provides uniform classification of information technology expenditures in all business units. Ideally, the chief financial officer would make such record-keeping mandatory. If not, the CIO can try to conduct an annual survey of the business units.

•Continue to establish, update and enforce corporate technology standards as much as possible. Encourage users to buy through the IS department by obtaining the best deals through volume discounts.

•Take on a consulting role, educating the "loose cannons" about data integrity, backup and security. Offer to provide support for renegade LANs on a charge-back basis.

•Avoid the temptation to try to take complete control over the shadow IS groups. After all, the very reason they exist is that they feared the hassle of dealing with a sluggish, control-oriented IS bureaucracy.

That last point may be the hardest for traditional IS managers to stomach, but experts say they must adapt to a world where the IS department will have a mixture of consulting and controlling roles.

That mixture of consulting and controlling roles may explain why in the *Computerworld* survey most IS managers (65%) say they have a "moderate" amount of authority over business units' technology spending.

"The old-style MIS control freak is going to die because that approach is incompatible with the need to create true partnerships between IS and the business units," says Patrick J. Zilvitis, vice president of corporate information technology at Gillette Co. in Boston.

Waverly, Inc.'s Terry Dwyer: *IS must avoid being obstructionist*

Zilvitis says his group tracks expenditures, educates business units about how to make their LANs as robust as a data center and offers LAN support services on a charge-back basis.

Other CIOs have also made peace with their new role, especially at highly decentralized companies where the reigning philosophy is that business managers are in the best position to make prudent investment decisions.

"While there are some short-term problems — for example, you can't put together the cleanest architecture — on balance, [decentralized IS spending] probably serves the company well," Great-West Life Assurance's Pedersen says.

A classic case of internal IS consulting is taking place at Waverly, where the CEO has worked out a deal between the IS department and the business units that control 50% of IS spending.

The deal works this way: All technology purchase orders must be initialed by IS executive Terry Dwyer, so the IS staff can review them, log them into an accounting database and expedite the purchase with vendors. In return, Dwyer must not veto the purchase.

At first, the business units were wary of the IS role, but Dwyer says they have warmed up to the idea because IS has kept its promise not to be obstructionist. Of course, being a consultant comes second nature to Dwyer because he once worked at Ernst & Young.

Help, don't control

These days, CIOs say it is more important to *participate* in technology spending decisions than to control them.

"The old way of thinking was that whoever controls the dollars controls the action, and that's not true anymore," Dwyer says.

Thinking along the same lines, William Eager, the IS chief at First Bancorporation of Ohio, tells the story of the accounting department's ill-fated attempt to install a LAN three years ago.

"It was bungled pretty badly so my organization was called in to straighten it out," Eager recalls. "That allowed us to take on the role of facilitator and helper, rather than controller. It also led to a new policy that my organization gets to review any information technology expenditures before they are made."

Checkup

The unchecked proliferation of computers is depriving CIOs of a powerful management tool: asset tracking.

Many companies have no idea how many PCs they have, for example. A few years ago, one Washington, D.C.-area bank hired a college intern to spend the summer counting up the PCs in various nooks and crannies of the organization.

"When you take a look at the total dollars spent on information technology across an organization, it can add up to as much as a manufacturing plant," says William Eager, IS chief at First Bancorp of Ohio.

"While people micromanage a manufacturing plant, distributed information technology assets don't get the same level of scrutiny," Eager says.

The corporate fixed-asset accounting system is probably unfit for the task, so Eager suggests tracking technology purchases from the capital budget on an ongoing basis.

Some companies conduct annual surveys of the business units to tally systems. In addition, a new breed of software is available that creates an automatic inventory of all hardware, software and peripherals hooked up to local-area networks.

Users noted that the advantages of creating an asset inventory include the following:

•The aggregate figures are very useful for negotiating volume discounts with vendors.

•IS managers can identify software packages that are popular in far-flung parts of the corporation and consider making them corporate standards.

•The inventory may turn up unauthorized copies of software that could lead to software piracy charges.

•The IS department gets solid cost figures that can be used for benchmarking comparisons with competitors.

Yes 84%
No 16%

BASE: JULY 1993 SURVEY OF 191 IS MANAGERS AND EXECUTIVES

Adding up the company's technology assets can also give the CIO some political clout. In his 1991 book, "Shaping the Future: Business Design Through Information Technology," IS consultant Peter Keen writes about a bank with an annual IS budget of some $200 million. But the tally of all IS assets, including the data center and all software and information resources, totaled $2.5 billion.

The magnitude of the assets was a jolt to senior management, which then realized these assets were being undermanaged, Keen writes. Now the time senior management spends on IS is measured in days rather than minutes.

—Mitch Betts

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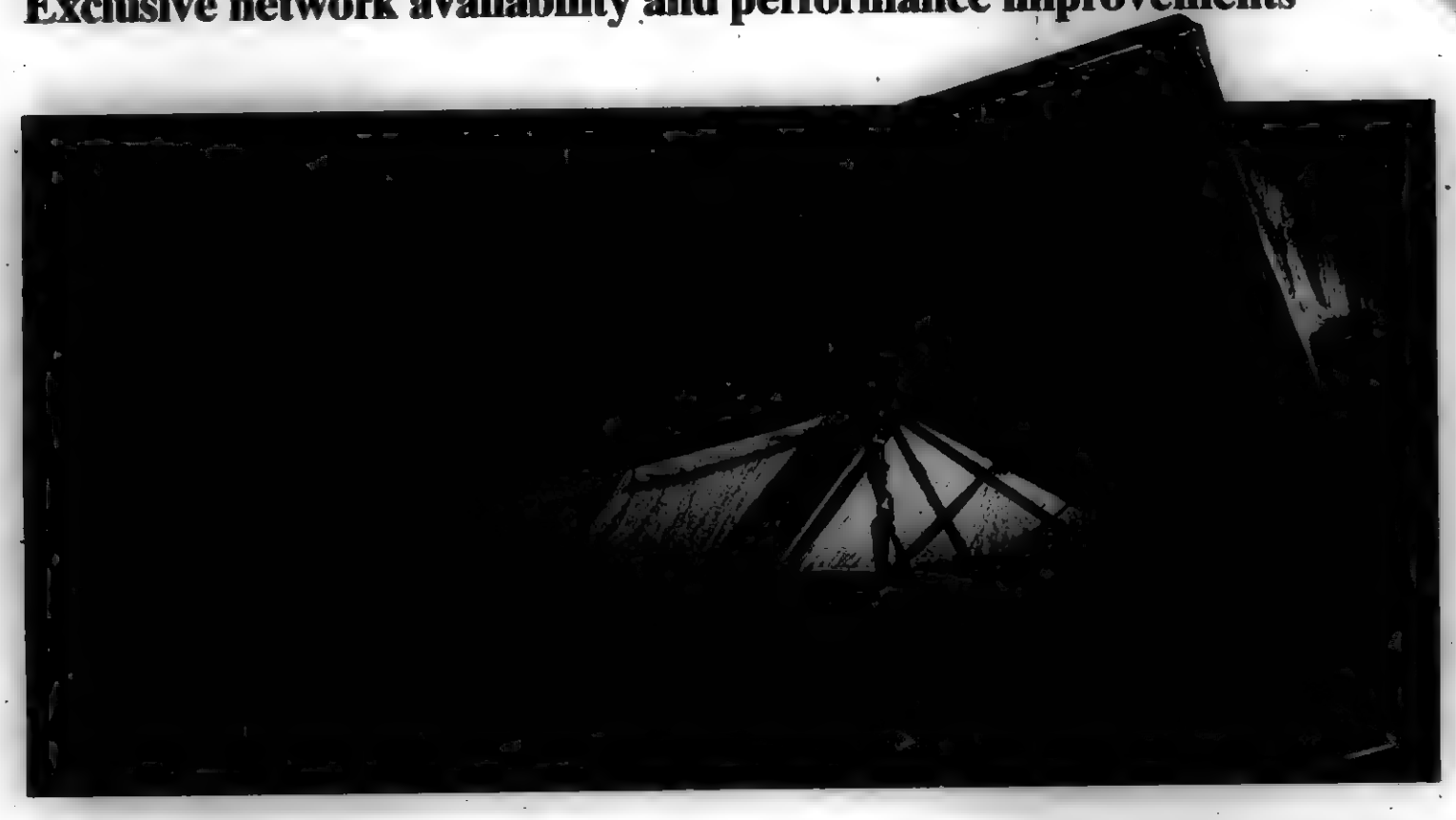

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IBM Business Partner

Management Shorts

Re-engineering services abound

Consultancies and vendors continue to expand services aimed at helping corporations re-engineer business processes, implement client/server technology and integrate systems. Recent developments include the following:

• **Inference Corp.** announced the formation of a new consulting practice responsible for handling the company's increasing involvement in business process re-engineering initiatives.

The new group also announced completion of the first phase of a study aimed at re-engineering the North American customer support operations of Reuters America, Inc., the main U.S. operating division of Reuters Holdings PLC.

The El Segundo, Calif., software and consulting firm said its approach is to re-engineer through iterative redesigns and upgrades. A gradual approach is more realistic than radical approaches, the firm said, and has a better chance to accomplish dramatic benefits.

Robert Friedenberg, vice president at Inference's Consulting Group, will head the new re-engineering practice.

• **Sun Data** has established a professional services division to provide high-level consulting, systems and network integration and technical support.

The unit encompasses Sun Data's systems integration group, formed last October. Company officials said the expansion was triggered by feedback from information systems managers, whom the company said wanted one-stop support for a broad range of services ranging from planning to support.

Notable among the new offerings: imaging services that include, among other things, work-flow analysis, business process redesign and imaging systems implementation.

Company officials said they expect the new unit to play a major role in company growth this year and plan to add at least 25 professionals during the next 12 months. The parent company, Atlanta-based Sungard Data Systems, Inc., specializes in disaster recovery, communications and systems integration services and also provides IBM and compatible equipment.

• **Microsoft Corp.** announced it will expand and refocus its consulting group to transfer development skills for its client/server platform to a broad range of value-added resellers, independent software vendors, developers and other solutions providers.

• **BSG Consulting, Inc.**, a Houston-based client/server integrator, recently announced two high-level appointments aimed at continuing worldwide expansion.

Thomas E. Mark was named director in the Houston office, and Jay H. Rosenfeld was appointed national director of sales and marketing.

A 14-year industry veteran, Mark served as director at Ernst & Young's information technology consulting group. Rosenfeld, a 20-year industry veteran, was most recently a partner at Andersen Consulting.

• **Coopers & Lybrand**'s Boston-based Advanced Technology Group has developed a new re-engineering and process modeling tool. The software, called Sparks, will be used as part of the consultancy's productivity and quality-improvement programs.

Service pacts inked

PNC Bank Corporate Services announced an agreement with the University of Pittsburgh Medical Center to process Medicare payments using an electronic version of claims/payment information recently developed for the health care industry.

Separately, **Nation's Bank**, the country's fifth-largest national bank based in Charlotte, N.C., signed a disaster recovery agreement with **Computer Sciences Corp.**

Quality programs boom

A new study by the **American Electronics Association** showed a 22% leap in the number of participants using ISO 9000 and/or Malcolm Baldrige National Quality Award programs. Of 455 participants polled, 64% had one of the programs in place, up from 42% last year.

Awards deadline

Ouellette & Associates Consulting, Inc. in Bedford, N.H., has announced the sixth annual Excellence in Developing the Human Side of Technology awards.

Top IS executives from leading firms are invited to submit entries that exemplify outstanding IS achievement through a project, program or system promoting the true value of IS.

Entry deadline is Oct. 18. For more information, call (603) 623-7373.

Calendar

AUG. 8-AUG. 14

Sounds of Change: Emerging Technologies/Re-engineering State Government. Nashville, Aug. 9-11 — Contact: National Association of State Information Resource Executives, Lexington, Ky. (606) 231-1970.

AUG. 15-AUG. 21

Share Summer 1993 Meeting. Washington, D.C., Aug. 15-20 — Contact: Share headquarters, Chicago, Ill. (312) 644-6610.

International Networking Conference '93 (INET). San Francisco, Aug. 17-20 — Contact: Universities Space Research Association, Mountain View, Calif. (415) 390-0317.

Client/Server '93 East. Washington, D.C., Aug. 17-20 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-5717.

AUG. 22-AUG. 28

Interop '93. San Francisco, Aug. 23-27 — Contact: Interop Co., Mountain View, Calif. (415) 941-3399.

AUG. 29-SEPT. 4

Fed Micro '93 CD-ROM and Multimedia Conference and Exposition. Washington, D.C., Aug. 31-Sept. 2 — Contact: Tom Lauterback, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Structured Development Forum. Philadelphia, Aug. 31-Sept. 2 — Contact: Esprit Systems Consulting, Inc., West Chester, Pa. (215) 436-6290.

SEPT. 5-SEPT. 11

Compucopa '93. Las Vegas, Sept. 9-11 — Contact: UNSC Investment Group, Newark, Calif. (510) 657-3415.

SEPT. 12-SEPT. 18

Expo '93 East. Atlantic City, Sept. 14-15 — Contact: C.S. Report, Inc., Uwchland, Pa. (215) 458-5415.

Engineering Document Management Systems. Anaheim, Calif., Sept. 14-16 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 871-6606.

SEPT. 19-SEPT. 25

Mobile World. San Jose, Calif., Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Unix Expo '93. New York, Sept. 21-23 — Contact: National Blenheim Expositions, Inc., Fort Lee, N.J. (201) 346-1400.

Document World '93. Hartford, Conn., Sept. 22-23 — Contact: Key Productions, Inc., Hartford, Conn. (203) 247-6363.

SEPT. 26-OCT. 2

OOPSLA '93: Conference on object-oriented programming systems languages and applications (OOPSLA). Washington, D.C., Sept. 26-Oct. 1 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

OCT. 3-OCT. 9

The Ninth International Congress on Advances in Nonimpact Printing Technologies/Japan Hardcopy '93. Yokohama, Japan, Oct. 4-8 — Contact: The Society for Imaging Science and Technology, Springfield, Va. (703) 642-9090.

OCT. 10-OCT. 16

Design/West. Anaheim, Calif., Oct. 10-12 — Contact: Karl Steidl, Reed Exhibition Cos., Stamford, Conn. (203) 964-0000.

Hypertext '93. Seattle, Oct. 14-18 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Executive Track

Denis M. Brown, former director of the Defense Information Systems Agency's Center for Information Management, has joined **PRC, Inc.** as executive director of the firm's Patent and Trademark Office program. At the McLean, Va.-based IS and services firm, Brown, who retired from the U.S. Air Force as a brigadier general in 1988, will manage day-to-day operations of a $455 million program under way to automate the Patent and Trademark Office.

Los Angeles-based Sanwa Bank California has a new senior vice president and Information Services Department manager: **H. Lynn Ryan**. A seven-year veteran of the banking industry, Ryan comes to her new post after serving at Security Pacific Automation Co.

Randy W. Wewers, senior vice president of Equifax information technology at **Equifax, Inc.**, is retiring after three decades of service at the Atlanta-based IS and services provider. Through the end of the calendar year, Wewers, who recently orchestrated the company's telecommunications outsourcing deal with IBM subsidiary Integrated Systems Solutions Corp., will serve as a transition consultant for the White Plains, N.Y.-based outsourcer.

At Springdale, Ark.-based **Tyson Foods, Inc.**, **Steven G. Hankins**, former director of MIS, has been promoted to the position of MIS vice president.

Hankins, 34, who joined Tyson 10 years ago and rose through the accounting ranks, is now responsible for the firm's full complement of computing and communications activities.

Michael A. Gallagher has been named executive vice president of Lawrenceville, N.J.-based **First Fidelity Bancorp.** The new title comes on the heels of Gallagher's appointment early last month as head of the company's Corporate Operations and Systems Department.

Sheleen Quinn Fryer has been appointed senior vice president and chief information officer at Blue Cross/Blue Shield of Illinois. A 15-year veteran of the health care industry, Fryer comes to the new post from Blue Cross/Blue Shield of Kentucky, where she served as executive vice president for two years. Previously, she worked at Humana, Inc. and Hospital Corporation of America.

Her new responsibilities will include all of the systems operations, telecommunications and administrative service areas.

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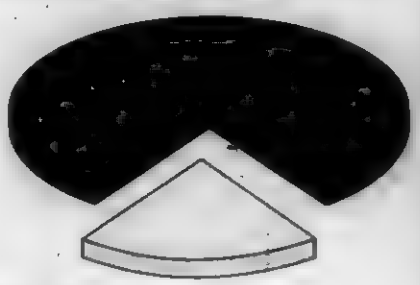

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12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
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70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Educator, Journalists, Librarians, Students
90. Other Titled Personnel

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b. PCs/Workstations
c. Large Scale/Midrange Systems
d. Software
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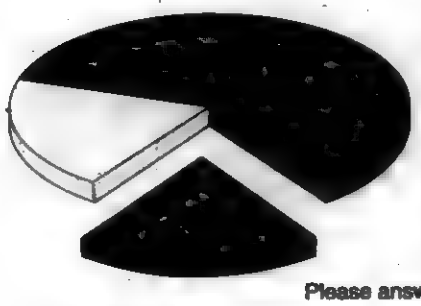

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For the data-hungry

By Howard Dresner

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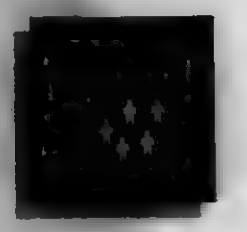
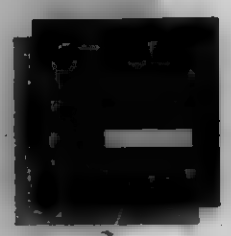
How to select EIS, decision-support and query and report tools. Pages 74 and 75.

Buyers' Scorecard: Pilot Software taps user satisfaction ratings of EIS products. Page 80.

Firing Line: Beta evaluation proves Cognos' Impromptu 2.0 to be a robust database query and reporting package. Page 82.

E. F. Codd's 12 rules for on-line analytical processing. Page 87.





It's Thursday. Corporate marketing is holding a meeting to decide on new markets. The director of worldwide sales is presenting his report to the CFO on the company's expected performance in 1994. The human resources director is conducting research for a new benefits package. And all regional sales managers are preparing their monthly reports.

WHAT TO FEED PERUSERS, WHIZ KIDS, HEAD HONCHOS AND JOE NEXT DOOR

And that's just Thursday. . . .

Data-hungry, *page 74*

Data-hungry

CONTINUED FROM PAGE 73

In today's world of scarce resources, fierce competition, dynamic markets and lean profit margins, users throughout the company have at least one thing in common: a thirst for data. No longer will "gut feelings" and "trial and error" cut it; these people need targeted, accurate, timely and complete data.

Enter "business analysis" or "business intelligence" software, which has existed in many forms but is just now coming into its own. The tools range from low-end query and report tools or spreadsheets to newer, advanced decision-support tools up to executive information systems. These systems allow users to explore data from internal and external sources, uncover trends within the customer base and the larger market and translate them into new business opportunities and cost savings.

In many organizations, a small number of financial analysts or experts in operations research spend most of their time analyzing data. Increasingly, however, all managers and professionals will spend more of their time using these systems to perform various activities:

- Interpret historical data.
- Anticipate future trends.
- Set accurate goals.
- Measure performance against goals
- Identify variances quickly.
- Allocate resources dynamically.
- Adapt to unanticipated events.

If your company is like most companies, users are probably already requesting direct access to data or new reports and extracts of data in various formats. These requests will continue to grow, outpacing your staff's ability to respond. Therefore, you need to take a comprehensive, long-term, architectural approach to the system.

Which leads us to the "ugly side" of business intelligence systems: getting the data ready. The tools get all the flash, but the most important and challenging aspects of the job revolve around gathering data requirements; extracting, staging and preparing the data; and then summarizing the data and distributing it to users. In fact, these steps are more than three quarters of the job.

The "data requirements" stage entails some real advance work with users. Most users request data just hoping that it will answer their business questions. It may not. For that reason, IS departments have to go beyond literal requests to understanding "critical success factors" and "key performance indicators."

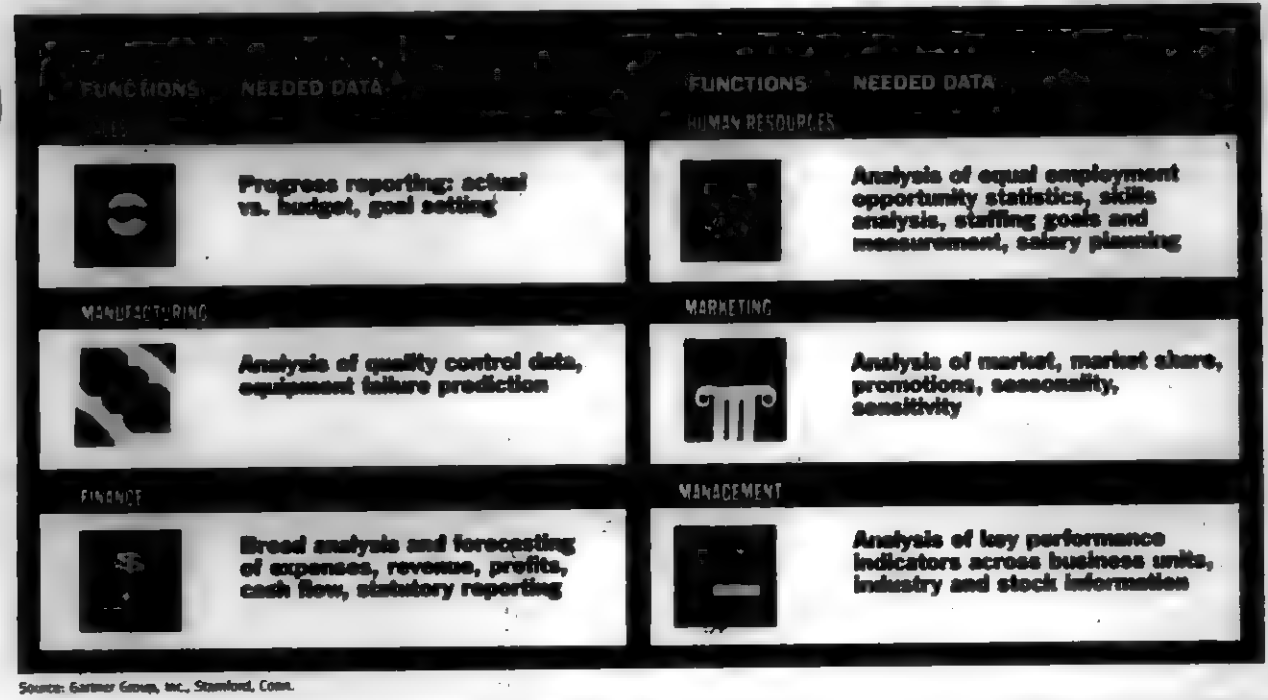
The next steps — extracting, staging and preparing the data — start with determining which data is needed, how that data will be captured, what systems it resides on and whether there are political issues to resolve regarding who receives access to the data.

And that's not even the hard work yet. If yours is a traditional organization, you'll likely be pulling data from a number of legacy systems. One way is to use data extractors, consolidators and user servers. Extractors "front-end" operational data sources, pulling data off hosts. Consolidators merge the extracted data, summarize it and distribute it to user servers.

Between the extractors and consolidators, the data is prepared, which includes translation, conversion and rationalization.

Centralized data warehousing is not optimal for everyone. For many companies, a better way is to distribute summarized corporate data extracts to relational and multidimensional databases.

Most people would like to forget about all this preparation and move right into the application-building stage. Even the vendors tend to focus on the end-user tools, not the data preparation and warehousing side. But when all is said and done, keep in mind that if you do a thorough job with the data, the application building will be that much easier. ■



Source: Gartner Group, Inc., Stamford, Conn.

THREE PRODUCT TYPES; THREE KINDS OF USERS

If you've looked into EISs before, you've probably heard the phrase "everybody's information system." It's the slogan EIS vendors use to say that a single system — theirs — can serve all users, not just head honchos.

The truth is, there are three very different kinds of users, and one tool does not fit all. Low-end tools cannot be stretched to do complex tasks, and sophisticated tools would be overkill for users with simple needs.

Available products do not, of course, fit into neat categories, but here's at least a sketch of how the market looks:

Query and report tools are best for users needing basic access to data, often using predefined reports. These users are often not technology-savvy and lack an understanding of modeling, statistics and data structures.

There are actually three categories of query and report tools, which require various levels of support from the database administrator.

- There are the very basic tools, such as Pioneer Software, Inc.'s Q+E, in which you do everything yourself, including sometimes writing SQL.
- One step above are visual programming environments, which let the user work mostly with icons, rather than raw code. But users still need to understand relational concepts. Examples include Microsoft Corp.'s Access, Lotus Development Corp.'s newly acquired Approach for Windows and Hewlett-Packard Co.'s Information Access.
- The third category raises the nature of the query to the business level. Users deal with logical domains of data, such as "sales." These require the database administrator to do a lot of setup work. The user, on the other hand, just manipulates high-level objects and plugs in variables. Examples include Cognos, Inc.'s Impromptu.

Advanced decision-support tools are for sophisticated users skilled in modeling, forecasting and analyzing data. Examples are Comshare, Inc.'s System W, Information Resources, Inc.'s Express, Kenan Technologies' Acumate and SAS Institute, Inc.'s SAS.

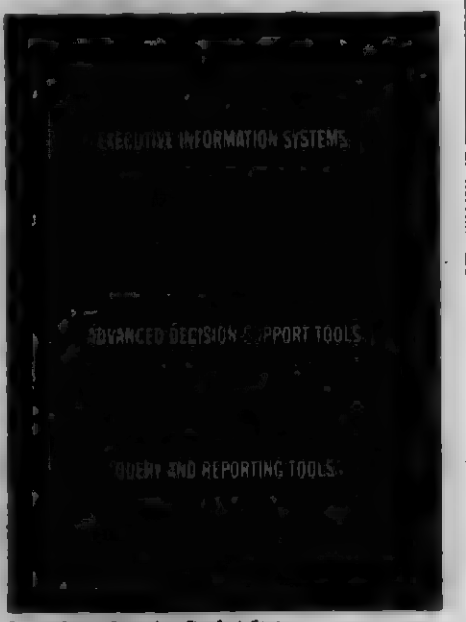
As spreadsheets become more robust, they can also be considered here. Some of the newer models actually provide tools for goal-seeking, regression analysis and correlation analysis, traditionally found only in products such as SAS.

EISs are intended for users who need to quickly and visually navigate data using broad domains, seeking answers to high-level strategic questions.

The applications are easy to use and display data graphically. Data is typically culled from a broad array of sources, including external information, such as Dow Jones. Examples include Comshare's Commander/EIS, Pilot Software, Inc.'s Lightship, Information Resources' Express/EIS and Holistic Systems, Inc.'s Holos.

Products on the periphery of the EIS category include Dimensional Insight, Inc.'s CrossTarget and Cognos' PowerPlay. Both are useful for someone who wants to analyze business data from a number of different dimensions and at fairly high levels of aggregation. However, there's no sophisticated modeling capability, you cannot customize the interface, and you cannot write programs in either one of these tools, as you can with EIS products.

— Howard Dresner



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ARCHITECTURES AND PLATFORMS

By Howard Dresner

Business intelligence software has been around for many years, mainly in the form of host-based, proprietary executive information systems (EIS) and decision-support systems. Now, with the move to PC local-area networks and Windows, an entirely new breed of products has arrived that takes advantage of shared server environments — such as Dynamic Data Exchange and Object Linking and Embedding — and also leverages the graphical user interface.

These products tend to be higher priced than typical PC software, but they cost significantly less than traditional business intelligence products.

LAN-based products are also more open than the traditional business intelligence systems, conforming with standards and de facto standards such as Open Database Connectivity, EDA/SQL and SQL Server.

If things keep moving in this direction, users will one day be able to mix and match elements of a business intelligence system instead of buying from a single vendor. But there are four areas from which business intelligence vendors are evolving:

Traditional vendors

Currently, these vendors still offer the most sophisticated data navigation and robust modeling for complex decision-support needs.

And they are not standing still in the face of competition from the newer LAN-based products. Vendors such as Information Builders, Inc., Information Resources, Inc., SAS Institute, Inc. and Metaphor, Inc. are porting to LAN servers, opening their proprietary interfaces to server engines, providing more intuitive, Windows-based tools and, in some cases, dropping prices.

It's really just a matter of whether they can hold off the competition. They may be blazing new trails, but there's a chance a swifter upstart could come along and pave them.

Middleware vendors

LANs have proved fertile ground for the emergence of business intelligence "middleware," which is server-based software that acts as a go-between for the client and back-end host. Middleware products contain varying degrees of enhanced database access and complex modeling; some are stronger in one category or another.

Middleware products perform number-crunching activities on the LAN and pass the results to the desktop. In many businesses, this shared environment makes sense because of the group nature of decision-support activities.

Middleware products can be considered "open," although there really are no formal standards in place beyond SQL on the server and Windows on the desktop. Without standards, plug-and-play business intelligence solutions will remain elusive until 1995 or 1996.

At that point, users should be able to plug in any piece of middleware or have disparate pieces of middleware talking to a single client or multiple clients. For now, however, there is just too much integration work required for most companies.

For the immediate future, users who lack the resources for this integration work must rely on integrated, single-vendor products such as SAS from SAS Institute and Express from Information Resources.

Application development vendors

These vendors create the desktop component, be it personal productivity tools such as spreadsheets and multidimensional spreadsheets or client development tools such as Powersoft Corp.'s PowerBuilder, Microsoft Corp.'s Visual Basic or Pilot Software, Inc.'s Lightship. Included in this category is anything that can talk to the middleware and understand the data that's returned to it. As the market continues to mature and more standards become available, the desktop component will be less important and middleware more important.

Data preparation vendors

These vendors deal in the dirty work of warehousing and preparation. For example, data preparation might include translating coded fields into intelligible data, homogenizing join fields, deleting irrelevant columns and removing redundant data. Giving end users direct access to warehouse data is rarely desirable if the information has not been summarized and cleaned up.

The traditional decision-support and EIS vendors such as Comshare, Inc., IMRS Co., Metaphor, SAS Institute and Information Resources all include some semblance of data preparation.

Middleware vendors that provide connectivity to back-end sources of data also work here. Included in this list are EDA/SQL, Cross Access, Trinzic Corp. with InfoHub, Micro Decisionware, Inc.'s Gateway and Pioneer Software, Inc.'s Q+E Lib.

Other middleware products, such as Prism and Trinzic's Infopump, go beyond basic connectivity to add "smarts," such as: "How do I extract data and when? How do I clean and prepare the data? How do I summarize it? Where do I dump the data when finished?" ■

Dresner is a program director at Gartner Group, Inc. in Stamford, Conn.

	INTEGRATED	MIDDLEWARE	DATA PREPARATION	APPLICATION DEVELOPMENT
[illegible]				X
[illegible]		X		
[illegible]		X		X
[illegible]	X			
[illegible]			X	
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Source: Gartner Group, Inc., Stamford, Conn.

How to select

Once you've established the types of users you need to support, you should check into the requisite user, developer and management features available on the product. Here are the selection criteria to consider:

USABILITY

Extensive statistics. Statistical capability can range from simplistic (limited to things such as mean averages and standard deviations) to very sophisticated (such as multiple regressions and exponential smoothing).

N-dimensionality. Some users need to view data in more than two dimensions. With multidimensionality, data is organized not in rows and columns but in a hierarchy of dimensions and measures. Users can more readily navigate the data and ask more complex questions.

Data-driven. Some programs are linked to the data so that when the data changes, the analysis changes as well.

Windows support. An increasing number of tools use Windows functions such as Dynamic Data Exchange and Object Linking and Embedding.

DEVELOPMENT

Object-oriented. There are two ways a product can be object-oriented: It can be internally developed with object technology, making it easier for the vendor to get the product out the door; or it can manifest object characteristics that users can take advantage of.

Completeness. Some products are soup to nuts, providing everything from data access to a full-function desktop application.

GUI generator. Some tools allow you to customize the interface, while others are less flexible.

4GL. Sophisticated products include a development language; others are just an application.

MANAGEABILITY

Scalability. Once a product is installed, it's likely to expand to include more users. Some products can tolerate this growth, while others can't.

Distributed application. Although most tools are not at this level, client/server products allow you, for instance, to place some of the application on the desktop, some on a Unix machine and some on the mainframe.

Multivendor support. Some products offer wide support for multiple operating systems, while others are limited to just one or two.

Management facilities. This includes features such as security, access limitation, etc.

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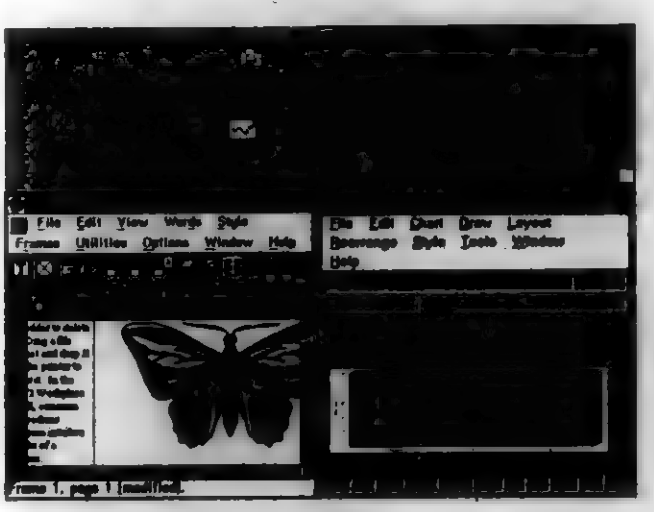

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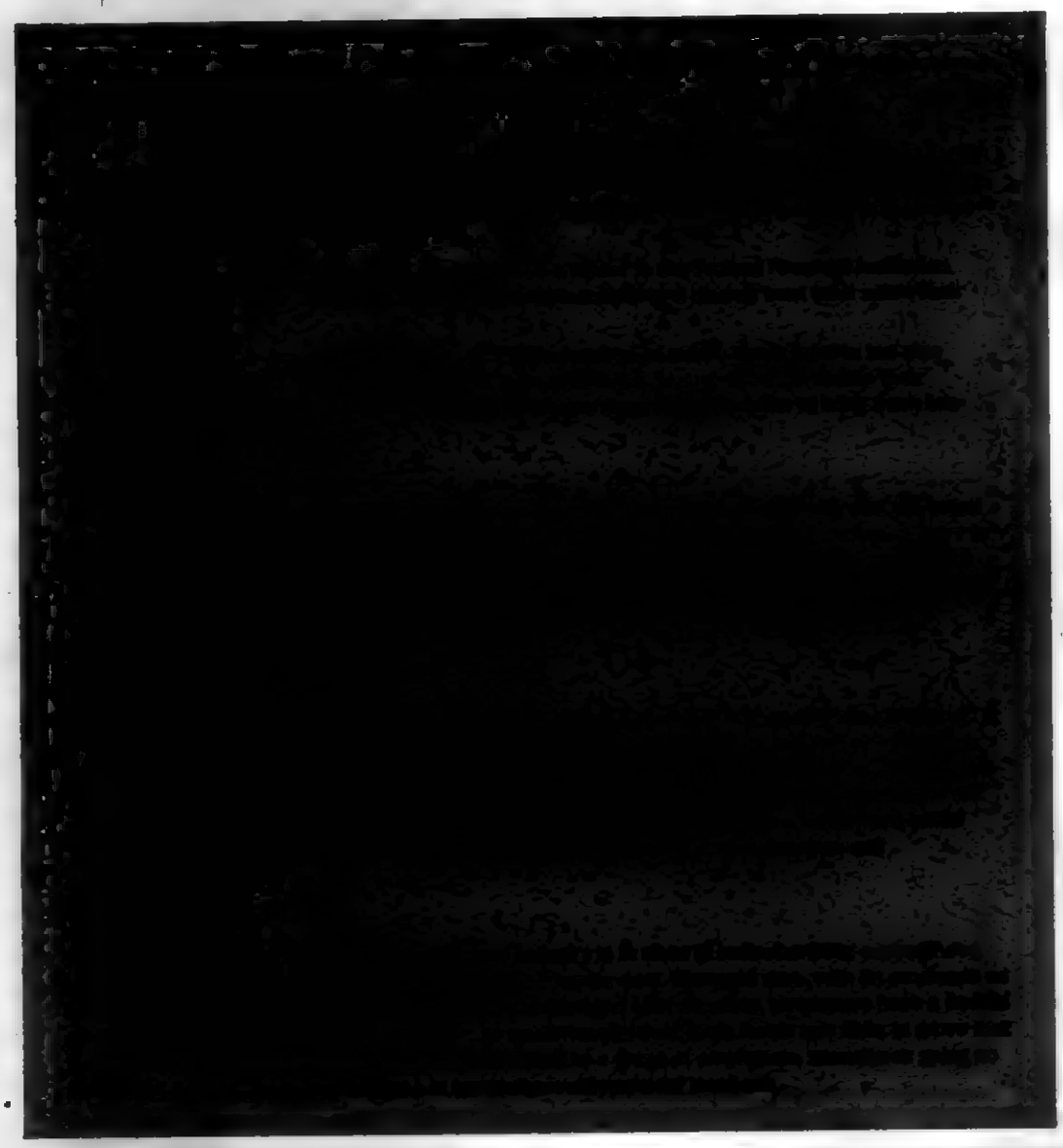
A look at GIS

By Nora Sherwood Bryan

The saying 'location, location, location' applies to much more than real estate. Businesses need to locate stores, analyze risk, develop sales territories, design media campaigns, comply with regulations, optimize delivery and assess product demand. Sooner or later, geography enters the decision loop.

So instead of sticking pushpins in color-pencil-drawn maps, more businesses are catching on to a technology that governments and utilities have been using for some time: geographic information systems (GIS).



DEFINITION

Software specifically intended to present and analyze spatial data.

TYPICAL USES

- To find out the demographics of the people who live within one mile of an intersection.
- To determine the sales potential of a new territory.
- To figure out the fastest route to pick up six packages during rush hour.

THE FIRST GIS

Although it didn't look like today's systems, the first GIS was implemented by the Canadian government in the early 1960s.

EARLY ADOPTERS

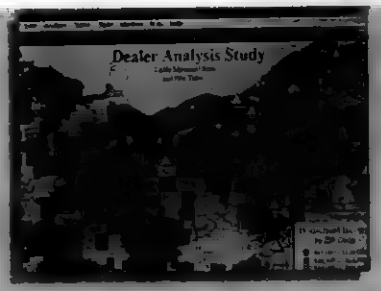
Allstate Insurance Co.
AT&T
Blockbuster Entertainment Corp.
Federal Express Corp.
The Gap, Inc.
Levi Strauss & Co.
Sun Microsystems, Inc.
The Travelers Corp.
United Parcel Service, Inc.

MARKET INDICATORS

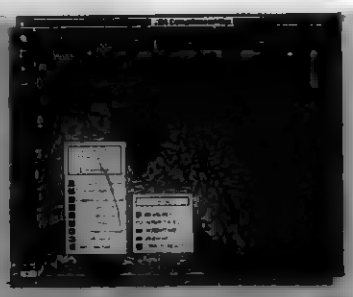
- The business sector is the fastest growing application segment of the $2 billion GIS market.
- Software sales to the private sector have grown more than 100% during the last several years and are expected to continue to grow rapidly for the next five to seven years.

GIS IN ACTION

A 'ring' is created around a sports store to analyze demographics of nearby ZIP codes. The analysis will help the store design target-marketing programs. (Slide courtesy of Strategic Mapping, Inc.)



Leads for hot tubs are primarily coming from upper-income ZIP codes. The map is used to create direct-marketing programs for the most promising areas. (Slide courtesy of MapInfo Corp.)



Banking and demographic census data is combined to analyze Community Reinvestment Act compliance. Census tracts are color-coded by level of reinvestment in comparison to level of deposits. (Slide courtesy of Tactics International Ltd.)

Sherwood Bryan is editor of Business Geographics, published by GIS World, Inc. in Fort Collins, Colo. She can be reached at (303) 223-4848.

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Buyers' Scorecard: Pilot's Lightship tops satisfaction ratings

By Kevin Burden

The executive information systems (EIS) market has long been a playground for just two vendors: Comshare, Inc. and Pilot Software, Inc. Each vendor independently developed and shaped the market with their host-based EISs, and together they hold 85% of the installations.

But when sales began to level off, EIS vendors were forced to look beyond the mainframe. As a result, a number of vendors now offer lower cost local-area network-based EIS packages. Running under Windows, these new EISs are more open and flexible than their host-based predecessors.

Comshare and Pilot have also led this market since its inception, with shares of 50% and 15% of the worldwide revenue, respectively, according to International Data Corp.'s Clare Gillan.

Despite its lower market presence, Pilot's Lightship received higher overall satisfaction ratings on most categories in our LAN-based EIS Buyers' Scorecard. The product received a total score of 69, more than enough to edge out Comshare's Commander/EIS' total score of 65.

Pilot's early commitment to PC-based EIS is paying off in high user satisfaction with its Windows-based product. Lightship scored higher marks than Commander in all but one of the six EIS features rated as most important by users. In addition, Lightship topped Commander in all but four of the 20 features evaluated in this Scorecard. Commander received higher ratings in the following areas: customization, graphical reporting, security and remote access capabilities.

Lightship received its highest satisfaction score (7.9) for hot spot and drill-down capabilities. Hot spot actions provide greater programmability over previous versions with new mathematical, string and relational functions.

Commander received its highest score (7.3) for graphical reporting. Users also praised the flexibility of the product's graphical user interface even though it scored below that of Lightship.

Commander's Desktop Builder gives developers the option of working in an expert keyboard mode or a point-and-click interface. Both modes allow users to manipulate virtually any object from charts and icons to text reports and live database queries.

Asked to rate their satisfaction with the packages, users gave Pilot's Lightship a rating of 6.9, while Comshare's Commander received a 6.5.

When asked what they felt was the product's major strength, Lightship users noted its user-friendliness and the product's flexibility in customization. Commander users also cited the product's ease of use but also singled out its accessibility to multiple databases. On the downside, poor documentation was seen as a drawback to Commander, while Lightship users complained it was too slow.

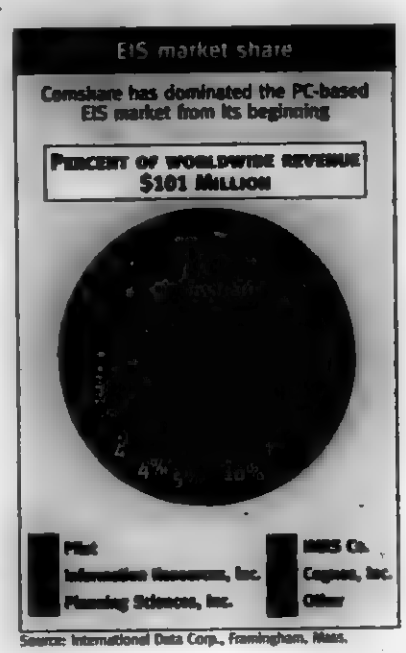
Most respondents indicated that their primary responsibility for EIS products was to purchase and set up for user departments. Their average number of years of experience with EIS products was between three and four years.

History repeats itself

Two years ago in the Scorecard [July 22, 1991], Pilot's host-based EIS Command Center slipped by Comshare's host-based Commander by a score of 54 to 52.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their LAN-based EISs in 20 specific categories.

All categories were factored into the final scores. The scores for each product in the six most important categories are listed in the charts. ■



Source: International Data Corp., Framingham, Mass.

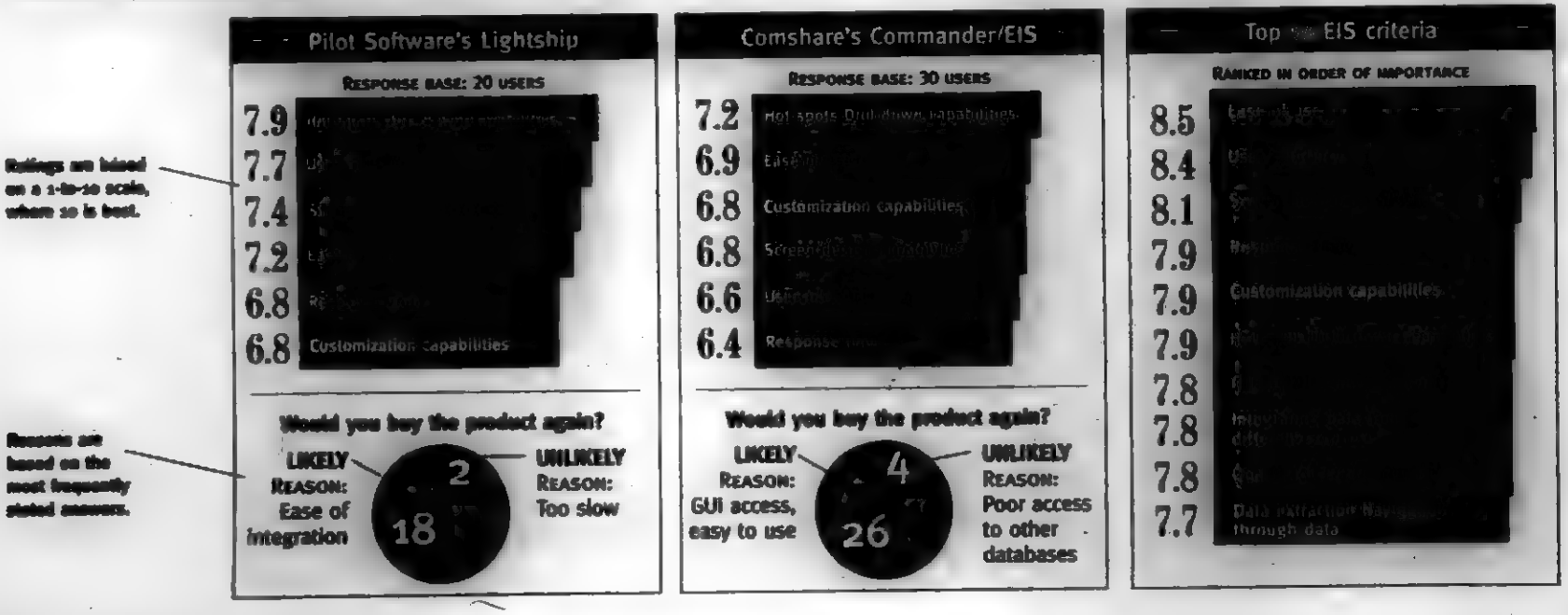
METHODOLOGY

User names were obtained from non-vendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 50. Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another.

To compute the overall score for each product, perform the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and firms for their assistance in preparing this Buyers' Scorecard: *Computerworld* Database Division; Clare Gillan, International Data Corp.; Robert Konrad, RI.K & Associates; Krystyna Filistowicz, Dataquest, Inc.; and Hugh Watson, University of Georgia.



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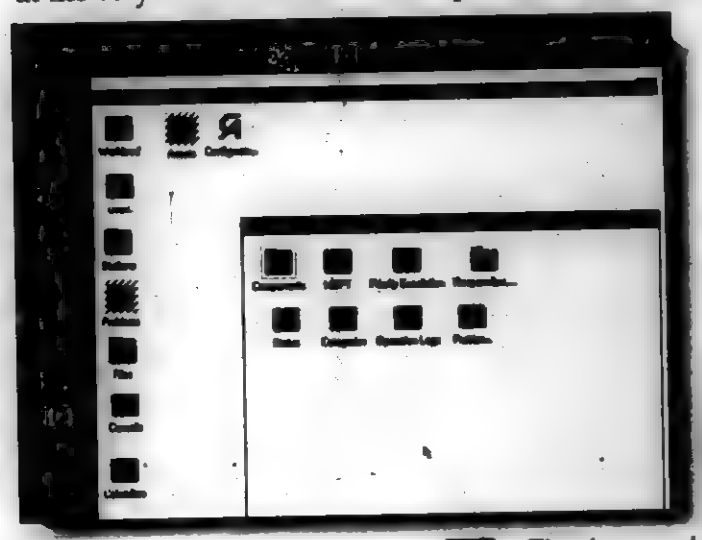

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Cognos' Impromptu 2.0:
Beta-test version of database access tool offers robust capabilities

Impromptu 2.0

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ Cognos, Inc.'s Impromptu 2.0, to be released next month, offers flexible and robust database access and reporting to end users, evaluators said.

■ Despite helpful data access features, such as the local storage of query results and intermediate "catalogs" that insulate users from physical databases, Impromptu 2.0 could use some additional reporting features, the evaluators added.

Immediate, flexible and robust database access and reporting is key to many business analysis software applications. Cognos' Impromptu Version 2.0., to be released next month, offers some new wrinkles from an established database access product set.

In beta testing since early this year, Impromptu has been available for about two years. But users at beta-test sites interviewed for this Firing Line said the original Version 1.X lacked the features and functions they required.

Among the new features provided in Version 2.0 is "catalog distribution," which allows a database administrator to create a database catalog with predefined relationships among tables. The catalogs can be automatically changed or updated by the database administrator, and all users can subsequently work with the updated catalogs.

Overall, the evaluators gave Impromptu 2.0 a strong rating, emphasizing good technical support, high value and impressive enhancements as their reasons for choosing the tool.

The evaluators for this Firing Line included four analysts with oversight of Impromptu testing and installation at their companies. The industries they represent are pharmaceuticals, consumer goods, computer software and agricultural chemicals. They collectively oversaw more than 75 users working with beta-test versions of Impromptu 2.0.

SITE PROFILES

Installation descriptions for users who evaluated Impromptu 2.0

	Pharmaceuticals firm	Consumer goods firm	Software manufacturer	Chemical manufacturer
[illegible]	DEC VAX	HP 9000	NOT APPLICABLE	VAXCLUSTER
[illegible]	ORACLE	ORACLE	ORACLE	DEC RDB
[illegible]	20	10	6	40+
[illegible]	SEPTEMBER 1992	MAY 1992	JANUARY 1993	DECEMBER 1992
[illegible]	PIONEER Q+E, EASY SQR	SQL PLUS, ORACLE FORMS	EASY SQR, SQL PLUS	QUIZ

Ease of use

The evaluators said Impromptu's Windows interface provided an excellent launching pad for end-user reporting. The tool, they said, will make it easier for users to gain quick access to databases, with little intervention from the information systems department.

Pharmaceuticals firm: "A very good interface which completely hides SQL from the end user. The best product out there right now."

Chemical manufacturer: "You don't need to know any language to execute reports."

Installation

Installation was not of any concern to the evaluators. The maximum reported installation time was two hours, although the chemical manufacturer said locating the needed databases required the assistance of the IS department.

Pharmaceuticals firm: "It took less than 10 minutes to install."

Consumer goods firm: "In three installations, it always maintained the default files on the LAN server."

Development

Impromptu uses an intermediate "catalog" to insulate users from the physical database dictionary. This catalog should be developed by someone familiar with the database structure, although not necessarily by a formal database administrator, the evaluators said. Even so, they said catalog creation was straightforward and actually enhanced the functionality of Impromptu.

Consumer goods firm: "You can do a lot within it that you can't do in Oracle."

Chemical manufacturer: "If you don't know your data, you need MIS to tell you where the data is and how to get to it."

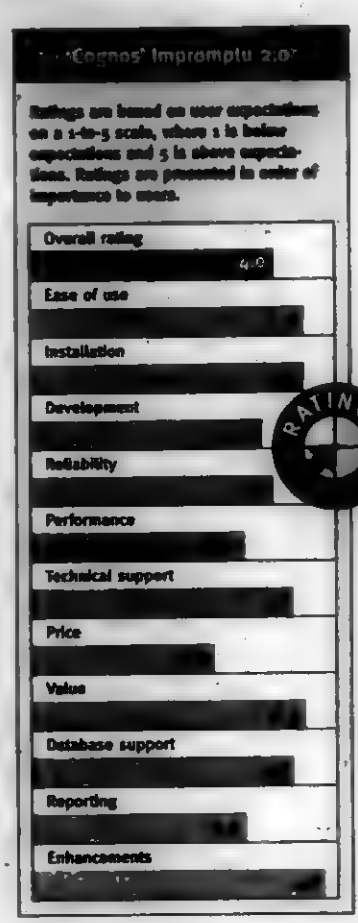
Reliability

The evaluators reported no significant problems with reliability. They said previous versions of Impromptu were not adequately reliable, but Version 2.0 solved those problems.

Pharmaceuticals firm: "Sometimes when we had a network failure, it didn't exit very gracefully."

Consumer goods firm: "You don't get a consistent return time on queries, and you can't predict the load on the server."

Software manufacturer: "We had problems with Oracle handshaking."



Performance

Performance was deemed adequate. The evaluators said a true performance measurement was difficult to render because of network limitations. However, they claimed Impromptu was on par with other data access tools, with performance somewhat enhanced because of the database "snapshot" feature.

Pharmaceuticals firm: "It depends on network traffic, but [Impromptu] is a little better than others we tested."

Impromptu, *page 84*

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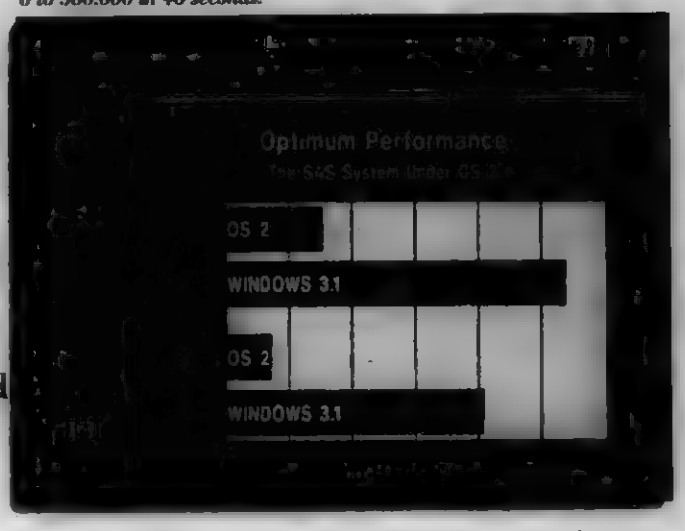

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Evaluators say Impromptu has improved technical support but is priced too high

CONTINUED FROM PAGE 82

Consumer goods firm: "It's exactly what I expected to see."

Software manufacturer: "Given the functionality, it compares favorably [to other query tools]."

Technical support

Given that they were beta-test users, the evaluators were provided a great deal of hand-holding with Impromptu 2.0. However, they concurred that there was a qualitative difference in the support they received for Version 2.0 vs. Version 1.X.

Pharmaceuticals firm: "We had a lot of problems with Version 1.X, but we decided to give it another chance."

Consumer goods firm: "I pulled the plug on Version 1.X, but this is like a brand-new product. No complaints."

Software manufacturer: "Their technical support has been very good."

Chemical manufacturer: "I had a very low opinion [of Cognos support] a few years back, but this experience has turned me around."

Price

At $395 per copy (and $595 for an "administrator edition"), the evaluators said Impromptu pricing was a bit steep. But special purchasing deals, including site licensing, somewhat mitigated the sting. The computer firm and chemical firm evaluators were uncertain about the actual cost of Impromptu because of site licensing arrangements with other Cognos products.

Pharmaceuticals firm: "It's not like [a database tool] that you buy for $99."

Software manufacturer: "The cost will have to be lower on a per-copy basis to allow a broader roll-out."

Impromptu 2.0 features

- Windows-based, SQL query tool supporting Sybase's and Microsoft's SQL Servers; Oracle via SQL Net; Rdb/VMS; Borland interfaces; and others.
- Supports 'local snapshots,' which allow query results to be stored locally.
- Administrator-defined 'catalogs' insulate users from physical database.

Value

The evaluators said Impromptu provided extremely high value because of the functionality made available to end users. They added that the easy setup and administration, the bypassing of the IS department for simple reporting and the minimal requirements for user support and hand-holding made Impromptu a valuable product in their organizations.

The consumer manufacturing evaluator said Impromptu would replace an expensive and dated service provided by a third-party software firm.

Pharmaceuticals firm: "Getting information at the right time is sometimes more important than what you pay for it."

Consumer goods firm: "We're focusing on removing software support from another vendor, and there will be savings there."

Software manufacturer: "It offers the users something they can appreciate: more timely access to their data."

Chemical manufacturer: "I don't have to have IS construct a database report."

Database support

The evaluators were primarily using Oracle Corp.'s Oracle and Sybase, Inc.'s SQL Server. They said Impromptu adequately supported all of their needs and database support was on par with competitive tools.

Pharmaceuticals firm: "They support all of the major databases, which is better than some of the other vendors."

Consumer goods firm: "Our focus right now is on Paradox and Oracle."

Software manufacturer: "Impromptu supports more file formats than we currently require."

Reporting

The evaluators said they liked the range of reporting options, including presentation quality font and shading adjustments; analytics such as subtotaling, summing and averaging; and sorting and filtering of data. However, they also wished for more, generally agreeing that Impromptu suited their needs today but possibly not tomorrow.

Pharmaceuticals firm: "You can change report headings and add bit maps. Very powerful."

Consumer goods firm: "Users producing standard reports will want a lot of capability."

Software manufacturer: "It does very sophisticated [report] formatting."

Chemical manufacturer: "It's about 50% of what it could be, but it does everything that we currently need to do. We wrote the database with the intention to use Impromptu. We'll have 50 users running this product."

Enhancements

Impromptu 2.0 is a significant rewrite and revision of the previous version. The list of enhancements is extensive, and all of the evaluators said the differences between Versions 1.X and 2.0 established Version 2.0 as essentially a brand-new product.

Pharmaceuticals firm: "The difference between day and night."

Consumer goods firm: "I'd give it a 10, if it was on the scale."

Software manufacturer: "They made some very significant gains over Version 1.1. Much classier output."

Chemical manufacturer: "It's not utopia, but I'm coming from the Stone Age."

Written by senior editor Garry Ray.

Cognos responds

Impromptu product manager Robert Rose provided the following responses to issues raised in this evaluation:

▶ **PowerPlay vs. Impromptu:** PowerPlay was designed for multidimensional analysis that typically is performed on summarized decision support data. Impromptu builds reports based on detail-level data stored in a database. In August, Cognos will launch PowerPlay Administrator Edition, containing PowerPlay Transformer, which transforms query data into multidimensional data structures for PowerPlay analysis.

▶ **Pricing:** Impromptu 2.0 is priced at $395 for the Enterprise edition and $595 for the Administrator edition. The Enterprise edition, in volume purchases for corporate standard reporting, can be priced as low as $249. While not the lowest priced reporting software on the market, Impromptu has unique features such as direct manipulation, the catalog, and query and reporting functions as one that place Impromptu in a very competitive position.

An aggressive introductory price will be announced at the time of the product release.

▶ **Reporting and analytic functions:** The reporting features of Impromptu make it an excellent solution for complex reporting needs. These include if-then-else conditional reporting, grouping and sorting on calculated columns, sorting and filtering aggregates and the ability to drag and drop report elements into headers and footers. We expect the reporting improvements from Version 2.0 to 3.0 to be as dramatic as from Version 1.1 to 2.0.

▶ **Performance:** Internal benchmarks show that Impromptu is four times faster than our fastest competitor with native Xbase and Paradox files. We have addressed network performance with a caching feature that processes query requests on the user's PC, dramatically reducing server impact. In addition, a snapshot feature, which stores query results to disk locally, enables users to continue working while not physically connected to the database.

▶ **Learning curve:** Impromptu users can become productive in less than 30 minutes. Our PowerBar provides the same direct manipulation of data elements as Microsoft Office or Lotus SmartSuite. Impromptu presents the database with meaningfully named folders containing logical groupings of columns. The business requirement is supported by the software design.

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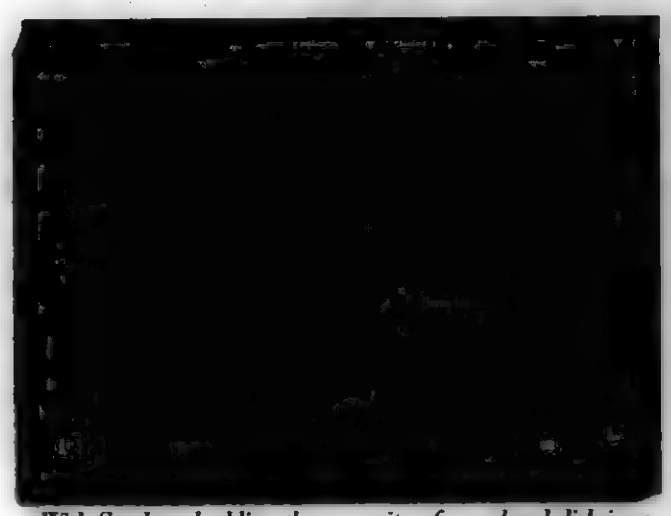

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In 1985, E. F. Codd shook the database world with his 12 rules for relational DBMSs.

He's back.

This time, Codd's devised 12 rules for a new group of analytical processing tools that can put substantive decision-making data at users' fingertips.

BEYOND DECISION SUPPORT

By Edgar F. Codd
Sharon B. Codd and
Clynch T. Salley

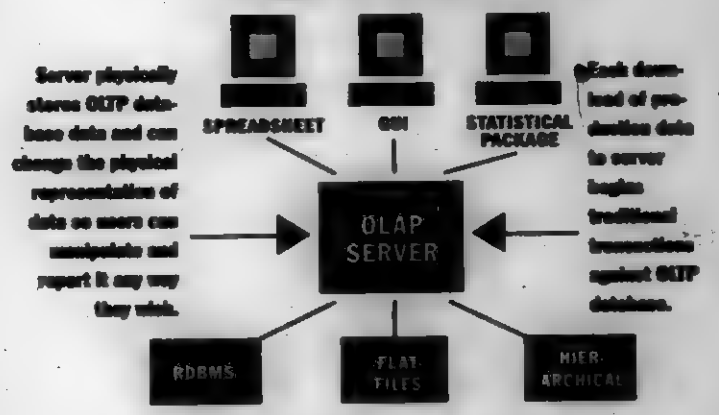
The amount of corporate data has grown consistently and rapidly during the last decade, so much so that companies today are manipulating data in the terabyte (one trillion bytes) to petabyte (one thousand terabyte) range. If bytes were raindrops, that would be enough to float the QEII.

Businesses today prosper or fail depending on their ability to synthesize and analyze this data using information systems.

To date, however, this information analysis and synthesis has been rather thin. Most users have been stymied because their systems have

SERVING UP DATA

What the OLAP setup looks like

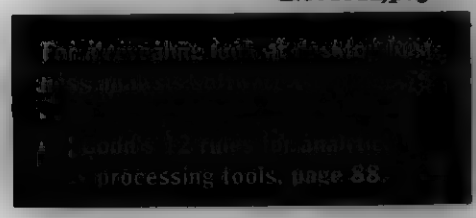


been able to handle and present data in only two dimensions — typically, in columns or rows. That kind of limit has, in turn, limited decision-making.

But a new way of getting at important information — what we call online analytical processing (OLAP) — promises to shatter barriers to strategic decision-making.

Relational database management systems have taken us far. RDBMSs can be credited with putting data

E. F. Codd, *page 88*



E. F. Codd

CONTINUED FROM PAGE 87

analysis and synthesis at end users' fingertips. Nearly anyone with a computer can perform sophisticated analyses on database information. Users don't have to wait for help from database administrators and application developers.

No heaven on earth

But having an RDBMS doesn't mean instant decision-support nirvana. As enabling as RDBMSs have been for users, they were never intended to provide powerful functions for data synthesis, analysis and consolidation (functions collectively known as multidimensional data analysis). Instead, these functions were relegated to separate end-user tools, such as general-purpose query products, spreadsheets, graphics packages and specialized application packages.

But such front ends are limited in presenting data in different formats, under different headings and according to diverse dimensions.

Front-end tools make it nearly impossible for the average user to consolidate, view or manipulate data in dimensions the database designer did not anticipate. Seemingly simple data presentation changes require the system to devise and execute a more complex query. The upshot is slow system performance and the inability to view data as desired without complex SQL operations.

IS and users need some help but not in the form of another database technology. Robust enterprise data analysis tools are needed that complement the existing DBMS. These OLAP tools should enable users to build and work with analytical data models easily and view data in multiple dimensions.

Instead of columns and rows, users would get a puzzle of information, in which every multidimensional block is connected and associated to every other block. While a column might contain information on product names, sales revenue and expenses for a row of products (such as nails, screws, hammers), OLAP tools would add dimensions such as time periods, sales territories and distribution channels.

Users can find out how many Brand X nails they shipped by distribution channel in the third quarter in Japan and investigate problem spots. If shipments into Japan declined in the first quarter, for instance, the user could check through shipments by channel (and drill down to performance by specific distributors) or by product (and drill down to specific product lines or products). He could determine the source of the trouble.

In fact, with OLAP, it isn't unusual for users to be able to discern relationships between eight or nine data dimensions.

With analytical processing tools, users can do the dynamic enterprise analysis required to create, manipulate, animate and synthesize information from data analysis models. The result is that users can see new relationships in data.

Dynamic analysis differs from the stat-

THE 12 RULES

When E. F. Codd's first set of rules for RDBMSs debuted in 1985, it caused quite an uproar. Today, Codd and his colleagues have devised 12 rules for would-be contenders for the on-line analytical processing (OLAP) crown. The 12 rules for evaluating OLAP products are as follows:

1 Multidimensional conceptual view

A user's view of the enterprise is multidimensional in nature. Sales, for instance, can be viewed not only by product but also by region, time period and so on. That's why OLAP models should be multidimensional in nature. This multidimensional user view facilitates model design and analysis, as well as inter- and intradimensional calculations, through a more intuitive analytical model.

Users are able to manipulate such multidimensional data models more easily and intuitively than is the case with single dimensional models. For instance, users can slice and dice, pivot and rotate consolidation paths within a model.

2 Transparency

The fact of whether OLAP is part of the user's customary front-end product (e.g., spreadsheet or graphics package) should be transparent to the user. OLAP should exist within an open systems architecture, enabling the analytical tool to be embedded anywhere the user desires without adversely affecting host tool functionality.

Additionally, the user should not have to be concerned with whether the data input into the OLAP tool came from a homogeneous or heterogeneous database environment.

3 Accessibility

The OLAP tool must map its own logical schema to heterogeneous physical data stores, access the data and perform any conversions necessary to present a single, coherent and consistent user view.

Moreover, the tool (and not the end user) should be concerned about where or from which type of systems the physical data is coming.

4 Consistent reporting performance

As the number of dimensions increases, the OLAP user shouldn't see any significant degradation in reporting performance.

5 Client/server architecture

Most data requiring OLAP is stored on mainframes and accessed via PCs. It is, therefore, mandatory that the OLAP products be capable of operating in a client/server environment.

To this end, it is imperative that the server component of OLAP tools be sufficiently intelligent so that various clients can be attached with minimum effort and integration programming.

The intelligent server must be capable of mapping and consolidating data between disparate logical and physical enterprise databases. This is necessary to maintain transparency and build a common conceptual, logical and physical schema.

6 Generic dimensionality

Every data dimension must be equivalent in both its structure and operational capabilities. There should exist only one logical structure for all dimensions. Furthermore, any function applied to one dimension should also be able to be applied to another dimension. Basic data structure, formulas and reporting formats should not be biased toward any one data dimension.

7 Dynamic sparse matrix handling

The OLAP server's physical structure should have optimal sparse matrix handling. A sparse matrix is one in which not every block, or cell, in the matrix contains data.

When confronted with a sparse matrix, the system must be able to deduce the distribution of the data and how to store it most efficiently. The OLAP tool's data structure should be configurable.

The physical access methods must also be dynamically changeable and should contain different types of mechanisms, such as direct calculation; B-trees and derivatives; hashing; and the ability to combine these techniques when advantageous.

The inability to adjust to a data set's data distribution makes for slow, inefficient operations and needlessly large and/or hopelessly slow data models.

Access speed should remain fairly constant across models containing different numbers of data dimensions or varying sizes of data sets.

By adapting their physical data structure to the specific analytical model, OLAP tools let users easily perform previously complex analyses.

8 Multiuser support

OLAP tools must provide concurrent access (retrieval and update), integrity and security to support users who may need to work concurrently with the same analytical model or create different models from the same enterprise data.

9 Unrestricted cross-dimensional operations

In multidimensional data analysis, all dimensions are created and treated equally. For instance, a user should be able to perform the same actions on the dimension "time" as on the dimension "product."

The OLAP tools should handle associated calculations among dimensions and not require the user to define what these calculations should be.

Some calculations require the definition of various formulas according to a computationally complete language. Such a language must allow calculation and data manipulation across any number of data dimensions and must not restrict or inhibit any relationship between data cells, regardless of the number of common data attributes each cell contains.

10 Intuitive data manipulation

Manipulation, such as reorienting the consolidation path, drilling down across columns or rows or zooming out, should be accomplished via direct action on the analytical model's cells.

Such manipulation should not require the use of a menu or multiple trips across the user interface. The dimensions defined in the analytical model should contain all the information the user needs to put in motion any inherent actions.

11 Flexible reporting

Using the OLAP server and tools, a user can manipulate, analyze and look at data any way he wants, including placing rows, columns and cells close to one another visually or arranging them in logical groupings.

Reporting facilities must mirror this flexibility and present synthesized information (or even data that has yet to be synthesized) any way the user wants to view it. Reports should reflect the model.

12 Unlimited dimensions and aggregation levels

Research into how many dimensions analytical models possibly require shows that users may need as many as 19 concurrent data dimensions. Any serious OLAP tool should be able to accommodate at least 15 and preferably 20 data dimensions within a common analytical model.

Furthermore, each of these generic dimensions must enable an essentially unlimited number of user-defined aggregation levels within any given consolidation path.

For a copy of Codd et al's white paper on OLAP, please call (408) 441-6400.

ic analysis usually associated with databases designed for on-line transaction processing (OLTP). Static data analysis examines historical data without the benefit of much manipulation. With static data analysis, users get comparisons, such as "Is Charlie's salary greater than Ted's?" or lists: "List all suppliers that supply red parts and are in Paris."

With OLAP, historical data is manipulated extensively. OLAP makes possible numerous, speculative "what-if" scenarios. Within these scenarios, users repeatedly change the values of key variables or parameters to reflect changes in internal or external business factors.

A sales force director, for instance, might start out with his desired total revenue goal for the year, input initial values for dimensions, such as "products" and "sales region," and figure out the amount of sales per region necessary to achieve his revenue goal for the year.

OLAP tools also let users identify the parameters necessary to handle large amounts of data, create an unlimited number of consolidation paths and specify cross-dimensional conditions and expressions.

Into users' hands

Today, the challenge for such rich analytical processing is how to get OLAP functionality into the hands of users with a minimum of new education and without sacrificing their existing productivity. The obvious approach is to add the functionality to an interface the user is comfortable with — namely, the spreadsheet.

What a spreadsheet needs to support OLAP includes the following:

- Access to the data in the DBMS or access method files.
- Definitions of the data and its dimensions required by the user.
- The variety of ways and contexts in which the user might wish to view, manipulate and animate the data model.
- Access to these functions via the user's customary interface.

Unfortunately, spreadsheet vendors have shown little interest in supporting robust OLAP.

So we've had to come up with a framework that would make OLAP functionality appear as if it were part of the user's spreadsheet without actually being so.

Our vision for OLAP hinges on the work of an OLAP server (see chart page 87). The user is on-line to the OLAP server, and each download of production data to that server begins a transaction against the production OLTP database.

The OLAP server stores data from the OLTP database and changes (or "morphs") the data's physical shape so users can manipulate it in any way imaginable. OLAP servers transform the respective user view or external structure of the OLTP database into an alternate, multidimensional storage structure that lends itself to soft analysis.

The server sits between the DBMS and user interface. In this way, the OLAP interface requirements to slice, dice, pivot and consolidate data are seamlessly integrated into the spreadsheet product, with physical schema morphing occurring as a function of the OLAP server.

. . . . . .

Ultimately, an enterprise's ability to compete successfully will be in direct correlation to the quality, efficiency and pervasiveness of its OLAP capability. It is, therefore, incumbent on information technology groups to prepare for OLAP and to provide rigorous support for it in their organizations. ■

E. F. Codd is founder of Codd and Date, Inc. in San Jose, Calif., a consulting firm specializing in relational technology. His seminal work establishing 12 rules for relational products appeared in *Computerworld* in 1985. Sharon B. Codd is president of Codd and Date. Salley is editor of the *Relational Journal* and personal technical assistant to E. F. Codd.

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Yes	No	No	No	No
Yes	Yes	Yes	Yes	Yes
Yes	?	No	No	No
Yes	No	No	No	No
Yes	?	Yes	No	No
Yes	No	No	No	No
Yes	Yes*	No	Yes	No
Yes	Yes	No	Yes	Yes
Yes	No	Yes	No	No
Yes	Yes	No	Yes	Yes
Yes	Yes	No	No	No

Data on ESSbase comes from hands-on study; all other data supplied by vendors. * Mainframe version only.

DEFINITIONS

● Data consolidation
The process of synthesizing pieces of information into single blocks of essential knowledge.

● Data consolidation path
A series of consolidation levels or steps defined in terms of multilevel parameters.

For example, 'business enterprise' might include as a consolidation path the levels 'business area,' 'division,' 'department,' 'project,' 'task' and 'employee.'

Consolidation paths determine which details are visible to the end user when the user drills down.

● Data dimension
The highest level in a data consolidation path. A data dimension represents a specific perspective of the data.

● Dynamic data analysis
Comparison of data values from disparate data stores and a number of diverse dimensions.

● Multidimensional data analysis
Simultaneous analysis of multiple data dimensions.

● Sparse matrix
A matrix in which not every block in the grid of columns and rows is filled with data. The opposite of dense matrix.

● Static data analysis
Comparison of one static data value with another. Commonplace in OLTP systems. (See dynamic data analysis.)

Extra! Extra! LA TIMES REPORTS IN

The Los Angeles Times is improving its reporting — its management reporting, that is.

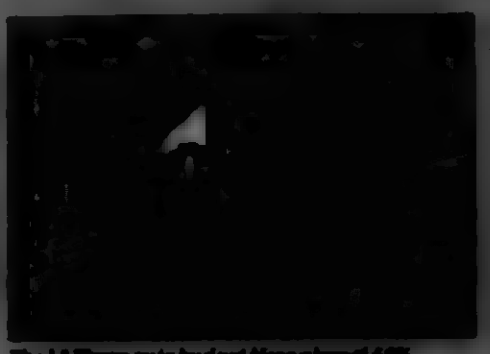
Under pressure from various media competing for advertising dollars and reader mindshare, the newspaper, which delivers 1.2 million papers daily, found it needed to keep a close eye on its revenue figures. Its budgeting and reporting department turned to OLAP to help it analyze hundreds of data elements and how that information affected revenue.

Before OLAP, the 12-person budgeting and reporting department worked with spreadsheet and database tools. But data was inaccessible: Analysts literally had to walk around departments collecting a mishmash of disks to retrieve the numbers required for budgeting, forecasts and consolidations.

As a result, annual budget preparation required all 12 analysts working four months, seven days a week.

Enter OLAP. It reduced the time it took to prepare the annual budget by almost half, says Betty Emirbayer, budget and reporting manager. Currently, it takes analysts 2½ months of five-day workweeks.

It used to take three days to obtain and load forecast data, run consolidation and deliver finished reports, says Kevin Connors, senior analyst. Now, data is downloaded from the general ledger systems or uploaded from departmental spreadsheets into an OLAP server. OLAP consolidation takes only about 3½ hours.



The LA Times auto budget drew almost 50%

OLAP has enabled several key applications:

- Raw material utilization model. This model was designed to track consumption of newsprint for the main and regional production runs. The model helps determine the correct print runs by allowing analysts to analyze multiple dimensions, including circulation figures and advertising/editorial ratios by each section of the paper and by day. The multidimensional capabilities of OLAP, Emirbayer says, let the department get data needed to see how specific items affect revenue.
- Salary and work-hour tracking. About 2,000 employees work 24 hours a day, seven days a week to manage prepress tasks, print and deliver the newspaper, says Leon Pfleuf, operations planning supervisor and developer of the tracking application. Annual salaries run $60 million.

The system extracts data from payroll information, then converts and loads it into the OLAP server. Pfleuf's group tracks every hour worked and information according to pay-code categories such as regular time, vacation time and overtime. The system consolidates data at the account, department, plant and operations levels. From this data, the department produces 100 different weekly reports.

Pfleuf's group has reduced the time it takes to load data from seven person-days to two hours. Report runs have been cut from six hours to three.

A BALANCING ACT

Middle managers in traditional data centers need to brush up on their technical skills so they can monitor the influx of new technologies.

By Alice Bredin

TWO YEARS AGO, systems manager John Tomkutomes used his 10 years of mainframe experience 100% of the time, but in the last year he has used it only about 60% of the time.

His company, C-Land Services, Inc., an Elizabeth, N.J.-based global transportation firm, is moving toward distributed systems, and Tomkutomes admits he has learned more about local-area networks and technology than he ever thought he needed to know as a manager.

"It's not enough to know that my area will use a relational database. I have to know how well the structure of that database will fit," he says.

Tomkutomes' situation is not uncommon in big-iron shops, however. Many managers in traditional data centers are just getting their feet wet with LANs. In fact, while it may seem like old news, some are only starting to learn new programming languages, methods of connectivity and LAN tools.

The Massachusetts Bay Transit Authority in Boston, for example, is in the process of adding a LAN to its mainframe. Bill Morin, manager of technical support, and his staff are also getting their first taste of routers.

Morin's training focuses on what routers do, while his staff is learning how to use them. "I'll know the broad knowledge about where we need a router, what needs to be on the box and how traffic will flow through that router," Morin says. "My staff will learn how to configure the box. That's the difference."

Getting up to speed

As they ramp up on new technologies, managers are also being asked to do things faster and better. Scott Scherrer, a senior systems analyst at Commonwealth Edison in Chicago, and his staff used to rely on traditional programming methods. In the last year, however, Scherrer moved his department to a faster, new coding approach. Instead of writing each piece of code, his staff members use Texas Instruments, Inc.'s Information Engineering Facility (IEF), which generates code after the programmer draws data models and activity hierarchies.

IEF is intended to make the department more efficient, but, Scherrer says, he has yet to see the benefits. However, as his employees become more efficient using the product, Scherrer says he believes the benefits will become apparent.

To master this change, Scherrer learned the new terminology and tools within IEF. He also took three weeks of vendor training, while his staff, which does the actual programming, took six. "I draw models and write descriptions of what I need my staff to accomplish," Scherrer says, "but my staff fills in all the details of how to make that happen within the program."

As managers prepare for the next wave of technology, many say they cannot forego their traditional mainframe skills. They agree that most managers still need familiarity with Cobol and how to use it as an interface between new systems and mainframes. "Cobol hasn't died. We still keep things like general ledger on the mainframe," says David Kleba, a senior systems analyst at Abbott Laboratories in Abbott Park, Ill.

Scherrer also plans to continue using his information engineering skills for maintenance. "Technology such as ISPF [a utility used with the MVS operating system] will continue to make up about 20% of my day, and I don't think this will change."

Managing transition — the toughest part

"I get a lot of questions about how to redo things that we used to have sitting on the mainframe. I'm expected to lead the way, but I'm still learning too."

David Kleba, a senior systems analyst at Abbott Laboratories in Abbott Park, Ill.

"We need to learn so many new technologies. We are expected to be hands-on managers and direct our staffs in new products. The amount of time I have spent in training has doubled or tripled."

John Tomkutomes, systems manager at C-Land Service, Inc. in Elizabeth, N.J.

Bredin is a free-lance writer based in New York.

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Advice for a crash LANding

By Joanne Cummings

WHEN A LOCAL-AREA NETWORK goes down, can you handle it? Skills required for LAN disasters are dramatically different than those needed in the traditional data center. If you're charged with preventing and rebounding from LAN crashes and your background is in the data center, you need to change your mind-set.

The first step in proper disaster recovery planning is to identify critical resources. Centralized data is easily identified and protected, but it is not so clear-cut with a LAN. "In LANs, there are lots of small pieces of information distributed all over the place and taken together they comprise a lot of the value within a company," says Patrick Corrigan, managing director at The Corrigan Group, a network consultancy in Sausalito, Calif.

Disaster masters

- Attempt to quantify the value of down-by-time affecting users.
- Learn to diagnose single points of failure.
- Create an alternative course of action should one piece of the LAN go down.
- Apply the same problem-solving techniques to troubleshooting a terminal-to-host network to LANs.

Add to the complexity the fact that users have a larger degree of autonomy in LAN-based environments. End users are free to add files and applications to the LAN, forcing LAN managers to hone their investigative skills to plan for and troubleshoot problems. "You need to be able to talk to users who have little or no knowledge of what they're working with," says Jennie Matson, network consultant at Texas A&M University System in College Park, Texas. "You have to know how to ask the right questions."

And that takes time. "In a LAN environment, the end user is much more involved with the day-to-day running of the network, and, as a consequence, they're usually more involved with the failures," Matson said.

Matson knows from experience how important end users can be to LAN troubleshooting. Shortly after the university cut over to an IBM Token Ring LAN for its administrative offices — the most critical users of its 4,000-node LAN internetwork — the LAN failed.

The initial problem was caused by a power failure. Then, the LAN repeaters did not respond properly because they were old. While fairly new, the Token Ring had bugs that still needed to be hammered out in the various adapter cards.

After rebooting some pieces of equipment, Matson rebooted the repeaters.

"The LAN came back for a minute, but the repeaters put some trash out on the network and knocked down the front-end processor because its [Token Ring interface card] couldn't handle it. When the front-end processor crashed, all the users on the Ethernets and the Token Ring were down," she says.

All in all, a bad day. "But we were able to edge closer to the solution by talking with everyone and piecing together the order of events and how the network reacted," Matson says.

An alternate route

Other skills are just as necessary. "You have to be good at figuring out where you have single points of failure," says Dennis Sullivan, vice president at Scudder, Stevens & Clark, a New York investment firm. "You have to have an alternative course of action in the event that any one piece of the LAN goes down."

And that is a difficult, but possible, process. "Many times, you can't simply replace a malfunctioning card because you'd have to bring down the whole LAN," Sullivan says.

There are things that carry over from the data center. "Basic troubleshooting methods are the same," Matson says. "If you can troubleshoot a terminal-to-host net, you can apply those same problem-solving techniques to LANs. If you have basic knowledge of what it's supposed to be doing and what the protocols running on it are supposed to do, then you can usually fix it."

Problems and avoidance

It doesn't take a Hurricane Andrew or a World Trade Center bombing to render a LAN useless.

Unlike mainframe networks in which every cable runs through a control center, the primary source of LAN outages is poor cabling or cabling breaks. Here are other culprits:

■ Bad LAN design

Watch out for bad LAN design. Because LANs offer flexibility, users tend to be more lax when it comes to their design. Errors to avoid are failing to provide redundant paths and hanging too many PCs off the same server.

In many bus-based topologies, a single cable cut can bring down an entire network. Users need to be aware of this and design their networks properly.

■ Too many points of entry

Many times there are just too many points of entry and LAN managers tend to be lax about things such as regularly updating passwords.

Also, unlike a mainframe that has a central location and can be protected centrally, LANs spread all over. LAN managers need to decide if they want to hang uninterruptible power supplies all over the place or consolidate all of the servers in one room.

Source: Cheryl Currid, president of Currid & Co., a Houston-based LAN consulting firm

Cummings is a free-lance writer in Marlboro, Mass.

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SOFTWARE ENGINEER (REF. #38588) to consult with clients to ascertain & define their business requirements or problem areas & utilize tech expertise to provide solution to clients' needs, incl analysis, design, development & implementation comp s/ware for clients' EDP sys, incl: design & develop gateway, network app for asynchronous communications, porting communications SW from UNIX SVR3 to SVR4 incl studying feasibility, conducting sys anal, design, development & implementation of protocols for on-line communication across M68010 processors of a Digital Switching Sys using UNISYS SU00/60, 6000/65, Motorola M68000 series, VAX, UNIX SVR3, SVR4, C-ISAM, INFORMIX 5.0, ESQL/C, NFS & TCP/IP. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 years of college ed plus 3 years of exp in related occupation in lieu of the req ed & exp. REL EXP: In whole or in part; designing protocols for on-line sys, s/ware development for maintaining Digital Switching Sys; & using/Motorola M68000 & 68010, VAX, C & UNIX. Pay is $34,000/yr. 40 hr/wk.

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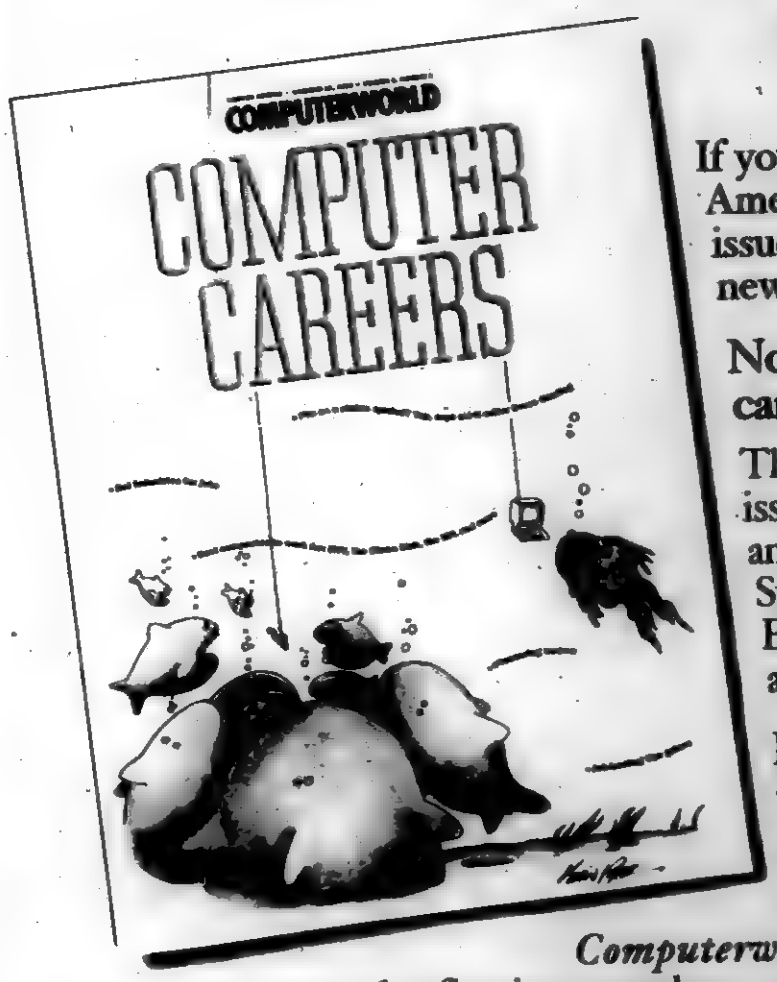

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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
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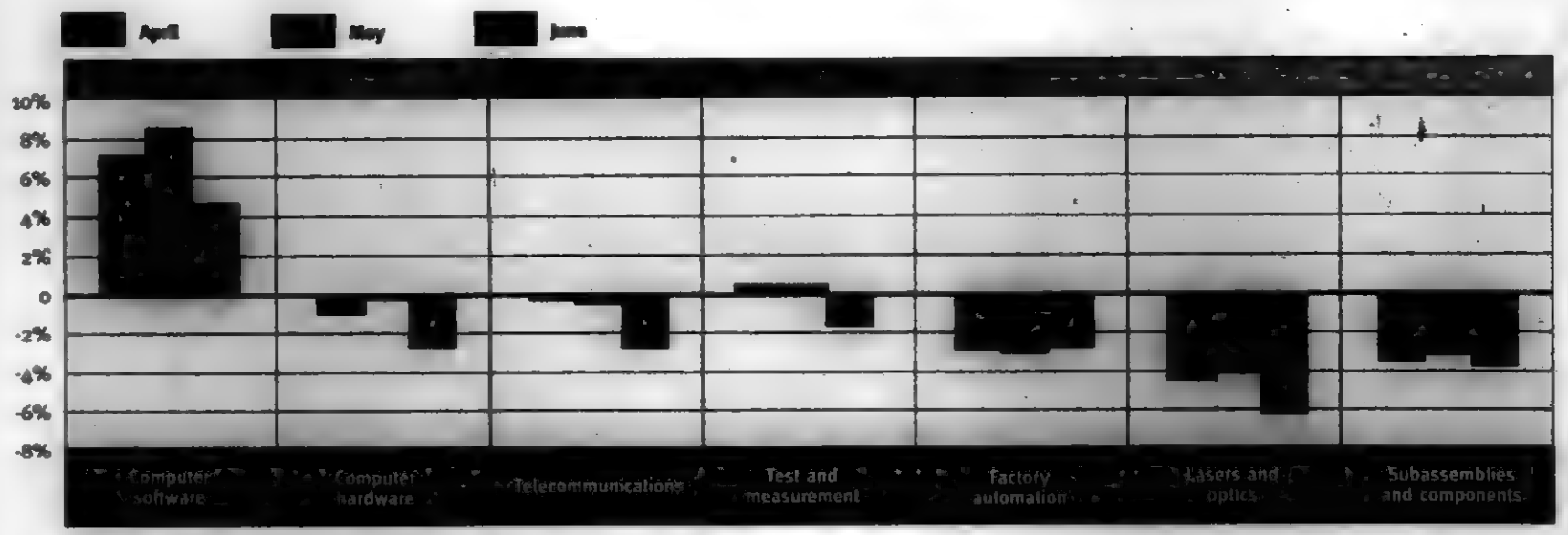

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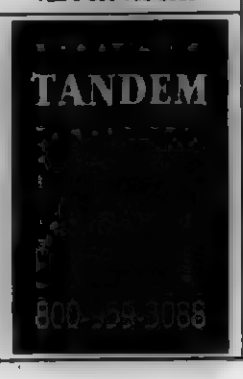

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Cutting through the hype

One information systems director's view on proprietary vs. industry-standard PCs

BUYER'S VIEW

Ciolkowski is the MIS director at Abrams Benisch & Klaw, Inc., a real estate company in New York. He has been working with and purchasing PCs since their inception.

By David B. Ciolkowski

WHY WOULD ANY company buy into a proprietary PC when industry-standard machines are a dime a dozen? Well my company did, and we're glad.

In the past, the term "proprietary" was used to describe equipment that did not conform to the clone standard, was not compatible with any other product line and was difficult to upgrade. Eventually, these problems steered computer professionals away from anything proprietary.

Today, proprietary PCs are not that different from the industry standard, except that they use custom-designed, integrated motherboards. Unlike previous proprietary machines, such as IBM's Personal System/2, they also offer upgradable BIOS and microprocessors.

Proprietary PCs have video subsystems, hard-drive interfaces and basic I/O that are part of the motherboard instead of existing as add-on boards. In my experience, these systems were designed and are manufactured better than industry-standard counterparts. In fact, many industry-standard PCs have motherboards that use cheaper third-party add-on cards for video and I/O.

I've found that design problems in these machines are not as evident in straight DOS applications as they are under Windows. This is because graphical user interfaces task hardware significantly more than character-mode operations.

In my position, I inherited eight machines that use standard motherboards and add-on interface cards. Using DOS, WordPerfect Corp.'s WordPerfect and Lotus Development Corp.'s 1-2-3, they run just as well as their integrated counterparts. Windows operation, however, exposed problems with single in-line memory module interface design (memory parity errors) and I/O problems while printing (device conflicts).

Double(Space) trouble

While evaluating DOS 6.0, we also noticed that industry-standard machines experienced more problems with installation and DoubleSpace, DOS 6.0's compression utility, than proprietary machines. The only problematic proprietary PC was an IBM L40SX laptop. The installation program failed with a system board error, but after manual installation, it worked fine.

I find it hard to blame Microsoft Corp. for DOS 6.0 problems. We cannot expect PC operating systems to work flawlessly on the entire spectrum of PCs. Instead of asking for more sophisticated features, we should demand a higher standard for PCs.

I'm not saying that all industry-standard machines should be used as paperweights. There are reliable industry-standard machines. Any manufacturer can create a thoroughly engineered PC with a standard case and motherboard, but few choose to do so. I believe a proprietary machine with an integrated motherboard has a better chance of being reliable because the I/O interface is conceived and designed with the motherboard.

REALITY CHECK

Purchasing guidelines for PCs

■ **Look under the hood.** Hard-wire corrections to the motherboard, usually in the form of little yellow wires lacing the surface, are signs of poor engineering.

■ **Examine the design with respect to maintenance.** How accessible are SIMM slots and hard drive bays? How difficult is it to replace the floppy drive? Machines that were poorly designed in this regard are difficult to maintain.

■ **Test PCs with your own programs and applications.** Thorough testing in Windows is a must. Be extra careful if planning to use any Microsoft video drivers, and test all video configurations. If you must use high resolution, proprietary drivers are often required. It is always best to use video systems that are compatible with the Microsoft-supplied VGA.DRV.

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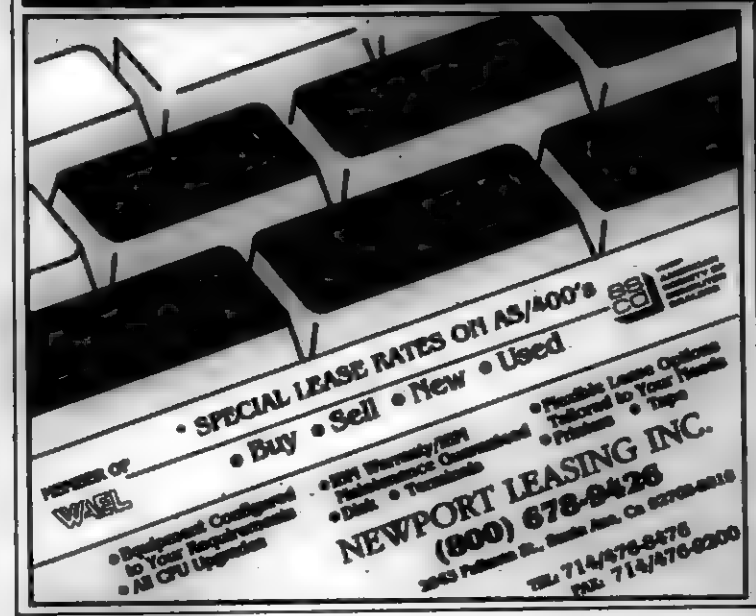

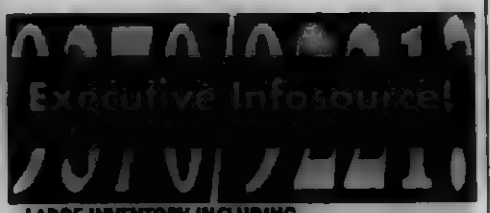

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Week ending July 16, 1993

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PS/2 Model 55SX	$650	$625
ThinkPad 300	$1,400	$1,375
PS/2 Model 90-Offp	$1,700	$1,650
PS/2 Model 95-Off	$3,000	$2,800
Compaq Prolinea 4/66	$2,000	$1,500
Prolinea 486/50	$1,450	$2,725
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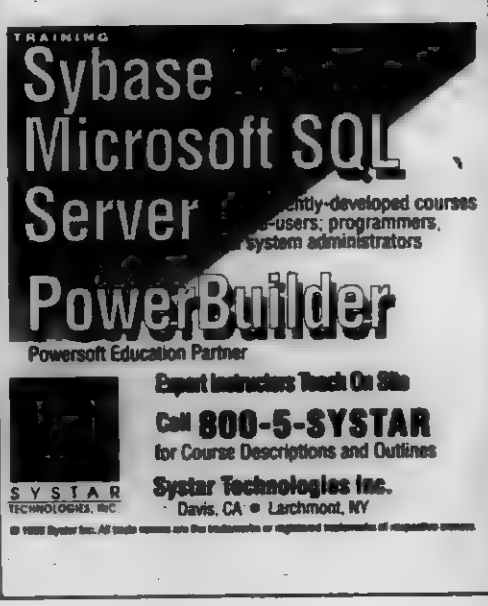

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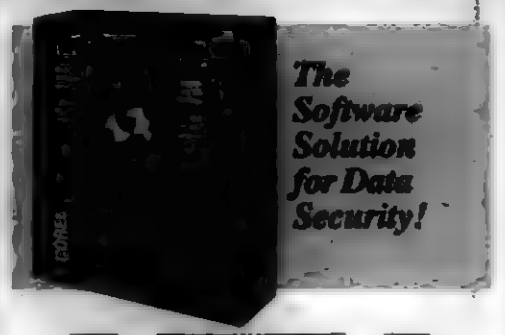

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SynOptics	15.6
Commtron Inc.	15.0
Computer Computer Corp.	15.2
AST Research Inc.	14.5

Corporate Software	-23.9
Intersolv Inc.	-22.2
Cosmotronics Corp. (L)	-21.7
American Mgmt. Systems	-19.5
Aspen Communication Corp.	-17.8
Phoenix Technologies	-16.3
Rainbow Technologies Inc. (H)	-16.1
Northern Telecom Ltd. (L)	-14.2

Dollar

Microcom Networks Corp.	6.75
Compaq Computer Corp.	6.63
SynOptics	6.50
Compucom Corp.	5.13
BMC Software Inc.	4.75
Oracle Corp.	4.68
Cabletron Systems	4.38
American Power Conversion (H)	4.25

Rainbow Technologies Inc. (H)	-3.00
Northern Telecom Ltd. (L)	-3.63
American Mgmt. Systems	-3.63
Microsoft Corp.	-3.38
3Com (L)	-3.25
Cross/Comm	-3.25
Software Spectrum Inc.	-3.00
Corporate Software	-2.63

IBM, DEC stocks may liven up

Two slumbering giants could awaken on Wall Street this week. The trouble is, no one is sure whether they will rise and conquer — or topple like Goliath.

Investment analysts said IBM (IBM) and Digital Equipment Corp. (DEC) issues, which have been sluggish performers trading in narrow ranges recently, may get downright frisky this week as the companies announce results for the June quarter.

"There could be sharp movement in both of these stocks the day they announce, depending on what they come out with," said Neeraj Vohra, an industry analyst at Standard & Poor's Corp.

Investors seemed particularly skittish about IBM's prospects last week. IBM stock began to show signs of activity, but in an unfavorable way: Share price dropped under 42 for the first time in many years. Analysts said it is difficult to predict IBM's Tuesday disclosure but guessed at an operating loss of 30 cents per share, plus more charges for restructuring.

While Vohra said big-iron competitor Amdahl Corp.'s (AMH) huge quarterly loss likely indicates dim prospects for IBM's bread-and-butter mainframe business, others found some positive signs.

"The Amdahl quarter was certainly terrible but better than I expected," said Martin Reesinger, an analyst at Duff & Phelps Investment Research Co. "So there may be some glimmer of hope in the mainframe market that IBM will also pick up on." Reesinger currently rates IBM stock a Sell, but he said the stock could bounce up if the company's announcement holds enough of such surprises.

Investors might also react well to greater aggressiveness in cost-cutting and in moving resources away from traditional mainframes and toward growth areas such as superservers and parallel processing systems.

Before awarding IBM shares a long-term appreciation in share value, however, investors will most likely wait for tangible signs of earnings momentum. "You're talking about a pretty long project. I don't think the market is going to wait until [IBM Chairman Louis Gerstner] gets it all done, but clearly it's going to take more than they've seen so far, which is basically a bunch of appointments," said Casey Stern, senior vice president at Starr Securities.

DEC's near-term future, meanwhile, is even more inscrutable. DEC announces results on Wednesday.

"Digital is virtually impossible to forecast," Vohra said. "Most analysts seem to be expecting a profit, though, so if Digital doesn't earn money, that stock is going to get hit hard." — *Derek Slater*

Exch	52-Week High	52-Week Low		July 23 3 PM	Wk Net Change	Wk Pct Change
[illegible]						
OTC	40.00	9.88	3 COM Corp.	22.25	-0.25	-1.1
NYS	81.00	63.38	American Info Techs Corp.	78.38	0.00	0.0
NYS	64.88	40.63	AT&T (H)	63.63	0.38	0.6
OTC	4.06	0.75	Aptel Communication Corp.	2.44	-0.50	-17.0
OTC	24.50	10.25	Banyan Systems Inc.	19.38	1.38	7.6
NYS	59.50	44.50	Bell Atlantic Corp.	58.50	1.25	2.2
NYS	57.50	46.75	Bellsouth Corp.	56.50	0.50	0.9
NYS	9.75	3.63	Bolt, Beranek & Newman	9.75	1.88	23.8
OTC	18.50	9.50	Brooktrout Technology	13.25	0.13	1.0
NYS	109.00	52.13	Cabletron Systems	103.38	4.38	4.4
OTC	23.75	5.75	Centigram Communications (H)	23.00	0.63	2.8
OTC	50.50	19.00	Chipcom Corp.	48.88	5.13	11.7
OTC	57.25	22.13	Cisco Systems Inc.	53.00	3.25	6.5
OTC	16.38	5.50	Compression Labs Inc.	11.75	-0.63	-5.1
OTC	36.00	13.00	CrossComm	28.00	-3.25	-10.4
OTC	4.63	1.38	Data Switch Corp.	3.13	0.25	8.7
NYS	19.88	12.38	Digital Comm. Assoc.	13.75	-0.25	-1.8
OTC	12.75	4.00	Digital Systems Int'l Inc.	4.38	-0.38	-7.9
OTC	53.38	5.88	DSC Communications	51.50	0.75	1.5
OTC	9.50	4.88	Fibronics Int'l Inc. (L)	5.13	-0.63	-10.9
OTC	24.00	8.75	Frenet Corp.	12.25	-0.25	-2.0
OTC	4.38	1.50	Gandalf Technologies Inc.	3.00	0.13	4.3
OTC	7.06	0.94	Gateway Communications	1.13	0.06	5.8
NYS	15.75	2.88	General Datacomm Inds.	9.38	0.63	7.1
ASE	3.75	2.00	Go Video	2.38	-0.19	-7.3
NYS	37.75	32.38	GTE Corp.	35.75	-1.25	-3.4
NYS	88.63	62.75	ITT Corp. (H)	88.63	0.88	1.0
OTC	29.75	16.06	MCI Communications Corp. (L)	29.13	1.00	3.6
OTC	6.50	1.75	Microcom Inc. (L)	1.94	-0.06	-3.1
OTC	24.25	4.75	Netwin Corp.	4.75	-0.25	-5.0
OTC	19.00	7.50	Network Computing Devices	7.50	0.00	0.0
NYS	15.00	5.38	Network Equipment Tech.	7.25	-1.13	-13.4
OTC	20.13	8.00	Network General	11.25	-0.13	-1.1
OTC	15.75	8.13	Network Systems Corp.	8.50	-0.13	-1.4
OTC	54.75	7.50	Newbridge Networks Corp.	54.75	6.75	14.1
NYS	46.00	21.88	Northern Telecom Ltd. (L)	21.88	-3.63	-14.2
OTC	35.25	22.50	Novell Inc.	25.25	2.00	8.6
NYS	92.50	79.00	Nynex Corp.	90.25	-1.25	-1.4
OTC	30.00	14.50	Octel Communications Corp.	22.38	-0.25	-1.1
OTC	6.13	3.38	Peiril Data Comm Networks	4.00	0.13	3.2
OTC	30.50	10.25	Picturetel Corp.	17.88	-1.63	-8.3
OTC	15.25	3.63	Proteon Inc.	4.00	0.13	3.2
NYS	35.00	16.34	Scientific Atlanta Inc.	29.75	-1.25	-4.0
NYS	40.75	31.75	Southwestern Bell Corp.	40.25	0.13	0.3
NYS	35.38	22.00	Sprint Corp.	35.00	1.25	3.7
OTC	27.00	11.00	Standard Microsystems Corp	15.25	-0.13	-0.8
OTC	18.50	7.00	Stratacom Inc.	12.25	-0.75	-5.8
OTC	42.75	10.53	Synoptics Communications	33.25	1.25	3.9
OTC	7.00	3.00	Telebit Corp.	3.00	-0.06	-2.1
OTC	9.38	2.13	Telematics Int'l Inc.	8.00	0.25	3.2
OTC	25.50	14.00	US Robotics	23.00	-0.13	-0.5
NYS	47.75	35.25	US West Inc.	47.13	1.13	2.4
OTC	55.50	16.63	Wellfleet Communications	51.75	3.50	7.3
OTC	17.25	7.25	Xircom (H)	15.50	-0.25	-1.6
[illegible] and Applications						
OTC	5.56	2.50	Advanced Logic Research	3.38	-0.13	-3.6
OTC	66.25	25.38	Apple Computer Inc. (L)	26.13	-1.38	-5.0
OTC	24.25	11.25	AST Research Inc.	15.75	2.00	14.5
NYS	10.25	2.50	Commodore Int'l	3.38	-0.13	-3.6
NYS	61.75	27.75	Compaq Computer Corp.	50.13	6.63	15.2
OTC	49.88	13.50	Dell Computer Corp.	17.50	1.63	10.2
NYS	89.25	50.25	Hewlett Packard Co.	77.00	1.00	1.3
NYS	39.25	17.63	Silicon Graphics	37.50	-0.38	-1.0
OTC	41.00	24.00	Sun Microsystems Inc.	27.38	-1.38	-4.8
NYS	32.38	22.25	Tandy Corp.	28.88	-0.13	-0.4
OTC	7.00	2.75	Zeos International Ltd.	3.38	0.25	8.0
[illegible] Systems						
ASE	15.13	4.63	Adoame Corp.	5.25	0.25	5.0
NYS	8.75	4.25	Convex Computer	4.75	-0.13	-2.6
OTC	6.13	2.00	Cray Computer	3.00	0.38	14.3
NYS	30.88	19.00	Cray Research Inc.	26.88	-0.25	-0.9
NYS	13.88	7.63	Data General Corp.	8.63	-0.50	-5.5
NYS	49.25	30.38	Digital Equipment Corp.	37.50	-1.88	-4.8
NYS	39.25	27.25	Harris Corp.	38.13	-0.13	-0.3
NYS	55.50	41.63	IBM (L)	42.38	-3.25	-7.1
OTC	22.00	5.50	Kendall Square Research	17.25	-1.13	-6.1
NYS	127.50	83.00	Matsushita Electronics	122.50	3.50	2.9
OTC	23.75	18.25	Netframe	18.25	0.75	4.3
OTC	17.25	9.25	Parallan Computer (H)	15.88	0.38	2.4
OTC	21.00	6.00	Pyramid Technology	19.00	-0.50	-2.6
OTC	24.00	11.25	Sequent Computer Sys.	12.38	-0.13	-1.0
OTC	8.75	1.38	Sequoia Systems Inc.	2.06	0.13	6.4
NYS	48.38	29.50	Stratus Computer Inc.	30.13	-0.38	-1.2
NYS	16.88	9.63	Tandem Computers Inc.	10.50	0.50	5.0
OTC	23.50	10.63	TeleCard Systems	20.00	-1.75	-8.0
NYS	13.88	7.75	Unisys Corp.	10.50	-1.00	-8.7
[illegible] Software						
OTC	74.00	25.25	Adobe Systems Inc.	53.50	-0.25	-0.5
OTC	20.75	10.25	Aldus Corp.	15.25	1.50	10.9
OTC	14.25	5.50	American Software Inc.	6.75	-0.50	-6.9
OTC	28.13	10.00	Ase Computer Systems	11.13	0.38	3.5
OTC	56.75	38.50	Autodesk Inc.	45.00	0.50	1.1
OTC	12.00	2.50	Bachman Info. Systems	4.00	0.88	28.0
OTC	43.00	31.00	BGS Systems Inc. (L)	32.25	0.50	1.6
OTC	64.13	38.75	BMC Software Inc.	56.25	4.75	9.2
OTC	28.25	17.00	Boole & Babbage	24.75	0.50	2.1
OTC	49.00	17.50	Borland Int'l Inc.	20.13	-0.38	-1.8
OTC	5.38	3.00	CE Software	3.38	-0.13	-3.6
ASE	34.88	6.84	Cheyenne Software Inc.	34.00	2.38	7.5
OTC	19.50	8.25	ChipSoft	10.00	1.00	11.1
OTC	9.00	5.63	Cognos Inc.	8.25	0.00	0.0
NYS	31.38	13.00	Computer Associates	29.75	1.25	4.4
NYS	12.38	2.75	Computervision Corp.	3.25	0.00	0.0
OTC	34.25	19.25	Compuware Corp.	26.00	-0.50	-1.9
OTC	14.75	5.75	Comshare Inc.	7.50	1.00	15.4
OTC	19.13	10.75	Corel Corp.	17.63	0.38	2.2
OTC	15.25	5.00	Easel Corp.	7.25	1.13	18.4
OTC	25.25	12.00	Ati Dimension	18.75	-1.50	-7.4
OTC	19.50	5.25	Frame Technology	6.50	-0.25	-3.7
OTC	19.00	8.38	Group I Software	9.50	-0.50	-5.0
OTC	35.25	14.50	Gupta	20.13	-1.38	-6.4
OTC	9.25	4.13	Hogan Systems Inc. (H)	8.38	-0.13	-1.5
OTC	25.75	13.25	HNBS	18.50	-0.50	-2.6
OTC	38.00	21.00	Information Resources	34.00	-1.00	-2.9
OTC	27.25	8.75	Informix Corp.	22.25	1.50	7.2
OTC	16.75	8.75	Intergraph Corp.	9.38	0.00	0.0

Exch	52-Week High	52-Week Low		July 23 3 PM	Wk Net Change	Wk Pct Change
OTC	13.63	6.13	Interlear Inc. (L)	7.13	0.88	14.0
OTC	18.00	5.25	Intersolv Inc.	5.25	-1.50	-22.2
OTC	16.00	7.75	Knowledgeware Inc.	11.00	-0.75	-6.4
OTC	54.75	15.50	Legent Corp.	17.50	1.25	7.7
OTC	37.75	14.75	Lotus Development	37.75	2.50	7.1
OTC	23.00	6.25	MathSoft	6.25	0.25	4.2
OTC	23.25	5.25	McAfee Associates	6.13	0.38	6.5
OTC	11.63	1.88	Meca Software	5.38	-0.63	-10.4
OTC	12.00	5.25	Mentor Graphics	9.25	-0.13	-1.3
OTC	46.00	26.63	Micro Focus	29.75	2.13	7.7
OTC	18.25	4.38	Microgrape Inc.	6.63	0.98	6.0
OTC	98.00	68.00	Microsoft Corp.	78.00	-3.38	-4.1
OTC	51.75	15.75	Oracle Corp.	50.50	4.63	10.1
OTC	37.00	16.75	Parametric Technology	34.25	0.38	1.1
OTC	40.50	22.50	Peoplesoft	31.63	-0.13	-0.4
OTC	7.13	3.50	Phoenix Technologies	4.50	-0.88	-16.3
OTC	60.00	22.00	Powersoft	33.00	0.75	2.3
OTC	41.50	17.00	Platinum Software	23.13	-1.88	-7.5
OTC	25.00	10.75	Platinum Technology	12.63	0.13	1.0
OTC	61.50	32.25	Progress Software Corp.	45.00	0.50	1.1
OTC	7.38	2.56	Quarterdeck Office Sys.	2.69	0.06	2.4
OTC	32.00	14.25	Rainbow Technologies Inc. (H)	24.00	-5.00	-16.3
OTC	12.25	4.00	Rasterops	8.75	0.38	4.5
OTC	15.25	5.63	Ross Systems	10.50	-0.25	-2.3
OTC	27.50	9.63	Sapiens Intl. Corp. N.V.	24.00	-0.88	-3.5
OTC	14.50	5.88	Software Publishing Corp.	6.63	-0.25	-3.6
OTC	12.00	2.38	Software Toolworks Inc.	10.88	-0.13	-1.1
OTC	3.13	0.75	Spinnaker Software	1.31	0.00	0.0
OTC	12.75	3.25	State of the Art	11.38	-0.13	-1.1
NYS	24.63	15.00	Sterling Software Inc.	23.25	1.88	8.8
OTC	21.50	8.00	Struct. Dynamics Research	18.50	-0.75	-3.9
OTC	77.50	26.50	Sybase Inc.	73.00	1.00	1.4
OTC	22.25	5.88	Symantec Corp.	13.38	1.63	13.8
NYS	12.50	5.75	Systems Center Inc.	10.25	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	20.00	1.25	6.7
OTC	6.38	2.75	Tomic Corp.	3.50	-0.31	-8.2
OTC	22.75	9.75	Viewlogic Systems	19.88	0.38	1.9
OTC	23.50	5.50	Wallel Interactive Systems (L)	5.50	-0.50	-8.3
OTC	3.19	1.38	Wordstar	1.41	-0.09	-6.3
[illegible] [illegible]						
NYS	32.88	8.38	Advanced Micro Devices	24.25	1.25	5.4
NYS	22.00	9.38	Analog Devices Inc.	21.25	-0.13	-0.6
OTC	27.88	7.63	Atmel Corp.	25.75	1.25	5.1
OTC	5.75	2.75	Chips and Technologies	4.38	0.38	9.4
OTC	39.75	13.00	Cirrus Logic	19.13	2.63	15.9
NYS	15.00	7.88	Cypress Semiconductor Corp	14.38	-0.13	-0.9
NYS	16.50	9.38	Dallas Semiconductor (H)	15.75	0.25	1.6
OTC	60.63	27.13	Intel Corp.	51.88	0.88	1.7
NYS	17.00	4.88	LSI Logic Corp. (H)	16.13	0.13	0.8
OTC	22.16	10.84	Lattice Semiconductor	18.00	-0.50	-2.7
NYS	44.88	14.38	Micron Technology (H)	42.75	1.88	4.6
NYS	90.63	41.00	Motorola Inc.	87.88	0.63	0.7
NYS	17.25	9.50	National Semiconductor	16.50	0.00	0.0
OTC	15.75	6.50	Sierra Semiconductor	7.25	0.63	9.4
OTC	48.25	22.25	SynOpsys	48.25	6.50	15.6
NYS	76.50	36.75	Texas Instruments	73.25	0.75	1.0
OTC	11.75	6.13	VLSI Technology	10.63	0.00	0.0
OTC	12.63	2.63	Weitek	11.50	0.75	7.0
ASE	9.63	3.63	Western Digital Corp.	3.88	0.00	0.0
OTC	39.50	14.50	Xilinx	39.50	1.25	3.3
OTC	33.00	14.00	Zilog Inc.	26.25	0.00	0.0
[illegible] [illegible] Systems						
OTC	40.75	14.33	American Power Conversion (H)	40.75	4.25	11.6
OTC	20.16	14.50	Banctec Inc.	18.00	0.00	0.0
OTC	18.00	4.50	Cambex Corp.	4.50	-0.25	-5.3
ASE	18.38	4.50	Cognitronics Corp. (L)	4.50	-1.25	-21.7
NYS	25.50	9.00	Conner Peripherals	10.88	1.00	10.1
OTC	38.50	10.75	Creative Technologies Inc.	29.00	-1.13	-3.7
OTC	30.75	11.00	Data Race Inc.	12.50	0.50	4.2
ASE	17.00	4.75	Dataram Corp.	9.38	0.25	2.7
NYS	25.75	5.06	EMC Corp. (H)	24.88	0.13	0.5
OTC	10.50	5.38	Emulex Corp.	6.38	-0.50	-7.3
OTC	19.00	13.25	Evans & Sutherland	16.88	1.63	10.7
OTC	33.00	7.50	Exabyte	9.00	0.50	5.9
OTC	28.75	7.09	Intelligent Info. Systems	24.00	-2.00	-7.7
OTC	8.88	3.75	Iomega Corp.	3.75	-0.31	-7.7
OTC	16.00	5.75	IPL Systems Inc.	9.00	0.25	2.9
OTC	24.00	12.75	Komag Inc.	16.00	0.63	4.1
OTC	19.63	5.00	Maxtor Corp. (L)	5.88	0.13	2.2
OTC	11.25	5.75	Micropolis Corp.	6.25	-0.13	-2.0
NYS	117.00	97.00	3M Corp	109.00	-1.25	-1.1
OTC	7.75	4.00	Printronix Inc.	7.00	-0.13	-1.8
NYS	17.25	6.88	QMS Inc.	8.50	0.50	6.3
OTC	17.88	9.50	Quantum Corp.	9.88	-0.25	-2.5
OTC	11.88	3.13	Radius Inc.	4.13	0.13	3.1
NYS	16.50	7.75	Recognition Equipment	13.50	0.38	2.9
OTC	13.88	9.75	Rexon Inc.	4.13	-0.13	-2.9
OTC	22.38	12.00	Seagate Technology	18.00	0.25	1.4
NYS	45.00	18.00	Storage Technology	27.88	-1.50	-5.1
NYS	27.88	17.63	Tektronix Inc.	25.63	-0.75	-2.8
NYS	88.88	71.50	Xerox Corp.	73.25	-1.38	-1.8
Services						
OTC	23.75	15.00	American Mgmt. Systems	15.00	-3.63	-19.5
NYS	4.75	2.38	Analogic Inc.	2.88	0.25	9.5
OTC	35.75	16.25	Analysts Int'l	28.25	-0.75	-2.6
NYS	56.13	42.00	Auto Data Processing	49.13	0.38	0.8
NYS	17.25	12.50	Ceridian Corp.	15.63	1.00	6.8
NYS	17.38	13.13	Comdisco Inc.	14.63	-0.50	-3.3
OTC	8.63	4.50	Computer Horizons	8.63	0.88	11.3
NYS	85.75	58.75	Computer Sciences (H)	82.63	-1.88	-2.2
NYS	9.25	6.50	Computer Task Group	7.13	0.50	7.5
NYS	40.50	22.00	CompUSA Inc.	23.50	1.75	8.9
OTC	14.25	6.00	Corporate Software	8.38	-2.63	-23.9
OTC	19.25	7.38	Egghead Discount Software	7.38	-0.50	-6.3
NYS	35.88	25.25	General Motors E (EDS)	27.63	-0.50	-1.8
OTC	25.50	10.00	Inacom Corp.	21.13	-0.63	-2.9
OTC	16.25	8.13	Intelligent Electronics (H)	16.25	1.25	8.3
OTC	13.13	6.63	Medisel	12.38	-0.13	-1.0
OTC	20.25	5.75	Microage Inc. (H)	20.25	1.00	5.2
OTC	63.00	24.00	Paychex	61.00	-1.50	-2.5
NYS	87.25	25.25	Policy Management Sys.	39.25	0.13	0.4
NYS	41.38	20.38	Reynolds and Reynolds	40.50	0.00	0.0
OTC	17.25	11.00	SEI Corp.	16.50	-0.50	-2.9
OTC	24.38	18.63	Shared Medical Systems	20.38	-1.38	-6.3
OTC	12.63	5.75	SHL Systemhouse	10.38	-0.25	-2.4
OTC	50.75	19.00	Software Spectrum Inc.	26.75	-3.00	-10.1
OTC	36.00	23.25	Sungard Data Systems (H)	36.00	2.50	7.5
NYS	4.38	1.13	Ultimate Corp.	3.00	-0.38	-11.1

KEY: (H) = New annual high reached in period (L) = New annual low reached in period
NOTE: MCI Communications Inc. completed a 2-for-1 stock split on 7/9/93.
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Compaq results counter PC trend

Focus on price/performance and cost-cutting yield sales volume and profit growth

By Michael Fitzgerald
HOUSTON

■Last week, Compaq Computer Corp. stepped out of the competitive bloodbath called the PC hardware market without a trace of red.

The world's fourth largest PC maker was solidly in the black, posting sharply higher sales and profits for the first half of 1993. Compaq bucked the trend that has shaken Apple Computer, Inc., Dell Computer Corp. and AST Research, Inc. from the profit tree and threatened the future of myriad smaller companies.

Gian Carlo Bisone: *Compaq is benefiting from customers returning to brand-name players*

Compaq's sales doubled from the year-earlier period, while net profit almost tripled (see chart).

Compaq officials attributed those results to the company's continued focus on cost-cutting and aggressive product introductions. The firm has restructured much of its desktop product line this year, placing renewed emphasis on price/performance. Compaq's new low-priced Prolinea, Contura and DeskPro/I models fueled growth in the period.

The company also beefed up its notebook line with several new models.

Compaq claimed that it gained from the general financial shakiness of many PC makers. "As the market is getting more concerned about what's happening [to PC vendors], we're benefiting from customers looking back to brand-name players," said Gian Carlo Bisone, Compaq's vice president of marketing, North America.

"Compaq is the strongest, most healthy company in the business, and this quarter affirms that they have their act together," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass. He added that Compaq has hit a 6.3% net profit margin for its last three quarters, a sign of consistent management.

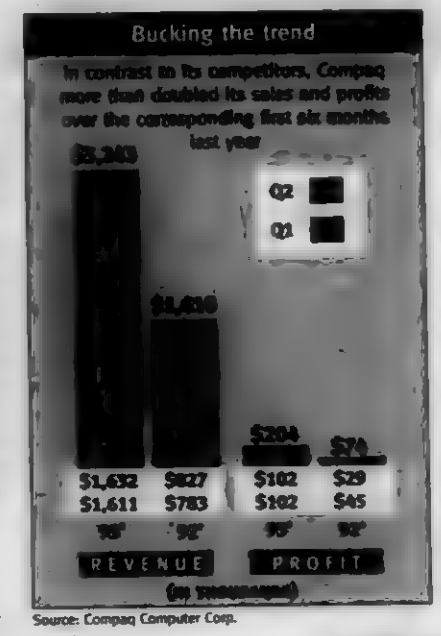
High expectations

Still, analysts pointed out that Compaq's second-quarter dollar and unit sales were up only slightly over its first quarter and that it would be difficult for the company to match its growth rate from the second half of last year.

Bisone said Compaq will try to maintain momentum by introducing significantly more products in the second half of 1993 than it did in the first half. Compaq has said it will introduce a new line of mission-critical servers in the fall, and sources said its notebook and desktop lines will be revamped this fall, as well. The company is also readying its first subnotebook and a notebook with pen input. Bisone refused to comment on specific products. He said he would not predict a repeat of the 150% unit growth Compaq experienced between the first half of last year and the first half of this year.

Bisone also said the competitive waters were rolling, so Compaq could not afford to relax.

"Our rough sailing is not behind us," he said. "We know that a lot of people will go down in the next few months, and they will go down swinging."



Source: Compaq Computer Corp.

Spending habits

Compaq raised second-quarter research and development spending 7% above first-quarter levels, despite gaining only 1% in revenue for the same period.

Weeding-out process

Analysts also cautioned that fundamentally solid companies such as Dell [CW, July 19] or AST should not be lumped with endangered companies like Everex Systems, Inc., which last week laid off another 125 workers during a restructuring of its manufacturing facilities.

Most analysts said Dell is simply going through the kinds of growing pains that its competitors went through earlier. AST's losses, analysts said, come from its purchase of Tandy Corp.'s computer business, which should help AST compete more effectively in the future.

Compaq, meanwhile, announced plans for Innovate '93, its first effort at a Compaq-oriented trade show/technology conference. Andrew Grove, Intel Corp.'s president and chief executive officer; Steve Ballmer, Microsoft Corp.'s executive vice president; and Ray Noorda, president and CEO at Novell, Inc. will be among the speakers at the Houston conference, which will run from Sept. 13-17.

Second-quarter earnings, calendar 1993

Company	Revenue	Percent change	Net income	Percent change
Amdahl				
BMC Software Inc.		25%		
Borland International				
Bytex Corp.		(65%)		
Cabletron				
Computer Associates Int'l Inc.		9%		
CrossComm Corp.				
Easel Corp.		(6%)		
HPL Systems Inc.				
Lotus Development Corp.		7%		3%
Network Systems Corp.				
Parallan Computer Inc.		274%		224%
PeopleSoft Inc.				
Powersoft Corp.		138%		167%
Pyramid Technology				
Sybase Inc.		54%		98%
Unisys Corp.				

*Not meaningful

Client/server software vendors such as **PeopleSoft** and **Powersoft** had uplifting quarters. Both vendors experienced increases in demand because more companies are deploying the networks and servers that will support such applications across the enterprise. Powersoft continued to add third-party resellers, which now account for 50% of their sales, and PeopleSoft's service revenue increased 183% by bundling service into new contracts. **Easel**, another client/server vendor, reported a loss resulting mostly from its decision to invest in new product development and a slight decline in sales.

NetFrame Systems and **Pyramid Technology**, both developers of high-end network superservers, are also benefiting from the client/server evolution where scalable, fault-tolerant systems are in demand. Pyramid announced its third-consecutive profitable quarter and its fifth-consecutive quarter of sequential revenue growth. **Parallan Computer**, also a developer of high-performance servers, entered into a strategic alliance with IBM in June 1992, which makes the two quarters uncomparable. The company's primary source of future revenue will be royalties paid and projects funded by IBM.

Despite several cost-cutting measures in the quarter, **Amdahl** still posted a quarterly loss as a result of its ongoing switch to smaller distributed systems.

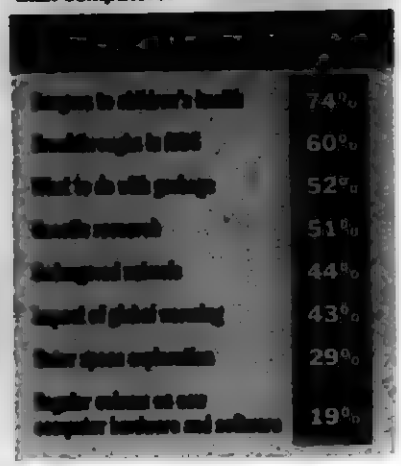
Software giants **Borland** and **CA** each had successful quarters. Indicating greater acceptance of its Windows-based software, Borland increased its sales and more than doubled its earnings during the same period last year. CA's multiplatform computing strategy continues to pay off – midrange platform revenue increased more than 100%.

– Kevin Burden

Wysiwyg

DOES NOT COMPUTE

Computing may be your life, but the general public is not so enamored. In a 1993 survey of 1,250 U.S. adults, respondents were more interested in articles on animals and garbage than computers.



LIGHT BITS

What do you get when you cross Lee Iacocca with a vampire?

Autoexec.bat

Hidden features

Norton Desktop for Windows Version 1.X and 2.X

Select Help and About, going to the icon in top left (Norton Viewer icon). Hold down N, D and W keys. Click on that icon three times. You'll see a box come up with a bitmap version of the development team and the title bar with quotes from various poets, including Shakespeare and Emerson.

Did you know?

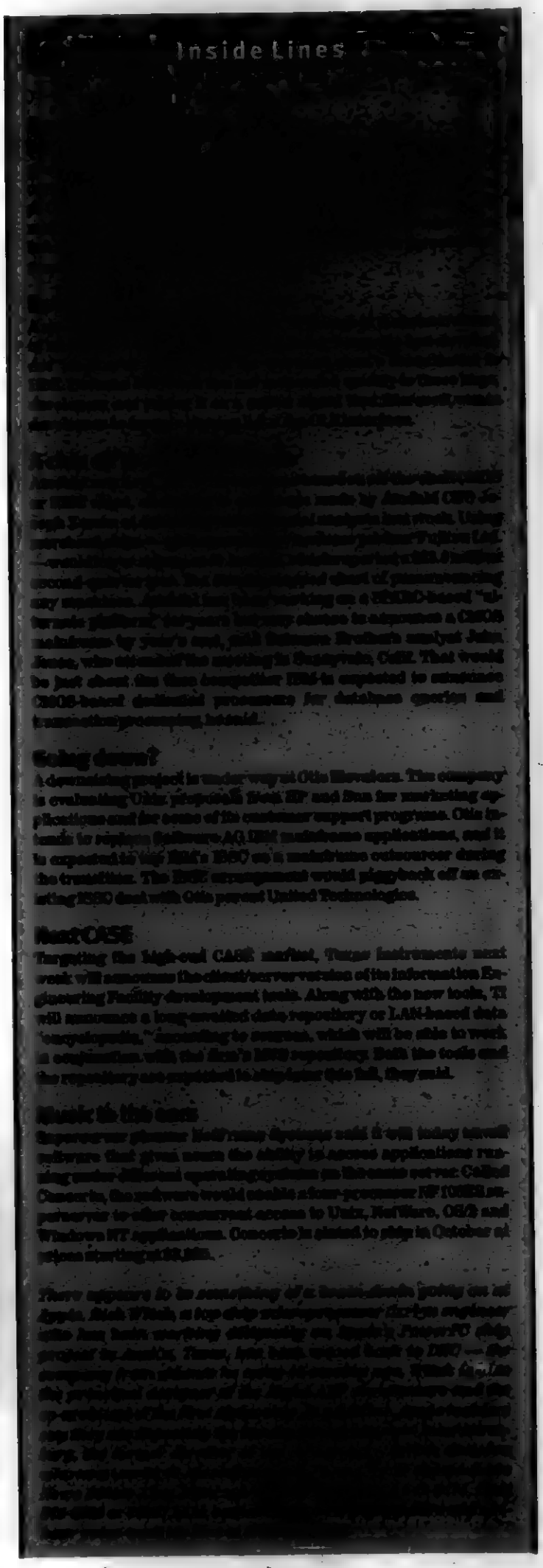
In developing Pentium, Intel had to work with transistors so tiny that it would take 500 of them to circle a human hair.

Sources: Businessweek; Scientists' Institute for Public Information (New York).

WHAT'S THE WORST LIE YOU'VE EVER TOLD YOUR BOSS OR USERS ABOUT THE SYSTEM? WE'D LIKE TO KNOW. PHONE LORY DEE AT (800) 343-6474 EXT. 236, MCI MAIL 594-8011 OR COMPUSERVE THEM TO 594-8011 OR 76537,2413.

The 5th Wave *by* Rich Tennant

Inside Lines



XEROX

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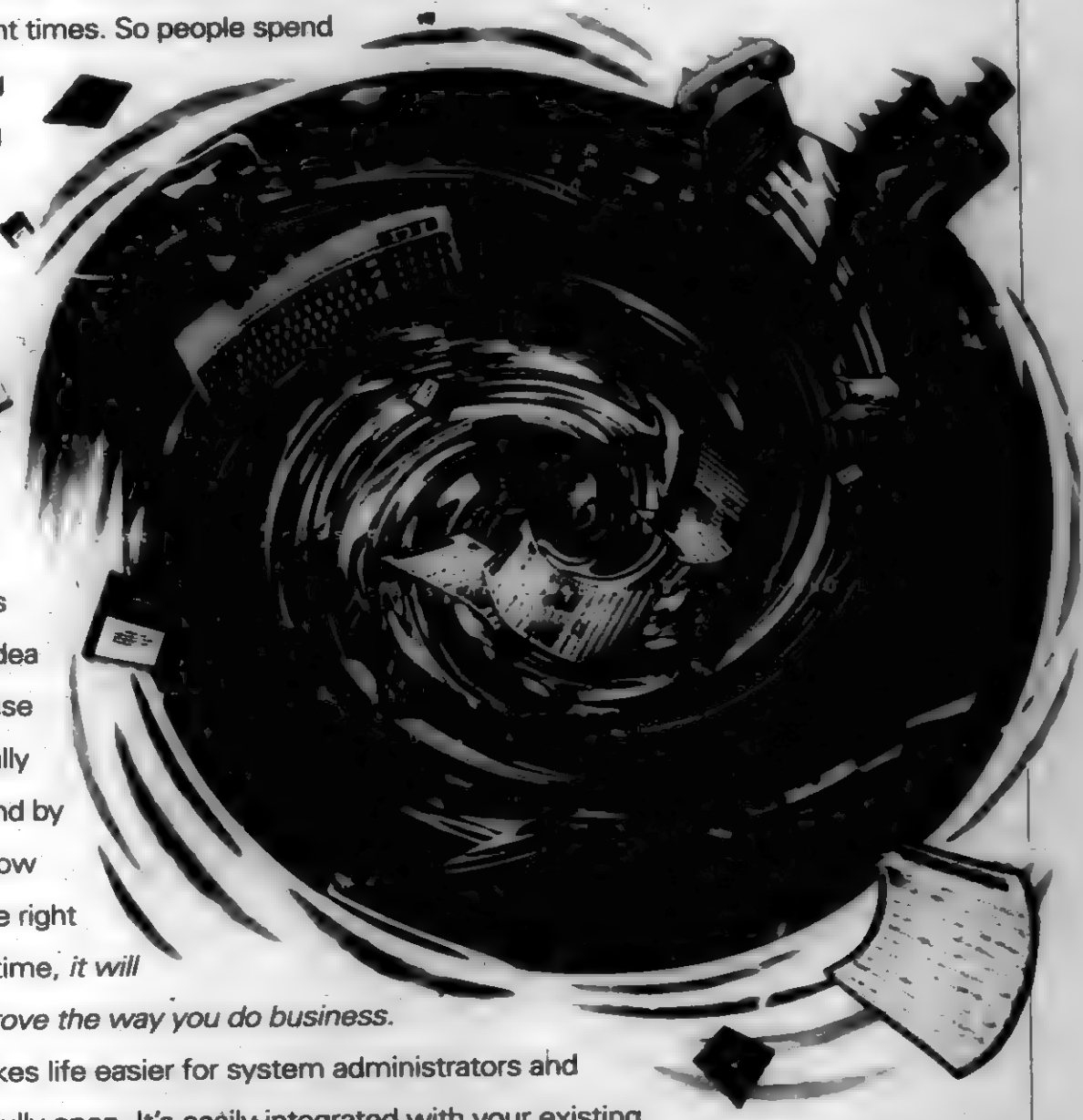
What went wrong? It's largely a matter of different technologies moving in different directions, at different times. So people spend more time thrashing than they do getting work done.



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InConcert goes beyond the typical idea of "software," because it's tailored specifically to your business. And by synchronizing the flow of information to the right people at the right time, *it will fundamentally improve the way you do business.*

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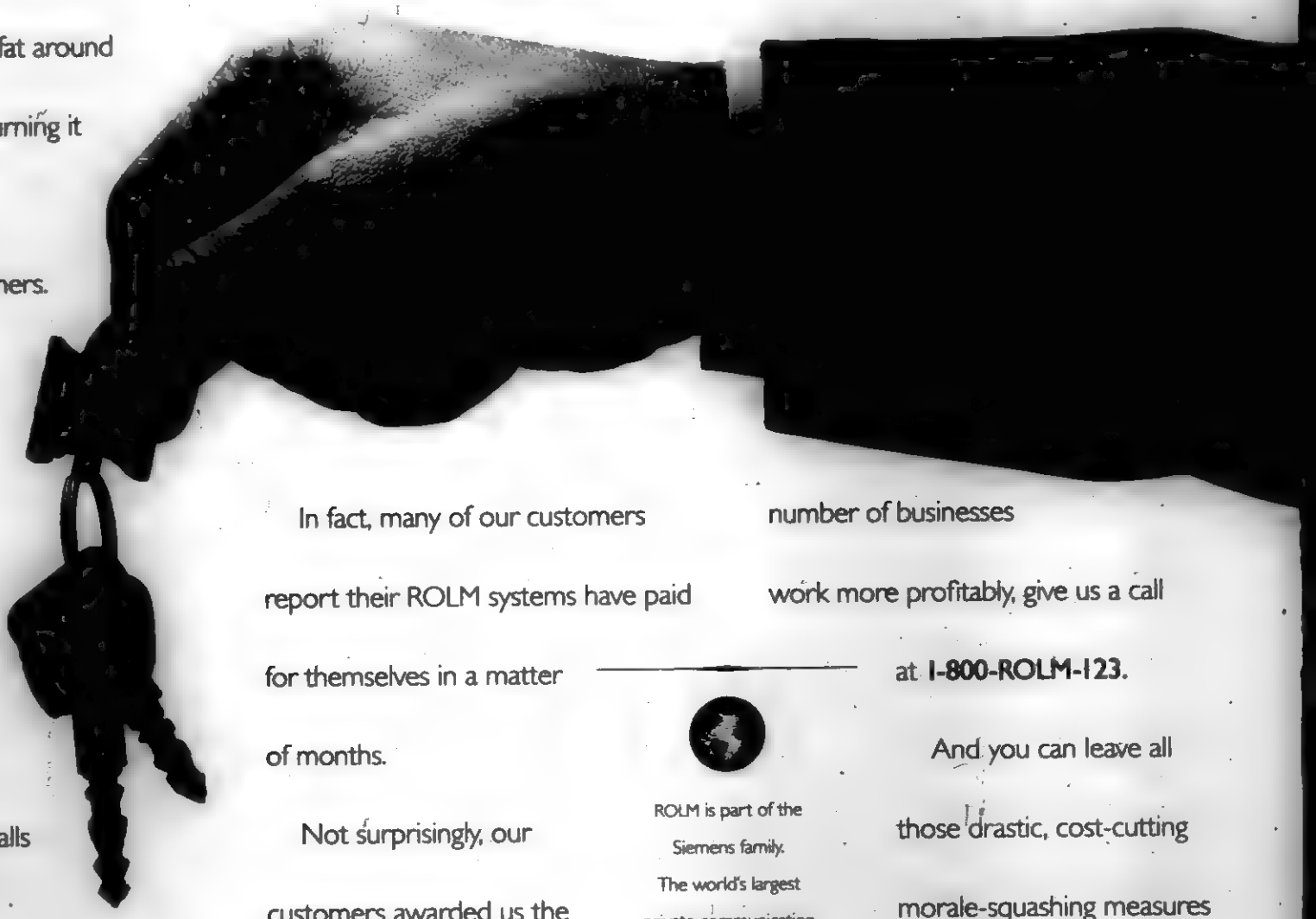

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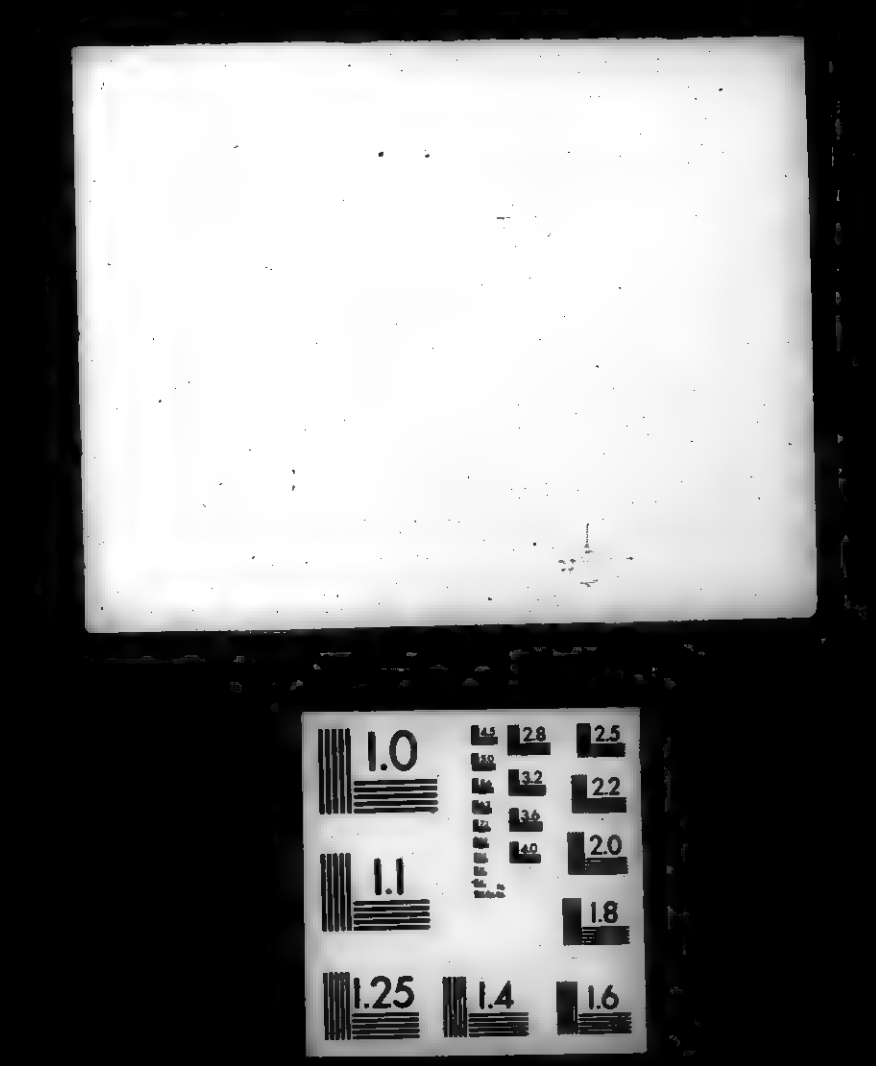
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COMPUTERWORLD

Database administration

Security lapse bedevils users of SQL Server

Microsoft, Sybase promise fixes but provide no dates

By James Daly

■ Users running Microsoft Corp./Sybase, Inc. SQL Server on an OS/2 network have discovered that its lack of any centralized security administration or reporting tools is hurting their ability to build client/server networks.

The resulting inability to grant and revoke access privileges from a main administrative cockpit has created a management nightmare for computer security staff members.

"We want to decentralize, but managing SQL security is just too much of a headache," said Kevin Kenefic, a senior data security analyst at Houston Lighting and Power Co. "Who has the time to go out and tweak security for every server, every database and every individual?"

Eighteen months ago, Kenefic's organization expanded from a centralized DB2 environment to a networked client/server setup. Since then it has hooked up 400 users to 16 servers throughout the Houston area, most of them using SQL Version 4.2 over a Token Ring network running Novell, Inc.'s NetWare v3.11.

SQL works by collecting data on a server and making it im-

SQL Server, *page 24*

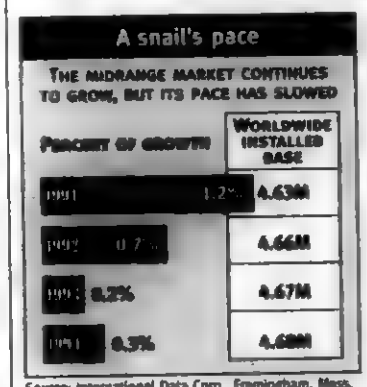
Red ink soaks vendors

Second-quarter results indicate midrange firms still floundering

By Craig Stedman

IBM may no longer be the industry's driving force, but its $8 billion second-quarter loss set the tone for other old-line hardware vendors that are also striving to enter the world of open systems.

No other company came close to matching the magnitude of IBM's shortfall. However, the midrange and large systems markets remain in flux. Once-fat vendors last week chocked up losses, puny earnings or issued fiscal warnings as they struggled with the downward spiral in hardware pricing.



Source: International Data Corp., Framingham, Mass.

"The business just got so extremely competitive, and the big companies weren't used to that," said David Foss, section leader for scientific systems at Glidden Co. in Strongsville, Ohio.

Compaq Computer Corp. recognized that trend in the PC market and turned itself around, but it remains unclear whether midrange companies can do the same, Foss added.

Steve Ruger, MIS manager at Smith Industries Ltd. in Malvern, Pa., noted that as vendors move toward open systems, "I don't know if I care whose box I use." A Digital Equipment Corp. user now, he said he "could see the day four or five years from now when there's not a single piece of DEC equipment in this building."

Midrange players, *page 97*

Gerstner bites bullet: Margins, write-offs contribute to $8B loss

By Johanna Ambrosio
ARMONK, N.Y.

THE FIRST DAYS

IBM Chairman Louis V. Gerstner's disclosure last week that 85,000 people will leave IBM by the end of next year — to the tune of $8.9 billion in write-offs — was the latest bullet-biting example of why he is winning good reviews after four months on the job.

Among the positives: his continuing focus on cutting operating costs, as underscored by last week's announcements (see story page 14); his increased emphasis on customers, as evidenced by the two or three he meets with each day; his appointment of strong outsiders to key management positions; and his decision to keep IBM as one large company with many discrete pieces, instead of breaking up the monolith into baby Blues.

Also in Gerstner's favor, at least so far: He opted to tweak

Gerstner, *page 14*

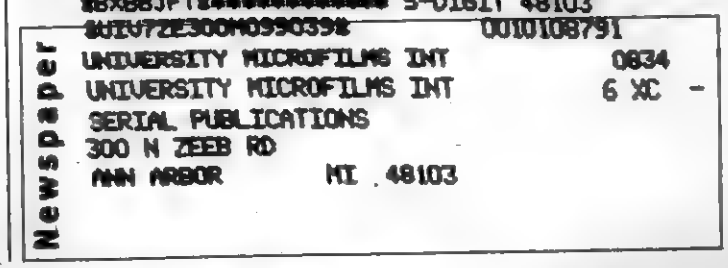
Client/server computing strategies

Outsourcing's pricing conundrum

By Mark Halper

With the tides of change pulling many information systems captains in a client/server direction, critics are questioning the ability of outsourcers steeped in mainframe ways to go with the flow.

But even setting aside the debate over whether old-school outsourcers can become capable distributed computing technologists, another issue remains. After so many years of honing highly profitable cost/price formulas to compute mainframe outsourcing contracts (see story page 68), how do the likes of Electronic Data Systems Corp. and Integrated Systems Solutions Corp. price their services in these new times?

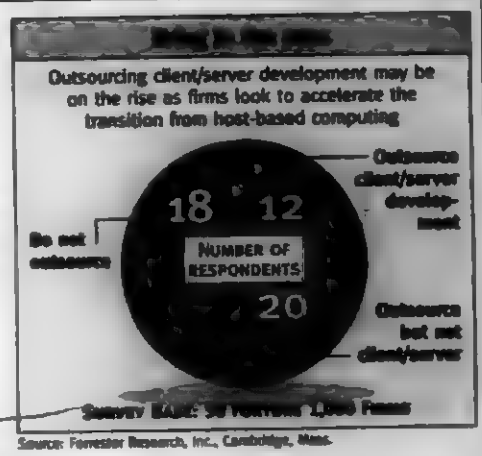


Choppy waters

After decades of basing pricing on host processing volume, outsourcers today are confounded over how to charge for their services in a desktop environment where CPU cycles are less measurable and less outsourcer-reliant.

"All of us in the industry are working on how you deal with this," acknowledged Ron Johanson, a Boulder, Colo.-based manager of systems technology at IBM subsidiary ISSC.

"We're not really there yet because no one has really asked us to put together client/server in a cost/price model," concurred Harvey Cohen, director of commercial operations at Unisys Corp.'s system support operations.



Source: Forrester Research, Inc., Cambridge, Mass.

User wariness over this confusion helps explain a growing interest in the IS community in structuring deals in which the prices paid are tied into a company's business results [CW, June 21]. The difficulties of directly measuring service in a client/server world open an oppor-

Outsourcing, *page 16*

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NEWS

■ **Vice President Gore** receives preliminary recommendations for improving government services through information technology. *Page 4*

■ Some of Seattle's leading IBM sites ponder sharing data center facilities to reduce overhead costs. *Page 4*

■ **Microsoft** gets Windows NT and Windows NT Advanced Server into production on the same day. *Page 6*

■ **IBM** announces the first Pentium-based server for the midrange market. *Page 7*

■ **Stratus** tries to get in line with current pricing trends by introducing Unix-only fault-tolerant models costing almost 50% less than its current models. *Page 8*

■ **Boundary Routing** technology for remote sites helps **3Com** appeal to large companies. *Page 10*

■ **IBM** changes components, design and sourcing methods with new ValuePoint models in an attempt to prevent future backlog problems. *Page 15*

■ Despite the estimated $12 billion price tag, Midwest flooding has had little impact on data processing operations across the country. *Page 20*

■ The **Federal Emergency Response Agency** scrambles to reshape systems for flood relief support. *Page 20*

ADVANCED TECHNOLOGY

■ It sounds like science fiction, but molecular computing may not be as far off as you think. *Page 28*

DESKTOP COMPUTING

■ **NBC's** Operation Peacock outfits stations with desktop systems in a drive to improve sales and marketing productivity. *Page 37*

Alan Doering of Pepsico *says there's an 80/20 rule for global use of software. Culture and local regulations usually require customization of about 20% of the programs in any overseas location.* **Page 74**

WORKGROUP COMPUTING

■ **Compaq Computer** installs a new client/server personnel system that will have 6,000 client PCs, allowing employees to maintain their own personnel data. *Page 53*

■ **NetFrame's** Concerto software enables users to run multiple operating systems on a single multiprocessing server. *Page 53*

ENTERPRISE NETWORKING

■ Confused about which networking technology is appropriate for which application? There's good news: The smoke is clearing. *Page 57*

■ **Texas Micro** gives NetWare users a reasonably priced option for internetworking. *Page 57*

LARGE SYSTEMS

■ You don't have to be an outsourcer to find opportunities for savings in an IS operation. Many shops are turning down outsourcing proposals as they catch on to the economics. *Page 63*

■ **D&B Software's** decision to put all of its SmartStream chips on **Sybase's** SQL Server database draws some questions. *Page 64*

APPLICATION DEVELOPMENT

■ **Digitalk** offers a tool for rapid visual development and incorporation of CICS transaction processing requirements. *Page 69*

MANAGEMENT

■ As many multinationals have discovered, software often doesn't travel well. Standardization across many countries should be approached cautiously. *Page 74*

IN DEPTH

■ The next software frontier isn't new applications but more content-rich applications capable of seducing reluctant users. *Page 79*

CAREERS

■ For traditional programmers, a shift to object-oriented tools requires some technical adaptation but mostly a mind-set change. *Page 81*

MARKETPLACE

■ Short-term leases can be a very smart approach to large system acquisition. *Page 89*

COMPUTER INDUSTRY

■ Network operating systems vendors **Novell** and **Banyan Systems** experienced very different fiscal quarters. Novell is predicting its worst in several years, while Banyan's was the best in its 10-year history. *Page 97*

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Executive Briefing

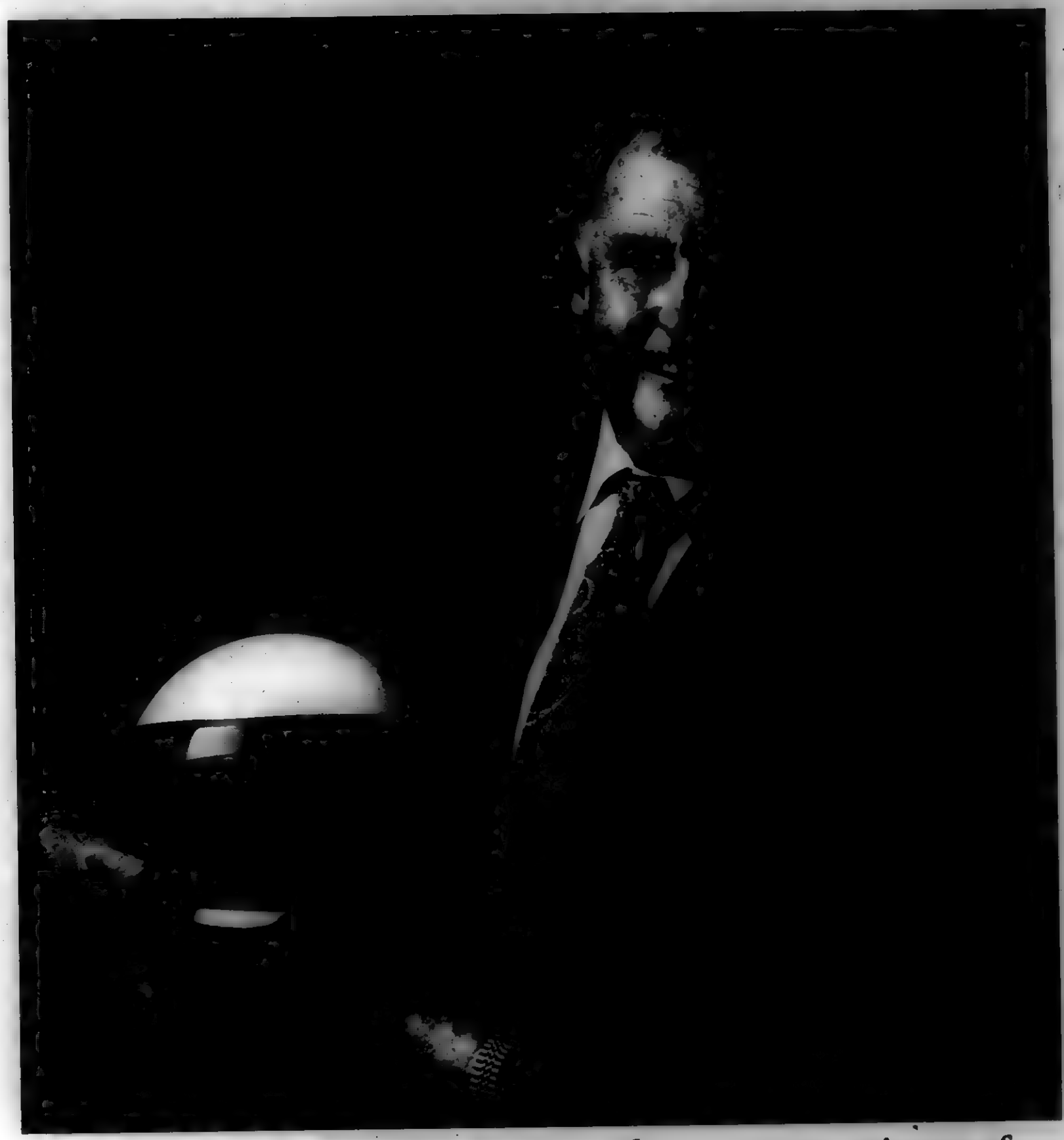
There is often a good reason to shy away from early implementation of new technology. The IS department at CNA Financial in Chicago had a long, hard climb back from a disastrous foray into distributed computing three years ago. After a total revamp, the initiative is back on track, but re-engineering is expensive: CNA will spend more than $30 million this year. *Page 12*

Still, there are sometimes compelling reasons to walk the leading edge. **Bank of America** says its decision to commit to Microsoft's Windows NT was born not of any desire to pioneer but rather of a need for the information access and sharing offered by the ES/base multidimensional spreadsheet database. *Page 6*

Rough sledding is common as companies transition to client/server and may only get worse in the short term. Chief difficulties are achieving interoperability when multiple suppliers are the norm and guiding users through a tough transition without adequate training budgets. A study of 150 Fortune 1,000 companies commissioned by the user group **Open User Recommended Solutions** and conducted by **Gartner Group, Inc.** in Stamford, Conn., found that 89% said they expected retraining needs to increase in the next few years. However, less than half of them expected their training budgets to increase. *Page 10*

The lack of network security tools has also been a sticking point for many companies trying to make a move toward client/server. Users running **Microsoft/Sybase** SQL Server on an OS/2 network say the absence of centralized security administration and reporting tools impedes efforts to build client/server networks. *Page 1*. Also contributing to the confusion are a lack of benchmarks in areas such as evolving networking technologies *(Page 57)* and confusing benchmarks. Charles Babcock says the dispute between **Oracle** and the **Standish Group** over the research firm's criticism of Oracle's System 7 benchmark results will probably never see a courtroom. Reason: Much of what Standish says is true. *Page 36*

Is outsourcing a smart option for these confusing times? Critics contend that outsourcers, most of which have roots in the mainframe world, are not equipped to deal with client/server issues. *Page 1*. And prospective customers are asking whether they might be able to save more with a savvy internal IS group. *Page 63*



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Seattle IS: Can we talk?

By Jean S. Bozman
SEATTLE

■A group of top information systems executives in the Seattle area have organized themselves to figure out how — or even if — this city's major mainframe data centers could share resources.

In recent weeks, the group has met to discuss the construction of a shared data center to stretch IS dollars during tough economic times. IBM's Integrated Systems Solutions Corp. (ISSC) has been leading some of the group discussions, several IS executives said last week.

So far, there has been no decision — and there may never be, some of the attendees said. "We're still deliberating," said Bruce L. Carlson, general manager at Paccar, Inc.'s Management Information Systems Division in Renton, Wash. "It's inconclusive, but we're optimistic that, either on our own or with IBM's help, something can be done."

Among the companies represented, several Seattle users said, were Puget Sound Power & Light Co., US West Communications, Inc., Washington Natural Gas Co., Nordstrom, Inc., King County Medical/Blue Shield, Safeco Insurance Company of America and Paccar.

"We're all looking for ways to reduce costs while maintaining control over the computing assets," explained John Rowlands, vice president of IS at Washington Natural Gas. "We've heard some of the outsourcing stories," he said. "Some are horror stories, and some aren't. We said, 'Let's get a handle on all of our options.'"

Miffed at being left out

Some area IS executives were critical of the concept — and unhappy that they were not invited. "I can't even picture how it would work because you could never have enough equipment on-site at one time to meet everybody's needs," said one executive who declined to be named. He also questioned whether competing demands for computing power and differing business cycles might make the very concept of a shared megadata center impractical.

But others, who have been involved for a period of months, said the concept began with discussions about sharing data resources in a regional mutual-aid pact. It evolved into a round of specific discussions with ISSC over the creation of a shared data facility in the area.

Some participants sought to downplay the significance of the recent meetings. Robert Nelson, director of corporate IS at Puget Sound Power & Light, said the meetings were part of an ongoing series of meetings among Seattle IS executives. The IS executives have long been associated through their involvement in the Society for Information Management, he said. "We've been meeting for years. Not only have we shared our jobs for a long time, we're personal friends."

But Nelson acknowledged there have been some meetings with ISSC and IBM competitors such as Electronic Data Systems Corp. to discuss outsourcing. "These are tough times for our business, and I'm sure any slight movement generates a lot of interest," he said, referring to ISSC's involvement in the meetings.

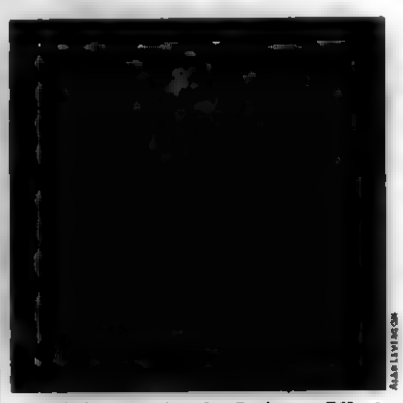
White House gets tech advice

Gore report focuses on practical technology highlighting 'best practices'

By Gary H. Anthes
WASHINGTON, D.C.

The information technology team behind Al Gore's "reinventing government" effort will today deliver to the vice president its draft plan for a wider and wiser deployment of computers and communications within the federal government.

The report will not be made public until it is presented to President Clinton the day after Labor Day, but sources said it will spotlight and recommend for broad adoption a number of "best practices" — high-speed networks, electronic benefits transfer, geographic information systems (GIS) and public access to on-line data — culled from federal, state and local governments and industry.



City of Phoenix's Laraine Rodgers: *Effort would have been doomed without 'best practices' approach*

"This report represents things that really can get done," said team member Laraine Rodgers, director of MIS for the city of Phoenix and a veteran banking industry information systems manager. "We will have some fantasy and science fiction stuff, but we'll say, 'Get to that in a few years. Here's what to do now.'"

The draft report for Gore, who is heading the six-month National Performance Review, is a major part of an overall plan being put together by 200 people from 11 agency teams and 11 cross-agency functional teams.

During the next month, the recommendations from the information technology team will be integrated with those from other review groups. The president is expected to immediately implement some of the items by executive order next month and call for legislation for others. In the meantime, federal agencies will begin working on items that can be implemented without changes in regulations or funding.

Rodgers said the effort would probably have been doomed to fail — as some other attempts to improve the workings of the bureaucracy have — if the team had started with a blank sheet of paper. Instead, she said, the "best practices" approach provided some quick points of focus as well as some means for benchmarking the workability of ideas.

For example, much touted in the nation's capital of late is the Iowa Communications Network, 2,700 miles of fiber-optic cable that will soon carry voice, data and video to state agencies, schools and libraries. Nine federal agencies that recently completed a study of the network hailed it as a "unique laboratory" and concluded that its promised improvements in service delivery could be expanded nationwide.

"Basically, they've wired the whole state with fiber," said Larry Bernosky, director of the Center for Information Management at the National Academy of Public Administration in Washington, D.C. "It's a microcosm for the national information highway."

Also recommended

These recommendations will likely be in the report:

▶Bring government services to places such as shopping malls via multimedia interactive kiosks. A model is the PC-based "Postal Buddy," already in a few locations, that processes change of address requests, dispenses stamps and performs a few other tricks.

▶Make much greater use of the Internet to provide public access to government databases and services. For example, the government might give industry on-line access to 6T bytes of patent and trademark data.

▶Build on projects in place in Maryland and other states to expand electronic distribution of food stamps and other benefits, such as welfare.

▶Emulate Phoenix and other municipalities by building a national infrastructure of GISs and data to support a host of functions in law enforcement, natural resource management, agriculture, transportation and other areas.

▶Knock down barriers between citizens and government via toll-free telephone numbers with Touch-Tone input and automated voice response. The Internet Revenue Service is doing that to let taxpayers get answers to commonly asked questions, obtain tax forms and even file simple returns.

A fix on good

"The history of federal reform efforts counsels humility, not hubris," said The Brookings Institution in a report last week. In "Improving Government Performance — an Owner's Manual," Brookings warned the Clinton administration to avoid four pitfalls: confusing questions of what the government should do with how well it does it; rushing into judgment and action; promising that management reforms will save money; and seeking "The Answer," not incremental improvements.

▶Push ahead with the development of the National Information Infrastructure, built around the "data superhighway" long championed by Gore, to move medical care, educational services and on-the-job training to all corners of the U.S.

Charles Brownstein, co-leader of the information technology team and director of the Office of Planning and Assessment at the National Science Foundation, said few of the teams' recommendations will require legislation.

Many can be set in motion by simple handshakes among agency heads, and some will require executive orders from the president.

"A year from now many of these recommendations will be regarded as 'no-brainers,'" he added.

Bernosky, who is not a part of the National Performance Review, said the review is going well.

"At a minimum, they have been able to capture the attention of people in all the agencies. It's brought together people who were working on this but working it alone. I think the result of this will be to start to change a culture of isolationism in the [government's] information technology world. People will start saying, 'The data I have here is going to go to some other agency or state, so I better architect accordingly.'"

Corrections

• Because of a reporting error in the July 26 issue, the level of use of Lotus Development Corp.'s Freelance Graphics at Pepsi-Cola Co. was misrepresented. Freelance Graphics users tend to use their presentation graphics packages more frequently than users of Microsoft Corp.'s PowerPoint package.

• Because of a reporting error, Jan Scites, Connecticut Mutual Life Insurance Co.'s vice president, individual life insurance, was incorrectly identified in a story in the June 28 issue.

• Despite the fact that TSI International's Trading Partner PC ranks third in electronic data interchange (EDI) software market share, the product was not included in the July 12 Buyers' Scorecard on EDI software because an insufficient number of users was available.

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2	2	EXXON Irving, Texas
3	3	FORD MOTOR Dearborn
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5	5	GENERAL ELECTR
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8	8	E.I. DU P
9	10	CHEVRO
10	9	TEXACO W

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News Shorts

Networking chieftains depart suddenly

The heads of two networking companies resigned last week: Ralph Ungermann announced that he has stepped down as chief executive officer of **Ungermann-Bass, Inc.** in Santa Clara, Calif., and **Proteon, Inc.** President and CEO Patrick Courtin resigned. Ungermann is leaving to form a new venture. Meanwhile, UB and Asynchronous Transfer Mode partner BBN, Inc. in Cambridge, Mass., have formed a new company called LightStream.

Tandem announces quarterly loss

Tandem Computers, Inc., true to its warning, last week announced a $44 million quarterly loss on revenue of $476 million and began its second restructuring in two years. This time, the firm will reduce its work force by 15%, and paychecks will be cut 5% firmwide.

Hackers sentenced to jail

Two members of a computer hacker ring known as MOD, or Masters of Disaster, were sentenced in New York federal court to six months in prison, six months of home detention and 750 hours of community service. Paul Stira and Elias Ladopolous, both 23, pleaded guilty in March to conspiracy in a scheme to break into corporate and university computer systems.

International cable plans move forward

Nynex Corp. said companies from 10 countries agreed to jointly plan and develop a $1.2 billion undersea fiber-optic cable. The pact was signed by firms from Gibraltar, Hong Kong, India, Indonesia, Italy, Japan and the UK. The 29,000-km cable will connect three continents through 13 landing points on a route stretching east from the UK to Japan. Nynex said it will be ready for service in December 1996.

More computers in the dell

Dell Computer Corp. this week will release three desktop lines, including NetPlex, a line targeted at **Compaq Computer Corp.**'s high-volume ProLinea models. Dell will also release OptiPlex, an enhanced version of its L and M desktop lines that include the Video Electronics Standards Association VL local bus. Dell will boost its low-end Dimension line as well, bringing out the Dimension XPS, which will include two graphics accelerator options to help the machines hit up to 60 million Winmarks.

IBM consolidates consulting unit

IBM is expected this week to transfer responsibilities for the **IBM Consulting Group** from the company's application solutions unit to **IBM North America**, the company's marketing arm, according to analysts briefed by IBM and sources at the company. The move, which will be announced internally, was designed to provide the group's 500 consultants with additional expertise about vertical industries.

SHORT TAKES William R. Johnson Jr. resigned last week as vice president of corporate marketing and head of the Alpha AXP program office at **Digital Equipment Corp.**... **Oracle Corp.** said Oracle 7 for Windows NT has gone into beta testing and should be available within 60 days after Microsoft Corp.'s Windows NT ships.... Anthony G. Ward, most recently director of information technology at **Swiss Bank Corp.** in Chicago, has joined the **Philadelphia Stock Exchange** as executive vice president and chief operating officer.... **NCR Corp.** announced that its NCR System 3000 platform will be the first to support **Computer Associates International, Inc.**'s CA-Unicenter systems management product set for Windows NT.

More news shorts, *page 16*

Microsoft moves NT into production

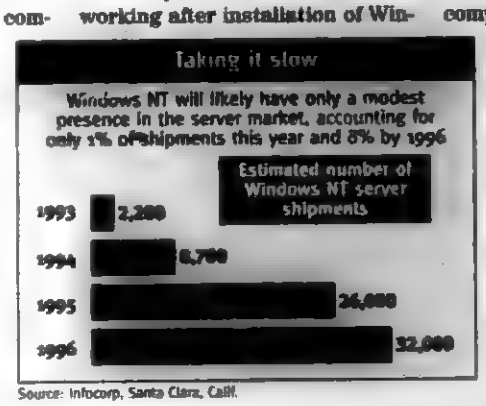
Dual delivery promised for NT and Advanced Server packages

By Christopher Lindquist
REDMOND, WASH.

Users still cannot hold the baby, but Microsoft Corp. finally went into labor with Windows NT last week, delivering the long-awaited operating system to the production line.

Contrary to the comments of many industry pundits, the company announced that full-function Windows NT Advanced Server will arrive at the same time as its more client-oriented sibling.

Retail versions of Windows NT and Windows NT Advanced Server should be available in the middle of the month for $495 and $2,995, respectively, Microsoft said. Pricing for upgrades from Windows or OS/2 to Windows NT will be $295; upgrades from LAN Manager to Windows NT Advanced Server will cost $595.



Source: Infocorp, Santa Clara, Calif.

Ready for action

Beta-test users in general have described Windows NT and Windows NT Advanced Server as ready to ship, with only minor bugs still being reported (see story below). However, potential customers will be able to get a known bug list from Microsoft, with bug fixes and updates to that list being made available on CompuServe. Among the issues in need of resolution are the following:

- There are missing drivers for some CD-ROM drives and sound cards.
- There is no support for "dongles," hardware security devices that attach to parallel ports.
- Windows NT cannot read DoubleSpace compressed drives.
- The Novell, Inc. NetWare Requester is still in beta testing.
- There are problems with some Small Computer Systems Interface adapters and CD-ROM drives working after installation of Windows NT but not during the installation.
- No fax software is currently available, as there are no drivers for any fax modems.
- Windows NT for Digital Equipment Corp.'s Alpha systems may not be available for 60 days. A coupon for the Alpha release will be included with Windows NT.

But while NT may soon hit the shelves, applications for the new operating system may take some time because developers need to test their products on final code before shipment and because some vendors are wary of developing for an operating system that has no proven sales.

"I wouldn't be surprised to see some 'Let's wait and see what happens' [by developers]," said Jim Hebert, vice president of business development at Q+E Software in Raleigh, N.C. He noted that many vendors followed Microsoft's OS/2 lead in previous years. "Some developers didn't ever get over that."

Others did, however, as several companies have announced availability of Windows NT applications. And at least one reseller, the Programmer's Connection in North Canton, Ohio, has already started advertising Windows NT for $295 and Advanced Server for $885.

For corporate developers, the release of Windows NT will mean a chance to start investigating serious development efforts on a shipping platform, though some firms gambled on developing with a beta-test version of Windows NT.

"As soon as we get the gold code for NT, we will move all developers to NT," said Louis Kahn, chief of computer and network operations for the National Immunization Program at the Centers for Disease Control and Prevention in Atlanta.

Kahn said it is the immunization program coordinators' intent to move at least 50% of the 200 users to Windows NT by year's end and 100% by 1994 — assuming no serious bugs surface. He said the primary goal of moving everyone to Windows NT is to gain a more "robust" environment and to take advantage of 32-bit 486 platforms.

Bank of America puts early stock in NT Advanced Server

By Michael Vizard
SAN FRANCISCO

While most information systems shops are still in the early stages of evaluating the Advanced Server edition of Microsoft Corp.'s Windows NT, BankAmerica Corp. has already moved one NT server into production. The bank is moving to Microsoft's next-generation operating system for performance and standardization reasons.

Currently, Bank of America has NT Advanced Server on a 66-MHz Intel Corp. 1486-based PC from Dell Computer Corp. The PC is employed solely to run a multidimensional spreadsheet application called ESSbase from Arbor Software in Santa Clara, Calif. Advanced Server provides the speed needed to run what is essentially a database application running under LAN Manager. It is linked to about 55 users running Microsoft's Windows, Excel and Word.

Bill Carpenter, vice president of PC/MIS at the world banking information unit of Bank of America, said he has been running the ESSbase application on NT for two months, with only one crash attributed to it.

Luck of the draw

Bank of America fell into NT because Carpenter wanted to use ESSbase, which was being beta-tested on NT. His group had been relying on three 16-bit OS/2 Version 1.3-based LAN Manager servers, which continue to run the unit's file server operations.

"They're incredibly stable," Carpenter said.

Even so, he said he expects to migrate LAN Manager file services to the 32-bit NT environment sometime early next February.

"The NT server we have has been fabulous. You can't really compare a 16-bit environment to a 32-bit environment, but the performance is great," Carpenter said.

The move to NT is also being driven by a desire to consolidate the number of application programming interfaces his small staff currently supports for a mix of Windows and OS/2 applications.

"I don't really want to get caught in the middle of arguments between Microsoft and IBM. We want to concentrate on one set of technologies where possible," he said.

Carpenter said he intends to put a SQL Server application on the NT server in the near future; he will also look at moving some client applications to the NT server.

IBM jumps on Pentium server bandwagon

By Stephen P. Klett Jr.
SOMERS, N.Y.

Action in the middleweight server division promises to heat up this fall with the debut of the IBM PC Co.'s first Pentium-based server.

Announced last week, the Personal System/2 Model 95 560 puts IBM in the ring with competitors that have already released Pentium-based servers such as AST Research, Inc., Compaq Computer Corp. and Hewlett-Packard Co.

Slated to ship in September, the 560 will include the following: Intel Corp.'s 60-MHz Pentium microprocessor; Small Computer Systems Interface-2 (SCSI-2) support; error-correcting code (ECC) memory, expandable from 16M to 128M bytes; and security features such as password access and boot-sequence control.

ECC memory was designed to eliminate errors and potential server downtime without interrupting performance, and SCSI-2 support allows data transfer rates of up to 20M byte/sec.

The debut of the 560 is a precursor to a host of announcements customers can expect to see by year's end [CW, July 19].

"We're making big investments in our server business and will be making announcements through the whole family in the fall," said Dave Saxby, general manager of server systems at the PC Co. For example, users can expect to see Pentium support for IBM's high-end PS/2 Server Models 195 and 295, he said.

While he said he hoped IBM would unveil a server based on the 66-MHz Pentium chip at the same time, analyst Randal Giusto at WorkGroup Technologies, Inc. in Hampton, N.H., said the 560 "gives IBM a pretty fresh, well-rounded server line to sell."

"Basically, they now have the feature set to make them more competitive," Giusto said, referring to the ECC and SCSI-2 additions.

The PS/2 Server 95 560 in a base configuration — including 256K bytes of Level-2 cache, 16M bytes of ECC memory and a SCSI-2 controller — will cost approximately $13,000.

Users contacted were either unfamiliar with the product or declined to comment on how the server fit into their plans.

At long last

Apple's Newton MessagePad

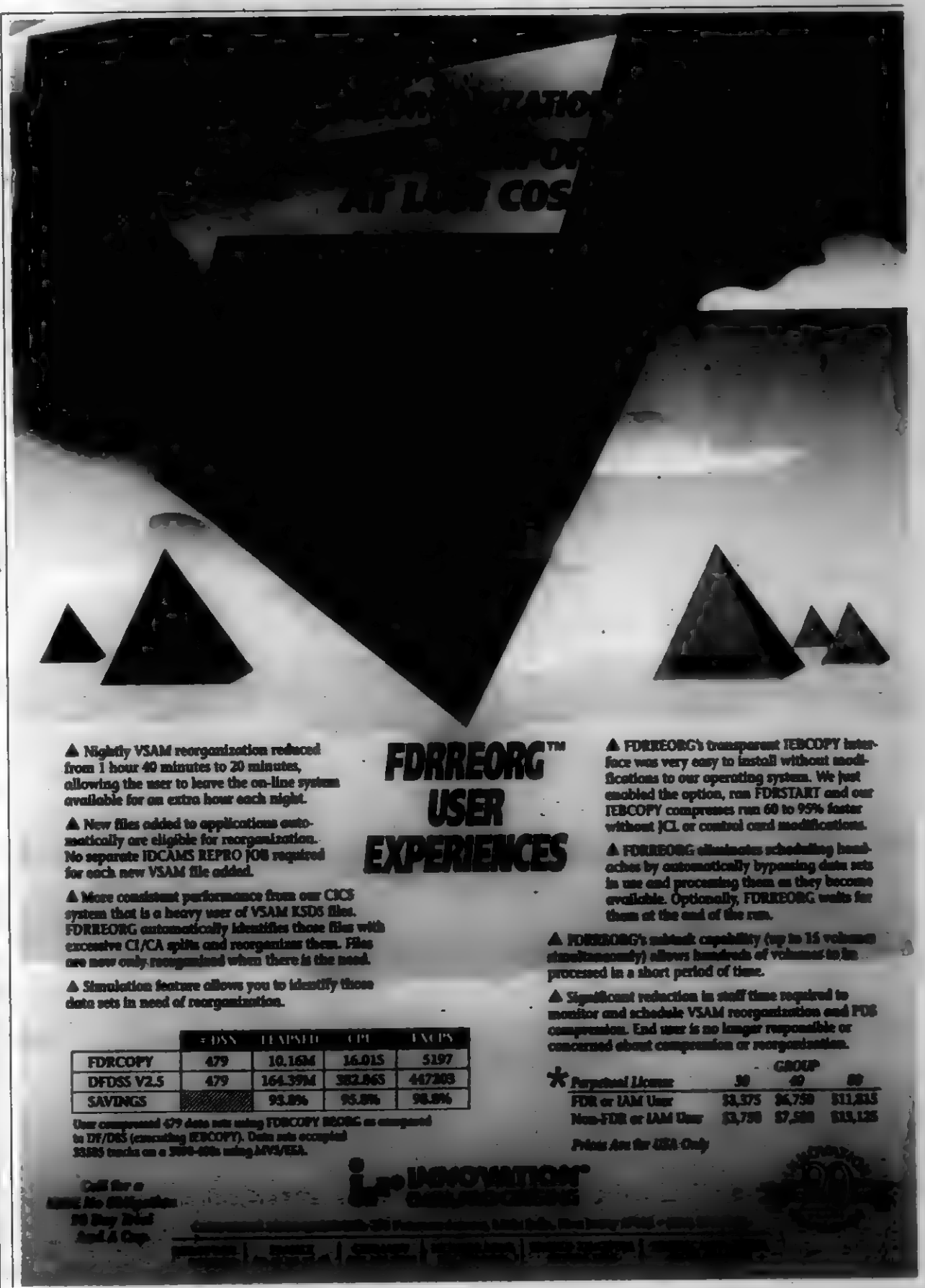
After nearly two years of beating the publicity drum, Apple Computer, Inc. Chairman John Sculley today will unveil the Newton family of personal digital assistants.

The first to be introduced will be the handheld MessagePad, an executive organizer that can read handwritten notes and then automatically add an appointment to a calendar, dial a phone or send a fax. An entry-level model starts at around $700.

More than 1,300 firms are developing retail and in-house Newton applications, but only about a dozen MessagePad applications are expected to be on retailers' shelves by next month. About 50 are expected by Christmas.

Apple officials said they expect "several thousand" MessagePads to be for sale at this week's MacWorld show; full availability in retail outlets such as CompUSA, Inc. is expected by Labor Day.

— James Daly



Stratus moves server down stream

By Craig Stedman

MARLBORO, MASS.

Trying to shed its midrange image and ride the shift toward lower end systems, Stratus Computer, Inc. plans today to introduce Unix-only versions of its XA/R fault-tolerant computers priced almost 50% lower than current models.

With base pricing cut from $124,000 to $69,000, the seven new systems, called the XA/R-S series, represent Stratus' first real attempt to compete in the emerging client/server market, according to Barbara Babcock, vice president of marketing.

Until now, the company has avoided the under-$100,000 market, "where you can position yourself at the top of the [low-end] server range," she noted.

Industry observers agreed that Stratus' move, which comes just two weeks after archrival Tandem Computers, Inc. repositioned its fault-tolerant line as Unix-compatible servers [CW, July 19], is needed in order to make the company's systems more price-competitive with more conventional machines.

The existing XA/R hardware "is an expensive box," said Jonathan Lawry, a consultant working on a Stratus installation at Boston's Logan International Airport. He added, however, that the cost can be justified for applications such as Logan's ground security program.

According to Larry Cardwell, director of business development at On-Demand Technologies, Inc., an Austin, Texas, developer of interactive video software for the XA/R line, Stratus' lack of a low-end offering has required him to cut special deals with some prospects.

"We had to look for ways to provide them with entry-level equipment if we decided they were a strategic customer," Cardwell said. The pricing on the new models should "allow us to go into a wider range" of accounts, he added.

Pump it up

Specifications for selected models of Stratus' lower cost XA/R-S servers, which are topped off by a new four-processor system

	Low end		Midrange
	R3S	R3S	R3S
Number/ Type RISC processor	1 I860XR 32 MHz	1 I860XR 32 MHz	4 I860XP 48 MHz
Maximum memory	256M bytes	512M bytes	512M bytes
Maximum disk	26G bytes	52G bytes	52G bytes
Entry price	$69,000	$147,000	$504,000

Five of the XA/R-S models use the same I860-based hardware as Stratus' previous low-end and midrange models but have lower prices and expanded memory and storage capacities, the company said (see chart above). New low-end, two-processor and four-CPU midrange models are also being added.

Right on target

Stratus said it is on target to shift the XA/R line from the i860 to Hewlett-Packard Co.'s Precision Architecture-RISC microprocessors in late 1994/early 1995.

The XA/R-S systems will run only Stratus' FTX Unix derivative when they ship this month. Support for the proprietary VOS operating system may be added later, "but with this announcement we wanted to just specify some initiatives in the open systems market and not really muddle it up with both VOS and FTX," said Bill Ledingham, manager of XA/R systems marketing.

Stratus plans to add to its client/server capabilities late next month by shipping a fault-tolerant version of Novell, Inc.'s NetWare that has been in development for the past two years, Babcock said.

Despite the new low-end focus, the company does not intend to become a PC local-area network server vendor, Babcock added. "We see ourselves more as a node in the LAN environment that could do database and other critical server functions, rather than as the environment itself," she said.

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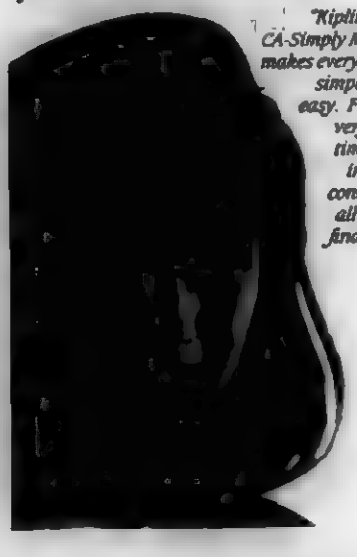

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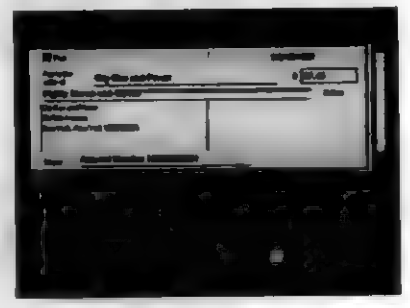

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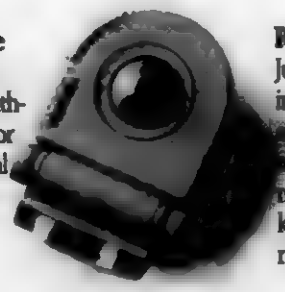

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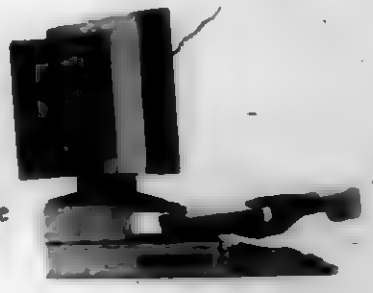

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IS pleads for training in move to client/server

Vendor mix creates gap in skill sets, product interoperability

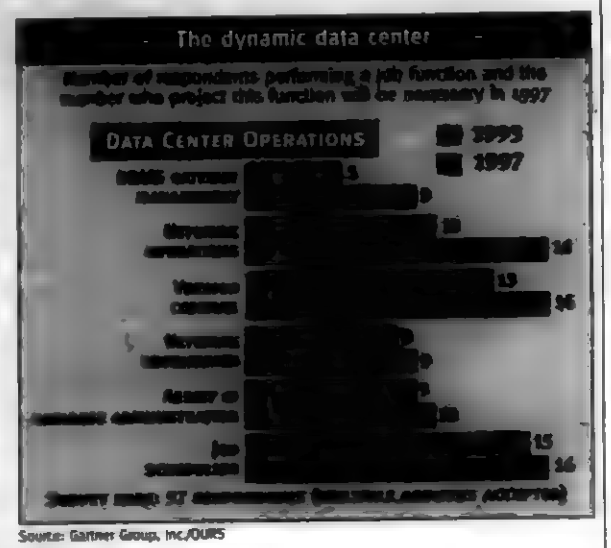
By Joanie M. Wexler

Distributed MIPS may be cheap, but information systems managers moving their companies to client/server computing continue to pay dearly in the form of cultural and interoperability headaches.

Several IS managers interviewed last week said they have discovered a migratory stumbling block in the "melting pot" of vendors they now rely on, which has resulted in widespread product interoperability and skill chasms.

"We are moving away from the mentality of having a primary vendor with a coterie of supporting vendors" to a larger, mixed group of peer vendors, said Doug Holmes, director of advanced information applications at Pacific Gas & Electric Co. "When you start mixing Microsoft, Lotus and Banyan [for example], you wind up with this boundary problem" between products and training methods, he said.

While managers agree that choice is good, companies must deal with the disparity in skill sets as different staff members are trained by different vendors. To that end, Holmes is participating in a movement to standardize basic industrywide technology training in the multivendor world. He heads a user/vendor task force formed by the Open User Recommended Solutions (OURS) group, an organization trying to simplify life for IS in the world of multivendor products.



Source: Gartner Group, Inc./OURS

"It's the price of MIPS and how cheap they are on a PC," said Tom Egan, vice president and systems group manager at a large West Coast financial firm. "But client/server touches more people in the organization than we originally thought."

For example, Egan said the whole idea of data security, which happened "behind closed doors" in the mainframe world, has completely changed as data is distributed all over the globe. "The education level has to change with it," he said.

This change includes a big focus on "soft" skills, including interpersonal communications, said Elaine Bond, president of OURS and former senior vice president of corporate systems at Chase Manhattan Bank NA in New York.

"It's the soft issues that are killing us," agreed Nicholas D'Altilio, director of MIS at The Jockey Club, a Lexington, Ky.-based organization that provides on-line information services to the horse and racing industry. He said some high-level jobs in his department have been restructured because those filling them "can't communicate with [end users]."

D'Altilio said IS has historically believed it knew what users wanted; users, in kind, have viewed IS as an authority that can more or less read their minds. For example, D'Altilio said he finally made an end user sign a paper listing what he wanted after redoing a project several times.

"The user simply wrote, 'You know what I want' and signed it," D'Altilio sighed.

Bond noted that unfortunately, some companies perceive such skill set gaps as failures on the part of individuals rather than training shortfalls. However, "we're all in the same boat; everyone can't swap out their expertise and hire new people because there aren't enough to go around," noted Mark Sievers, vice president of information and technology services at Long John Silver's, Inc.

Down the road

The eventual goal of OURS' Multivendor Education Task Force is to create a generic best practices training road map for the client/server industry. Scheduled to be in near-final form next spring, it would allow corporations to count on a consistent core skill set by virtue of standard basic technology certification covering application development, network, database and other client/server technologies.

The first road map fruits rolled out last week in the form of an OURS-commissioned study of 150 Fortune 1,000 companies that identifies training needs based on how companies are organized and how they use vendors' products. Conducted by Gartner Group, Inc. in Stamford, Conn., the study revealed that a good chunk of corporate America — about 40% — has no training programs in place to help users weather the sweeping changes they already or soon will face in making the transition to client/server.

"Everyone is focused on the

Where there's a will...

OURS suggests the following ways to circumvent the scarcity of resources for retraining staff:

- Formally train a small number of people on new tools/technology. Then have them train others.
- Focus on self-paced, computer-based training as it fits into an individual's schedule.
- Encourage vendors to embed product training in the actual products.
- Work with industry groups to help establish a basic technology curriculum.

3Com's Boundary Routing wins cost-sensitive users

By Joanie M. Wexler

3Com Corp. appears to be scoring points in the fight for internetworking market share with its Boundary Routing architecture.

Last week, William Carter Co. and United New Mexico Bank said they chose to install 3Com networks from scratch largely because of the technology, which is aimed at lowering the cost of blending remote sites into corporate backbones. In addition, San Francisco Federal Savings recently replaced its modem-based solution for remote-site networking with Boundary Routing.

Boundary Routing, introduced last December, is 3Com's $3,495-and-up approach for linking remote sites into backbones inexpensively and with minimal staff. It intrigues users with its ability to allow network managers to administer and configure the routers from a central spot.

Competitors take notice

The technology, which followed a flood of low-end announcements kicked off by Proteon, Inc.'s $4,995-and-up DNX 500 last summer, has spurred moves such as market leader Cisco Systems, Inc.'s competitive introduction of the $3,195 and $4,195 Cisco 2000 routers in June [CW, June 28].

William Carter, a nationwide maker of children's clothing based in Griffin, Ga., replaced modems and some Network Application Technology, Inc. bridges with Boundary Routing-based NetBuilder Remote Control routers for transmitting inventory and shipping information over leased lines from Ethernets in its 12 finishing mills to its central distribution center.

The move has been largely responsible for the company's meeting its business goal of slashing product delivery time from a week or more to two to three days, said Russ Banks, senior telecommunications technician. He said he evaluated most of the router players, including Cisco, Wellfleet Communications, Inc., Advanced Computer Communications, Cabletron Systems, Inc. and Ascom Timeplex, Inc., "but they were kind of pricey."

"We can do all the programming from here. That's appealing because most people out there are not technical, and it's cumbersome trying to explain [how to control the router] over the phone," Banks said.

At the United New Mexico Bank in Albuquerque, Dan Langenwalter, assistant vice president of technical services, said he began routing electronic mail, teller transactions and loan processing data from Ethernets in 28 locations into headquarters using Boundary Routers in May.

"The one thing we give up is the ability to split routes" at the remote site for redundancy, he said. This is because in 3Com's attempt to keep routing simple, it does not allow for a mesh network design.

Wireless mail moves forward

By Lynda Radosevich

Wireless messaging got a boost last week when Microsoft Corp. and Intel Corp. disclosed plans to support drivers that will transmit data via a wireless modem over RAM Mobile Data's network.

The disclosure follows similar arrangements announced in June by Lotus Development Corp. for its DOS-based CC:Mail and by AT&T for its EasyLink global messaging service.

Last week, Microsoft said it will deliver wireless drivers for its Windows-based remote electronic-mail software, while Intel said it would package the software with a wireless modem and support for RAM Mobile's wireless network.

However, one prospective customer has different ideas for the technology.

Charlie Stoner, a computing services analyst at Allied Signal Aerospace in Tempe, Ariz., a division of Allied Signal Corp., said he is interested in supplying wireless messaging for employees in hard-to-wire manufacturing floors and chemical laboratories.

Rather than linking the employees with wireless local-area networks, which would allow them to log in to the network as if they were "wired," a messaging service would let them simply send and receive Microsoft Mail messages and forms using the wide-area wireless waves.

"Our biggest requirement is E-mail, so why buy more product than is needed?" Stoner asked.

Intel will sell the wireless modem (developed by Ericsson GE Mobile Communications), with the RAM network protocols built-in. The $747 package will also include drivers for Microsoft Mail Remote. Microsoft sells the actual client software separately for $195.

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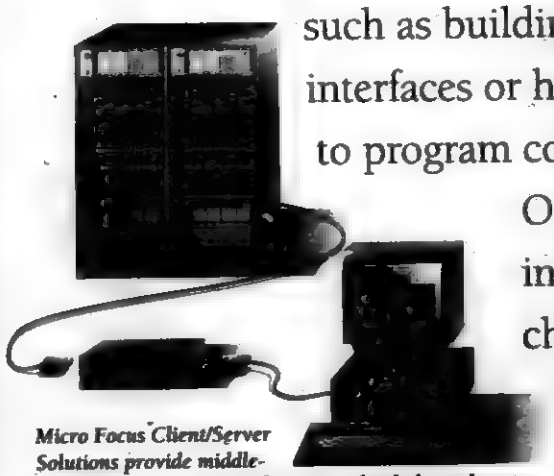

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Microsoft lowers expectations

By Michael Vizard
REDMOND, WASH.

Microsoft Corp. executives sounded a cautionary note late last week, telling analysts to expect measurably slower growth in fiscal 1994 due to a dependence on low-margin upgrades.

The downbeat view came on the heels of the company's posting of almost $1 billion in profits for fiscal 1993 ended June 30, on revenue of $3.75 billion. In fact, Microsoft reported its first $1 billion revenue period in the fiscal fourth quarter, which also ended June 30 (see chart page 97).

In particular, Microsoft executives said the company will not be able to maintain momentum in the first fiscal quarter of 1994 because the next major wave of new applications, which account for 57% of revenue, will not have a financial impact until the second fiscal quarter. Long term, Microsoft officials said they expect Windows NT to provide less than 10% of Windows sales, at best.

In addition, Microsoft said it does not expect to deliver any major updates to Windows, beyond the recently launched Windows NT, until the first half of 1994. System software accounts for 34% of the company's revenue.

"Microsoft's outlook this year is much more cautious, and I think it's justified," said Lee Spelman, a vice president at J. P. Morgan Investment Management, Inc. in New York.

"You have to remember that they don't get a lot of ongoing maintenance revenues. So they have to reinvent the product line every year to maintain growth," she added.

Microsoft expects that its biggest challenge in 1994 will be persuading users to upgrade to the forthcoming version of its Excel spreadsheet and Word word processor, while maintaining acceptable margins in a business that will be driven by low-price upgrades.

Hands full

In fact, Microsoft's challenge to get sites to upgrade may be even greater than it surmises, given the mood of some information systems shops.

"Because of budget cuts, our business units want us to slow down. They're saying they have too much technology right now," said Paul Dunton, director of technology planning at Pacific Gas & Electric Co. in San Francisco.

"We're going to wait for them to get it right. We've learned to curb our appetite," said Phillippe Hoare, manager of corporate MIS at Occidental Petroleum Corp. in Los Angeles.

Microsoft's schedule calls for the delivery of Excel 5.0 and Word 6.0 before Jan. 1, 1994, followed by upgrades to the rest of the company's applications. That schedule is part of an effort to break down the boundary between applications using the Object Linking and Embedding 2.0 interface, noted company Chairman Bill Gates.

Following this effort, Gates said Microsoft's next major application upgrade effort will not take place until after the company deploys Windows 4.0, a 32-bit implementation code-named Chicago that is expected to arrive in the first half of 1995. That offering will be followed by the launch of Cairo, an object-oriented operating system scheduled to debut in the second half of 1995, Gates said.

Because of this scenario, Microsoft will live primarily off upgrade revenue in 1994. Those upgrades take the form of individual applications — Windows and Microsoft Office, which contains five applications that sell for only 1½ times more than Excel.

"No one really pays more than the price of a competitive upgrade for software anymore. This is a pricing action we have to be aware of and respond to," said Executive Vice President Steve Ballmer. He claimed that Lotus Development Corp. recently gave a large IS shop SmartSuite bundled with Notes for $130 per desktop in a battle for market share.

"We're taking the long-term view. If short-term profit has to suffer to maintain market share and keep up on research and development, then so be it," Gates added. In fact, Microsoft Chief Financial Officer Mike Brown said he does not expect revenue growth to exceed 27% in fiscal 1994, compared with a 36% growth rate in fiscal 1993.

But whether Microsoft can maintain its dominance over the long term remains to be seen, as its rivals band together in an effort to thwart Microsoft's bid to dominate the coming generation of object-oriented software.

In fact, it may be object technology that ultimately proves to be Microsoft's undoing. "There's a push to get object technology out more quickly. Software vendors don't want to bet the bank on a single platform anymore," said Liz Barnett, an industry analyst at Meta Group, Inc.

Pointing fingers

Emboldened by expectations that the Federal Trade Commission will soon drop its investigation of Microsoft's business practices, founder Bill Gates last week blamed Novell, Inc. for instigating the three-year review as part of a bid to sell DR-DOS.

According to Gates, the investigation concerned Microsoft's volume licensing program and any intentional incompatibilities Microsoft may have allegedly put in Windows upgrades.

"After three years of looking for anticompetitive behavior, they found nothing that causes us the slightest concern," Gates said, adding that Microsoft never intentionally added incompatibility to any of its operating systems.

Given that Novell controls the server market, Gates implied that Novell's alleged pushing of the investigation hints of the pot calling the kettle black.

Gates said it would be inappropriate to require Microsoft to freeze development of any one operating system in response to antitrust claims.

"In that case, we wouldn't be able to develop a new version of MS-DOS to take advantage of the long file names in Chicago," Gates said.

—*Michael Vizard*

Second time golden for CNA client/server move

By Michael Fitzgerald
CHICAGO

When John Lochow came to run CNA Financial Corp.'s information systems department in 1990, he walked into a technologist's nightmare: Not only did end users hate his department, but he also inherited a staff on the verge of mutiny following a severely flawed foray into distributed computing.

Three years later, the company will today complete an eight-week, 5,500 PC rollout to its 70 branch offices.

CNA will spend more than $30 million this year alone to re-engineer itself. For the money, Lochow and his staff can point to a negligible 150 terminal hours of downtime — compared with 15,000 hours in one year — and to application developers who are producing faster than Lochow can implement their programs.

"If you look at the cost of thousands of hours of downtime [CNA suffered], it totally overshadows what we spent," Lochow said. His group has also managed to consolidate five mainframes into two large machines, eliminating one of its four data centers.

"We were three years behind our competitors, and now I think we're two years ahead in terms of infrastructure," he said. "We have to exploit that now."

Lochow inherited an IS environment that had made a halting attempt to get into distributed computing at a time when it was not well-understood. CNA had used PC LAN Program (PCLP), IBM's initial, ill-starred effort at networking PCs. By 1990, it was still not uncommon for major, 600-person branch offices to be down for an entire business day, and half the PCs were relegated to use as dumb terminals.

Worse, CNA's 800-strong, host-oriented application development staff refused to program for the unstable environment. Still, Lochow was convinced that despite CNA's problems, distributed computing was the best way to go.

To get started, he charged an IS task force with creating a five-year architecture and undertook the painful process of championing a second run at distributed computing.

The task force, which included end users, came up with a four-part project (see chart at left). At the heart of the effort was a decision to pull away from complete systems dependence on IBM. This required hiring nonmainframe staff.

The task force came up with a plan that gutted its infrastructure and replaced the initial PCLP plan with Novell, Inc.'s NetWare. It also replaced its low-speed, wide-area lines with high-speed 56K-byte lines and added an AT&T multiprotocol router to connect its 48 major branch offices to the home office.

Cleaning house

Other steps included consolidating servers and standardizing peripherals and PCs to reduce the number of configurations supported and ease maintenance costs. The process eliminated 3,000 pieces of fully depreciated equipment.

OS/2 is used to run heavy-duty commercial insurance applications tied into the mainframes, giving agents the ability to process multiple policy quotes simultaneously instead of serially. Meanwhile, Windows is used to run the office automation platform, including Microsoft Corp.'s Office suite.

CNA created Desktop Executive, a password-keyed interface that lets a user call up the appropriate applications set from any PC in the company.

CNA is now poised to install NCR 3450s with Pentium processors and a Sybase, Inc. Unix-based database to allow agents for the first time to query the mainframe directly.

CNA pumps up

The status of CNA's four-part re-engineering effort

STABILIZE THE NETWORK
- Replaced IBM's PCLP with Novell's NetWare v3.11.
- Replaced telecom infrastructure.

SLASH COSTS
- Shuttered a data center.
- Consolidated five mainframes into two.
- Cut branch-office installation costs from $375,000 to $125,000.

REBUILD THE PLATFORMS
- Will install almost 12,000 new 486-based PCs this year.

PREPARE FOR THE FUTURE
- Preparing for possible Novell/Unix mix by piloting NCR 3450 servers running Sybase in branch offices.

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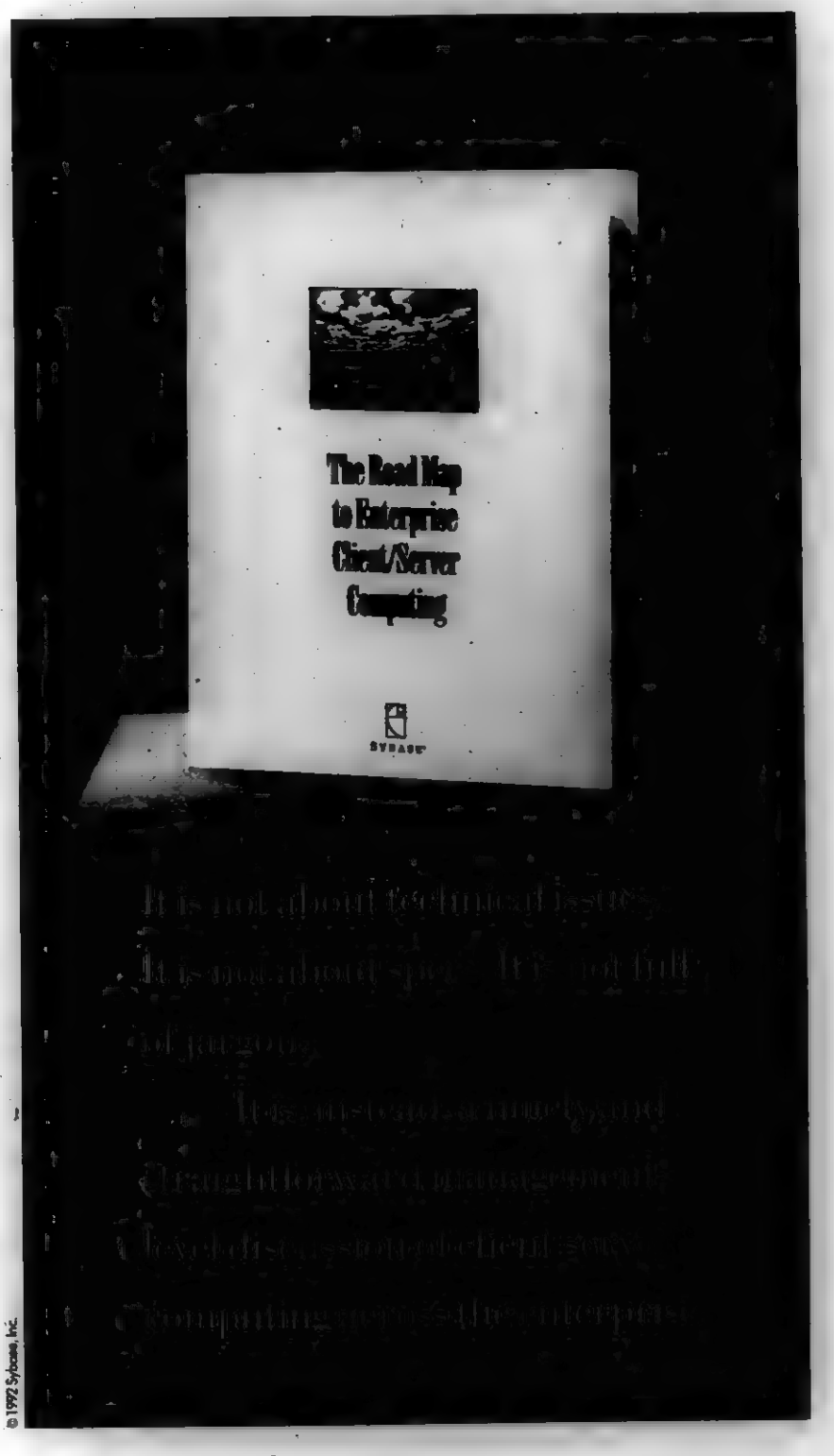

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CONTINUED FROM PAGE 1

the sales force to allow for more product and industry specialists instead of going with different sales forces for different lines of business [CW, July 12].

At the same time, Gerstner and his team have started attacking the bureaucracy that is IBM. Among other moves, he has canceled all meetings of the management committee for the foreseeable future. He still meets with top IBMers but not on a fixed schedule.

Although known to be a tough questioner with a low tolerance for canned presentations, Gerstner is also more approachable and open to learning from others in ways that previous IBM chiefs have not been, insiders said.

In fact, the only significant negative so far is Gerstner's refusal to articulate a grand vision for IBM. Although he said he is not yet prepared to do so, Gerstner last week dropped some hints about where IBM is going. IBMers said the strategizing is further along than has been publicly acknowledged (see story below).

The more things change. . . Much like their Digital Equipment Corp. counterparts [CW July 26], many IBM customers said they have not yet seen any major signs of change under their vendor's new chief — but then, they did not expect to. The big announcements — revamped mainframe software pricing in June, for example — were in the pipeline long before Gerstner started in May, many noted.

"Is he doing his job? Yes," said Tom Loane, vice president at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., echoing the sentiments of other large customers. "Is he parting the waters? No, not yet. Did we expect him to so soon? No."

No escape

IBM's cost-cutting extended to its leasing subsidiary, IBM Credit Corp., which took a $12 million charge in the second quarter to reduce its work force by about 15% through a voluntary program.

Others are less impressed. "He just didn't leave me with a warm fuzzy feeling," said George Sekeley, president of CSX Technology, Inc. in Jacksonville, Fla. Sekeley met Gerstner in Chantilly, Va., during a June mixer of 200 of IBM's largest customers and the vendor's top executives.

Sekeley said that to his surprise, "Gerstner just left us the second day. He was nowhere to be seen. Apparently he had more pressing things to do." Still, Sekeley said he is very happy with his local IBM sales contact. "I don't think Gerstner has anything to do with that."

Nevertheless, most observers are giving Gerstner high marks — except for the "vision thing," which he has started to address.

"He's concentrating on the correct things. But it's critical for Gerstner and the other executives to get their vision out to the public so customers understand the investments they're making and so they feel safe and secure," said Robert Puffer, an analyst at Gartner Group, Inc. in Stamford, Conn.

Same wavelength

A grand strategy will ensure that everyone at IBM is working from the same tea leaves, said consultant Robert Djurdjevic, president of Annex Research in Phoenix. "By the end of the year, even with the cuts, IBM will have a quarter of a million people on the payroll. If even one-eighth of those minds are thinking differently, it could mean chaos and conflict," he said.

At last week's press conference, Gerstner said he has no intention of announcing a grand plan for IBM anytime soon.

"The last thing IBM needs right now is a vision," Gerstner said. "What IBM needs right now is a series of very tough-minded, market-driven, highly effective strategies for each of its businesses — strategies that deliver performance in the marketplace and shareholder value."

Adjusting the viewfinder

Louis V. Gerstner said last week he is not ready to provide a big-picture view of where IBM is going and how it will get there. But he did drop some hints that tip his hand a bit.

The grand strategies are in the planning stages, an IBM spokesman said: Company executives met for two days in Chantilly, Va., before customers joined them and formed task groups to determine IBM's plans for the future. Gerstner and strategy guru Bernard Puckett are overseeing these task forces.

Although IBM executives have not publicly discussed these groups, whose work is still under way, some details are starting to emerge.

Among the subject areas: the convergence of computers, communications and consumer electronics; leveraging semiconductor technologies; and leveraging hardware and software technologies across multiple platforms. In addition, each line of business is responsible for defining its own strategy vs. the competition.

"We've got a whole series of strategic efforts under way," Gerstner said. These decisions will not be made all at one time but rather will be released "as they're ready," he said.

Internally, one IBM executive said, virtually all the lines of business are concentrating on solving large, enterprisewide kinds of problems, but doing so within the framework of client/server and open systems. Gerstner acknowledged as much during the press conference when he said IBM will do "even more in client/server," and the company will continue in its role as a full-service provider of hardware, software and services.

Although there are critics who believe that Gerstner should unveil the grand strategy as soon as possible — certainly by the fall — others said he is doing the right thing by waiting.

"I think what he was trying to say is that people should have confidence in IBM's general direction and should not have to wait for Gerstner to come up with a vision," said James Moore, president of GeoPartners Research, Inc. in Cambridge, Mass. "It was a message designed to evoke confidence."

—*Johanna Ambrosio*

Stunning cuts said to be last

By Johanna Ambrosio

Last week IBM announced a second-quarter loss of $8 billion. That included a restructuring charge of $8.9 billion to pay for 60,000 additional people leaving the company by the end of next year, as well as for closing offices and manufacturing facilities.

Other announcements included these:

▶ The retirements of Stephen Bechtel Jr. and J. Richard Munro from IBM's board of directors. Charles F. Knight, chairman and chief executive officer of Emerson Electric Co., has been elected to the board. IBM is looking to bring in outside board members with technology smarts.

▶ A cut in the dividend from 54 cents to 25 cents.

IBM Chairman Louis V. Gerstner said this should be the end of the massive layoffs and plant shutterings — if planning assumptions are on track.

The current round will eliminate 25,000 people by the end of this year — in addition to the 25,000 already announced, for whom charges were taken at the end of last year. In addition, 35,000 people will leave the company during 1994. All told, IBM will have 85,000 fewer employees on its rolls by Dec. 31, 1994.

Before the special charge, IBM announced a second-quarter net loss of $40 million vs. earnings of $734 million a year earlier. Revenue totaled $15.5 billion, a decline of 4.3% from a year earlier.

Gerstner said at last week's press conference that "rightsizing the company is my highest near-term priority." It is one that Wall Street obviously agrees with: The day of the announcement, IBM's stock price jumped $3.25.

"In a perverse way, people figure that the bigger the bad news, the better it is because it's over and behind you," said Jay Stevens, an analyst at Dean Witter. "I had forecast a loss of 35 cents; they came in at negative 8." He added he is expecting IBM to break even for the year and to earn about $2.50 a share next year.

Although IBM's overall hardware sales declined 13% in the second quarter, to $7.5 billion, IBM said there were some bright spots. Mainframes did better this quarter than in the first quarter of the year, although they declined compared with the second quarter of last year.

PCs and workstations "did well," IBM said, although company spokesmen declined to provide specifics, and IBM PC Co. reported a profit for the second year in a row.

Likewise, revenue from IBM's services businesses grew by 27%, to $2.4 billion.

IBM PC Co. pumps up ValuePoint line—again

By Michael Fitzgerald
SOMERS, N.Y.

The IBM PC Co. last week released redesigned ValuePoints aimed at preventing future backlog problems.

Separately, IBM's Ambra Computer Corp. subsidiary will make its U.S. debut today.

While resellers said the PC Co. has largely caught up on its ValuePoint backlogs, the new Intel Corp. I486-based ValuePoint SI models represent a strategic shift for ValuePoint by stepping away from its previous "one motherboard fits all" approach.

The SIs use different motherboard and component designs from each other and the current ValuePoint line, and they will also rely on multiple sourcing. ValuePoint designers went with new suppliers for its new designs because "we've had the line go down for days at a time because we can't get a 50-cent part like the blue OverDrive upgrade slot," said Jose E. Garcia, director of ValuePoint development.

The new products use Intel's 25-MHz I486SX and 33-MHz 486DX, but the SIs lack some of the features of the current versions — for instance, VL local-bus expansion slots. Base price, however, is $899, the lowest yet for a ValuePoint.

Facing the problem

Analysts praised the PC Co. for addressing a shortcoming in its product design by adding the two new motherboard designs.

Richard Zwetchkenbaum, analyst at International Data Corp. in Framingham, Mass., noted that the new models do have potential limitations in terms of upgradability, compared with the current ValuePoint line.

"We like the idea of these products — for us, it's a discount on an existing box," said Victor Mutnick, corporate vice president of information systems at New York Life Insurance Co. Mutnick said the fact that the new ValuePoints lack Pentium upgradability and offer a VL-bus expansion slot means little to his users.

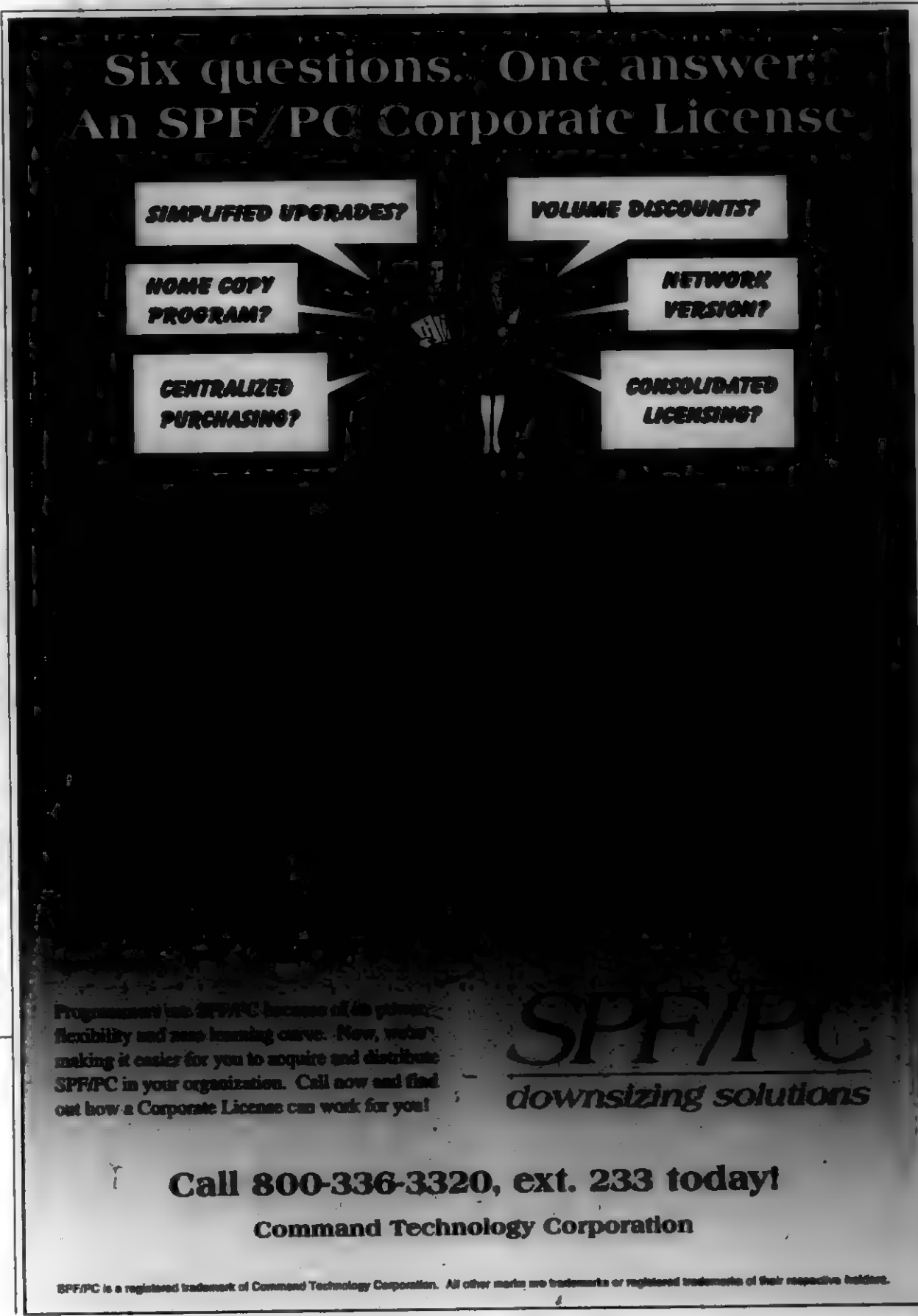
The ValuePoint brand team also pushed to churn out the new products in an aggressive four-month time frame. Analysts said the multiple motherboard designs probably foreshadow the strategy ValuePoint will adopt with an expected major announcement next month that will include energy-efficient models.

IBM also cut ValuePoint prices 11%.

In addition, the company today will announce Ambra, a loosely affiliated U.S. subsidiary. Ambra, which sells boxes that do not carry the IBM logo, will share only a name with the Ambra effort in Europe and Canada, where it has been billed a clone killer.

The U.S. version of the company, which will eventually swallow the Canadian side, will target buyers "who want the latest stuff cheap," said David Middleton, Ambra's North American president. He promised Ambra will turn over its product lines every three to four months, adding technology as rapidly as possible.

Middleton said Ambra hopes to gain 10% of the direct-mail market, which could doom many mail-order companies, according to analysts. While most analysts said Ambra appeared likely to fly, they agreed that Middleton is juggling a lot of balls.



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News Shorts

Textile maker opts for client/server

Graniteville Co., a Graniteville, S.C., textile manufacturer, has signed a $1.2 million contract with **NCR Corp.** to replace its proprietary mainframe system with an NCR-based client/server environment. The systems, which include two NCR 3450 multiprocessor systems, will be used for inventory management, customer invoicing and purchase order processing.

Sun reports financial results

Sun Microsystems, Inc. in Mountain View, Calif., said last week that it had fourth-quarter revenue of $1.26 billion and yearly revenue of $4.31 billion. Profits for the year ended June 30 were $156.7 million, or $16.6 million less than they were last year. But most profits came late in the year, Sun said.

AT&T updates Mac E-mail software

AT&T introduced updated Macintosh software for its EasyLink global electronic-mail service and will demonstrate the product at Macworld Expo/Boston this week. Features include enhanced directory services, support for multiple attachments and background mail-transfer capabilities. General availability is scheduled for September; the suggested price is $210.

Pen computers can get host data

Notable Technologies, Inc. will this week begin shipping Mobile Access-Personal, the first program designed to give pen-based users access to host-based data. Mobile Access-Personal includes a variety of scripts to give users access to public information services such as CompuServe or Dow Jones News/Retrieval. It runs under Go Corp.'s PenPoint operating system and is priced at $195 a copy.

Vendors run FDDI through copper wire

Support is emerging for running the high-speed Fiber Distributed Data Interface networking protocol over regular unshielded twisted-pair copper wire. A standard for allowing this to happen is in draft form, so many vendors are beginning to roll out products. Last week, new players entered the market, including **Optical Data Systems, Inc.** with a hub and **Advanced Micro Devices, Inc.** with chip sets.

Rexon restructures to save money

Tape drive subsystem and backup software maker **Rexon, Inc.** announced last week that it will restructure its business in response to price erosion and soft demand for its products, particularly in Europe. The Simi Valley, Calif., firm will consolidate its four independent subsidiaries under centralized management. The company plans to write off $38 million to $48 million for the reorganization, which will result in a loss for the third fiscal quarter ended June 27.

SHORT TAKES **Digital Equipment Corp.** said the expected release of a version of its RAID Array 1108 disk drive to work with Sun's Scalable Processor Architecture machines has been delayed. The array, originally due this summer, has been pushed into the October time frame.... **Jasmine Alexander**, formerly senior director of MIS at **ABC Radio Networks** in New York, has been promoted to vice president of MIS.... **Interleaf, Inc.** has signed a pact with **Phoenix Technologies Ltd.** under which Interleaf will use Phoenix technology to add support for PostScript Level 2 to its document publishing software.... **Collaborative Technologies Corp.**, which creates calendar scheduling software called VisionQuest, has signed a pact with **Intellect Corp.** under which the latter company will help port VisionQuest, which runs on Windows and DOS, to Macintosh and Unix platforms.

Standards

Vendors unite to promote work flow

By Lynda Radosevich

Hoping to avoid the embarrassing interoperability battles waged last year by messaging vendors, an international group of work-flow vendors, integrators and two large end-user companies plan to announce a work-flow consortium next month.

The announcement will be coordinated with the Workflow Conference in San Jose, Calif., on Aug. 12-13.

Called the Workflow Management Coalition, the group's goal is to foster interoperability among work-flow products by developing a consistent set of application programming interfaces (API), format specifications and protocols. The strategy is to unify the market as soon as possible and avoid API turf wars. In general, work flow is defined as intelligent routing of electronic documents, data and images.

"It's a great idea because one of the problems with work-flow systems is that if you choose one and anybody else in the building chooses another, you're stuck," said Ronnie Marshak, vice president of the Patricia Seybold Office Computing Group in Boston.

"There is no CIO for the universe; companies pick what's best for them. Then we have to figure how to make it all work together. Anything that helps us do that is great," said Nicholas Rudd, chief information officer at Young & Rubicam, Inc., an advertising and communications firm in New York.

Vendor roster

U.S. members include Lotus Development Corp., Action Technologies, Inc., Wang Laboratories, Inc., NCR Corp., Quality Decision Management, Saros Corp., TSI International, UES, Inc. and Electronic Data Systems Corp. International members include Cap Gemini Sogeti in France, Staffware and ICL, Inc. in Great Britain, Groupe Bull, Siemens Nixdorf Information Systems, Inc. and IBM Germany. End users include Europe-based General Motors Corp. and Wurttembergische in Germany.

Notably absent from the group are imaging work-flow vendors such as FileNet Corp. and application vendors such as Microsoft Corp. Microsoft officials said they were unaware of the coalition, and a FileNet official said the company was not involved in this alliance but was coordinating efforts with Lotus. Additionally, analysts said they expect to see other companies joining in soon.

"Work flow is an important technology, and a coalition like this is key for helping end-user companies leverage it well," said Lisa Gansky, a managing partner at Technology Trading Partners, a consultancy in Oakland, Calif.

Meanwhile, the Groupware Users and Vendors Association will have its first meeting at a groupware conference on Aug. 8-10 in San Jose, Calif. David Coleman, chairman of Groupware '93, said the goal of the group is to raise awareness and work on standards for groupware technologies.

Vendor consortia are not a new animal, and many are not successful. However, "coalitions tend to work better than actual standards organizations, and customer participation is key," Marshak said.

Outsourcing

CONTINUED FROM PAGE 1

tunity to price deals using new formulas, users said.

In one of the largest client/server outsourcing deals, the $500 million that Paris-based Europcar International is scheduled to pay Perot Systems Corp. is based largely on revenue-sharing tied into Europcar's business projections, according to Robert Verasdonck, corporate director of MIS at Europcar.

The deal, executed a little more than a year ago, is structured so Europcar will pay Perot approximately 3% of Europcar's revenue after the second year of the 10-year deal. The arrangement provides assurance that Europcar will slash its IS costs from what has been 6.8% of revenue to about 3%, Verasdonck said.

Vendors seemed loathe to discuss client/server pricing. Requests for interviews with EDS and Computer Sciences Corp. were not granted by press time.

"These guys are going to have to price based on what they deliver to the client, not on DASD, CPU cycles or I/O operations," predicted Gordon Kerr, senior vice president of MIS at Hyatt Hotels Corp., who is considering handing over responsibility for Hyatt's Unix-based Spirit reservation system to a client/server specialist.

"Moving to client/server takes away [outsourcers'] cost advantages," observed Rudy Hirschheim, a University of Houston IS professor.

Jack Eckerd Corp., which earlier this month struck a 10-year client/server outsourcing deal with ISSC, discovered that pricing was no easy matter. Eckerd Vice President of IS Jerry Rothmeyer said the Clearwater, Fla., drugstore chain first figured out how much an in-house conversion from mainframes to client/server would cost and then compared its finding with ISSC's offer.

"It was very tedious," Rothmeyer recalled. "We put together a very detailed plan that included what we thought would be the people requirements for developing applications and where we thought the price of hardware would go over the next 10 years."

Rothmeyer declined to reveal Eckerd's own estimate. He said, however, ISSC's price was less than Eckerd's estimate.

But in a further illustration of the vagaries of client/server pricing, Eckerd and ISSC acknowledge the deal does not have a firm price tag. Eckerd said it expects to pay between $320 million and $440 million during the 10 years of the deal.

In some client/server outsourcing cases, vendors are charging flat fees.

When Enron Corp., a Houston natural gas company, renegotiated its EDS pact to accommodate more client/server work, the company agreed to pay a fixed fee for services covering any combination of client/server and mainframe computing, according to Warren Gallant, vice president of Technology Partners, Inc. in Houston.

Price formula

When outsourcing client/server projects, the processing and storage component of the cost/price formula is by definition reduced, compared with the host-based pricing formula. If all the client/server zealots are to be believed, outsourcers would provide less expensive operations.

Rudy Hirschheim, a University of Houston IS professor, claimed that outsourcers are attempting to figure out how much the job would cost on a classic CPU mainframe basis and charge accordingly.

"The question is, who would obtain the savings?" he asked. —*Mark Halper*

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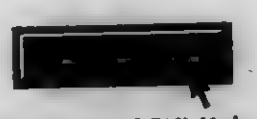

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Fed agency tailors GIS to locate flooded areas

By Gary H. Anthes
WASHINGTON, D.C.

Nothing concentrates the minds of workers at the Federal Emergency Management Agency (FEMA) like a $10-billion natural disaster.

"My focus had been on hurricanes," said Louis A. Wolsy, chief of the Applications Division at FEMA's Office of Systems Engineering. "But when the Almighty sets His agenda, we have to redo ours. What we had planned to do over eight to 10 months, we've done in eight to 10 days."

What Wolsy's staff and others have been doing is tailoring a prototype modeling and geographic information system (GIS), started in the wake of Hurricane Andrew last year, to support disaster relief in nine Midwestern states devastated by the Great Flood of '93.

ASAP — for All-hazards Situation Assessment Prototype — is a combination of custom-built and commercial software for predictive modeling, analysis, data management, mapping and reporting. Intended to predict the location, severity and type of damage from hurricanes, it was created to give FEMA more lead time in planning how and where to respond to hurricane disasters.

The plan was to then extend and adapt ASAP, in a relatively leisurely way, so it could also handle disasters resulting from fires, earthquakes and floods.

But now FEMA, in just a few days, has pressed ASAP into service for its first megadisaster. While it cannot yet predict the course of the flood or its effects, it is helping the agency and many other federal, state and local groups understand just what has and has not been flooded — a crucial first step in planning and executing relief for tens of thousands of victims.

ASAP gets its flood data from a Thermal Infrared Observation Satellite and from U.S. Air Force U-2 spy planes that carry superaccurate cameras that can tell within 5 meters whether a piece of property is under water.

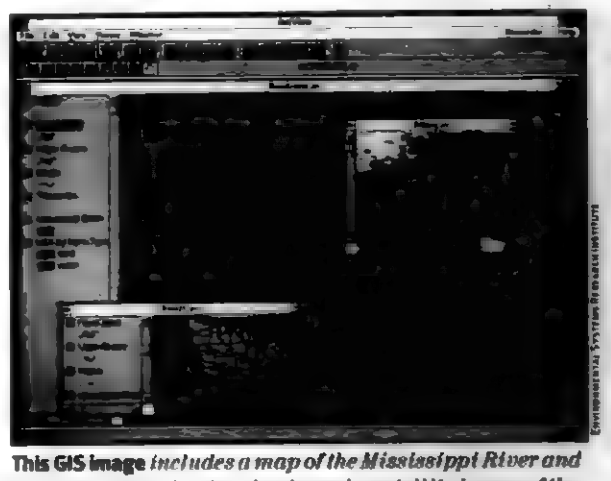
While that may be painfully obvious to those living near the rampaging rivers, it is information that was previously collected from multiple ground sources in a process that was slow and error-prone. Now, Wolsy said, accurate and timely flood-boundary information has been used to do the following:

▶ Tell the U.S. Department of Education which schools are flooded to help it decide where to boost student-aid benefits.

▶ Show the Centers for Disease Control and Prevention in Atlanta where disease-bearing mosquitoes are likely to strike.

▶ Recommend to President Clinton areas to be declared major disasters.

▶ Help nine FEMA field offices with local disaster relief.



This GIS image *includes a map of the Mississippi River and its tributaries, the river basin and a satellite image of the area during the week of July 18, 1993*

Jim Darnes, a member of FEMA's Aerial Recognizance Team, said current policy does not allow FEMA field personnel to give subsistence funds to disaster victims until FEMA has verified their claims. But he said the new GIS is timely enough and accurate enough that it could enable FEMA to cut a check for temporary living expenses to disaster victims on the spot, after checking a computer terminal or printout to see if the claimant's address is indeed flooded.

The ASAP local-area network at FEMA headquarters here is "one of the more heterogeneous LANs ever," according to Wolsy. Key components include a DOS-based file server running Novell, Inc. NetWare, a "GIS server" in the form of an IBM RISC System/6000 running AIX, a PC acting as a "database server" running The Santa Cruz Operation's SCO Unix and Oracle Corp. databases and an assortment of PCs and RS/6000 user boxes.

The database server holds 115 databases from 27 federal agencies, including more-or-less static data on power plants, hospitals, airports, communications facilities and the like. The GIS server holds geographic data related to roads, rivers, land features and elevations, mostly from commercial sources. The third major source of data is the aerial recognizance information from planes and satellites.

Flood has minor impact on data centers

By Ellis Booker
CHICAGO

While certainly a disaster of gargantuan proportions for local farming communities, a month of unrelenting Midwest flooding has not proved to be an information systems catastrophe.

Even as some riverside communities sank from view, most data centers were high and dry, said IS managers in the region. The notable exceptions were in Des Moines, Iowa, where flooding caused a loss of commercial power and water in the downtown area, prompting several businesses to relocate to disaster recovery hot sites [CW, July 19].

As of late last week, one financial customer from Des Moines was still operating out of a Comdisco, Inc. Disaster Recovery Services facility in Wood Dale, Ill. A number of Comdisco's Missouri customers have put the disaster recovery provider on alert.

Also escaping with minimal and manageable impact from the flooding were data processing operations far away from the disaster areas — at federal agencies in Washington, D.C., commodity markets in Chicago and private insurance companies across the nation.

In Kansas City, where it rained for all but two days between June 25 and July 25, there was plenty of anxiety over the waves lapping against levees. Wayne Boggs, director of information technology at Kansas City Power & Light, had special cause for alarm, given the location of the power company's data center.

Pitt Des Moines, Inc. *owner, Craig Pitt, and workers saving equipment when the metal company plant flooded*

For a decade, the utility has operated its data center in the Hunt Midwest Underground, a limestone mine located in a 500-year-old flood plain. There, 150 feet down and a half-mile in from the cave mouth, the power company operates all its administrative systems on two Unisys Corp. 2200 mainframes. The center, also the hub for the company's communications network, is operated by 15 of the IS group's 120 employees. The portal of the cave, in a bluff an eighth of a mile from the Missouri River, is the same height as the levee — 52 feet.

"There's been more concern than actual impact," said Boggs, adding that the company lost one local-area network server when 18 inches of water quickly flowed into one of its power plants. Even if water were to breach the levee, Boggs said he doubted he would suffer more than a loss of power and access to the data center.

Still, better safe than sorry. Boggs last week had his staff walking the levee, watching for breaks. "We've got a hot backup with another 2200 in another building we use for application development and backup testing," he added. As the Missouri and Kansas rivers crested last Tuesday, Boggs said he was confident a move to the hot site would not be needed.

In Des Moines and other towns that had lost commercial water because of flooding, users faced the problem of overheating computers.

At Heartland Health System in St. Joseph, Mo., commercial water was lost at 10:30 p.m. on July 24. "Our 3090, which is on a closed loop [cooling] system, wasn't in jeopardy but the telephone system and the servers were cooled by chillers," said MIS director Larry Koch.

Air-conditioning was restored to the two-campus hospital within 12 and 20 hours, respectively, said Koch, who used window air-conditioners in the doorways of the rooms housing the LAN server and telecommunications equipment.

While Heartland did not lose data or any of its 1,500 computer users as a result of the episode, "it has changed our thinking about cooling systems in areas with mission-critical computer systems like telephone systems," Koch said.

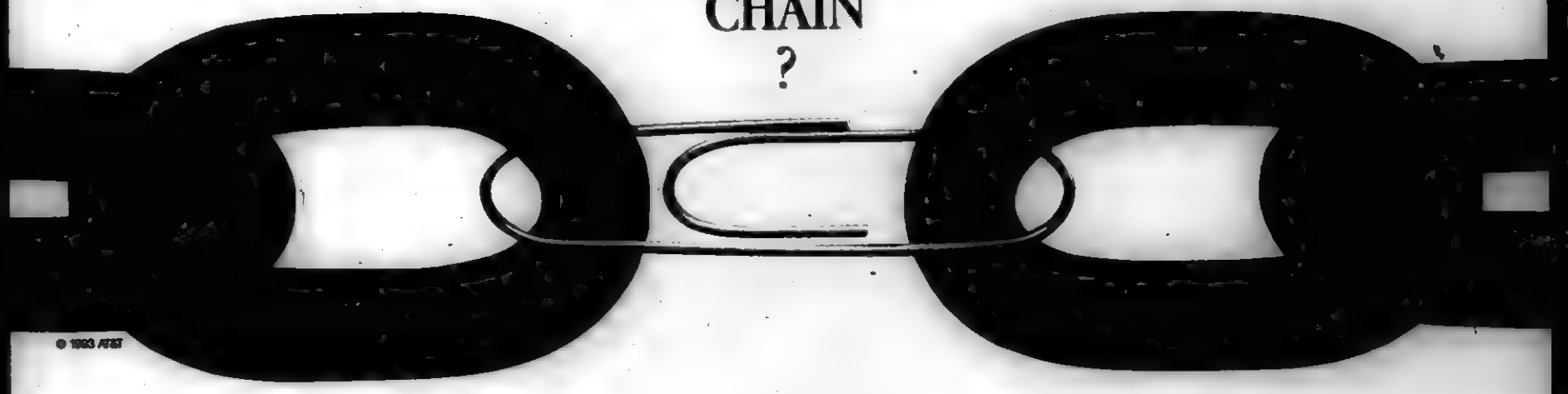
Handle on claims

Mounting losses — estimated at $10 billion to $12 billion — will mean an increase in federally managed flood insurance claims, but the agency responsible for processing them said it is not overly concerned about handling the volume.

For now, the Federal Insurance Administration, part of the Federal Emergency Management Agency, has not witnessed a logjam of claims. For some weeks, a Flood Insurance Claims Office has been set up in St. Louis. The center is on-line with the Maryland host computer.

The spokesman said the agency closes 90% of claims within 90 days. To date, he said, 4,200 claims have come from the declared disaster states. "At this point, the mainframe is not being run extra hours," he added.

JUST HOW STRONG IS YOUR INFORMATION CHAIN ?



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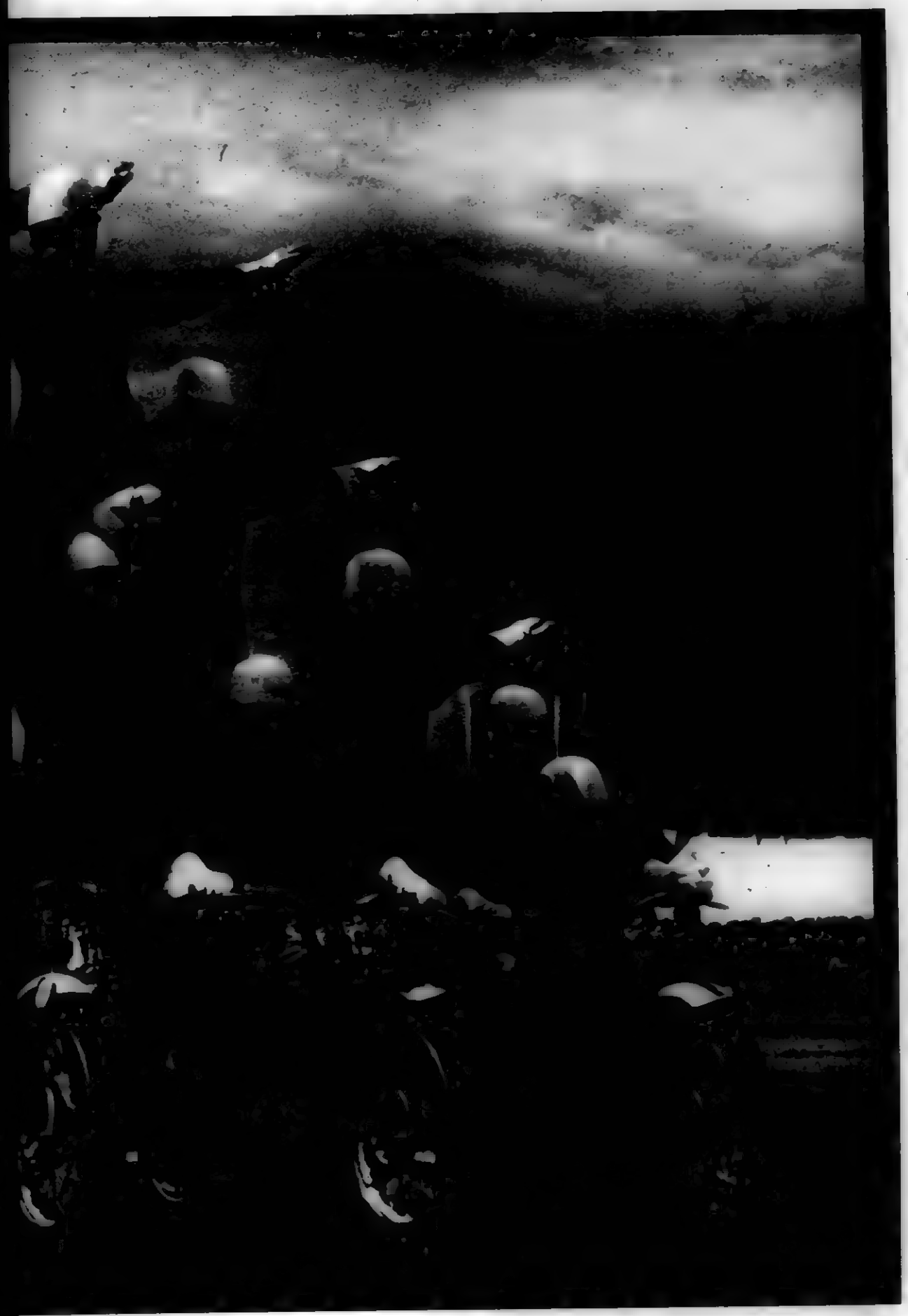

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CONTROL DATA
The Integration Company

Security lapse bedevils SQL Server users

CONTINUED FROM PAGE 1

mediately available to all authorized users. Security here is key, Kenefic said, but centralizing the administration of that function has been nearly impossible. Frustrated by the lack of a standardized SQL security administrative function, company programmers created primitive ad hoc reporting tools.

Kenefic's problem is not unique. It could trip up any company trying to employ a SQL Server setup in a decentralized client/server environment.

"If I was trying to centrally manage the security on a dozen or more SQL Servers, I'd go nuts," said Michael Fitzmaurice, MIS director at the National Association of Broadcasters in Washington, D.C. "There are just no decent front-end tools [for doing it]."

Sybase, for its part, is not pointing the finger. "We recognize that the tools are not adequate for centralized SQL security administration at this point, but we're working on addressing those issues in the future," a spokeswoman said. She could not say when those fixes would be in place, however.

What users are finding particularly frustrating is that neither of the other two vendors involved in the SQL Server OS/2 setup — Microsoft or IBM — will acknowledge or take ownership of the problem.

Microsoft blamed the design on OS/2. "It wasn't designed for managing large collections of distributed servers in a unified way. And this is clearly an issue that current products are not addressing," said Gary Voth, Microsoft's senior product manager for corporate and networking systems.

> SQL Server's primary means of security is the use of a log-in ID to control the data access from the server.

Not true, IBM officials said. "There is nothing inherent in OS/2 that would make it more difficult to administer security," said Art Olbert, IBM's director of local-area network systems.

In fact, Olbert said IBM offers several products that assist in the administration of security. These include Datahub, which manages the actual relational data across servers and hosts in a network; and LAN NetView, which manages the different clients and servers on a LAN.

"Third-party options also exist," Kenefic said, but he "wants the major vendors that provide the SQL Server OS/2 product to provide answers."

Under guard

Users want to centralize security administration to block common entry points from security breaches

NETWORK ATTACK POINTS

- Multiple keyboards
- Several places to print data
- Rooms to lock
- Cables to tap
- Connections to hack

Remote control

Meanwhile, there are ways of getting around this issue, according to Michael Smith, a senior software engineer at Boeing Computer Services in Richland, Wash.

SQL Servers can remotely connect with other SQL Servers, so an administrator can log in and execute stored procedures, a set of code that automates some tasks. Smith acknowledged it is a patchwork solution but it does save time.

Fitzmaurice added that users would like to see a point-and-click administrative function to grant and revoke security privileges, along with a "drill-down" approach to security administration.

Microsoft plans to add an auditing function to its Sybase System 10 version of SQL Server, but that will not be available until early 1994, Voth said.

Sybase is also working with Tivoli Systems, Inc. on security administration features for a future version of the SQL Server database.

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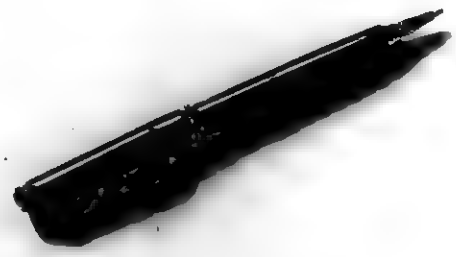

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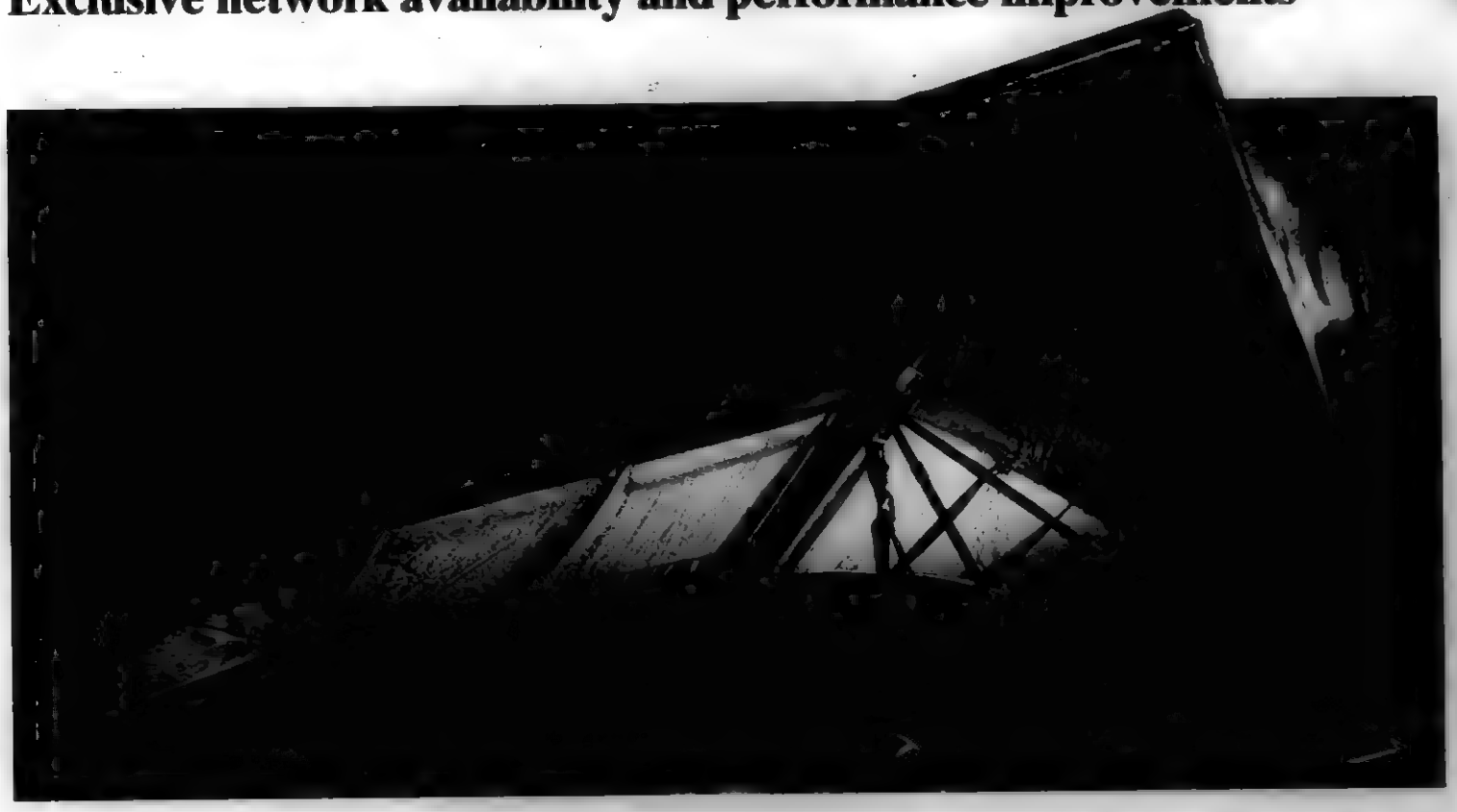

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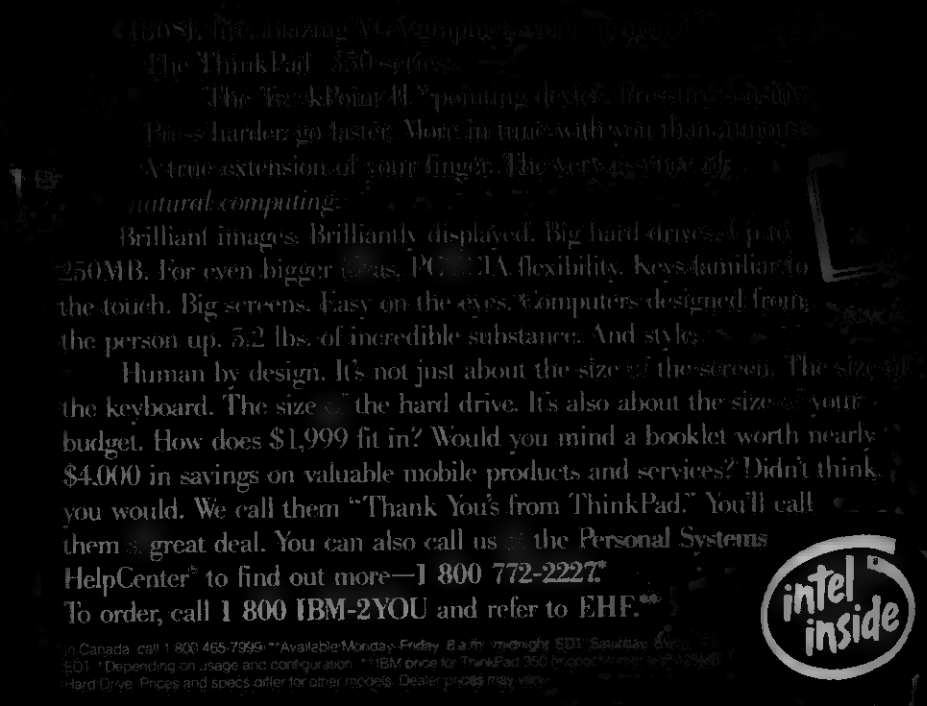

deep pockets.

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What's inside

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IBM

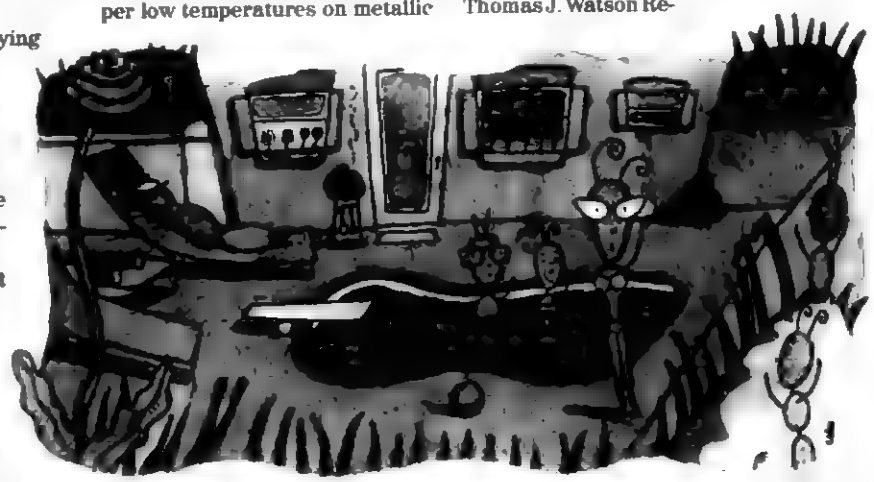
Tiny technology

The small world of nanotechnology opens possibilities for molecular computing

By Jean S. Bozman

Think small. Really small. Enter the world of nanotechnology, where distance is measured in atoms and molecules, and where the object is to rearrange the elements.

Humans have been trying to tinker with nature's basic forces for centuries, but only in recent years have scientists been able to move atoms, aligning them, like dominos, into simple patterns.



Paul Fasch

Two distinctly different approaches have developed in the way nanotechnology is being pursued: One group sees it as a form of basic research that will indirectly affect future computing by expanding science's understanding of the forces that bind all materials together.

Another camp sees nanotechnology as a means to an end, a method of molecular manufacturing in which physicists (and, perhaps someday, computer system designers) can build things by placing atoms exactly where they want them. Next, these advocates must find a way to copy those tiny building-block components to form the stuff of computers, chemicals or mini-machines.

IBM scientist Don Eigler falls into the first camp, having successfully demonstrated that he can move atoms of the gas xenon at super low temperatures on metallic surfaces. Just three years ago, Eigler collected images of xenon atoms arranged to spell out the word I-B-M. Since then, Japanese scientists have moved silicon atoms about at room temperature, creating Japanese characters.

But Eigler, who was recently named an IBM Fellow, emphasizes that he is not planning to apply his atom-moving techniques to the manufacture of tiny computers.

"It opens up the possibility, and I emphasize the word possibility, of developing new technologies and a better understanding of existing technologies," he said. However, other IBM scientists at IBM's Thomas J. Watson Research Laboratory in Yorktown Heights, N.Y., are working with silicon atoms and a scanning-tunneling microscope to develop very small electronic devices [CW, Nov. 2, 1992].

The other camp is exemplified by K. Eric Drexler, an academic who laid out the blueprint for molecular machines, factories and computers in his books *Nanosystems* (John Wiley & Sons, Inc.) and *Unbounding the Future* (Wm. Morrow and Co).

"I would say that the big gap is between people who are in the world of existing laboratory research, doing things with existing equipment," Drexler said, "and people who are using the best available computational models and looking at what we can do with tools we don't have yet."

Drexler said he envisions micromachines and built-to-order molecules arriving sometime after the year 2000. But the molecular-size tools needed to build designer molecules should appear well before that, he said. They would be used to "replicate" tiny structures, using building blocks sized in the hundreds of atoms to build molecules. He has often cited a 1959 lecture by the late physicist Richard Feynman — who said moving atoms violates no physical laws — as providing the conceptual groundwork for his nanotechnology research.

To promote his ideas, Drexler's nonprofit Foresight Institute in Palo Alto, Calif., is hosting its third annual molecular nanotechnology conference in Palo Alto in October. The past two conferences have drawn fewer than 200 invited guests. But this one, Drexler said, will emphasize the role of computer-aided design and simulation as a way to spur the technology.

Big tiny problems

Before nanotechnology comes off the drawing board, a number of scientific issues must be addressed. Drexler's book, *Unbounding the Future*, lists the following items:

- Thermal vibrations that might shake apart nanotechnology structures.
- The "uncertainty principle" of quantum mechanics that could interfere in obtaining exact atom placement.
- The untidiness of loose molecules flying around finished structures.
- The long-term chemical instability of these tiny structures.

However, Drexler said he believes these worries will prove to be unfounded. He argued that nanotechnology may save the day when traditional lithography techniques used to etch today's very large-scale integration chips reach their physical limits.

Ralph Merkle, a researcher at Xerox Corp.'s Palo Alto Research Center, works with Drexler to model nanocomputer components on supercomputers and Silicon Graphics, Inc. workstations.

"As you make transistors smaller and smaller, you'll reach the point where random fluctuations [in the positions of some atoms] will make some of the transistors [fail to] work," Merkle said. "If we're going to push the lithographic limits in 10 years, we need to be researching this new technology now."

Projecting from past trends in computing, Merkle predicted that sometime between the years 2010 and 2020, it may take just one atom to store a bit of computer information.

"I feel confident that, just as rocketry came true eventually, bits of this will eventually come true, too," said Paul Saffo, an analyst at the Institute for the Future in Menlo Park, Calif. "But it may come out quite differently than they have imagined."

Mini building blocks

Conventional silicon semiconductors are made by etching circuits into the layers of silicon atoms. Dopant atoms, such as gallium, arsenic and phosphorus, are used to create the gaps that make electrons flow across semiconductor circuits, said Ralph Merkle, a research scientist at Xerox's Palo Alto Research Center.

Lithographic techniques used in the etching process do not place atoms individually. Seen from an atomic perspective, it is a rather gross way of fabricating semiconductor structures, nanotechnology advocates said. Lithography is a technology that depends on "statistics" — that is, the likelihood that atoms will be in the right place when needed. By contrast, nanotechnologists intend to build semiconductor structures atom by atom, assembling them like Lego blocks.

The time scale for deployment of nanotechnology is reasonably far off; it may not be until the year 2010 or 2015 that nanocomputers or nanomachines are a reality. However, the first building blocks could arrive much sooner.

"We are looking at a series of developmental steps, with incremental payoffs at different levels," said K. Eric Drexler, a leading nanotechnology booster. "Many researchers think we're about one year of hard work away from having a tool that's able to position reactive molecules and to guide chemical reactions by putting molecules together like Tinker Toys."

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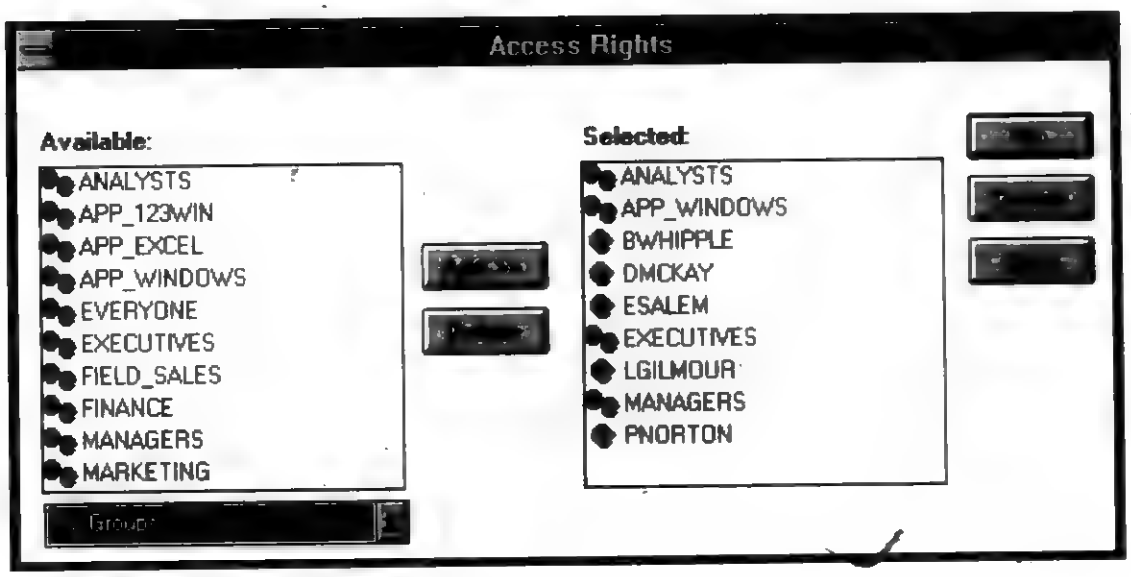

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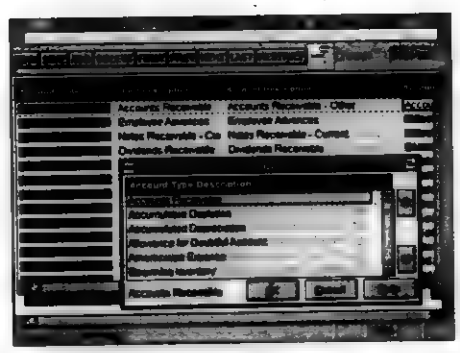

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Dismantling IBM

The sheer magnitude of IBM's second-quarter $8 billion loss posted last week shocked many industry watchers, but the news from Armonk was actually pretty good.

The silver lining is that IBM's operating loss was smaller than expected, and the charge it took for cost-cutting measures was surprisingly aggressive. After three months of seclusion, IBM CEO Louis Gerstner is going public with a plan that shows he means business.

Now it's time for Gerstner to articulate that plan more clearly. The initial stirring from the CEO's office indicates Gerstner will not let the decentralization craze ravage IBM into shattering into dozens of autonomous units. That's good because a knee-jerk move to decentralize would ignore the core strengths that IBM as a corporation can bring to the table.

Certainly IBM should be broken up to some degree, but only in those markets where it makes sense: disk drives, printers and PCs, for example. Those businesses are fighting a share war in markets in which small size is a definite asset. For example, IBM's PC business was ponderous and unresponsive when it was part of the mother ship.

The new IBM PC Co. is a role model for decentralization. Slimmed down and outwardly focused, the division is competing effectively in a breakneck business.

But what's sauce for the goose isn't necessarily sauce for the gander, and the PC Co. model won't fit the rest of IBM's business. There are still tremendous synergies in IBM's systems and software lines, which the company would be foolish not to exploit. What the decentralization fanatics ignore is that IS managers still value a single point of contact and a coherent message from a vendor with which they do a lot of business. IBM has long had that single point of contact. What it hasn't had is a coherent message.

For too long, IBM's sales strategy has been focused on pushing one product line or another. Customers have often felt like hostages in the holy war between, for example, the AS/400 and RS/6000 groups. That must change. What's needed is a culture shift that turns IBM's sales vision toward proposing a product mix that makes the most sense for the user's unique situation. That won't be easy, but it can be done.

IBM would also be unwise to ignore its potential for industry leadership. One of the most radical — and welcome — shifts at IBM in recent years has been its active participation in standards organizations such as the OMG and X/Open. In an industry that is increasingly jittery over Microsoft's hegemony, IBM has also assumed the unlikely mantle of the benevolent alternative. As a corporate entity, IBM brings tremendous power to that role, but it can't do that as a loose confederation of satellites. Gerstner would do well to pay attention to IBM's strengths and not let downsizing mania tear apart what's taken so long to build.

Paul Gillin, *Editor*

Relational redux

I was very surprised to see C. J. Date's naive response to Charles Babcock's "Relational backlash" column [Letters to the editor, CW, July 12].

Mr. Babcock's analogy about disassembling a car every time it is driven is an excellent example of the overhead that relational systems impose on the computer industry. Relational databases have never been known as high-speed engines, and atomic data items that are shared by many logical objects do indeed require overhead.

It is ludicrous for Date to imply that proper "domain" support within a relational database would allow a relational database to do all the things an object-oriented database can do. I have yet to see any relational database that can fully support polymorphism or multiple inheritance. Most important, it is very difficult to "shoehorn" a relational database to support the encapsulation of behaviors.

Contrary to Date's assertion about the similarity of Codasyl [Conference of Data Systems Languages] to object technology, it is very clear he missed the point. Both models use pointers to link data items together, thereby reducing the overhead of reassembling the objects.

Object-oriented databases also share the concept of "currency" with Codasyl databases. Currency allows users to see where they are in the database, and the failure of the relational model to support currency is a major drawback.

Finally, Date alleges that the relational model is built on a sound theoretical foundation. Anyone who has read E. F. Codd's criteria for relational databases knows that attempts to apply mathematical rigor to the relational model fall apart in practice.

Relational databases sacrifice performance to remain flexible, and object technology databases sacrifice flexibility to gain performance. Much of this argument reminds me of the Codasyl bashing that was going on when the first commercial relational databases were introduced.

Donald Burleson
Rochester, N.Y.

Custom definition

I thoroughly enjoyed Amy Bermar's "Custom image" article [CW, July 5] but wanted to clarify an issue regarding U.S. Customs' use of CA's Datacom/DB.

The article refers to CA's Datacom/DB as a hierarchical database. In fact, Datacom/DB is a high-performance relational database management system. It has no embedded pointers and stores the data in a flat file "tabular" arrangement using a sophisticated index system.

Feodorus Diakonikolas
Vice president, R&D
Computer Associates International, Inc.
Islandia, N.Y.

Natural selection

The editorial "Jurassic lark" [CW, July 12] seems to have missed a major component of the "tremors of cataclysmic proportions" that you are concerned are causing problems for users.

It is the shifting patterns of where money is being spent that are rocking the IBMs, DECs and now Apples of the industry. And who is responsible for the shifts in purchasing? The users. They are only selfishly interested in their own good, in getting the most value for their system budget dollar these days.

You also failed to note that for every person laid off at Apple, another is employed by one of the companies growing to take its place with products that customers perceive provide more value for fewer dollars. Other than IBM, the computer industry routinely turns over four out of five of its largest suppliers every decade.

What we are just witnessing, again, is the turmoil caused by a phenomenally creative industry continuing to be ripped apart by the greedy and selfish users. Damn their eyes.

Robert Young
Editor
"New York Unix Newsletter"
New York

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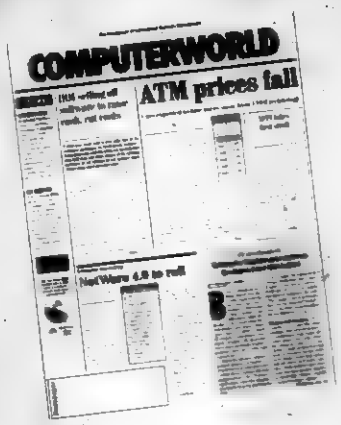

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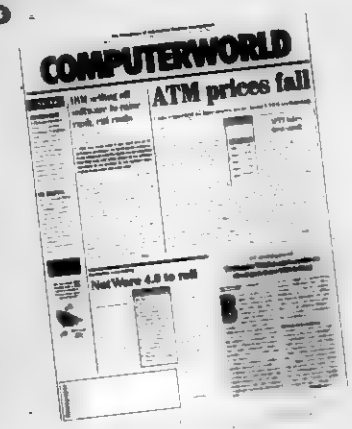

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What's excellence got to do with it?

Ben Rothke

Many analysts have called 1993 the year of the battle of the operating system. I say it's never been anything but a paper war, and the outcome is a foregone conclusion.

Forests have been devastated in the cause of figuring out which of the many operating systems poised for action is truly the best. Thousands of articles and case studies have been penned contrasting the merits and drawbacks of each, often in minute detail.

I don't know why we bother when what's technically best is so clearly beside the point.

Let's face it, the driving force in the computer industry is no different from the driving force in any industry. It's image, hype and appeal to the herd instinct that counts. Excellence is entirely beside the point.

Are Calvin Klein jeans the best out there? Who cares — Klein jeans are what the people want. Johnny Ramone has sold orders of magnitude more records than Andres Segovia. Does that make him a better guitarist? Of course not. Any individual of insight discerns that quality and quantity do not necessarily, and most often don't, go together.

So why do we in the IS business think that the dominant operating system in the 1990s will be the finest one?

If quality were genuinely the issue, members of the New York Philharmonic would be millionaires and Billy Ray Cyrus wouldn't be. Query anybody in advertising, and he can tell you that an ounce of Freudian impulse directed to the buyer sells much more than a pound of rational thought.

We can debate all we want about whether OS/2 is better than Windows or Solaris is better than UnixWare. Deep down, we all know the outcome already. While IBM sat around waiting for the stock dividends to arrive, Microsoft put all of its efforts into one area: gaining market share, saturating the market and dominating it.

Making the best operating system was never Job 1 at Microsoft. Bill Gates doesn't worry about that because he understands business and human nature and the fact that "the best" and "the most popular" have yet to meet in any industry, let alone in IS.

The only thing I can't figure out is why most IS people don't see this.

IS is a service division dedicated to serving the end-user community. This is the same populace that turns the publishers of the *National Enquirer* into millionaires and Juilliard-trained musicians into waiters. Given that fact, how can we even wonder why NextStep will never get a serious amount of market share?

What this all means is that, at least for the next few years, no one will ever be terminated for standardizing on Windows. If you happen to work in an environment where standard graphical user interfaces and common application programming interfaces are not critical, you'll have the luxury of picking whatever operating system you think is "the best." The rest of us will have to settle for "the winner."

Rothke is network computing manager at the National League for Healthcare in New York. He can be reached on Compuserve at 74710,3325.

Mr. Orwell, Mr. Machiavelli, meet T. J. Rogers

COUNTER-INFORMATION *by* Michael Schrage

Trust me on this: Unless you're an incredible masoch . . . um, overachiever . . . you probably wouldn't be happy working at T. J. Rogers' Cypress Semiconductor. If T. J. Rogers didn't exist, George Orwell would have to invent him. So don't think of T. J. as just a boss; think of him as a very concerned Big Brother.

Cypress may be a wonderful company and T. J. may be a prince of an entrepreneur, but I'm afraid Mr. Rogers' neighborhood is a place that takes information technology a little too seriously. In fact, T. J. probably takes information technology more seriously than anyone who reads (or writes for) *Computerworld*.

His new book, *No Excuses Management* (Doubleday/Currency 1993), represents computerdom's answer to Machiavelli's *The Prince*. It's an intensely pragmatic, acutely political but techno-savvy manual of manipulation that deserves special study by the corporate digerati. Rogers espouses a software philosophy of such ruthless vigor that it represents a direct slap in the face of traditional CIOs who bleat about the myriad wonders of information technology. This is a CEO who clearly doesn't care to invest millions to better analyze market data; he wants Cypress to implement technology that fundamentally transforms people's behavior.

In Rogers' mind, technology isn't primarily a medium for information management; it's the medium for managerial enforcement. For example, Cypress takes employee compensation and the concept of pay-for-performance very seriously — so seriously that it has designed a software regime to enforce it. [The software] "helps us apply our pay-for-performance principles *without usurping managerial discretion* [italics his]," T. J. writes.

Control from above

As T. J. would say, "Barnyard epithet!" This software was explicitly *designed* to usurp managerial discretion. Follow the compensation exercises detailed in T. J.'s book and what you discover is software that unsubtly herds Cypress managers into awarding compensation precisely along the dimensions that T. J. and his management team want.

Now there's absolutely nothing wrong with using software to delimit managerial discretion; it unquestionably reduces much of the whim and capriciousness that makes such decisions so arbitrary. However, it should be absolutely clear that managerial actions surrounding compensation are now as much determined by T. J.'s software constraints as by any managerial intuition or experience.

Similarly, critical Cypress corporate processes are now monitored by what the company likes to call "killer software" (did I mention that T. J.'s nickname is "The Tburminator"?). If reviews aren't filed on time, your paycheck doesn't get sent; if a production line doesn't move swiftly enough, killer software shuts it down.

Instead of using computers and networks for analysis and synthesis, T. J. wants to use them to reinforce Cypress' cultural norms.

Would you want to work at a company that takes its software this seriously? Should Cypress become the model for organizations that believe the key to corporate transformation is in changing behavior, rather than twiddling bits? What will you do when the CEO comes and asks for a dose of these technologies?

You might want to work at such a place, but I wouldn't. There should be no question that using software to challenge managerial behavior represents a frontier that more firms are going to seriously explore — whether their people like it or not.

Schrage is a fellow at the MIT Sloan School Center for Coordination Science. He is also the author of *Shared Minds: The New Technologies of Collaboration*, (Random House, 1990). His Internet address is schrage@media-lab.media.mit.edu.

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Charles Babcock

Oracle's moot court

The Standish Group issued a report recently that took a swipe at Oracle's System 7 benchmarks and, as competitors ordered copies by the truckload, Oracle filed suit, charging libel and slander.

This is a case that will never go to court. The suit was filed to intimidate a small research firm into a retraction. But the Standish Group, far from fading away, is taking every opportunity to trumpet its stand with reported backing from Oracle competitors.

The case will not go to court because if it did it would establish that much of what the Standish Group said is correct. Factual accuracy would be a blow to Oracle's suit because one test of libel is whether there was a reckless disregard for the facts. There could still be a debate over the firm's interpretation of the facts — that Oracle's benchmark was "fraudulent" — but that is a lesser issue.

Walter Baker, chairman of the Technology Review Committee of the Transaction Processing Council, said his committee was asked by Sybase to review the benchmark and concluded that Oracle had not violated the TPC-A benchmark specification. What Oracle did was base its benchmark on a new stripped-down transaction option, a "discrete transaction," which eliminates useful I/O features. Baker said this is not cheating because "their test was compliant as the specification was written." But the specification is silent on many issues of how a test is to be run, and few Oracle customers say they need discrete transactions in their systems.

If Oracle didn't violate the loosely worded benchmark, its actions are debatable on other grounds. Oracle customers, looking at the benchmark, would tend to compare it to Oracle Version 6 and draw the conclusion that System 7's 1,003 trans./sec. meant Oracle had made a great leap forward. With no mention of the discrete transaction, foolish customers would have no other context in which to view the results.

In fact, a test of System 7 using the same type of transaction as Version 6 would show there was no such leap forward. This of course is another reason this case won't go to court. If it does, Oracle's competitors will eagerly line up to finance a benchmark to illustrate the point.

As Oracle's lawyers know well, the Transaction Processing Council is a quasi-public body with a quasi-public process of validating benchmarks. Once you enter such a process, you are submitting yourself to public scrutiny and comment, and it becomes difficult to plead libel when some of the comments don't go the way you think they should.

In terms of the council's workings, it is questionable whether this quasi-public process is good enough. For example, there is no easily accessible record of the Review Committee's vote. It would shed light on how the council really functions if we could see how committee members voted. A benchmark that makes a database system look fast also shows off the hardware on which it is running and a majority of the seven-member committee was made up of Oracle and three hardware vendors. Two Oracle competitors, Informix and Unify, constituted a minority, while IBM, the seventh member, is both — a vendor whose hardware runs Oracle and a database competitor.

The Standish Group is guilty of the same thing that Oracle has always been charged with — flamboyant phraseology. Oracle may summon members of the council to testify that it didn't violate the specification. But in airing how its tests actually took place, it would reinforce the impression that it violated the goals and spirit of the benchmark. And the customer base is a court of opinion to be feared by more than one research firm.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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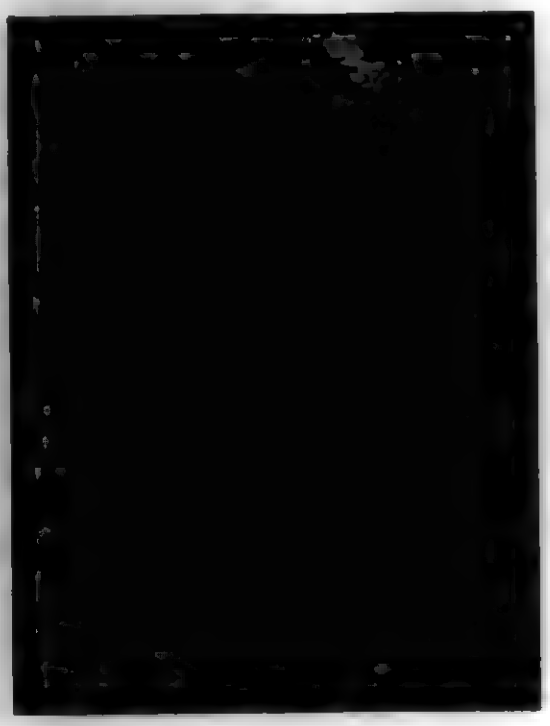

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David Coursey

Serious business

The common view of Microsoft is of a company with a MS-iah complex, looking to populate every electronic gimmick, gadget and gizmo with its own software to the absolute exclusion of 1s and 0s creatively arranged by anyone else.

That viewpoint, besides being widely held, is also a pretty fair assessment of the "I'm on a mission from God" seriousness with which some Redmondians address their tasks. The whole mess would be insufferable, save for the inconvenient truth that Microsoft has unquestionably done more for its customers than any other company in the industry.

Some, however, would venture that this hard work and divine purposefulness has been at the expense of a sense of humor, necessary to leaven the bad times and maintain perspective during a boom.

Leno as pitchman?

When, for example, MS-DOS 6.0 went sour at a most inopportune moment on the eve of the advent of Windows NT, the best course might have been to hire Jay Leno to do some funny spin-control TV commercials. "If you lost data because of DOS 6.0, my friend Bill here (points at a life-size cardboard cut-out of Gates) will be happy to send you some of his data to replace yours. Just tell us what you want. Important-looking spreadsheets? Word processing documents? We'll Fedex them right away and include an autographed Bill-the-Gates .BMP wallpaper file, a set of Ginsu knives and three tickets to the Super Bowl merely as our way of saying, 'Thanks!' "

But instead of a good-natured admission that something had gone awry, some folks at Microsoft went ballistic, and we were treated to spin control worthy of the Nixon White House. And it was about as effective. After all, it isn't like they hadn't already lost a DOS release

Coursey, *page 44*

NBC stations tune in to PC use

'Operation Peacock' brings TV stations' sales and marketing teams up to speed

By James Daly
WASHINGTON, D.C.

They slipped quietly into the offices of WRC-TV one Saturday, quickly securing the main conference room and unloading the tools they would need to take over. The sales department was the first to be hit, followed by marketing. Soon the whole place would feel their presence.

A terrorist attack? Far from it. This precision effort was part of "Operation Peacock," an ambitious effort by the NBC TV Stations' information technology group to make the PC a vital and productive tool in several key departments.

Joe Harris *says psychological barriers are hardest to clear*

"We couldn't afford to be an ostrich anymore," said Joe Harris Jr., director of information technology at NBC TV Stations, a division of the National Broadcasting Co. "We have to take our heads out of the sand. If you use technology appropriately, you become a whole new company."

Harris flips through a jagged stack of memos on a borrowed desk. "We told them that this is no longer your desktop," he said. He pointed a finger at the computer screen: "This is."

Operation Peacock targets the sales and marketing divisions as well as key department heads of the six NBC-owned TV stations in New York, Washington, Miami, Chicago, Denver and Los Angeles.

Harris was not dealing with complete computer illiterates, but he had a lot of what he calls "maybes."

"*Maybe* they knew how to call up E-mail; *maybe* they could get into a word processing package," he said. "Or maybe not."

Operation Peacock had its genesis in the summer of 1991. A growing proliferation of PCs, coupled with a move by TV stations to cut costs, had intersected with a directive from NBC's chairman to make it as easy as possible for customers to do business.

Assisted by his peers at parent company General Electric Co., Harris and a two-person team spent six months exploring the nether reaches of OS/2, Windows and Macintosh environments. When the smoke dissipated, the Macintosh emerged a winner.

"We had cleared our first hurdle, but we still had a very long road ahead of us," he said.

Harris, a 20-year industry veteran, knows that there are usually two ways people respond to change: kicking and screaming. The psychological barriers would be the hardest walls to clear. "PCs have been around for 15 years, and we're still trying to convince people they are great."

With limited manpower and stations scattered throughout the country, it would be impossible to get everyone up and running at the

NBC, *page 42*

On Site

NBC TV Stations
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Challenge: To familiarize and train advertising sales, promotion and marketing department employees into efficient computer users.

Technology: Apple Computer, Inc. Macintosh IIXs equipped with CD-ROM drives; Macintosh Quadra fixes and gyps.

Goal: To improve sales staff productivity by at least 10%.

PC demand

HP battles backlog

By Michael Fitzgerald
SUNNYVALE, CALIF.

Hewlett-Packard Co. has capitalized on its ability to ship PCs when its competitors cannot, making its PCs the ones dealers recommend when they cannot get product from demand-waterlogged IBM PC Co. and Compaq Computer Corp.

But HP has hit the same problem as its much larger competitors. "Basically, demand has outstripped our supply, and it will take us a couple of months to completely catch up," said Boris Elisman, HP product marketing and programs manager for desktop PCs.

Elisman said the backlogs were caused by swelling demand and by a shift in product lines. He stressed that HP was already catching up to demand and would outproduce its order rate this month.

Growth chart

HP has increased its unit shipments by as much as 150% in the past year.

While HP's backlogs are surprising, given the company's strategic emphasis on its ability to supply product, analysts downplayed their impact, if HP is in fact catching up with demand.

"A temporary backlog at this time of year isn't going to break their momentum significantly, as long as they're in position to deliver product in the critical fourth quarter," said Bruce Stephen, director of PC hardware pricing and research at International Data Corp.

The demand affects all of HP's new products to varying degrees. HP said it will catch up to demand on its M, XM and VL lines by the middle of the month.

However, Elisman said HP does not expect to catch up on its 486N and NI products until October. Its new OmniBook 300 portable is also backlogged.

Microsoft puts focus on client/server

By Christopher Lindquist

Microsoft Corp.'s Consulting Services Group is tightening its focus on the roots of client/server development in an attempt to build client/server momentum from the ground up.

The consulting arm will now concentrate on the architecture and design of software using Microsoft tools instead of actually developing the "meat" of an application. The group will also offer "re-engineering" services to companies that want to rebuild their organization as well as their software.

"As we go forward, we're going to really emphasize the architecture and design services," said Bob McDowell, vice president of Microsoft Consulting Services.

Several programs are available, including the following:

- **Architecture and Design:** services for client/server applications created using Microsoft products and platforms.
- **Information Technology and Information Systems Re-engineering:** re-engineering of applications that will derive the most benefit from client/server technology.
- **Methodology and Tools:** information concerning practices and tools used by Microsoft Consulting Services for client/server development.
- **Knowledge Transfer:** assistance for developers in enhancing their coding skills for client/server applications.

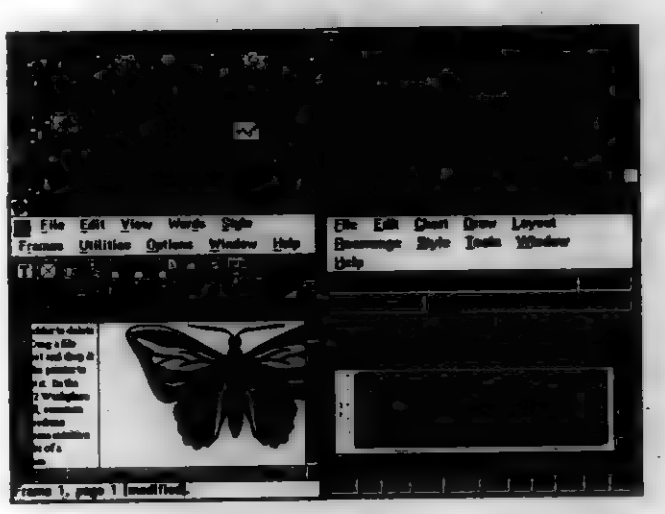
"We're listening to what corporations want," McDowell said — not just help developing their code but also in performing tasks such as redesigning work spaces and evaluating organizational structure.

Now's your

You wanted the power to choose from a world of different applications. DOS applications. Windows™ applications. OS/2® applications. OS/2 2.0 gave you the power. And the response was impressive, to say the least. Over two million copies shipped in less than one year. More than 1,200 OS/2 applications already available*. But now you want more. More features. More functions. More applications to choose from. That's why we're introducing OS/2 2.1.

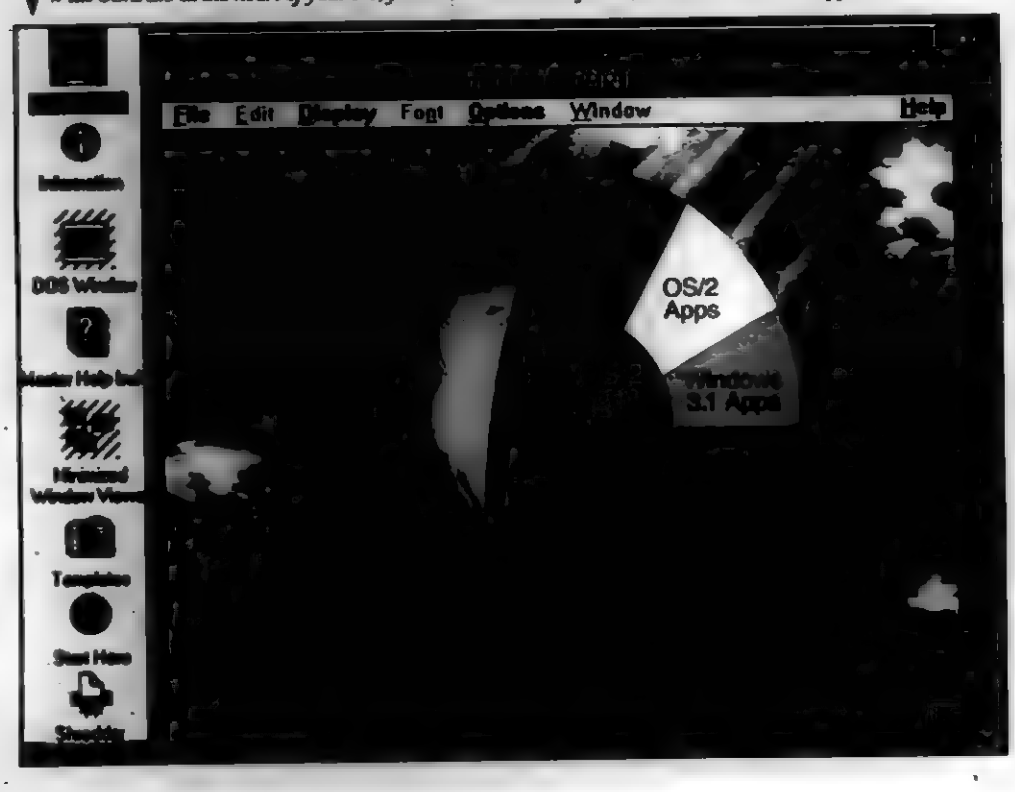
The new OS/2 2.1 lets you run the latest Windows 3.1 applications, in addition to the DOS, Windows and OS/2 applications you can already run. We've also added TrueType fonts, select Windows applets, File Manager and support for Windows 3.1 printer and display drivers, including 32-bit seamless SVGA support. And now you can start DOS and OS/2 applications from a WIN-OS/2 session, too.

Portable users will be glad to know that OS/2 2.1 provides industry-standard Advanced Power Management (APM) support, to help extend battery life.



▲ *There's no need to buy DOS and Windows to run DOS and Windows applications.*

▼ *With OS/2 2.1 at the heart of your PC, you can run a world of DOS, Windows and OS/2 applications.*



We've made the cursor larger so it's easier to find your place on the screen. And OS/2 2.1 continues to exploit the very latest in technology. You'll find improved support for multimedia applications and pen-based capabilities, along with built-in CD-ROM and AS/400® terminal emulation support.

Of course, OS/2 2.1 still gives you true pre-emptive multitasking, superior OS/2 Crash Protection™ and the easy-to-use object-oriented Workplace Shell™ interface. All the features that made Version 2.0 an award-winner. But now, you also get a whole new world of possibilities.

OS/2 2.1 is now also available on CD-ROM. It comes with exciting

*To order CD-ROM with list of OS/2 applications, call Walnut Creek at 1 800 786-9907. IBM, AS/400 and OS/2 are registered trademarks and OS/2 Crash Protection, Workplace Shell and "Operate at a higher level" are trademarks of International Business Machines Corporation. Windows is a trademark of Microsoft Corporation. TrueType is a trademark of Apple Computer, Inc. ©1993 IBM Corp

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OS/2 2.1 Advantages

Improves productivity
- Now runs OS/2, DOS, and new Windows 3.1 applications.
- New TrueType fonts, Windows applets, File Manager.
- Advanced Power Management (APM) support extends battery life for portables.
- OS/2 Crash Protection and pre-emptive multitasking.

Easy to use
- Now also available on CD-ROM.
- Object-oriented Workplace Shell interface.

Advanced 32-bit architecture
- Seamless SVGA support.
- Fully exploits latest multimedia applications.
- Supports CD-ROM, PCMCIA and pen technologies.

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IBM

Power outages

Utility switches on automation lights

By Michael Fitzgerald
GREENSBURG, PA.

The last thing a power company wants is to have its customers lose power.

But it happens all the time — a tree falls on a line or, worse, a storm strikes, causing major power outages.

The storm issue is huge, as those events can render thousands of homes and businesses powerless. At Allegheny Power System (APS), which provides service for three utilities, the goal is to use technology to improve response time in crisis situations. Currently, its three operating companies, The Potomac Edison Co., Monongahela Power Co. and West Penn Power Co., write power-outage reports manually on cards and route the cards to a dispatch center, which tries to sort through the cards to see which areas need the most help.

The utilities service 1.3 million customers spread out over five states and 29,000 square miles. A major storm might generate as many as 12,000 cards for a single one of APS' 24 divisions, or four-fifths of its yearly total.

"A violent storm will generate almost an overwhelming number of calls, and it's an enormous task for dispatchers to figure out where to send the crews because you want to restore power to the maximum amount of customers in the minimum amount of time," said Maryann Revers, a systems analyst at APS.

To meet the challenge, the Allegheny power companies are spending some $2 million to implement Trouble Call System and Crew Management from M3i Systems, Inc., a subsidiary of Canadian power supplier Hydro-Quebec.

APS' Maryann Revers *says, 'We can grow with [M3i]'*

APS wants to use a subset of M3i's PC-based command-and-control system to automate its problem tracking and crew dispatching over its territory.

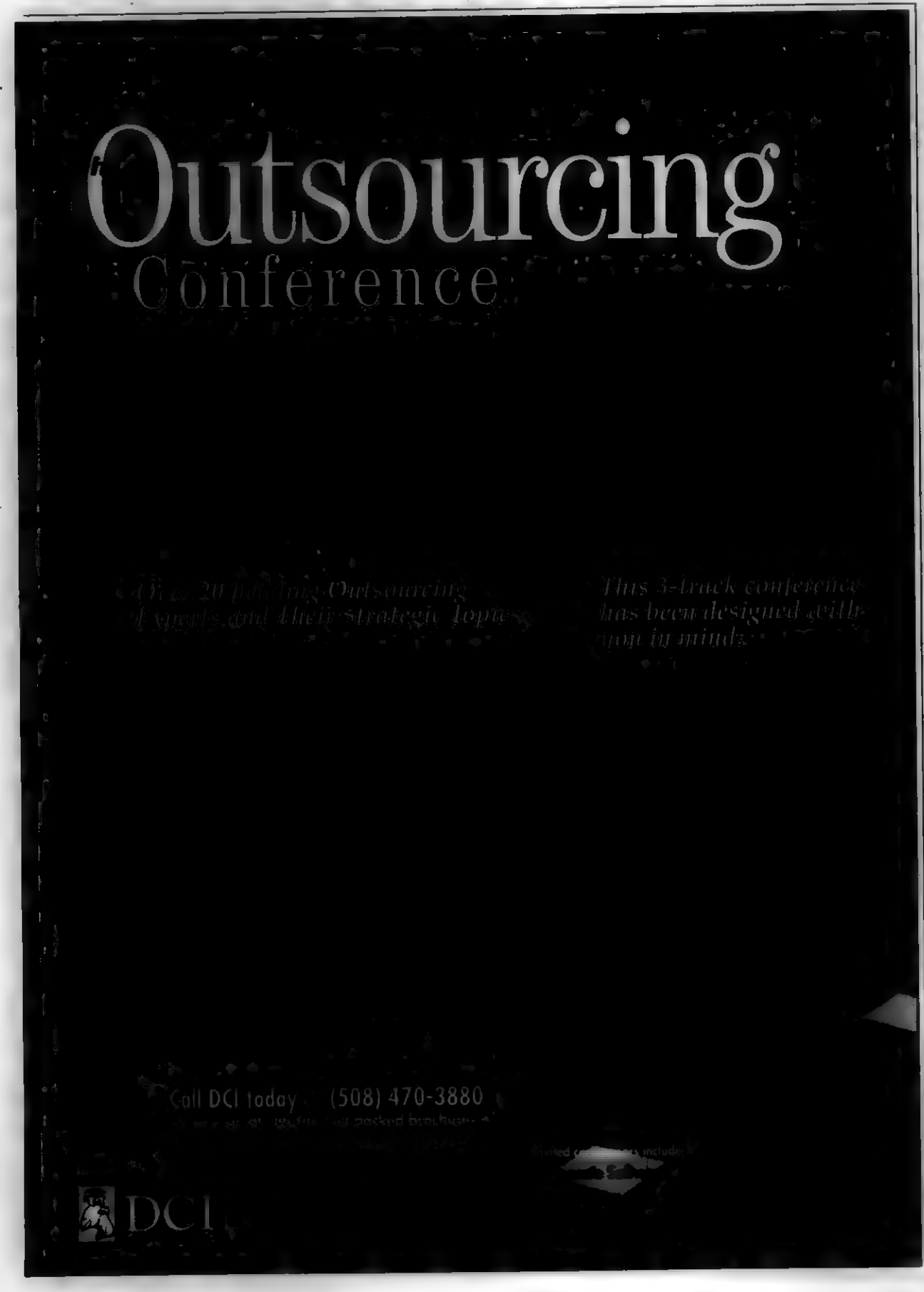
Since 1990, APS has been tracking the best ways to go about this and has come up with six criteria, among them the ability to report outage statistics, analyze calls to find the trouble source and track outage crews. It picked M3i because "we needed software that would function with any amount of data and still provide benefits," Revers said. "We can grow with it as we improve our models."

APS expects that even the basic software will help make its call-tracking and outage reporting more efficient. Its three operating companies have separate operations (information systems is centralized at the holding company), and two of them do not have computerized models of their circuit breaker locations, which are necessary to run the more sophisticated modeling features in M3i's software. Potomac Edison does have the model and will use the dispatching aspects of the software as well.

M3i, or management through instant interactive imaging, was developed by Hydro-Quebec, the world's fourth largest generator of electric power. The utility uses M3i to

Meanwhile, APS is focusing on customizing the application for each of its operating companies. All three pilots will roll out in the fall, according to Revers.

M3i's application set is a DOS application that APS will run under OS/2. Revers said she expects the operating companies will use up to 136 Intel Corp. 80386 and I486-based PCs, split roughly into 36 dispatcher's stations and 100 call-taking stations. These stations will link into the corporate mainframes to give users split-screen access to corporate data as well as to the M3i-based data.



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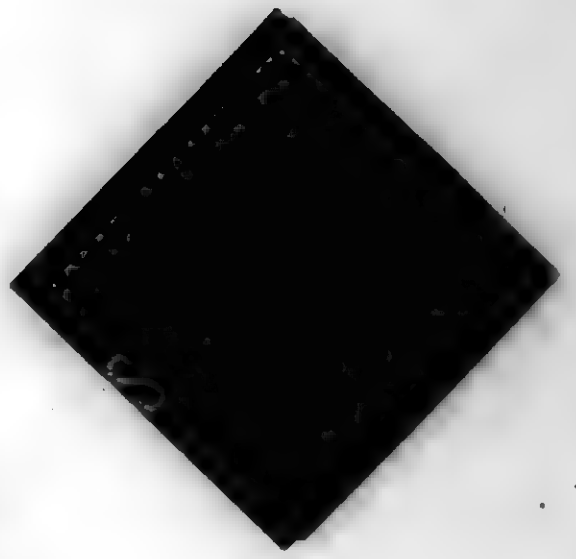

Everyone knows OS/2® gives you more applications to choose from. Now all you need is more space on your hard disk to load them all. Stacker® for OS/2 & DOS is your answer. Stacker lets you quickly and safely double the capacity of your hard disk, so you can take full advantage of OS/2—and virtually any DOS, Windows™ and OS/2 application you want.

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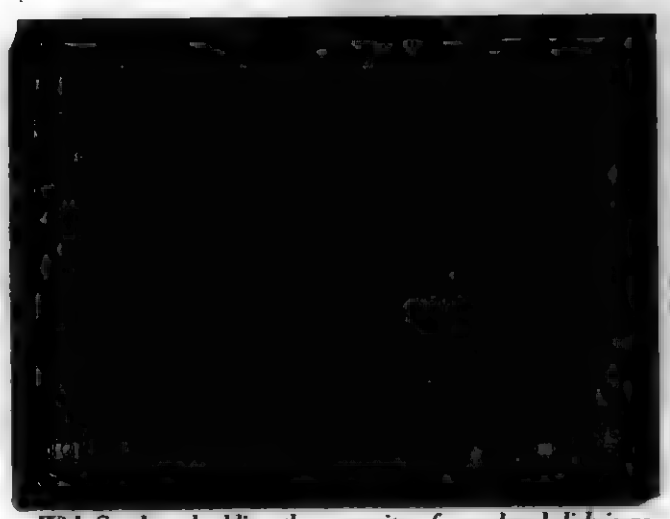

With Stacker, doubling the capacity of your hard disk is as easy as pie.

Stacker fully supports Boot Manager and Dual Boot configurations. And there's full support for OS/2's extended attributes, too. The AutoProtect™ feature detects disk errors at boot-up and immediately protects your Stacker volume. AutoRecovery™ automatically repairs errors on the disk. And Stacker Optimizer™ even defragments a Stacker drive for optimal performance.

With Stacker, you can get the most from your hard drive. And with OS/2 on it, you can get the most from your computer. To order or to find out more about OS/2 2.1 or Stacker for OS/2 & DOS, call 1 800 3-IBM-OS2. In Canada, call 1 800 465-7999.

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IBM

Equitable extends Windows to regional sites

Insurance company to install 7,000 to 10,000 PCs worldwide

By Michael Vizard
NEW YORK

After mastering the intricacies of migrating from DOS to Windows at its corporate headquarters, the Equitable Life Assurance Society is now undertaking an effort to convert its field agents from standalone DOS systems to Windows systems that will be linked over Equitable's proprietary network.

According to David Chan, Equitable's director of technical standards, the company plans to deploy about 150 prototype systems running Windows on Intel Corp. 1486-based 33-MHz PCs as part of its initial test phase. Using data drawn from this program, Chan said he expects to have a pilot project in place by year's end.

All told, Chan said he expects to install anywhere from 7,000 to 10,000 PCs in regional offices throughout the world as part of an overall effort to tightly integrate Equitable's business operations. Those systems will run Notes groupware in addition to a variety of other Windows applications, Chan said.

To support this effort, Equitable has created a 12-member SWAT team whose primary function is to respond to disasters. But as far as day-to-day support goes, Chan said he is not really expecting any support issues beyond the ones he already has. "All the applications are basically a point-and-click interface," Chan said.

After upgrading regional offices, Chan said, Equitable will have completed the transition from DOS to Windows.

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NBC stations

CONTINUED FROM PAGE 37

same time. The decision was made to stagger the installation: settle into one site and complete the project there before moving on to the next.

Harris enlisted a half-dozen technical assistants who moved into each site city for the 10 to 12 weeks needed to get everyone up, running and comfortable. "Joe's gypsies," he calls them.

The cost of installation was not going to be cheap. Harris estimated spending about $400,000 per station. "But that's nothing compared with the cost of technologically falling behind," he said.

The first station to undergo the transformation was WMAQ in Chicago. Harris and his gypsies spent 12 weeks living in the Windy City, teaching WMAQ salespeople how to use their new Macintoshes to organize sales accounts, facilitate billing and communicate more effectively. Within weeks, productivity in the sales department was up 10% and computers were an integral part of life.

It has not always been easy. At the first class, Harris is usually met with crossed arms and skepticism. He counters with "a real showbiz style" that includes pep rallies, hokey signs, newsletters, free games — whatever it takes to make learning fun.

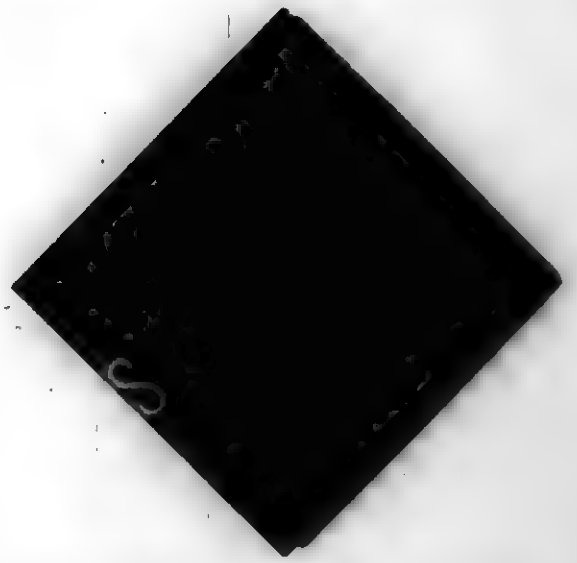
Soon the training wheels come off. By the end of the fifth day, everyone using Macintoshes has to communicate by electronic mail. "Like a good parent, you have to build the habit for them," he said.

After the main team departs, a part-time hire remains for user support. An original installation team member will return to each site for a minimum of one week each month until the end of the year.

The installation pace has been swift. WTVJ in Miami was done this spring. Only 10 short days after they boarded homebound jets from Miami, the gypsies once again packed their bags and headed for the nation's capital. KCNC in Denver is expected to be set up in early fall, and all six stations are scheduled to be complete by the first quarter of 1994.

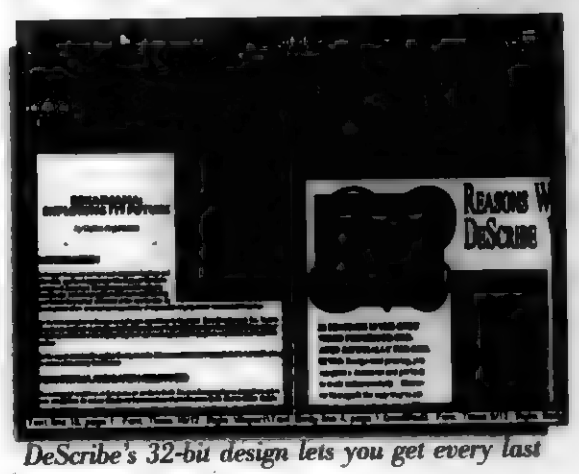
"Then can the gypsies rest," Harris said.

Mere words



Superlatives would be much more fitting. Awesome comes to mind. Powerful. And then there's innovative.

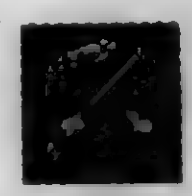
PC Magazine had these words to say about DeScribe® Word Processor 4.0 for OS/2®—"It...performs amazing acrobatic feats of editing and display that leave rival programs gasping in envy."



DeScribe's 32-bit design lets you get every last bit of power from OS/2.

PC Week wasn't exactly at a loss for words either. They said DeScribe "sets the standard for OS/2 applications by taking excellent advantage of the operating system's advanced features."

DeScribe is the only word processor designed from the ground up for OS/2. That's why it thrives in the Workplace Shell.™ Print an unopened document, copy it to the clipboard or paste it directly into another document simply by dragging the DeScribe document object and dropping it on the appropriate custom tool icon. DeScribe's 32-bit architecture is designed to give it a performance advantage over 16-bit Windows™ programs. And with OS/2's multithreading and true pre-emptive multitasking, DeScribe can perform several tasks simultaneously while operations in other applications are underway.



can't DeScribe it.

If you desire an OS/2 application that combines advanced word processing functions with powerful desktop publishing features and extensive drawing capabilities, there's really just one word to know—DeScribe.

Until September 14, 1993, DeScribe is just $99* when purchased as a package with OS/2 2.1.

To order or to find out more about OS/2 2.1 or DeScribe 4.0 for OS/2, call 1 800 3-IBM-OS2. In Canada, call 1 800 465-7999.

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Coursey

CONTINUED FROM PAGE 37

(remember 4.0?) to unforeseen elements of the feature set. And, wonder of wonders, Microsoft survived and continues to grow quite nicely.

It is better, I think, to level with your customers, even at the risk of flying in the face of the spin doctors' and image makers' external portrayal of Microsoft as a company too smart to make big mistakes, like screwing up when it finally decides that operating system utilities aren't such bad things to offer after all.

Somberness spreads

This lack of good humor is spreading across the industry. It's not quite the same when some of our industry's top CEO/raconteurs stop telling Microsoft stories in public for fear that either someone will get miffed and decide to retarget a few million marketing bucks against the offender's company or Microsoft's Department of Turning the Tables will somehow make the errant competitor live to eat his words in a most public venue. I am not accusing, by the way — just reporting on the chill I sometimes encounter.

It would be wrong, however, to blame a lack of industry mirth on Microsoft. Two smaller companies are, in fact, working hard to earn the top spot in Mr. Coursey's Register of the Pretentious, where Microsoft's self-seriousness isn't nearly as unctuous as that practiced by start-ups 3DO and General Magic.

General Magic is trying to convince the world that its Magic CAP GUI environment for palmtops and Telescript messaging encapsulation language are cool enough to change the world — without bothering to show them around very much. It is worth remembering that these are some of the same folks who brought HyperCard, another supposedly earth-changing technology, out of the laboratory and into shelfware.

3DO, fueled by the mesmerization skills of Trip Hawkins — who is supposed to be as good at not letting reality get in the way of a good vision as Steve Jobs was in his prime — has managed to persuade Wall Street to pony up an incredible $200 million-plus market cap for a company that so far has only lost money. And 3DO's product? A low-resolution, but very fast, graphics toy for the home whose chief selling feature seems to be that it might beat Nintendo's and Sega's new products to market by six or nine months. But be careful: Don't call this a games machine, or 3DO will slap your hand and remind you this is an "interactive multiplayer" you're talking about.

Apple gets a special mention for its plan to introduce Newton at MacWorld after steadfastly avoiding the plebeian computer shows for the loftier aeries of the Consumer Electronics Show throughout the hype phases. Are they afraid a less familial crowd might not be suitably impressed?

Tops them all

But topping out the hubris index is the company that two weeks ago sent me a nicely printed invitation to a product introduction at a swank hotel down in Silicon Valley. Besides the date, place and time, the invite also announced that signed nondisclosure agreements would be required for admittance and viewing of the grand new product.

"Gee, this must be really important if they want an NDA," I guess I was supposed to say to myself.

I am sure it was a real letdown to many attendees: Not only did the offender not hold a signing ritual, but a press release also went out before the event even took place. And they say Microsoft has nerve.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4460.

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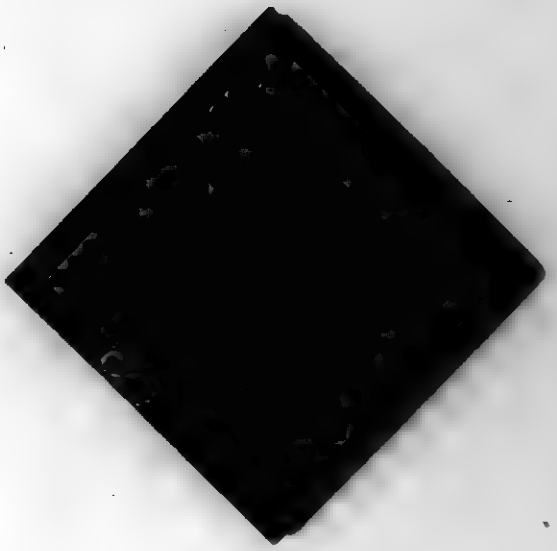

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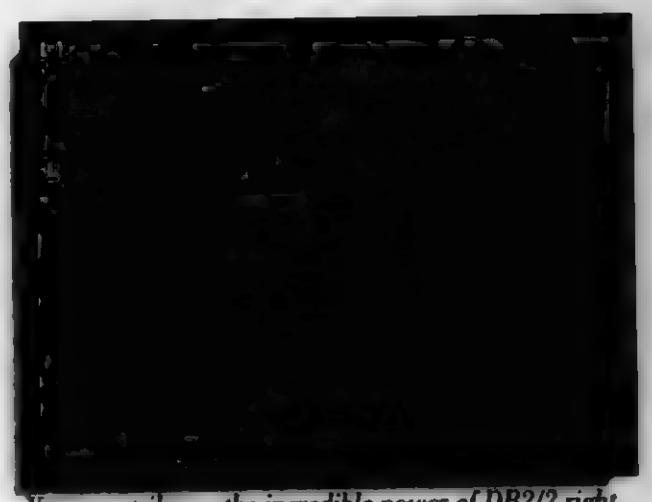

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[redacted]

Software application packages

Campbell Services, Inc. has started shipping OnTime Versions 1.5 (Windows) and 2.5 (DOS), an upgrade to the company's personal calendar and group scheduling software.

Key calendar features for OnTime include date range selection and alarms, recurring events and an import/export facility. The product also offers the ability to automatically configure and maintain the correct desktop-to-palmtop communications settings, according to the company.

Both versions can print all appointments or just critical events.

OnTime Windows Version 1.5 costs $129.95, and the DOS Version 2.5 costs $69.95.

▶ *Campbell Services*
Suite 1070
21700 Northwestern Highway
Southfield, Mich. 48075
(313) 559-5955

User Solutions has introduced Inventory Analyst Professional, a spreadsheet-based program.

A tool set is provided with the product to help users build accurate purchase or production plans, reduce inventory costs and maximize cost savings.

Features for Inventory Analyst Professional include "best fit" forecasting, a planning technique called "ABC" analysis that ranks and groups items by dollar volume and batch planning for hundreds or thousands of items, according to the company.

Inventory Analyst Professional costs $495, and it offers templates that operate concurrently with Unix, DOS, OS/2, Windows, Macintosh, Microsoft Corp.'s Excel, Borland International, Inc.'s Quattro Pro and Lotus Development Corp.'s 1-2-3.

▶ *User Solutions*
11009 Tillson Drive
South Lyon, Mich. 48178
(313) 486-1934

Utilities

Vertisoft Systems, Inc. has announced SpaceManager Version 1.5, a data compression utility.

According to the company, the product gives MS-DOS 6.0 and Windows users up to 40% more disk space than can be gained through MS-DOS 6.0 DoubleSpace.

The product also offers SelectCompress, SuperExchange, SpaceMonitor, SuperMount and FortuneTeller, which are modules designed to simplify file management. Installation takes less than five minutes, and operation is transparent to the user, the company reported.

SpaceManager costs $49.95 through Nov. 15 and includes both 5¼- and 3½-in. disk media.

▶ *Vertisoft Systems*
Fourth Floor
Transamerica Pyramid
600 Montgomery St.
San Francisco, Calif. 94111
(415) 956-5999

Symantec Corp. has announced The Norton Essentials for PowerBook Version 1.1.

According to the company, Version 1.1 consists of a suite of utilities designed to improve Apple Computer, Inc. Macintosh PowerBook performance by enhancing productivity and usability, maintaining synchronized files, increasing battery life and providing battery gauge compatibility for the PowerBook 180C, 145B and 165C.

The Norton Essentials for PowerBook 1.1 can extend the life of a battery charge by an average of 40% or more. Features such as battery saver, backlight dimmer and instant access for AppleTalk allow users to adapt battery use to different power conditions.

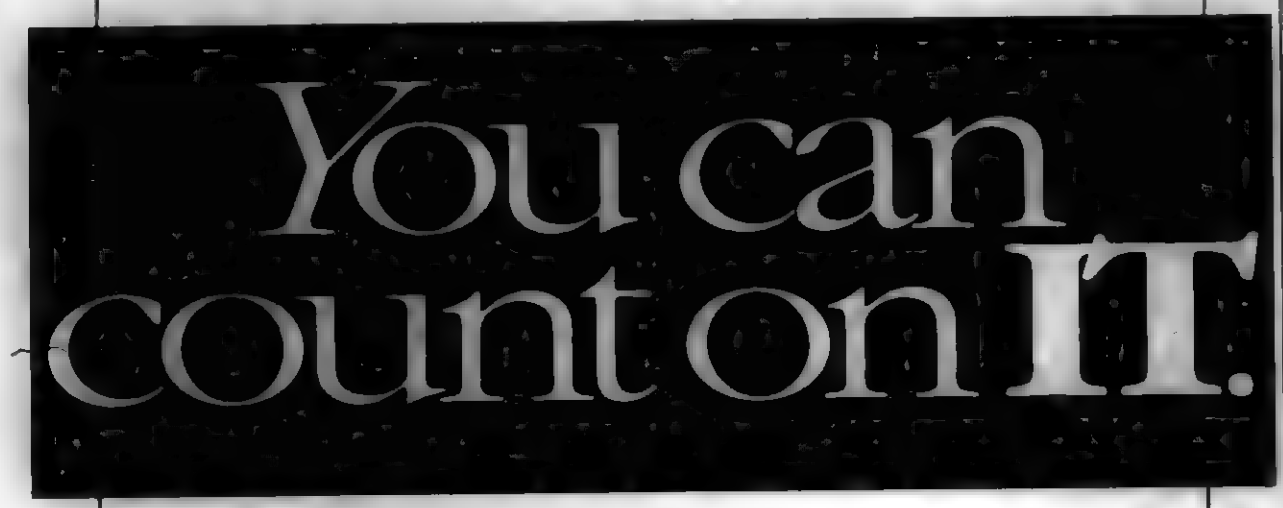
The utility package also can automatically disable/reconnect AppleTalk with Instant Access. The Norton Essentials for PowerBook Version 1.1 runs on any Macintosh PowerBook and PowerBook Duo. It requires System 7 or higher.

The product costs $129.

▶ *Symantec*
10201 Torre Ave.
Cupertino, Calif. 95014
(408) 253-9600

More new products, *page 48*

Think about it. Odds are that your company uses Information Technology today to help sharpen its competitive edge – nine out of ten companies do. And there's even more good news: the IT products and services needed to keep you ahead of the game will be there tomorrow – no matter what that game might be. That's because the



IT industry is investing heavily in research and development. More, in fact, than any other U.S. industry. And the potential of this work is beginning to show.

In aerospace, smart materials may one day allow airplane wings to adjust to changing weather conditions. In medicine, computational biology is helping unlock the secret causes of cancer and other diseases. And in business, advances in data base technology will allow retailers to mine vast quantities of point of sale information to discover consumer buying patterns and make better inventory decisions.

So when you think about your next IT purchase, think about the investment IT is making in the future of your business. Information Technology – keeping America a world leader in commercial markets. Count on IT. To learn more about the Information Technology industry, contact ITAA at 703-284-5326.

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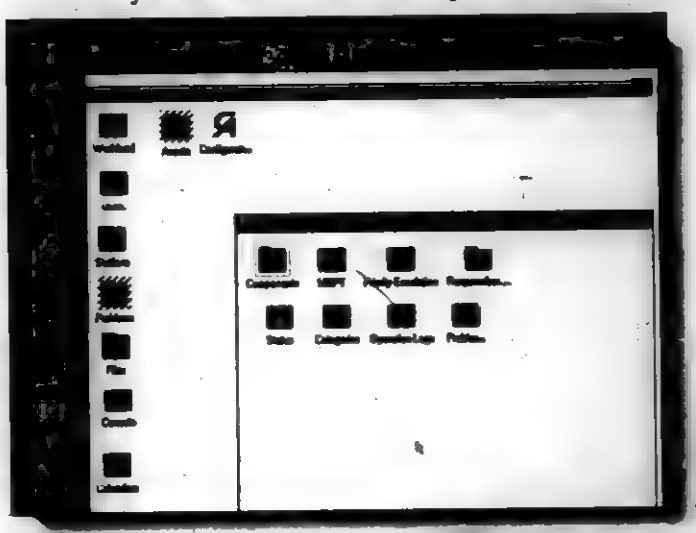

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[redacted]

Macintosh products

Business Objects, Inc. has announced BusinessObjects for the Macintosh, a business-intelligent decision-support solution.

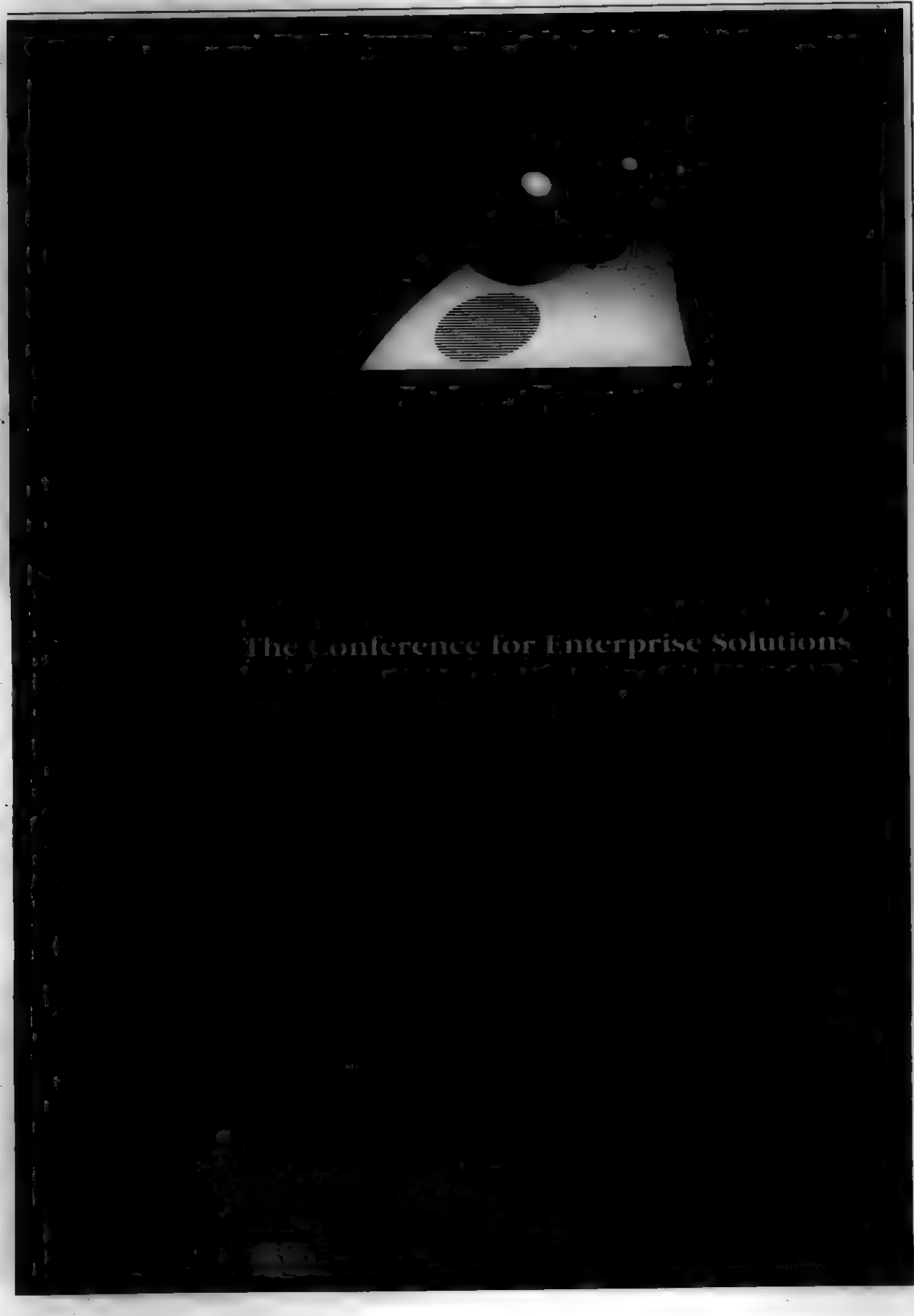
According to the company, the product uses the Macintosh's proprietary programming interface to support its native look-and-feel features.

Macintosh features such as "publish and subscribe" are supported, and BusinessObjects for the Macintosh is compatible with BusinessObjects for Windows. Users can share reports, graphs and queries.

Report and graph generation capabilities are also provided for data returned by an end-user query, the company said. BusinessObjects for the Macintosh is currently available for Oracle Corp. and Sybase, Inc. environments.

The end-user version of BusinessObjects for the Macintosh is called the User Module and costs $595. The database administrator version costs $3,495 and is called the Manager Module.

▶ *Business Objects*
Suite 240
2500 Sand Hill Road
Menlo Park, Calif. 94025
(415) 854-1500



Orange Micro, Inc. has introduced Version 2.0 of its OrangePC MS-DOS coprocessor.

According to the company, OrangePC is an Intel Corp. 80386- or 1486-based coprocessor card designed for Nubus-based Macintoshes.

Users can simultaneously run Macintosh or PC programs on the same platform, the company said. Enhancements include Macintosh/DOS copy and paste, Macintosh/DOS shared volumes and PostScript printing.

Prices begin at $1,099.

▶ *Orange Micro*
1400 N. Lakeview Ave.
Anaheim, Calif. 92807
(714) 779-2772

Peripherals

Xerox Corp. has introduced the Xerox 4700 II Color Document Printer, a next-generation laser printer.

Features for the product include Adobe Systems, Inc.'s PostScript-based color printing, added Token Ring and Transmission Control Protocol/Internet Protocol connectivity to its existing Novell, Inc. Ethernet and Apple Computer, Inc. AppleTalk support; support for Hewlett-Packard Co.'s PCL5 page description language; job accounting for internal auditing and billing control; larger image disk; larger system disk; and improved performance in the Xerox Escape Sequences print mode.

According to the company, the product also has an industry standard 66-MHz Intel Corp. 486DX2 main processor and an Extended Industry Standard Architecture bus. It can perform auto-emulation switching between PCL5 and PostScript.

The 4700 II is available in its standard configuration for nonnetworked remote host connections for $45,150. The 4700 II with its network Page Description Language option, including PostScript, PCL5 and HP/GL emulations, will be packaged together for $48,150.

▶ *Xerox*
800 Long Ridge Road
Stamford, Conn. 06904
(203) 968-3000

APS Technologies has started shipping the T 340, a hard drive with 324.8M bytes of formatted capacity.

The drive was designed for use with all Apple Computer, Inc. PowerBooks and has a 19mm, 2½-in. form factor with sustained Small Computer Systems Interface transfer rates as high as 1.2M byte/sec.

The product has an average access time of 26 msec and an average seek time of 11.3 msec, according to the company.

The internal version costs $799. The external version is equipped with an APS Companion case constructed for portable AC and/or battery operation with PowerBooks.

The AC-only version costs $859, and the AC/DC version costs $929.

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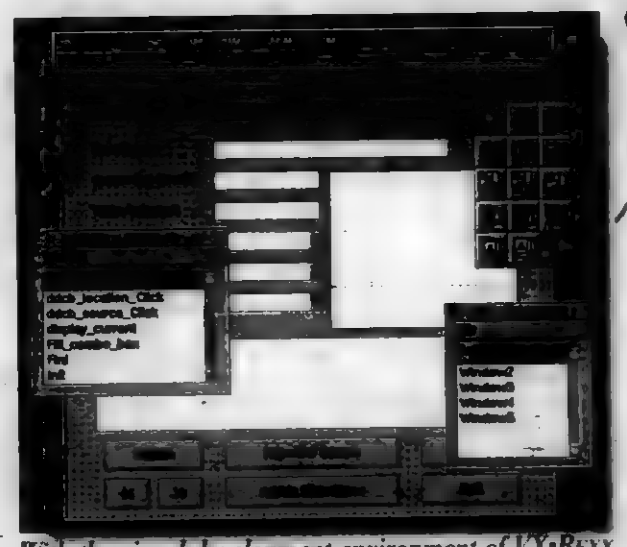

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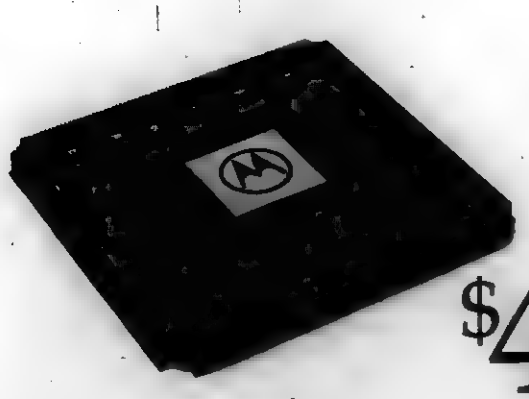

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- Learn the details of the three key elements of the Internet Network Management framework: the SMI, the MIB and the SNMP.
- Survey the key elements of Abstract Syntax Notation One (ASN.1), the language used to define SNMP message formats.
- Understand how TCP/IP and the related Internet protocols such as UDP and IP support SNMP.
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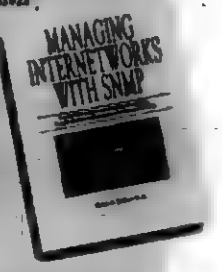

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Retail

Mrs. Fields spin-off cooks up paperless retail product line

By Paul Gillin
PARK CITY, UTAH

Park City Group hopes to build a business duplicating the retail management system that made Mrs. Fields Cookies an information systems legend.

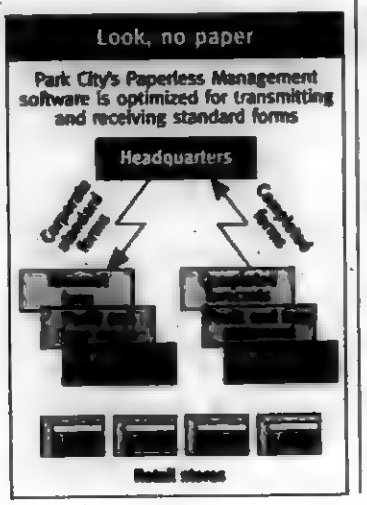
The company last month unveiled a new corporate image and a repackaged product line that it claims virtually eliminates paperwork in widely distributed operations such as retail chains, field offices and franchises. The Paperless Management series puts a custom authoring system on top of a set of core development tools for creating mail- and forms-based applications.

Park City Group, which was formerly called Fields Software Group, made its name in the mid-1980s as a spin-off of the IS operations at Mrs. Fields Cookies. Mrs. Fields became a popular IS success story because of its highly automated and consistent in-store management systems that required almost no user training.

The Paperless Management system allows business users to create documents such as employment forms, cash reconciliations and government reporting forms and distribute them in a standardized fashion to large numbers of users, according to Randall Fields, chief executive officer of Park City Group.

The forms can have business rules embedded in them as well as rules that trigger other actions such as database updates. Paperless Management is oriented to-

Park City, *page 54*



Compaq empowers employees

Human resources cutbacks force changes in management, entry of HR data

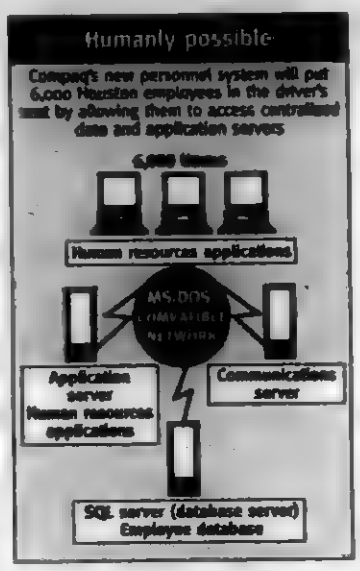
By Gary H. Anthes
HOUSTON

The radical '60s may be long over, but "power to the people" is very much in vogue at Compaq Computer Corp.

The PC maker is rolling out a human resources system that turns over nearly all data entry and validation chores to 6,000 employees and their supervisors linked by a fiber-optic backbone on the 800-acre corporate campus here.

"We realized that it is a huge productivity hit to try to have a few people maintain data for a lot of employees," said Brenda Miller, program manager for compensation, benefits and systems at Compaq. "We decided that accountability and responsibility for data belong with those who own it."

Cost-cutting mandates by management resulted in a reduction in staff in the human resources department from 300 to 90 people in two years, Miller said. That forced the department to find ways to eliminate labor-intensive functions such as data entry, training and documentation. "They knew it would be painful at first, but they felt that the people left would come up with ways to manage the functions more efficiently," Miller said.



She said many personnel systems — even those of recent vintage that use client/server technologies, graphical user interfaces and relational databases — still rely on employees sending in paper forms for processing and keying by a central staff. Miller said a Compaq manager at a remote site initiating a pay increase could trigger a process with as many as 31 steps involving multiple telephone calls and paper flows.

Minimal training

Now the new system — tailored for Compaq by Easense Systems, Inc. in Peabody, Mass., from its own standard products — will eliminate most of that while giving employees options for data entry that are so intuitive that little training or documentation is needed, she said.

Miller estimated that decentralized data entry will save the human resources department $313,000 per year.

The system is in pilot use now at various offices here, but the real test of Compaq's "employee self-service strategy" will come in October when the company uses it to enroll its employees in a new "cal-

Compaq, *page 56*

Client/server HR

Easense Systems is on a roll with the PC manufacturers. Nearing completion of a client/server human resources system for Compaq, the software and consulting company is now embarking on a similar development effort for Dell Computer Corp. Its key objective is to put responsibility for data in the hands of the employees to which it applies. Benefits: improved accuracy and reduced costs.

NetFrame gives servers flexibility

By Stephen P. Kiett Jr.
MILPITAS, CALIF.

Being able to run whatever application they want — regardless of operating system — appeals to users but is expensive to implement in a PC-based local-area network. To achieve this end, information systems departments have had to purchase a dedicated server to run each operating system.

However, NetFrame Systems, Inc. is slated to unveil today software aimed at reducing this expense dramatically while giving superservers a new level of flexibility.

The software, called Concerto, allows a single multiprocessor server to run up to four off-the-shelf operating systems concurrently. For example, NetFrame said its NF100ES, configured with four processor boards, could be set up to run Unix, IBM's OS/2, Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT with no performance degradation.

Problem solved

NetFrame gave the following example of the flexibility Concerto offers: A law office with several hundred PCs sharing WordPerfect Corp. spreadsheet files off a single-processor NetFrame server wants to launch a Unix application to keep a large, complex database of case files. The firm buys an application processor board for about $12,000, loads Concerto, and everyone has access to the Unix database. The traditional solution of adding another server would cost roughly $30,000.

While analysts acknowledged that Concerto would provide superservers with newfound flexibility, they said they would take the wait-and-see approach in regard to performance.

"To get Concerto to work, you have to walk a very fine line," said Peter Kastner, a vice president at Aberdeen Group, a consultancy in Boston. "The [concept] of having multiple peripherals running under different [operating systems] sharing main memory on a single server is very complex."

According to NetFrame, Concerto acts as a transparent messaging system that connects and coordinates multiple processors with individual client workstations on the network.

Flexible fix

The software was developed in response to customer feedback, said Jeffrey Hudson, vice president of marketing at NetFrame. "Customers are telling us they're not sure of the future — what app and [operating system] they will want to run," Hudson said. "This product solves that problem by giving them the flexibility to run up to four different [operating systems]."

Hudson added that it also aids network consolidation efforts.

Concerto appeals to Henredon Furniture Industries in Morgantown, N.C., according to Richard Claus, LAN administrator. The furniture maker has a NetWare-based LAN running Oracle Corp.'s Oracle database as a NetWare Loadable Module off a dual-processor NetFrame NF400 superserver.

Claus said the company plans to move to Windows NT for its Advanced Server functions as soon as possible. He said the prospect of being able to run NT by adding a third processor board to the NF400, while keeping its NetWare applications in place, was intriguing. "Concerto sounds like it would definitely be a plus for us," Claus said.

Concerto is slated to ship in October for $3,995 for a dual-processor version and $4,995 for a three- or four-processor version. The product is compatible with all NetFrame servers, according to the company. An application processor with 8M bytes of random-access memory costs $12,495, and each processor can be configured with up to 128M bytes of RAM.

Navy puts documents on-line

By Michael Vizard
MCLEAN, VA.

The U.S. Navy is in the midst of an effort to put all the documentation required to support the Mission Display Systems of the Tomahawk cruise missile system on-line aboard vessels.

With an eye toward simplifying one of the most important mission-critical systems in its arsenal, the Navy has contracted systems integrator PRC, Inc. to build an electronic document delivery system based on the DynaText software developed by Electronic Book Technologies, Inc. in Providence, R.I.

The first ship to adopt the new system, which is based on the Standard Generalized Markup Language (SGML), was the aircraft carrier USS Abraham Lincoln. Following the USS Abraham Lincoln were the aircraft carriers USS America and USS Blueridge.

The Navy has added the DynaText software to 28 systems on board the aircraft carriers as well as additional shore sites in Europe, the Persian Gulf and the U.S.

The driving force behind the move to an electronic document delivery system is the need to reduce the amount of paper required to support on-board systems, while also providing a tool that will allow the Navy to update those systems electronically, according to Dennis Rozanski, a logistics engineer at the Naval Electronics Systems Engineering Activity Detachment in Philadelphia. The first paper document to be converted into an SGML format is a 200-page reference manual used by mission planners for the Tomahawk missiles.

The DynaText software is being adopted because the Navy required PRC to come up with an electronic delivery system that could run on both Windows and Unix platforms running the Open Software Foundation's Motif interface under the X Window System, said Peter Wakiyama, an on-line support specialist at PRC.

"We also needed the ability to annotate documents on-line, while providing a look and feel that was consistent with other applications," Wakiyama said.

DynaText uses SGML to add tags that simplify searching and browsing standard ASCII text documents.

Park City

-CONTINUED FROM PAGE 53

ward routing and consolidating large numbers of forms for reporting and analysis.

For example, a tool to create cash sheets can be mated with another tool that consolidates the cash sheets and generates exception reports when figures are out of balance.

Paperless Management comprises about 25 mix-and-match modules covering such diverse areas as messaging, sales forecasting, time and attendance, executive information systems, production, lease management and auditing.

Disney Stores, Inc. in Glendale, Calif., signed on to the first version of Paperless Management four years ago and has stayed with it while Disney has grown from 38 to 220 stores, said Bill Macfarlane, vice president of information services.

Disney uses Paperless Management to distribute customized personnel and reporting forms as well as electronic mail to its stores each week. It also polls each store daily to upload receipts and completed forms for consolidation and analysis at headquarters.

The major benefits are "clarity and consistency," Macfarlane said. "Everyone gets the same message in the same fashion at the same time." And because company procedures, policies and manuals are built into the forms that are delivered, "We get our people out of the back room and onto the floor where they should be," he said.

Fields said the system is aimed at companies with 50 or more outlets or field offices. The software is operating system-independent, an accommodation that he said does not seriously impact performance. Although pricing was not announced, Fields said a typical retail store could be outfitted with about a dozen software modules for $3,000 to $4,000.

Compaq empowers employees

CONTINUED FROM PAGE 53

eteria-style" benefits program, in which employees are given a fixed stipend to spend as they choose on an array of benefits options.

Compaq hopes the new system will enable the company to move to the flexible but complex program with no increase in administrative support costs.

During an enrollment period this fall, employees will interactively craft their benefits packages through a PC-based system that prompts them for information about themselves and dependents and guides them through a menu of choices. They will see at the bottom of the screen an available-balance field that tells them how many of their benefits dollars have been allocated to chosen options and how many remain. When the bucket runs dry, the system will notify the user of payroll deductions that will be established.

Easy enrollment

Instead of using a PC, an employee may enroll in the flexible benefits plan via a telephone front-end system from AT&T that uses Touch-Tone input and automated voice response to capture, validate and read back enrollment information.

According to Joel R. Lapointe, president of Essense Systems, an employee could enroll at home by phone, then check his enrollment data on a PC at work. Or he could enter the data at work, then listen to his enrollment choices later at home.

In either case, once the enrollment period has ended, the system creates transactions and passes them to Compaq's Collier-Jackson, Inc. payroll system, which — like the old personnel system — runs on a Hewlett-Packard Co. HP 3000 computer.

Nearly all Compaq employees have PCs attached to the company's worldwide Banyan Systems, Inc. fiber-optic network. The personnel system will be able to support as many as 3,000 simultaneous users, Miller said.

The Essense application software and the employee database are kept on separate Compaq SystemPro 486/33 servers attached to the network. The two machines will run Microsoft Corp.'s Windows NT and will serve users in each of the company's 20 campus buildings.

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LAN hardware

Xircom, Inc. has introduced Xircom Netwave technology.

According to the company, Xircom Netwave technology is the first truly cordless approach to local-area networking.

The Xircom Netwave product line includes the Xircom Credit Card Netwave Adapter (a Personal Computer Memory Card International Association Release 2.0-compliant Type II card).

For high-speed operation, the Xircom Pocket Netwave Adapter supports Enhanced Parallel Port data transfers and is connected to the computing device through the parallel port, the company said.

The Xircom Netwave Access Point for Ethernet provides the cordless link between a Xircom Netwave LAN and a wired, IEEE 802.3 Ethernet LAN.

Both the Credit Card Netwave Adapter and the Pocket Netwave Adapter cost $499. The Xircom Netwave Access Point for Ethernet is priced at $999.

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Network technologies step forward

By Lynda Radosevich

A recent rush of activity in several quarters, coupled with positioning efforts by some vendors, offers users a strong indication of how evolving networking technologies may best be used.

What is emerging is a picture of corporate networks that will support several network technologies, including Fiber Distributed Data Interface (FDDI), Asynchronous Transfer Mode (ATM) and 100M bit/sec. Ethernet — each optimized to support particular classes of applications.

For instance, 100M bit/sec. Ethernet or FDDI is good for high-volume file transfers because their data packet formats, which vary in size, are appropriate for transferring data files, which also vary in size. Here, delays of five seconds or more are acceptable, according to Jim Jones, product marketing manager for advanced networking at National Semiconductor Corp.

Conversely, applications such as desktop videoconferencing will be better suited for use with emerging "isochronous Ethernet," FDDI II or ATM networks. This is because the continuous transfer of information and the need for steady, immediate delivery are better suited to those technologies' fixed-size data packets and cells, according to Jones.

Users generally applauded the positioning because it will help them decide where to deploy new networking technology. Some said they expect to support more than one of the new networks and are beginning to make choices already.

What's the difference?

Matching applications to specific network technologies is becoming clearer

Application	Transfer type	Latency tolerance	Data format	Network product
File transfer	Variable	High	Packet	FDDI, 100M bit/sec. Ethernet
Transaction processing	Small files	Low	Cell	ATM
Publishing	Large files	High	Packet	FDDI, 100M bit/sec. Ethernet
Medical imaging	Large files	High	Packet/Cell	FDDI, ATM
Visualization	Large files	High	Packet/Cell	FDDI, ATM
Low-bandwidth voice/video	Isochronous	Very low	Fixed-length packets	Isochronous Ethernet, FDDI-II
High-bandwidth voice/video	Isochronous	Very low	Cell	ATM

Source: National Semiconductor Corp., Santa Clara, Calif.

At the Texas Children's Hospital in Houston, for example, network manager Randy Cosby said he plans to install FDDI networks for medical imaging by year's end. He will use 100M bit/sec. Ethernet next year to meet the file-transfer needs of record management personnel.

But in order to fully evaluate these efforts, benchmarks are needed to provide a yardstick for determining which networks are best for particular applications, said Marty Palka, principal networking analyst at Dataquest, Inc.

To meet that need, the Multimedia Communications Forum will meet Aug. 23-24 in San Francisco to match applications with the services and to establish benchmarks.

For example, networks that support desktop training videos might have to supply 1.5M bit/sec. to each node with less than a 5-sec. delay, said Dave Van Voorhis, the forum's president.

However, the forum will not tie

Net technologies, *page 60*

Going down

National Semiconductor's components for building FDDI network devices for copper cabling allowed 3Com Corp. to build FDDI concentrators for $550 per port, down from around $1,000 per port for fiber FDDI connections, said George Prodan, a product manager at 3Com.

NetWare shops gain PC-based option for internetworking

By Joanie M. Wexler
HOUSTON

■A low-end option for internetworking Novell, Inc. NetWare sites emerged recently from Texas Microsystems, Inc.

The maker of ruggedized PCs for industrial environments is shipping its $3,495 to $10,900 NetGenesis series of Intel Corp. 1486-based platforms. The 20-slot PCs can be configured as wiring hubs, Novell routers, asynchronous wide-area communications servers, file servers or any combination of these functions, said Richard Spangler, product marketing manager.

Meta Group estimated that 40% to 45% of installed PCs are linked to LANs today.

The resulting "internetwork server," as Texas Micro has dubbed the product line, can be managed by NetWare's Hubcon administrative service and high-level NetWare Management System. Spangler said the NetGenesis line is aimed at providing a "more appropriate hardware foundation for Novell software."

The Industry Standard Architecture/Extended Industry Standard Architecture platforms allow NetWare shops to choose from competing network vendors' PC communications interfaces, such as Newport Systems, Inc.'s asynchronous PC adapters, rather than being locked into buying proprietary cards from hub vendors for their own platforms, Spangler said.

He estimated that the approach could save users half the cost of specialized router and hub communications equipment.

"As increasing numbers of smaller companies or large firms with many small sites internetwork LANs, the more in demand lower cost solutions are becoming," said Matt Cain, an analyst at Meta Group, Inc. in Westport, Conn. "This usually means something internal to a PC."

Cain said that hardy Texas Micro PCs do not have the same degree of fault tolerance as many proprietary hub platforms, such as those from market leaders Cabletron Systems, Inc., SynOptics Communications, Inc., 3Com Corp. and others. However, "for most applications, [the Texas Micro platform] is adequate," he said.

Texas Micro will ship the PC-based internetwork server from the factory, configured with the customer's interfaces of choice. Modules available include Ethernet and Token Ring adapters with NetWare drivers; X.25, frame relay, asynchronous and Integrated Services Digital Network wide-area network links; fax and modem cards; and Novell's MultiProtocol Router software.

Hypercom targets branch offices

By Elisabeth Horwitt
PHOENIX

A growing number of products on the market are targeting small sites that need a low-cost way to do a little of several types of communications: fax, local-area network internetworking, voice and perhaps IBM Systems Network Architecture (SNA) as well.

"These are what you would broadly classify as branch-office products for companies whose offices only communicate with headquarters and have a low level of traffic for any one type of transmission: voice, fax or LAN," said Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy. Such sites cannot afford to install a separate box for each type of communication.

Recent vendors to release such an offering are Texas Microsystems, Inc (see story at left) and Hypercom, Inc. Hypercom plans to officially announce in late August its Integrated Enterprise Network, a family of multiprotocol internetworking devices that reportedly support a variety of networking protocols.

The data protocols supported are IBM Synchronous Data Link Control (SDLC)/SNA, conversion of SDLC to Logical Link Control/2 for transmission over a LAN, routing of Transmission Control Protocol/Internet Protocol and Novell, Inc.'s IPX, Hypercom said.

Also supported are voice, video and popular wide-area networking standards such as frame relay and X.25. The products range in price from $1,950 to $32,500.

What differentiates Hypercom from the old time division multiplexers (TDM) is that its boxes use a combination of TDM and packet switching to allocate slots between voice and data applications on a dynamic basis, Nolle said. Asynchronous Transfer Mode devices perform the same type of dynamic bandwidth allocation; however, they are not cost-effective for the low bandwidth needs of small sites.

Hypercom's boxes do support enough routing to eliminate the broadcast storms to which bridges are prone, Nolle said. However, they were designed as "border devices" and lack both the breadth of protocol support and the power of a full router from a company such as Cisco Systems, Inc., he added.

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Network technologies step forward

CONTINUED FROM PAGE 57

the specifications to particular technologies such as ATM, said Van Voorhis, who is also a manager of multimedia network subsystems at IBM.

Participants include Apple Computer, Inc., Ascom Timeplex, AT&T, IBM, National Semiconductor and Siemens AG.

Still skeptical

At least one user said he is skeptical about supporting separate networks for different applications.

"I would say you go with the fastest. If costs are in line, why bother mixing all the protocols and giving yourself all the headaches?" asked Mark Gleason, senior network analyst at PMA Reinsurance Corp. in Philadelphia.

Others said FDDI is the only new technology that is standardized and sufficiently mature today, and they will not need to choose between the network options until 1995 or so when others are more mature.

Meanwhile, among the developments users should be watching are the following:

- Standards committee progress on isochronous Ethernet — a networking standard that separates voice/video traffic and data traffic — proposed by IBM and National Semiconductor (see story below).
- Near completion of FDDI II, an extension to the FDDI standard that supports isochronous voice/video traffic.
- A National Semiconductor announcement of new low-cost transceiver and silicon products for FDDI over data-grade unshielded twisted-pair cabling, as well as a commitment from 10 networking vendors to deliver products based on silicon.
- An announcement by several major networking vendors to push ahead with standards efforts by jointly developing specifications for 100M bit/sec. Ethernet based on a proposal by Grand Junctions Network, Inc.

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DEC promotes DECnet/OSI despite low U.S. demand

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. continues to actively develop and market its DECnet/OSI backbone networking software supporting the Open Systems Interconnect (OSI) standard, but analysts still see little demand for that technology as a transport mechanism in this country.

DEC last month introduced second releases of DECnet/OSI for both VAX systems running OpenVMS and Alpha AXP machines with DEC OSF/1. An OpenVMS version for Alpha also remains under development, although the company said its introduction has been delayed from the second half of this year into 1994.

But is anybody out there listening? In the U.S. at least, several analysts said only a few large customers are tuned into the OSI message; the great mass of users is sticking with the Transmission Control Protocol/Internet Protocol (TCP/IP) transport, they added.

"OSI is hardly worth a breath," said Todd Dagres, vice president for communications research and consulting at the Yankee Group consultancy in Boston. "I appreciate their persistence, but [DECnet/OSI] is a dead horse." Only 5% of the top 1,000 U.S. companies are using OSI, "and even there it's less than 10% of the traffic," Dagres said.

The earlier DECnet Phase IV proprietary backbone "was probably the last widespread DECnet architecture we'll see out there," said Frank Dzubeck, president and chief executive officer of Communications Network Architects, Inc. in Washington, D.C.

OSI is more popular as a transport in Europe and Japan, noted Thomas Golway, president of GCE Consulting, Inc. in New York. "But I get the feeling the rest of the world will probably follow [the U.S.] onto TCP/IP." The important parts of OSI now, he said, are applications such as X.400 messaging and X.500 directory services running over TCP/IP.

OSI additions

DEC has introduced new versions of DECnet/OSI for OpenVMS VAX and DEC OSF/1 AXP

Product	New features
DECnet/OSI v5.6 for OpenVMS VAX (available now)	• Supports running DECnet Phase IV applications over OSI transports.
DECnet/OSI v1.1 for DEC OSF/1 AXP (available in August)	• Supports full OSI application suite. • Allows OSI applications to run over TCP/IP transports.

Slow to move

Mary Ellen Fortier, DECnet/OSI marketing manager at DEC, acknowledged that commercial users in the U.S. are "not moving as quickly as some others to an OSI base." Customers here are mainly interested in getting access to OSI applications from their existing transports, she agreed.

The new Version 1.1 of DECnet/OSI for DEC OSF/1 AXP adds support for running all OSI applications over TCP/IP, Fortier said.

DEC is also "seriously looking" at adding TCP/IP support to DECnet/OSI for OpenVMS, but the company sees less need for it there because OpenVMS users are more likely to use DECnet Phase IV as a transport, she added.

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Outsourcers: Saviors or charlatans?

By Mark Halper

While outsourcing can save information systems shops money, many chief information officers are learning they can implement many of the same efficiencies promised by an outsourcer themselves — and save even bigger bucks.

"Outsourcers have marketing expenses and a profit motive," said Ed Barrows, IS executive at Occidental Petroleum Corp., which three years ago rebuffed proposals from IBM, Electronic Data Systems Corp. and Perot Data Systems Corp. in favor of an internal proposal.

And while outsourcers are changing their pricing models to cope with the shift toward client/server technology, their traditional pricing has been based on processing volume, a practice many observers believe is inconsistent with providing deep savings for customers.

"If you charge by volume, it's like a drug addict — get me more volume," observed Ron Fischer, chief executive at Insource Management, Inc., a Houston consulting firm.

Convincing argument

So when cost is the key in an outsourcing evaluation, IS chiefs can often prove to their bosses that they can do just as good a job as an outsourcer can.

USX Corp. figured out three years ago that it could lower its costs through internal practices and dismissed outsourcing proposals from two vendors.

"We were interested in one thing: Would we save money?" said North Connors, vice president of information technology at USX Engineering and Consulting.

When proposals came in, Connors determined that outsourcing would actually cost USX more — at least 5% more than USX's internal costs.

But if not for some savvy negotiating with the outsourcers, Connors may never have concluded that his own costs were less. "We wouldn't tell them what our budget was," Connors recalled. "We said, 'You tell us. We're not going to give you our target.'"

That would be a wise move for any IS executive dealing with proposals from outsourcing vendors, according to Thomas Blitz, president of Compass America, Inc., a Reston, Va., consulting firm that specializes in measuring IS shop efficiency.

"The first thing an outsourcer wants to know about an IS shop is what their costs are," Blitz said. "And regardless of what they are, they will come back with 20% lower. That's very appealing, but often what an IS shop doesn't realize is that a good spring cleaning will do better than 20%."

The IS folks at Textron, a Providence, R.I., conglomerate, understand what Blitz means by spring cleaning. Before Textron makes any decision in its ongoing outsourcing evaluation, it will most likely consolidate its data centers, a process an outsourcer would otherwise undertake.

"Why let an outsourcer get all the low-lying fruit?" asked Textron Vice President Cecil Labhart.

At Compass, Blitz disputed a common notion that outsourcers can improve economies of scale by putting a small or medium-size IS shop onto a larger system where it would share space with other IS operations.

While the economies of scale would improve immediately and generate short-term benefits, in the long run, the IS shop could probably generate more substantial savings by continuously honing itself.

"A well-run shop should be able to reduce its costs by 20% a year," Blitz claimed.

Use your clout

University of Houston business professor Rudy Hirschheim advises IS shops to try to exercise the same kind of bargaining power with hardware and software suppliers that outsourcers wield. Large shops — 150 million instructions per second or more — should have the clout, Hirschheim said.

"Outsourcers like EDS have sound, shrewd business practices. Why can't a reasonably sized IS shop do the same thing?" Hirschheim asked.

One controversial method for cost reduction that no IS shop or outsourcer likes to talk much about is staff reduction.

The decision by Los Angeles-based Occidental to lay off more than half its IS staff played a key role in the company's decision to retain operations when it evaluated outsourcing proposals three years ago.

Occidental's internal proposal came in $14 million below the next most competitive offer from any of the outsourcers that vied for the business — EDS, IBM or Perot Data Systems, Barrows said. It cut annual IS costs from $33 million to about $20 million.

The chief contributor to the cost slashing was the overnight reduction of Occidental's IS staff from 143 people to 67, according to Barrows.

Ed Barrows: *'Outsourcers have marketing expenses and a profit motive'*

Hidden costs

While Occidental's shop purge helped slash its IS costs, it also exposed an outsourcing fallacy that suggests an IS shop will save money by transferring its employees to the outsourcer's payroll.

When an outsourcer takes a customer's staffers onto its payroll, it does not do so gratuitously. Rather, the outsourcer figures the cost of paying salaries into the fee it charges the customer.

When USX fielded bids, for instance, "the cost of the payroll was built into the quote. It was a matter of whose payroll the workers were on," Connors said.

In fact, Connors pointed out, employee compensation issues can emerge as hidden costs that detract from outsourcing savings. For instance, responsibility for the pensions and benefits of long-term employees who transfer to the outsourcer's payroll may remain with the outsourcing client.

While staff reduction and data center consolidation are critical chores in a spring cleaning, they do not complete the task list. At Occidental, eliminating redundant software and hardware and minimizing site licenses all contributed, Barrows said.

Will outsourcing save money?

YES. **However, IS shops could realize cost reductions on their own. Some methods to consider:**

- Consolidate purchasing activity – drive volume bargains like outsourcers do.
- Eliminate unnecessary services.
- Eliminate redundant compute functions.
- Consolidate computing operations.

MAYBE. **Outsourcing deals could cost more than users bargained for. Some common hidden costs to avoid by writing thorough contracts:**

- Define all types of services – outsourcers profit from providing services deemed extra.
- Define service levels and baseline computing needs to avoid excessive "above baseline" charges.
- Ensure flexible technology options; outsourcer could charge penalties, for instance, for switching applications.
- Negotiate escape clauses that provide for contract termination at reasonable rates.
- Do not disclose your budget to outsourcers during negotiations.

Some customers satisfied

While evidence mounts that IS shops can often generate equal or greater savings on their own, there are plenty of financially satisfied outsourcing customers.

Anticipated savings are right on track at PPG Industries, Inc., according to Sally Wellinger, corporate director of information technology.

PPG handed over MVS data center responsibility to EDS two years ago, even though a Real Decisions Corp. benchmark showed that substantial internal data center consolidation already had PPG running efficiently compared with other companies of its size.

Wellinger declined to quantify her savings, but she attributed them to two factors: PPG trimmed its payroll, and EDS transferred computer operations to a large Midwest data center that runs with greater economies of scale than did PPG's former shop.

Another happy camper — although it has not always been so felicitous in its outsourcing appraisal — is Southland Corp. in Dallas.

Southland, which owns the 7-Eleven chain of convenience stores is 4½ years into a 10-year, $120 million mainframe outsourcing contract with Affiliated Computer Systems, Inc. (ACS). Southland pays about 22% less in IS costs today than it did before entering the arrangement, according to Lee Marquardt, manager of systems hardware operations.

Part of that reduction has nothing to do with any ACS magic. Southland, which endured a five-month spell of Chapter 11 protection during the early years of the contract, is a smaller company today, with $7.5 billion in revenue compared with $8.5 billion in 1989.

But Marquardt said the arrangement has helped Southland avoid costly write-offs of systems it would no longer have needed and also helped it avoid upgrade expenses.

Southland's savings have grown from about 12% in the first year to 22% currently, in part because the firm agreed to less savings up front to help a then-fledgling ACS take flight, Marquardt said. — *Mark Halper*

D&B gambles on Sybase for sole database

By Craig Stedman
FRAMINGHAM, MASS.

While Dun & Bradstreet Software's strategy of integrating outside software directly into its SmartStream client/server products generally draws applause from analysts and early users, some said the company's embrace of only one relational database could limit its potential market.

D&B Software is building Sybase, Inc.'s SQL Server database into SmartStream as part of its approach to use what it deems "best of breed" software in the emerging client/server line, which is starting to be fleshed out after nearly two years of talk [CW, July 26].

The tight integration of SQL Server that D&B Software promises is seen by analysts as a possible competitive advantage. On the other hand, they noted that customers who have committed to other databases may decide to pass on SmartStream rather than switch to the Sybase package.

Jennifer Scholz, a software analyst at International Data Corp., a market research firm based here, pointed out that both Oracle Corp. and Informix Software, Inc. currently have larger market shares than Sybase. "A lot of corporations are comfortable with Informix and Oracle," Scholz said. D&B Software "really has to work on getting their software on another [database] platform," she added.

Limiting decision

"They're locked into Sybase SQL Server for a long time," said Tony Percy, vice president of software management strategies at Gartner Group, Inc., a Stamford, Conn., consulting firm. Both Scholz and Percy said they view the use of a single database as SmartStream's one potential shortcoming.

A D&B Software spokesman said the company has "no immediate plans to support anything other than SQL Server." D&B Software is looking at the idea of eventually integrating other databases into SmartStream, "but there are no commitments and no dates" for doing so, he added.

Growth surge

Market researcher International Data Corp. (IDC) projects that worldwide sales of client/server applications will reach the $1 billion level by 1997. The client/server market totaled just $69 million last year, according to IDC.

Beta-test users of the soon-to-ship SmartStream Decision Support 2.0 and Financial Stream 1.0 packages said the Sybase-only approach did not affect them because they had already selected SQL Server as their lead database before settling on SmartStream.

However, they agreed that it may be a concern for other users. "I can see where clients who have experience with Oracle or something else wouldn't want to have to give up on that," said Larry Bredin, senior business systems specialist at Enron Operations Corp. in Houston.

"For [D&B], it's probably an issue, but for me it isn't," added Peter Burrows, director of systems engineering at Reebok International Ltd. in Stoughton, Mass. Reebok is "very pleased" with Decision Support 2.0 and expects to make it "almost a general-use system" after a small pilot program ends in September, Burrows said.

Mainframe, PC data access needs spawn tools activity

By Johanna Ambrosio

With accessing legacy data on more information systems managers' minds, increasing numbers of vendors have started to target their tools for this arena. Two of the smaller and lesser known players are Cross Access Corp. and Carleton Corp.

Executives from both vendors claim their packages allow users to access both relational and nonrelational data. In that regard, both Cross Access in Oak Brook, Ill., and Carleton in Burlington, Mass., compete with Information Builders, Inc. and Micro DecisionWare, Inc., the market leaders in the data-access niche.

Carleton claims its software is geared for high-speed on-line applications, while Cross Access says its package is intended to take the development work out of data access as well as provide high performance.

Cross Access' tool, called CrossAccess, uses IBM's DB2 SQL as its data-access method. The difference between CrossAccess and other products, said President Ray Nawara, is that with the others, "once you get to the mainframe you have to write and test applications" to actually take the data and do anything useful with it.

How it works

In contrast, with CrossAccess the programmer has to code a SQL "select" statement "and then we take over," Nawara said. CrossAccess handles the communications, optimization, data translation and other tasks associated with data access. There is one additional step for getting to nonrelational data: a database analyst has to map the nonrelational data to the relational world. CrossAccess provides a set of utilities to do that.

Nawara claimed his package has better performance than Information Builders' EDA/SQL, a claim backed up by a Gartner Group, Inc. bulletin that said CrossAccess will be "orders of magnitude faster in certain environments."

CrossAccess, announced in May 1992, had five users as of early May, with the number expected to double by the end of this month, Nawara said.

CrossAccess runs on Windows, IBM's MVS, Digital Equipment Corp.'s VMS, Microsoft Corp.'s Windows NT and different flavors of Unix including Sun Microsystems, Inc.'s SunOS. A server and a client portion are both required.

For its part, Carleton claims about 25 customers for its data-access tool, formerly called Data Engineer and now called Passport, in addition to the 100 or so users of Carleton's earlier product suite, a report writer for the audit community.

Data warehouses

Passport runs on IBM's mainframes and Application System/400s and on OS/2, DOS and Windows. Its target niche, said Carleton President Paul Fluckiger, is high-speed movement of legacy data into data warehouses. These are storehouses of information that typically reside on a Unix-based database management system or on some other host computer and are used for decision-support applications. In this the company competes with Information Builders, Micro DecisionWare and Prism Solutions.

But Carleton's difference, Fluckiger said, is that Passport can call up to 20 different databases or files with just one data definition.

In September, Carleton will make generally available a graphical user interface component that will simplify the tool with menu options and screen prompts.

Faster tax returns offered

By Thomas Hoffman

As in most states, personal income tax refunds for residents of New Mexico usually take from four to 10 weeks to process and return. Tax returns there and elsewhere are most often delayed by the paper-intensive, manual processes that state taxation agencies have historically used to sort through documents.

But thanks to an image processing system that the New Mexico Department of Taxation and Revenue is installing, residents from Tucumcari to Zuni next year should see their state tax refunds in two to four weeks.

Dick Minzner: *'We expect to get many of the early returns out within two weeks'*

New Mexico recently plunked down $1.3 million for an NCR Corp. document management system that it will use to process $2.7 billion in tax and Motor Vehicle Division revenue each year. The system, which includes three NCR 7780 image item processing transports, will be used to dispatch revenue generated by the state's 49 tax and fee programs.

New Mexico's Revenue Processing Division has been piloting an image-based application for personal income tax returns since April, according to Dick Minzner, cabinet secretary at the Department of Taxation and Revenue.

Historically, it has taken the state about 10 weeks to complete tax returns for residents who file on April 15. But Minzner said he believes the personal income tax system, based on an application developed by Inteius, Inc. in Rockville, Md., will narrow that time.

"If we can get the late returns out within a month, that would be adequate. We expect to get many of the early returns out within two weeks," Minzner said.

In the past, the routing and sorting of tax returns was done by hand, which was time-consuming and error-prone.

But the client/server system, powered by an NCR 3445 server running Unix System V Release 4, will be designed to scan, index and route tax returns to the proper departments in seconds.

The system will be aided by an NCR intelligent character recognition module that was designed to capture the handwritten amount on tax returns, according to Ken Thompson, a project manager at Inteius.

By automatically capturing handwritten amounts on tax returns, the state expects to minimize its data entry requirements, Minzner said. In the past, the state relied on dozens of data entry clerks to input tax information into an IBM mainframe.

Minzner said the state should be able to shave about 20 part-time data entry clerks from its payroll. That alone should result in $200,000 to $300,000 in annual savings.

Minzner said the staff cuts are in line with the tax department's 10% annual turnover rate.

Traditionally,
when you bought something
from IBM, it came in a box.

[redacted]

Software application packages

Advanced Software Products Group, Inc. has announced Version 2.1 of Ecop-Logical, an executive planning tool.

According to the company, Ecop-Logical is a disaster recovery system designed to minimize downtime by monitoring backups and creating job control language necessary to restore an environment when a problem affects a computer installation.

In a computerized format, Ecop-Logical's structured methodology automates information control, recovery and security. It resides in the user's environment but uses off-site storage.

The product runs on MVS/ESA, MVS/SP, MVS/XA and DOS/VSE.

Pricing for the product ranges from $35,000 to $65,000.

▶ *Advanced Software Products*
995 8th Ave. S.
Naples, Fla. 33940
(813) 649-1548

Eclipse Corp. has announced FormsPlus/400 forms software.

According to the company, FormsPlus/400 software allows users to create checks, labels and customized forms on the PC and then upload them to an IBM Application System/400.

On-screen icon selection for text, lines, circles, shades and more are included in the design process. The product merges complex graph forms and data from newly created files or preexisting files stored on the AS/400, the company said.

Prices range from $4,000 to $12,000.

▶ *Eclipse Corp.*
6624 Jimmy Carter Blvd.
Norcross, Ga. 30071
(404) 242-0815

Marcam Corp. has introduced Approval, an application that automates the flow of documents through an organization's approval routing system.

According to the company, the product is a work-flow management application that helps users move toward a "paperless" environment with an electronic system that provides more efficient and responsive management control of maintenance activities.

By pressing a single command key, users can produce request approval after developing a work request or requisition, and in one step can approve or reject multiple documents.

The product also has the ability to assign automatic approval for designated ongoing orders with predefined value limits, the company reported.

Prices range from $15,000 to $40,000.

▶ *Marcam*
95 Wells Ave.
Newton, Mass. 02159
(617) 965-0220

Generic Software, Inc. has announced Oakword, a word processing and office automation software package that runs on IBM's Application System/400.

The product comes equipped with an integrated spreadsheet, interfaces for directly accessing data files, a full-function text editor, a mailing list/customer base manager and a 78,000-word plus spelling dictionary.

Prices range from $995 to $4,995.

▶ *Generic Software*
936 Madison Ave.
Madison, Miss. 39110
(601) 853-1189

Database management

Sybase, Inc. has announced that SQR Workbench, the company's production report writing solution that is optimized for IBM's SQL databases, now supports two additional platforms, Data General Corp.'s Aviion DG/UX 5.4.2 and NCR Corp.'s 3000 Unix 5.4. According to the company, the product is an open reporting system that generates simple to complex reports in an assortment of formats from data housed in SQL databases.

Version 2.1 is bundled with a suite of analysis and debugging tools: Easy SQR, a menu-driven report prototyper, and SQR-Execute, a runtime program that permits users to execute SQR programs.

Prices range from $1,880 to $128,080, depending on CPU size and number of users.

▶ *Sybase*
6475 Christie Ave.
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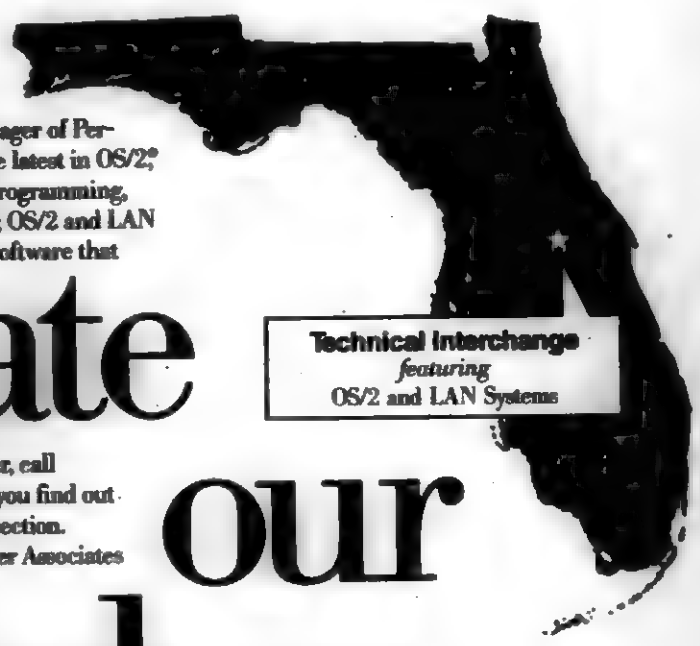

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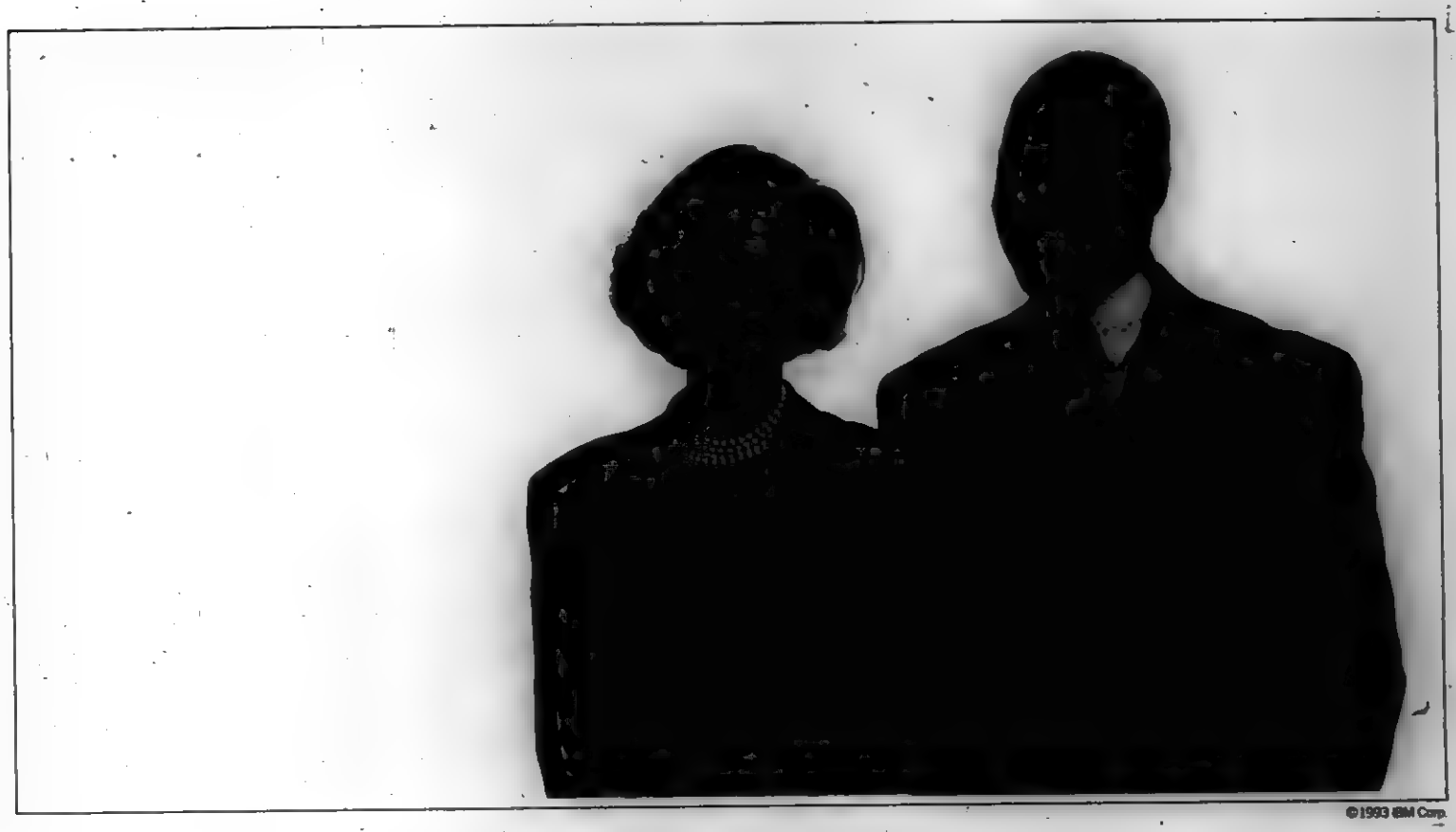

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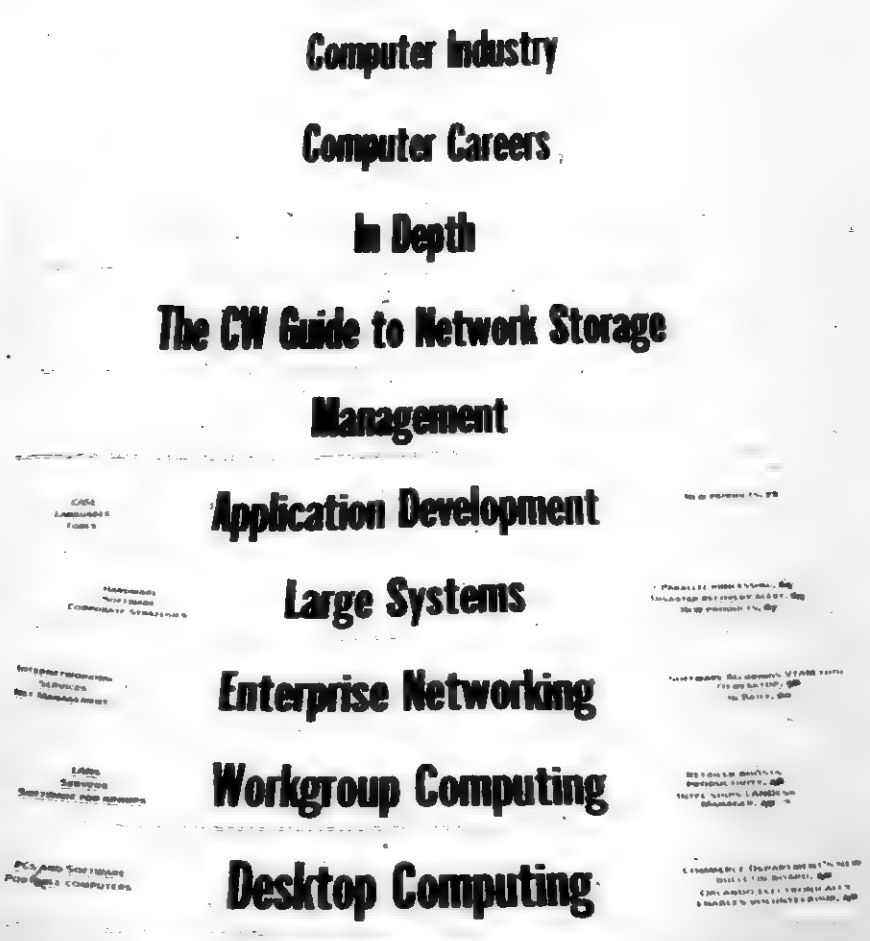

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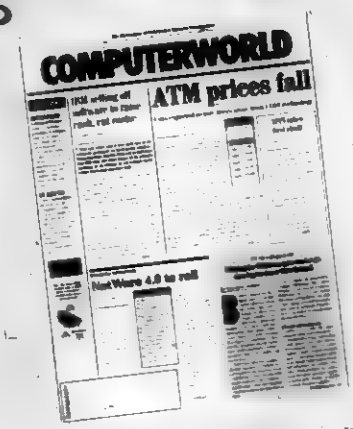


E4331-4

Transaction processing

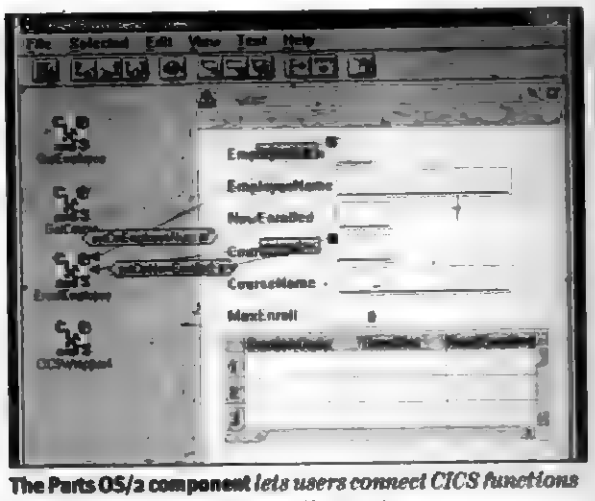
Digitalk adds CICS integration to Parts

By Melinda-Carol Ballou

Digitalk, Inc. this week will ship Parts CICS Wrapper for OS/2, a component for Digitalk's Parts Workbench that will enable users to integrate CICS' on-line transaction processing capabilities with Parts applications.

Parts — Parts Assembly and Reuse Tool Set — is Digitalk's client/server tool set that provides rapid visual construction of applications from prefabricated software components. This allows users to assemble and reuse components from different technologies more easily, officials said.

For instance, in addition to supporting CICS, Digitalk said it will provide the ability to encapsulate Microsoft Corp.'s Object Linking and Embedding (OLE), Open Database Connectivity and the Object Management Group's Common Object Request Broker Architecture (Corba) later this year. Components can be written in Smalltalk/V, Cobol, C or other languages.



The Parts OS/2 component *lets users connect CICS functions and data to applications on other systems*

The Parts CICS Wrapper lets users connect CICS legacy functions and data to visual applications. The Wrapper manages data conversions between CICS and the Parts Workbench formats. Developers will also be able to call CICS Cobol subprograms on local or remote systems running under OS/2, Windows, MVS and Unix.

Users will be able to coordinate commit or rollback operations across several CICS parts within the same unit of work and use the multitasking support of CICS and OS/2 to support parallel tasks. They will also be able to organize CICS transactions into individual parts, such as NewOrder part, ChangeOrder part and PrintInvoice part, to provide a logical view of transactions. Developers will be able to store the resulting CICS parts in a Parts Catalog for future use in building applications, officials said.

Developers will welcome the CICS support for Parts, said Stuart Woodring, analyst at Forrester Research, Inc., a Cambridge, Mass.-based consulting firm. Parts Wrappers for other technologies — such as Corba and OLE and communications protocols such as IBM's Advanced Program-to-Program Communications — will also facilitate development by shielding developers from dealing directly with the alphabet soup of emerging standards, he added.

The Parts CICS Wrapper is priced at $2,995.

Free software cataloged

Firm compiles listing of 9,000 programs used by government

By Gary H. Anthes
BELMONT, MASS.

The good news is that Uncle Sam has a multimillion-dollar treasure chest of public domain software, much of it available free for the asking.

The bad news is that asking for it is not easy. Many of the programs are haphazardly archived and cataloged, poorly publicized and difficult to obtain.

But Source Translation & Optimization (STO), based here, may have a solution — a catalog of 9,000 pieces of government software augmented by professional services to help users locate, obtain and sometimes re-engineer the code.

The catalog is built from STO's database of 15,000 programs written at the U.S. Departments of Energy and Defense, NASA, the Internal Revenue Service, other federal agencies and government contractors. The 600-page catalog is updated annually and is available on paper or PC disk for $156.50.

> "We charge fees to recover our cost of being the government's unofficial archivist. If that seems wrong, please complain to Washington; we welcome an opportunity to testify to Congress about the mismanagement of this valuable national resource." — *STO*

The software spans 80 categories in mathematics, business, information processing and other disciplines. Sample catalog entries list programs dealing with Bayesian analysis, solar flares, environmental control, thermal regulation in the human body, manufacturing cost accounting, road design and thousands more topics. Programs typically are 100 to 500,000 lines of C, Fortran or Ada code.

Financial Analytical Strategic Trading, Inc. in Belmont, Mass., investment advisers and fund managers, paid $75 for government software for real-time analysis of financial data to support trading. David Treister, vice president, said he found the software in the STO catalog, then had STO procure, install and help test it and train users.

Treister said the alternative would have been to develop the software from scratch at an estimated cost of $15,000 to $25,000. The software was well-documented and thoroughly debugged, he said. "It is sophisticated, and the graphics are quite good," he added.

STO will send free abstracts of software to catalog owners, said Greg Aharonian, company president. STO's charges for the source code typically range from "a few hundred to a few thousand dollars," depending on what STO has to pay the government, he said.

Although the government is improving with the Defense Department, the Energy Department and the National Aeronautics and Space Administration all having established software reuse centers, it is still not doing a good job of preserving and disseminating its investment — worth billions of dollars — in application code, Aharonian said. "There is little coordination across agencies. And you don't get any points for this stuff; there is no one whose career depends on it," he said.

Speaking from experience

MathSoft, Inc., a Cambridge, Mass.-based vendor of mathematical routines, said some of the software for its flagship product Mathcad was obtained from government laboratories with the help of STO. "The STO catalog is an incredible collection of stuff," said Frank Purcell, director of applications.

Purcell said the software was generally of good quality but had to be tested and significantly reworked to fit into the Mathcad user framework. He said some came with documentation and some did not, although often it was so extensively commented it did not need additional documentation.

"Some large fraction of the programming time spent in industry is devoted to routines that have already been written," Purcell said. "STO potentially can save time in orders of magnitude over writing [an application] yourself."

Aharonian acknowledged that not all 9,000 programs in his catalog are in demand. "Some of it is very specialized," he said. "One program I have simulates village life in the Andes mountains."

Software group unites on piracy

By Christopher Lindquist

Despite the stories of constant infighting and vicious competition in the software industry, there are core issues of enough importance — such as the battle against software piracy — to bring even the most distrustful parties together.

Now the Santa Clara, Calif.-based Software Industry Coalition (SoftCo) has appeared in hopes of protecting the software that exists today and the ability of developers to create new software.

SoftCo, a spin-off of the Joint Venture: Silicon Valley Software Working Group, will begin a nationwide push to get software vendors to promote educational and legislative measures to protect software in the future, said John Moran, president of SoftCo.

That effort will include working with software vendors and information systems management to determine what skills employees must have and then helping educational organizations develop curricula around those skills.

Interested parties can contact the group at (408) 980-8294 or via CompuServe at 72163,3274.

Softool ships link for mainframe/ PC development

By Melinda-Carol Ballou

Softool Corp. is now shipping CCC/Bridge, a product that links software development on mainframes using the company's change and configuration management tools with development on PCs, company officials said.

For those developing and testing applications on PCs and then deploying them on the mainframe, CCC/Bridge can provide a connection, officials said.

CCC/Bridge acts as a communications link between CCC/Life Cycle Manager running on the mainframe and CCC/Manager running on the PC. CCC/Bridge enables users to synchronize local-area network and host activities, allowing developers to monitor changes occurring in both environments, officials said.

CCC/Bridge operates in a three-tiered environment using a communications link to make the host environment conceptually and operationally equivalent to disk space, officials said.

CCC/Bridge is shipping now and is priced at $12,000 per mainframe CPU.

Briefs

Progress, SCO unite

Progress Software Corp. in Bedford, Mass., and The Santa Cruz Operation in Santa Cruz, Calif., have signed a strategic partnership and cooperative support agreement under which the companies plan to optimize performance between Progress' Application Development Environment and the SCO Unix operating system. Under the support agreement, staff members from both firms will be trained to support the other company's products.

4GL for AXP

Information Builders, Inc.'s fourth-generation language tool set Focus is now available on Digital Equipment Corp.'s OpenVMS-based Alpha AXP systems. Focus for OpenVMS is a fully compiled version of the complete Focus tool set and will support read/write access to DEC's Rdb and RMS database management systems, according to New York-based Information Builders.

Motif tool kit for Solaris

Sunsoft, Inc. in Mountain View, Calif., recently released a Motif tool kit for the Sun Microsystems, Inc. Solaris 2.2 environment. The tool kit is for developers building applications for the common desktop environment.

Graphical user interfaces

On-line Help for GUI developers revised again

By Christopher Lindquist

What constitutes "good" vs. "bad" graphical user interface (GUI) design is often a crapshoot for developers, who have no way to tell how the dice will come up but put the application in front of users and hope for the best.

Corporate Computing in Sausalito, Calif., is trying to make the situation more scientific with the third revision of its GUI Guidelines, on-line Help software that provides developers with rules and examples for good and bad GUIs. The company also offers an "Effective GUI Design" course.

GUI Guidelines Version 3.0 costs between $1,995 and $10,995, depending on the number of users. The course is $7,500 to $12,000, depending on the number of attendees.

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Application development tools

Easel Corp. has introduced ENFIN SQL Edition for AIX Motif, an object-oriented client/server application development tool for IBM's RISC System/6000.

According to the company, ENFIN for AIX is a Unix development environment that is based on the industry-standard SmalfTalk object-oriented programming language.

Client/server applications can be developed that use AIX's multiuser, multitasking environments. The product can also be seamlessly ported to OS/2 and Windows.

ENFIN for AIX is said to be the first client/server application development tool to adopt the Common Open Systems Environment. ENFIN Commbuilder and ENFIN Multimedia, two enhancements to the ENFIN family, have also been introduced.

Prices range from $1,995 to $7,900.

▶ *Easel*
25 Corporate Drive
Burlington, Mass. 01803
(617) 221-2100

The Alsys CASE Division has expanded its family of User Interface Management System (UIMS) products that offer a multilanguage solution for developing and maintaining the full life cycle of graphical user interface development.

Support for C, C++ and Ada languages is provided by the TeleUse 2.7 multilanguage family of UIMS products.

According to the company, enhancements for TeleUse 2.7 include support for X11R5 and Motif 1.2.

Single-user license prices for TeleUse/C++ 2.7 are $7,500 and $9,500 for TeleUse/Ada 2.7.

▶ *Alsys CASE Division*
5959 Cornerstone Court West
San Diego, Calif. 92121
(619) 457-2700

Computer-aided software engineering

CGI Systems, Inc. has announced a new Lateral Engineering service for LINC applications.

According to the company, Lateral Engineering is a technique for converting fourth-generation language applications to CGI's Pacbase, enabling them to run in any of 35 operating environments, including those from Digital Equipment Corp., Hewlett-Packard Co., Novell, Inc. and IBM as well as Unix. The service employs a compiler that CGI designed to convert existing applications automatically to the company's repository-based Pacbase environment.

Prices range from $80,000 to $250,000.

▶ *CGI Systems*
1 Blue Hill Plaza
Pearl River, N.Y. 10965
(914) 735-5030

Languages

Liant Software Corp. has introduced RM/Companion 2.0, a report writer for the company's RM/Cobol environment.

A new what-you-see-is-what-you-get editor is provided that speeds and simplifies ad hoc reporting without custom programming.

An improved user interface and a direct interface to Liant's business graphing and charting software for RM/Cobol users has been included.

The product runs on every platform supported by RM/Cobol: DOS, OS/2 and a variety of Unix systems.

RM/Companion 2.0 prices begin at $700.

▶ *Liant Software*
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- One Diskette Drive (3.5" or 5.25")
- MS-DOS 6.0/Microsoft Windows 3.1/ Mouse
- High Performance Windows Drivers
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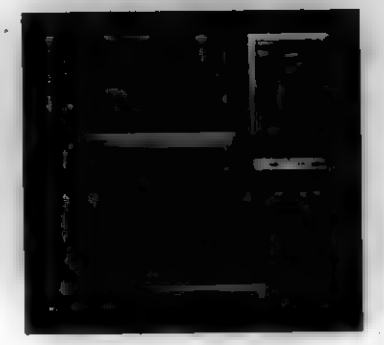

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- High Performance Windows Drivers
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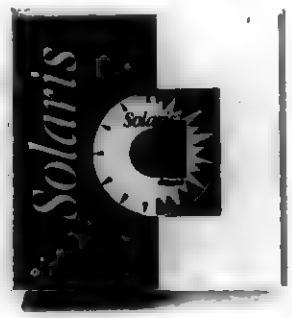

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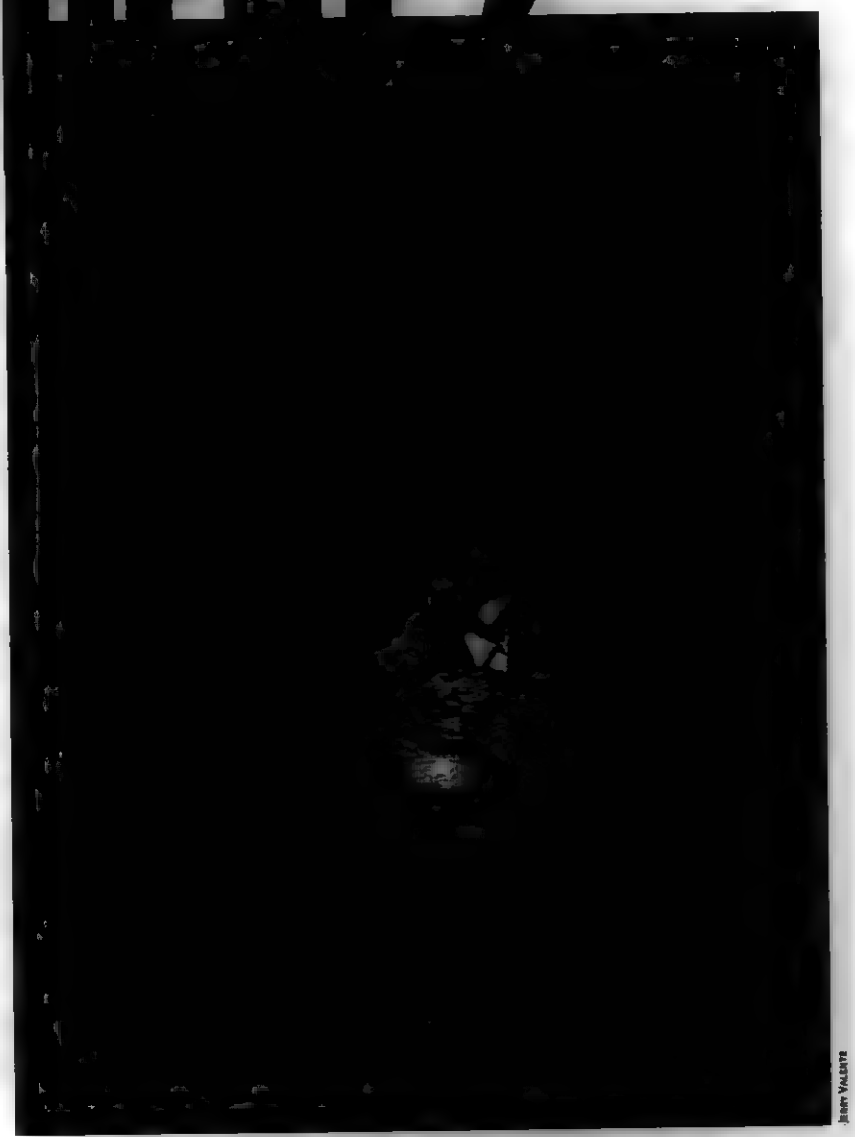
SOFTWHERE2

GLOBAL

When does it make sense to share software with offshore units? Pepsico, Esprit, Corning and other experienced hands tell what works — and what doesn't.



Pepsico's Alan Deering: *'When someone who can speak only Polish calls up a vendor's support line in the states, it can get very interesting'*

By Johanna Ambrosio

ete Bates, vice president of systems at clothing manufacturer Esprit de Corp. in San Francisco, found out the hard way that sharing software on a global basis does not always work according to plan.

About a year ago, Esprit's U.S. subsidiary adopted a production management system developed at the company's Far East affiliate. The software tracks where an item is manufactured, sewn, pressed and so on. But the software was only a "moderate" success here, Bates says, because "the ways of doing business are quite different in the two hemispheres."

Bates' company ran into a wall shared by virtually all major corporations that do business overseas: Despite good intentions and the business benefits, sharing software does not always work because of differences in how people work around the world.

Although many companies are going global and information systems groups are under increasing pressure to maximize technology investments, seasoned IS hands say not all software can or should be common everywhere.

In the Far East, for example, it is standard for the shop sewing the garment to handle the other steps of finishing and washing. In the U.S., however, convention dictates that the individual steps be contracted out to different parties.

The end result, Bates says, was that "the system that Hong Kong put together did not have the features for us to manage effectively the transition from factory to factory."

Consequently, Esprit's U.S. group is converting to another package.

Deciding on the basic infrastructure of what will be shared is just the beginning, according to IS executives and consultants. The biggest management hurdles by far involve cultural issues: convincing overseas management that the systems people at headquarters are there to help and involving the overseas managers in the whole process.

Other "gotchas" include the following:

- Arranging for service and support in remote locations.
- Making sure the package as well as the documentation support all the major national languages.
- Dealing with import restrictions and other legalities in foreign countries.
- Tracking vendors' different prices and business requirements worldwide.

With all these different balls in the air, managing global software is akin to "playing a chess tournament at 15 different tables while spinning plates," says one former chief information officer who attempted it, with mixed success.

Managing chaos

The most critical factor — which can make or break a global software situation — is getting buy-in from the managers overseas. This requires the tact of a diplomat and the selling skills of a superstar salesperson, as well as an honest attempt to include the foreign managers in as many steps of the process as possible.

Otherwise, managers will never truly implement the software the way it was intended and will likely erect all kinds of barriers to prevent the project from being done.

Experts say it's also helpful to remember two prime rules that apply to many IS endeavors. Rule No. 1: It always takes longer than you think, so patience is definitely a virtue. Rule No. 2: See rule No. 1.

Not even megacompanies with many subsidiaries and expertise in overseas dealings are immune to pitfalls. Nearly everyone has problems, as did a huge energy concern that recently tried to introduce into two Canadian groups software that had been running in certain U.S. operations.

Complicating matters was the fact that the two Canadian facilities had at one point been competitors; an acquisition had forced them to rethink their information technology infrastructure.

"So we go into the Canadian guys and ask them what they think about using X or Y," the clearly exasperated CIO says. "And once one found out that the other was going to use it too, well then he didn't want it."

What was originally scheduled to take three or four months wound up requiring the better part of a year, the CIO says. "We resolved it by basically working with them, building them up so they could get to a point where they could share things."

While that may be an extreme example, CIOs say it is common for people in far-flung operations to partially mistrust the IS group that is sent by headquarters to "help." One counter tactic: Get overseas management involved as early as possible and position the new system as something that will help everyone meet the company's goals.

That philosophy worked well at Corning Glass Works' Japanese operation. Corning does not have a mandate to standardize on software worldwide but will share "where it makes sense," says Harvey Shrednick, senior vice president of information services at the Corning, N.Y., headquarters.

In this instance, Corning developed a plant floor reporting system used domestically. The Japanese group needed the same basic functions, customized to their requirements.

"It probably would have been a lot easier to pull something from domestic and say, 'Use it,' but the involvement of the Japanese IS people in the process probably did more to gain acceptance of the system than any other factor," Shrednick says. In the end, "they felt it was their system, not the U.S.,' even though there was a U.S. guy over there facilitating things."

The IS facilitator went to Japan three times during a six-month period, working with the Japanese to help transfer knowledge about the system and what they needed to change — for example, a hot key to switch between English and Kanji characters.

How much to standardize?

Some applications are local in nature, so it doesn't make sense to seed them throughout a corporation. Others are appropriate to share throughout a business division or in a specific region — North America, for example. Only a very few applications can truly be standardized for use virtually anywhere.

Sid Diamond, former CIO at Black & Decker Corp. and now an independent consultant in Stevenson, Md., figures that only between 5% and 15% of a company's applications are truly

Global software?, *page 78*

It's a big world after all

THE PROBLEM

Managing global software, one former CIO says, is like "playing a chess tournament at 15 different tables while spinning plates."

GOTCHAS

- Service and support difficult to arrange in remote locations.
- Software and documentation might not support foreign languages required.
- Hassles with import and other tariff laws.
- Vendor prices and global policies may differ widely.

WHAT TO DO

- Make sure you get buy-in from local managers overseas. Nothing can make or break a project faster.
- Allow twice as much time for setting up global software distribution.
- Make sure applications chosen are really suited for global distribution. It makes sense, for example, to transplant financial systems.
- Make sure you get reference accounts. Ask for a detailed list of the vendor's overseas support facilities. Look for "front-to-local" support.
- Decide who's best to do the implementation: a U.S.-based MNC team? locals? consultants?

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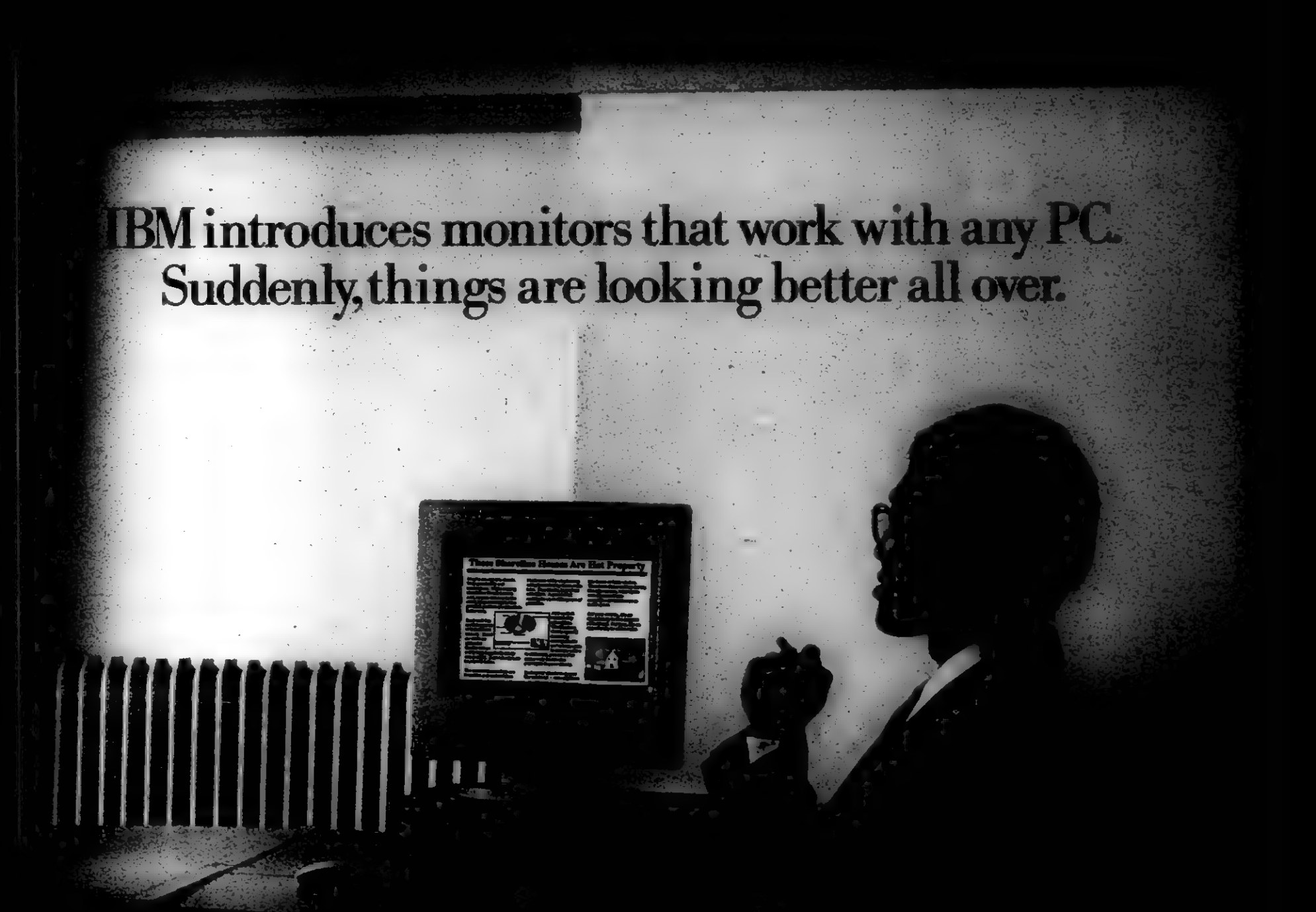

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Global softwhere?

CONTINUED FROM PAGE 75

global in nature. These include functions such as financial reporting and electronic mail, he says.

"You must be careful in what you designate as a common system. It must be companywide in terms of business functions, and there must be an overwhelming business case for doing so," Diamond says. "And even then you have to provide some room for local flexibility." For example, a common order-processing system must allow for local differences in billing conventions.

Financial-reporting systems are good candidates for standardization: They enable multinational firms to make sense of the numbers coming in from all over the globe. But even here, local differences in monetary units and reporting practices must be accommodated.

Another good business case can be made for operations that run virtually the same around the globe — Pepsico, Inc.'s Pizza Hut chain, for example. "The Pizza Hut business from country to country is not that different," says Alan Deering, vice president of management information services at Pepsico in Purchase, N.Y. "There's a rather significant cost advantage to using software that is already developed rather than developing it again and again." He says this creates consistency and speeds up implementation of systems that are already proved and bug-free.

But even here, the software is "not a mirror image" from country to country, Deering says. "You're implementing about 80% the same; then there are differences in language and tax code." Most IS shops that have rolled out software among different locales estimate that between 60% and 80% of a given system is truly the same, with regional variations accounting for the rest.

Service in Bora Bora

IS managers looking for a real kick can try installing a PC local-area network in some remote region of a foreign country. When the LAN goes down, or if there are any other problems or questions, who handles them? Someone in the U.S. headquarters group, an IS staffer in a more local place, a vendor in the U.S. or a vendor representative overseas?

As Deering puts it: "When someone who can speak only Polish calls up a vendor's support line here in the states, it can get very interesting." As such, global software implementation can lend an entirely new meaning to the concept of "help desk." Support and service issues must be thought through at the beginning of the process — whether the company will handle it on its own or if there is an outside vendor to provide the service.

Roger Pierce, manager of international accounting at Russell Reynolds Associates, Inc., an executive search firm in New York, has a war story of his own. Russell Reynolds has offices in 12 foreign locations. It implemented an accounting package in four of those offices from a Big Six accounting firm that Pierce declined to name.

"We thought they would be big enough to support the product, and we bought their story that the support would come through their international network of tax, audit and consulting locations," Pierce says. "But it turned out that the product just wasn't a big enough revenue producer for them to manage on a worldwide basis." The vendor's European offices "just weren't interested" in supporting the product, and the Far East affiliates "just didn't know enough," he explains.

Russell Reynolds has since installed an accounting package from another vendor. But the first time through was definitely a "learning experience," Pierce says, and this time "we really did our homework and talked to references instead of taking it at face value."

Sound advice

When looking at global support and service, keep in mind the following tips:

- As you would with any other software product, talk to actual customers about their experiences.
- Ask for a list of the vendor's overseas support facilities. Find out which ones are bona fide employees and what their skill levels are vs. which ones may be agents or representatives working on behalf of a larger number of suppliers.

Lori Fena, a principal at Fena & Bates, a software licensing consultancy in San Jose, Calif., suggests paying particular attention to "local-to-local" support. This means users in Australia, for example, get supported by whatever vendor location is closest, preferably in the same country but maybe in Hong Kong, instead of being supported by the Boston office.

Whatever happens, it may be worthwhile to consider some advice from Robert Rubin, vice president of information services at Elf Atochem North America, Inc. in Philadelphia. "It's simply a matter of style. Different cultures may solve the problems very differently, but businesspeople have very common objectives." ■

Intelligence Files

Rule of seven

A review of discussions at past American Management Association, Inc. meetings suggests that it takes about seven years for an idea to work its way into the mainstream of corporate America.

For example, seven years ago, talk about "quality management" was confined to the executive suite and focused on product improvements, whereas today it is considered a business necessity across the board. Likewise, seven years ago, just-in-time concepts were confined to manufacturing. Today, the concept includes all parts of the organization — even just-in-time personnel policies.

Seven years ago, the information systems function was more interested in computer functionality than in business alignment. Today, customer service is on every IS manager's lips.

Source: *Management Review* magazine, July 1993. (212) 903-8063.

How CIOs do it

At a time when chief information officers must juggle a variety of problems simultaneously, researchers are trying to figure out how CIOs get the information they need to make decisions. After carefully tracking the activities of three CIOs dealing with 17 different decisions, researchers came to two conclusions.

When it comes to the "selection" stage of a decision, such as selecting a vendor, CIOs turn to external sources of information. They may seek out reports of other companies making the same choice, for example, in order to legitimize their decision.

Otherwise, they usually consult internal sources of information, especially when time is limited, but they do not use their own computer systems for decision support. All three CIOs had executive information systems, but the CIOs did not personally use them.

Source: Exploratory study by Jack Jones at Texas Christian University, (817) 921-7558; Carol Saunders at Florida Atlantic University, (407) 367-3183; and Raymond G. McLeod Jr. at Texas A&M University, (409) 845-3139.

Half and half

A recent IBM survey of 400 executives found that half of them plan to deploy an imaging system and then undertake reengineering of work processes. The other half plans to take the opposite approach but arrive at the same destination: they will re-engineer work processes and then use imaging technology to manage the work flow.

Source: IBM executive David Liddell quoted in "The Delphi Workflow Report," June 1993, (617) 247-1511.

Ergo-helper

The Center for Office Technology has published a set of guidelines for establishing a comprehensive program to improve employee comfort, morale and productivity in the use of VDTs. It was designed to help employers cope with the growing problem of cumulative trauma disorders related to computer work.

The program covers five essential areas: management commitment and employee involvement; workplace analysis; intervention; ergonomic medical management; and training and education. The guidelines are available for $10.

Source: Center for Office Technology, Rosslyn, Va., (703) 276-1174.

Calendar

AUG. 15-AUG. 21

Share Summer 1993 Meeting. Washington, D.C., Aug. 15-20 — Contact: Share headquarters, Chicago, Ill. (312) 644-6610.

Client/Server '93 East. Washington, D.C., Aug. 17-20 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-5717.

International Networking Conference '93. San Francisco, Aug. 17-20 — Contact: Universities Space Research Association, Mountain View, Calif. (415) 390-0317.

AUG. 22-AUG. 28

Interop '93. San Francisco, Aug. 23-27 — Contact: Interop Co., Mountain View, Calif. (415) 941-3399.

AUG. 29-SEPT. 4

Fed Micro '93 CD-ROM and Multimedia Conference and Exposition. Washington, D.C., Aug. 31-Sept. 2 — Contact: Tom Lauterback, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Structured Development Forum. Philadelphia, Aug. 31-Sept. 2 — Contact: Esprit Systems Consulting, Inc., West Chester, Pa. (215) 436-8290.

SEPT. 5-SEPT. 11

Compuexpo '93. Las Vegas, Sept. 9-11 — Contact: UNSC Investment Group, Newark, Calif. (510) 657-3418.

SEPT. 12-SEPT. 18

Expo '93 East. Atlantic City, Sept. 14-15 — Contact: C.S. Report, Inc., Uwchland, Pa. (215) 458-6415.

Engineering Document Management Systems. Anaheim, Calif., Sept. 14-16 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 671-6606.

SEPT. 19-SEPT. 25

Mobile World. San Jose, Calif., Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Unix Expo '93. New York, Sept. 21-23 — Contact: National Blenheim Expositions, Inc., Fort Lee, N.J. (201) 346-1400.

SEPT. 26-OCT. 2

IS as a Service Organization. Columbus, Ohio, Sept. 27-28 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

OCT. 3-OCT. 9

The Ninth International Congress on Advances in Nonimpact Printing Technologies/Japan Hardcopy '93. Yokohama, Japan, Oct. 4-8 — Contact: The Society for Imaging Science and Technology, Springfield, Va. (703) 642-9090.

OCT. 10-OCT. 16

Design/West. Anaheim, Calif., Oct. 10-12 — Contact: Karl Steidl, Reed Exhibition Companies, Stamford, Conn. (203) 964-0000.

THE content challenge

Whether you download data from an on-line newspaper or capture selected in-house information for desktop publishing, you are using content — key business information embodied in software. The edge will go to those companies that can manipulate and use content wisely.

By Esther Dyson,
PRESIDENT,
EDVENTURE HOLDINGS, INC.,
NEW YORK

Mention content to computer people and they think of multimedia, video-based electronic mail, virtual reality and other flashy offerings. Ask about usefulness and they'll admit that content will all happen in entertainment, advertising and, perhaps, training first.

However, there is more to "content" than that. It lies in what I call "business content" — not jazzy multimedia that performs great demonstrations but useful business information embodied in software that performs actual work.

Although content doesn't have to be electronic, the focus here is on electronic content and how it can be brought alive.

Dead texts, unparsable images, monolithic stretches of video can be delivered electronically, but they might as well be delivered on paper, records (remember those?), film or tape.

The challenge — or opportunity — is to transform them into live information that can be manipulated and enhanced electronically.

That's not to say all content has existed before. Fresh electronic content, created for its electronic form, is especially exciting.

The value of electronic content lies in its manipulability, either to make it more intelligible or accessible to humans or to make it interact with other applications and tools. Ideally, humans can query content (for example, in an on-line newspaper or classified listing) by key words or values in fields such as date, topic, author, skills in a resume or name of an applicant. They can also browse through some automatically arranged schema, specify criteria for display and highlight information of particular interest.

But the information can also be reused and recombined as well as transmitted, searched and displayed (see page 80 for "Content in action"). It can be defined and manipulated before being fed into an application such as a letter generator or selective publishing tool, or it can generate parameters that control execution of an application.

Thus, the more interesting content is executable and active — information to drive tools or to be refined or manipulated by tools. Expert systems typically provide advice; software content tools execute the advice. Call them "clerk systems" that do dull but useful tasks.

For example, you can almost automatically design a deck, plan a schedule that fits both Juan's and Alice's constraints, organize a conference or an office move or send the right letters to the right people.

The goal is a combination: user input and generic rules or formulas and suggested values for, say, building a deck or calculating a year-end bonus.

In a world of commodity software tools and platforms, content software is the next frontier of unique value and usefulness. Just as PCs brought tools to the common person, so does the embodiment in software of content (knowledge and procedures) bring a sort of wisdom — or at least procedural expertise and consistency — within reach of the departments, branch offices, smaller firms and individuals who couldn't develop it themselves.

The discussion about content is just beginning. On the next page, key players in the market tackle issues such as development, hot technologies and content-rich applications.

The information is from talks at the 1993 PC Forum conference sponsored by EDventure Holdings, Inc.

Barton Stabler

CONTENT POVERTY

"Today's electronic offerings are content-poor. It's not that content isn't there; it's that nobody's successfully brought it into a product. Electronic encyclopedias are based on those you used to be able to buy at Safeway. They're not the Encyclopedia Britannica. Until content is more complete, such efforts won't be successful."

MICHAEL W. DOBSON, VICE PRESIDENT, INDUSTRY AFFAIRS, AND CHIEF CARTOGRAPHER
RAND McNALLY & CO., SKOKIE, ILL.

THE content challenge

content IN action

CONTENT SERVICE: Retailer trading service.
COMPANY: Quick Response Services, Inc., Richmond, Calif.
DESCRIPTION: Facilitates trading partnerships between retailers and their vendors. Using universal product codes, electronic data interchange and a retail version of just-in-time manufacturing (called Quick Response), the system lets retailers and vendors set up a connection to exchange a self-populating database.

CONTENT SERVICE: MusicNet.
COMPANY: MusicNet, Inc., San Francisco.
DESCRIPTION: MusicNet puts buyer preference information into a database, which it then uses to cross-reference people on a network and provide artist recommendations. When users sign up (for a flat fee of a few dollars a month for unlimited use), they submit a list of favorite artists. MusicNet matches profiles to new artists and music and lets users preview 30-second cuts.

Users can get detailed information (credits, recent *Billboard* chart position) about a recording. They can also find out about concerts in their area, look at the auditorium's seating plan, pick out a seat and order a ticket.

CONTENT SERVICE: Conquer.
COMPANY: Trilogy Development Group, Austin, Texas.
DESCRIPTION: Conquer is an online order processing configuration quoting system for computer vendors. Salesmen can find out if certain system configurations work together and get a price quote. They can also order. Plans are in the works to expand the service to noncomputer vendor customers. The company is testing a system that will configure the Top 5 PC vendors in a multivendor network configuration, generate the prices and respond to requests such as "Give me the cheapest system" and "Give me the one with the longest warranty."

How do you build content-rich applications?

"Properly done, the information technology people write the model, and the business people say, 'Yes, that reflects our business; that's what we want to do.' If you change the model, you change the applications. The model becomes a common way to communicate. This minimizes the amount of ad hoc code written and results in higher productivity.

There's no longer the notion of one monolithic application — say, the customer's sales order system. Instead, many individual application fragments must be able to exploit different devices [and] not be dependent on any platform. They have to be portable.

Even if your organization decides to standardize on a particular device, your customers will not. The software will always have to support diversity.

One key to applications this diverse is something we might call safety or quality assurance. To achieve this, the business content — the business rules — have to be built into the applications and the servers. They have to be dynamic: Change the policy, and the system immediately reflects that.

Object orientation is not the solution to all of these problems; it's just one aspect. In its purest form, object orientation says there's only one error message: 'I don't understand.'"

ROBERT EPSTEIN, FOUNDER AND EXECUTIVE VICE PRESIDENT, SYBASE, INC., EMERYVILLE, CALIF.

"[Taligent] works on a concept of frameworks, which is the content piece. We put together classes of objects that focus on a reusable design to solve a problem. Think of a networking framework that allows you to generically support networking but then add your individual support for TCP/IP, AppleTalk, Ethernet and so forth. The applications immediately are aware of the application support implied in your network support.

That idea also carries down into the systems level. People use this notion in tools, interface work and database access. Frameworks enable you to work on that little piece of code.

The object structure enables us to put in all these functions. In the end, you have a system that has objects at its heart, but the frameworks make it powerful. The content becomes the frameworks.

All this is not just theory; some of these systems are up and running, although they're not the robust ones you'd ship into the marketplace.

One of them is a MacDraw-class application, written in several thousand lines of code and in months, rather than in hundreds of thousands of lines of code written over years. We added features to it in 100 or 200 lines of code in a couple of days, rather than thousands of lines of code in months."

JOE GUGLIELMI, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, TALIGENT, INC., CUPERTINO, CALIF.

What will make content viable?

"A type of computing is emerging that will become mainstream between now and the end of the decade. We refer to this as elective-use computing. Elective users don't have to use computers; [they have to be] seduced into using them.

Where will the users come from? Customers and prospects. You'll deal with hundreds of thousands of users.

Imagine building a computer system with 100,000 users, only a few hundred of whom are your employees. How do you build that system so that everything is protected and everyone gets consistent access? Applications will have to look like your business. By looking at the screen, somebody will recognize what your business is and the products and services you offer.

What's the market getting instead? Business content is hopelessly buried inside code.

Three major changes must occur in order to make content viable and to focus computer systems externally.

The first change is to create applications with visible content; the second, applications that can travel safely; the third, applications that encourage elective users.

The notions of visible content and elective-use applications blur the distinction of where the company ends and the customer begins. The fundamental difference among businesses is not the technology but their business models. In the computing environment today, the business model is completely divorced from the computer model."

ROBERT EPSTEIN, FOUNDER AND EXECUTIVE VICE PRESIDENT, SYBASE, INC., EMERYVILLE, CALIF.

random thoughts ON content

MODELING'S FUTURE

"The increase of user content and decrease of model content is the trend in computer simulations, which will become a more effective tool for learning and communication.

About a year ago, we started a business simulations division. Our first contract was with Chevron, simulating its refinery. We're working on projects with PG&E, California's power utility, to simulate the power grid. These simulations are becoming tools for education."

WILLIAM WRIGHT, DESIGNER, MAXIS, ORINDA, CALIF.

BYE-BYE COMPUTING

"The notion of computing as a distinct content-independent pursuit seems to me to be doomed to exactly the same fate as that of scrivening. Today, we think of computing as something that stands alone. But it seems very clear that computing will disappear into the things for which we use it."

DAVID LIDDLE, PRESIDENT, INTERVAL RESEARCH CORP., PALO ALTO, CALIF.

The *rough road* to OBJECTS

By David Baum

PROGRAMMERS WHO have learned to think in terms of object-oriented concepts say the change isn't easy. "It is 80% psychological and 20% technological," says Chris Stone, president of the Object Management Group in Framingham, Mass. "Programmers must rethink software systems from the standpoint of assembling pretested, reusable components, rather than producing thousands of lines of new code for each application."

These psychological differences pose special challenges, especially to the large group of mainframe Cobol programmers who are accustomed to thinking in terms of structured programming techniques. "Using a language like SmallTalk is as much an unlearning as a learning experience," says Dana Toraason, a programmer/analyst at the Lawn and Grounds Care Division of Deere and Co. in Horicon, Wis.

Training classes

Toraason and others on her team are making the transition from mainframe Cobol to client/server development using object-oriented techniques. She advises programmers to seek instruction in an object-oriented programming methodology to ease the transition. "It will help you grasp important concepts such as reusable code and doing data modeling for the entire enterprise rather than just one application," Toraason says.

Many mainframe programmers who have switched to object-oriented programming say the first step is to obtain a PC and an inexpensive tool such as Microsoft Corp.'s Visual Basic or Borland International, Inc.'s Object Vision to see how graphical and object-oriented applications are constructed. These products give developers an easy and cost-effective way to begin producing object-oriented systems by providing high-level description languages and reusable libraries of objects as starting points.

Object-oriented application development also implies a new type of interaction with users, says Linda Slitz at Slitz Professional Search, an executive placement firm in Boulder, Colo. Many object-oriented tools make use of a rapid prototyping process where users and developers work together to flesh out the requirements of an application. It's essential that developers are comfortable with this type of approach and are able to convey technical concepts in terms users can understand.

Programmers must also learn how to create visual representations of reality that are clear and understandable. "The need for visual communicators is mushrooming with the emergence of tools such as HyperCard, Visual Basic and hundreds of object-oriented Windows products," says Dan Shafer, editor of the "Inventive User Letter" and president of Graphic User Interfaces, Inc., a consulting firm in Redwood City, Calif. "But there aren't a lot of people who are very good at creating visual representations of functionality."

Visually arresting

Many programmers making their first forays into object-oriented and graphical user interface development get caught up in the visual side. "They enjoy creating elegant and sexy pictures, but do they communicate much?" Shafer asks. Some products provide guidelines for effective screen design in the documentation and offer templates to help programmers learn the basics of ergonomics — when a slider is more appropriate than a button, how to overlap windows or what colors work best together.

While technical experience as an object-oriented programmer is important, many employers say having a solid knowledge of the business is key. This can be a boon to staff programmers hoping to move into new object-oriented programming jobs.

"Our existing people are valuable partly because of their working knowledge of the business," says Dave Kelley, manager of computer systems at Deere's Lawn and Grounds Care Division. "We've found that's more important than having someone who knows a new operating system or set of programming tools."

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.

Object-oriented programmers don't usually earn more than other types of programmers. In fact, in many cases they earn less. Many jobs requiring object-oriented skills are being filled by recent college graduates and newer programmers with lower tenure, who are coming in at the lower end of the salary scale, says Victor Januliatis at Positive Support Review in Santa Monica, Calif., a recruiting firm that specializes in information systems jobs.

Key positions, such as a senior architect on an object-oriented project, can earn six-digit salaries because the job calls for rich experience and cutting-edge knowledge of new programming technologies. But most object-oriented programmers earn salaries comparable to that of Assembler programmers, about $41,000 to $45,000 per year for a top-level employee, Januliatis says.

Experts predict skills will eventually become a commodity, as the line between power user and developer blurs. Consequently, positions requiring these skills will soon pay less than positions where mainstream data processing skills are required, such as the ability to create objects in a high-level language such as C or C++.

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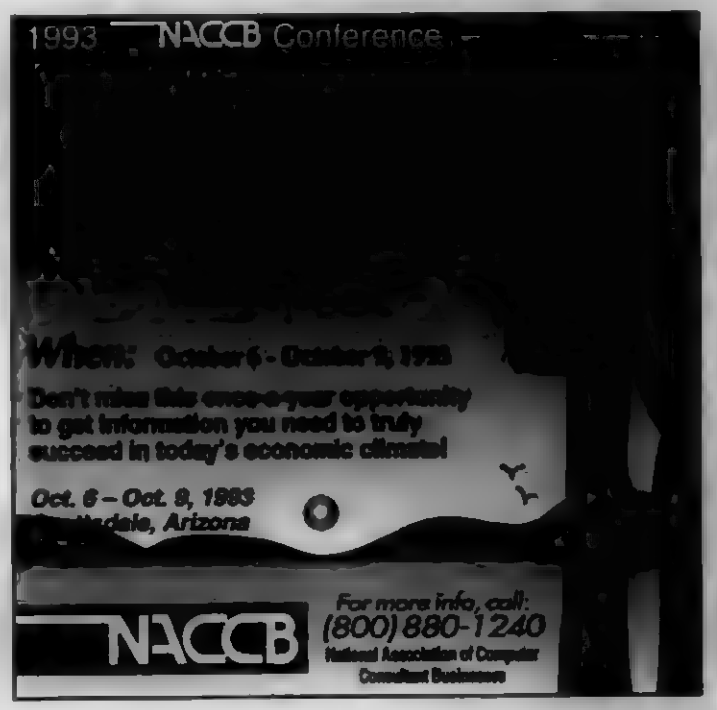

THE UNIVERSITY OF THE WEST INDIES

Notice for Individual Contract Services for Project Officer for Computer Systems for the University Project Implementation Unit of the UWI Development Programme IDB Loans 679/OC-RG, 680/OC-RG, 681/OC-RG

The University of the West Indies (UWI) is inviting expressions of interest from individuals to manage and implement, over the three campuses, installation of an inter-campus communication and fibre optic network including computer equipment and labs under the project guidelines and the overall co-ordination of the Project Director of the University Project Implementation Unit (UPIU).

The Development Programme, which is partially funded by the IDB (Loans 679/OC-RG, 680/OC-RG, 681/OC-RG), will involve a broad spectrum of activities with the objective of expanding UWI's enrolment capacity, strengthening research and development capability and diversifying and improving the outreach services.

The contract period will be of a 3-4 year duration.

Project Officer for Computer Systems

The Officer will be responsible for coordinating all technical details with respect to hardware, software and communications development across all three campuses to ensure the overall development of computing in keeping with the terms and conditions of the IDB loans. He/she will also assist the University-wide Computing Committee to devise forward-looking strategies for the upgrading of the Computer Systems and skills at the University.

Minimum Qualifications and Requirements

A Master's degree or its equivalent in Computer Science, Computer Engineering and ten years networking experience which should include at least three years of related management experience.

Replies from suitably qualified individuals interested in this contract position must be written in the English Language and must contain an updated CV giving concise details of capability and experience and must be received at the address listed below by 1200 hours on **31 August 1993.**

University Registrar, Attention: Assistant Registrar (Centre), Office of Administration, University of the West Indies, Mona, Kingston 7, Jamaica, W.I. Fax: (809)-927-4869 Telephone: (809)-927-5469.

Only Nationals from member countries of the IDB will be eligible for this position.

POMONA COLLEGE
Revised posting

Director of Information Technologies

Pomona College, a co-educational liberal arts college of 1380 resident students and 150 faculty located in Claremont, California, 35 miles east of Los Angeles, seeks a Director of Information Technologies. Pomona is one of six independent, contiguous colleges in Claremont, five undergraduate and one graduate, which share many resources and facilities including libraries, network infrastructure, and telecommunication utilities.

Pomona College currently supports a variety of computer platforms, including two VAX/VMS machines and approximately 500 DOS, MAC, and UNIX microcomputers and workstations. Networking of these computers is in progress, and our goal is to provide access at virtually every faculty/staff desktop and student room in the near future. Much of this work is completed and connects many Pomona College users to academic resources through an infrastructure developed in cooperation with the six Claremont Colleges. As technology and funds permit, the College wants to encourage integration of computers with other technologies for both research and instructional purposes. Fifteen professional and support staff currently work in the areas supervised by the Director, who reports to the Vice President for Planning.

The Director is expected to provide leadership and coordination for all aspects of academic computing, administrative computing, and networking for Pomona College, to guide the planning and enhancement of educational technologies and instructional applications such as audio-visual classroom, cable-TV distribution, interactive video workstations, and multimedia applications, and to represent Pomona College in development of cooperative infrastructure and programs with the other Claremont Colleges. The College seeks a person with vision, knowledge of developments in computer hardware and software, a foundation in research, interpersonal communication skills, and a commitment to working in an ethnically diverse community. An advanced degree and college or university computing experience are preferred, but not required. Compensation is competitive, based on experience and qualifications.

Please send nominations or letters of application with resume and covering letter to Ms. Anna S. Johnson, Director of Personnel Services, Pomona College, 550 N. College Avenue, Claremont, CA 91711. Nominations and applications received by September 1, 1993 will be given full consideration. Pomona College is an Equal Opportunity Employer and encourages applications from women and minority candidates.

POMONA COLLEGE

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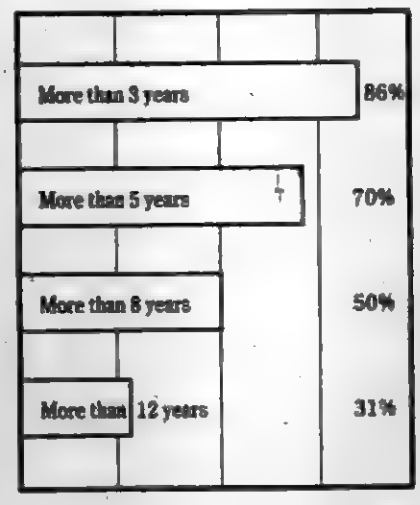

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X terminal encounters: Virtually pain-free

By Joe Panepinto

AN X WINDOW SYSTEM terminal is really nothing more than a slightly smarter-than-average dumb terminal designed for rendering graphical displays. Therefore, seeing one shouldn't send the average systems administrator into an anxiety-induced tizzy.

X terminals are making their way out of the technical, computer-aided software engineering and computer-aided design and manufacturing environments in which they started. In fact, the likelihood of encountering an X terminal during the course of an information systems career is pretty good, so it pays to be prepared.

Most X terminals are colorful, beefed-up, diskless network devices on Ethernet networks running Transmission Control Protocol/Internet Protocol (TCP/IP). They have two basic components: a remote (client) component that generally runs on a Unix host and a resident X server process (server) on the device itself. Note that in the X world, client and server are reversed: The software process on the local X terminal is a "server" that exchanges X protocol commands with a "client" host computer running X-capable applications.

Unfortunately, there really is no place to get X terminal training except from the vendors, says Steven Mikes, editor of the "X Journal" and an industry consultant.

"Typically, the vendors will send in personnel to configure X terminals because it is profitable for them," Mikes says.

Certainly, a decision has to be made early on about whether to have the X server and window manager software loaded on the host or on the X terminal. If IS expects a lot of X terminal users to boot up at the same time, it is easier on the network and network personnel if the X server software is on the X terminal itself. Once that decision is made and the X terminal is configured, there is little or no additional management.

"It really is easier to manage X terminals than PCs," says Jack London, director of the medical computer facility at Fox Chase Cancer Center in Philadelphia. "With X terminals, you can set up one template for a configuration file that works for all of your users."

PC X

While the management of X terminals is straightforward, grappling with PC X, the software that lets users run X Window System applications on PCs, is not.

In PC X environments, systems administrators lose the centralized control offered by X terminals. The X server software on PCs is just one of dozens of programs that can take a long time to troubleshoot once something goes awry.

Systems administrators also have to make sure PCs are properly equipped to achieve even a reasonable level of X performance. They also have to preload both Ethernet and TCP/IP drivers on the system to ensure a proper X server-to-client connection.

The bottom line is that IS personnel working with PC X may be forced to troubleshoot the range of PC applications, subsystems and components if X performance drops below an acceptable level. For example, PC X users can have multiple windows open simultaneously, so sluggish performance on the X application may be due to random-access memory problems on the PC, network or server.

Network management of PC X also becomes more difficult because IS is dealing with a full-blown network node, which can do other network processing simultaneously, instead of a Simple Network Management Protocol-manageable device.

In general, networked PC users put more demands on systems management because they have more freedom to experiment (and potentially break) applications locally and over the network. In contrast, X terminal users are restricted to a single set of centrally managed X applications.

As for workstations, many of the same configuration and maintenance problems apply. For example, users on multitasking workstations who leave an X window open while working in other windows may crowd out other processes on the network and at the host CPU.

Beyond the management of X in networked environments, IS personnel may find themselves in a situation that requires some X Window programming — a daunting task that can easily turn the joy of X (terminal management) into the "Oy!" of X (programming).

The bottom line is that while programmers building X applications may be working in the familiar C language environment, they will need to learn hundreds of new function calls to build an X application that will interact properly with the network, the X server software and other X applications.

Panepinto is a free-lance writer in Amherst, Mass.

Where can I get X training?

The best (and only) place for training on X terminal configuration is the vendors themselves.

For X training in general (including X programming), there are a number of sources: Integrated Computer Solutions in Cambridge, Mass.; Bluestone Consulting in Mt. Laurel, N.J.; Addison Wesley's Technology Education Center in Reading, Mass.; The Institute for Software Advancement in Boston.

The cost per seat for a five-day introductory courses in X programming ranges from $1,200 to $3,000, with an average of roughly $2,200.

RESOURCES

- The 12-volume guides to the *X Windows System*, O'Reilly & Associates, Inc., Sebastopol, Calif.
- *Monthly X Journal*, Northboro, N.J.
- *X Resource*, O'Reilly & Associates, Inc.

UPCOMING CONFERENCES

- X Technical Conference, sponsored by MIT, held every January at MIT in Cambridge, Mass.
- X World, sponsored by *X Journal*, April 1993, in New York.
- Xhibition, sponsored by Integrated Computer Solutions, Cambridge, Mass., held every June in San Jose, Calif.

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Halifax Medical Center

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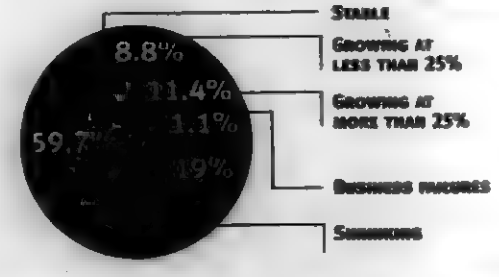

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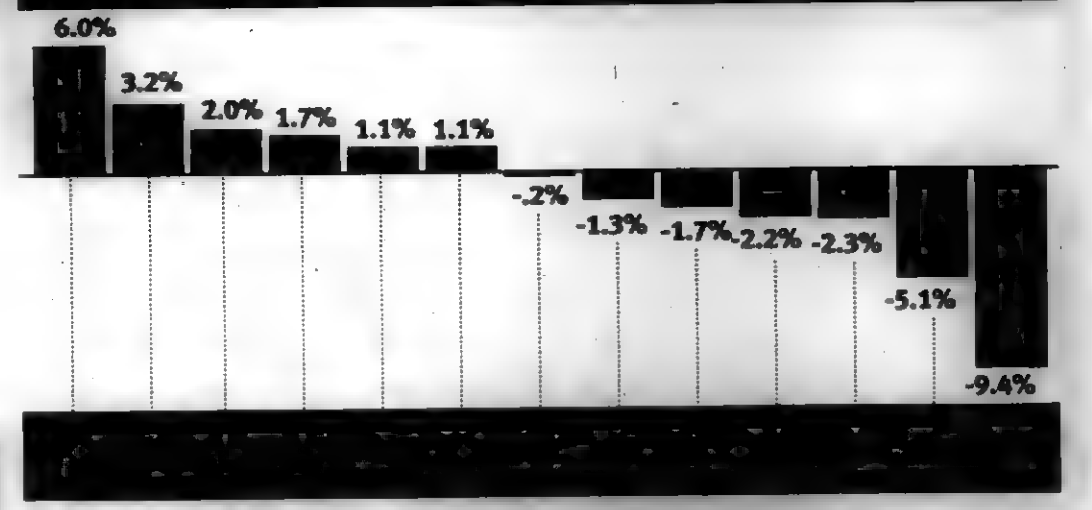

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SYSTEM PROGRAMMER/ANALYST (REF. #14883) to analyze, design, develop & implement comp s/ware for clients' EDP sys. Incl: provide sys support for multi-sys installations, Network Management (for SNA Networks using NCCF & VTAM), develop tools & utilities on IBM Mainframes & UNIX & OS/2, Mainframe performance measurement & tuning & using S/370 assembly language, C, Intel 80x86 Assembly Language, PL/I, REXX & PASCAL. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: developing s/ware for SNA network management utilities; & using IBM comp, UNIX, NCCF & VTAM. Pay is $33,155/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF. #31483) to consult with clients to ascertain & define their business req or problem areas & utilize techn expertise to provide solutions to clients' needs, including analysis, design, development & implementation of comp s/ware for clients' EDP sys incl graphics app development, developing device drivers on UNIX systems, designing & implementing CAD s/ware on graphics workstations & maintenance of existing code. Duties require interfacing h/ware such as pointing devices, developing graphics libraries, interprocess communication & CAD app using FORTRAN-77 & C languages on PRIME, DEC-8000, RS-6000, HP-9000, SUN SPARC & UNIX graphics workstations. ED & EXP: Bachelor's in Comp Sc, Engg or Sys Anal & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 years of college ed plus 3 years exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, development & implementation of app sys, device drivers & graphics libraries, sys interfacing; & using RS-6000, C, FORTRAN-77, UNIX & UNIX graphics workstation. Pay is $34,000/yr. 40 hr/wk.

SYSTEMS PROGRAMMER/ANALYST (REF. #31393) to consult with clients to ascertain & define their business requirements or problem areas & utilize tech expertise to provide solutions to clients' needs, including analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. 1 specific duty to be performed will be designing & developing app s/ware using CICS, Db2, VS COBOL II; installation & maintenance of comp installation controlling of IBM ES/9000 mainframe running MVS/ESA with DB2 & CICS as major subsystems & PC/XTs & PC/ATs running MSDOS incl the duties of housekeeping activities, upgrade of existing s/ware; troubleshooting; & writing in-house utilities using REXX, CLIST, ISPF, C & MASM. ED & EXP: Bachelor's in Comp Sc, Engg or Sys Anal & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, development of app sys; installation & maintenance of MVS/ESA operating sys with CICS & DB2 as its subsystem running on IBM mainframe; writing utilities; & using IBM PC/AT, PC/XT, MS DOS, VS COBOL II, MASM, CLIST & ISPF. Pay is $34,000/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF. #31793) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, including analyzing, designing, developing & implementing comp s/ware for clients' data processing sys incl design, development & implementation of various database app sys incl 1 specific on-line database paperboard manufacturing sys incl establishing a 24 hour real time database; set up project design & coding standards; dictionary enforcements; procedures & programs for data conversion; develop pseudo-code for modules; establish modular interfaces & test standards; code various modules & implement them; design & implement interdatabase data interchange using BNA, HUB, interface with PC packages like EZSPEC/DARGAL, RBASE & Schedule trimming; & technical support & administering the different databases with file maintenance procedures using UNISYS A-12, A-6, Micro-A hardware & UNC II Levels 14.3, 14.5 & MCP 3.8 s/ware. ED & EXP: Bachelor's in Comp Sc, Engg or Sys Anal & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, design, develop & implement on-line database app; & using UNC II (14.3) & UNISYS A-Series, set up overall project standard, detailed design of modules, dictionary enforcement & database transfer using BNA & HUB Pay is $33,200/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF. #31665) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl analysis, design & development of integrated welfare sys. Duties: process/data flow design, data modeling, developing program specifications using ADW Knowledgeware CASE tool, overall design of Quality Control part of the sys, meeting with users to gather req & develop the sys using IBM 3090, IBM PC/ATs, using MVS/ESA, DB2, IMS/DB/DC, TELON, COBOL, TSO, JCLs & Word Perfect for OS/2. ED & EXP: Bachelor's in Comp Sc, Engg or Sys Analysis & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, Ass Sys Anal, Trainee Sys Anal, S/ware Engg, Trainee S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, analyze, design & develop app s/ware; & using IBM 3090, MVS, IMS DB/DC, DB2, COBOL, TSO & JCLs. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF. #32793) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, including analyzing, designing, developing, & implementing comp s/ware for client's EDP sys incl development & sys test of Market Information Capture process. Duties: develop s/ware, Final Integration test plans, test scripts, reviews & tech support of the process that populates the Single image database. The tech support will be for the app using IBM 3090, MVS/ESA, VM/XA, DB2, SQL, QMF, PILEAID, PLIMACRO, PL/I, REXX, JCL & ISPF. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, design & develop app sys; sys testing; & using IBM 3090, MVS/ESA, VM/XA, DB2, SQL, QMF, REXX, JCL & ISPF. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF. #37993) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl object-oriented app sys. Duties: analysis of user requirements & designing app in object-oriented fashion using Case Tools such as IDE/STP. Development will be done using X/Xview in Ansi C on SUNOS UNIX based sys with following h/ware, s/ware & languages: Sun Sparc 10 & 2 workstations, SLC, IPC, 4/490 servers; SUNOS 4.x, RPC, Mainframe Interface over 3270 byte stream, RAMP Interface on IBM 3090, X windows, Xview, Unix utilities LEX, YACC, AWK, SED, MAKE, SCCS; IPC's, shared libraries; development tools Sabar C; Design Case Tools Software Through Pictures (IDE). ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math and 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, Development Staff Specialist or Consultant. REL EXP: in whole or in part, app sys design; & using UNIX, C, X WINDOWS, SUN workstations, CASE tools, s/ware development tools & Object Oriented programming. Pay is $34,000/yr. 40 hr/wk.

SYSTEM ANALYST (REF. #38083) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, including analyzing, designing, developing & implementing comp s/ware for client's EDP sys, incl Management Information Sys (MIS). Duties: analyses current corp operational procedures then develop & implement MIS to assist top management in budgeting different cost centers; design Data/Process flow charts specifying detailed operations to be performed; & providing tech support to all users of the sys & using IBM 3090, IBM PC 386, 486 NOVELL-NETWARE, VAX/VMS, MVS/XA, TSO, ISPF, JCL, CLIST, SYSTEM-W, CLIPPER, FOX BASE & DOS. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or its equivalent and 2 yrs exp in the job offered of 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, design & develop app sys; & using IBM PC 386, VAX/VMS & Novell/Netware. Pay is $34,200/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF. #38193) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients needs, including analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl analysis, design, development, implementation & support for mfg. sys, developing Graphical User Interface (GUI) apps in X-windows environment & OSF/MOTIF using an object oriented GUI Builder Interface Architect; customizing the C code to meet the mfg. environment automation; & interfacing the developed GUI app with the relational database Oracle for data retrieval, & displaying the processed data to end users in the form of customized graphs using a Statistical Anal S/ware (SAS) pkg. Tech support provided will be for design of this main GUI app on HP9000 running HP-UX 9.0 using HP 9000/720, HP-UX 9.0, X11R5, OSF/MOTIF V1.2, ORACLE 6.0.36, Interface Architect 2.0 (GUI Builder), SAS, WINGZ, C and UNIX s/ware development tools. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, design & development of comp app programs; s/ware interfaces; & using X-Windows, OSF/MOTIF, relational database, Graphics s/ware & C. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF. #38483) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, including analyzing, designing, developing & implementing comp s/ware for client's EDP sys, incl analysis, design, development & migration of General Ledger Accounting Sys. Duties: data anal, design screens, interpret E-R diagrams & maintain referential integrity. Tech support provided will be for design of apps using CICS/DB2 on IBM 3090 & DMSII/COBOL on UNISYS A/15 using IBM 3090, MVS/XA, CICS/VSAM/DB2/COBOL II/SQL/IMS DB & on UNISYS A-15 DMS II COMS/COBOL & debugging tools INTERTEST/XPEDITER. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, development of app sys & conversion programs, & using IBM 3090, UNISYS A-15, DB2, CICS, DMS II, COBOL & COMS. Pay is $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #45183) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients needs, including analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl, analyses, design, development, implementation & testing UNIX utilities, apps & Graphical User Interfaces for apps running on heterogenous sys such as IBM mainframes & UNIX Workstations. Duties: develop GUI prototypes; porting of s/ware to different platforms; & evaluation of s/ware tools & using IBM 3090, IBM PS/2 & compatibles, IBM-plus compatibles, Sun Sparc workstation, Sun OS, UNIX, SCOSystem-V Sinix, OS/VS, CMS, BS2000, X Windows with Motif Windows manager, C, COBOL & FORTRAN. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp &/or training in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part; development of UNIX app; User Interface implementation; sys porting; & using IBM 3090, IBM PS2, Sun Sparc, Sun OS, SCOSystem-V, X WINDOW, MOTIF & C. Pay is $34,000/yr. 40 hr/wk.

SENIOR SYSTEM ANALYST (REF. #48593) to consult with clients to ascertain and define their business req or problem areas and utilize tech expertise to provide solutions to clients' needs including analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl an integrated insurance processing sys. Duties: process & data flow design, data modeling, database design, client liaison, tech support & quality assurance of the app. The tech support provided will be for the design of app using DB/2 & SQL server on IBM 3090 & IBM PS/2 h/wares using DB/2 as host database and SQL server on IBM PS/2 as app database & using: IBM 3090, MVS/XA, DB/2, QMF, TSO, ISPF, JCL, REXX, PL/1, CLISTS, C, IBM PS/2, UNIX, DOS 5.0, WINDOWS 3.1, VISUAL BASIC & SQL Server. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg, Consultant, Engg or Manager, Operations. Will accept 3 yrs of college ed plus 3 yrs of exp. in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, design, tech support & quality control of app sys & using IBM 3090, MVS/XA, UNIX, Visual Basic & Windows. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF. #16983) to analyze, design, develop & implement comp s/ware for clients' EDP sys, incl: analyze, design & develop an integrated welfare sys. Duties: process/data flow design, data modeling identification, tech support & overall design of app entry part of the sys & meetings with users to gather req. Tech Support: for design of app using IMS DB/DC on IBM 3090 using IBM 3090, MVS/ESA, IMS DB/DC, TELON, BRACKETS for PC3 & MSWORD for PC3 used for sys design, COBOL II, ASSEMBLER, XPEDITER, VSAM, TSO, NETVIEW, REXX & CLIST. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: design & analyses of s/ware app; & using IBM 3000, IMS DB/DC, COBOL II, Assembler, Xpeditor, VSAM, TSO, CLIST & MVS operating sys. Pay is $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #18983) to analyze, design, develop & implement comp s/ware for clients' EDP sys, incl: Integrated Student Information Sys. Duties: Impact Analysis, Tech Design; Programming based on functional req & impact anal; code new programs; modify existing programs; unit testing; preparing JCL in s/ware development; & constant interaction with user group for enhancements/changes to functional req & using: IBM 3090, OS, MVS/ESA, ISPF, TSO, IDMS/R, ADS/O, COBOL II, ADSA, DML, IDD, CULPRIT, OLM, ADSG, JCL (JES2). ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp: REL EXP: app design & development; implementation with user interaction & program testing; & using IBM 3090, IDMS, ADS/O, DML, CULPRIT & JCL. Pay is $38,000/yr. 40 hr/wk.

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Responsibilities: Develop, implement and maintain a data security policy; implement and enhance security improvements for both batch and on-line processes; coordinate with systems programmers for RACF administration; work closely with the Internal Audit department for security reviews and data security-related issues.

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The Tamaki Campus is the second campus of the University of Auckland. It was established in 1991 as part of the University's strategy for meeting the ever-increasing demand for university education particularly in Auckland. The Campus is located about 13 kilometres from the City Campus on a 30 hectare site in Glen Innes that was used for the 1990 Commonwealth Games Village. It overlooks the Tamaki River estuary and includes the excellent playing fields and spacious clubrooms of the University Park. There are three academic divisions at Tamaki. These are the divisions of Arts, Commerce, and Science and Technology.

Teaching commenced in 1991 with a stream of Bachelor of Commerce students; arts and science teaching started in 1993. Ultimately Tamaki Campus will offer research and teaching programmes in a wide range of Arts, Commerce, Science and Technology and will provide places for approximately 7000 students.

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COMPUTER SCIENCE

Division of Science & Technology
Vacancy UAC.307

Applicants should have a higher qualification in Computer Science (normally a PhD or equivalent) and have demonstrated abilities in teaching and research. While applications are welcomed from candidates from all backgrounds, priority may be given to those specialising in the data communications area.

The appointee will be expected to begin teaching during the academic year that commences in February 1994.

Commencing salary will be established within the range NZ $37,440 - NZ $49,088 per annum for Lecturers, NZ $52,000 - NZ $60,944 per annum for Senior Lecturers.

Closing date: 27 September 1993.

CHAIR IN
INFORMATION TECHNOLOGY

Division of Commerce or Science & Technology
Vacancy UAC.315

Information Technology is being regarded as central to academic developments at Tamaki. Degree courses specialising in aspects of computing and information science are available to Commerce and Science students. In addition, a new four-year Bachelor of Technology degree is being created. To support these developments the University has established this Chair in Information Technology.

For the Chair in Information Technology the University is seeking applicants who could develop strong programmes in Commerce and in Science. Applicants should have backgrounds in Computer Science, Information Systems, Engineering, or an appropriate branch of Mathematics, provided that they have a research and teaching background relevant to the position. The University wishes to establish at Tamaki a special emphasis on Communications and Networking so that a candidate with expertise in these areas would be particularly welcome.

The University wishes to appoint candidates who are not only strong in their own fields but are also interested in developing a new institution and giving it a distinctive character within the University of Auckland system. They must have strong records of teaching, research and publications and a demonstrated ability to provide academic and research leadership. Relevant commercial or industrial experience would be an advantage although it is not essential.

Commencing salary will be established within the range NZ $80,080 - NZ $94,840 per annum.

Closing date: 13 October 1993.

Conditions & Procedures for Both Vacancies

Further information, Conditions of Appointment and Method of Application should be obtained from the Academic Appointments Office, University of Auckland, Private Bag 92019, Auckland, New Zealand, telephone (64) 9 373-7999, ext 5097; fax (64) 9 373-7454. Three copies of applications should be forwarded to reach the Registrar by the closing date specified.

Please quote relevant Vacancy Number in all correspondence.

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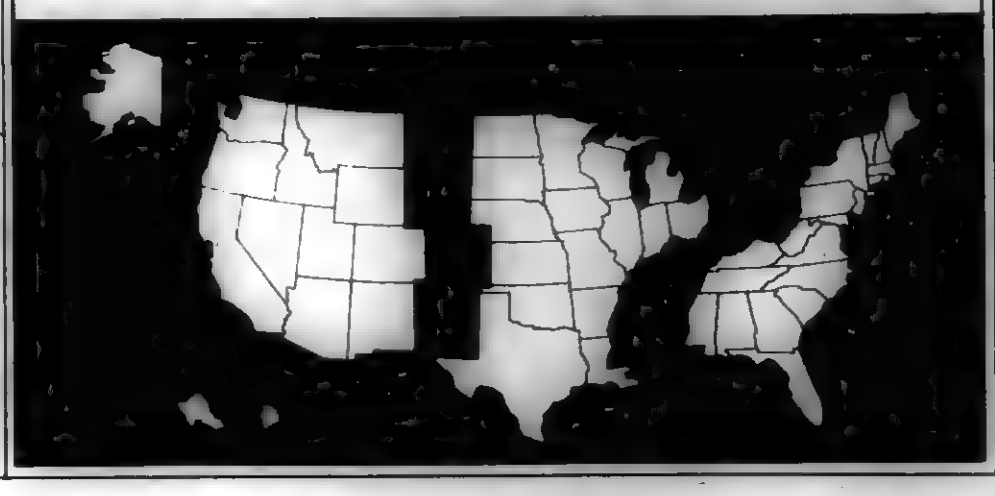

Big (system) savings

By Stephanie Wilkinson

KNOWING WHEN TO add capacity to a mainframe is a no-brainer; when use thresholds reach 70% to 80%, it's time to think of supplementing your large systems. But the days of simple one-stop shopping are over.

Changes in the way large systems vendors are doing business have created more options for data center managers looking for deals. When contemplating changes for your system — adding to it, trading up or down or rightsizing — there are a number of options to choose from and resources to use.

Trade-ups

On some trade-ups, prices may be more flexible now than ever before. In February, for instance, IBM announced it would no longer distribute list prices on large air- and water-cooled mainframes. Customers can now negotiate with IBM on prices "based on the amount of business they do with IBM," says Glenn Brogan, a spokesman for the Mainframe Marketing Group in New York. That could be good news for those in the market for new large systems, says Mike Heylin, an industry analyst at Creative Strategies Research International, Inc. "If you can deal, you can deal down."

Short-term lease

The rising popularity of distributed systems combined with growth in the power and capacity of smaller systems has made short-term leasing of mainframes more attractive.

For instance, when Cleveland-based Agency Rent-A-Car decided three years ago to move its database from a Wang Laboratories, Inc. VS 10000 to a network of distributed PCs connected to a Digital Equipment Corp. VAX server, they purchased the mainframe outright. They hoped the machine would have enough capacity to be cost-effective during the transition. But with the project approximately 70% complete, the company needs to supplement the VAX with several smaller platform database servers.

"These days, price/performance ratios are changing so dramatically that we could replace that $1 million machine with high-powered workstations with similar capacity for a fifth of the price," says John Scallan, director of MIS at Agency.

"If you make commitments on shorter terms, you won't buy excess capacity," he says. Scallan's advice: Don't commit dollars today for computing power you won't need for two or three years.

Mainframe economics

Learn to calculate the "useful life" vs. the "economic life" of your mainframe. Many companies that have shifted their critical applications to other hardware still hang on to their old mainframe for less critical applications. According to Susan Middleton, senior analyst at International Data Corp. in Framingham, Mass., this makes sense — to a point.

"It is similar to the situation with PCs: You give the technical engineers the most advanced machines, but for data entry people, an old 286 [PC] will be fine," she says. Older mainframes still have a place in the data center but when maintenance costs become a burden, it's time to get rid of them, Middleton says.

On-line forums

Bulletin boards and user groups provide a forum for buying and selling used equipment. User groups, such as Digital Equipment Computer Users Society (DECUS) and Guide/Share for IBM customers, also provide a network of potential buyers for hardware you are looking to sell.

"I always check the 'Swap Shop' on the DECUS bulletin board when I'm looking for equipment," says Ralph Mercorella, deputy director of operations at the Department of General Services, Office of Fleet Administration for the city of New York. "I have seen people offering such things as a DEC 6310 for 60% to 70% cheaper than you could get it elsewhere."

Benchmarking

Some consulting companies can show you how efficiently and economically mainframe equipment is being used. "We closely match our statistics so that clients are only compared to their peers — similar-size companies or companies in the same line of business," says Gilbert Mott, vice president of data center operations at Real Decisions Corp. in Darien, Conn.

Wilkinson is a free-lance writer in Charlottesville, Va.

Swap shops

User groups such as the following can match buyers and sellers of used equipment:

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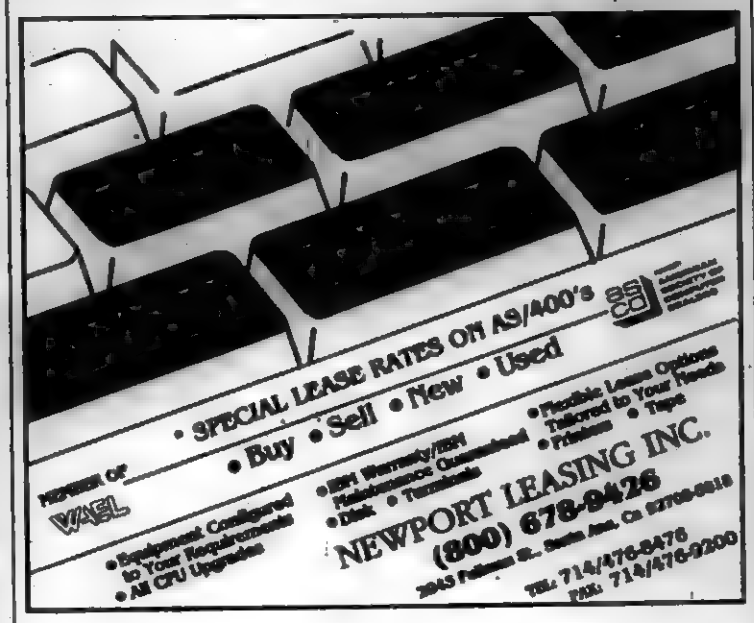

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PS/2 Model 70-A21	$875	$800
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ThinkPad 700C	$3,500	$3,600
PS/2 Model 90-Ol9	$1,700	$1,600
PS/2 Model 95-OJF	$3,000	$2,800
Compaq Prolinea 4/66	$2,000	$2,225
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A conference will be held in Kuala Lumpur, Malaysia on 20 August 1993, at 10 am, to discuss the RFEI. Participants of this conference must be holders of a valid copy of the Bank's RFEI document. They must confirm attendance by 17 August 1993.

Responses are on an obligation-free basis.

Contact Persons :

For discussion :
Name : Mr Joseph A P Heathcote,
Information Services Controller
Tel : 603-2741788 Ext 271
Fax : 603-2012125

For Appointments, Cash Security Deposit Details & Logistics :
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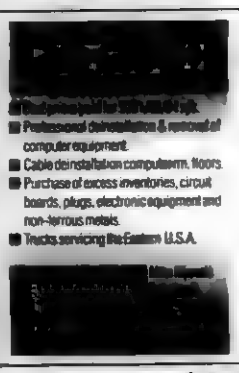

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Thomas J. Watson Research Laboratory 28
Transaction Processing Council 36
Trilogy Development Group 80
TSI International 16

U

U.S. Air Force 20
U.S. Department of Education 20
Ues, Inc. 16
Ungermann-Bass, Inc. 6
Unisys Corp. 1,20
United New Mexico Bank 10
University of Houston 1
US West 4
User Solutions 46
USX Corp. 63

V

Vertisoft Systems, Inc. 46
VMark Software, Inc. 96

W

Wang Laboratories, Inc. 1,16
Washington Natural Gas Co. 4
Wellfleet Communications, Inc. 10
William Carter Co. 10
Workflow Management Coalition 16
WorkGroup Technologies, Inc. 7,15
Wurttembergische 16

X

Xerox Corp. 48
Xircom, Inc. 55

Y

Yankee Group 61

Gainers Losers

Percent

Platinum Software	44.9	Stratus Computer Inc.(L)	-27.4
Cirrus Logic	54.0	Creative Technologies Inc.	-26.7
Komag Inc.	28.1	Network Corp.(L)	-21.1
Telebit Corp.	23.0	Synoptics Communications	-21.1
Walker Interactive Systems	22.7	Cray Research Inc.	-19.5
Quarterdeck Office Sys.	18.6	Convex Computer(L)	-18.4
US Robotics(H)	18.3	Novell Inc.(L)	-17.8
Aldus Corp.	15.6	Network Equipment Tech.	-17.8

Dollar

Platinum Software	10.38	Stratus Computer Inc.(L)	-8.25
Cirrus Logic	6.50	Creative Technologies Inc.	-7.75
Komag Inc.	4.50	Synoptics Communications	-7.00
US Robotics(H)	4.25	Cray Research Inc.	-5.25
DSC Communications(H)	3.25	Hewlett Packard Co.	-5.00
American Info Techs Corp.	2.88	Novell Inc.(L)	-4.50
Micron Technology(H)	2.75	Microsoft Corp.	-4.25
Sapiens Intl. Corp. N.V.	2.75	Autodesk Inc.	-4.00

Earnings reports move stocks

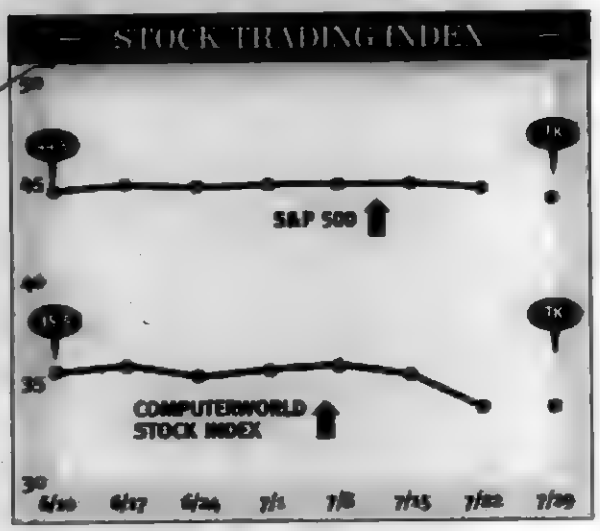
High-tech stocks rode up and down last week in the wake of quarterly financial announcements. While many firms had good news to report, several companies found investors hard to please.

•Chip maker Cirrus Logic, Inc.'s (CRUS) quarterly sales were down sequentially but up 47% year-over-year. The firm's profit of $3.8 million reflected a $10 million inventory write-down charge but an offsetting $10.1 million in onetime credits. Cirrus Logic shares hiked up 1¼ points on Monday and 3½ points the next day.

•Centigram Communications Corp.'s (CGRM) stock responded to record financial results. Centigram shares jumped 2½ points to hit a new 52-week high Monday after the company posted sales up 32% and profits up 86% from the year-ago quarter.

•Big-system software provider 4th Dimension Software Ltd.(DDDDF) found Wall Street less responsive. The company racked up record revenue and a 67% increase in quarterly income, but 4th Dimension's shares moved up only half a point on Tuesday after the announcement.

•VMark Software, Inc. (VMRK), an applications development tool vendor, saw revenue increase 63% for the quarter and operating profit grow by 64%, but VMark issues reacted Tuesday with a 1½-point slide. —*Derek Slater*



Exch	52-Week High	52-Week Low		July 30 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						
OTC	40.00	10.25	3 COM Corp.	22.13	-0.13	-0.6
NYS	81.25	63.38	American Info Techs Corp.	81.25	2.88	3.7
NYS	65.00	40.63	AT&T(H)	63.63	0.00	0.0
OTC	4.06	0.75	Artel Communication Corp.	2.38	-0.06	-2.6
OTC	24.50	10.25	Banyan Systems Inc.	17.00	-2.38	-12.3
NYS	59.63	44.50	Bell Atlantic Corp.	59.63	1.13	1.9
NYS	58.00	46.75	BellSouth Corp	58.00	1.50	2.7
NYS	9.25	3.63	Bolt, Beranek & Newman	9.25	-0.50	-5.1
OTC	18.50	9.50	Brooktrout Technology	13.75	0.50	3.8
NYS	109.00	52.13	Cabletron Systems	102.38	-1.00	-1.0
OTC	25.75	5.88	Centigram Communications(H)	25.00	2.00	8.7
OTC	50.50	19.00	Chipcom Corp.	46.50	-2.38	-4.9
OTC	57.25	22.13	Cisco Systems Inc.	52.00	-1.00	-1.9
OTC	16.38	5.50	Compression Labs Inc.	13.00	1.25	10.6
OTC	36.00	13.00	CrossComm	26.13	-1.88	-6.7
OTC	4.63	1.38	Data Switch Corp.	2.88	-0.25	-8.0
NYS	19.88	12.38	Digital Comm. Assoc.	13.38	-0.38	-2.7
OTC	12.75	4.00	Digital Systems Int'l Inc.	4.25	-0.13	-2.9
OTC	54.75	5.88	DSC Communications(H)	54.75	3.25	6.3
OTC	9.50	4.75	Fibronics Int'l Inc.(L)	5.50	0.38	7.3
OTC	24.00	8.75	Fluent Corp.	12.00	-0.25	-2.0
OTC	4.38	1.50	Gandalf Technologies Inc.	2.88	-0.13	-4.2
OTC	2.06	0.94	Gateway Communications	1.13	0.00	0.0
NYS	13.75	2.88	General Datacomm Inds.	9.50	0.13	1.3
ASE	3.75	2.00	Go Video	2.38	0.00	0.0
NYS	37.75	32.38	GTE Corp.	36.00	0.25	0.7
NYS	88.75	62.75	ITT Corp.(H)	88.75	0.13	0.1
OTC	28.94	15.50	MCI Communications Corp.	28.00	-1.13	-3.9
OTC	6.50	1.88	Microcom Inc.	1.88	-0.06	-3.3
OTC	24.25	3.75	Netrix Corp.(L)	3.75	-1.00	-21.1
OTC	19.00	7.50	Network Computing Devices	7.50	0.00	0.0
NYS	15.00	5.38	Network Equipment Tech.	7.38	0.13	1.7
OTC	20.13	8.00	Network General	11.50	0.25	2.2
OTC	15.75	7.13	Network Systems Corp.(L)	7.13	-1.38	-16.2
OTC	55.75	7.50	Newbridge Networks Corp.(H)	55.75	1.00	1.8
NYS	46.00	21.38	Northern Telecom Ltd.(L)	23.75	1.88	8.6
OTC	35.25	17.63	Novell Inc.(L)	20.75	-4.50	-17.8
NYS	92.50	79.00	Nynex Corp.	90.13	-0.13	-0.1
OTC	30.00	14.50	Octel Communications Corp.	23.63	1.25	5.6
OTC	6.13	3.38	Period Data Comm Networks	4.25	0.25	6.3
OTC	30.50	10.25	Picturetel Corp.	17.75	-0.13	-0.7
OTC	15.25	3.63	Proteon Inc.	4.13	0.13	3.1
NYS	35.00	16.34	Scientific Atlanta Inc.	30.50	0.75	2.5
NYS	40.75	31.75	Southwestern Bell Corp	40.25	0.00	0.0
NYS	36.38	22.25	Sprint Corp.(H)	36.38	1.38	3.9
OTC	27.00	11.38	Standard Microsystems Corp.	17.38	2.13	13.9
OTC	18.50	7.75	Stratacom Inc.	12.00	-0.25	-2.0
OTC	42.75	10.75	Synoptics Communications	26.25	-7.00	-21.1
OTC	7.00	3.75	Telebit Corp.	3.75	0.75	25.0
OTC	9.38	2.25	Telematics Int'l Inc.	9.13	1.13	14.1
OTC	27.25	14.00	US Robotics(H)	27.25	4.25	18.5
NYS	47.75	35.25	US West Inc.	47.00	-0.13	-0.3
OTC	55.50	17.50	Wellfleet Communications	51.50	-0.25	-0.5
OTC	17.25	7.25	Xircom	16.00	0.50	3.2
PCs and Workstations						
OTC	5.56	2.50	Advanced Logic Research	3.25	-0.13	-3.7
OTC	65.25	25.25	Apple Computer Inc.(L)	26.00	1.88	7.2
OTC	24.25	11.25	AST Research Inc.	15.00	-0.75	-4.8
NYS	10.25	2.50	Commodore Int'l	3.25	-0.13	-3.7
NYS	61.75	27.75	Compaq Computer Corp.	47.13	-3.00	-6.0
OTC	49.88	13.90	Dell Computer Corp.	20.13	2.63	15.0
NYS	89.25	50.25	Hewlett Packard Co.	72.00	-5.00	-6.5
NYS	39.75	17.63	Silicon Graphics(H)	34.25	-3.25	-8.7
OTC	41.00	24.00	Sun Microsystems Inc.	29.63	2.25	8.2
NYS	32.38	22.25	Tandy Corp.	28.50	-0.38	-1.3
OTC	7.00	2.75	Zeos International Ltd.	3.00	-0.38	-11.1
Mainframes and Supercomputers						
ASE	15.13	4.63	Amdahl Corp.	5.38	0.13	2.4
NYS	8.75	3.75	Convex Computer(L)	3.88	-0.88	-18.4
OTC	6.13	2.25	Cray Computer	2.78	-0.22	-7.3
NYS	30.88	19.00	Cray Research Inc.	21.63	-5.25	-19.5
NYS	13.88	7.63	Data General Corp.	8.50	-0.13	-1.5
NYS	49.25	30.38	Digital Equipment Corp.	35.88	-1.63	-4.3
NYS	39.25	28.13	Harris Corp.	38.50	0.38	1.0
NYS	95.25	41.13	IBM(L)	44.00	1.63	3.8
OTC	22.00	5.50	Kendall Square Research	17.00	-0.25	-1.5
NYS	127.50	63.00	Matsushita Electronics	125.00	2.50	2.1
OTC	23.75	8.25	NetFrame	15.00	-3.25	-17.8
OTC	17.25	9.25	Parallan Computer	16.13	0.25	1.6
OTC	21.00	6.00	Pyramid Technology	18.25	-0.75	-4.0
OTC	24.00	11.25	Sequent Computer Sys.	12.88	0.50	4.0
OTC	8.75	1.38	Sequoia Systems Inc.	1.94	-0.13	-6.1
NYS	48.38	21.88	Stratus Computer Inc.(L)	21.88	-8.25	-27.4
NYS	16.88	9.88	Tandem Computers Inc.	10.38	-0.13	-1.2
OTC	23.50	10.63	TriCord Systems	19.50	-0.50	-2.5
NYS	13.88	7.75	Unisys Corp.	10.13	-0.38	-3.6
Software						
OTC	74.00	25.25	Adobe Systems Inc.	50.13	-3.38	-6.3
OTC	20.75	10.25	Aldus Corp.	17.63	2.38	15.6
OTC	14.25	5.50	American Software Inc.	6.38	-0.38	-5.6
OTC	28.13	10.00	ASE Computer Systems	10.38	-0.75	-6.7
OTC	56.75	38.63	Autodesk Inc.	41.00	-4.00	-8.9
OTC	10.75	2.50	Bachman Info. Systems	3.63	-0.38	-9.4
OTC	43.00	31.00	BGS Systems Inc.	31.00	-1.25	-3.9
OTC	84.13	38.75	BMC Software Inc.	55.50	-0.75	-1.3
OTC	28.25	17.00	Boole & Babbage	24.50	-0.25	-1.0
OTC	49.00	17.50	Borland Int'l Inc.	18.50	-1.63	-8.1
OTC	5.38	3.00	CE Software	3.19	-0.19	-5.5
ASE	34.88	7.75	Cheyenne Software Inc	30.63	-3.38	-9.9
OTC	19.50	8.25	ChipSoft	9.75	-0.25	-2.5
OTC	9.00	5.63	Cognos Inc.	8.50	0.25	3.0
NYS	31.38	13.00	Computer Associates	28.38	-1.38	-4.6
NYS	12.38	2.75	Computervision Corp.	3.38	0.13	3.9
OTC	34.25	19.25	Compuware Corp.	28.50	2.50	9.6
OTC	14.75	5.75	Comshare Inc.	8.13	0.63	8.3
OTC	19.13	10.75	Corel Corp.	19.00	1.38	7.8
OTC	15.25	5.00	Easel Corp.	7.00	-0.25	-3.5
OTC	25.25	12.00	4th Dimension	18.63	-0.13	-0.7
OTC	19.50	5.25	Frame Technology	7.38	0.88	13.5
OTC	19.00	8.38	Group I Software	10.50	1.00	10.5
OTC	35.25	14.50	Gupta	20.25	0.13	0.6
OTC	9.38	4.13	Hogan Systems Inc.	9.38	1.00	11.9
OTC	25.75	11.25	IMRS	19.25	0.75	4.1
OTC	38.00	21.00	Information Resources	35.00	1.00	2.9
OTC	27.25	8.81	Informix Corp.	21.50	-0.75	-3.4
OTC	16.75	8.75	Intergraph Corp.	9.38	0.00	0.0
OTC	13.63	6.00	Interleaf Inc.(L)	6.38	-0.75	-10.5
OTC	18.00	5.50	Intersolv Inc.	5.50	0.25	4.8
OTC	16.00	7.75	Knowledgeware Inc.	11.25	0.25	2.3
OTC	54.75	15.50	Legent Corp.	20.00	2.50	14.3
OTC	37.00	14.75	Lotus Development	36.50	-1.25	-3.3
OTC	23.00	6.25	MathSoft	6.25	0.00	0.0
OTC	23.25	5.25	McAfee Associates	6.25	0.13	2.0
OTC	11.63	1.88	Mega Software	5.13	-0.25	-4.7
OTC	12.00	5.25	Mentor Graphics	8.50	-0.75	-8.1
OTC	46.00	26.63	Micro Focus	28.25	-1.50	-5.0
OTC	13.25	4.38	Micrografx Inc.	6.06	-0.56	-8.5
OTC	98.00	68.00	Microsoft Corp.	73.75	-4.25	-5.5
OTC	52.63	15.75	Oracle Corp.(H)	50.50	0.00	0.0
OTC	37.00	18.38	Parametric Technology	35.00	0.75	2.2
OTC	40.50	22.50	PeopleSoft	30.25	-1.38	-4.4
OTC	7.13	3.50	Phoenix Technologies	4.38	-0.13	-2.8
OTC	40.00	22.00	Powersoft	30.88	-2.13	-6.4
OTC	61.50	17.00	Platinum Software	33.50	10.38	44.9
OTC	25.00	10.75	Platinum Technology	12.50	-0.13	-1.0
OTC	61.50	32.25	Progress Software Corp.	43.50	-1.50	-3.3
OTC	7.38	2.56	Quarterdeck Office Sys.	3.19	0.50	18.6
OTC	32.00	14.25	Rainbow Technologies Inc.	25.50	-0.50	-1.9
OTC	11.50	4.00	Rasterops	8.25	-0.50	-5.7
OTC	15.25	3.63	Ross Systems	10.75	0.25	2.4
OTC	27.50	9.63	Sapiens Intl. Corp. N.V.	26.75	2.75	11.5
OTC	14.50	5.63	Software Publishing Corp.	5.63	-1.00	-15.1
OTC	12.00	2.38	Software Toolworks Inc.	12.00	1.13	10.3
OTC	3.00	0.75	Spinnaker Software	1.25	-0.06	-4.8
OTC	12.75	3.75	State of the Art	12.00	0.63	5.5
NYS	24.63	15.00	Sterling Software Inc.	22.38	-0.88	-3.8
OTC	21.50	8.00	Struct. Dynamics Research	19.75	1.25	6.8
OTC	77.50	26.50	Sybase Inc.	71.00	-2.00	-2.7
OTC	21.38	5.88	Symantec Corp.	13.50	0.13	0.9
NYS	12.50	5.25	Systems Center Inc.	10.25	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	20.00	0.00	0.0
OTC	6.38	2.75	Teradc Corp.	3.75	0.25	7.1
OTC	22.75	10.00	Viewlogic Systems	21.00	1.13	5.7
OTC	23.50	6.50	Walker Interactive Systems	6.75	1.25	22.7
OTC	3.19	1.31	Wordstar(L)	1.31	-0.09	-6.6
Semiconductors						
NYS	32.88	8.38	Advanced Micro Devices	23.75	-0.50	-2.1
NYS	22.38	9.38	Analog Devices Inc.(H)	21.88	0.63	3.0
OTC	26.50	7.63	Atmel Corp.	26.50	0.75	2.9
OTC	5.50	2.75	Chips and Technologies	3.75	-0.63	-14.3
OTC	39.75	13.00	Cirrus Logic	25.63	6.50	34.0
NYS	15.13	7.88	Cypress Semiconductor Corp.(H)	15.00	0.63	4.4
NYS	16.50	9.38	Dallas Semiconductor	15.75	0.00	0.0
OTC	60.63	27.13	Intel Corp.	52.00	0.13	0.2
NYS	17.00	4.88	LSI Logic Corp.	16.38	0.25	1.6
OTC	22.16	11.09	Lattice Semiconductor	38.25	0.25	1.4
NYS	45.50	14.38	Micron Technology(H)	45.50	2.75	6.4
NYS	90.88	61.38	Motorola Inc.(H)	90.25	2.38	2.7
NYS	17.25	9.88	National Semiconductor	16.38	-0.13	-0.8
OTC	15.75	6.50	Sierra Semiconductor	7.00	-0.25	-3.5
OTC	50.75	23.00	SynOptics(H)	49.00	0.75	1.6
NYS	76.50	36.75	Texas Instruments	71.00	-2.25	-3.1
OTC	11.75	6.25	VLSI Technology	11.75	1.13	10.6
OTC	12.63	2.63	Weitek	11.75	0.25	2.2
ASE	9.63	3.63	Western Digital Corp.	4.13	0.25	6.5
OTC	40.75	14.50	Xilinx(H)	40.00	0.50	1.3
OTC	33.00	13.84	Zilog Inc.	24.50	-1.75	-6.7
Peripherals and Subsystems						
OTC	42.00	15.00	American Power Conversion(H)	39.50	-1.25	-3.1
OTC	20.16	15.50	Banctec Inc.	18.25	0.25	1.4
OTC	18.00	4.25	Cambex Corp.(L)	4.50	0.00	0.0
ASE	10.38	3.88	Cognitronics Corp.(L)	4.63	0.13	2.8
NYS	25.50	9.00	Conner Peripherals	11.25	0.38	3.5
OTC	38.50	10.75	Creative Technologies Inc.	21.25	-7.75	-26.7
OTC	30.75	11.00	Data Race Inc.	12.75	0.25	2.0
ASE	16.38	4.75	Dataram Corp.	9.38	0.00	0.0
NYS	26.25	5.06	EMC Corp.(H)	24.00	-0.88	-3.5
OTC	10.50	5.38	Emulex Corp.	6.50	0.13	2.0
OTC	19.00	13.25	Evans & Sutherland	16.00	-0.88	-5.2
OTC	33.00	7.50	Exabyte	8.75	-0.25	-2.8
OTC	28.75	7.09	Intelligent Info. Systems	24.75	0.75	3.1
OTC	6.88	3.63	Iomega Corp.(L)	3.75	0.00	0.0
OTC	15.75	5.75	IPL Systems Inc.	9.00	0.00	0.0
OTC	24.00	14.00	Komag Inc.	20.50	4.50	28.1
OTC	19.63	5.00	Maxtor Corp.	5.25	-0.63	-10.6
OTC	11.25	5.75	Micropolis Corp.	6.25	0.00	0.0
NYS	117.00	97.00	3M Corp	106.00	-3.00	-2.8
OTC	7.75	4.00	Printronix Inc.	6.38	-0.63	-8.9
NYS	17.25	6.88	QMS Inc.	9.00	0.50	5.9
OTC	17.88	9.50	Quantum Corp.	11.13	1.25	12.7
OTC	11.88	3.13	Radius Inc.	4.25	0.13	3.0
NYS	16.50	7.88	Recognition Equipment	12.00	-1.50	-11.1
OTC	13.88	3.75	Reton Inc.	4.13	0.00	0.0
OTC	22.38	12.00	Seagate Technology	19.50	1.50	8.3
NYS	45.00	18.00	Storage Technology	27.25	-0.63	-2.2
NYS	27.88	17.63	Tektronix Inc.	25.75	0.13	0.5
NYS	88.88	71.50	Xerox Corp.	71.00	-0.25	-0.3
Services						
OTC	23.75	14.88	American Mgmt. Systems(L)	16.00	1.00	6.7
NYS	4.75	2.38	Arlac Corp Inc.	2.88	0.00	0.0
OTC	38.75	16.25	Analysts Int'l	27.75	-0.50	-1.8
NYS	56.13	43.00	Auto Data Processing	49.88	0.75	1.5
NYS	17.25	12.50	Ceridian Corp.	15.00	-0.63	-4.0
NYS	17.38	13.13	Comdisco Inc.	14.38	-0.25	-1.7
OTC	9.00	4.50	Computer Horizons(H)	9.00	0.38	4.4
NYS	85.75	63.13	Computer Sciences	83.88	1.25	1.5
NYS	9.25	6.13	Computer Task Group	8.13	-1.00	-14.0
NYS	40.50	20.63	CompUSA Inc.	20.63	-2.88	-12.2
OTC	14.25	6.00	Corporate Software	8.75	0.38	4.5
OTC	19.25	7.00	Egghead Discount Software(L)	7.00	-0.38	-5.1
NYS	35.88	26.00	General Motors E (EDS)	27.63	0.00	0.0
OTC	25.50	10.50	Inacom Corp.	22.00	0.88	4.1
OTC	16.25	8.13	Intelligent Electronics(H)	15.63	-0.63	-3.9
OTC	13.13	6.63	Merisel	12.38	0.00	0.0
OTC	23.75	5.75	Microage Inc.(H)	22.25	2.00	9.9
OTC	43.00	24.25	Paychex	42.75	1.75	4.3
NYS	87.25	25.25	Policy Management Sys.	27.50	-1.75	-6.0
NYS	41.38	20.38	Reynolds and Reynolds	40.88	0.38	0.9
OTC	17.25	11.00	SEI Corp.	17.00	0.50	3.0
OTC	24.38	17.50	Shared Medical Systems(L)	20.25	-0.13	-0.6
OTC	12.63	5.75	SHL Systemhouse	9.88	-0.50	-4.8
OTC	30.75	20.00	Software Spectrum Inc.	26.00	-0.75	-2.8
OTC	36.50	23.25	Sungard Data Systems(H)	36.25	0.25	0.7
NYS	4.38	3.13	Ultimate Corp.	3.38	0.38	12.5

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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INDUSTRY PULSE: Wireless technology

Many network users remain skeptical about wireless technology for good reasons — high product costs, slow network speeds, lack of standards and the investment in their current system. All of these have kept wireless technology in a small niche market.

TOTAL U.S. WIRELESS REVENUE (IN MILLIONS)

1989	$1.2
1990	$3.6
1991	$24.8
1992	$96.6
1993*	$456.9
1994*	$961.8
1995*	$1.56B

LEGISLATIVE WATCH

- The Federal Communications Commission has reserved 3 MHz of spectrum in the 900-MHz band for wireless personal communications systems [CW, July 5].
- Because of an outdated law, the privacy of wireless data communications does not get much legal protection. The Electronic Communications Privacy Act of 1986 failed to anticipate the advent of radio-based communications services and does not cover them [CW, June 17, 1993].

INDUSTRIES (PERCENT OF U.S. REVENUE)

	LAN	VOICE	INTEGRATED
1989	100%	-	-
1990	100%	-	-
1991	97%	3%	-
1992	74%	26%	-
1993*	42%	25%	33%
1994*	39%	27%	34%
1995*	38%	21%	41%

TECHNOLOGIES (PERCENT OF U.S. REVENUE)

	SPREAD SPECTRUM	MICROWAVE	OTHER
1989	100%	-	-
1990	58%	-	42%
1991	39%	37%	24%
1992	44%	27%	29%
1993*	43%	37%	20%
1994*	43%	38%	19%
1995*	43%	41%	16%

*Projected

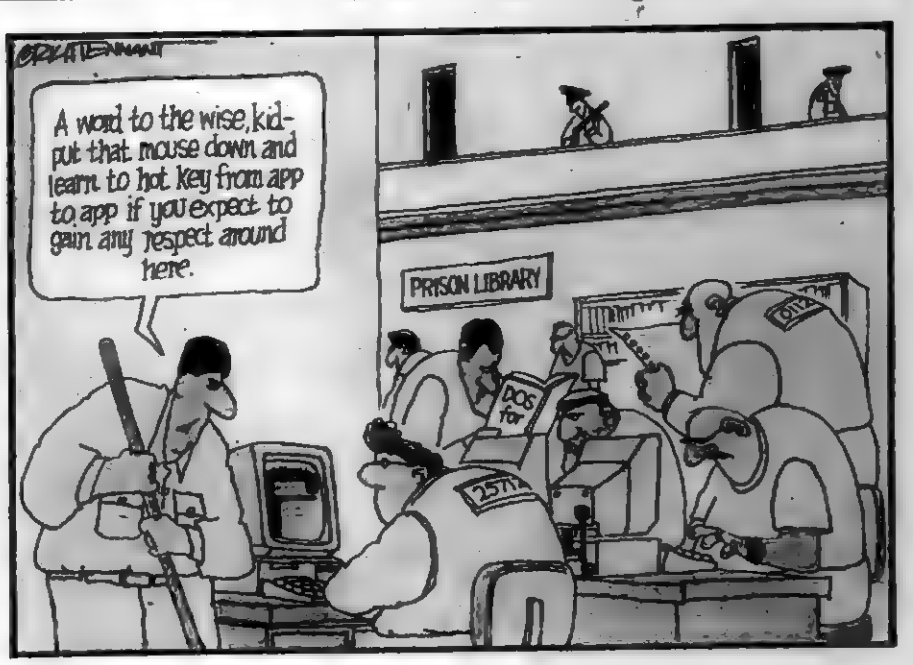
LAN COSTS PER USER

NETWORK INTERFACE CARD	HUB PORT	CABLE	LABOR	TOTAL COST	COST TO MOVE EACH USER
WIRELESS	$120**	$1,000 – $2,000***	-	$50	$1,170 – $2,170	$50
ETHERNET	$120	$100	$50	$500	$770	$550
TOKEN RING	$180	$150	$50	$500	$880	$550
FDDI	$1,500	$1,500	$100	$750	$3,850	$850

**Wireless-specific network interface card is not required except by NCR WaveLAN
***Per-user pricing for high-speed (x86 bit/sec. or greater) wireless LAN has a wide range depending on product configuration

Source: Frost & Sullivan/Market Intelligence, Mountain View, Calif.; The Yankee Group, Boston, Mass.

The 5th Wave *by* Rich Tennant



Inside Lines

Stacking the deck?

Novell will take a swipe at Microsoft today when it announces it will integrate Stacker with Novell DOS 7.0. Microsoft wooed Stacker maker Stac Electronics for its compression software, then jilted it in favor of customizing someone else's software. Stac is suing Microsoft for patent infringement. Novell and Stac will also announce a strategic development agreement, including the prospect of a compression utility in NetWare.

Hats off to competition

MFS Datanet will become the first carrier Thursday to fire up nationwide Asynchronous Transfer Mode (ATM) service with transport and application services available immediately in 15 cities. The San Jose, Calif.-based company's ATM network will diverge from the WilTel links it currently resells, sources close to the company said.

Meet ya'll later

Lotus will unveil a group version of its Organizer scheduling software at the Groupware '93 conference in San Jose, Aug. 10-11. A version that is integrated with CC:Mail will be available by the end of this month, and a version that is integrated with Notes and Vendor Independent Messaging applications will follow "shortly thereafter," according to a source.

On the block? You bet!

Rumors that restructuring Tandem is looking to dump part or all of smart hub company Ungermann-Bass in Santa Clara, Calif. — which it bought for $220 million in 1988 — are backed up by Rochester, N.H.-based Cabletron Systems chairman Craig Benson. He said he has been approached by investment bankers twice in the past eight months about purchasing the firm. The most recent proposition came about six weeks ago, he said. However, "I have enough trouble managing a company with a 50% growth rate without taking on a company 3,000 miles away with financial problems," Benson said.

Tracking on

E. O. (Skip) Stout has been replaced as vice president of Navistar International's IS department. Arthur J. Date Jr., formerly the head of the business and technical systems group for the company's Engine and Foundry Division, took over Stout's post last week. Neither could be reached for comment. Stout joined Navistar in 1983 as a senior network consultant; he was made vice president of the approximately 200- to 250-person IS department in 1989 with a mandate to implement a companywide IS reorganization, centralizing IS and distributing application development. A company spokeswoman said Stout was being retained for a special project but had no additional details.

Microsoft may have spoken cautiously about its financial future at last week's analysts meeting (see story page 12), but it wasn't acting that way. The company previewed some of the features that will be included in Excel 5.0 and Word 6.0, programs that are the core offerings of the Microsoft Office 4.0 suite, which the company will begin selling this fall. However, delivery of the full Office 4.0 suite is likely to be piecemeal as some applications in the suite become ready before others, Microsoft Executive Vice President Steve Ballmer said. The major new feature in the suite will be support for OLE 2.0, which Microsoft executives say will break down the boundaries between applications. In addition to OLE 2.0, Office 4.0 will support the use of Visual Basic as a common macro language; cross application Wizards; context-sensitive agents called IntelliSense that will customize applications to a particular user's habits; and a query tool that will let applications draw in data from external sources. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8166.

Midrange players

CONTINUED FROM PAGE 1

"The fundamental implication of open systems is that hardware is a commodity, and commodity competition is not a pretty picture," said Robert Herwick, an analyst at Hambrecht & Quist, Inc., a venture capital firm in San Francisco.

"The model is the PC model," added Barbara Babcock, vice president of marketing at Stratus Computer, Inc. Even Stratus, which had been somewhat insulated from pricing pressures because of its fault-tolerant focus, now sees eroding profit margins as "unavoidable," she added.

As a result, system vendors are now "competing with people they never heard of" selling PCs and are scrambling to bring their costs down to the level that a commodity market demands, said Chris Christiansen, an analyst at market research firm International Data Corp. in Framingham, Mass.

Mixed bag

Beyond IBM, financial results in the just-finished quarter have proved to be a mixed bag for vendors trying to move from their proprietary sinecures into the open systems and client/server domain.

DEC, as expected, returned to profitability after six straight losses with a $113.2 million net income for its fourth fiscal quarter. Revenue was flat at $3.9 billion, though, and William Steul, DEC's chief financial officer, said the company "cannot count on a profit" in the first quarter of fiscal 1994.

Other vendors did not fare as well. For example, Tandem Computers, Inc. reported a whopping $549.5 million loss fueled by a $451 million charge taken to cover a 15% work force reduction. Data General Corp. lost $16.4 million, and Wang Laboratories, Inc. lost another $43.8 million. In short, many midrange firms' earnings reports were soaking in red ink.

Adding to woes caused by changing technology trends are weak economic conditions, especially in Europe (see story at right), analysts said. As a result, forecasts for the current quarter were not optimistic. Most midrange vendors said they remain extremely cautious about the short-term outlook.

The problem, said Jim Ousley, president and chief executive officer of Control Data Systems, Inc., is that these companies had infrastructures that were used to living off 60% or 70% margins. "They're literally half that now."

"Bigness was goodness" when companies were oriented toward manufacturing rather than services, added Geoffrey Woollacott, president of Renaissance Group International, Inc., a Pepperell, Mass., consulting firm. "Now it's an albatross."

One DEC customer empathized with what DEC and others face.

"It's tough to restructure a company," said Frank Brake, director of international operations for technology business development at Newport News Shipbuilding and Drydock Co. "Only time will tell if they're better at it than the rest of us are."

Novell flat; Banyan up in Q3

Slow NetWare 4.0 sales, sluggish industry hamper growth, Novell says

By Lynda Radosevich

■ Novell, Inc. said it will post uncommonly weak revenue and income for its fiscal third quarter. At the same time, Banyan Systems, Inc. reported its highest ever revenue and profit.

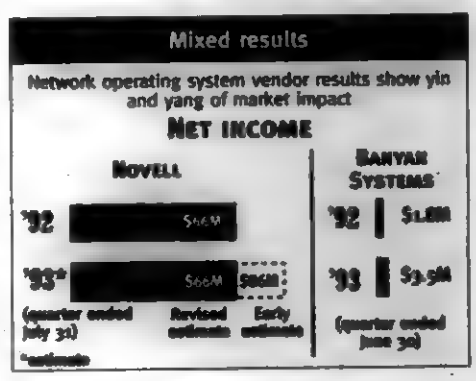
However, industry observers said the deviation in Novell's earnings is not linked to Banyan's success because Banyan traditionally serves the large enterprise market while Novell serves the workgroup market.

The ordinarily fast-growing Novell put the brakes on last week by announcing that it expects revenue from its fiscal third quarter, ended July 31, to be flat with its second-quarter revenue of $281 million.

That amounts to roughly a 15% increase over the third quarter of 1992, but Novell's 1993 third-quarter net income is expected to decline from the previous quarter and roughly equal the previous year's third-quarter income of $66 million. (Exact numbers will be released at the end of this month.)

Banyan, meanwhile, recorded revenue in its second fiscal quarter, which ended June 30, of $32.2 million, a 17% rise from the previous year's second quarter. Net income increased to $3.49 million, an 89% increase over the prior year's second-quarter income.

Novell attributed its flat earnings to weak European sales. The company relies on international sales for 49% of its total 1993 sales and apparently was heavily affected. However, observers said European sales have been soft for some time, and other major software vendors have not seen unexpected precipitous drops in that market.



"I think there are other issues," said Rick Sherlund, an analyst at Goldman Sachs & Co. For instance, NetWare customers have been "ramping slowly" to the recently released NetWare 4.0. Although Novell said it expected this, it may have put too much inventory into the distribution channel in the second quarter, leading to slower sales in the third quarter, he said.

Contributing to Novell's unspectacular quarter were onetime write-offs for several purchases, including $270 million for Unix System Laboratories, Inc. and another $30 million for two smaller purchases, including Fluent, Inc. in Natick, Mass.

Analysts generally agreed Novell's stumble did not signal long-term growth problems but said the disclosure indicates slower growth in the entire PC industry.

Banyan had better luck by offsetting declining international revenue with strong North American sales, which were $27.3 million, up from $21.6 million for the same period last year.

According to Jeff Glidden, Banyan's chief financial officer, non-North American sales account for less than 25% of the company's revenue, so Banyan was not as affected by the international downturn.

Second-quarter earnings, calendar 1993

Company	Revenue, April through June	Percent change from 1992	Net income, April through June	Percent change from 1992
Advanta Corp.				
Aldus Corp.	$45.6M	17.2%	$222,000	(124.7)%
Computer Sciences Corp.				
Computervision Corp.	$216.9M	(25.6)%	$(8.8)M	*
Control Data Systems, Inc.				
Cray Research, Inc.	$187.7M	1.4%	$6.2M	398.1%
Data General Corp.				
Digital Equipment Corp.	$3.91B	0.2%	$123.2M	(93.6)%
Electronic Data Systems Corp.				
Marcam Corp.	$34.9M	56.8%	$2.7M	26.1%
Microgratx, Inc.				
Microsoft Corp.	$1.04B	37.5%	$265M	26.2%
Platinum Software Corp.				
Proteon, Inc.	$26.9M	(14.6)%	$1.2M	(52.3)%
Quarterdeck Office Systems				
Silicon Graphics, Inc.	$319.3M	33.1%	$33.2M	132.3%
Stratus Computer, Inc.				
Sun Microsystems, Inc.	$1.26B	29.6%	$96.1M	100%
The ASK Group, Inc.				
Wang Laboratories, Inc.	$344M	(40.3)%	$(44.9)M	*

*Not meaningful

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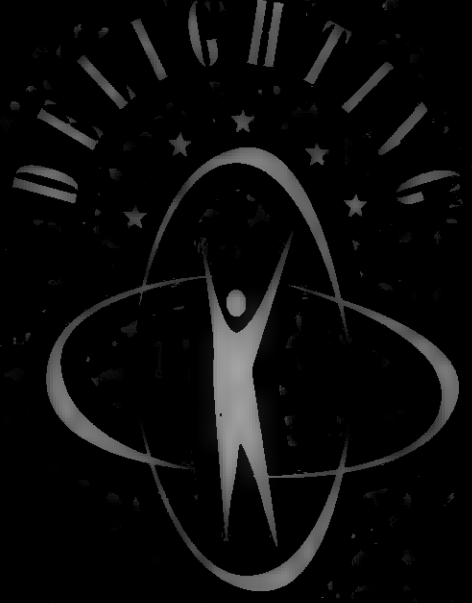

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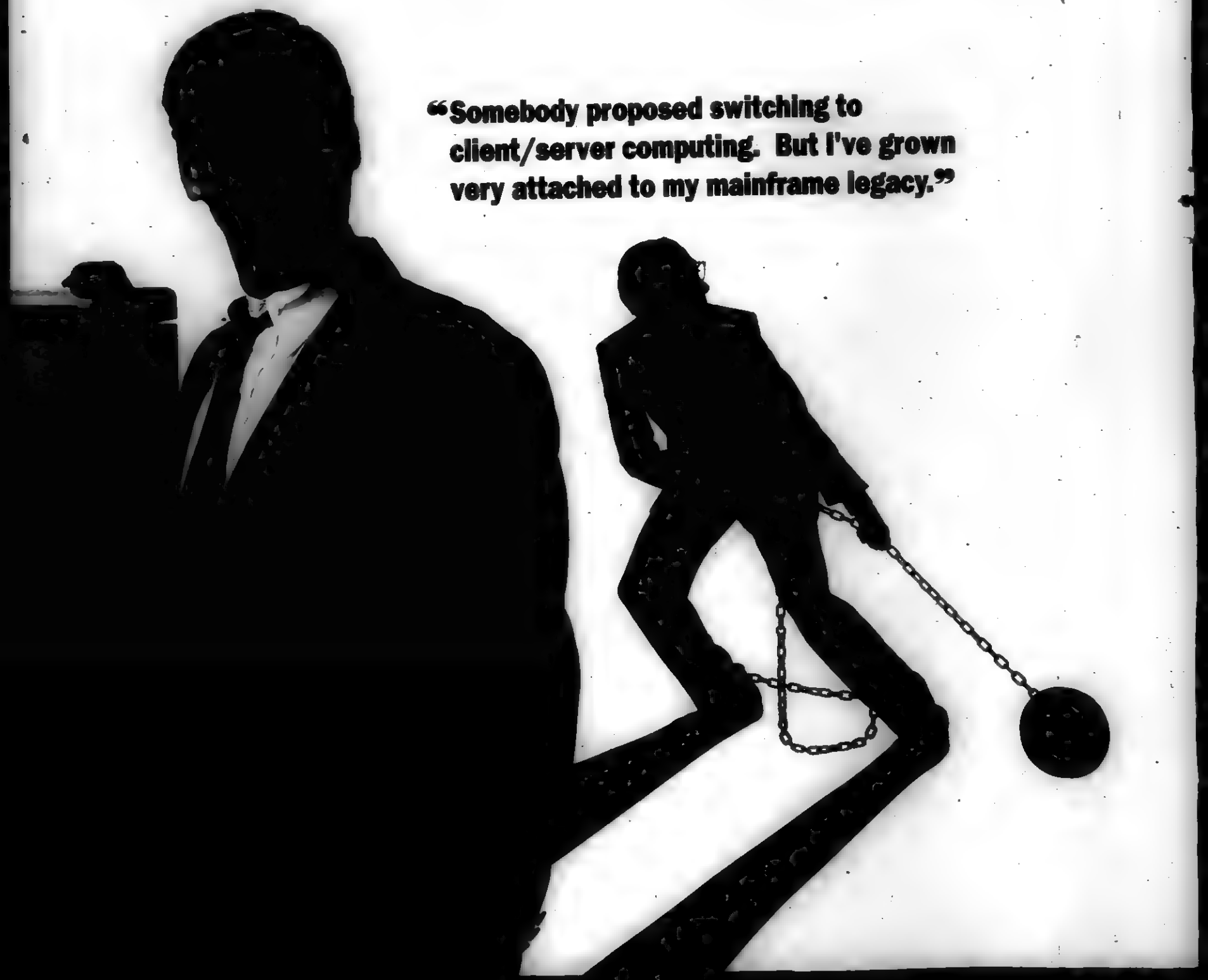

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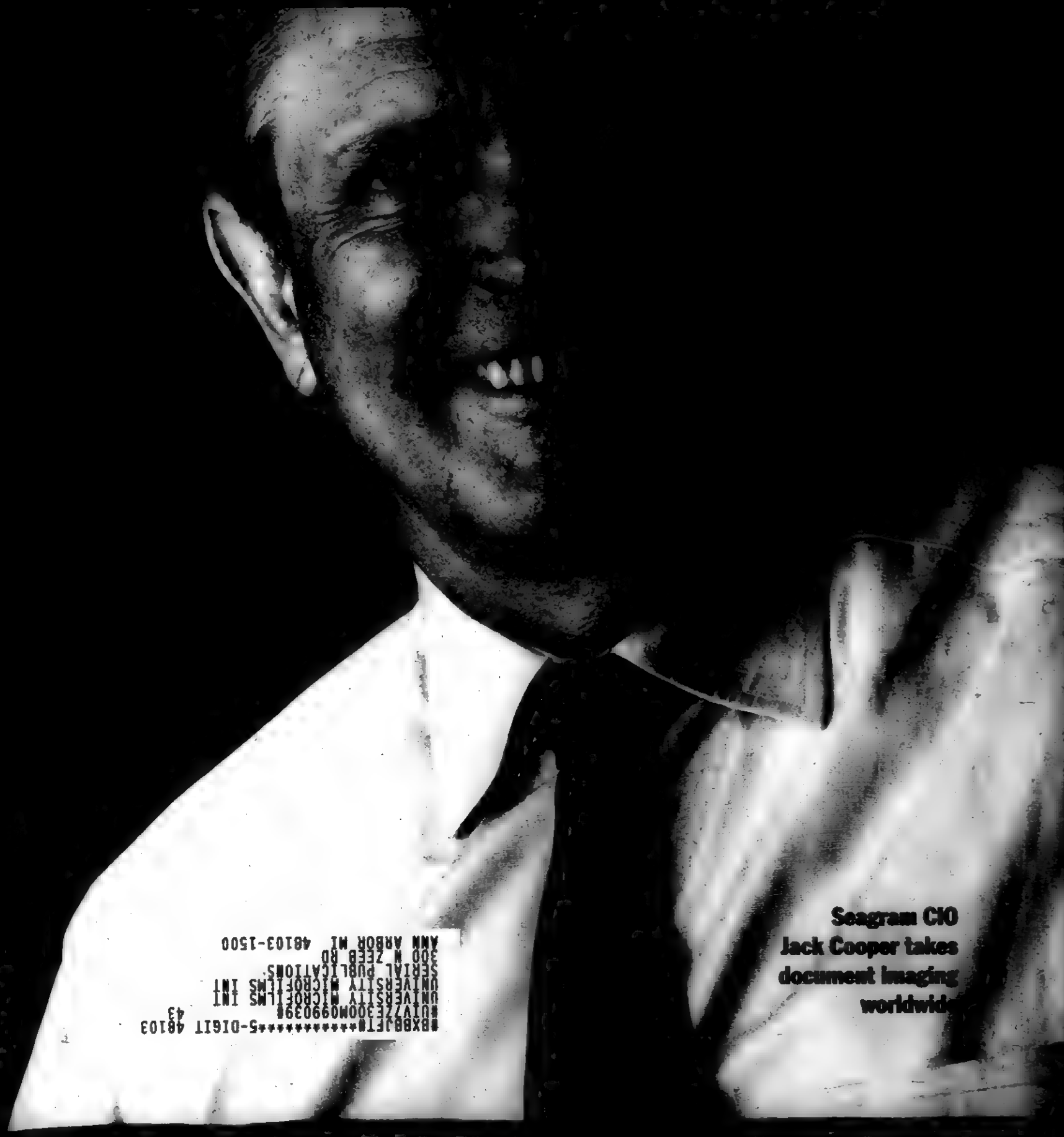

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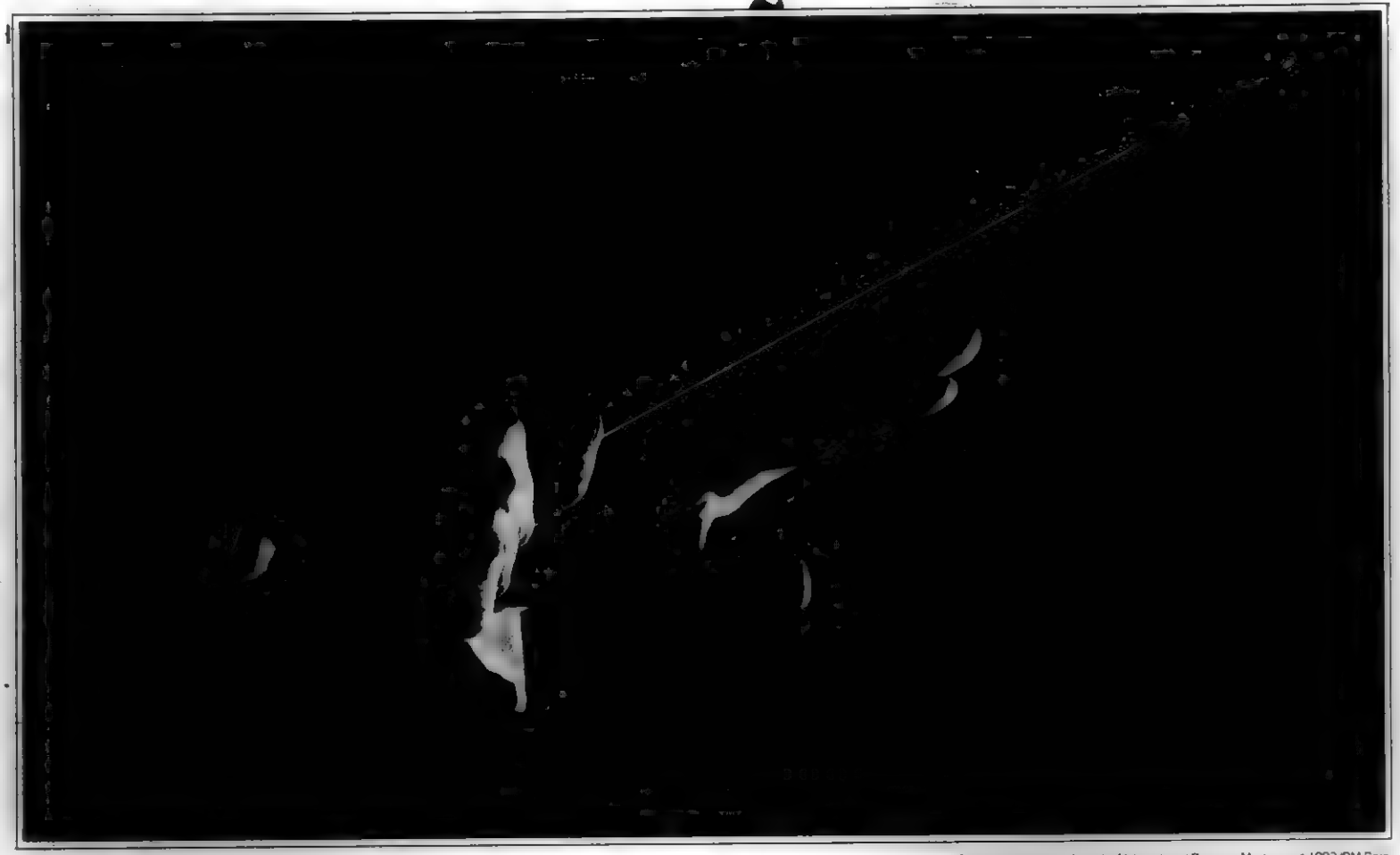

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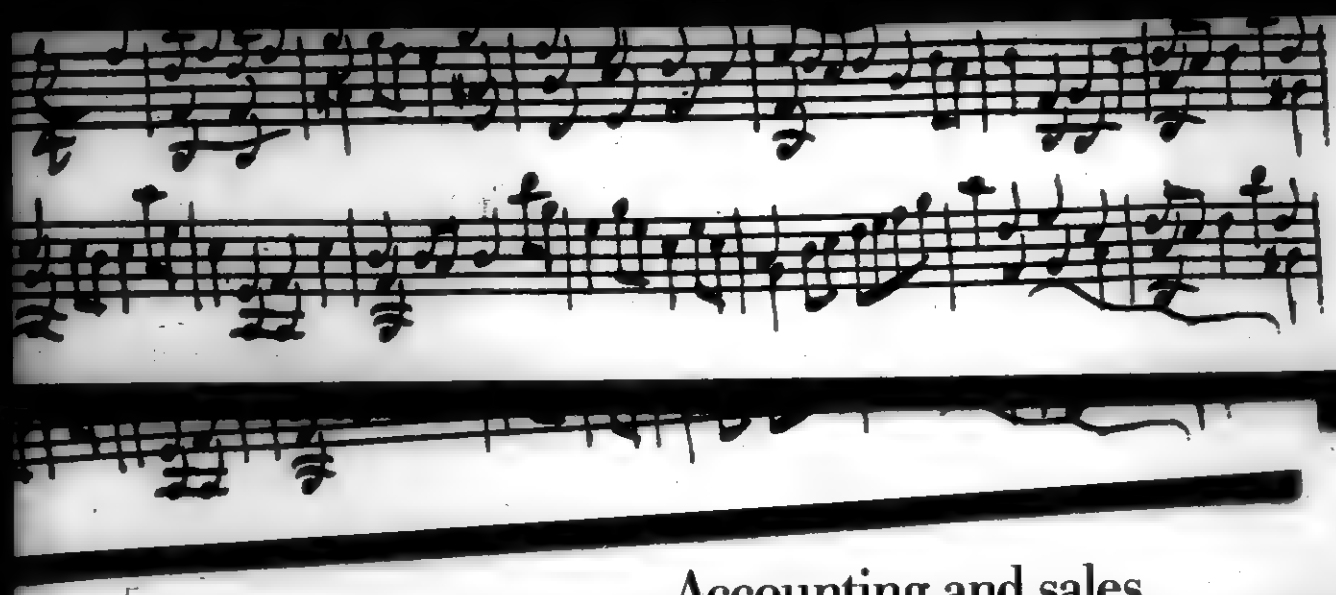


Accounting and sales

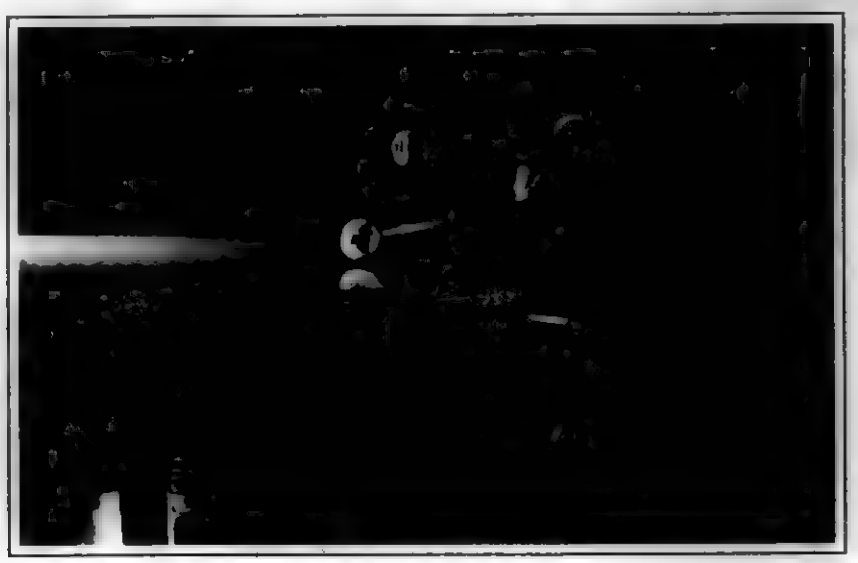
can't seem

to get in tune.

Marketing

is fiddling around

on their own.



And basically,

everyone seems to be marching to their own drummer.

Sound familiar?

EDITOR'S NOTE

Hitching a ride on the glacier

I called up one of my favorite IS guys recently and caught him going live with his new client/server operation — the culmination of a carefully orchestrated two-year rollout. His usual relaxed Southern charm was worn to a fricassee.

"I've had four hours' sleep in the last three days," the manager growled, as he ticked off a verbal list of unnerving things-gone-wrong.

Understand, now: This man is an open systems, distributed computing, client/server *believer*. He chose his vendors carefully, benchmarked hardware 'til it squeaked and extracted every written guarantee he could dream up from his software suppliers.

Still, there were jolting and distressing surprises. Like the database vendor that blithely broke its vow to continue supporting the Cobol interface on his company's Unix variant.

Despite such bumps in the road, however, this manufacturing company remains committed to client/server, confident that the change will quicken its responsiveness to customers, streamline internal business processes and improve overall communication.

Stephen Sherman

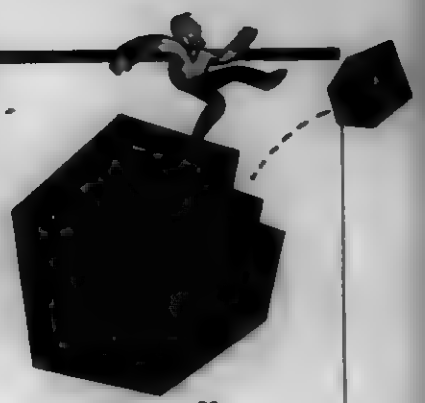
If such a mixture of frustration and faith sounds familiar, then welcome to the premier issue of *Computerworld Client/Server Journal*, a reality-based, warts-and-all exploration of these new technologies at work in your businesses.

Computerworld Client/Server Journal will focus exclusively on the increasingly open and distributed nature of computing in the '90s. We will cover the topic from many vantage points, including system and network management, case studies of user companies, multivendor support issues, data security, applications development and more.

As many of *Computerworld*'s readers know only too well, the move to client/server can be complex and cumbersome in some places and maddeningly immature in others. Yet no one talks about turning back or unlearning hard-won new skills. As the rewards start to roll in, they are simply too compelling to ignore.

"As an industry, we're still early on in the learning cycle. But I'm hearing some very good stories about client/server from some of our brokerage member firms," said Wayne Fowler, director of technology and network services at the Toronto Stock Exchange, which is already saving 20% annually on cost of operation from its client/server conversion.

"This is, quite simply, where the business is going," Fowler added. "Client/server is like a big glacier and you've got two choices: Plaster yourself up against the front and try to stop it. Or get on top and ride."



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War stories and advice from the user front lines on how to disarm the technical land mines that can bring down your client/server project.

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Client/server design promises easy access to reams of critical information, yet it can swing the door open to intruders as well.

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Managers try to regain control of communications bandwidth as client/server applications gobble it up.

33 **Decision time for applications** ♦ *by David Baum*
Choosing the right applications for client/server vs. host-based computing means factoring in everything from user demands to data requirements.

48 **No trouble for Tribble** ♦ *by Maryfran Johnson*
An interview with Sun Microsystems' "objects guru" Bud Tribble, who says the programmer learning curve and immature tools are slowing acceptance of object-oriented technologies.

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A quarterly compendium of industry events, opinions, research findings and more on client/server issues.
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Exclusive user survey
As more client/server apps roll into production use, our survey of IS professionals shows networking is still the No. 1 hassle.
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User viewpoints
Top IS execs at Hyatt Hotels and John Hancock offer some advice and observations on moving to new environments.
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Users put USL's Unix Tuxedo transaction processing monitor through its paces and find some room for improvement.
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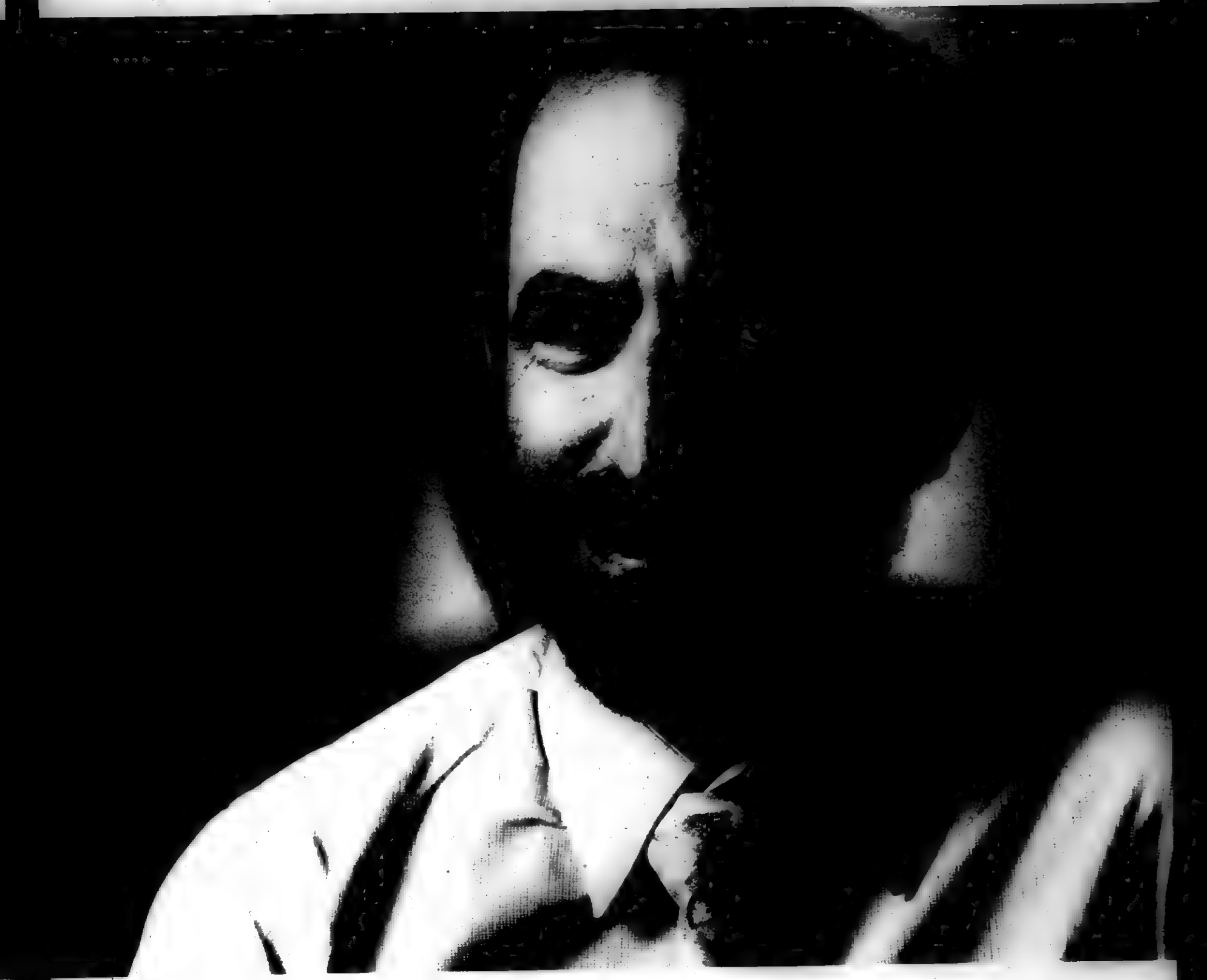

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PERSPECTIVES

A QUARTERLY REVIEW OF CLIENT/SERVER VIEWS AND EVENTS

World Cup '94 kicks in client/server goals

◊ WORLD CUP '94 SOCCER *will highlight on-line access to game information*

The organizers of the 1994 World Cup soccer games — being held for the first time in the U.S. next June and July — said they hope to make history by using advanced technology to manage the world's largest single-sport event.

"Never before has a World Cup been handled in a theater of operations like the U.S.," said Juan Jose Vidal Noya, director of technology at World Cup's Los Angeles headquarters. "Client/server was our best architecture choice, given the geographic situation" of the games being held in nine cities.

World Cup chose Sun Microsystems, Inc. as its exclusive hardware supplier, Sprint Corp. for telecommunications and Electronic Data Systems Corp. to handle systems integration, software development and user training. Three multiprocessor SPARCcenter 2000s in Los Angeles, Dallas and Washington, D.C., will anchor a network of SPARCstation 10 servers and up to 1,000 SPARCclassics and LX workstations, which will be used to centrally monitor ticketing information, display scores, provide on-line news service feeds for journalists and monitor track records and all related game logistics.

"Our biggest concern is not so much the client/server technology side as it is user training," said Bud Bencic, the EDS account manager for the World Cup project. Many of the users, he explained, are "soccer buffs who've never used a computer before" — let alone a Unix environment.

The World Cup staff is also growing apace, from 100 a few months ago to more than 200 by midsummer. "Unix hasn't scared away too many of them," Bencic said. "We had to put a few traps in the menus, but once everybody gets used to doing double clicks [with the mouse] rather than single clicks, they're OK. But WordPerfect on Unix vs. MS-DOS is not exactly the same, so there's definitely some training involved."

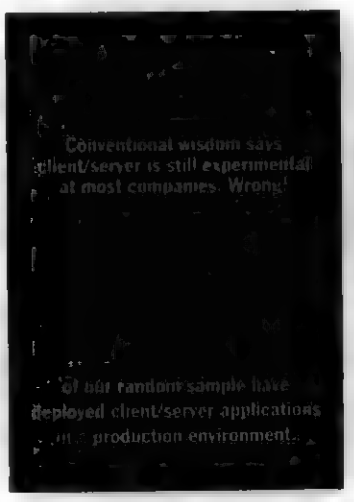
Bencic said client/server was the most sensible choice for the high volume of transactions required by the event management applications EDS will develop.

— by [redacted]

Mission changes

[redacted], Inc., a mainstay in the minicomputer world with its PowerHouse development tools, is transforming itself into a PC tools vendor for the client/server market. With its Windows NT products slated to appear in March 1994, Chief Executive Officer Ron Zamboni said the $150 million firm is shifting from direct sales into the reseller channel.

Also working on a change of market is [redacted], Inc. in Westboro, Mass., originally a vendor of network storage boxes for technical workstations. The company is now pushing its client/server data management software, which automates the processes of data migration, backup and recovery. The Epoch software runs on major Unix platforms but is also heading for the PC space. ■



Common denominators

Aberdeen Group in Boston, which is now shipping its *Client/Server Application Development Environment Buying Guide*, interviewed a number of customers who had successfully completed commercial client/server development projects.

Here's what the users had in common:

- They all started with pilot projects, mainly the "high-payoff, make-money" kind rather than back-office or decision-support projects.
- Corporate visibility tended to be high, which exacerbated fear of failure but was later welcomed when benefits were rolling in.
- Cost justification was surprisingly easy, regardless of project size. Comparing the cost of mainframe development chargebacks to the client/server project helped some, while others justified their efforts via projected returns on investment.

CSJ

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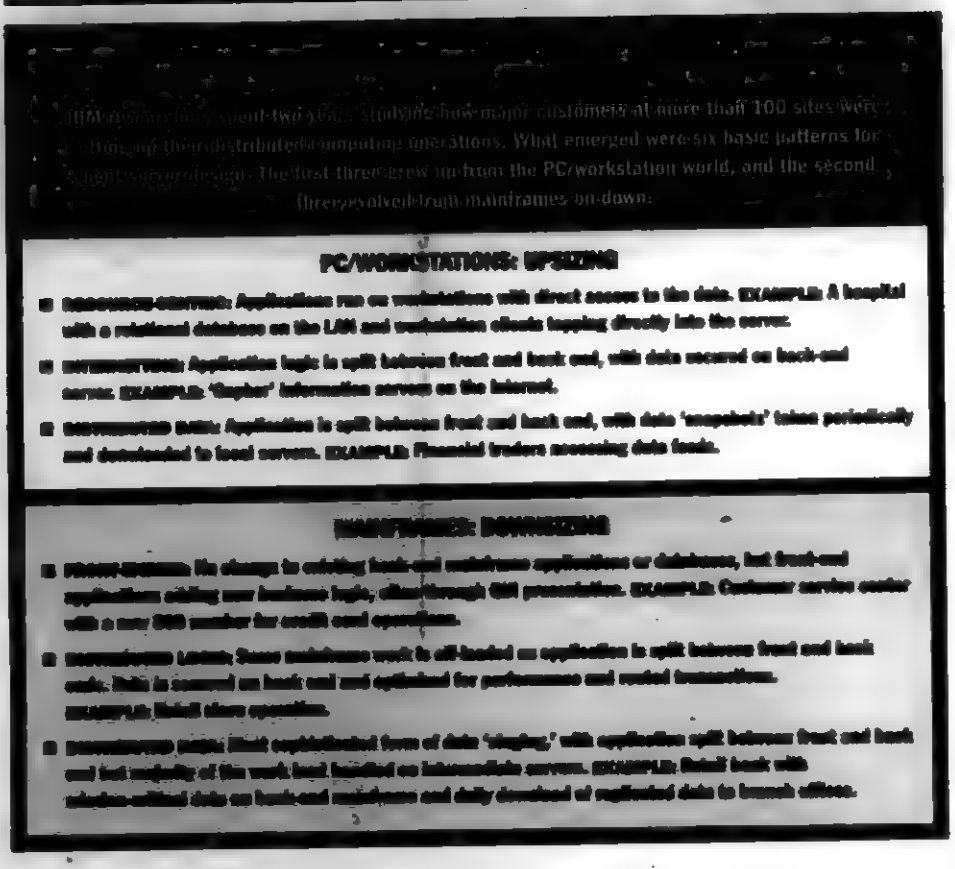

Client/server setup boosts underwriter productivity 25%

Cigna Property & Casualty Cos. in Philadelphia has turned to a companywide set of client/server product standards to improve its competitiveness and empower a key group of users: the policy underwriters.

"With our new standardized property and casualty client/server system, we are making more viable business decisions because information is more readily available," said Arnold Herenstein, vice president of workstation and office technology. "We're pushing as much of the mystery out of technology as we can and just making it a tool for our underwriters."

The system has boosted underwriter productivity by 25% to 35%, he added, because the employees can work faster and more accurately. For example, the system's electronic forms cabinet, which stocks 2[illegible] oft-used policy forms, has helped save time. "Now we don't have to stock 30,000 forms from every state. Employees can just look up the one they want, click on the screen and print it out," Herenstein said.

Anointing specific products as corporate standards has given Cigna "tremendous leverage with the people we buy from," Herenstein noted. It also enables a smoother rollout of newly developed applications to Cigna's enormous 30,000-plus employee user base, he added.

"Standardizing truly focuses our skills on the products we use and encourages a higher degree of interchangeability so that we can transfer a successful program to another division easily," the manager noted.

Cigna's standards guided the consolidation of 73 property and casualty marketing centers into six specialized processing centers serving more than 4,000 users. The insurer chose IBM Personal System/2 Model 95-type servers, OS/2 2.0, Token Ring networks and IBM LAN Server 2.0 as standards. The underwriters use workstations running DOS 5.0, Windows 3.1, Microsoft Corp.'s Mail, Lotus Development Corp.'s 1-2-3, WordPerfect Corp.'s WordPerfect 5.1, Borland International, Inc.'s Paradox, Microsoft's Access and Attachmate for Windows. With these tools, Herenstein said they are well-equipped to respond to any customer request.

Even so, standards must be constantly reevaluated. "Standards become impositions if they don't match the requirements of the business," he noted. One of the early screen development languages Cigna used, for example, was dumped in favor of Powersoft Corp.'s PowerBuilder and Microsoft's Visual Basic. **CSJ**

David A. Kelly is a client/server consultant in West Newton, Mass.

TOOL WARS

[illegible] ready to spend [illegible] on development tools during the next few years, says Forrester Research, Inc.'s "Software Strategy Report." In an analysis of 50 early adopters of client/server decision-support systems, the Boston-based consultants predicted that today's $2,000 tool will cost about $2,000 by 1998. The downside view, however, was that today's so-called power tools aren't all that powerful, and vendors are not adequately supporting enterprises yet. There also lacks a "robust development methodology" today. Even so, product shipments for 1993 will reach 84,700 units, while 1998 will pull out stakes for 700,000 users, Forrester predicted. Further, 1,000 companies are expected to expand [illegible] use more fully into transaction processing. ■

CONSULTANT'S VIEW

A different kind of spirit

Encouraging certain personality traits in your staffers can ease the uproar of a client/server conversion

With any new technology, individual personalities and development team "chemistry" have more to do with its success or failure than most organizations realize. Many a company finds itself engulfed by the technology aspects and pays very little attention to the staff implementing the new technology.

Client/server is no exception.

Yet what are the fundamental differences in personnel characteristics in the client/server environment vs. the conventional host-based organization? How do you identify who among your "vintage" Cobol, VSAM and CICS programmers will "make it" over to client/server?

Here are some of the traits to watch for:

1. A sense of urgency: The main concept of client/server is a short delivery schedule with use of many desktop tools. Some deliverables have to be provided in a six-month time frame, and once you reach a goal you must set another one. Programmers who have not met deadlines in the past will probably not make it in a client/server environment.

2. A willingness to forego perfection: About 90% of almost every deliverable is finished in half the time; the remaining 10% takes an additional 50% of the time. If the programmer will not release the program to the tester for three months, the tester will not be able to test it in less than three months.

3. An inquisitive mind: Programmers should become familiar with numerous windows-based graphical user interface (GUI) applications to learn the characteristics of good and bad GUIs. The programmer will also acquire a greater understanding of when it is appropriate to use specific objects.

By Shulcu Atre

4. A taste for exploration: The person should be open to using new technologies. When programmers are just learning to develop GUI applications, they should be given the leeway to explore the functionality of a front-end tool.

5. A certain team spirit: Any group of developers and programmers will learn functions and tasks at varying rates. The environment in a GUI project should be conducive to the interaction of ideas, so the individual must be open to information-sharing with peers. Two or three types of programmers are likely to work on a project: one with front-end GUI expertise, one with database skills and possibly a third who can access the mainframe for legacy data.

6. Respect toward users: Because most client/server implementations take place in user departments, programmers who think users are stupid will have a very hard time functioning in this new environment. **CIS**

Atre is president of Atre Associates, Inc., a consultancy in Port Chester, N.Y., that specializes in client/server technologies.

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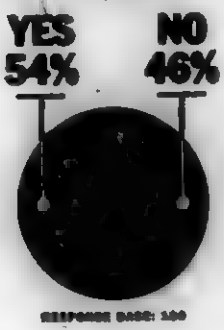
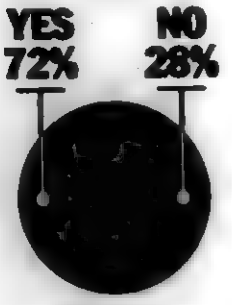
PRODUCTION MODE

Are you testing any applications slated for production?



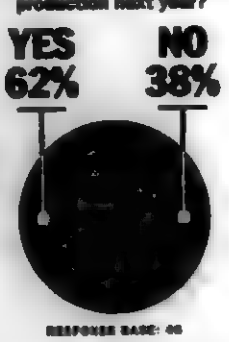
RESPONSE BASE: 180

Are you moving applications to production this year?



RESPONSE BASE: 184

Are you moving applications to production next year?

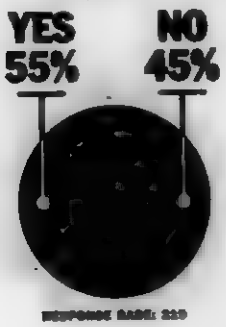


RESPONSE BASE: 46

Slow ever, old technology: Most Client/Server Survey respondents are testing and moving more and more applications into production now and in 1994.

STUCK ON THE NETWORK

Are you having networking problems while moving to client/server?



RESPONSE BASE: 219

What kinds of networking problems are you having?

58% have incompatibilities with their existing network.

46% have network management difficulties.

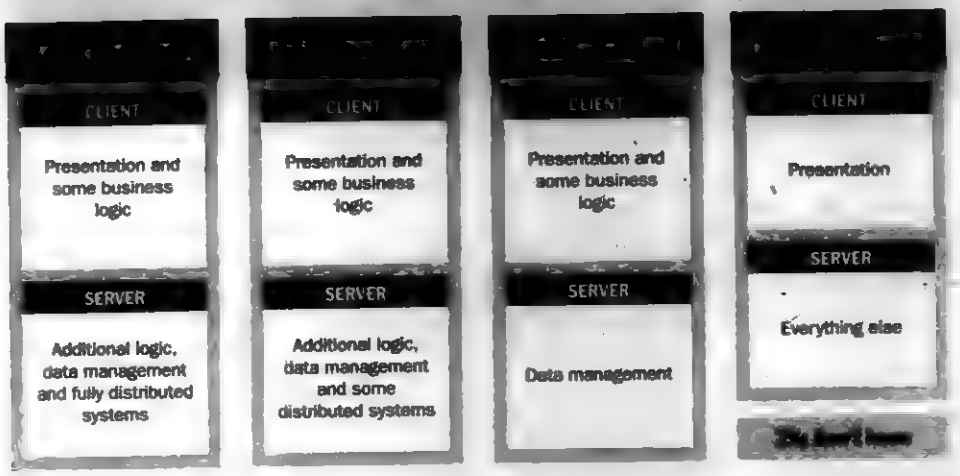
28% deal with bandwidth and throughput issues.

8% have other network problems.

RESPONSE BASE: 90
(MULTIPLE RESPONSES ALLOWED)

HOW ARE YOU DEFINING CLIENT/SERVER?

RESPONSE BASE: 219



You're further along than you think

Our exclusive survey finds a majority of IS shops running some production applications under client/server

For those who doubt the progress of client/server computing, we have new evidence of its steady growth as a primary systems platform. *Computerworld*'s *Client/Server Journal* survey reveals that a majority of the 219 information systems professionals polled run production applications in client/server environments.

One-third of the survey respondents consider client/server a key part of a broader company strategy, while 11% consider it more of a departmental project. Only 8% are still in the pilot stages.

Networking surfaced as a major problem area for most of the users surveyed, with incompatibilities among existing networks representing the most significant headache, followed by network management and throughput issues.

The survey also showed that the level of client/server computing is more advanced than many experts believe.

One-third of the professionals defined their client/server efforts at the most advanced level: That is, user presentation and some business logic are on the client, while additional logic, data management and fully distributed systems are on the server.

Another 24% have some distributed applications on the server and the same business logic split as the first group, while 22% have all the logic and presentation on the client.

Only 19% are defining client/server as presentation on the client and everything else on the server — which is similar to traditional non-client/server computing models.

In addition to running production applications at a high level of client/server implementation, a large portion of the users are testing additional production applications to roll out this year or in 1994.

What is your level of client/server activity?

40% are building new applications in client/server.

34% are building new applications and migrating to client/server.

20% are migrating to client/server.

6% don't know.

RESPONSE BASE: 219

Despite their interest in client/server, the respondents cited object-oriented systems as their greatest technology interest. Electronic-mail-enabled applications, work-flow systems and systems management middleware — the more client/server-related technologies — were next on the list.

METHODOLOGY

The survey was conducted and tabulated by First Market Research, an independent telephone research firm in Austin, Texas. A random sample of IS organizations were polled.

—by MICHAEL L. GOLDMAN-TRAINOR, Computerworld's research manager

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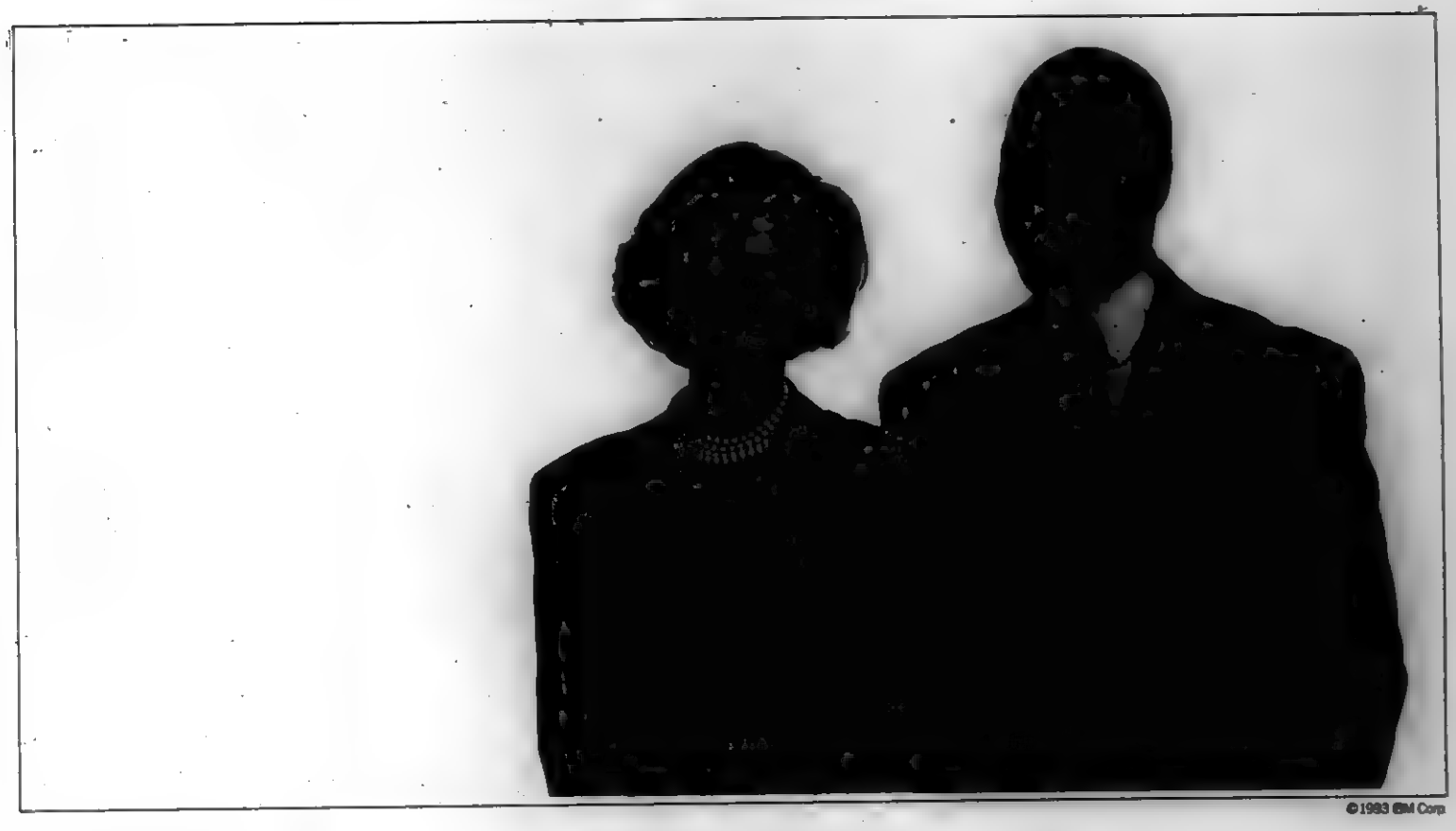

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HYATT HOTELS: Sticking with simplicity

Experience in the art of science and technology shows us that the best designs are simple, elegant and effective. The information technology industry has too many examples of complex and complicated systems that fail the simple test of effectively solving a business problem.

If you want to be successful in developing client/server applications, you must define and follow an architecture that is simple to describe but solves your problems.

We at Hyatt Hotels Corp. faced an array of technology choices in 1988 when we began our conversion to the new heresy of open systems. We evaluated Application System/400s vs. Unix-based systems; traditional vs. relational databases; Oracle Corp. vs. Informix Corp.; C vs. fourth-generation language (4GL) programming — to name a few. Our final selection seemed almost too simple: Choosing the Informix 4GL implied Unix and relational technology, while having Unix allowed more freedom in selecting hardware.

This five-year client/server journey sidestepped the knife-edge technologies and trimmed operating costs by up to 40%.

In the end, our technology selection was put to the test by benchmarking and pilot-testing the entire set of architecture choices. Hyatt created a test using the Informix 4GL to emulate a central reservation system, the most technically demanding application we face. That benchmark proved that the architecture hung together.

Yet decisions sometimes loop back on themselves, reappearing in other guises years later. Our first two applications were developed using these architectural choices to create a number of sales and reporting systems. When it came time to begin the reservation project, there were a number of seemingly new technical choices to be evaluated. Oracle had announced new versions; Sybase, Inc. and The ASK Group, Inc.'s Ingres Products Division were being used for large applications; Sequent Computer Systems, Inc. had a new and faster box; and so on.

But we stuck with our initial architecture choices, which in hindsight was not only the right decision but the only decision. Make sure the first major architectural decision you face — whether it's object-oriented vs. relational or Smalltalk vs. C++ — will meet your demonstrable requirements during the next three years. If it does, don't change your mind because of some new feature.

TEST BOUNDARIES Don't choose knife-edge technologies that have great promise but are at the boundary of current capabilities. I wouldn't try to build a reservation application in a powerful, object-oriented language yet.

By Gordon Kerr

You also need to evaluate what to do if a choice goes bad. This testing of future horribles is not just an intellectual exercise; it is critical to everyone's understanding of how the architectural choices fit together and how they can amplify your productivity.

LEVERAGE YOUR CHOICES Once you've chosen your architecture and you've stuck to your guns by not changing technologies every year, look for the simple and effective way out of some difficult application development situations: Buy the solution elsewhere.

It still amazes me that our industry writes as much custom code as it does, given how similar many of our problems are. We may still be 10 years away from reusable applications — and two to three years from reusable objects — but it doesn't mean we should ignore off-the-shelf solutions for basic applications such as payroll.

SIMPLE IS BEST Hyatt has stuck with its approach for five years, not without challenge and resistance. But it has served us well, saving us 30% to 40% in operating costs and forming the basis for our major applications, including reservations.

We've evaluated some new technologies such as Powersoft Corp.'s PowerBuilder, but we haven't yet gotten the full benefit of our experience in the current architecture. Simplicity has its own benefits, and they keep getting bigger every year. CSJ

Kerr is senior vice president of MIS at Hyatt Hotels Corp.

JOHN HANCOCK: Filing a claim in future technology

I may be dating myself, but I can't help comparing today's ubiquitous "client/server" with the single word of career advice given to the young Dustin Hoffman's character in the movie *The Graduate:* "Plastics!"

During the past few years, while we in the IS profession prepared for the arrival of the new world of client/server, somehow that new world arrived. The paradigm shifted — even though we're not ready, and the technology is neither mature enough nor industrial-strength yet.

For us, client/server has more or less evolved during the past three years. At last count, within John Hancock, we had more than 30 client/server applications on-line. Some are fairly simplistic and intended for decision-support use, while others are transaction-oriented and very complex, such as our group underwriting and billing system for our group clients.

By Diane Smigel

The issue is no longer "Will we build client/server applications?" but "How will we build and manage client/server systems?" for an enterprise with more than 400 field offices. By next month, we should have in place the first milestone on this long journey: our definitions of five models for distributed computing and recommended standard products for each model.

Our efforts began last year when we devised and adopted an enterprisewide technical strategy that outlined our vision and goals. This year, we are laying the foundation for an industrial-strength client/server environment.

We think of our client/server environment in terms of three interrelated management domains: execution, development and operations architectures.

The execution architecture is driven by technical requirements for client and server. It consists of hardware platforms, databases, distributed services and communications protocols.

The development architecture encompasses tools and methods for building applications. To prepare for skill set changes, we will be setting up new educational curricula and retraining plans, including on-the-job mentoring. We also use outside consultants to augment our skills base and accelerate our learning curve.

Two years of careful study led this giant insurer down a new path.

The operations architecture consists of the products and processes for managing applications in a production environment. This domain presents what is perhaps the biggest challenge as we switch from a platform-centered approach to a new model of managing distributed computing resources.

We have active projects under way on many fronts, from upgrading our wide-area network to automating software distribution and password synchronization — to name just a few. Sometimes it seems like an endless web, with every project on the critical path!

Collaboration and cooperation are the watchwords for our client/server strategy work, which involves more than three dozen people in our Boston headquarters. Associates from across the firm are also involved in a variety of task teams and committees that make up our Client/Server Environment Project.

We do not expect our initial cut at client/server architecture to answer all of our questions about distributed services and network management. But we do expect to provide leadership and direction to a diverse business community across the company and establish solid ground for future systems development. CSJ

Smigel is vice president of corporate information services at John Hancock.

Seagram's CIO Jack Cooper (left) and project manager John Hall used a 'cookie cutter' approach to application design

Webb Chappell

HIGH SPIRITS AT

SEAGRAM

By Johanna Ambrosio

Bert Glinn, Magnum Photos, Inc.

The international beverage retailer makes a business case for its leading-edge multimedia document management system

So what do you get when you cross an upstart technology with a venerable retailer of beverages, wines and spirits? In the case of 136-year-old Seagram Co., the result is a multimedia document management application that is the most far-reaching yet in a companywide move toward client/server architecture.

"The ideal is boundary-less document access anywhere in the world," said Seagram Chief Information Officer Jack Cooper. A document may originate in Hong Kong, be reviewed by someone in the U.S. and eventually wind up stored on a computer in London.

The system, called Open Document Management System (ODMS), will also be useful for online companywide procedure manuals, where a video clip might illustrate a new technique or a new chapter could be added to the manual via voice annotation.

While not quite finished, ODMS has already begun accruing benefits for the accounts payable department — the first end-user group to adopt it. Among the time-savers are the following:

- The ability for employees to send and receive faxes from their desktop computers.
- Immediate access to scanned purchase orders instead of up to a two-week wait to get a microfilm tape developed.
- Voice annotation of purchase orders, which allows managers, for example, to tell processors to expedite a certain customer's account.

The big payoff arrives later this month, when the accounts payable group should have received and worked out the kinks in its work-flow management software and a tool to alter the work flow at will. The in-house-developed software will allow employees to set up, and later change, who gets to see which documents and in what order the purchase orders work their way around the department.

With those tools in place, accounts payable will be able to cut down on the time it takes to process customer inquiries. One customer service representative will be able to answer any question instead of customers — both outside suppliers and Seagram employees — having to search out one of 18 specialists.

Managers will also be able to track the productivity of each step of the accounts payable process — as well as that of each employee — through an audit trail.

Eventually, the White Plains, N.Y., accounts payable users will be joined by Seagram brethren around the globe, Cooper said. His goal is to persuade three groups each month to implement the system.

STARTING THE HARD SELL Once the document management software and tools have been put in place and have been proved to work, the sales pitch starts in earnest. Cooper and his team were scheduled to demonstrate the system to Seagram's Scotland subsidiary, although to date no other group has taken the bait.

By using a "cookie cutter" development approach, Cooper said, his group will be able to help end users customize ODMS wherever they may be.

ODMS joins two other client/server applications already deployed at Seagram: a sales reporting system that executives use to determine global sales by customer and a human resources information system.

Within five years, Cooper said, Seagram will move entirely to an information architecture based on two tiers: end-user workstations that are equipped with a graphical user interface and multimedia capabilities, and a network of servers ranging from PCs to mainframe-class machines.

Seagram has the majority of its production applications running on two IBM Enterprise System/9000s and a Digital Equipment Corp. VAX 6000 in data centers in New York and Bradenton, Fla. Some 35 IBM Application System/400s that are scattered throughout the world run a standard suite of financial applications

SEAGRAM, page 14

SEAGRAM'S 1430 PEEL ST. *headquarters in Montreal reflects its mid-19th century roots*

Seagram's 1992 revenue by product

For the year ending Jan. 31, 1993, Seagram reported $6.1 billion in revenue. Net income was $677 million.

Seagram does business in 94 countries. In 1992, the company opened offices in China and by the end of this year will have offices in the Ukraine.

SEAGRAM, *from page 13*

and some production and logistics. The company will continue to use these larger, proprietary machines as databases and other types of servers. "This will happen in concert with the reengineering of our business," Cooper explained.

ON THE SEAGRAM The business traces its history back to 1857 with the founding of Joseph E. Seagram & Sons' distillery company, which merged in 1928 with Samuel Bronfman's Distillers Corp. It was the Russian-born Bronfman, whose descendants still run the firm, who molded Seagram into a corporate powerhouse that today manufactures and distributes the best-selling brands of whiskey in the world.

The Seagram portfolio of products ranges from Chivas Regal and Perrier-Jouet champagne to Monterey Vineyard wines and Tropicana orange juice. Its global reach of 34 countries on six continents underscores the importance of its move to client/server applications such as ODMS, which Cooper said must meet specific business needs but also be tailored to work anywhere in the company.

Thinking globally was also the mind-set behind Seagram's earlier client/server applications — a sales reporting system and a front end onto the mainframe-based human resources applications — which have been running for about a year.

Because of their simplicity, they were "good candidates" for the company's first client/server forays, said Joseph Herrin Jr., director of systems development. Both are essentially decision-support applications that "are relatively inexpensive and safe because they do not directly impact the business, although they help in running it," he said.

Furthermore, both applications share a common architecture: an Intel Corp. I486-based PC acting as a file server on a Novell, Inc. local-area network. In both cases, data from other sources is summarized onto a Gupta Corp. SQLbase relational database management system that runs on the server. Windows-equipped PC clients complete the picture.

The employees in accounts payable can use the new system for instant on-line access to purchase orders that once took as long as two weeks to obtain.

PROJECT MANAGER JOHN HALL *works with Candice Puleo and Luisa Greco on the ODMS system.*

The nonaffiliate sales reporting system is used to help Seagram executives track what they sell in countries or locations too small to have full-blown offices. These locations do not have the usual back-office operations that support larger Seagram entities "so they lack some information about the state of the business," Herrin noted. "We wanted to provide some electronic means for them to see how their business is doing, instead of getting monthly printed reports from different sources."

Data from different shipping locations is sent to the PC LAN in New York via a standardized transmission format. The data is then processed and loaded into the Gupta DBMS, from which it is transmitted to servers in three other Seagram offices. Herrin's group is adding more kinds of data to the mix, including accounts receivable, and is setting up data extracts about specific customers and products within the geographic regions. Currently, the data is set up by region only.

As for the human resources system, that is simply a graphical front end to mainframe human resources applications.

"The idea was to provide easier access, not to replace the mainframe systems," Herrin said. Rather than logging on to the network, the mainframe and the specific applications — and then navigating through whichever application is required — users simply log on once and view a menu of choices.

"We extract the data that is most important to the users, which they select," Herrin said. The data extracts are updated monthly.

In contrast to these decision-support applications, ODMS was intended as a more strategic, bet-your-business kind of system.

It took a little more than a year and about $400,000 to develop the document management system with a two-person team that used off-the-shelf tools (see related story page 16). It will cost roughly $5,000 per user to deploy, Cooper said. That deployment cost covers most of the client hardware and software, including a Macintosh with a 21-in. color screen, a runtime license for the image decompression software used to view the scanned images, plus all the software to track, view and manipulate the purchase orders and related information.

The scanners and software used to scan the purchase orders into ODMS are not included in that price.

No outside consultants or services were used — one reason why ODMS was "on time and on budget," Cooper noted. "We can't always claim that, but it happened with this one."

Because of the global rollout intent, there were several tenets that the ODMS design team held to: scalability, open architecture, support for as many national languages as possible and the ability for end users to change the system as their business requirements change. To accomplish this, Seagram developers built the server database — Sybase, Inc.'s Sybase running on a Hewlett-Packard Co. 9000 Model 720 — to dynamically configure each user's screen

SEAGRAM, *page 16*

Object (and other) lessons

As a triple-play veteran of client/server projects, Seagram has learned firsthand about the joys and sorrows of this brave new computing world.

Some of the advice the staff offers for novices is as follows:

THINK BACKUP AND RECOVERY

"It is absolutely essential that you have the appropriate levels of backup and recovery, and they have to be a part of the system design," CIO Jack Cooper warned. "But you don't have as much canned material to do this with client/server software as you do on the mainframe, so you have to write your own."

PREPARE STAFF FOR CHANGES

From a programming standpoint, client/server is much more "rigorous" to deal with, Cooper noted, and there are fewer people who know how to do it. To address this concern, Cooper brought in Joseph Herrin Jr., director of systems development, and John Hall, distributed systems project manager, to head up client/server development at Seagram about two years ago.

As the company moves its legacy systems over to the new environment during the next three to five years, the IS staff members who work on those systems will be trained "so they can develop on the new technology," Cooper explained.

WAIT OUT THE LEARNING CURVE

Herrin said it takes about six months for an experienced C programmer to become "reasonably" productive in C++ object-oriented techniques and "to realize what you have and what you can use."

That learning curve, while steep, pays off on subsequent projects, he added.

PLAN FOR SCALABILITY

While working through the challenges, Cooper said, remember the goals of client/server. They include enormous scalability, the ability to design once and deploy many times and uniformity of systems throughout the company.

Delivering "strong functionality" to end users is another important benefit. Users "can do more, with a higher degree of control over the work process and a higher degree of productivity," Cooper said.

DO THE MATH . . . AND BREATHE EASIER

Finally, something sure to warm the cockles of many CIOs' hearts: Seagram has found that developing for client/server is 12% to 15% less expensive than developing for other platforms. These costs include hardware, software development, system design and planning. Support costs are about "break-even" from one platform to another, Cooper said. ■

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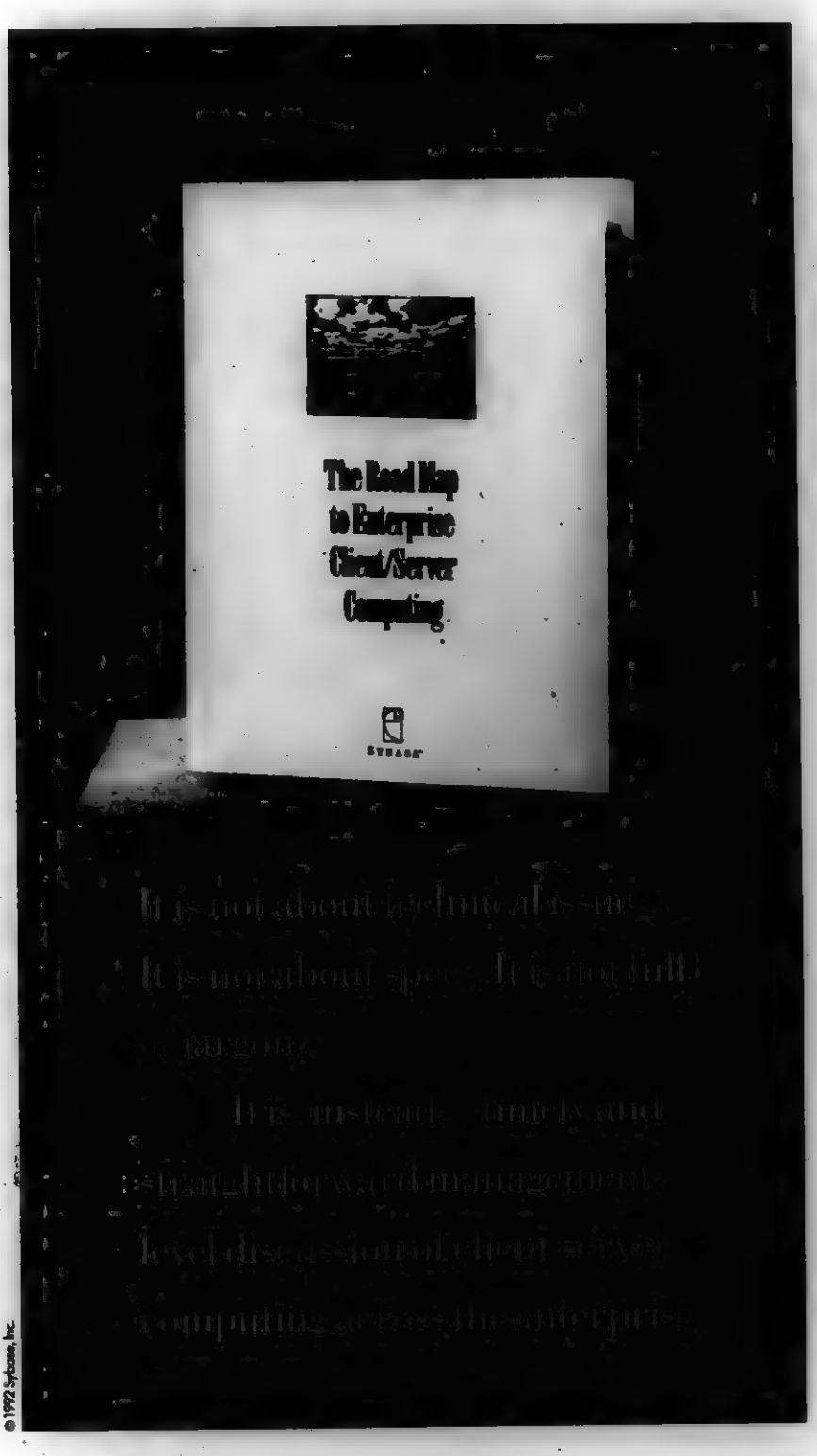


call 1-800-8-SYBASE.

SEAGRAM, *from page 14*

depending on the needs of that person. This approach was taken instead of the "hard-coding" approach traditionally used for applications, where the same screen is provided to every user.

Although the server database is currently on the HP machine in New York, that may change as other departments adopt ODMS. The server can sit at the end-user location, as the business rules and data it contains are department-specific anyway, or it can be located at some central IS site.

The fax server is an Intel-based machine, as is the image server, but most of the hardware components — except for the Macintosh client piece — can be changed later. For example, the server portion that currently runs under Unix on the HP 9000 can run on any Unix machine. Similarly, other parts of the C++ language-based ODMS code are portable.

As requirements change, IS needs only to update the server database instead of each client machine. Alternately, users will be able to make some changes themselves once the work-flow tools are delivered this month. In accounts payable, for example, if an invoice over $10,000 needs management approval and that amount is later raised to $25,000, users can amend the work-flow software rules.

The open architecture also separates the various components of ODMS into Macintosh objects: one for retrieving scanned images from the scanner, one for faxing, another for viewing the image on the Macintosh, etc. If Seagram needs to change one object down the road because, say, a more efficient decompression algorithm becomes available, it will not impact the other objects. Also, new objects, such as one for video, can be added with minimal disruption.

But openness comes with a cost. "Building flexibility in up front doubles development time," said John Hall, distributed systems project manager. "You realize the benefits later, when users can make the changes instead of having to go through IS."

Scalability was another key design element, so the system can be used by a relatively small operation such as the one in Chile or by a large transaction environment such as Seagram's U.S. operation.

So far, about eight people in accounts payable are using ODMS. By year's end, that number should grow to about 20, including some people in California who will use viewing stations to access accounts payable data. Until then, Seagram's employees must ask that the data be faxed to them.

The cost of developing the client/server project was 12% to 15% cheaper than on mainframes. It took about one year and $400,000 to create a document management system.

Candice Puleo, accounts payable supervisor, said she is "very happy" with the new system so far. Currently, invoices are processed by having the paper mail sorted out by type of bill and then delivered to the appropriate specialist. The phone bills go to one person, the supplier bills to another and the bills from Seagram affiliates to yet another person.

"If there are any questions, the customer has to call that person," Puleo explained. The person then has to rifle through a stack of paper to find the invoice and determine the status.

That will change with the work-flow software, which will allow the customer service representative to handle all queries. "That's going to be a big savings of time," especially given that the department processes about 450 invoices each day, Puleo said.

LESS TIME ON AUDITING Another benefit should show up during the group's audits, which Puleo said are "continuous." Before ODMS, those often required grueling searches for microfilm. In one recent instance, she had to wait four months to receive more than 400 boxes of paper for an Internal Revenue Service audit. The imaging system will be a "real time-saver" for audits, she added.

Nevertheless, Puleo said, as the first users, "we're working out the bugs."

Most of the problems have been resolved, but printing a scanned invoice still takes up to five minutes. Earlier on, there was also a wait of up to a couple of minutes to save each scanned image, but that was fixed by moving one of the servers from New York to a technical center near the accounts payable department.

"That's put us a little behind in scanning," Puleo said, "but these kinds of things are par for the course. All in all, we're lucky to be working with the in-house IS group because so far there's nothing we've asked for that we haven't gotten."

Originally, Seagram had looked at off-the-shelf imaging systems. But at a onetime deployment cost of $40,000 to $100,000, members of Cooper's team determined they could do it themselves for less money in the long run and meet specific business needs as well.

"We're ensuring our architecture stays open and is geared for the future," Hall said. **CSJ**

Ambrosio is *Computerworld*'s senior editor, systems & software.

COOL TOOLS

Seagram developed — and delivered — its multimedia document management application on the Macintosh "because it already has objects for sound and video," said Joseph Hirsh Jr., director of systems development. "We didn't have to buy special equipment for the PCs."

Another factor was that Macintosh desktop tools are "years ahead of other platforms," he noted. And in client/server development, the tools have begun to [illegible].

Here is a sampling of what Seagram used to create its new system:

- Apple Computer, Inc.'s Multimedia Toolkit, which will allow the IS group to localize the imaging system in different national languages, including Spanish and French.
- Apple's MacApp Object Framework, a collection of ready-made objects. The team also reused objects from other client/server projects. Previous experience with MacApp was not another factor in the tool's favor, said John Hall, distributed systems project manager at Seagram. "We got hundreds of ready-to-use objects," he said.
- [illegible] tool kit from [illegible], Inc. in Wilmette, Ohio, to write the object that compresses and decompresses the graphics rather large on it seems around the network. "It's debugged, and it works," Hall noted.

THE CLASSIC LOOK *of Seagram's Scottish distillery belies its high-tech operation*

Managing documents the multimedia way

Among the first Seagram facilities to try out the new document management system this fall will be the accounts payable department in the Scottish Highlands near Keith, home of the Chivas Regal and Glenlivet brands of whiskey. Employees using the new method will follow this procedure:

After a purchase order is scanned into one of two Macintoshes, an employee working as an indexer pulls the image up and keys in several fields of data about that purchase order.

Assuming there are no problems with keying in the fields, the data is entered into the Sybase database running on a Hewlett-Packard 9000 main Unix server. If there are problems keying in the proper data, the indexer logs on to the mainframe from the Macintosh and searches through the host financial software for the proper information.

The image is actually stored on an optical server, which is now a Sun Microsystems, Inc. workstation, but will soon move over to the HP 9000 server. The optical server moves the image files between the end user's magnetic disk on the Macintosh and an optical disc setup controlled by a Laser Magnetic Storage, Inc. jukebox.

When employees in the accounts payable department log onto the Macintosh, they will see several things on the screen: a listing of all the purchase orders that have been scanned in and are awaiting processing; a window into the corporate mainframe; and objects providing users with functions such as sending or receiving faxes.

To send a fax, the user will activate the fax icon on the Macintosh and fill out a form. That request is then shuttled to the HP server. A separate machine acting as a fax server — a Compaq Computer Corp. 386-based computer — polls the HP server every 30 seconds and takes over when it finds a fax request. ■

Coping with the technical and managerial snafus in migration and conversion projects

SHOWSTOPPERS!

One of the war stories making its way around the client/server conference circuit recently concerned a Chicago-based bond trading company and its unfortunate experience with a Unix utility called cron.

Seems that cron, which can be set up to run certain computing jobs at specific times of the day, was primed for a crucial 3 a.m. processing job every night. Before cron swung into action, however, a series of smaller jobs had to be run for about an hour each night, beginning at midnight.

But one night the data center operator was ill, and the small jobs didn't begin their run until 2 a.m. They also didn't make it to the finish line. And cron did what every good Unix utility does: what it was told.

The result was a showstopper — in this case, a commercial processing snarl with the wrong data overwritten or erased and financial records compromised. Senior managers at the Chicago firm reportedly "went ballistic."

The moral of the story — one that mainframers particularly relish — is that complex business processing environments still require the built-in protections and controls that large systems were fine-tuned over the years to provide.

By Maryfran Johnson

Johnson is editor, *Computerworld Client/Server Journal*.

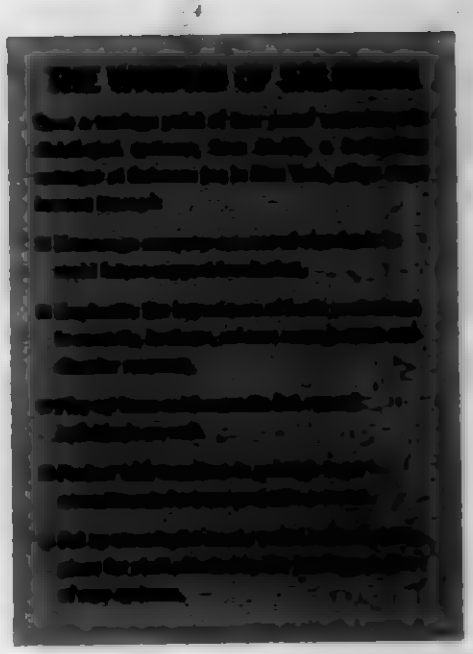
As commercial enterprises today migrate away from the safety of the traditional glass house toward the greater flexibility of distributed client/server systems, they are bumping into a new lineup of project showstoppers. These technical and managerial snafus can halt a conversion or migration effort for hours, days and even months.

"Client/server ought to come with a label saying: Misuse of this could be harmful to your health," said James Daly, director of human resources administration at New England Telephone Co. in Boston.

A recent survey conducted by *Client/Server Journal* among 219 corporate users at medium- to large-size businesses showed that 38% experienced technical problems that stopped projects cold for one to three months' time. Another 19% got stalled for at least a week; 13% for more than three months; and 10% for at least one day. Only 19% reported no work stoppages from technical difficulties.

"Everything that applies to good business practices in computing in general applies to client/server, but people overlook that," said Wayne Fowler, director of technology and network services for Canada's Toronto Stock Exchange, one of the pioneering users of open systems for mission-critical business computing.

Among the most commonly cited delays in client/server projects are the cost of training and retraining users, the need to fill in feature/function gaps in third-party software and the tedious job of integrating multivendor systems.



"What happens in client/server is the negative gets amplified and you find yourself deeper and deeper in trouble," Fowler noted. "In essence, client/server amplifies stupidity. If you're stupid about systems development, design or requirements gathering, you essentially end up far worse, quicker."

While showstoppers are often as highly individual as the business itself, there are several categories they seem to have in common: performance testing, networking, support, personnel and software issues.

[illegible], *page 30*

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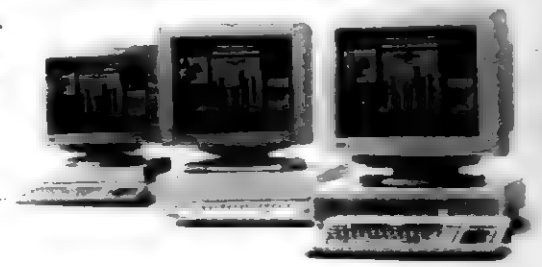

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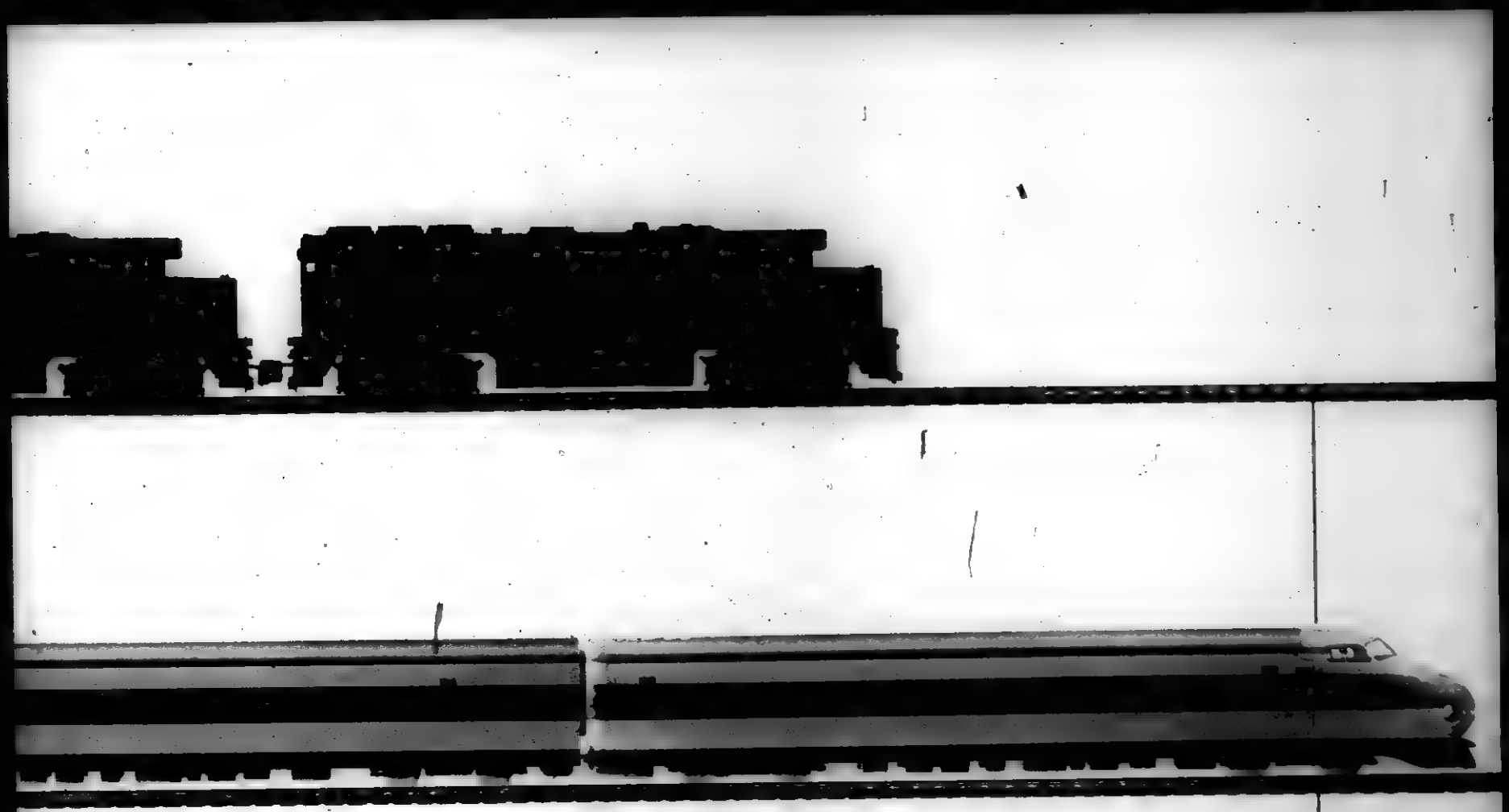


SHOWSTOPPERS, *From page 17*

1 TESTING IS 'INSANITY PLUS'

One showstopper the Toronto Stock Exchange encountered involves performance testing in the complex client/server environment. "It's insanity plus," Fowler said. "We've found a tremendous lack of structured test tools and a tremendous misunderstanding of rigorous testing processes."

In the mainframe environment, testing a fixed number of screens or fields is commonplace. "But what happens when you have multiple windows?" Fowler asked. "What happens when applications pick up information from one window to another before they ship a request to the server? Physically, how do you test that?"

One product Fowler is working with now for the kind of benchmark simulation he needs is the Rhobot master controller from Promark in Parsippany, N.J., which enables the user to tailor custom scripts that replicate users keying live data into the system. The vendor is adapting its testing tool to interact with the stock exchange's Unix-based transaction monitor.

WATCH THAT DATA STRUCTURE

An Florida-based grocery retailer Kash n' Karry Food Stores, Inc. got its client/server conversion under way, old data structure was "one of the things that slowed us down," said Jim Stikeleather, director of systems development. "We discovered how poorly thought out our data is, so we have handed this project with huge enterprise modeling efforts.

"We were surprised how much we had to do on the data side," he added. "It took one whole team normalizing data to set up a relational table, clean up the existing system and understand what we were really doing." ■

2 NETWORKING MORE COMPLEX, CRUCIAL

As the lifeblood of any client/server setup, the network is frequently the trip wire for a host of troubles, from bandwidth limitations to inexplicable crashes and data loss. *Client/Server Journal*'s survey of 219 users found that 60% of their problems related to connectivity or networking, for example.

"For technical showstoppers, the network is the one I keep running into the most," said Hugh Ryan, director of Andersen Consulting's New Age Systems unit. "Our clients get into this and fail to anticipate the difficulty of upgrading a network, particularly if they are putting in machines where there haven't been any before."

To sidestep network bandwidth problems, one major New York securities firm "over-engineered" itself by wiring up each trader workstation with eight strands of fiber-optic cable plus 10 strands of copper unshielded twisted pair.

Although the use of Ethernet and Transmission Control Protocol/Internet Protocol (TCP/IP) networks is a mainstay in many client/server shops — particularly Unix-based ones — there are still messy issues with getting it to work right, users said.

The Toronto Stock Exchange found that the first implementation of TCP/IP on a Tandem Computers, Inc. mainframe did all the networking within the CPU, for instance. "So we ended up having the busiest task in the system being the TCP/IP driver because the way Ethernet and TCP/IP work, they monitor all the traffic and pick up what's yours," Fowler explained. "You spend all your time monitoring traffic. We had to segment the network with Cisco routers and hang them around the Tandem to isolate it from traffic that doesn't belong to it."

3 SUPPORT TAKES ON NEW DIMENSIONS

Higher-than-anticipated levels of technical and administrative support are frequently cited as showstoppers in client/server projects. One particular pitfall, oddly enough, can be giving users exactly what they want. That can spawn a highly diverse, mixed environment that escalates and complicates support needs.

"How companies address that support cost will dictate how successful they will be," said New England Telephone's Daly.

"There is a whole learning phenomenon with client/server that has not been properly scoped out yet," Daly said.

New England Telephone emphasizes a strong education component for its technologies, Daly said, including a resource center where employees are encouraged to come for hands-on training. The company uses both formal and informal training approaches such as classroom teleconferencing or placing individual learning centers in heavily populated business locations.

"In essence, client/server amplifies stupidity. If you're stupid about systems development or design or requirements gathering, you end up far worse, quicker."

WAYNE FOWLER
DIRECTOR OF TECHNOLOGY AND NETWORK SERVICES
TORONTO STOCK EXCHANGE

4 THE HUMAN FACTOR

When asked what terrible technical trials they encountered on the road to client/server, many information systems executives said technology was sometimes the least of their worries. What tripped them up instead was the human factor — from recalcitrant programmers to reluctant users.

"I'd say our biggest issues were getting people trained in the new technologies, getting them productive and thinking of data in different ways," said Pompi Malik, manager of IS at Brewers Retail, Inc., a $1 billion beer distributor that manages 450 retail and wholesale outlets in Ontario, Canada.

Rewarding the teamwork required to make client/server development projects a success — while still recognizing individual achievement — is a delicate balancing act, several IS executives said. According to industry surveys, staff turnover during conversion projects averages 35% to 40%.

"The people transition issue just surprised the hell out of us," said Jim Stikeleather, director of systems development at Kash n' Karry Food Stores, Inc., a $1.2 billion grocery store chain in Tampa, Fla. Its client/server migration sparked a 70% exodus of the mainframe programming staff in the first six months.

In the future, Stikeleather said he may try out an idea passed along by colleagues at a user conference: team up two or three programmers, one of them a "new architecture type" and the others old-school mainframers.

"I think that very intense mentoring will do a couple of things," Stikeleather said. "One, it'll make the transition less scary. They're not learning by themselves. And two, you have built-in bonding so you get constant encouragement and a little hand-holding."

5 COUNT ON SOFTWARE GLITCHES

Software-related showstoppers are perhaps the most commonplace of all in client/server shops. According to users, there are still huge holes in the area of system and network management software.

They also cite scalability shortcomings when PC and workstation software goes big-time on a corporate network. And many companies are bedeviled by version control and software distribution problems with multiple packages running on different hardware platforms.

"One of the biggest challenges of client/server is software distribution," said Linda Kern, manager of application development and support services at El Paso Natural Gas Co. in Texas.

"Before you can do heavy-duty client/server for transaction systems, you have to be able to automate that process," Kern said.

At Hickory White Furniture Co. in Highpoint, N.C., migration from a Burroughs Corp. mainframe environment to Unix-based systems from Sun Microsystems, Inc. has been hobbled with a series of problems with third-party software, said Pat Thomas, MIS director at the $60 million furniture manufacturer. Those difficulties include months-overdue versions of certain software packages, plus inaccurate or incomplete documentation.

Describing his current frustration with open systems, Thomas likened the situation to a "mega-grocery store" where all the canned goods cost 30 cents but not one has a label.

"All the responsibility is yours because you've become the system integrators for your company," he said.

Taking on that job of systems integrator is often one of the ruder shocks involved with client/server, according to Jerrold Grochow, vice president of advanced technologies at American Management Systems, Inc. in Reston, Va. "Invariably, it takes much longer to deal with these issues than anyone thought," he said.

Despite the inevitable showstoppers, however, users and consultants said that even the most difficult projects eventually get done. "Setting expectations and being able to deal with things are part of the management issues in client/server," Grochow noted, "so a problem becomes something to solve rather than a disaster." CSJ

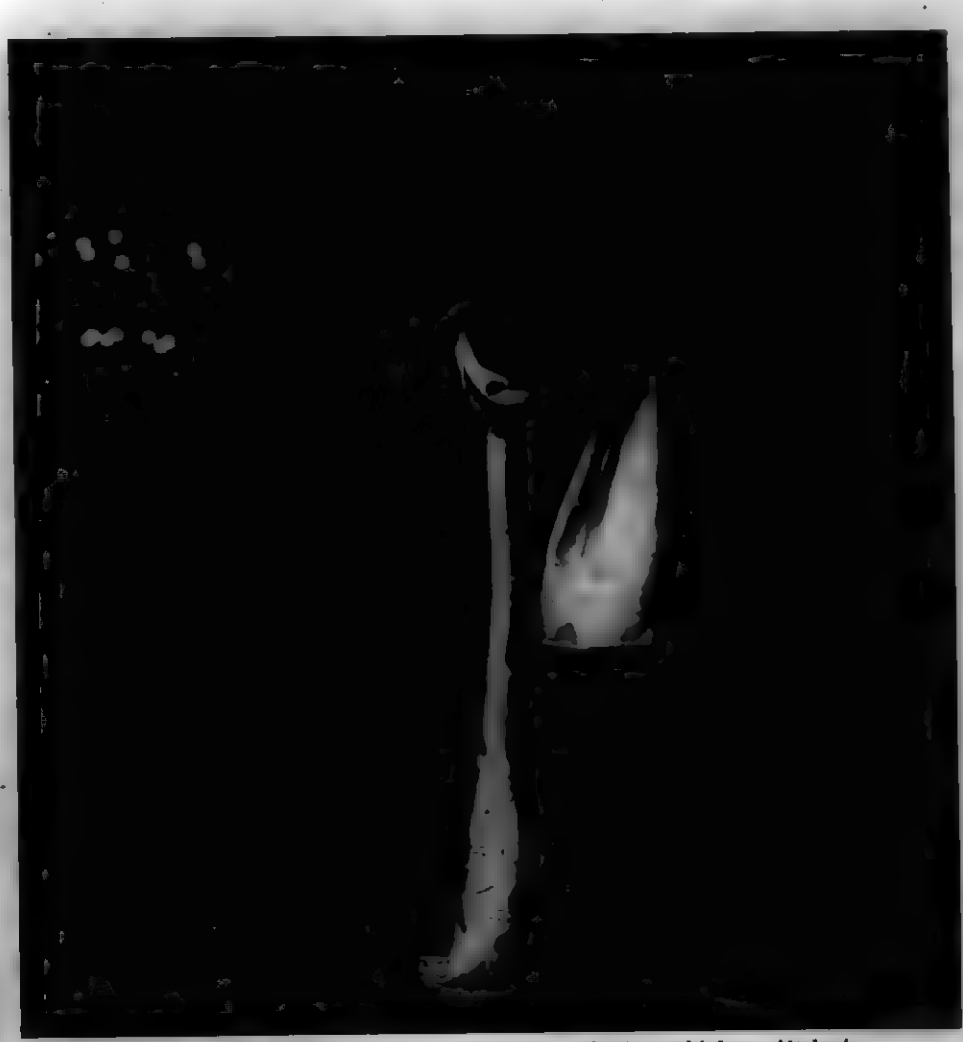
ASK THE TOUGHER QUESTIONS

There may be failing to ask the right questions of their vendors, several managers and consultants said. Rather than asking "Can we do XYZ with this machine or that software?" the better question might be: "Should we want to do this? What's the downside?"

At one publishing company, for example, a 20-minute backup operation on the old mainframe turned into an 18-hour ordeal on a Unix-based server running an RDBMS. The vendor promised to fix it — but not until the next version. ■

The Wide-Area Information Server on the Internet is ready for its commercial debut, as a popular grassroots application comes of age

THE CASE FOR WAIS



BREWSTER KAHLE *says that while people await the information 'superhighway,' today's Internet has become the well-traveled 'dirt road'*

By Charles Babcock

A new concept in client/server computing, the Wide-Area Information Server (WAIS), is coming of age on the Internet as a way to broadly disseminate information. It offers a promising model for the commercial world as well.

These wide-area servers are providing access to databases of public or quasi-public information to any interested Internet user. There is a weather information server run by the University of Michigan, for example, and another that offers the lyrics of any popular song. So far, there are 434 WAIS-based databases out there.

THE FREEWARE CONNECTION

"What people are looking for is the information superhighway. What we have is an information dirt road, but it's working," said Brewster Kahle, who created the Internet's first WAIS while working at Thinking Machines Corp. in Cambridge, Mass.

Some Internet users — including Kahle, who last year founded a private company, WAIS, Inc. in Menlo Park, Calif., to sell wide-area client/server software — are confident there is a commercial future for the wide-area network server. One scenario is that a new form of publishing business will be established to make vast quantities of information available at a fee through WAISs.

COMPANY BLUEPRINT "Access to reference information is extremely useful in the business world," noted Dan Goldman, spokesman for Perot Systems Corp. in Reston, Va., an early WAIS, Inc. customer.

WAIS provides a blueprint of how companies could make reams of standard, up-to-date information available to their employees. Lawrence Livermore National Laboratory in Livermore, Calif., is putting its management guidelines and health and safety rules onto a server that will be accessible to those who need it at the 8,000-employee facility, said David Grubb, a member of the lab's administrative information systems staff.

The Internet examples of WAIS are necessarily public information servers and open to any Internet user with the means to access them. But a business seeking to create its own WAISs has several options for keeping them closed to employees or restricted to groups with the appropriate access privileges. Livermore Laboratory's in-house information, for example, will be placed on a server that is screened off the Internet by a router placed in front of it, Grubb explained.

Any business with a WAN can theoretically build databases and make them available on low-cost servers. WAIS also offers the opportunity for more direct information sharing between companies and their customers. Sun Microsystems Inc., for instance, has established a customer support database at the University of North Carolina. Customers can turn to that server for help before tapping more conventional forms of support, which in turn helps hold down costs for Sun.

Wide-area server capabilities came about through an early effort to automate library and other research text exchange over great distances using the Z39.50 protocol, which managed computer-to-computer links over a WAN. While at Thinking Machines, Kahle built the WAIS on top of the protocol to create a user-friendly approach to the wide-area server.

Mimicking the searches of large text management systems, Kahle created a search mechanism using key words typed in by the user. The search returns a list of documents to the user, with those scoring the most keyword hits listed at the top. By selecting those that are most pertinent, the user can direct the process through a feature built into WAIS called "relevance feedback." CW

Babcock is *Computerworld*'s technical editor.

'OPEN' SECURITY:

Client/server design promises easy access to reams of critical information. Yet it also ushers in new ways for intruders to gain access and lose data. Here's how to cope.

By Jean Daly

It's enough to give the most stouthearted information security chief the willies. Thousands of PCs and workstations with dissimilar operating systems spread across an organization, connected to networks, minicomputers and mainframes in other locations, sometimes across states or countries.

It's also a reasonable description of a client/server environment.

The wide distribution and easy access to critical information, which has many users salivating over the prospect of establishing a client/server network, is already proving to be a nightmare to those trying to secure that data. Open networks mean new channels through which data can be lost and intruders can gain access.

"It's a whole new ballgame right now," said Brian Redler, director of security and operations at National Securities Clearing Corp., a financial service firm in New York.

Providing security in a widely distributed client/server design is different — far different — from the mainframe-centric, centralized security planning of the good old days. For one thing, many of the tools needed for the job are simply not there yet. "The approach right now is to cut and fit with what's available and, to tell you the truth, the fit isn't always that good," said Fritz Wagner, manager of corporate electronic information security at Du Pont Co. in Wilmington, Del.

Managing a mixed-platform client/server environment also means managing a lot of user confusion about things such as identifications, passwords, log-on sequences, data encryption and access privileges.

Yet information systems security chiefs need to get their hands around the issues — and fast. Some security experts say that protection of the electronic access to corporate resources may prove to be *the* most important issue in the next phase of client/server architecture development.

Consider the cost of letting down your guard. The Communications Fraud Control Association estimated that losses caused by unauthorized access to computer and telephone systems last year exceeded $500 million in the U.S. and more then $2 billion worldwide.

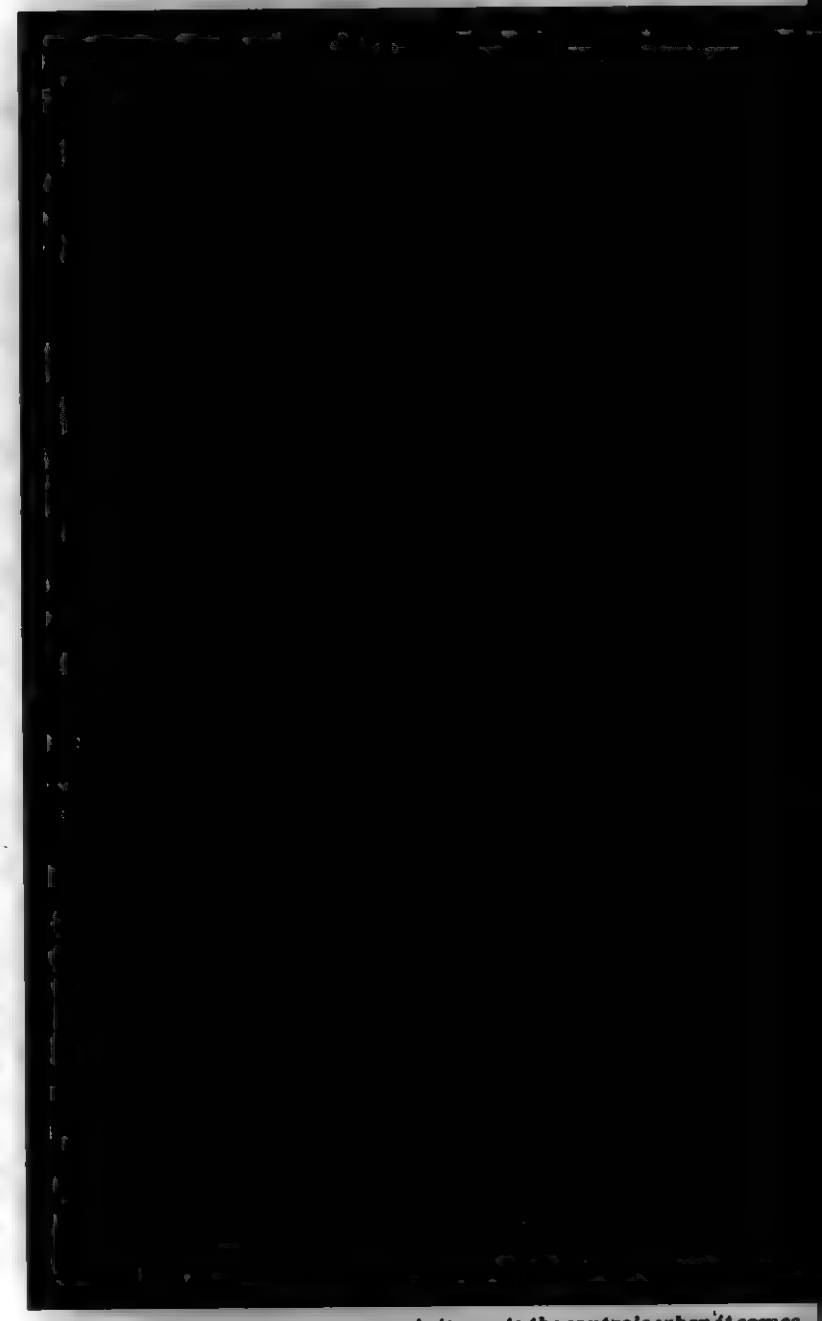
In another study by the University of Texas at Arlington, 43% of the companies that lose a major portion of their data via a major disaster (be it hacker or hurricane) will never reopen. And 90% will be out of business within two years.

"We're at the end of legacy systems and the beginning of broad distributed systems, so it's a critical time for people to plan for these things," said Bill Lowery, a manager at Toolmaker, Inc., a systems integrator in Bellevue, Wash.

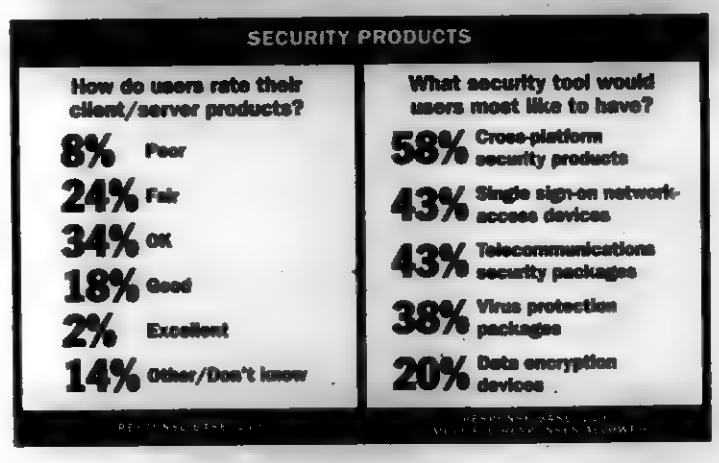
Still, it won't be easy. Securing a client/server environment is like throwing mud at the invisible man — it may be messy, but pretty soon you get an outline of what you're up against.

RAISE AWARENESS Information security chiefs need to burrow into the client/server design process as soon as possible. "Computer security is still a difficult point to get across," said Jack Skalon, a network specialist at the University Hospital Consortium in Oak Brook, Ill. "People need to know security is not a joke."

Chief executive officers and top managers also need to play a more active role in planning data security, which some experts say is one place where early mistakes are made. "Sometimes I think that security administrators need to go to a Dale Carnegie course and learn



DU PONT'S FRITZ WAGNER *says users must step up to the controls when it comes*



Daly is a *Computerworld* West Coast senior correspondent.

RESOLVING THE PARADOX

Nick Keith

Ways to stand guard over corporate data: Raise user awareness; control file access; back up critical data; and beef up your company's security ranks

to security — and not leave it solely up to the IS department

SWAPPING SECRETS

Like secret agents meeting in a dark corner of Gorky Park, computer users on a network must be certain of one another's identities before they can confidently exchange information.

One of the primary data authentication standards for open computer networks is Kerberos, which was developed by MIT. Kerberos requires users to exchange secret messages that prove their identities to one another, while concurrently preventing unauthorized parties from eavesdropping on data that is on the wire.

Kerberos allows its users to identify themselves and verify their identities with secret key encryption technology. These credentials, called tickets, contain user information such as name and location.

In addition, Kerberos provides the principals with a secret key, which they use to exchange confidential messages. Possession of the secret key, which allows each party to encode and decode the messages, constitutes verification of the credentials.

For example, a national sales manager might want to dial into a database to see which region is burning up the boards on widget sales. Before the database service complies with that query, it must verify the sales manager's identification.

Kerberos is not without its critics. They say it requires tremendous technical knowledge. End users, however, may be desperate for the software standard no matter what the cost. Kerberos has the endorsement of the Open Software Foundation, and some 700 user companies are implementing pilot programs based on the security standard. ■

how to better sell their jobs to their managers," said Cheryl Currid, president of the Currid & Co. consultancy in Houston and director of information technology at The Coca-Cola Co. for eight years.

Several user groups are involved in client/server security. These include SAFE (Security Alliance for Enterprise), a recently formed voluntary group dedicated to enhancing the security of Unix-based networks, and New York-based OURS (Open User Recommended Solutions), a relatively new user group.

Security awareness must likewise be passed to the user community. "We're distributing the resources, and we're also distributing the responsibility," Wagner said. "The IS guys can't do it all. Users need to take control of their own environment."

PUT NEW SECURITY DESIGNS INTO OLD ARCHITECTURES "Just because you decentralize the computers doesn't mean you decentralize all the security administration," Currid said. "We went through an enormous decentralization process, splattering data from one mainframe onto 50 servers. But we did not decentralize security. It ended up being put in the hands of more than one person, but we did not give every Tom, Dick and Harry the keys to the computer."

The new distributed function may create a need to hire more security employees. That happened at Mastercard International, Inc. in St. Louis. "We found that we needed to bring more people in just to keep up the same level of security," said Tom DeWald, manager of technical development at Mastercard.

CONTROL FILE ACCESS Illegally accessing systems is quite easy. "I can get into nearly any corporate network just by tapping in numbers randomly," said Robert Schiffreen, a hacker-turned-security consultant who once broke into Prince Philip's electronic-mail file in England. "People just leave their IDs and passwords lurking around. It isn't all that hard."

START WITH THE BASICS The most promising line of

SECURITY, *page 26* ◆

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SECURITY, *from page 23*
attack for interlopers seeking access to data on a network is a networked workstation. These must be protected carefully. Restrict access and power-up to workstations through keys, identification cards, smart-cards or biometrics.

The network administrator might also want to classify network users in order to impose the appropriate level of security. The following is a suggested three-level system:

- Administrative users who design, maintain and run the network — likely to be a small group of support and managerial staff.
- Trusted users whose work benefits from greater freedom of access to the network.
- Vulnerable users — those who do not have the need to access secure data.

Proper access control requires that authorized users have considerable ease of access, while non-authorized users have difficult access. Striking that balance — between a system secure enough to protect data but not so tightly locked as to hinder user access — remains "one of the trickiest parts of the job," Redler said.

AUDITING Once you've got everyone under control, it's time to start keeping tabs on who is doing what. A computer file or printed report that lists attempted access is an excellent warning system that lets you know if data is under attack.

Keep a chronological log of all events that occur on the computer system. Log all workstation activity, identified by user identification, and make this feature known. The fact that all access is recorded is in itself a great deterrent to wrongdoing.

Auditing should be frequent because some types of intrusion can go undetected for a long time otherwise. One threat-monitoring system is concurrent auditing, which provides continuous monitoring and reporting of unusual activity, including variances and exceptions to company policies and procedures.

CRYPTOGRAPHIC CONTROL If information is accessed illegally, make sure it will be useless. Typically, this means that the data in the file is encrypted using some form of password as a key. Only authorized users can de-encrypt the data, using the secret password.

Encryption is a rule that should be enforced, especially for all communication to and from the host computer and especially for top-secret messages. There are many good products on the market for doing this, ranging from rudimentary third-party vendor applications to the super-sophisticated Data Encryption Standard used by the government.

SECURITY THREAT — AN INSIDE JOB

The greatest client/server security risk is on the:

- 45% Desktop client platform
- 41% Network
- 14% Server platform

The greatest security threat is from:

- 67% Inside the company
- 30% Outside the company
- 3% No opinion

The biggest source of data loss is:*

- 42% Inexperienced users
- 24% Database crashes
- 15% Electrical surges
- 5% Computer viruses
- 2% Fire or natural disaster
- 12% Other/Don't know

BACK UP CRITICAL DATA A client/server design is actually a good tool for avoiding a total information systems loss. "In a decentralized environment, you actually have a better chance of recovering from a disaster faster than you do in a mainframe environment because it's very, very unlikely that you will ever lose the whole system at once," Currid said.

But that doesn't mean you're out of the woods. Backing up data in a decentralized environment can be tricky, according to Herb Edelstein, a principal at Euclid Associates, a Potomac, Md.-based consultancy. Edelstein noted that databases sometimes exist on multiple servers, which often have different backup regimens. His suggestion: Centralize the servers where they can be controlled by systems administration staff.

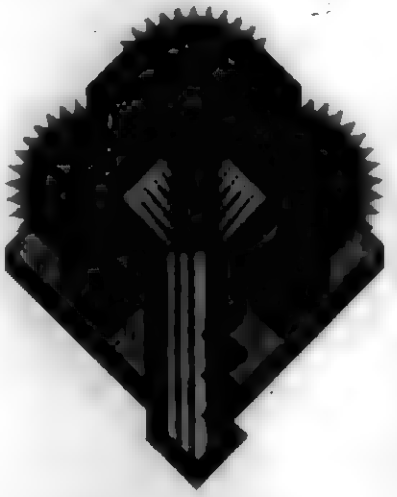
SIMPLIFY, SIMPLIFY... The very nature of a client/server design requires tying together multiple operating systems, each with separate access codes and passwords. But what will you do — sacrifice security to simplify it?

One solution is a single sign-on security package (see story this page). Using such an application makes moving through a complex, mixed-platform environment as easy as remembering one personalized password. For IS managers, these packages also offer an easy way to distribute security from a central location.

"You can have the best system in the world, but if everyone is pasting their passwords on the side of a terminal with little yellow sticky notes, it doesn't mean very much," said Peter Wild, an EDP audit manager at Melville Corp. in Rye, N.Y.

Most of the single sign-on products on the market create a restricted access "security kernel" on each PC that contains (in encrypted form) all the usual passwords, identifications, log-on sequences and authorizations required to access individual systems. When users try to attach to a particular system, the sign-on product prompts them for their single passwords and checks their access privileges for that system before logging them on.

"Ultimately, we'd like to have security be almost invisible to the end user, but we know that's not always possible," said Ray Mueller, president of Management Information Support, Inc. in Lakeland, Colo. "But either way we know we have to be secure. If not, we're sunk." CSJ



SECURITY PRODUCTS

When shopping for security products to meet your company's needs, the classic advice "Let the buyer beware" is the best advice of all. The following is a brief sampling of the many dozens of products available for a distributed environment. Prices range from $250 to several thousand dollars.

- Single Sign-On Data Access Control System (DACS) from Norgent International, Inc. in Rocky Hill, Conn. Allows users to travel through various networks and gateways with only a single password. Provides centrally managed security control.
- SAFE Single sign-on application from Fifth Generation Systems, Inc. in Baton Rouge, La. Creates restricted access security kernel on individual PCs and can create and distribute security kernels from a centralized location.
- The Eagle Network Isolator from Raptor Systems, Inc. in Wilmington, Del. Lets you specify, on a per-machine basis, exactly what kinds of communications will be allowed and when they will be permitted.
- The Enterprise Security Manager from Hughes STX in Vienna, Va. Places the entire enterprise under centralized control.
- LanMark DataCom Security Corp. in Hayward, Calif. Provides a range of access control products and personal authentication devices.
- The Network Security System from Semaphore Communications Corp. in Santa Clara, Calif. A family of hardware and software products that control access and protect data as it travels from source to destination over both local- and wide-area networks.

—by JAMES DALY

NETWARE: SECURE AT LAST?

In October 1992, Novell, Inc. got a disturbing call. The kind of call that makes you feel like you just swallowed a brick.

A student at Leiden University in the Netherlands discovered that with a little tinkering, any user with an easily attainable NetWare server account could gain access to any other user's file.

The chilling potential of that security gap led to NetWare 4.0, released in March of this year, which Novell officials claim is their most secure product to date. That's a given — network security was virtually nonexistent on Version 3.0.

The updated NetWare packs in security features from a password integrity checker to data encryption techniques and audit trail service. A directory services utility provides a simplified way to grant and manage the security privileges of global network users.

Version 3.0 also restricted the ability of the system administrator to delegate responsibility to subadministrators. Version 4.0 provides a more flexible approach, allowing the system administrator to grant a subadministrator specific authority to perform certain functions while withholding others.

In addition, an authentication service also verifies the validity of a user's identification, using RSA Data Security, Inc.'s encryption key technology. A client's signature, the basis of authentication, is valid only for the duration of the current session. The signature itself is never transmitted across the network.

Prior to Version 4.0, NetWare provided customers with security implementation services in the areas of administration, authorization, access control and assurance. Auditing services were limited but were provided through third-party products. CSJ

Network ahead WHOA!

Managers try to regain control as client/server applications wreak havoc with communications bandwidth and user response times

By Jeannie M. Weekley

Companies splintering their data processing across far-flung, shared computers have discovered that the networks gluing these distributed machines have the power to single-handedly ambush the most well-intentioned client/server efforts.

Consequently, information systems departments are learning — some the hard way — that the care and feeding of a corporatewide network is a science in itself.

"Everything in client/server computing depends on the network," asserted Raymond Perry, vice president and chief information officer at Avon Products, Inc. in New York.

Perry has added three people to his networking and hardware staff to manage five relatively new client/server applications, including a desktop publishing system for designing Avon's weekly products brochure.

"Just keeping the network operational while adding and removing workstations is a significant task in itself," Perry said.

The IS department, which was largely left out of the loop as pockets of local-area networks sprang up around the corporation, is now finding itself charged with preventing a single hiccup in what has grown into sprawling internetworks. This task means ensuring that the network — which is continually expanding and changing — is rock-solid reliable, delivers the predictable response times that terminal-to-host users have come to expect and does not drain the corporate coffers.

KEEPING THE CORPORATE NETWORK RUNNING *while adding and removing devices is a major challenge on its own, says Avon CIO Raymond Perry*

IS groups are tackling these challenges in a variety of ways, ranging from looking to technology for managing network bandwidth to reorganizing their staffs.

For example, when JC Penney Co. in Dallas began deploying client/server applications, "what really killed us was NetBIOS," said Jim Ducatelli, manager of advanced information technology. NetBIOS, a LAN protocol upon which many client/server applications sit, broadcasts itself across the entire network each time a session is opened, he explained.

JC Penney added one NetBIOS-based application too many, Ducatelli said, and "all of a sudden — boom! Links started to congest, and response times dropped."

In addition, the widely used Transmission Control Protocol/Internet Protocol (TCP/IP) "has tremendous overhead" that can clog the network, Ducatelli said. "It's much larger than that of SNA [Systems Network Architecture] because TCP/IP was designed for a global environment, and SNA was designed for just one."

HOPING TO COUNTERACT these ill effects, JC Penney is working with its router vendor, Cisco Systems, Inc., to activate appropriate router filters that suppress such needless traffic from traversing the internetwork.

Until networks simply become fast, cheap and widespread enough to accommodate whatever traffic loads users decide to pump onto them, vendors are coming up with innovative interim technologies to help users control their bandwidth (see story page 28).

more, page 28

WIDENING THE HIGHWAY

Data superhighways are opening up now to network services that accommodate client/server computing. A key component is Synchronous Optical Network (Sonet) technology, a very fast fiber-based communications platform. Some Sonet projects in the works now include the following:

- A $240 million, 12-state effort by GTE Telephone Operations to install 58 Sonets in 1993 and 1994.
- A $4.4 million endeavor in North Carolina for a statewide government, educational and medical network. Initial services are expected in mid-1994.
- "Private" citywide Sonet installations by the city of Milwaukee and Chicago-based Commonwealth Edison.
- Efforts by New York Telephone to build a regional network linking medical, manufacturing and research and development communities that will eventually connect to the public telephone network.

...mess, from page 27

One large company saw that "sloppy" application development could result in unexpected bandwidth demands by putting unneeded data on the network. Thus, development and network people at Convex Computer Corp. have joined forces to make sure "the correct processing is done in the correct location," said Coyne Gibson, manager of information technology at the Richardson, Texas, firm.

"Our database administrator is now part of the information technology group. He understands what's going on with both the network and the database and can communicate network issues to the developers," Gibson said.

Michael Millikin, a vice president at Interop Co., a Mountain View, Calif., company that provides trade shows, conferences and tutorials on how to build, operate and manage heterogeneous networks, agreed that the network administrator/developer liaison can be useful.

"The protocols and application interfaces you use all have bandwidth implications" that developers need to know about, he said. Millikin added that today there are not many good guidelines available for figuring out "what part of an application should run on what processor."

The overhead with NetBIOS, a 'chatty' LAN protocol, can gobble up your network resources.

A DEFICIT OF ANALYSIS tools also exists for determining how much traffic to expect over a given communications link in the fragmented client/server environment, according to Hub Vandervoort, president of Horizon Strategies, Inc., a consulting firm and maker of client/server development software in Needham, Mass.

In a distributed computing environment, when a user hits the enter key on his client workstation, "queries can be off to multiple servers and may consume MIPS in a variety of processors," he said.

In the client/server world, this traffic is tougher to get a grip on than in the mainframe world, where IS could install a line monitor next to a front-end processor and measure how long it took traffic to go in and come out, Vandervoort noted.

To plan for bandwidth consumption in the shadow of fickle client/server applications, Kash n' Karry Food Stores, Inc. "greatly simplified how the network was constructed," said Donald E. Rimel Jr., a quality engineer at the Tampa, Fla.-based company. This entailed eliminating routers and bridges, creatively segmenting networks, direct-connecting servers to a 100M bit/sec. Fiber Distributed Data Interface (FDDI) backbone and installing X Window System display terminals, Rimel said.

Kash n' Karry had experimented with some internetworking devices, "but we immediately got a lot of traffic all over the place, which had a strong negative impact to the organization. Collisions went through the roof, and response times went down," Rimel said.

While bridges and routers allow network segmentation with better performance per segment, they create additional sources of overhead, he explained. For example, while the development team was doing multimegabyte compilations over the network, a word processing user would move his mouse around and "see the screen stutter," Rimel said.

Kash n' Karry subsequently isolated the developers onto their own Ethernet with a connection to the FDDI and gave them X terminals, which transport only display traffic across the network instead of entire files. Processing of files in the X world is done on the host computer, not the desktop.

Meanwhile, the response-time challenge to IS is getting even trickier as internetworks grow across wide-area telecommunications links — traditionally orders of magnitude slower than LAN speeds.

The good news is that "broadband" wide-area networks, such as Asynchronous Transfer Mode and Switched Multimegabit Data Service, which run much faster than most of today's LANs, are emerging to handle aggregated LAN traffic.

BUT UNTIL THESE roomy data highways are widespread and economical, users such as JC Penney are turning to internetworking vendors for technologies, such as compression, traffic filtering and prioritization, that help them conserve and manage bandwidth.

Ahlstrom Pyropower, Inc., an engineering and construction firm in San Diego that is moving its PC interrogation program off the host and onto the PC, summed up the client/server challenge this way: "Client/server represents change, and change is the enemy of reliability," said Michael McEwen, manager of IS. "Some people are buying new servers just to run client/server," and adding resources and changing application dynamics means congestion problems, he said. **CSJ**

Wexler is a *Computerworld* senior editor, networking.

Rx for network stress

To alleviate overworked network bandwidths, router vendors offer compression, filtering and traffic prioritization techniques on their products. Compression lets users squeeze in up to 10 times more traffic, while filtering schemes flush out bottlenecks by shunting user-identified "garbage" onto wide-area links. Prioritization gives certain types of traffic clout over others.

Swiss Bank Capital Markets and Treasury in Lisle, Ill., has looked beyond router capabilities to a smart device called the Datamizer IV from Symplex Communications Corp. The Datamizer was specifically designed for bandwidth management.

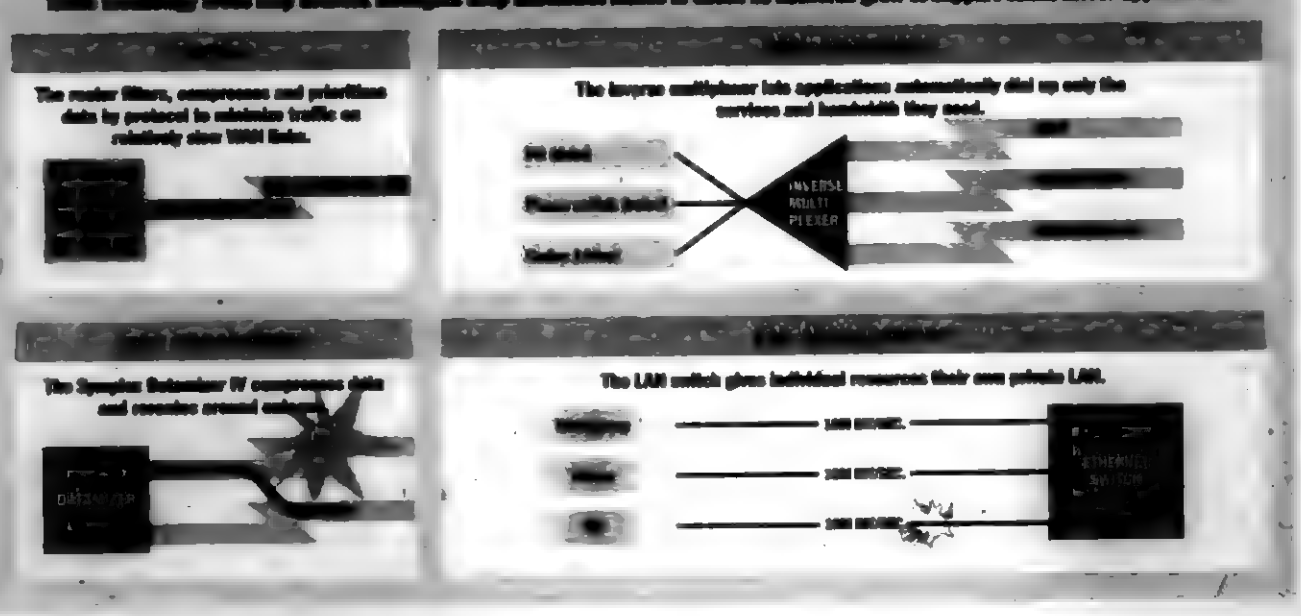
Aside from sophisticated compression, it plays sentry against network outages: The moment it detects one, it will reroute traffic over a backup line.

It will also monitor T1 lines for congestion and bump voice traffic off to the public switched network in favor of data when necessary. Swiss Bank said it postponed new WAN bandwidth investments for at least six months when it merged with The O'Connor Partnerships last year because of the efficiencies it gained with the Datamizer.

Other tactics for handling the flood of network traffic caused by distributed computing include the following:

- **LAN SWITCHING HUBS:** These network segmentation products from the likes of Alantec, Kalpana, Inc. and Synernetics, Inc. deliver full LAN bandwidth to an individual user or a heavily accessed network resource, such as a server. This precludes growing numbers of resources from contending for a fixed amount of bandwidth but allows them to maintain existing investments in LAN adapter cards. Such capabilities are also showing up as modules in smart wiring hubs.
- **INVERSE MULTIPLEXERS:** These devices let applications dial up public network services on demand, rather than paying for dedicated bandwidth that can sit idle much of the time. ■

GETTING A GRIP



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CONSULTANT'S VIEW

Client/server + object technology = BUSINESS INNOVATION

Over the years, the information systems industry has seen many technological innovations, each presented as "the coming thing," capable of solving all problems. On-line systems, structured methods, fourth-generation languages, CASE, relational databases — each was introduced with the fanfare of an old-time medicine show, and each, somewhat like a patent medicine, had its good and its ill effects.

More recently, client/server computing and object technology have arrived on the scene, like previous innovations, with an excess of fanfare and hype. But something is significantly different this time: the synergy of client/server and object technology.

That difference is evident in the amount of money being spent by organizations large and small, and by the rate at which major end-user companies are adopting these approaches. These innovations are attracting more attention than any others I've seen during the past 25 years.

While client/server may be the latest buzzword for distributing an application and its data over more than one computer, it has actually taken almost 20 years for this architecture to make its way into the world of strategic business systems.

Katherine Lambert

Distributed object computing is still a few years away, but it promises to solve real business problems.

Object technology also got its start at least 20 years ago, as its basic ideas can be traced back to the Simula programming language in the late 1960s.

What lies ahead now as the really exciting innovation, however, is combining object technology and client/server. The distributed computing architecture is provided by client/server, while objects supply the appropriate modular units to distribute.

I'm not just talking about applications that run on PCs and store their data on separate database servers, but rather true "distributed object computing," where multiple computers participate in providing a computing function. The objects (data and processes) on one machine transparently interact with objects on other machines.

It is this combination of client/server with object technology that provides maximum flexibility to adapt applications to changing business conditions. One can scale hardware configurations by the needs of different business units (via client/server) and vary the location of computing functions based on network performance (via objects).

Different human-to-computer interfaces can also be supplied to different classes of users (via client/server and objects).

By Jerrold Grochow

Today, we regularly implement object-oriented applications that employ a database server. We also implement systems where one object-oriented application communicates with another using standard communications protocols.

But developing an object-oriented application that is itself spread across several machines is still an experimental effort. This type of distributed object computing requires the services of a distributed object request broker, a technology that is just starting to emerge in the marketplace. The distributed object request broker allows objects to pass messages to each other without regard to where (on what machine) they are located.

While there are examples of distributed object request brokers implemented as components of commercial applications (for example, in NCR Corp.'s Cooperation desktop environment), general-purpose, cross-platform technology is just now making an appearance.

Given the relative immaturity of both client/server and object technology (at least in the realm of strategic business systems), much of the work going on in distributed object computing is still in its early days.

While there have been some notable successes, it will be two to three years before we see ongoing use of this technology in high-reliability, high-performance, business computing environments.

Yet with its potential of eventually solving real business problems, the combination of client/server and object technology may be just the medicine we have been waiting for. **CSJ**

Grochow is vice president and chief technology officer of American Management Systems, Inc. in Reston, Va.

Dealing with disaster planning, legacy data and NT

STRATEGY SNAPSHOT

Access control and virus checking are not the only client/server security issues to worry about. Companies need to plan for physical threats to their networks as well — from fires to disgruntled employees, said Michael Miora, president of Miora Systems Consulting, Inc. in Playa Del Ray, Calif.

Client/server systems should be considered secure only if they can be reassembled or regenerated after a natural or man-made disaster, Miora said. This business resumption planning means backups for the following:

- **Equipment:** Detail all the necessary hardware and software to run your business, including network software and equipment, printers and remote connections. Don't forget telecommunications equipment, fax machines, modems and EDI connections.
- **Data:** Off-site backups of data are needed. Make sure to include both data on servers and any necessary data on local drives or floppy disks. "You have to have a strategy to save all your data," Miora said.
- **Locations:** Find suitable sites to rebuild the needed parts of your client/server system. To back up equipment without huge expenditures, Miora recommends that users negotiate an agreement with their computer resellers for 24-hour replacement equipment — or consider using one of the company's other locations as a repository for extra equipment.

LEBHAR FRIEDMAN, INC.

For the information systems division of Lebhar Friedman, Inc., converting to client/server was not just a matter of switching hardware. When this publisher of industry directories in Tampa, Fla., moved its databases from dBase III files to Microsoft Corp.'s SQL Server, it discovered that converting data can be an enormous project. "We spent between 25% and 40% of our conversion on converting data," said Lewis Katz, corporate director at Lebhar.

The firm needed to move more than 50 databases from an old publishing system database and that meant 500M bytes of legacy data needed to be normalized and validated, with dead records removed.

The four-step process used was to:

1. Define old data and create a data analysis specification on the old database. Run any old programs associated with the data and define program requirements.
2. Load data into SQL Server. Translate the data into a SQL database and analyze the data that was loaded.
3. Develop data reports and interface. Conduct additional checks for inaccurate or missing data. Create a user interface to examine and control data.
4. Get user feedback, asking them to analyze the data from both negative and positive aspects.

EL PASO NATURAL GAS CO.

Although much of its business is still tethered to a Wang Laboratories, Inc. VS10000 minicomputer, El Paso Natural Gas Co. is moving briskly toward open client/server computing as it builds a network running Microsoft Corp.'s Windows 3.1 and Windows NT.

After rejecting both Unix and OS/2, El Paso settled on NT last year despite the concerns about its stability and robustness. "We've had our problems, but the beta version we have now is stable," said Linda Kern, manager of application development and support services at El Paso, which transports gas over its pipelines for other gas marketers.

The network now under construction will eventually rope together the gas company's 1,500 PCs. By fall, the plan is to have several production applications running under NT, Kern said.

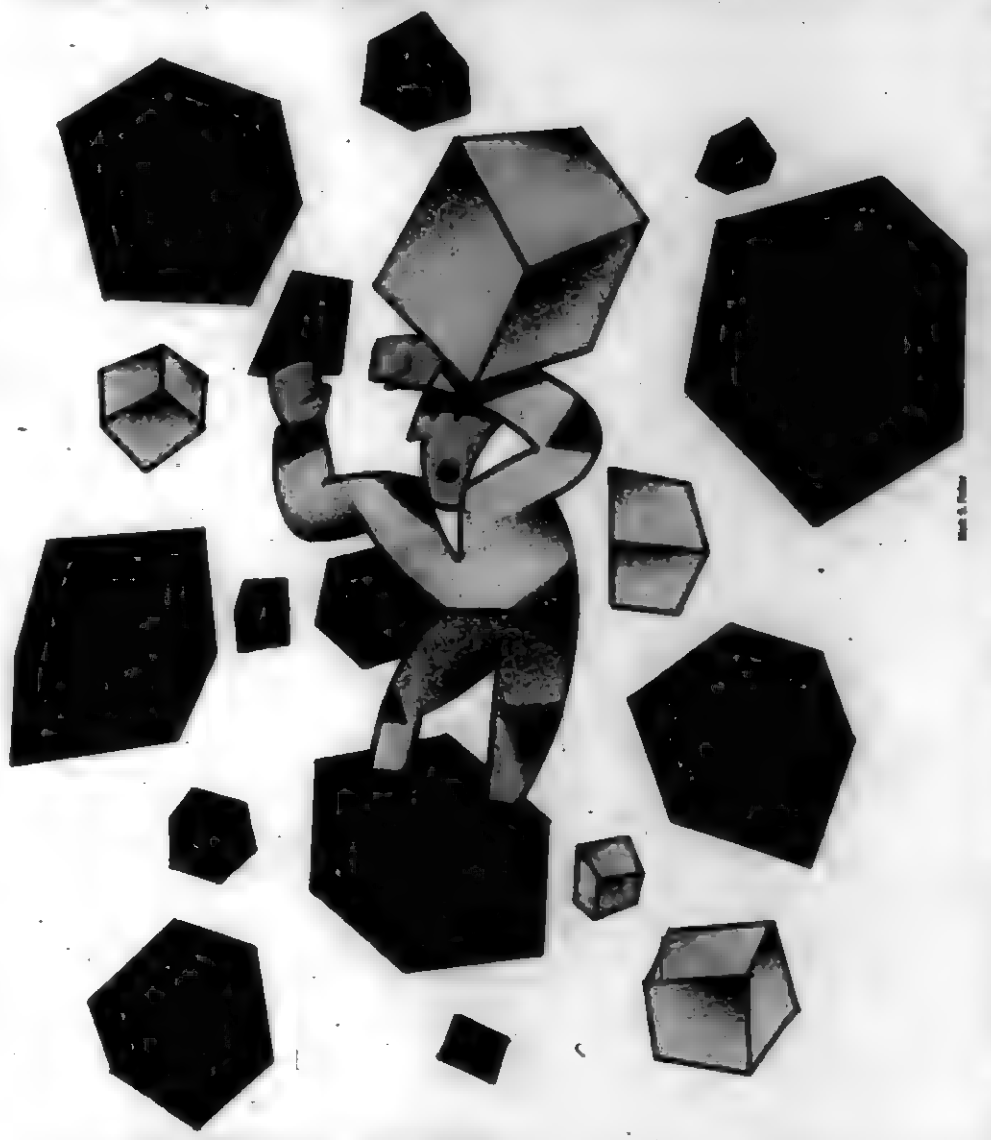
The company used Powersoft Corp.'s PowerBuilder to develop reporting applications that allow customers to schedule gas on the company's pipelines and graphically see an analysis of their request.

"A strategic advantage for our client/server software is its flexibility," Kern said. "We can deploy the programs that we're developing in the different environments that our customers need," such as OS/2, Unix or Windows.

David A. Kelly is a free-lance writer in West Newton, Mass.

Decision time

Choosing the right apps for client/server involves everything from user demands to data needs



By David Baum

The decision to move an aging mainframe application to client/server was far more than a flip of the coin for Terry Longoria, deputy director at Napa County's Department of Health and Human Services in Napa, Calif.

Her department needed to update a cumbersome welfare application that was running on a Unisys Corp. 2200 mainframe. Users were complaining about how difficult it was to use—but at least it worked.

Longoria wondered whether a new client/server architecture, sporting PCs for front-end screen navigation and processing, would really make that big of a difference. In the end, it was the users who won the toss.

"They're familiar with word processing programs. They're familiar with spreadsheets," she explained. "Adding a similar interface to our welfare system puts us in line with the strategic direction of the industry."

That decision also made good business sense, said John Rymer, an analyst at the Patricia Seybold Office Computing Group in Boston. Whenever data-entry clerks are moving frequently among five or more screens and their work involves checking and cross-checking of data, Rymer said a desktop PC with a well-designed graphical user interface (GUI) can boost productivity.

Such was the case with Napa's welfare system, which monitors continually changing government regulations. The first step was to replace desktop terminals with PCs, using Unisys' Designer Workbench to build graphical front ends for existing Unisys mainframe applications. Longoria and her team created a Windows interface that automatically navigates users from screen to screen, reduces keystrokes and handles data validation and reporting functions.

While it is still too early to tell whether the change will significantly increase user productivity for Napa County, the experience there reflects some of the key guidelines that determine when client/server is right and when a traditional host-based environment still makes better sense.

DISTRIBUTION OF PROCESSING Ultimately, the major factor in putting any computing architecture into place is what type of information is required, where it will be processed and where it can be optimally stored.

"We try to place our users on either side of the decision-support line," said Keith Therrien, an independent consultant and software architect at Arkwright Mutual Insurance Co. in Waltham, Mass. "When workers have complex processing to do, such as calculating premiums and adjusting insurance claims, it makes more sense to have the capabilities of a PC. But if there isn't need for much processing at the desktop, it is hard to justify the extra expense."

Arkwright is midstream in its voyage to client/server, making tools that can combine old and new technologies a primary consideration. The company found that the SmartStar product set from SmartStar Corp. was a good fit, Therrien said, because it enabled Arkwright to create a consistent presentation layer for both character cell and GUI applications.

Therrien said his team decides whether or not client/server is appropriate on a case-by-case basis. For intensive heads-down data entry, why bother users with all that pointing and clicking, he asked, or developers with splitting application logic between client and server nodes?

But some cases are not so clear-cut. "There might be an instance in which you are doing a little bit of front-end process control, and a lot of data entry," he noted. "Architecturally, it could go either way."

In these cases, it is usually the cost that clinches the decision, or the user vote. Many users have grown weary of the mechanical constraints of command-line syntax and are begin-

DECISION TIME, *page 34*

Source: CW Client/Server Survey

BOTTLENECKS, *from page 33*

ning to ask why the applications they use at the office cannot be as flashy as the ones their kids are using at home.

WHERE'S YOUR DATA? Yet even when split-logic client/server applications make good architectural sense, a common complaint is lack of facilities for database and network management. With client/server applications, data may be spread across multiple servers, and applications must understand different transport protocols to distribute information.

"This [problem] is overwhelming us," said Tom Runkle, North Carolina's deputy state controller for information resource management. "One of the promised benefits of client/server is simultaneous access to multiple databases. But we find it very difficult to coordinate data from many different departments and agencies. What we haven't ironed out yet is the data administration side: What data do we have? What does it mean in this application over here or over there? Where does it come from? When is it updated? How accurate is it? This has become our Achilles' heel."

Such complications lead many information systems pros to question the "cure-all" mentality behind so much of the client/server propoganda sweeping the industry today. "PCs and workstations can provide wonderful analytical capabilities on the desktop," said Ed Toben, director of IS at Colgate Palmolive Co. in New York. "But in some cases, the sheer magnitude of the data processing requirements indicate that a large, centralized system is a safer bet."

STAFF EXPERTISE Another crucial point to consider when determining the viability of client/server for large projects is staff expertise.

The client/server world seems to be more the province of people migrating up from PCs than those migrating down from mainframes, said Kent Failing, president of Computer Design Professionals, a consulting firm in Atlanta. "That makes me uncomfortable. There are certain considerations that mainframers will bring to a project that PC people won't — things like data protection and validation," he explained.

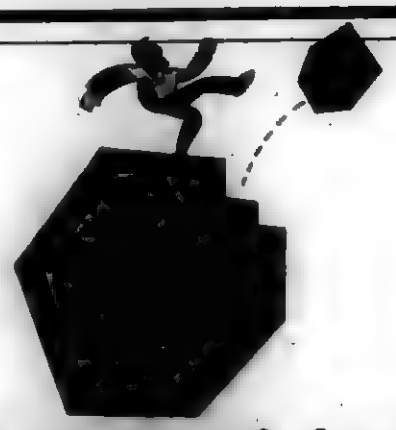
Unfortunately, many of the PC-oriented client/server development tools aggravate this problem by neglecting to enforce design methodologies or project management disciplines. While this is not a problem when developing smaller, tactical applications, it is an issue with mainstream, mission-critical systems. Corporate developers stress the importance of working from a data model in which all objects and attributes have been carefully defined.

Vendors of client/server development tools recognize the problem, and many of them are establishing links to computer-aided software engineering (CASE) products to remedy it. For example, PowerBuilder from Powersoft Corp. can now make use of a logical data model as the foundation for applications.

More sophisticated development products, such as SmartStar's SmartStar Vision and The ASK Group, Inc.'s Ingres/Windows4GL, offer more intimate links to CASE tools, which enables developers to automatically populate a repository from a previously defined data model.

There is no shortage of tools, and tool vendors are scrambling to address the remaining challenges. Despite some lingering skepticism, most IS managers are eager to put client/server into practice. Like Napa County's Longoria, once a critical project comes along that can justify the expense, they are inclined to make the leap. **CSJ**

Baum is a free-lance writer based in Santa Barbara, Calif. He specializes in emerging technologies.



Smoothing out the bumps

Charged with the care and feeding of more paved roads than any other state in the nation, the North Carolina Department of Transportation's highway division is one of the largest construction companies in the world. The state is nearing completion of its first project — an on-line highway management system that will automate the state's road maintenance program and help keep better track of records.

About 150 workstations were installed at 55 sites, along with OS/2 data servers to handle local database processing. A wide-area network connects each local-area network to an IBM 3090 mainframe, where centralized data resides in a DB2 database.

"Client/server is much more involved than it appears on the surface," said Tom Runkle, deputy state controller for information resource management. His advice? Plan for a "tremendous difference" in support levels for PCs and LANs vs. mainframes, and factor in extra time to get programmers up to speed. ■

CONSULTANT'S VIEW

Technological growth makes scalability a key concern

Just about every week, a new client-based application development system appears on the market.

This is good news for organizations that want to begin moving the application development process from server- and character-oriented tools to a graphical client environment. The benefits of graphical application development — easier prototyping and iterative development — are becoming clear to many developers working with these tools.

But the same qualities that make development systems so useful and appealing also present potential dangers.

As organizations move out of the pilot stage with these new tools, they will begin to discover that many of these tools cannot scale upward as the size, complexity and number of users grow. Yet scalability is the one criterion that information systems management cannot afford to underestimate.

By Judith Hurwitz

Unfortunately, it is not always easy to judge how scalable a tool will be without careful investigation. On the surface, these tools look very much alike, while under the covers there are dramatic differences.

Whether a developer begins the development process with a tool such as Microsoft Corp.'s Visual Basic or KnowledgeWare, Inc.'s ObjectView, the initial development periods will have much in common.

Even when an initial pilot project has been completed, the differences may not be apparent. Where the rubber meets the road is when business requirements dictate that an application become more complex and when large numbers of developers must work together to create a large-scale application.

Troubles with scalability can surface in various ways.

In one case, a developer who needed to build a seemingly simple application went to a local computer store, purchased a shrink-wrapped personal development system and very quickly constructed a useful and practical application. But his glory was short-lived. Managers within the organization who had started using this application soon needed more functionality.

So the developer had a dilemma: move from Visual Basic's higher level, point-and-click environment into straight C programming or select a completely different application development system — one that could allow the application to grow from its simple roots to a complex data analysis system. While it was early enough in the process for this developer to change to a more robust tool, the situation is not always so simple.

Some of the jazziest development tools cannot make the leap from small workgroup to large, complex projects.

In another case, a large manufacturing company decided to begin implementing a client/server development environment. It began with a pilot project using a popular PC-based development system, which was an excellent choice for the pilot project.

Problems rose to the surface after the initial pilot stage, however. Once the production project began, the two initial developers were joined by 30 more assigned to the project.

Because this particular tool was initially designed for small workgroups, it simply did not have the underlying structure to support as large a set of functions as the organization needed. After spending more than $5 million, the company is now re-evaluating its tools.

How can you tell how scalable a tool really is? For starters, talk to other customers who have used the product in a large-scale development environment. Ask the vendor for more than one reference.

Find out what kind of experience the tool vendor has. If the company has done only small desktop applications, chances are it does not have the expertise for large systems work.

Make sure you can articulate your own problem. Be able to explain — in specific technical detail — what you're trying to accomplish with the application. And think ahead about growth potential. **CSJ**

Hurwitz is president of Hurwitz Consulting Group in Watertown, Mass.

World's Largest Prosecutor's Office Adopts New Information Management System

The Los Angeles County District Attorney's Office is implementing a state-of-the-art information management system to help its 950 prosecutors handle the more than 300,000 adult and juvenile cases it tries each year more efficiently.

Under the direction of newly elected District Attorney Gil Garcetti, the head of MIS for the office, Sherron Trawick, is establishing a shared network that will increase the productivity of the prosecuting staff, enhance management information and increase information sharing with other criminal justice agencies throughout L.A. County.

Trawick reports that the success of the Prosecutor's Information Management System (PIMS) being put in place is largely due to the development of a cohesive team consisting of users, District Attorney Office management, Price Waterhouse Management Consulting Services (MCS) staff and technical staff from both the central County IS department and her IS division.

The combination of teamwork, choosing the right system and technology environment and careful implementation of the new system in incremental phases are the keys to meeting the goals set by the department.

Setting Objectives

The complexities involved in prosecuting cases in a county as large as Los Angeles were overwhelming the old system. The environment in place was comprised of several small systems with the equipment and applications that did not interface, requiring duplicate entry of data. Ms. Trawick notes that "one of our key goals was to provide our users with the ability to do case tracking and court document generation on a single system and eliminate costly and time-consuming duplicate data entry. We needed to improve the user interface, too; what was in place was an antiquated system."

Trawick explained that in addition to an improved user interface, and a timely and inexpensive ad hoc reporting system for management, they wanted to facilitate information sharing "with the rest of the criminal justice community." The DAO was one of the few agencies in L.A. County that could not share data with the other criminal justice groups.

The critical need for such information to flow across the criminal justice system was stymied because the DAO's systems were "outmoded and our minicomputer hardware had a proprietary operating system." What was needed was a way to "automatically capture important data electronically such as booking information when a defendant is arrested and other critical court events." Along the same line, when the DA's office files a complaint, that data would be generated electronically for the courts and other criminal justice agencies.

Choosing A Solution

When the scope of the problem was analyzed, the DA's office set about looking for help to develop a system that could provide timely information across a central office and 40 branch and area locations. It would have to provide the 950 prosecutors with current data on juvenile and adult defendants involved in the 250,000 misdemeanors, 50,000 felonies and 25,000 juvenile cases tried each year. To meet those needs, a decision was made to develop a client/server system for the unit's operations in order to reduce processing costs and provide added flexibility. The system would also have to continue to serve the office's data and wordprocessing needs.

Choosing The Right Vendor

Once the parameters for the new system were established, the DA's office issued a Request For a Proposal. After evaluating the vendor's RFPs, the two best were asked to present prototypes of the systems that they planned to build. After the all-day presentations and interviews to insure that the system would not only meet the specified technical demands but could also be implemented successfully, Price Waterhouse MCS was awarded the contract.

Trawick explained that the DA's office was very impressed by the way Price Waterhouse MCS "integrated data processing and wordprocessing into the system during their prototype presentation. It demonstrated a real understanding of what we wanted them to accomplish. We were convinced that they had the client/server skills required to deliver a system to meet our expectations."

A law clerk at the Los Angeles District Attorney's office prepares a crime scene diagram on his PC workstation.

Designing The System

The first step in designing the system was to gain an understanding of the user's needs. In addition to the office automation system, Price Waterhouse MCS was confronted with the challenge of designing and implementing three key subsystems -- juvenile, adult and victim/witness programs.

Price Waterhouse's design team worked with the users during the external design phase to understand the operation and streamline it. Trawick reports that "the approach used by Price Waterhouse MCS enabled them to quickly gain a thorough understanding of our business and to make valuable recommendations regarding which procedures to keep, to change and to automate."

One of the keys to designing the system was understanding the similarities and differences between the subsystems. The juvenile and adult operations both required document generation and case tracking. However, juvenile offenders are assigned a court case number that remains with them throughout their history with the court system and only one minor may be assigned to a case. On the other hand, with adults a new court case number is assigned every time a new case is filed and multiple defendants can be assigned to a case.

Trawick explained that the adult system "will be sending and receiving information from numerous systems used by the courts, probation department and law enforcement agencies, while, for juvenile defendants, we only receive and send data to the Juvenile Automated Index System." She indicated that "this was a far less complex system of information gathering, particularly since there are only nine juvenile offices versus 33 for adults." It was thus decided to implement the juvenile subsystem ahead of the adult.

Trawick added that another reason behind the decision was concern about the readiness of the court system interface with the adult subsystem and wiring demands in all the buildings that serve the adult program. At the same, she said, "there are components in the juvenile subsystem that will be reused in the victim/witness and adult subsystems. In effect, we're easing the ultimate implementation of three subsystems while we concentrate our efforts on bringing the first one up."

The design of the application also had to include support for the victim/witness assistance program, which has to be able to access information from both the juvenile and adult subsystems. At this time, although there is a California state system in place that tracks payments to victims and witnesses, other parts of the program are a local responsibility. Local DAO representatives require the ability to check on dates for court appearances, to arrange for transportation needs and other services available to those in the program.

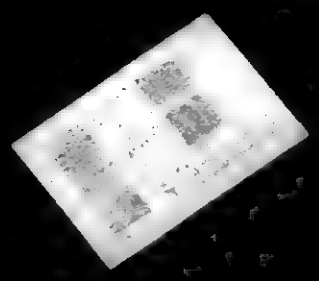
The Technology Environment

Clearly, the system is a complex one, calling for highly integrated network architecture and applications. For example, the architecture for PIMS is truly distributed. The database tables reside in DB2 on an IBM ES 9000 mainframe while the primary application programs are accessed from local file servers. The network architecture consists of Local Area Networks (LANS) connected to the County's Wide Area Router Network. SQL statements are used to transmit data from the mainframe to a file server and then a workstation where processing occurs. Information is then transmitted back to the mainframe for storage. Users are running Lotus Notes on OS/2 workstations in the office locations with servers for database, print, domain and communications.

Because it is critical that information be available for court appearances, the system designed by Price Waterhouse MCS has a great deal of built-in redundancy to take care of emergencies. For example, selected workstations can operate in a stand-alone mode when necessary to ensure that documents needed for court appearances can be printed even if the mainframe, wide area network and LANS are offline.

Continued on page 39

Some See Client/Server Only As Technology... Others As Results



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Price Waterhouse Case Study

Reengineering Operations and Systems Brings Maritz Travel Company Increased Sales And Customer Satisfaction

The combination of organization-wide business process improvement along with state-of-the-art networking and client/server computing is helping the Maritz Travel Company (MTC) achieve higher productivity, enhance its cost effectiveness, increase data integrity and respond to customers faster and more effectively. These changes are the result of an intensive reengineering of its business and systems that began in 1992 with the assistance of Price Waterhouse Management Consulting Services (MCS).

As a result of this reengineering effort, the $1.3 billion company is moving from a functionally driven organization with multi-layered decision-making to a client-focused team structure. To enable these major organizational changes, MTC is implementing a single, seamless data pathway network where all information driving the business is accessible over individual workstations. Although in the midst of implementation, these efforts are already bringing MTC higher productivity, enhanced cost effectiveness, increased data integrity, and speedier response to customers.

Gearing Change To Business Needs

MTC, challenged by sagging travel demand and increasingly complex customer requirements, recognized that it needed to find ways to enhance its ability to deliver high quality, cost effective group travel. After carefully examining its options, management concluded that fundamental changes to MTC's organization, processes, and technology would be required to ensure its continued leadership in the group travel industry. As a result, it engaged Price Waterhouse MCS to help it examine and reengineer its core business processes and to identify related information technology strategies to support the organization to the year 2000.

After an in-depth analysis of MTC's core service delivery process, including product development, supplier management, sales support and marketing, a joint MTC-Price Waterhouse MCS team recommended that MTC restructure its processes, organization and technology around the client-focused concept. The team identified a need for much stronger systems to leverage the skills that previously had been maintained in the functional organization.

"Handling the movement of 2,000 business travelers to a convention or meeting site requires a high degree of coordination and flexibility," according to Scott Guerrero, Vice President Information Systems at Maritz. "It demands ready access to information, quick turnaround and no dropped balls."

Improving Business Processes

The key to MTC's reengineering challenge was to recognize that the organization must be focused completely on meeting the group travel client's objectives. All efforts that didn't contribute to the central objective of designing, delivering, motivating and satisfying group travel programs had to be eliminated or reduced in priority. Recognizing this, the team focused on making changes that:

- Reengineered the way travel programs were designed and sold to eliminate errors and ensure client satisfaction from the outset

- Flattened the organization by eliminating an entire management layer

- Broke down functional barriers by reorganizing people into client-focused teams

- Reduced coordination and bureaucratic costs among functional groups by cross-training, redefining of job boundaries and locating staff members working on the same project in closer proximity

- Increased individual authority to make decisions that would improve client satisfaction

- Reduced non-value-added activity by streamlining specific processes such as job costing and contract administration.

The Technology Solutions

Very early in the process MTC recognized that the radical reengineering solution that was being developed could only be successful if supported by new information technology tools.

The empowered client-focused work teams needed technology to help provide the functional linkage and support roles that traditionally had been provided by the deep functional hierarchy. This required that MTC update its non-integrated platforms and systems that had grown up over the years with integrated systems that would allow work teams to communicate between and among themselves. Guerrero highlighted that problem, noting that "what we had were fragmented islands of automation that did not integrate well and required redundant databases with increased data input which led to higher costs and errors."

MTC first focused on developing the underlying communications infrastructure, basing the network on a Sybase database, a Novell Ethernet LAN system, Compaq 486 and Macintosh workstations, Sun Microsystem database servers and Microsoft Windows desktop applications. While the overall system rollout will take eighteen months to complete, a prototype system is already in operation in Maritz Travel's West Coast Area, according to Guerrero. "Our first objective was to replace our old wordprocessing system with the new spreadsheet and wordprocessing applications and network capabilities. The West Coast group has the ability to access data through the desktop."

Attempting to completely overhaul the IT infrastructure while implementing major organization change has been a big challenge for MTC. "Moving to a new technology requires a great deal of patience," Guerrero notes. "It entails a high learning curve and cultural change. You have to manage change by securing commitment to change, building dedicated teams and communicating to the stakeholders in the process. Accomplish that and you're home free."

A Holistic Approach

Looking back on the project Guerrero believes that "the integration of process and information technology change into a single solution has been an important key to improving our performance." Although they are not yet "home free," MTC believes that the improvements already validate their decision to undergo the radical change process. Indeed, after only six months of implementation, MTC has been able to achieve significant productivity improvements. MTC fully expects that when the process and systems changeover is complete, the benefits of the project both in terms of increased profits and improved customer satisfaction will be even greater.

Continued on page 39

Catering to business traveler needs includes a festive cocktail party for conference participants in a beautifully decorated hotel atrium near St. Louis.

Continued from page 35

World's Largest Prosecutor's Office Adopts New Information Management System

Teamwork

When asked about the success of the project to date, Trawick says "we are all one team." The collaboration with Price Waterhouse MCS and the users has eased the application design process. There are, she adds, regular meetings in which the users are asked to "review everything we do and incorporate their views into the process. My staff and the County IS people all report directly to the Price Waterhouse MCS team leaders."

Rip Sanders, the Price Waterhouse partner responsible for the program, agrees that much of the success of the project is due to teamwork. "Up front we invested in a substantial amount of training for the users and County technical staff in JAD sessions, analysis techniques and technical skills so that each team member would understand their role and the skills required to carry it out. We have ensured that the DA and the County staff are involved in every major aspect of the project." The goal of Price Waterhouse MCS was to see that there is a transfer of knowledge to the DA's staff so that they will be able to continue to support the system after Price Waterhouse's role is completed.

Trawick pointed out that since her staff had worked on the systems that were being replaced, they were able to call attention to potential problem areas early in the process. This approach, she said, "will help ensure that we are building a system that meets the user needs while limiting the amount of effort required for expensive retrofits or rework."

Facilitating Change

By working with the users, the implementation of the new systems will be far easier. Not only did the team work "hard to ensure that the system meets user needs," Trawick says, " but prototypes were built for all three subsystems thus increasing user familiarity." The advantages of introducing users to new systems well in advance before they are in place and making them an integral part of the process is a time-honored technique for managing change.

Training is also an important part of the change to new systems. Trawick explained that her department's goal was to "make sure that the users are properly trained on the new equipment and the new environment. Our users were familiar with the 3270 character-based system. Now they have to learn how to use a mouse and become familiar with graphical interface. We also needed to teach them how to access the 3270 emulator on their PCs so we can remove their old equipment and begin integrating them into the new system."

This part of the changeover has also created problems. Trawick points out that her staff has more responsibilities now that it has to keep "two antiquated systems on line to support users as they transition to the new system." She added that "supporting everyone, bringing on new equipment and the LAN environment has been a real hurdle to overcome."

The changeover has not only made difficult demands on the IS department, requiring a somewhat different allocation of internal staff resources, but it has affected users in many ways. For example, in addition to just learning the new system, "selected users have a new role to fill. In the past, they did not have to worry about LAN administration. Now each office has an administrator responsible for security, backups, initial troubleshooting and other LAN administration functions."

Moving Forward

These issues raised in a changeover to client/server environments are not easy for organizations to deal with. They require skills such as those brought to the project by the Price Waterhouse MCS team. Despite the challenges, Trawick says that they will not only have the juvenile portion of the application up and running in the third quarter of 1993, but will have the adult portion on-line by the end of 1994. These will be welcome benefits.

Trawick believes that the new system will help make it possible for the DA's office, faced with substantial budget cuts, to handle a larger workload without increasing staff size. She says they are "providing our attorneys with the ability to improve job performance."

Continued from page 38

Reengineering Operations And Systems Brings Maritz Travel Company Increased Sales And Customer Satisfaction

Group Travel at Maritz - The Ultimate Travel Experience

Imagine sending 10,000 important customers and executives of major corporations to the Olympics over a two week period. Moving thousands of people to hundreds of events, dealing with everything from lost luggage to getting a VIP into the sold-out basketball final - an impossible job? That's what Maritz Travel Company does for a living. MTC specializes in delivering unique and carefully crafted travel experiences for clients who want to make a major impression on their customers and top performers. This involves organizational challenges that would overwhelm even the most experienced manager. For example, when a major manufacturer wanted to give 200 parts distributors a unique tour of Maui, MTC devised an intricate rental car road rally, complete with event checkpoints, special maps and prizes. While the experience was preferable to hiring six tour buses, this precision and creativity doesn't come easily. The sheer volume (over 90,000 travelers a year) and complexity of moving thousands of people to exotic destinations without a hitch places great burdens on MTC's processes and systems. Consequently, MTC is continually looking for new ways to deliver the ultimate travel experience.

MTC's new networking and client/server computing system provides quick response in client programs such as this incentive travel cruise program to Antarctica.

USL's Tuxedo TP Monitor

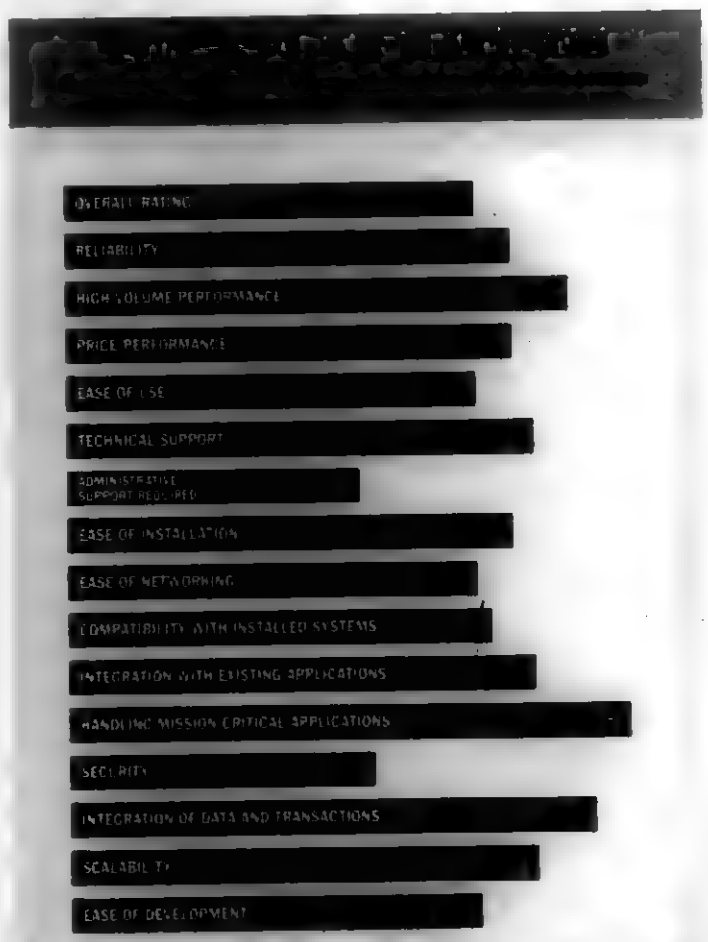
Primed for critical business use but still missing some key features

The Client/Server Journal's New Product Review is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in a production environment.

PROS AND CONS

Evaluators were pleasantly surprised by Tuxedo's performance and gave it high marks for integrity and reliability.

The lack of sufficient administration and security tools made using Tuxedo more difficult for evaluators, however.



Tuxedo from Unix System Laboratories, Inc. (USL) provides the reliability, integrity and scalability users need and offers stronger performance than expected.

But the product remains largely unproven in large, highly distributed environments and lacks management tools. Administrators also face a stiff learning curve, according to users who reviewed the product for this evaluation.

Gaining control of transaction volume is a key concern of information systems managers. Three major players in the Unix transaction monitoring market are Tuxedo, Transarc Corp.'s Encina Monitor and NCR Corp.'s Top End. Tuxedo is the most widely used transaction monitoring software in the client/server realm, with 51% market share in 1992.

As the granddaddy of the category, Tuxedo was introduced in 1983, when Unix adherents were mostly in academia or engineering and client/server was barely a whisper in corporate boardrooms. Today, it is offered on almost all Unix systems through more than 50 resellers.

Participants in this product evaluation have extensive experience with Tuxedo in multiplatform environments. All are running production applications with Tuxedo, except the expert user, who recently switched to a non-Tuxedo company but who has many years of experience with the software.

The format for this survey was developed by Howard Rubin & Associates, and the questionnaire for Tuxedo was created with assistance from Ed Acly, director of software research at Technology Investment Strategies Corp. in Framingham, Mass.

PRODUCT REVIEW

RELIABILITY, AVAILABILITY

The evaluators found Tuxedo to be very reliable, matching Unix's strong reliability. They attributed downtime to issues specific to their environments.

Utility: "Most of the problems that we would experience in a testing or production environment were not necessarily direct problems with the Tuxedo software as much as dealing with the configuration. Tuning the system leads to some downtime if you don't have it tuned and set up exactly correct."

Expert user: "Every time that we lost a Tuxedo — we had three running — we always found out that it was either something we'd done or we ran into a resource that we hadn't tuned properly."

HIGH-VOLUME PERFORMANCE

Operating speed in high-volume situations was a pleasant surprise, said users who bought Tuxedo for its reliability and tracking.

Financial services: "We chose Tuxedo more for reliability and guaranteed message delivery than performance and discovered that performance is a bonus for us. We are seeing performance gains using Oracle's relational database in that environment with multiple clients."

Utility: "Performance is at least meeting 90% of what our expectations are at high volumes. We've made some comparisons with other Unix systems that we have that do not use a transaction manager but use the process-per-terminal connection. We've seen on the order of at least 10% to 20% improvement on certain things vs. a non-transaction manager-based application."

PRICE/PERFORMANCE

The costs to run Tuxedo are far less than to build homegrown monitors. But some evaluators

would like prices reduced further.

Financial services: "Based on what we could actually build for the cost of Tuxedo, we would not even come close. It would be roughly an order of magnitude of difference, something like $100,000 in software licenses vs. $1 million worth of development."

Expert user: "Part of the reason we left the mainframe world was that things cost so much and in open systems, we could move software from one platform to the other. Tuxedo is one product that we can get on nearly every platform, but I still think it's a bit pricey."

EASE OF USE

Overall, Tuxedo was judged easy to use, although administrators have to climb through levels of complexity beyond what they might encounter with a fourth-generation language.

Retailing: "We found it quite easy to use. There are a couple of areas that we found were not intuitively obvious. One was 'How do you handle errors at places in the Tuxedo bulletin board?'"

Utility: "If you're from a Unix C software development view, you're probably comfortable with it. But it doesn't have the next-generation kind of things we're using to make it really easy to build servers. That's why we're building interface layers on top of it for our developers."

TECHNICAL SUPPORT

Service and support from both USL and its resellers are good, but there are occasional problems when USL is better able to solve a problem than the resellers.

Financial services: "USL has been supportive directly. Our only problem has been with the wholesale-to-retail channel. USL is usually a release or two ahead of everybody else."

Expert user: "We'd originally purchased the product through the retail channels but ended up dealing with USL because we wanted to get the straight scoop. Often you'll hear one thing from the retailer and something else from USL, and it may be because they were a little out of sync."

ADMINISTRATIVE SUPPORT

The evaluators were least happy with Tuxedo's administrative requirements. A lack of systems management tools plus the complexity of the new environment required substantial learning.

Utility: "It takes a highly skilled person to administer Tuxedo effectively — someone who is a very competent Unix administrator. The Tuxedo capabilities that they give you today haven't really changed in the last seven or eight years, so it's still rather crude. You cannot deploy it into a data center and have the existing operations people run in it. There is a lack of system management tools."

Retailing: "There are exactly three of us here who know what to do with Tuxedo. The fact that there are so few of us is a reflection that it is relatively tricky to turn this over to the people who handle more standard operations."

EASE OF NETWORKING

Mixing different vendors' hardware platforms on a large homogeneous network was no problem for Tuxedo users. The evaluators said they do have reservations, however, about using the product in heterogeneous networks that go across bridges and routers.

Utility: "One of the problems I still see with this is that it's still a fully connected network, and in our environment, we don't always want it to be a fully connected network. I think there's some basic scaling issues that they have not addressed in the product."

Expert user: "In terms of features and functionality, this thing works swell if you're on a LAN. But we had some significant issues to go through when we started to put this on a machine 300 miles away over a T1 [line]. It was a bit more difficult than it needed to be."

SECURITY

The evaluators rated this area low because Tuxedo does not support some commonly used security software, and it does not integrate authentication features.

Utility: "There are basic features lacking. They've only made some cursory attempts to integrate authentication, and there are no real hooks to do any authorization in the product."

SCALABILITY

Tuxedo proved to be scalable — but not easily so, largely because it requires changes to all the platforms. Some of the platforms are limited by their implementation of Unix.

Retailing: "Adding processors is fine. It's a little awkward, and I do have concerns about the limits of the kernels that we're dealing with. I don't know whether we're going to run into some limits or not, but I believe there are limits to the kernels somewhere. The other problem is that if you increase the size of your bulletin board, you have to change the kernel in every machine, and that can be a problem."

—Compiled by [illegible]

USL responds

[illegible] We have recently changed our pricing methodology from a machine-class pricing scheme to a user-based pricing scheme, which allows end users to pay based on use of the system.

[illegible] Historically, USL has left the administrative and management interfaces as an area for value-add by our OEMs, which have developed quite sophisticated tools for development and management of Tuxedo-based applications. Yet the management tools available today with Tuxedo are not based on state-of-the-art, simple graphical user interfaces. We have work under way on an application-level interface for administration.

[illegible] USL is developing a feature called "Domains" that will make implementation of very large distributed systems simpler. Domains will allow individually managed Tuxedo Domains to be linked up and participate in a single application.

[illegible] Tuxedo provides security features today for authentication either through the Tuxedo security mechanism or by plugging in a security server such as Kerberos. USL is improving this area and plans to provide authorization capabilities integrated with Tuxedo that will support the use of access control lists. ■

SITE PROFILES

[illegible]

	FINANCE	RETAILING	UTILITY	EXPERT
PLATFORMS	[illegible]	[illegible]	[illegible]	[illegible]
USING PREVIOUS VERSION	[illegible]	[illegible]	[illegible]	[illegible]
NUMBER OF APPLICATIONS	22	2	2	1
NUMBER OF USERS	[illegible]	[illegible]	[illegible]	[illegible]
APPLICATION TYPES	[illegible] ENTRY, MARKET DATA, ETC.	[illegible] AND TESTING	[illegible]	[illegible]

TUXEDO 4.2 FEATURES

- Runs on more that 20 major platforms including MVS CICS, OS/2, AIX, VMS, Sun, Windows, DOS, Ultrix and Unix.
- Newly released gateway allows users to access mainframe data in MVS/IMS databases via TCP/IP.
- Includes high-performance naming service allowing name access to be transparent to applications users and programmers.
- Offers multiple application load balancing schemes to optimize performance.

MULTIMEDIA MENU

- From 1992 to 1998, the worldwide market of video products is expected to grow at a rate of 4% to 25%.
- Multimedia hardware and software revenue will grow from $7.2 billion worldwide in 1992 to $30 billion worldwide in 1998.
- Upgrading a PC for multimedia applications can cost $400 to $1,200. Prices for incorporating video into applications are even higher.

Source: Market Intelligence Research Corp., Mountain View, Calif.

SAS TECHNOLOGIES unveiled **SCREENPLAY**, a multimedia tool used for recording, editing and playing on-line videos from Sun Microsystems, Inc. SPARCstations running Solaris.

According to the company, ScreenPlay was designed to let corporate workstation users create on-line screen videos incorporating sound, animation, drawings and text, as well as information from workstation applications.

ScreenPlay has a graphical control panel that looks similar to a VCR. This control panel helps the user create multimedia presentations with sound, animation, drawings and text.

The application is based on Microsoft Corp.'s AVI formats, so ScreenPlay videos can be converted to run under Windows. Workstations running ScreenPlay need to have an 8-bit color or gray-scale frame adapter, 16M bytes of random-access memory and a total of 24M bytes of disk space: 4M bytes for installation and 20M bytes for video capture.

The base unit price is $895 with licensing options available for 100, 500 and unlimited viewers.

SAS TECHNOLOGIES, 2639 Terminal Blvd., Mountain View, Calif. 94043, (415) 940-1961.

SYBASE, INC. has announced **GAINMOMENTUM 2.0**, the newest release of its object-oriented, multimedia application development environment.

GainMomentum 2.0 was designed to help create easy-to-use and powerful business applications that combine text, graphics, audio and video with transaction data from SQL databases. Target applications include decision support, interactive product catalogs and command and control systems.

Developers can create, edit and link all forms of multimedia objects, access and manipulate SQL data for Sybase, DB2 and Oracle servers, script applications behavior and deploy application runtimes.

GainMomentum 2.0 runs on Unix workstation platforms under Sun Microsystems, Inc.'s Solaris, IBM's AIX and Hewlett-Packard Co.'s HP/UX operating systems.

Pricing starts at $10,000 for a single developer license.

SYBASE, 6475 Christie Ave., Emeryville, Calif. 94608, (510) 596-3500.

SQL TOOLS

COMPUTER CORPORATION OF AMERICA (CCA) has begun shipping **SELECT STAR**, a SQL connectivity tool used to give SQL capabilities to CCA's Model 204.

Select Star is the newest addition to CCA's Advantage Series, an integrated information management platform and application development package. The Advantage Series allows for interoperability and connectivity. Select Star, along with Horizon, the company's LU6.2 communications package, allows for peer-to-peer connectivity with Model 204.

Select Star can integrate with Windows programs through Dynamic Data Exchange, and it provides SQL commands for Windows programming.

Select Star's five-user license is $3,975.

COMPUTER CORPORATION OF AMERICA, 4 Cambridge Center, Cambridge, Mass. 02142, (617) 492-8860.

SYBASE, INC. has announced the **SYBASE AUDIT SERVER**, an auditing tool that enhances security and enables the auditing of database activity across the network.

Company officials said the product was designed to give information managers more control over security in database server environments.

Sybase Audit Server validates and authorizes attempts to log into the SQL server system. It also captures and records all database access and allows administrators to easily extract data from the audit database.

The Sybase Audit Server works with Sybase SQL Server and Microsoft Corp.'s SQL Server. Pricing starts at $2,500.

SYBASE, 6475 Christie Ave., Emeryville, Calif. 94608, (510) 596-3500.

BILLIONS AND BILLIONS SERVED

Unix on-line transaction processing (OLTP) systems revenue is expected to grow from $1.1 billion in 1992 to $4.03 billion in 1996

The difference between OLTP and other application processing environments is how the system can provide the following:

- Data integrity
- Control
- Recoverability
- Performance
- Standardization

The following applications can benefit from the characteristics of OLTP:

- Order entry
- Manufacturing
- Inventory
- Distribution
- Financial accounting
- Reservations

Sources: International Data Corp., Framingham, Mass.; Datapro Information Services Group, Delran, N.J.

MICRO FOCUS, INC. has announced its **MICRO FOCUS TRANSACTION SYSTEM VERSION 1.1**, a multiplatform, multitasking, on-line transaction processing system. It provides a client/server and CICS application program development environment.

According to the company, the engine of the product was designed for scalability, flexibility, speed, CICS compatibility and integration with the Micro Focus Dialog System and non-CICS applications. It provides a high level of data integrity and security either on stand-alone workstations or as part of a client/server environment, company officials said.

Micro Focus transaction systems run under Unix, IBM's AIX, OS/2, DOS, Windows and Microsoft Corp.'s Windows NT. Relational database support includes Informix, Oracle, IBM Database Manager or DB2 for OS/2, Microsoft SQL Server, XDB and Gupta Corp.'s SQLBase.

Micro Focus Transaction System Version 1.1 costs $1,250 for the first copy.

MICRO FOCUS, 2465 East Bayshore Road, Palo Alto, Calif. 94303, (415) 856-4161.

HEWLETT-PACKARD CO. has introduced **HP ENCINA/9000** and enhanced its **HP DCE/9000**, two software products that process transactions across multivendor computer systems and databases.

HP Encina/9000 is a transaction manager that provides data integrity in distributed on-line transaction processing environments. HP claims to be the first vendor offering these products for its own systems in combination with the tools and utilities to make applications easier to develop and deploy. The transaction manager is compatible with the HP 9000 Series 800 and the HP Apollo 9000 Series 700.

The vendor also enhanced its HP DCE/9000 product to include replicated security, enhanced scalability and new management and development utilities. These features help users deploy enterprisewide Distributed Computing Environment (DCE) applications.

The HP Encina/9000 server products start at $3,600. Client licenses start at $150, with monitor licenses priced from $5,500. The DCE core services are $1,500. The DCE client licenses start at $395.

HEWLETT-PACKARD, 3000 Hanover St., Palo Alto, Calif. 94340, (415) 857-1501.

NCR CORP. has improved its **NCR TOP END** to provide mainframe functionality for client/server environments. This open, distributed transaction processing monitor allows the integration of existing applications with applications running under open systems environments.

NCR Top End controls message distribution and manages resources to provide an enterprisewide on-line transaction processing system.

This product is available on the NCR System 3000 series and the Hewlett-Packard Co. HP 9000 series machines.

Pricing for NCR Top End starts at $2,700.

NCR, 1700 South Patterson Blvd., Dayton, Ohio 45479, (513) 445-5000.

WINDOWS APPLICATIONS

DUN & BRADSTREET SOFTWARE rolled out **HR STREAM FLEX BENEFITS**, a human resources application. This application runs under Windows on the desktop, with SQL/Server database from Microsoft Corp. and Sybase, Inc. running on HP/UX and DG/UX platforms.

HR Stream Flex Benefits includes open enrollment and full modeling capabilities that allow employees to create and model their own benefits plan. The application can also download information from any human resources system to a workstation. This permits users to define limits of coverage, sources and costs.

HR Stream Flex Benefits pricing starts at $88,000.

DUN & BRADSTREET SOFTWARE, 3445 Peach Tree Road NE, Atlanta, Ga. 30326, (404) 239-2000

DCE SERVER KIT

AVERA TECHNOLOGIES has released its **DISTRIBUTED COMMON SYSTEM SERVICES** (DCSS) kit, a Distributed Computing Environment (DCE) application server kit for developers of distributed applications.

DCSS is a set of DCE-based applications with features including SQL query functions, distributed access control and generic notification.

DCSS includes simple application programming interfaces and Distributed Access Control Manager Service, under which servers are given the ability to control access to protected resources.

DCSS Server Kit is priced from $5,100 for a 20-node kit to $160,000 for a site license.

AVERA TECHNOLOGIES, 5000 Plaza of the Lake, Suite 275, Austin, Texas 78746, (512) 328-6977.

NOTES UTILITY

DISTRIBUTED SYSTEMS SOLUTIONS INTERNATIONAL, INC. has introduced **DSSI UTILITIES** for use with Lotus Development Corp.'s Notes Release 3. The utilities include Usage/Reporter, Replication/Reporter and Design/Monitor. The vendor has also released Notes mail utilities that include Time/Delivery Agent as well as Vacation/Agent.

Usage/Reporter and Replication/Reporter generate reports of Notes database and server activity and database replication histories across a network. Design/Monitor reports on changes in the design of Notes applications on any Notes server.

Time/Delivery Agent allows users to specify when a Notes mail message will be sent. Vacation/Agent allows users to automatically send an acknowledgment that the message was received, but there will not be a response until the user is back in the office.

The Usage/Reporter and Replication/Reporter cost $995 per server, and the Design/Monitor is $995. The mail utilities come bundled for $995.

DISTRIBUTED SYSTEMS SOLUTIONS INTERNATIONAL, 31255 Cedar Valley Drive, Suite 207, Westlake Village, Calif. 91362, (818) 991-0200.

ORACLE

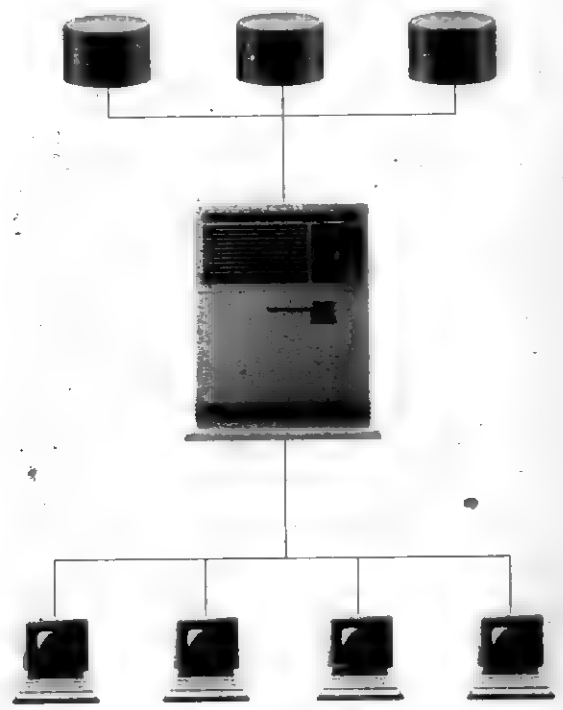
Multi-Server Database Environment

In most organizations, information is distributed across multiple computers. This distribution of information can make accessing that information very difficult.

First Generation Client/Server Database

Applications built using a first generation client/server database cannot access data residing on more than one server computer without a lot of extra programming. In technical terms, a first generation client/server database does not support a standard SQL query or update transaction accessing data on more than one server computer.

Single Server Limit

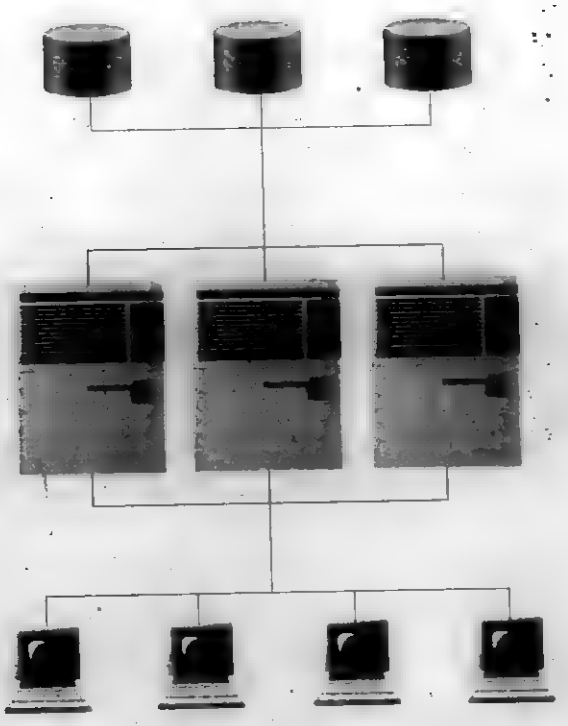


SQL Query and Update can Access Data on One Server Only

Cooperative Server Database

A cooperative server database is different from a first generation client/server database because it enables applications to access data located on multiple server computers just as if all the data were stored on a single server. That is, with a cooperative server database, a simple SQL query or update transaction works identically, regardless of whether the data is stored on one computer or on multiple computers. No extra programming is required.

Multiple Servers



SQL Query and Update can Access Data on Multiple Servers

Reliable, Fast, Low Cost

A cooperative server database simplifies application building and improves decision making by providing easier access to information distributed across multiple servers.

A cooperative server database running on a group of server computers offers high reliability because there is no single point of failure as there is when there is only one server in the configuration. And a group of low-cost server computers can easily outperform a database running on the largest mainframe. Specifically, the Oracle7™ cooperative server database has been certified as supporting over 10,000 users running more than 1,000 tpcA transactions per second on a pair of low cost UNIX computers. As a matter of fact, Oracle7 has recorded the fastest tpcA performance numbers ever recorded on IBM, DEC, NCR, Sun, Sequent, Pyramid, and HP.

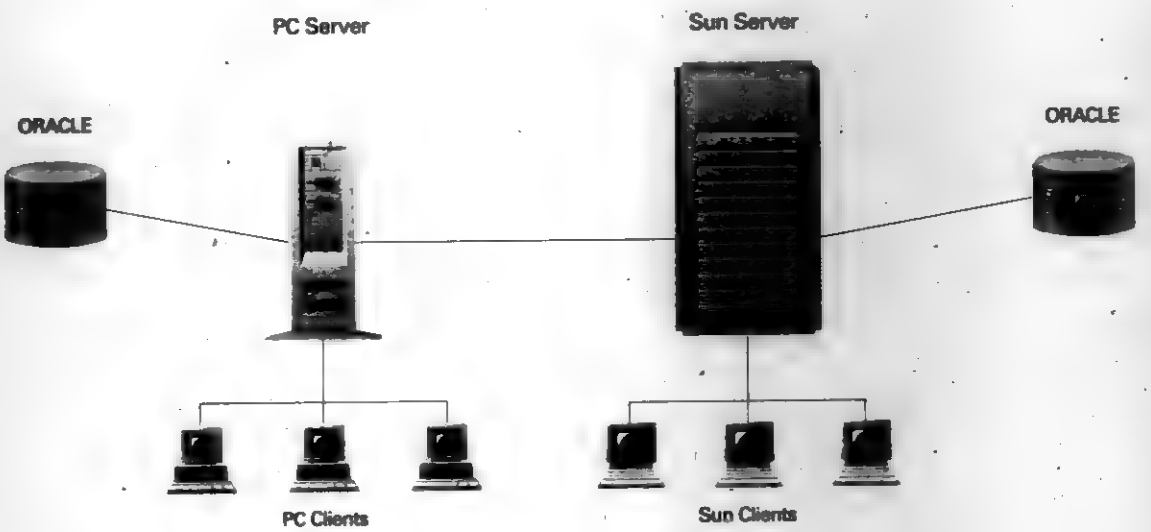
Multi-Vendor Database Environment

Many organizations have networks made up of different types of computers: PCs, workstations, minicomputers and mainframes. The data on these computers is often stored in different types of databases from different vendors. This complexity can make it difficult to access and share information.

Portable Database

The Oracle7 cooperative server database is portable. That is, it runs on PCs, Macs, workstations, minicomputers, mainframes and massively parallel computers. This portability gives organizations the option of running the same database software on different types of computers.

Any Client Can Access Data on Any Server



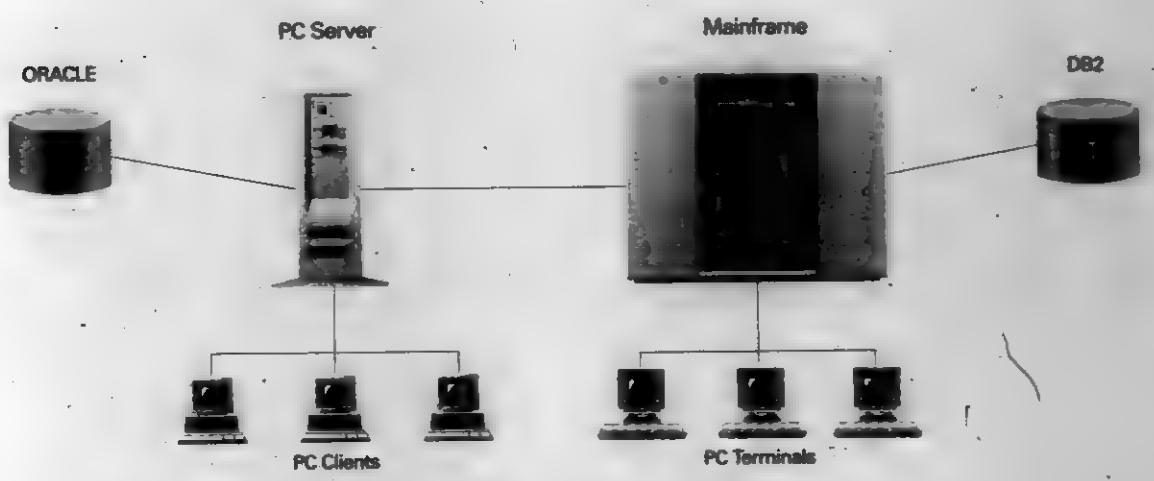
A single SQL query or update transaction can access data distributed across a Netware PC server running Oracle, and a UNIX Sun server running Oracle.

If your organization chooses this option, it is very easy for applications to access data stored on a network made up of different types of computers. For example, an application can retrieve or modify data distributed across a PC server and a Sun server just as if all the data were stored on a single computer.

Open Gateways

However, most organizations have data stored in different types of databases from different vendors. An open database solves this problem by providing applications with easy access to data stored in multiple vendors' databases. Oracle7 has gateways that allow applications to seamlessly access data stored in IBM's DB2, DEC's Rdb, Microsoft's SQL Server, and any other database. These gateways allow applications' access to non-Oracle data in exactly the same way and with the same ease as if all the data were stored in an Oracle7 database. For example, Oracle7's gateways enable a simple SQL query or update transaction to retrieve or modify data stored partially in an Oracle7 database residing on a PC server, and partially in a DB2 database residing on a mainframe.

An Open Database Enables an Application to Access Data Stored in Different Vendors' Databases



A single SQL query or update transaction can access data distributed across a Netware PC server running Oracle and an IBM mainframe running DB2.

The Oracle7 cooperative server database is both open and portable. This enables applications to access data stored in different types of databases on different types of computers just as if all the data were stored in one database on one computer. In this way, a cooperative server database hides network complexity, making access to distributed information easier.

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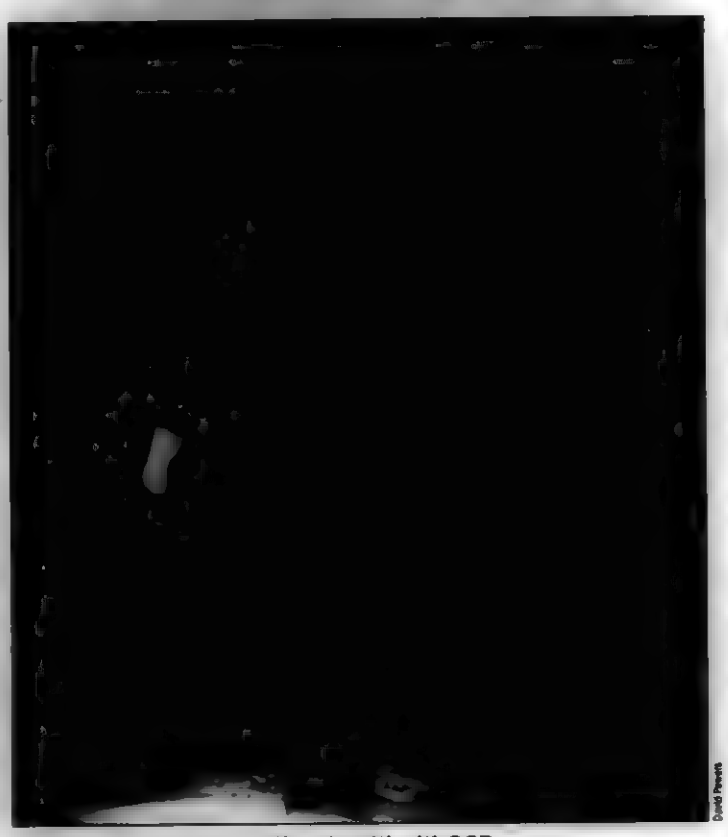
NO TROUBLE FOR TRIBBLE



BUD TRIBBLE: *It takes a while to 'get it' with OOP*

David Powers

In one of the classic *Star Trek* episodes, "The Trouble with Tribbles," the Starship Enterprise is overrun by lovable furry creatures that multiply at an alarming rate. Now imagine all those Tribbles as objects proliferating on company networks, and meet a different kind of Tribble: Guy "Bud" Tribble, vice president of end-user software at SunSoft, Inc. Once headed for a medical research career in neurophysiology, Tribble veered off course when a friend persuaded him to join a start-up called Apple Computer, Inc. He became one of the original software developers for the Macintosh and later a key architect of Next, Inc.'s NextStep operating system.

CSJ Why did you move to Sun, Next's archrival?

TRIBBLE I ended up becoming very interested in Sun's direction, which has always been aimed at solving the problems of distributed computing. From the start, Sun was focused on using the network as the computer.

CSJ Do you believe NextStep will be successful on the Intel Corp. platform, or will PC users find it too complex?

TRIBBLE Whatever that answer is, it's probably the same one for Solaris [Sun's Unix operating system]. There's a real challenge there. If any of these [32-bit advanced desktop operating] systems are going to be widely deployed on lots of desktops, we clearly have to get to the point where the user's main job is not learning how to use the computer.

CSJ What about programmer retraining in object technology? Doesn't that present a fairly steep learning curve for most MIS organizations?

TRIBBLE It's very analogous to the time when people programmed in Assembly language. They had to then learn Fortran or Cobol as a higher level language, and there's definitely training involved. But once you go through that, the productivity increase is tremendous.

It takes a while to 'get it' with object-oriented programming [OOP]. You can take someone from the procedural world and teach them OOP, but the first programs they write will still look and feel procedural in style. You won't get the benefits of the higher level language until you make the mind shift.

CSJ Is there a simple way to envision that mind shift?

TRIBBLE Imagine that you're cooking a cake. You can make it from scratch, from a recipe, by assembling a list of ingredients and following the directions step by step. That's procedural programming.

In the object-oriented world, you don't think about cooking as a sequence of steps.

You think about it as a package of cake mix, a cup of water, a bowl and an oven. It seems to be pretty obvious what you do with those elements.

CSJ How does object technology tie into client/server computing?

TRIBBLE It ties in with the productivity increases that will come from network-transparent programming. If I want to write a client/server application today, I have to write it using Sockets or RPCs [remote procedure calls] or one of a variety of very low-level networking protocols. It's not transparent at all. In the object-oriented paradigm, my program is made up of messages that get sent between objects, so having that application become a distributed application is much easier.

CSJ What do you think of the current state of object-oriented tools?

TRIBBLE Most of those are still in their infancy. On the other hand, I don't think the major benefit for object-oriented programming will necessarily come through the tools. They will make life better but they won't cause the paradigm shift that brings about an order of magnitude change in productivity.

CSJ What will cause that?

TRIBBLE That's going to come with the switch from procedural to object-oriented programming. The developers themselves will drive this issue. When you start seeing examples of deployed applications that get to market that much faster, or MIS shops able to satisfy their CEOs that much quicker, then you'll find that the process of acceptance will accelerate.

CSJ Do you have any advice on buying object-oriented tools today?

TRIBBLE Consider the C++ language a foregone conclusion at this point. Also, think about how the object-oriented computing you're doing fits into networked applications. Keep up with the Object Management Group's [OMG] work, and watch for standards compliance with OMG.

CSJ How does Sun differentiate itself from the other vendors — such as Apple, IBM and Microsoft — in object technology?

TRIBBLE It's a matter of believing that client/server distributed computing is an important center of gravity. [Those companies] have not chosen to concentrate on distributed computing as being central to their paradigm.

— Interview by [redacted]

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Think again.

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— Lawrence W. Hall, Director, Hotel Systems
ITT Sheraton Corporation

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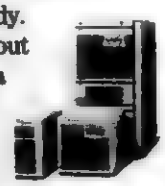

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COMPUTERWORLD

Novell pumping up services for enterprise needs

By Elisabeth Horwitt
PROVO, UTAH

■ Novell, Inc. is getting ready to introduce multiple phases of its campaign to snare the hearts and information systems budgets of rightsizing corporations.

A series of introductions will kick off this month that will map out the network operating system vendor's blueprint for enterprisewide client/server services and applications on the complementary operating systems of NetWare 4.0 and Unix.

The strategic directions, outlined at a briefing here last week, include positioning NetWare as a horizontal server and UnixWare as a vertical server, as well as extending and providing an integrated enterprise slant to NetWare services.

These directions are right on target if Novell wants to be taken seriously as an enterprise systems vendor by large IS shops, said Robin McCubbin, network planning analyst at National Grocers Co. in Toronto.

John Dubiel, manager of planning and tech-

Novell, *page 8*

Doubt clouds IBM 'open' plan

Wary users question diversity of Information Warehouse additions

By Johanna Ambrosio
SOMERS, N.Y.

IBM's upcoming additions to its Information Warehouse, due in October, will fill in some key gaps — providing a mechanism to get data off the mainframe and onto local-area networks, for example — but some users and analysts question how open the approach is.

The additions will prove to be a mixed bag from an openness standpoint. For example, the copy management software, which will move data from the mainframe to the PC network, will for the time being work only with IBM databases. Still, at least IBM is acknowledging customers' need to move some data to less expensive platforms, observers said.

An IBM executive said eventually the software will work with other vendors' database engines as well. He gave no time frames.

data

The data warehouse is a central storehouse of data that end users can easily access and manipulate. It can take many forms, from enterprisewide data on mainframes to a departmental database that resides on a server used by relatively few people.

The other major announcement planned for October is the Information Locator — software designed to help end users figure out what kind of data is in the warehouse so they can ask appropriate questions.

Although the Locator will include information about databases from IBM and other vendors, the Locator will run only under OS/2 and IBM's DB2/2 database management system. It will, however, interface with popular analysis tools, according to Chris Arnold, a marketing executive at IBM's Programming Systems business.

David Beulke, DB2 data administration manager at Spiegel, Inc. in Westmont, Ill., said that

IBM, *page 10*

FCC widens local loop options

By Joanie M. Wexler and Gary H. Anthes
WASHINGTON, D.C.

A key Federal Communications Commission ruling on the side of competition could knock down prices and improve services for corporate telecommunications shoppers.

The agency last week mandated that regulated local telephone companies allow competitors into their central offices to route switched traffic to long-distance networks. The action parallels an FCC landmark order last year that opened up this part of the network to competitors seeking to provide leased-line access services [CW, Sept. 21, 1992].

The latest interconnection decision, which opens this market segment to "bypass" carriers such as MFS Communications Co. and Teleport Communications Group, will benefit small and medium-size firms the most, said Henry Levine, an attorney at Levine, Lagapa and Block

FCC, *page 12*

Milestones

1913: Telcos can connect to the Bell long-distance network.

1968: Carterfone decision allows connection of non-Bell equipment to Bell System.

1978: MCI Communications Corp. and others win the right to connect to local public switched network to offer long-distance services.

1992: Alternative access carriers win the right to collocate networking gear at local telephone company offices and to connect to long-distance networks for dedicated services only.

CIO turnover

Job insecurity plagues higher-ups

Bad news. If you're a CIO, you might not want to unpack from your last job. Turnover due to advancements — and firings — is at record highs. Superstars like Progressive Corp.'s Allan Ditchfield (pictured) remain in high demand, but for lesser luminaries, things aren't likely to get better in the near future. *See story page 85.*

No prescription for medical privacy

Computerized records: An open book?

By Mitch Betts
WASHINGTON, D.C.

The computerized medical records championed by health care reformers will help doctors improve diagnoses, prevent drug interactions and avoid unnecessary tests. But they may also destroy what little medical privacy Americans have unless safeguards are built in at the outset.

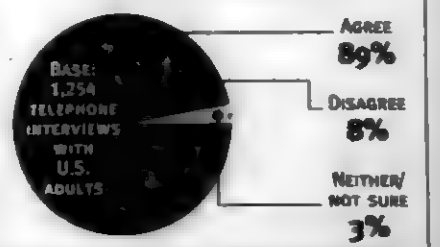
At a time when insurance companies, researchers, police, employers, hackers, drug companies, direct marketers, lawyers and reporters are all clamoring to get a peek at medical records, an electronic compilation could set the stage for massive intrusions into private lives, experts said.

"Americans are losing control over personal information contained in their medical files, which makes it more urgent for the Clinton administration's health care reform plan to address the privacy issues," said Marc Rotenberg, director of the Washington, D.C., office of Computer Professionals for Social Responsibility.

Privacy, *page 14*

Public pulse

A national opinion poll shows the public believes **"Computers have made it much easier for someone to obtain confidential personal information about individuals"**



Source: 1992 Harris-Equifax Consumer Privacy Survey, Atlanta

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August 9, 1993

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VIEWPOINT AND COMMENTARY

■ Patricia Seybold tells the truth about client/server application development: It's damned hard. *Page 33*

■ IS professionals can help upgrade the U.S. education system, says *Computerworld* Publisher Gary Beach. *Page 33*

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■ Love and network technology adoption go through predictable stages, says Jeffrey Fritz. Right now, we're seeing ATM through a romantic haze. *Page 64*

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Executive Briefing

Even if you aren't worried about escalating CIO turnover rates *(page 85)*, there are other things to keep you up at night . . . such as what system improvements might be doing to data security.

The IRS provides a cautionary tale. A U.S. GAO audit suggests abuse of confidential taxpayer data by employees may have been aided by system modernization efforts. The good news: "Pattern detection" software will be installed. *Page 15*

Concerns are also surfacing about the privacy implications of a national medical info network, expected to be a feature of President Clinton's health care reform plan. *Page 1*. Even on a smaller scale, distributed databases are often seen as antithetical to security. The issue tops most lists of IS concerns about client/server computing. This week, two new packages (one an upgrade) promise help in the form of centralized security control. *Page 62*

Client/server application development can be a real headache for a lot of reasons, Patricia Seybold says in her column. *Page 33*. Corporate developers complain about the difficulty of testing applications in complex, multilayered environments. There are some good tools to streamline the process, say developers at **Norwest Mortgage** and **Delta Air Lines**, but they can't solve problems of multiple variables interacting with one another. *Page 30*

Everyone wants to be a facilitator: **DEC** is bowing out of the application business and plans to concentrate software development on "frameworks" for tying multiple applications in multivendor client/server environments. *Page 2*. Meanwhile, many PC retailers, seeking brighter business pastures, have transformed into LAN specialists and LAN/WAN integrators. *Page 106*

Here comes the benchmark fuss: Accusations from rival bidders that it rigs its benchmark results have cost **Sun** its largest federal contract. *Page 2*

Real-life tests: **National Grocers** in Toronto says beta-testing Novell's NetWare 4.0 was challenging but worthwhile. *Page 61*. **CNA Financial** assigns a major role to **NCR** superservers. *Page 63*. Data modeling was key in the creation of the **United Nations**' global network. *Page 69*. **Cigna** makes reengineering pay. *Page 70*

Wish you could get away to the quietest place on earth? **IBM** says it's in Boca Raton, Fla. *Page 31*

DEC downplays its apps

Middleware focus will attempt to provide common user interface

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. has finalized plans for de-emphasizing its own applications and focusing software development on "frameworks" for tying together third-party and custom programs.

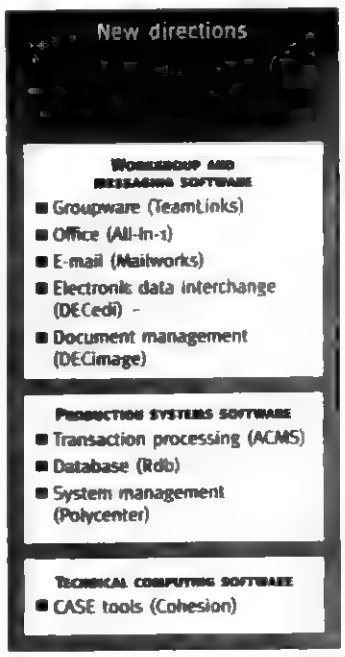
DEC, which broke up its software engineering group as part of the revamp (see chart), said its software offerings will be made over from all-encompassing, singular products into more of a middleware approach. The end result should provide an architecture and tools for blending multiple applications in multivendor client/server environments.

The tools are supposed to allow users to put a common user interface on applications from different sources and provide similar methods of structuring and exchanging data among different applications, the company said. The development shift and the accompanying restructuring took effect in the middle of last month.

Poker face

However, DEC last week continued to hold the details of the new strategy close to the vest, including its plans for making the frameworks available on Microsoft Corp.'s Windows NT and DEC's OSF/1 operating systems. The company would not specify which applications are slated to be dropped.

Major system-level software such as the Application Control and Management System transaction processing monitor will continue to be developed, a DEC spokeswoman said. However, analysts said they expect that virtually all end-user applications will be jettisoned or sold off.



"They seem to have learned that it doesn't make sense to go toe-to-toe with their [independent software vendors]," said Neal Hill, senior analyst at Forrester Research, Inc. in Cambridge, Mass. The frameworks approach appears to be aimed mainly at making DEC the dominant middleware vendor in the NT market, Hill added. "Long-term, NT is how they're going to stand or fall."

Hill described DEC's new strategy as "high-risk," given the unproven character of NT, but said the decision to give up on the application level was "a wise one, given the situation they find themselves in" financially.

Users said they were uncertain how to view the impending changes due to a lack of information.

To what effect?

Matt Holdrege, senior network specialist at PacifiCare Health Systems, Inc. in Cypress, Calif., said the framework concept sounds appealing but added that he is concerned about the possible impact on the development of products such as the DECedi electronic data interchange package.

"The key to this is to explain it well enough so people understand what it is that's there," noted George Reid, MIS director at Sanford C. Bernstein & Co. in New York. He added he has yet to see a clear explanation of how most of the middleware technology on the market works.

William Strecker, vice president of engineering at DEC and the driving force behind the new strategy, was not available for comment last week. The DEC spokeswoman said the company expects to elaborate on its plans "in the short term," but she would not be more specific.

Ruling reversal frees federal telecom users

By Joanie M. Wexler
WASHINGTON, D.C.

The federal government's Federal Telecommunications System 2000 (FTS-2000) network broke out of technological limbo last week after a federal court reversed a year-old decision to exclude high-speed services from the scope of the 10-year telecommunications contract the General Services Administration (GSA) holds with AT&T and Sprint Corp.

Because of protests by rivals MCI Communications Corp. and WilTel, which were upheld by the GSA Board of Contract Appeals last summer, AT&T and Sprint had been prohibited from providing T3 (45M bit/sec.) transmission services to government agencies under the FTS-2000 contract.

MCI and WilTel had formally objected to an AT&T/GSA plan to modify the contract to include T3 on the grounds that T3 is a new technology rather than an enhancement to existing dedicated services, such as T1.

This technical interpretation of what constitutes "improving services," which is allowed under FTS-2000, set a dangerous precedent that could have limited the FTS-2000 net to outmoded technology, government users and analysts said.

"This erroneous interpretation overlooks the contractor's obligation to improve Dedicated Transmission Service [sic] as a whole," stated the U.S. Court of Appeals for the Federal Circuit in its decision.

Now, with the ruling reversal, "we've been given back what we always thought we had under FTS-2000, which is technology refreshment," said David A. Bittenbender, telecommunications branch chief at the U.S. Environmental Protection Agency in Research Triangle Park, N.C., a user of T3 services.

"If the GSA had been prevented from providing T3 [and other new] services, FTS-2000 would have become a useless contract" — and the EPA would have been stuck without T3 service between its supercomputing center and its national computer center here, Bittenbender said.

The decision is "liberating for the planners of FTS-2000," said Steven A. Taylor, president of Distributed Networking Associates, Inc., a consultancy in Greensboro, N.C. "Now FTS-2000 can grow/to meet the needs of the individual agencies" rather than forcing agencies to build their own networks and miss out on the price efficiencies of large-scale volume, Taylor said.

Government contracts

NSA sacks Sun as rivals question benchmark results

By Carolyn Duffy Marsan

■ The National Security Agency (NSA) has stripped Sun Microsystems, Inc. of a workstation contract worth several hundred million dollars after rival bidders IBM, Hewlett-Packard Co. and Silicon Graphics, Inc. accused Sun of rigging its benchmark results, industry sources confirmed last week.

The NSA deal, known as the High-Performance Workstation (HPW) II contract, is Sun's largest federal contract. Sun has been the near-exclusive supplier of workstations to the NSA, which is believed to have been Sun's largest customer during the last five years.

Robert Herwick, managing director of technology research at Hambrecht & Quist, Inc., said that if Sun were to lose the NSA's business, the implications would be serious for the company overall.

It is unclear whether Sun will be allowed to participate in a rebidding of the contract. Neither the NSA nor Sun would comment.

Industry sources, however, confirmed that Sun's HPW II contract was suspended last Monday.

"IBM is pleased with NSA's action on its protest and pleased that we will have another opportunity to compete on a revised bid," said Sheila Shanihan, a spokeswoman for IBM's Federal Systems Division.

Tom Steipp, general manager of HP's Federal Computer operation, said, "There was enough substantiation of our concerns and the other protestors' concerns that the procurement was ended," he said.

Time will prove its worth

Sun won the HPW II contract in early June. Industry sources estimated the worth of the five-year contract at anywhere from $200 million to $800 million, depending on how well the NSA's budget fares under the Clinton administration. Sun was the incumbent contractor, having supplied workstations under the NSA's HPW I contract.

The other three bidders promptly protested Sun's performance on the AIM benchmark, which measures the overall performance of Unix systems. Run by AIM Technology, Inc. in Santa Clara, Calif., the benchmark is geared toward floating-point-intensive problems.

Industry sources alleged that in an attempt to outgun its rivals, Sun used random-access memory on its SPARCstation 10 Model 20 to a greater extent than it should have while running the AIM benchmark.

Benchmarking expert Andrew Allison said this kind of scenario does not happen accidentally. But whether a company has "cheated" on a benchmark or merely been "creative" depends on how clearly the government specified the configuration it wanted.

Steipp said HP's protest also questioned whether Sun bid fully commercial equipment, as was requested in the bid, to earn those high benchmark results.

"We didn't do anything wrong or illegal," a Sun source said. "We read the RFP and carefully responded. . . . We have not been barred or precluded from whatever happens next."

Procurement lawyers said the NSA has several options regarding HPW II, including awarding the contract to one of the other three bidders based on their earlier offerings; clarifying the benchmarks with a modification to the original solicitation and asking the four bidders to submit another round of best-and-final offers; or starting the procurement process over.

Marsan is a managing editor at Federal Computer Week, *an International Data Group publication.*

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Mail vendors converge

Highlight importance of linking groupware applications

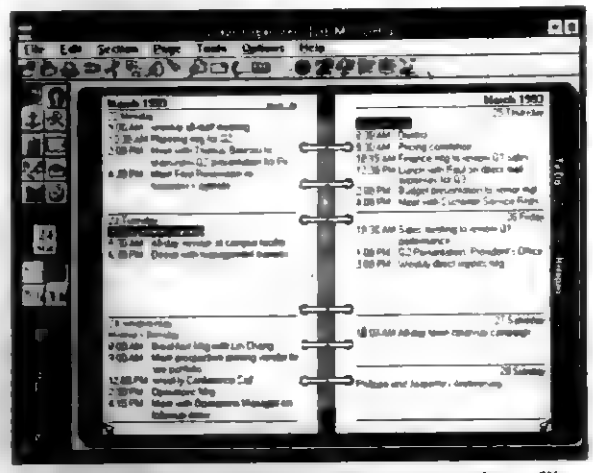
By Michael Vizard
SAN JOSE, CALIF.

The continuing push by electronic-mail suppliers to leverage their products as an enabling technology for groupware applications will be very much in evidence at Groupware '93 here this week.

Both Lotus Development Corp. and WordPerfect Corp. intend to showcase separate competing initiatives that will highlight the growing importance of linking groupware applications under a common E-mail transport and directory service.

The main advantage of tying groupware to E-mail systems — rather than directly to network operating systems' transport and directory services as is done in some stand-alone packages — comes when users on remotely located local-area networks exchange information. That is because the store-and-forward nature of E-mail provides a transport that does not require users to be connected permanently as a dedicated network node.

Lotus will release Version 1.1 of its Organizer personal information manager, which for the first time gives Lotus the ability to provide group scheduling on CC:Mail.



Lotus' Organizer personal information manager has a file-fax interface and is integrated with CC:Mail

WordPerfect will showcase the integration of four imaging applications that will take advantage of the distributed services in WordPerfect Office 4.0, which offers E-mail, calendaring and scheduling software in the same package [CW, May 17].

Vendors of the imaging applications include Imagery Software, Inc., PaperClip Imaging Software, Inc., Simplify Development Corp. and Watermark Software, Inc.

Also competing for mind share are Microsoft Corp., which bundles scheduling and mail software in Windows for Workgroups, and Beyond, Inc. in Cambridge, Mass., with its BeyondMail. Beyond has work-flow services and recently added forms software on top of its mail service. Additionally, E-mail vendor On Technology Corp. in Brookline, Mass., also plans to offer blended E-mail and mail-enabled scheduling services across multiple platforms after merging with Notework Corp.

Analysts said they like E-mail vendors' chances for success.

"I think the E-mail providers will be extremely successful. They have very aggressive pricing, can leverage suites of applications and share the same mail directories," said Matt Cain, program director at Meta Group, Inc. in Westport, Conn.

For example, Gulf Canada Resources Ltd. in Alberta recently opted to deploy Organizer for 700 users. "We wanted something to replace the functionality in Profs, which we got in Organizer and CC:Mail. We view these two as a single product," technical advisor Bob Stratton said.

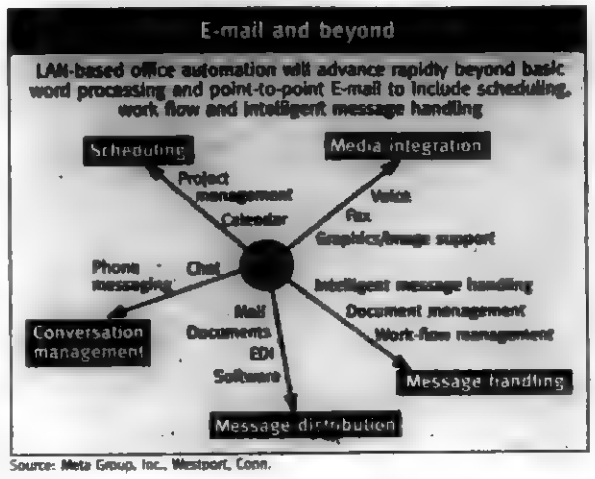
Before opting for Organizer, Stratton said Gulf Canada evaluated Network Scheduler from PowerCore International in San Francisco but chose Organizer because it has a filefax interface and is integrated with CC:Mail.

Besides group calendaring and scheduling, Stratton said Gulf Canada intends to serve as a beta-test site for Lotus Forms, which will run on top of CC:Mail rather than adopt any of the forms packages that are available today. Lotus Forms is due in early 1994. WordPerfect said last week it has begun delivering an add-on forms package.

Ultimately, the need to add functionality to E-mail services will drive providers to add a range of services that have thus far been purchased as stand-alone items (see chart above).

How successful providers of forms and conferencing software are in staving off the E-mail providers will depend on how well they can integrate their software with mail directories using standards such as the Vendor Independent Messaging protocol, noted David Ferris, president of Ferris Networks in San Francisco.

Staff writer Lynda Radosevich contributed to this story.



Source: Meta Group, Inc., Westport, Conn.

Notes phone

Extty Corp. will unveil this week at Groupware '93 a utility designed to allow remote users to more easily access their Notes databases via fax transmissions.

Using the firm's Electronic Workforce software running on a separate fax server, Notes users will be able to use a Touch-Tone phone to instruct a Notes database to send Notes mail to the fax server, which would then transmit those messages.

"As people build work-flow applications around Notes, we're moving toward structured work-flow assembly lines. And if a task needs authorization, people need to be able to access their Notes mail," said Tom Glassmoyer, vice president of marketing at Extty.

Pricing for the Extty software running on a fax server, which is linked to Notes over an application programming interface, starts at $20,000 for a server with four phone lines.

— Michael Vizard

Postal traffic cops

For companies dealing with E-mail overload, automatically filtering and routing systems can help manage the traffic. To better achieve this, Microsoft will bundle with its E-mail software filtering and absentee notification utilities that were previously sold separately at a premium.

The filtering portion, called Winrules, is a subset of a rules technology from Beyond.

"Winrules is good for simpler tasks, such as filtering E-mail," said Jim Lisiak, a systems engineer at Chevron Information Technology Co. in San Ramon, Calif.

Similar filtering capabilities are also included in the latest release of Lotus' CC:Mail Windows-based E-mail software.

However, for customers developing more complicated applications, such as using E-mail to access information from SQL databases, the full set of capabilities available from Beyond is more appropriate, company President Chuck Digate said.

Included in the bundle is software from Management Software Ltd. that can sort and forward mail to an appropriate destination when users are out of the office. Also, a utility from Systems Compatibility Corp. lets users manipulate attached files even if they do not have the application that created it.

The Microsoft Mail bundle will cost $995 for a 10-workstation license, which is $300 more than without the extra utilities, a Microsoft spokesperson said.

— Lynda Radosevich

Gateway ties Notes to Mail

By Michael Vizard

Corporate Software, Inc. plans to launch an electronic-mail gateway at Groupware '93 this week that will support bidirectional, native format message transfers between Microsoft Corp.'s Microsoft Mail and Lotus Development Corp.'s Notes mail.

Chosen one
Johnson & Higgins, a New York insurance provider, last week announced it has outsourced software support to Corporate Software. The insurer has more than 100 Notes applications used by 200 users.

Tentatively called the Mail Express, the gateway is intended to resolve incompatibility issues associated with running Microsoft Mail alongside Notes, the Canton, Mass.-based software distributor and services company said.

"There's a pretty big need for this. I've run into a number of clients with Microsoft Mail, and just about everyone tends to have multiple mail systems," said Norman Weizer, president of Weizer Associates, Inc., a consultancy in Lexington, Mass.

"Microsoft Mail doesn't have a huge percentage of the market [at Notes sites] yet, but it has enough to be a problem," he added.

To help simplify managing diverse Notes and Microsoft Mail installations, the Corporate Software gateway features a directory synchronization service that allows directories to exchange user names.

The gateway costs $5,000 per Notes server. Maintenance, which is free for the first 90 days, costs $700 per gateway per year.

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News Shorts

Bank, CA resolve legal dispute

First Fidelity Bancorp has resolved its software licensing dispute with **Computer Associates International, Inc.** and agreed to a five-year, flat-fee perpetual license agreement. The MIPS-based license — targeted at mainframe systems software but including a handful of desktop products — permits First Fidelity to use CA software on any of its computers at any of its sites. Last April, CA filed a lawsuit against First Fidelity for breach of software license agreements and misappropriation of trade secrets for CA software that was managed for First Fidelity by Electronic Data Systems Corp. [CW, May 11, 1992].

Bachman replaces president

Bachman Information Systems, Inc. announced last week that Peter Boni, former president of Paramount Communications' software and information systems group, will replace Arnold Kraft as president and chief executive officer. Boni was previously president of On-Line Software International, Inc. Kraft, who had been Bachman's president and CEO since 1988, will remain at Bachman as a consultant.

Panel clears Clipper encryption

A panel of five experts from outside the federal government completed its review of the secret algorithm used in the government's proposed Clipper encryption chip, a controversial method for safeguarding communications while allowing the government to crack them in court-approved wiretaps. The panel said the algorithm is not likely to be breakable by "brute force" trial and error using any supercomputer available in the next 30 to 40 years. It added that while the algorithm must remain classified for national security reasons, the strength of the algorithm against attack does not depend on its secrecy.

EDS widens its customer base

Electronic Data Systems Corp. inked two megacontracts — one in its traditional mainframe outsourcer vein and the other as a "technology partner." The mainframe deal calls for EDS to take over processing for Nielsen Information Services. In contrast, a $200 million, 10-year deal with IASD Health Services, which comprises Blue Cross/Blue Shield of Iowa and South Dakota Blue Cross, calls for EDS to re-engineer IASD's business processes and technologies.

Mellon sells outsourcing units to Fiserv

Mellon Bank Corp. took one giant step toward making its long-expected exit from the outsourcing business last week when it sold two business units to Milwaukee-based Fiserv, Inc. for $70 million. The sale of Mellon's Financial Institution Outsourcing and Data-Link Systems, Inc. operations removes Mellon from the banking outsourcing business. Mellon retains what it calls its Commercial Outsourcing unit, which provides data processing to non-banking customers.

SHORT TAKES **The Society for Information Management's** software licensing task force will sponsor a summit between users and software vendors on Sept. 22 in Washington, D.C., which will coincide with the society's annual conference. . . . **Monsanto Co.** has begun installing a multisite document imaging system from **FileNet Corp.** The imaging application will be deployed in more than 30 of Monsanto's U.S. manufacturing and technical sites. . . . **IBM's Adstar** storage business introduced its Distributed Storage Manager software, a way to back up data from different vendors' PCs and local-area networks onto IBM mainframes.

More news shorts, *page 16*

App delivery goes electronic

By Michael Vizard
BOULDER, COLO

The move toward widespread adoption of electronic software distribution received a major shot in the arm last week following IBM's announcement that it will bundle a compact disc containing a catalog of independent software applications with its low-end Ambra line of PCs.

At the same time, Gateway 2000, Inc. in North Sioux City, S.D., said it will distribute a free CD with 33 Microsoft Corp. applications to 25,000 Gateway customers who already have CD drives installed.

Both programs, which are based on technology from InfoNow Corp., located here, will allow users to browse for a package on a CD-ROM installed on a local server. They can then deploy that software by requesting an electronic key to be sent over a telephone line that unlocks the software on the CD.

For information systems directors, the advent of CD-based software distribution promises to lower one of the most significant costs associated with acquiring PC software: installation.

For example, Meta Group, Inc. in Westport, Conn., contends that a business with 1,000 PCs will spend about $50,000 annually for the distribution of one bug fix, two application upgrades and one operating system upgrade. That estimate is based on a labor cost of $40 per hour with an estimate of 20 minutes per PC upgrade.

"I know of some sites who won't buy some packages because it's just too difficult and expensive to install," said Carter J. Luscher, a program director at Gartner Group, Inc. in Stamford, Conn.

On your mark . . .

However, Luscher noted that the industry is just now coming to grips with the concept of electronic software distribution. "We're just starting the journey. Right now, we're about two steps from the starting line," he said.

One of the key technological challenges that still has to be overcome is the fact that most electronic delivery vehicles do not have the ability to determine what types of software and hardware are installed at a user's desktop. So making sure that systems are correctly balanced still remains a labor-intensive process.

In addition, the licensing and metering technology that would allow IS directors to keep track of software use is also in its infancy.

But as these technologies mature, with IBM, Microsoft and Novell, Inc. all working on their own implementations, industry analysts say the role of value-added resellers (VAR) will diminish as end users begin ordering software directly from vendors in greater quantities.

"The smart [VARs] are saying that software has a limited future. That's why companies like Corporate Software are focusing on value-added services," Luscher said.

In fact, VARs are expected to begin using CD technology to start packaging applications aimed at specific vertical markets.

IBM, Dell offerings have low-end emphasis

By Michael Fitzgerald

IBM and Dell Computer Corp. both went after cost-conscious buyers with vigor last week, introducing new systems with aggressive price points. Users, confronted by a general onslaught of technology, found it hard to generate much enthusiasm for the new products.

IBM unveiled Ambra Computer Corp., a U.S. company with the same name as an IBM subsidiary in Europe but with a completely different set of products and marketing approach than its European cousin, which was designed to target clone makers. Instead, Ambra U.S.A. aims at Gateway 2000, Inc., the North Sioux City, S.D., king of the mail-order hill.

Dell, meanwhile, went after Compaq Computer Corp., unleashing two product lines; it also took a potshot at Gateway with a new high-end model for its low-end Dimension line.

Analysts said IBM needed to create Ambra as a separate box to give itself credibility with buyers who like Gateway. They termed IBM's current efforts in the direct-mail market "half-hearted."

"IBM perceives, and accurately so, that people associate a premium with the IBM name, so [Ambra] says they don't have that premium," said William Abloudi, an analyst at BIS Strategic Decisions in Norwell, Mass.

Ambra features IBM's first aggressive push to use Intel Corp.'s Pentium chip and marks the first time an IBM entity will use the Extended Industry Standard Architecture bus.

Ambra's high-end product is the TP662E/VL, which uses dual 60-MHz Pentium processors and costs $6,559 for a box with 16M bytes of random-access memory and a 540M-byte hard drive. The line starts at $809 for a 486SLC2-based media-less box.

Color offerings

Ambra's product family also includes two color notebooks: a dual-scan passive-matrix model with a 120M-byte hard drive that costs $2,449; and a thin-film transistor active-matrix unit priced at $3,449 with the same configuration.

Ambra employs roughly 60 people and has outsourced production and telemarketing.

Dell, meanwhile, unveiled two lines, OptiPlex and NetPlex, and beefed up its low-end Dimension line. The three lines reflect a market study designed to link Dell's product moves to one of five customer types: those on corporate networks; those in mission-critical environments; those at small and medium-size companies who want bundled offerings; and power and novice users.

OptiPlex serves effectively as a replacement for the L and M product lines announced last December. The machine has a base price of $1,399 and uses processors ranging from a 25-MHz 486SX to a 33/66-MHz 486DX. A high-end OptiPlex with 16M bytes of RAM and a 450M-byte hard drive will cost $3,749.

NetPlex is targeted at Compaq's ProLinea low-end line and comes with a preinstalled network adapter card. Its base price is $1,099. The new Dell Dimension XPS family targets Gateway with a 466V model that has 16M bytes of RAM, a 450M-byte hard drive, a Diamond Viper video card and a Creative Labs, Inc. Sound Blaster for $3,365.

One potential customer for both Ambra and Dell summed up the differences in perception that each will face.

"Ambra sounds OK, but we'll see; we're more interested in ValuePoints. As for the new Dells, they seem well-engineered, if not terribly revolutionary, and we're interested in them," said John Woods, PC systems specialist at Chevron Information Technology Co., Chevron USA, Inc.'s information systems unit in San Ramon, Calif.

Chevron buys PCs from a multitude of vendors, Dell and Gateway prominent among them.

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COSE attacks net administration

By Elisabeth Horwitt

■ The COSE alliance of leading Unix vendors hopes within about six months to equip its common desktop environment with systems administration tools similar to what Microsoft Corp. provides for its Windows and Windows NT products.

The group is working on both a standardized framework and services for administering distributed Unix systems with the same ease that Microsoft claims users will be able to administer NT via Microsoft's Hermes, said Larry Robinson, an OpenView product marketing manager at Hewlett-Packard Co. and a participant in the COSE systems management group. The utilities will be included in the various Unix flavors that COSE vendors supply.

Such a development is key to the Common Operating System Environment (COSE) consortium's goal of providing a standardized Unix platform that can win out over NT as the centerpiece of corporate users' client/server strategies, according to Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass.

However, some analysts said they believe some of COSE's working groups, including the one on systems management, will not achieve consensus and may "fade away" because vendors will not be able to reach agreement on standards.

Neal Hill, a senior analyst at Forrester Research, Inc., takes a different view. "COSE is a way to arbitrate differences quickly. Because of the delay of [OSF's] DME, my suspicion is that what IBM and HP expect to do is to take [IBM's] NetView and [HP's] OpenView, mix them up together and throw them on the table. That would produce a widely supported system management specification that works and that already has tangible products based on parts of it."

Top priority

Indeed, the ability to manage distributed client/server systems with the same coordinated ease that a mainframe environment provides is a top priority for many downsizing corporations. "The tools available today for managing mission-critical applications" on distributed systems "are woefully inadequate," said David Sheppard, chief executive officer at Fleet Services Corp. in Providence, R.I.

COSE, which was formed earlier this year by HP, IBM, Unix System Laboratories, Inc., Sun Microsystems, Inc. and The Santa Cruz Operation, recently released the first version of a common Unix-based desktop environment that aims to provide users with a common look and feel and programming environment across the various vendors' flavors of Unix. Working specifications for the environment are due out by year's end, with products likely to appear in 1994, Robinson said.

The COSE group hopes to do Microsoft one better by enabling Unix systems to manage a variety of desktop environments, Robinson said. Hermes was designed to administer Microsoft's own Windows and NT systems.

A more long-term and far more ambitious project for the group is to come up with a common framework for managing distributed, heterogeneous client/server systems based on COSE, Robinson said. Such a framework is a high priority for companies such as Fleet, which needs a way to integrate the "various, fragmented tools" that vendors are bringing out, Sheppard said. The bank now has Unix and is probably going to implement NT, "so probably no one vendor will solve" its system administration needs, he added.

The COSE group is evaluating components of the Distributed Management Environment (DME) for potential inclusion in its specifications, Robinson said. However, the group has apparently decided to come up with its own systems administration standard because the Open Software Foundation (OSF) is taking so long to make DME into a viable product, Hurwitz said.

The group is likely to adopt an object-oriented framework based on the Object Management Group's Common Object Request Broker Architecture (CORBA) as a way to interconnect managing and managed systems, Morrison said. The OSF has announced plans to incorporate CORBA into DME.

COSE also plans to develop a set of services that will run on the framework.

Novell, Stac tighten ties

By Michael Fitzgerald

PROVO, UTAH

Novell, Inc. last week said it will build compression technology into all its future operating systems, creating the promise of widened data paths.

Novell's first step down that road was a deal to integrate Stac Electronics, Inc.'s Stacker compression software into Novell DOS 7.0. As part of the deal, the two companies will work together to build San Jose, Calif.-based Stac's LZS Compression algorithm into Novell's NetWare and UnixWare system software, but no target dates were announced.

Under the nonexclusive licensing arrangement, the two companies plan to develop methods to give users double the storage on their existing machines and as much as double the data path across their networks.

Decompression drawbacks

While Novell already has built compression capabilities into NetWare 4.0, that compression approach is oriented toward archiving and does not allow for dynamic decompression of files, according to Stac officials.

"What we announced was the first piece, the client side. The two remaining pieces are storage on the server, using our standardized algorithm, and then the third piece, which doesn't yet exist, is compression over the wire," said Gary Clow, Stac's president and chief executive officer.

Most users contacted said they thought the idea of compression over a local-area network seemed like a good one, if the technology could be trusted.

Novell pumps up enterprise

CONTINUED FROM COVER 1

nology at Boston Edison Co., said, "Novell's Unix direction is crucial to us" because it provides a scalable platform that can support new applications, particularly in the customer support area.

Novell plans to strengthen the integration between UnixWare and NetWare gradually during the next two to three years. Currently, UnixWare clients can access NetWare servers and vice versa. The rollout will for the first time extend to UnixWare basic integrated NetWare services, including authentication, network and systems management and directory services, a Novell spokesman said.

The company also plans to migrate Tuxedo, the Unix-based development environment, to NetWare by the end of next year, said Michael DeFazio, senior vice president of Unix System V. That would enable users to build NetWare applications that can access Tuxedo-compliant services on Unix and on IBM hosts via Tuxedo's CICS component, DeFazio said.

Another key goal of the rollout is to move NetWare from its current status as an isolated bindery-oriented server to a more enterprise-oriented system. This effort would build on what has been done with directory services to date with 4.0.

Services lineup

These efforts will create a new generation of NetWare Application Services, including the following:

▶ Work-flow management, which will enable the NetWare server to act as a directory server and router for documents generated by Novell and third-party messaging systems.

▶ A software distribution system based on NetWork Navigator that will provide centralized software distribution to NetWare 3.X and 4.X systems, due in the fall.

▶ A NetWare video server that will allow NetWare servers to deliver full-motion video to Windows clients over the local-area network. It is due out by year's end.

Novell intends to provide client systems with transparent access to the application services via NetWare 4.0's NetWare Directory Service, an object request broker within its AppWare framework. The directory will be extended to UnixWare at an undisclosed time.

Novell also plans to provide NetWare for Unix, which will allow users to run NetWare Loadable Modules and Unix applications concurrently on the same system.

This is similar to the NetWare for OS/2 product co-announced with IBM last week, which allows users to run OS/2 2.1 applications and NetWare 4.01 services on the same system.

Big piece of the pie

NetWare sales made up 82% of Novell's total business in 1992, with the remainder made up of IBM links, hubs, routers, network management, client systems, education and support.

All in the network

Novell plans to eventually provide integrated network and systems management across NetWare- and Unix-based client/server environments.

However, this is a long-range strategy that involves gradually moving core network management services off the current NetWare Management System (NMS) Windows 3.0 platform and onto NetWare, said Steve Dauber, product line manager for network management products.

The Windows 3.0 console would continue to provide a graphical user interface for viewing network management data, configurations and activities. The goal is to have multiple domains, each managing a different type of network device or installation, that could access one another's data and correlate management, Dauber said. No time frame was given.

Novell took a step toward a more enterprisewide network management system when it released NMS Software Development Kit 2.0. It includes agents for managing NetWare from any Simple Network Management Protocol platform, Dauber said.

Also in the works is a distributed version of Novell's LANanalyzer that will comply with the Remote Network Monitoring LAN diagnostic standard and feed a wide variety of data about local-area network systems to NMS, Dauber said. It is expected at Interop.

—Elisabeth Horwitt

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while the Locator is a nice idea, "unless it goes across diverse platforms, it doesn't do me any good."

Similarly, Bill Inmon, a data warehouse consultant associated with software vendor Prism Solutions, Inc. in Sunnyvale, Calif., said, "If you don't support multiple vendors and multiple technologies, then you don't have a viable product." He added that, based on his contacts with customers installing a warehouse, very few choose IBM platforms for it.

Arnold responded that the Locator's operating environment requirements "do not seem to be an inhibitor" to users whom the company has talked to so far. Nevertheless, he said, "We're looking at other platforms, and we'll continue to pursue that where it makes sense."

Not everyone agreed it is a large drawback. "I don't see it as a major hit," said John Mann, senior analyst at The Yankee Group in Boston. "You can put the Locator on an OS/2 server somewhere, and one server can support quite a few users."

More important, Mann said, IBM will finally allow customers to move data around the network. "IBM is recognizing the reality of customers' environments. They're doing the inevitable."

Susan Osterveit, a corporate data administrator at Storage Technology Corp. in Louisville, Colo., and an early warehouse adopter, said she is very interested in the Locator. "We've been dealing with it manually, on paper. Most of the products that exist are too technical for end users, so yes, it appeals."

Robert Holland, president of Holland Systems Corp., a consulting firm in Ann Arbor, Mich., said the Locator concept is a good idea but does not replace the time and energy required to standardize the data and build the basic warehouse architecture. "What good does the key to a car do you if you don't have a car?" he asked.

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Parallel box draws near

IBM is essentially on schedule with its Enterprise System/9000 parallel processor announcement set for later this year, a company executive said last week. But the unveiling will likely take place in October — or even later.

The machine, intended to handle complex database queries and off-load that work from the regular mainframe, will be able to link as many as 50 processors in its first go-round [CW, Jan. 18]. It will connect to a traditional ES/9000 via Sysplex, IBM's fiber-optic channel extender.

But the timing of the announcement is off IBM's usual second-Tuesday-in-September schedule. IBM is working with a few customers to get the major bugs out before announcing the system. General availability is scheduled for soon thereafter, said Bill Reedy, director of market operations at IBM's Enterprise Systems line of business.

— *Johanna Ambrosio*

Corrections

- Because of a reporting error in the Aug. 2 issue, the version of Windows NT that BankAmerica Corp. is running was misidentified. The bank is running the standard edition of NT.
- Because of a reporting error in the Aug. 2 issue, the company for which Liz Barnett works was misidentified. Barnett is an analyst at New Science Associates, Inc. in Westport, Conn.
- Because of an editing error, T. J. Rodgers' name was misspelled in the Aug. 2 issue.
- Due to a reporting error in the Aug. 2 issue, John Lochow's duties were incorrectly detailed at CNA Financial Corp. He runs the IS division, not the IS department.

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Reporter's Notebook

Michael Braun, the new chief executive officer of Kaleida Labs, Inc., was patrolling the MacWorld halls, perusing the multimedia competition and talking up his new role. Braun said he is "considerably more of a hands-on manager" than venture capitalist Nat Goldhaber, who resigned last month as CEO but who remains co-chairman. Analysts said the shift occurred because Kaleida's ScriptX cross-platform scripting language needs to be kicked into high gear. ScriptX is now in a prealpha phase. Look for an alpha version in the fourth quarter and a beta-test version in the first half of 1994. The first two platforms will be Macintosh and Windows, followed closely by OS/2.

Sharp Electronics jumped on the Apple Newton bandwagon last week, unveiling the PI-7000 Expert Pad, the first licensed personal digital assistant based on the Newton intelligence operating system. Priced at $999, the PI-7000 recognizes graphic patterns as well as cursive script, block letters or a mixture of both and "gesture commands." Sharp said it can learn the user's handwriting and work habits.

The Newton has finally been announced, but the hype machine just will not quit. This November, Beyond Words Publishing will publish *Defying Gravity: The Making of the Newton*. Because Apple has given the book its stamp of approval, it is questionable how much dirt will actually be dished in the new volume.

Apple last week announced its fifth round of price cuts in two months. It sliced price tags on its high-end computers by up to a third.

Apple also announced the PlainTalk Text-to-Speech developers tool kit, which can be used to create Macintosh-based applications that convert typed text to spoken English. It is slated to be available next month.

BellSouth's Mobile-Comm unit signed on to provide wireless messaging services for Newton users through its paging network starting this fall. Apple has also contracted with Sprint and BT North America to develop future Newton products with features ranging from banking to booking travel tickets.

More than 20 software developers unwrapped software for the MessagePad, from specialized realtor systems to titles for sports enthusiasts. Strangely missing from the ranks of those announcing any upcoming MessagePad release: longtime Apple supporter Microsoft.

Apple pitches Newton to corporate users

By James Daly
BOSTON

Tens of thousands of Macintosh fans braved the heat, the crowds and the overcooked chowder at last week's MacWorld Exposition to hear Apple Computer, Inc. make its corporate pitch for the Newton MessagePad.

Apple's primary goal at this early stage in Newton's life cycle is to make sure big business sees the handheld electronic organizer as something more than a Game Boy on steroids.

Analysts also noted that Apple must be able to provide an adequate supply and selection of communications products and application development tools to accompany Newton, while developing quicker and more accurate handwriting recognition. Although Apple is hyping MessagePad for its "anytime, anywhere" capabilities, its communications capabilities will be limited until the end of the year, according to company officials.

In its initial form, the MessagePad's built-in functions will include LocalTalk for Printing and communications with Macintoshes as well as a 9.6K bit/sec. infrared system to beam data to other Newtons. A Personal Computer Memory Card International Association slot will also offer options for future communications products.

Apple was able to pull a rabbit out of its hat at the product's splashy introduction by trotting out several major companies that are considering projects that will use the MessagePad.

Most of the MessagePad tire kickers said they see the device as a way to quickly manage and communicate information between their central office systems and the point of contact with the customer.

The U.S. Department of Defense, for instance, is working with Apple and systems integrator KPMG Peat Marwick to apply the MessagePad to its health care operations. Final contract negotiations are under way for a project called ProMed, said Col. Fred Goeringer, a project manager at the U.S. Army Medical Material Agency.

"The health care environment is a highly dynamic workplace, so we are excited about the promise of untethered communications," he said.

ProMed will allow physicians immediate access to critical care data such as medical history, test results, patient records and problem lists.

American Express Co. is also working with Apple to develop customized applications for card members who use the MessagePad, said John I. Williams Jr., senior vice president at American Express Travel Related Services Co. Williams was short on specifics but said American Express "is working to develop customized applications for the business traveler and American Express Card members."

Likewise, Ira Tolmich, The Coca-Cola Co.'s director of information technology, said the soft drink maker plans to integrate the MessagePad into its work-flow model.

Gaston Bastiaens, general manager of Apple's Personal Interactive Electronics Division, said corporate interest in developing applications for MessagePad is already high. According to the company, more than 1,500 developers have expressed interest in developing applications for the Newton family.

Jeffrey Henning at BIS Strategic Decisions in Norwell, Mass., said he was impressed with the developer curiosity. "That's a huge number of interested parties for a device with an installed base of zero," he recently wrote.

FCC widens options

CONTINUED FROM COVER 1

in Washington, D.C., who represents telecom users in the financial services industry. This is because switched services are used by firms with lighter traffic loads that do not justify dedicated-line price tags.

But the ruling should also touch large companies looking for alternative local access for their smaller sites, Levine said.

A possible downside of letting more carriers into the network chain is that it could "create more points of failure and concern," said Jerry Noble, director of telecommunications at the American Cancer Society in Austin, Texas. He said the finger-pointing among carriers when there is a network problem is already "a nightmare. You may trade off cost savings at the back end in terms of management headaches."

Although generally it is a customer's long-distance provider — not the user — that chooses who will carry the traffic between the local central office and the long-distance network, the continued erosion of the local phone company's monopoly should bring the cost savings and better service that traditionally accompany competition, users and analysts said.

"Our experience has been that this kind of activity has always resulted in lower costs," said Bob Michna, vice president of telecommunications at Aetna Life & Casualty Co. in Hartford, Conn. However, other users said the cost impact depends on interexchange carriers passing savings on to their customers.

"While we could benefit from lower costs . . . I'd have to see it to believe it," Noble said.

AT&T spokesman Andrew Myers said users "can pretty much bank on our passing the rates along." But he acknowledged that AT&T has a bias toward Bell operating company services.

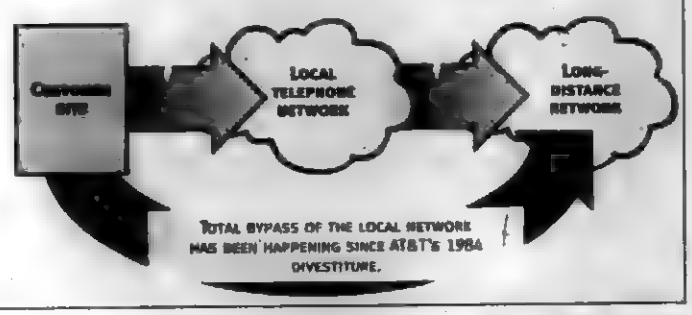
But "the smart user will see to it that the long-distance carrier chooses the cheapest or better access company," said Brian Moir, public policy counsel to the International Communications Association user group and a partner at Fisher, Wayland, Cooper and Leader, a law firm in Washington, D.C.

Chris Finn, a senior analyst at telecommunications consultancy TeleChoice, Inc. in Verona, N.J., predicted the ruling will not benefit most businesses for three to five years. "Interconnection . . . using switched services is technologically more complex than providing private lines," he explained.

Nonetheless, the FCC action "signals that the local-exchange monopoly is going to be dismantled, and sooner than most people thought," said Royce Holland, president of alternative access giant MFS Communications.

New avenue

Access lines from the local to the long-distance network is where interexchange carriers are gaining competitive choice on behalf of their customers



Bells slow [illegible]

Competition is forcing the Bell companies to get creative, said attorney Henry Levine. They are beginning to offer package deals resembling AT&T's Tariff 12 contracts, which provide large users with customized, discounted voice and data services. Last week's ruling could pressure the Bells to offer [illegible] at better prices.

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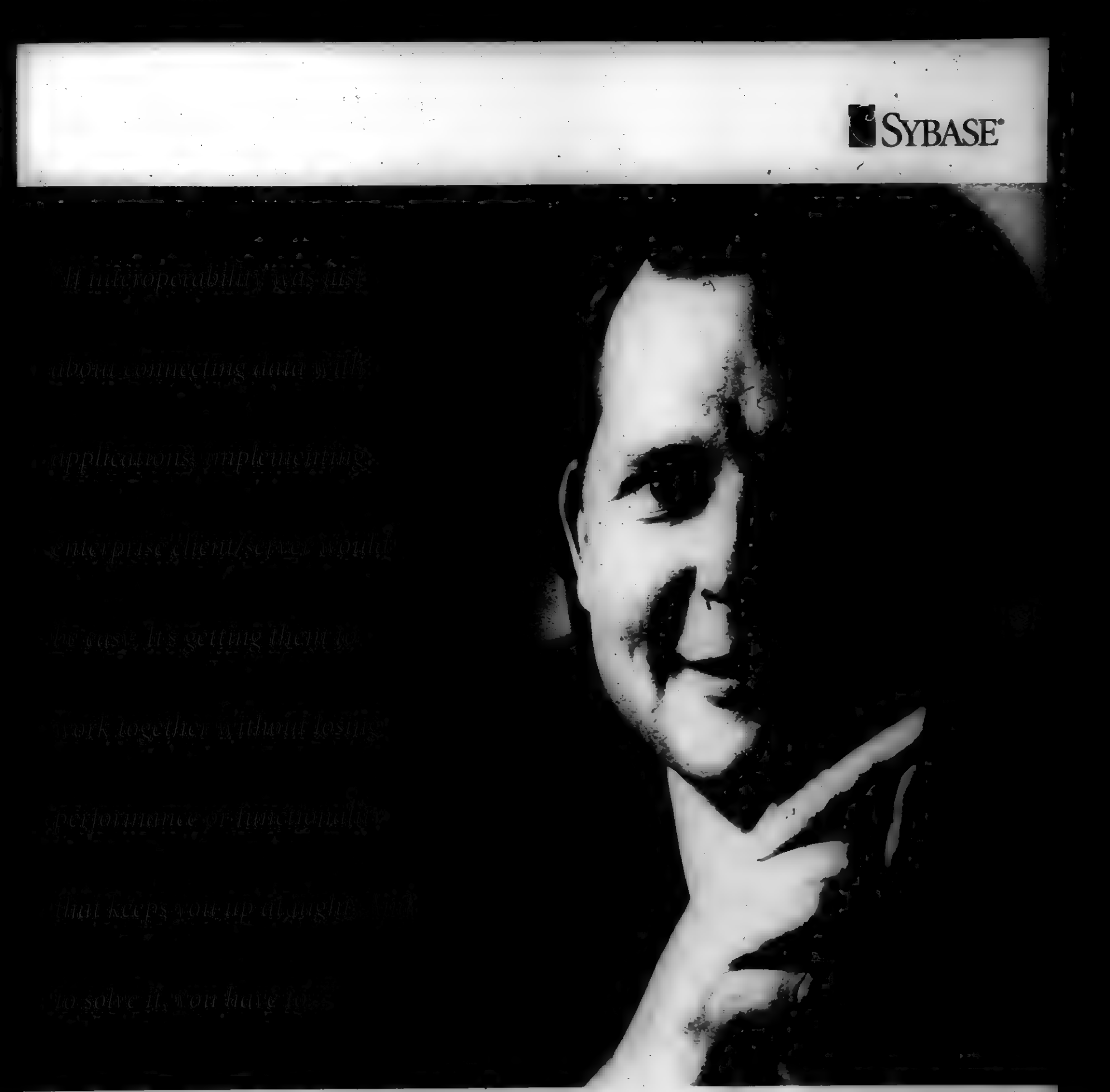

Mark Page knows the situation well. Vice President of Connectivity Products at Sybase, he's helped a long list of customers develop integrated solutions to one of the most significant problems in client/server computing. **He shares that experience in a taped conversation *"Making Connections In Client/Server Computing."* For your copy, call 1-800-SYBASE-1.**

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Computerized records: An open book

CONTINUED FROM COVER 1

Not just the usual cadre of privacy advocates is concerned. A major study by the prestigious Institute of Medicine in Washington, D.C., strongly backed computer-based medical records but said the privacy issue, not technology, is the No. 1 barrier.

"All that automation won't do a damn bit of good if people don't trust the system and then reform fails due to a lack of participation," said one member of the administration's health care reform task force, who requested anonymity.

No details were available yet, but the Clinton plan is expected to call for a nationwide network of computerized medical records. Instead of a monolithic database, the plan is to link the various electronic records in medical facilities and regional health alliances across the country into a very distributed database.

Every American will get a unique patient identification number, which will be the key that unlocks and consolidates the scattered electronic files for that patient. "You need a unique identifier so that when you go into an emergency room in Sheboygan [Wis.] but you live in Omaha, your information can be obtained," the task force member said.

One major controversy is whether that patient identifier should be the Social Security number or should be based on a different numbering system. The Social Security number has a practical advantage because most people already have one and know it, but a coalition of privacy advocates recently wrote a letter urging the Clinton task force not to adopt its use.

Unprotected password

The problem, Rotenberg said, is that the Social Security number is widely used as the identification number for tax, employment, credit and motor vehicle records already, so applying it to medical records would make it easy to merge all of those records into a Big Brother dossier. "The Social Security number is like a password to other files," he said.

Use of Social Security numbers is so widespread that it is easy for hackers to get them and access medical systems, privacy advocates said. Furthermore, it may be hard to keep records straight because some people have duplicate numbers, others share a family number, and the Social Security number lacks a "check digit" to verify keypunching accuracy.

The Clinton task force had originally settled on using the number but has recently begun leaning away from it because of the privacy controversy, according to Peter Waegemann, executive director of the Medical Records Institute in Newton, Mass.

Marc Rotenberg: *Big Brother-like connotations*

Whatever numbering scheme is used may be less important than passing federal legislation that establishes the ground rules (and penalties) for disclosure of medical records, said longtime privacy expert Alan F. Westin, professor of public law and government at Columbia University in New York.

"State law [on medical privacy] is extraordinarily diverse and, in many cases, antiquated. We're moving toward regional information systems and national exchange of [medical] information, so the time is right to enact broad federal legislation," Westin said.

U.S. Rep. Gary A. Condit (D-Calif.), chairman of a House subcommittee that deals with information privacy, is currently drafting privacy language to ride on the coattails of health care reform legislation.

"There is too much interstate transfer of patient information to continue to rely on differing state confidentiality laws," Condit said. "For example, which law applies to the record of a patient who lives in Maryland, has a doctor in Virginia, a hospital in the District of Columbia, an employer with headquarters in California and an insurer in Connecticut?"

Patient control

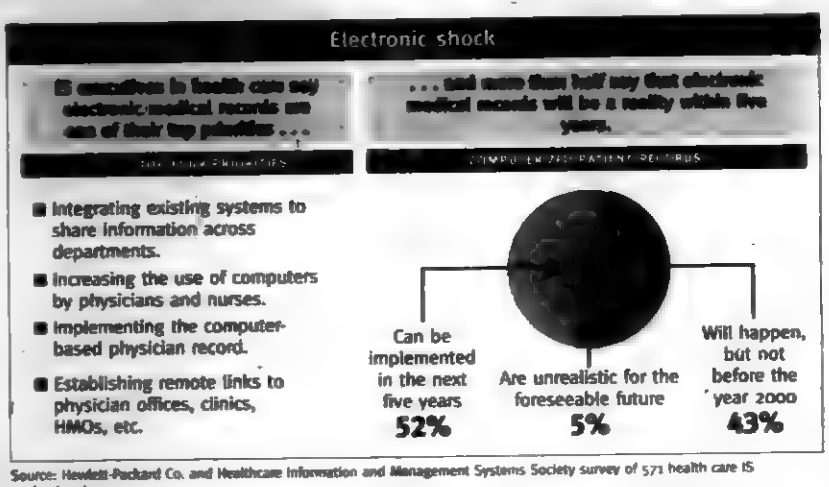
The Chicago-based American Health Information Management Association (AHIMA) has drafted a bill that would generally prohibit the disclosure of medical records unless the patient signs a narrowly defined authorization form. It would state a specific purpose, recipient and time limit for the disclosure.

"The problem now is that insurance companies require you to sign an open-ended, blanket authorization that allows them to access all of your medical records at any time," said Kathleen A. Frawley, director of the AHIMA's Washington, D.C., office.

Of course, it is possible that electronic patient records could be *more* confidential than paper records if strict security controls are implemented from the start.

For example, multilevel access controls could allow clerks to see only administrative data, not the whole medical file, and audit trails could identify users who have "peeked" at certain screens, noted Pamela Wear, executive director of the AHIMA.

A few medical facilities across the country already have electronic patient records and work hard to safeguard privacy, according to Wear, but the security of the nationwide network will only be as good as its weakest site. "That's why we want to set a high national standard," she said.



Source: Hewlett-Packard Co. and Healthcare Information and Management Systems Society survey of 571 health care IS professionals

Discomforting history

The nation's experience thus far with two of the country's largest electronic record systems — the national credit bureaus and the National Crime Information Center (NCIC) — is not comforting, observed Rep. Gary A. Condit at a recent congressional hearing.

Credit bureaus have been roundly criticized by consumers and regulators for accuracy problems and breaches of confidentiality. Likewise, there has been a variety of misuses of NCIC data, including cases in which police officers have been indicted for selling criminal histories gleaned from the NCIC.

After studying 62 examples of NCIC records abuse, the U.S. General Accounting Office last month urged Congress to enact strong criminal sanctions. "How will we be able to protect health records in a computerized environment," Condit asked, "if we can't adequately protect criminal history records or credit records?"

—Mitch Betts

IRS uncovers bogus access to tax records

By Gary H. Anthes
WASHINGTON, D.C.

Ongoing efforts to modernize systems at the Internal Revenue Service have had unforeseen consequences: unauthorized access to confidential data.

According to an IRS investigative report released last week by Sen. John Glenn (D-Ohio), 368 employees exploited "ineffective security controls" to snoop through the computerized tax accounts of friends, relatives, neighbors and celebrities at the IRS' Atlanta office. Glenn said five employees had used the system to engineer fraudulent returns, including one person who triggered some 200 false tax refunds.

Early investigations in other IRS regions have turned up another 100 people suspected of unauthorized access to taxpayer information, Glenn said.

A taxing situation

In fiscal 1992, the IRS:

- Processed 204 million tax returns, 11 million of them filed electronically.
- Processed 1 billion documents (W-2s, 1099s, etc.).
- Handled 2.7 billion pieces of paper.
- Collected $1.12 trillion in taxes.
- Issued 89 million refunds totaling $113 billion.
- Maintained 600 offices to assist taxpayers.

Source: U.S. General Accounting Office
Fiscal year 1992 financial audit.

"The IRS is the agency Americans fear most," said Sen. David Pryor (D-Ark.), who sits on the Government Affairs Committee, which held a hearing last week on the IRS. "This confirms their worst fears."

Glenn said he was especially troubled that the IRS' investigation had focused on just one of seven regions and just one of 56 ways the database system can be accessed by IRS employees. "I'm concerned this is just the tip of a very large iceberg," he said.

Problems with controls in IRS computer systems are not new. Last September, the U.S. General Accounting Office raised concerns about privacy and security in the architecture plan for the Tax Systems Modernization, a 10-year, $8 billion effort. It is the third attempt in 25 years to overhaul systems at the IRS.

Indeed, the IRS investigative report published last week said an enhancement to the existing system to support Tax Systems Modernization "greatly increases the risk of employee browsing, disclosure and fraud" by making more data accessible to more people.

Margaret Milner Richardson, commissioner of internal revenue, said the misused system is 20 years old and is used by 56,000 employees. She said it has nearly all the security features required by federal standards for such systems, including passwords and user profiles that limit types of access based on user job descriptions. She said the IRS has taken steps to put greater management emphasis on security and privacy.

Deputy Commissioner Michael P. Dolan said the IRS' Atlanta operation discovered the illegal activity by using software able to detect suspicious use patterns over three years from a database of audit trail information. He said widespread use of the detection technique has been inhibited by the difficulty of processing tape archives, which grow by 100 million transactions per month.

However, Dolan said, each regional IRS center will soon get the "pattern detection" software with high-capacity optical disc hardware to allow line managers to easily monitor system use — and possible misuse — by their employees.

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News Shorts

Wang details coming-out plans

Wang Laboratories, Inc. appears to be on its way to emerging from Chapter 11 bankruptcy protection next month. A U.S. Bankruptcy Court judge in Boston last week approved the disclosure statement filed by Wang as part of its reorganization plan and scheduled a Sept. 20 confirmation hearing on the plan as a whole. The plan will now go out to the company's creditors and stockholders for balloting. Wang also signed an agreement in principle for a $60 million private stock sale with Steinhardt Management Co. in New York.

BT, MCI progress on global deal

MCI Communications Corp. and **BT** said last week they have worked out the details of their global partnership, announced in June, which includes a $4.3 billion BT investment in MCI for 20% ownership. The agreements include the appointment of Chris Earnshaw, BT's managing director of worldwide networks, as chief executive of the BT/MCI worldwide joint venture for telecommunications services. The companies also decided the new company's headquarters would be in Northern Virginia.

Cisco yields to quasi-IBM net scheme

Cisco Systems, Inc. said last week it will support a "standards-based" version of IBM's Data Link Switching (DLSW) — under construction by an IBM developers' working group — on its routers in mid-1994. DLSW is IBM's method of encapsulating inherently nonroutable Systems Network Architecture protocols in Transmission Control Protocol/Internet Protocol packets.

Smart cards, unite!

Representatives of the financial services, telecommunications, entertainment, publishing, computer and health care industries have joined with government agencies to form the **Smart Card Forum** to address compatibility issues of smart card technologies across industries. Participants include **American Express Co., Citibank NA, Apple Computer, Inc., IBM, Bell Atlantic Corp.** and **Mastercard International, Inc.**

New subnotebooks from Gateway

Gateway 2000, Inc. will today release an Intel Corp. 1486-based version of its Handbook subnotebook and a 1.8-in.-thick color notebook family called ColorBook. The 2.9-pound Handbook will now come with either a 25-MHz 486SX for $1,495 or a new 20-MHz/40-MHz DX2 for $1,995, with a 130M-byte hard drive. The ColorBooks weigh 5.7 pounds and have a 9.4-in., dual-scan, passive-matrix color screen, a built-in trackball and a Personal Computer Memory Card International Association Type III slot. Using nickel-metal hydride batteries, Gateway promises two to four hours of battery life. A 486SX/25 with an 80M-byte hard drive costs $1,995. A top-of-the-line 486DX/33 with a 170M-byte hard drive will cost $2,595.

SHORT TAKES **Sterling Software, Inc.** reported third-quarter sales of $73.4 million, up 11% over last year's third-quarter results.... **Nordstrom, Inc.**, a $3.4 billion fashion specialty retailer in Seattle, has signed a $4 million contract to install **NCR Corp.** System 3000 servers and workstations for customer service and inventory management.... System Software Associates, Inc. last week acquired **Elke Corp.**, a Plymouth, Minn., maker of maintenance management and tracking software for IBM's Application System/400 computers.

Unisys, Intel take parallel road

Joint venture seeks boxes more powerful than mainframes

By Thomas Hoffman
SAN FRANCISCO

Seeking to leverage each other's strengths, Intel Corp. and Unisys Corp. last week said they are jointly developing a scalable parallel processing system for commercial use. The first beta-test systems are expected sometime next year.

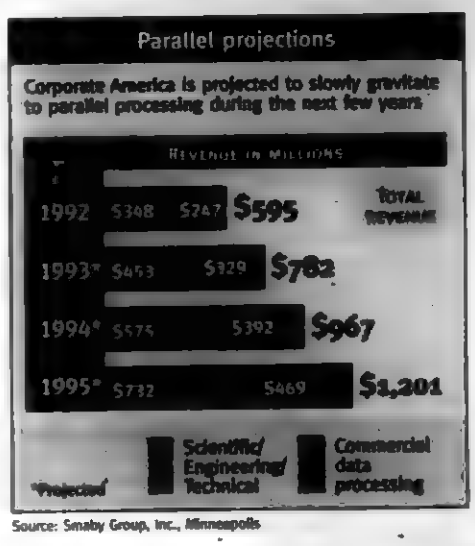
Early reports have indicated that scalable parallel processing systems are far less expensive and more powerful than mainframes.

Under the agreement, Intel will supply its Pentium microprocessors and scalable parallel processing mesh interconnect subsystem. The subsystem, currently used with Intel's i860-based Paragon supercomputers, was designed to provide high-speed communications between nodes.

Unisys, meanwhile, will provide a microkernel-based implementation of Unix System V Release 4 and other applications software. Nick Derchak, a vice president in the Unix systems group at Unisys, said Unisys will market the systems but added that the firms are still working out cross-licensing issues.

Still, the parallel systems, which are not expected to debut until 1995, will have to overcome some major obstacles, most notably the ability to "parallelize" existing applications in a way that is transparent to end users.

"The whole software picture is the home of the biggest technical challenges," said David Frankel, a director of technology at Smaby Group, Inc., a Minneapolis-based market research firm. Frankel and other analysts said the compiler technology required to parallelize existing mainframe and other applications is not yet available.



Source: Smaby Group, Inc., Minneapolis

Unisys executives downplayed those criticisms and said the company plans to attack parallel software development in other ways. For example, the mesh interconnect subsystem will include Unix microkernel message passing technologies from Chorus Systems, Inc. designed to provide a "single-system view rather than a multiple-processor view" of applications, according to Ron Bell, Unisys' chief technology officer.

In addition, Unisys is developing parallel versions of its fourth-generation language Mapper and LINC application development tools. These systems will be designed to "decompose" large macro functions across nodes, Derchak said.

"We think a number of functions can be improved without fiddling with the compiler technologies," he said.

Unisys customers said they liked the development effort but offered mixed views on how rapidly their organizations plan to deploy parallel processing systems. George F. Thomas, senior vice president and director of information systems at New York Clearing House, said his firm would likely implement one of the forthcoming parallel systems as long as they would run applications under MCP/AS, Unisys' proprietary operating system for its Model A19 mainframe.

Still, Thomas expressed caution on parallel processing. "We wouldn't jump on any new hardware or software venture until it's proven, which would probably be around the year 2000."

Though Unix will be the core operating environment for the scalable systems, Bell said the vendor is developing communications mechanisms to link the parallel systems with its customers' A series and 2200 series mainframes. Derchak said the new systems will complement, not compete with, Unisys' parallel processing initiatives for its 2200 boxes.

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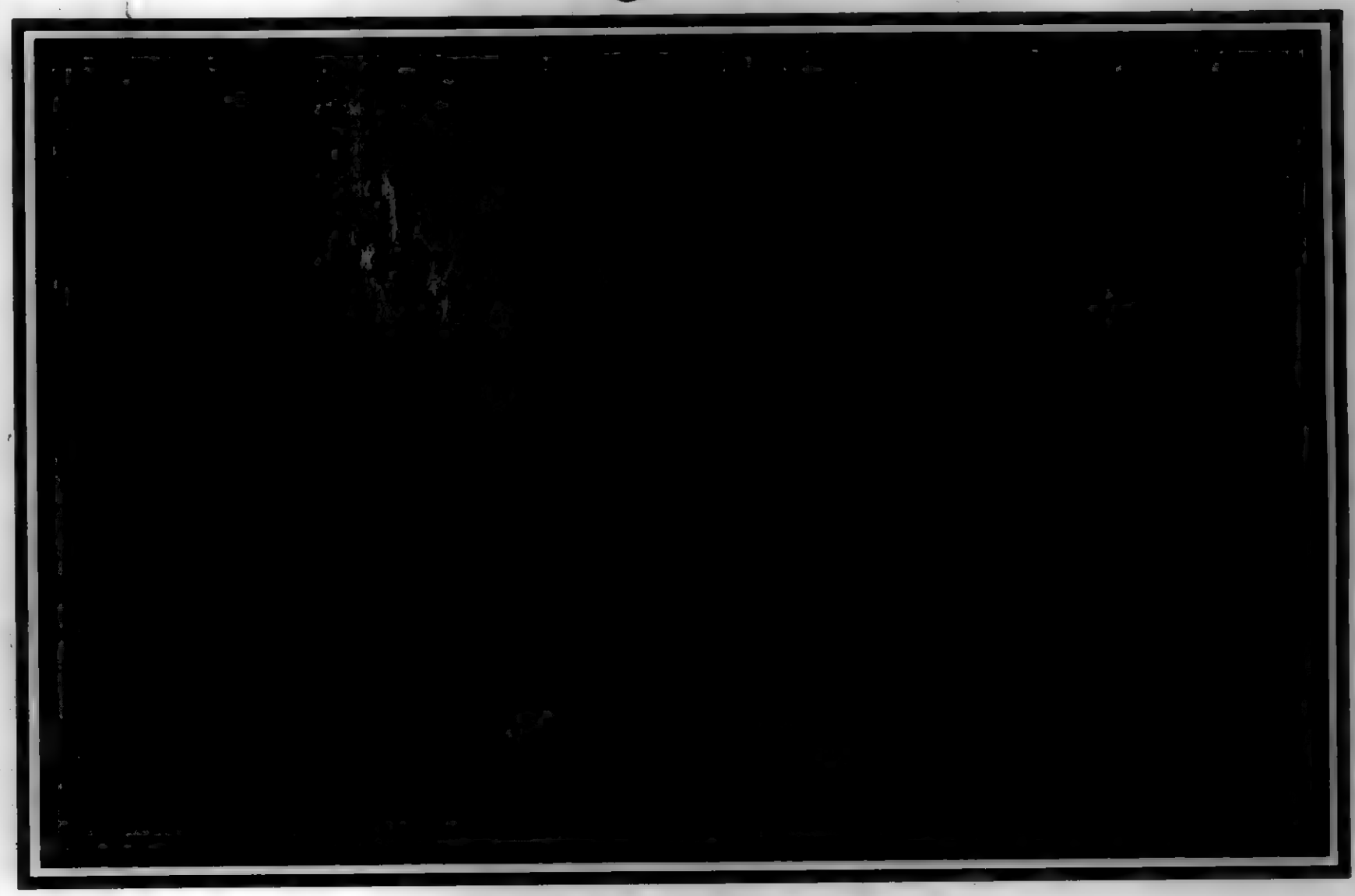

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that adapts to multiple environments.

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HEWLETT PACKARD

New tools debug client/server apps

By Melinda-Carol Ballou

Corporate developers of client/server applications are finding that testing distributed applications is dramatically more complicated than debugging host-based programs. This stems from the need to manage a much greater range of variables.

Developers at Norwest Mortgage, a national mortgage company in Des Moines, Iowa, and Delta Airlines in Atlanta recently overcame client/server testing woes by using tools that help streamline and automate the process. But challenges remain.

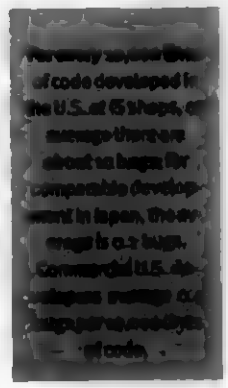
These include integrating a multiplicity of hardware architectures and applications and working around unstable desktop environments that do not offer support for multitasking, such as Windows and Novell, Inc.'s NetWare.

At Norwest Mortgage, senior quality analyst Joan Woodward spearheaded testing for a client/server mortgage processing application that was brought up last week on some 400-plus Windows-based desktops. The task was made easier by testing tools from Software Quality Automation, Inc. (SQA) in Woburn, Mass.

With the SQA tools, which use Microsoft Corp.'s Visual Basic as a scripting language, Woodward's team was able to create the appropriate tests in a 10-day period and run regression tests daily for the next 15 days. "Before, it would take us 10 days to perform one test manually. With the tools, we can stack the tests and run them in batch at night," she said.

Bill Elder, project manager at Delta, chose the SQA tools to handle object-based graphical user interface (GUI) development and testing for a client/server reservation system that will go out to 30 test users later this month.

"We wanted to come up with a test plan and reuse it," he said.



Among the factors that make client/server development so complex and applications so difficult to test are the management of GUIs and the integration of a range of applications across a range of platforms, databases and networking protocols, Elder said.

Test suites in conventional mainframe programming environments are more predictable and deterministic, while in client/server environments, multiple variables interact with one another.

"Regression testing with client/server is particularly important because everything interoperates with everything else, as opposed to mainframe environments, where it will be less likely that a change made in one place will necessarily affect other areas," said Phil York, a vice president at systems integrator SHL Systemhouse, Inc. in Chicago. SHL Systemhouse has an alliance with Softbridge, Inc. and uses its Automated Test Facility.

But one area these sorts of testing tools cannot address is the challenge of bringing together multilayered architectures with multiple applications.

"Our joke is that if you're going to have 20 different products inside one little box, it's highly improbable that anyone has used that exact combination of products before," York said. "How do you know whether it will work? You don't. You write to the APIs and hope."

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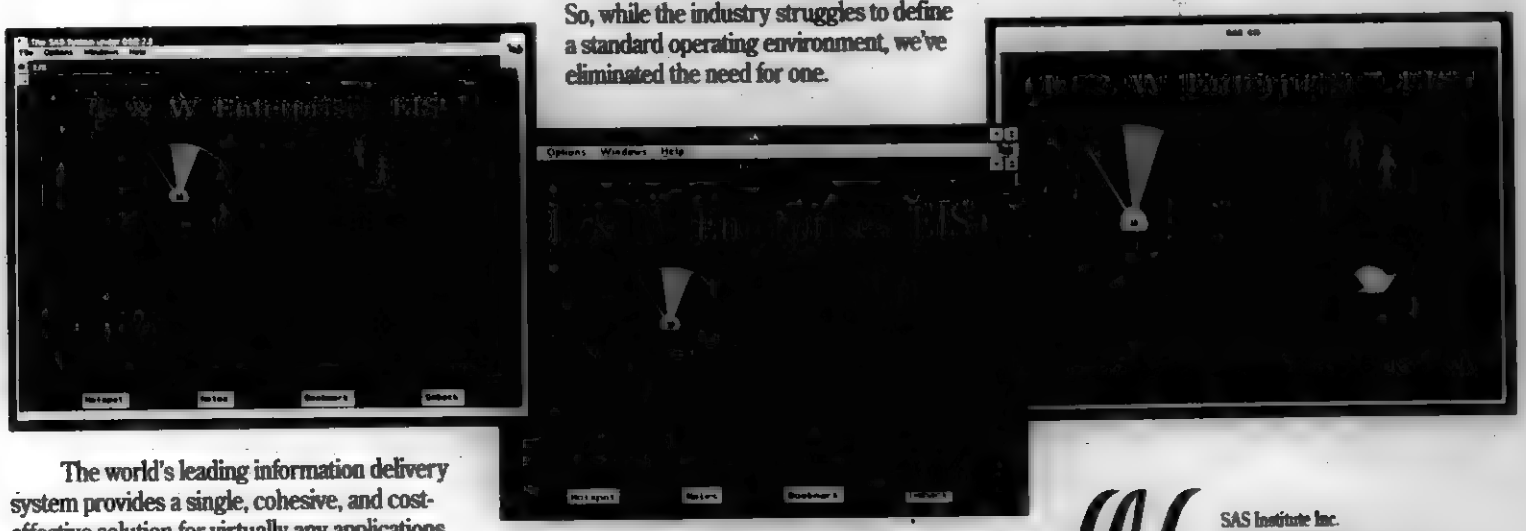

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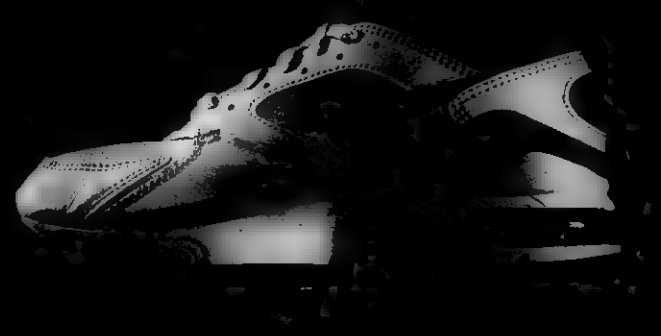

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Cross-regional ATM service debuts

By Joanie M. Wexler
SAN JOSE, CALIF.

The first carrier to offer Asynchronous Transfer Mode (ATM) network services stepped up to the plate last week when MFS Datanet, Inc. revealed it already has a 14-city ATM network up and running.

The move means that neophyte ATM has taken a key first step toward preventing the lack of interconnection among far-flung network "islands" that has previously derailed promising wide-area technologies such as Integrated Services Digital Network.

Ken Holcomb, vice president of MFS Datanet, estimated that local-area network interconnect services via the T3 (45M bit/sec.)-speed ATM network would average one-eighth to one-sixth the cost of ordering high-speed lines from local and long-distance carriers and investing in equipment that can handle T3.

The pricing that Holcomb outlined for the ATM service was $8,000 per connected site per month for 45M bit/sec. links within a metropolitan area. For users interconnecting between metropolitan areas, pricing depends on individual customer variables, he said.

"We see a lot of opportunity for ATM in the wide area," said Rosemary Cochran, a principal at Vertical Systems Group, a consultancy in Dedham, Mass., "but timing is an issue." At the moment, there are few local ATM networks needing to link across the wide area, she said.

However, pioneering companies with high-bandwidth applications can reap the benefits of MFS Datanet's wide-area ATM service.

Such bleeding-edge firms include Bear, Stearns & Co. in New York, which is already running some wide-area ATM over its own private Synchronous Optical Network metropolitan-area data highway to interconnect clusters of local ATM networks, said Jeff Marshall, senior managing director of communications technology.

The brokerage firm is ready to take advantage of the ATM service now, Marshall said. "We want to get our applications to operate seamlessly around the globe the way they do in the campus," he said. "Carriers such as MCI and BT may have a global presence, but we're starting with MFS because they have been a leader in getting things done."

Government users are also ramping up. The U.S. Environmental Protection Agency, for example, said that any new LAN wiring at the EPA will take advantage of ATM when it comes along, largely to serve desktop video applications.

The only application service MFS Datanet is providing to date is the High-speed LAN Interconnect (HLI) it has been offering since last fall [CW, Oct. 12, 1992]. ATM is not usually touted for its strengths in data-only applications because it is optimized as a compromise for mixing voice, video and data.

But MFS Datanet's advantage in supporting HLI is that "it gives customers native-speed connectivity for Ethernet or Token Ring without them having to pay expensive fees to the interexchange carrier for T3 lines," Holcomb said.

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We offer hundreds of brand-name hardware, software and peripheral options — everything from Hayes® modems to Lexmark® printers. To make sure that every possibility is open to you.

All AMBRA computers carry a 30-day, money-back guarantee.[1,2] They're backed by quick onsite service and round-the-clock support — the kind of service and support that never lets you down.

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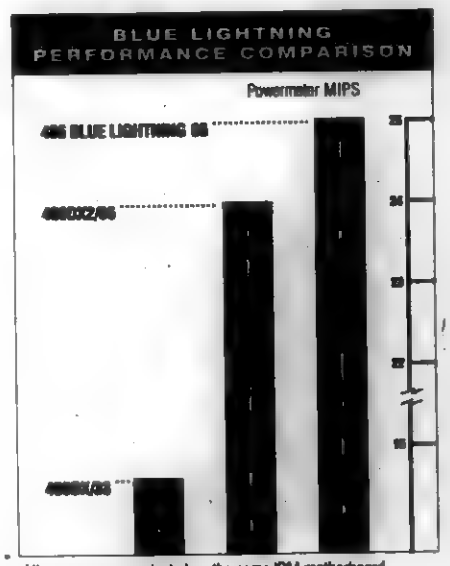
"BLUE LIGHTNING: AN ELECTRIFYING AMBRA ADVANTAGE."

IBM's 486 Blue Lightning processor builds on the best features of Intel microprocessors, including performance, instruction set and upgradeability. IBM optimized the instruction set, added a 16KB internal cache, lowered power consumption and improved power management. The result: Blue Lightning doubles internal clocking to 66 MHz, while maintaining full 486 compatibility. AMBRA harnesses the power of Blue Lightning to deliver 66 MHz system performance at 33 MHz prices.



All processors were tested on the same IBM motherboard.
MIPS = millions of instructions per second.

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AMBRA will custom-configure any and every computer for you — and it won't cost you an extra day or an extra dime! You have your choice of chassis, processors and a full range of memory sizes. Hard and floppy disks, tape drives, CD-ROM drives, multimedia kits, and more. Plus high-quality, low-radiation AMBRA monitors, network cards, you name it. You get it all preinstalled, from a single source.

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We automatically preload AMBRA computers with MS-DOS® 6.0 and Windows™ 3.1. Purchase any of our large collection of software, and we'll preload it for you at no additional installation charge.

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We've contracted with IBM to back each AMBRA with a one-year onsite warranty.[1] So you can count on 10,000 technicians at 190 locations nationwide to deliver service within two days of your call, Monday through Saturday. Plus, you get toll-free technical support — 24 hours a day, seven days a week.

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1 - 8 0 0 -

66 MHz performance at 33 MHz prices.

With Blue Lightning AMBRA models, you reap the benefits of 66 MHz system performance — at 33 MHz prices.

	AMBRA	GATEWAY	DELL
Model	486 Blue Lightning 66	486DX-33V	433/L
Internal clock	66 MHz	33 MHz	33 MHz
External clock	33 MHz	33 MHz	33 MHz
System case	Desktop	Desktop	Desktop
RAM	8MB	8MB	8MB
Cache	256KB	128KB	—
Floppy	One	One	One
Hard disk	340MB	340MB	340MB
Onboard SCSI	✔	—	—
Local bus	✔VESA	✔VESA	✔
Video	Win accel w/1MB	Win accel w/1MB	Win accel w/512KB
Color monitor	15" FST*	15" FST	15" FST
Pentium-ready	✔	✔	✔
DOS 6.0, Windows 3.1, mouse	✔	✔MS Works for Windows	✔
Network-ready	Ethernet (10BaseT)	—	—
Tech support	24 hours, 7 days/week from [redacted]	Mon-Fri, 6 am to midnight Sat, 9am-4pm	24 hours, 7 days/week
Warranty/Service	1 year [redacted] onsite	1 year onsite	1 year onsite
Price	$2,879	$2,025	$2,699

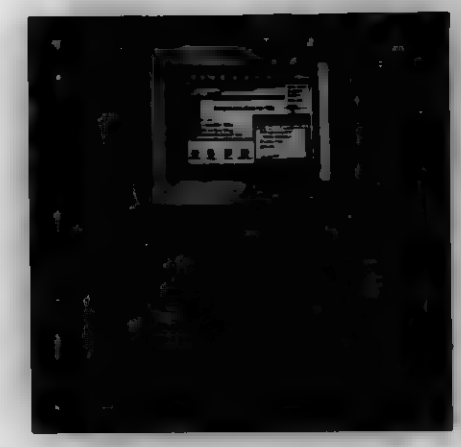
*Upgraded from 14" SVGA at no extra cost. See special offer.

Intel® Pentium, within your reach.

AMBRA is one of the few who can offer you Pentium today — and we offer it at a price you can afford.

	AMBRA	DELL
Processor	Intel Pentium 60 MHz	Intel Pentium 60 MHz
	64-bit proc complex	64-bit proc complex
Bus type	EISA	EISA
System case	Desktop	Tower
RAM	8MB	8MB
Cache	256KB	256KB
Floppy	One	Two
Hard disk	540MB SCSI	500MB IDE
Onboard SCSI	✔Dual 32-bit	—
Local bus	✔VESA	✔
Video	ATI™ Ultra Pro w/2MB DRAM	Win accel w/512KB
Color monitor	15" FST*	15" FST
DOS 6.0, Windows 3.1, mouse	✔	✔
Tech support	24 hours, 7 days/week from [redacted]	24 hours, 7 days/week
Warranty/Service	1 year [redacted] onsite	1 year onsite
Price	$4,299	$7,566

*Upgraded from 14" SVGA at no extra cost. See special offer.



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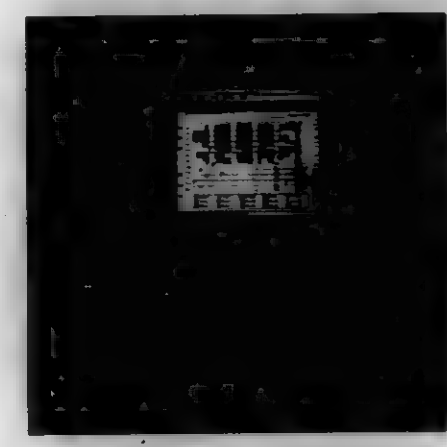
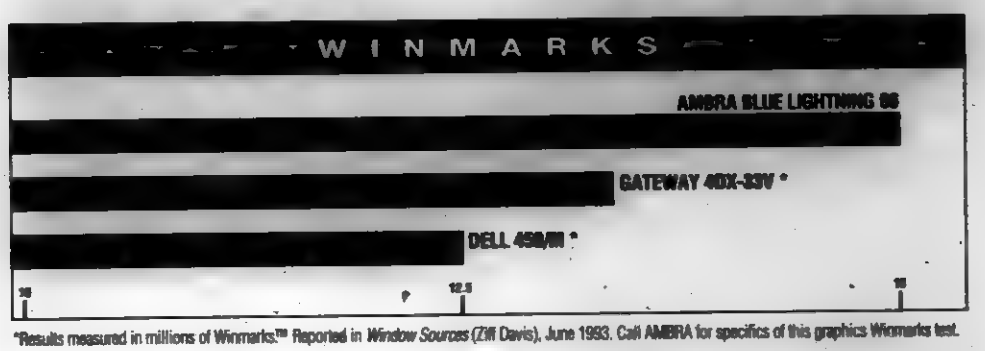
Competitive prices shouldn't mean mediocre machines. Example: AMBRA's low-cost Model S425SX. It puts you in touch with tomorrow's innovations. That's because it's Pentium-ready — and supports memory upgrades to 36MB. It features the upgradeable 486SX 25 MHz processor, cache to spare, a fast local bus, and Windows accelerator with 1MB video memory.



Extra compact design. Extra color.

At 6.4 pounds, our 486SX 25 MHz SL-enhanced notebook packs a lot of performance. You get 4MB of expandable memory; a 120MB hard disk; STN dual-scan, passive-matrix screen for vibrant color and easy mouse tracking; plus integrated fax/modem and built-in trackball. All for $2,449.



*Results measured in millions of Winmarks.™ Reported in *Window Sources* (Ziff Davis), June 1993. Call AMBRA for specifics of this graphics Winmarks test.

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- 64KB processor cache
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- Windows accelerator with 1MB video memory
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- Slimline case
- 3 16-bit ISA slots
- MS-DOS 6.0, Windows, mouse

$1,199

Model S425SX

- 486SX, 25 MHz
- Intel Pentium-ready
- 4MB RAM max 36MB
- 128KB processor cache
- 3.5" floppy
- 170MB (17ms) hard disk
- 2 VESA local bus slots
- Windows accelerator with 1MB video memory
- 14" SVGA LR color monitor
- Slimline case
- 3 16-bit ISA slots
- MS-DOS 6.0, Windows, mouse

$1,339

Model S433DX

- 486DX, 33 MHz
- Intel Pentium-ready
- 4MB RAM max 36MB
- 128KB processor cache
- 3.5" floppy
- 240MB (15ms) hard disk
- 2 VESA local bus slots
- Windows accelerator with 1MB video memory
- 14" SVGA LR color monitor
- Slimline case
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$1,689

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- Windows accelerator with 1MB video memory
- CD-ROM drive and software
- Media Vision 16-bit sound card
- Stereo speakers
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- Network-ready (Ethernet 10BaseT)
- Desktop case
- 5 16-bit ISA slots
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$2,869
(For minitower, add $50)

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- Onboard SCSI
- 2 VESA local bus slots
- Windows accelerator with 1MB video memory
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- Network-ready (Ethernet 10BaseT)
- Desktop case
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- Intel Pentium-ready
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- 2 VESA local bus slots
- Windows accelerator with 1MB video memory
- CD-ROM drive
- ★ 15" Flat Square LR color monitor, NI
- Network-ready (Ethernet 10BaseT)
- Desktop case
- 5 16-bit ISA slots
- MS-DOS 6.0, Windows, mouse

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Model D466E/VL

- 486DX2, 66 MHz
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- 256KB processor cache
- 3.5" floppy
- 440MB IDE hard disk
- 2 VESA local bus slots
- S3 video accelerator with 1MB DRAM
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- Desktop case
- 7 32-bit available EISA slots
- MS-DOS 6.0, Windows, mouse

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Pentium Powerhouse!

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- 64-bit processor complex
- VESA local bus with 1 available slot
- 8MB RAM max 64MB
- 256KB processor cache
- 3.5" floppy
- 540MB SCSI hard disk
- Onboard dual 32-bit Fast SCSI
- ATI Ultra Pro Mach 32, 2MB DRAM
- ★ 15" Flat Square LR color monitor, NI
- Desktop case
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Tech Talk

Voice recognition

Last week, Macintosh developer Articulate Systems, Inc. and Voice Processing Corp., a maker of voice-recognition systems, announced plans for the first over-the-phone speech recognition system for the Apple Computer, Inc. platform. The two will develop desktop applications for Apple's new digital signal processor-based Centris 660AV and Quadra 840AV Macintosh models.

Products resulting from the alliance, which will ship under Articulate's PowerSecretary brand name, could begin shipping by year's end. The partners will also offer Apple developers a telephony speech recognition tool kit suitable for phone-to-phone applications.

Blue light special

IBM recently used a solid-state, blue-light laser in an optical recording system that was able to read and write data at a record 2.5 billion bits (gigabits) per square inch. Higher-frequency blue light can be focused into a smaller spot on an optical disc than current infrared light systems.

At the new recording density, a 5½-inch optical disc could hold 6.5G bytes, a density five times higher than today's best rewritable optical discs. IBM's experimental system takes infrared light output from a gallium-aluminum-arsenide diode laser and passes it through a frequency-doubling device. Company scientists said they hoped to have a commercial version of the technology in four to five years.

Record quiet

IBM has applied for a *Guiness Book of World Records* citation for creating what it calls the quietest place on earth. The echoless testing room at IBM's Boca Raton, Fla., facility eliminates 99.99% of noise, the company said. The room is lined with sound-absorbing fiberglass wedges and sits on its own foundations to prevent vibrations. The 1992 edition of the book lists a "dead room" at a Bell Telephone System laboratory in Murray Hill, N.J., as the quietest.

Secret agents of software

MIT hopes apprentice agent technology will increase productivity

By Michael Vizard

While users today enjoy the benefits of the many tasks that supposedly have been automated by software, the reality is that these applications are still rife with the same repetitive processes as the old paper-based system.

As such, the electronic format certainly makes it easier to file and merge information, but it does precious little to automate the drudgery of performing the tasks that consume the average worker's day.

The folks at the MIT Media Laboratory have been giving this situation a great deal of thought lately and have some progress to report.

Funded by Apple Computer, Inc. and the National Science Foundation, MIT has been developing agent technology that can essentially learn how a person tends to use his software. The agent software monitors a user's behavior pattern and, using previous activities as a model, guesses the response the user would make under a set of circumstances.

MIT agents use icons *to tell users when they need more information or if they have a suggestion for automating a particular task*

ALAN BLOUNT

MIT's Pattie Maes: *'End users won't deal with conflict among rules'*

For example, if the agent software detects that every Monday morning a user downloads a specific set of database files into a spreadsheet, it will automatically download those files into a spreadsheet every Monday. Or the agent may detect that the user never refuses an electronic-mail borne request for a meeting from "Johns, P." Using this knowledge, the agent will automatically respond in the affirmative to any meeting request from this person; if the agent has learned the user does not accept meetings on Monday mornings, it will deny all conflicting requests.

Prototype ready

Led by MIT Associate Professor Pattie Maes, developers at the lab have created a prototype of their agent technology written in LISP that runs on top of the Eudora E-mail system for the Macintosh. The next step for the researchers is to convert their program into C language code that can be attached more readily to existing commercial programs. This work is scheduled to be completed by year's end.

According to Maes, building flexibility into the agents was a critical goal. The agents develop different confidence levels for each task as they monitor a user's activities. Users can set thresholds that specify if the agent should notify them of a particular action before it is taken or simply go ahead and perform the function.

In this way, agents are capable of learning, she said. In fact, the agents can learn from imitating examples drawn from memory, responding to user feedback or by being programmed by a series of examples created by the user.

Maes said end users may begin seeing a new generation of agent technology in late 1994.

"We wanted to make sure it would be easy to teach agents, as opposed to having a set of abstract rules. End users won't deal with conflicts among rules or maintain rules," Maes said.

The MIT approach differs from traditional artificial intelligence programs, which try to infer the user's ultimate goal by using rules with preprogrammed knowledge — an approach that requires large amounts of memory.

Maes said she can create agents that will only take up about 30K bytes of memory.

They're her

My department's editorial retreat last week featured a CIO roundtable discussion during which the conversation turned to the burgeoning wave of personal digital assistants, or PDAs, about to crash ashore.

About a year earlier at a computer industry conference, Apple's John Sculley talked about the eventual arrival of Newton, the most-awaited PDA. What he said was pretty remarkable to me: He didn't know what Newton would be or, for that matter, how it would be widely used. That was prophetic if nothing else.

One of the CIOs at our retreat said the last thing he wants is another digital wonder to hang off his trousers, cram into his vest pocket or stuff into his overstuffed briefcase, particularly when it's unclear what the device will do. A much better idea, he said, would be to build such a device into a briefcase, just like a lock. Just like a full-function calculator. Just as cheap.

Back to Sculley's conundrum of just what these things will do for you. They will recognize handwriting. But whose? If it can recognize my longhand, then it's smarter than I am because I can't recognize my writing half the time. It might recognize my printing. Now that's efficient. It will also provide me with a nice appointment calendar. All this for only $700.

This is not a column about Sculley, Newton or PDAs. It's about a throw-it-against-the-wall-and-see-what-sticks approach to new technology that doesn't do flip to help IS solve problems. You can pick out other technologies that ride into the marketplace with this approach and find they suffer from the same debilitating illness of being technology in search of a market.

Such homeless technologies wouldn't be a problem if they could be ignored. Unfortunately, they can't be. Part of the problem rests with the media, of which we are a part, that too often fails to ask the right questions when some starry, new-wave product rolls out.

Also, it is difficult to ignore the pleadings of end users, who can easily become enamored of technology for its own sake. And as we pointed out in our story on "shadow IS" spending, user departments are finding ways to spend money outside the purview of IS [CW, July 26]. That would be fine, too, if end users didn't eventually seek the help of IS when managing the things they've acquired independently. But the fact is that a lot of technology bought independently by end-user departments, such as incompatible LANs, has come to roost in the IS department.

The heartening news is that most of these throw-it-against-the-wall technologies eventually succumb beneath the weight of their own press releases. While that's bad for our forests, it does at least provide a costly lesson to technology providers that refuse to view the world through the eyes of people who really don't want any more junk hanging off their pants.

Bill Laberis

Bill Laberis, *Editor in chief*

Customer (dis)service

Esther Dyson's column "Just-in-time training" [CW, July 19] tells how computers can assist us in the depersonalization of everybody. Make each customer or prospect a profit center and let the computer assign a profitability number to each. If the number is too low, the customer is worthless.

This is not only callous, it is a stupid business plan. How can companies profitably grow just by selling more to the people who are already their best customers?

Dyson should realize that abandoning a customer is a rejection of opportunity. Listen to the customers who nobody wants, find the opportunity to satisfy them and reengineer your firm to do it efficiently. If you can do this, you will be good enough to also win your competitors' most prized customers.

I do not like to do business with anyone who lets his computer decide if he should care about me, and those who assign this role to a system assault my dignity and their own.

Al Christians
Lake Oswego, Ore.

Mail shortage

"Users narrow E-mail product lineup" [CW, July 19] on corporate electronic-mail gateways was interesting, but what happened to any mention of the use of public services such as AT&T Mail, MCI Mail and CompuServe? Companies with many sites would do well to consider these alternatives.

Also, it appears to me that Creative Network Strategies' cost comparison for a two-page fax in the accompanying chart is way out of line. If its $9.74 per fax is for real, and you have a PC with a modem, for the same price you could send that fax on CompuServe and get a free membership, even if you sent only one fax per month!

David W. Stover
Pasadena, Calif.

Dealing with disaster

"No one could have predicted a river would swallow our Des Moines building," said an MIS manager in "Data dowsed in Midwest floods" [CW, July 19].

Not so! This is exactly what experienced risk managers do. For example, it is essential to check the site plan of a building near a river to determine if the building's basement is above the "50-year" flood plan elevation.

A CIO would not dream of using a risk manager to integrate a new Unix environment. Why would he depend on an MIS manager to evaluate this?

Robert V. Jacobson
New York, N.Y.

What's 'standard'?

I would like to add my endorsement to the statements outlined in David B. Ciolkowski's article "Cutting through the hype" [CW, July 26]. The concept of more stringent standards for PC manufacturers, or simple adherence to accepted standards, would simplify the lives of IS management immensely. The checkered success record of implementation for the variety of industry-standard machines continues to wreak havoc with large-scale PC implementations.

Frequently, it is the price aspect of price/performance that dictates the purchasing decision, without sufficient regard to the performance end of the equation. Too often either a very competitively priced machine is physically incapable of providing the horsepower to run applications or the support of such a mainframe is an over-involved task at best.

In too many cases, one is faced with continual assaults on the budget to justify equipment that will undoubtedly prove its worth in the long run, but the issues are often reduced to the bottom line. Perhaps it is time to bring the manufacturers on a shorter leash or, more appropriately, develop a purer definition of precisely what is meant by "industry standard."

John Harding
Marietta, Ga.

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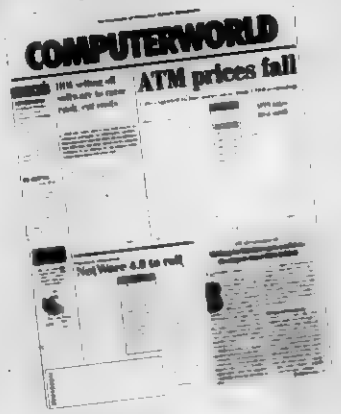

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   22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data/Tele Comm. Network Sys. Mgt.; LAN Mgr.; PC Mgr.
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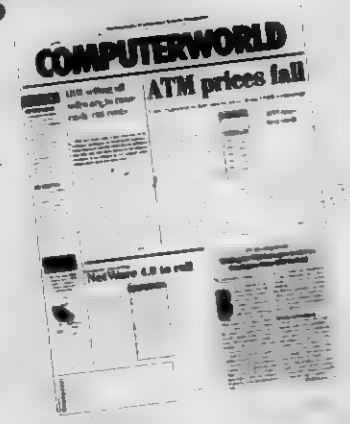

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   65. Communications Systems/Public Utilities/Transportation
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Help upgrade the U.S. educational system

Gary J. Beach

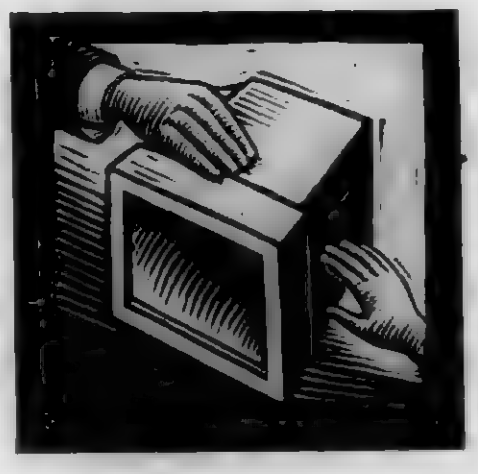
Emerson once said, "The challenge ahead of us is never as great as the power behind us." I want to talk about a very big challenge that we have the power to meet collectively — integrating computer technology into the fabric of the U.S. educational system.

You'll see a full-page notice about the launching of The Computers For Classrooms Foundation on page 92 of this issue. This is not a foundation in the traditional sense. It is a "virtual foundation," a concept around which we hope many people, as individuals, will rally.

There are no meetings, no dues, no committee reports. To join this organization, all you have to do is take an action to accelerate the introduction of information technology into U.S. classrooms.

Walk around your local school when it opens next month. If it's like the one in my community, it will have a computer room where students go a few times a week to learn "computer."

U.S. schools have to stop teaching "computer," in the same way they teach music — as a separate subject — and start integrating the computer into the whole learning process. Why? Because the sheer quantity of information available for learning today demands a technology-based solution. And because realities of all kinds are now changing so quickly that textbooks are outdated even before they reach the classroom.



Schools can't educate the way they should without our help. They don't have the budgets to purchase what they need, and vendors aren't inclined to give it to them. But chances are that you have good-quality used machines and unopened copies of software occupying space in a storage closet somewhere.

Computerworld recently conducted an analysis of its computer inventory and discovered that for every 55 employees, there was one computer available to donate. If your company has 1,000 employees, chances are it has 18 computers that it could donate to a school.

Even if you don't have equipment or software, you have another sorely needed resource — your own hard-won professional knowledge. It took those of us in the field 13 years to figure out that, by itself, putting computers on desks accomplishes nothing. Productivity only emerges when work is re-engineered to take maximum advantage of computer resources. That's knowledge that could save educators a lot of missteps.

Pick up the phone and ask your local school officials what's needed. Ask if they have a game plan for blending technology into their learning regimen; if they need help selecting the right products or getting those products; or if they need someone to do teacher training.

Become part of the solution. Join our virtual foundation and help wire our country's classrooms to the larger world of information. When you do, send me a note and let me know what you've accomplished. I'll fill you in on how we're working with Congress to put phone jacks into classrooms as well as with vendors to make software donation easier through co-licensing.

Beach is publisher of *Computerworld*. You can reach him on MCI mail at 507-7872 or by writing to him at our editorial office address on the masthead at left.

The secret shame of client/server development

ADVENTURES IN INFORMATION *by* Patricia B. Seybold

Three years ago, Mitch Kapor stood up at Esther Dyson's conference and spoke about the "secret shame" of the PC industry: PCs were too hard to use, and none of us was willing to admit it. Mitch was right. We were all participating in a shameful scam — pretending that computers were easy to use when most of us knew differently from personal experience.

Now there's another scam in progress. People are stampeding toward client/server application development because they are being told it's easy, and that's just not true.

No matter what application development tools you choose, it's *extremely* difficult to design a high-performance client/server application. It's worse than a black art. As one frustrated customer put it, "We've done about 12 projects now, some in-house and some contracted out. Less than half were successful, and we don't even know why some work and some don't."

The most popular way to implement client/server applications is to split the functionality right down the middle. You put the user interface and the application on the PC, and you store the data on a database server. When the user's program requests information, the PC program spits SQL requests to the database server, and the server returns the requested information. A piece of cake, right? Well, not exactly.

The problem is this model only works well for very small result sets. When the database server must return larger amounts of information, the network bogs down and so does the server's ability to service other requests.

What makes things even trickier is that it's extremely difficult to predict the size of a result set. Any assumptions you make about how much information people will need or want are likely to be wrong, particularly if users are in the throes of their first exposure to the seductive lure of point-and-click graphical access tools.

Having encountered this dilemma a few times, developers are getting smarter. Now they're restricting end-user access to a set of canned SQL queries. They're using triggers to do more processing on the back end and to deliver result sets to end users in conveniently sized batches (convenient for LAN traffic control, that is).

These are reasonable tactics given the limitations of current products, but they aren't a solution. Limited access is not what most businesspeople want. Users want, and should have, the ability to grovel around in the database doing what-if scenarios, updating records and adding fields and relationships at will.

We need better and more transparent tools for client/server application development. This means tools that do the following:

- Don't presume a simplistic split between client GUI application logic and back-end database services.
- Take into account trade-offs that must be made for different network topologies and bandwidths.
- Optimize performance by sliding the processing logic from the client to the server, depending on the type of request and the traffic.
- Will accommodate more sophisticated aspects of distributed computing, such as remote procedure calls and object messaging, without requiring developers to stand on their heads and twiddle their toes.

In the meantime, don't ever be ashamed to admit that it's very hard to develop client/server applications. Anyone who's honest will tell you you're right.

Seybold is president of the Patricia Seybold Group, a research, consulting and publishing firm in Boston that specializes in distributed computing for networked organizations. Her Notes address is Patricia Seybold @ PSOCG. Her Internet address is PSeybold @ MCImail.com.

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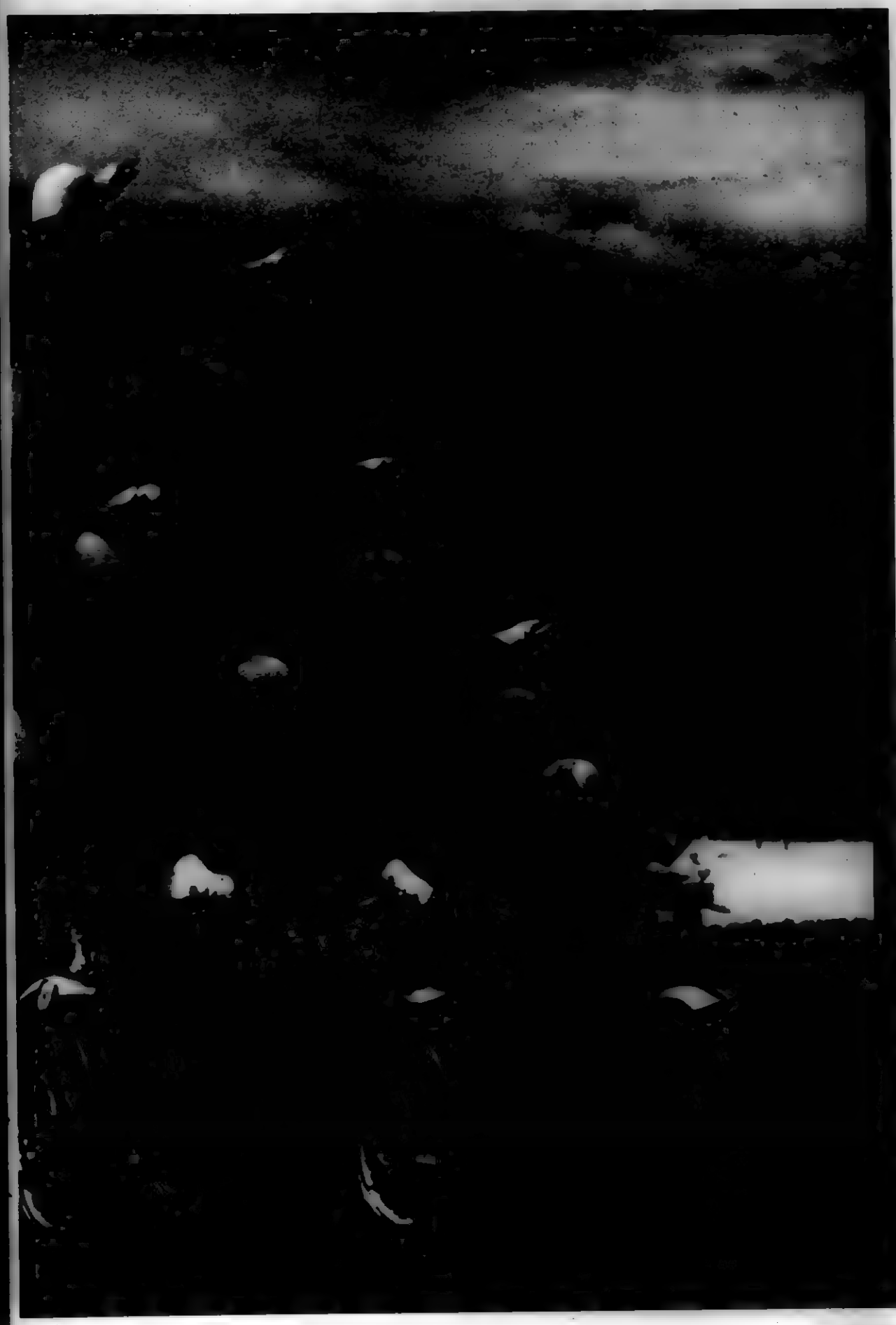

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Charles Babcock

LAN-locked

If it's difficult to manage a LAN right under your nose, what are you going to say when the boss calls demanding to know why his remote access device isn't connecting over the spread-spectrum radio frequency? Mobile workers are extending the corporate network, and all the problems of managing the network are going to be extended along with them.

It's not just the boss, either. More employees are spending time outside the office. Whether visiting customers, scouting the competition or merely camping out in someone else's office, they will continue to need a virtual link to their home office.

The form that link should take is being debated in IS shops today. Should mobile workers run a machine at the home office by remote control, or should they become nodes on an extended network, with all the services of a home user?

Until recently, the latter was not a realistic possibility. Laptops were an atomized extension of corporate information systems, carrying data and providing a modem link to home base, but the link was tenuous. Laptops functioned best as stand-alone machines, a weight added to the backpacks of corporate voyagers.

As the number of laptops exploded during the last three years, however, users began to agitate for the ability to use them as remote nodes — computers on the network rather than dumb terminals. Recent software additions have made that possible over a phone hookup for specific functions, such as CC:Mail Remote from Lotus or RemoteWare from Xcellenet.

Wireless communications, however, still have a long way to go because cellular phone services provide transmissions of uneven quality. The protocols of mobile radio-based systems do not match those of corporate nets without heavy customization. And satellite-based feeds, which can be launched from anywhere, are expensive compared with land-based means.

Once attached to a phone line hookup, the laptops themselves have become more mobile in most other respects. I carry a 6-pound, 386-based Compudyne equipped with a fax modem that to me is speedy, easy to read and comfortable with a full keyboard. But it is also passe, according to those who are really into mobile computing.

Four-pound subnotebooks with active-matrix color are now available, and regular notebooks come with credit-card-size plug-in fax modems, LAN adapters, hard drives and extra memory.

No matter how tiny the peripherals, however, the Achilles' heel of mobile computing remains the lack of support in the LAN operating system. IS managers should take a look at what their needs are going to be and advise LAN vendors of their mobile priorities. The following are a few suggestions you might want to put on your lists:

- LANs should be able to recognize a remote node user and provide remote node services, but most can't.
- A LAN should try to prevent accidental cancellation of a call due to noise on the long-distance connection.
- LANs should minimize the amount of time that a mobile worker needs to be connected, reducing the phone bill.
- LANs should offer minimal data synchronization services for mobile workers. Lotus' Notes is one of the few ways to get synchronization, but the service is needed on more than an application-by-application basis.
- LANs should provide virtual connectivity, which allows the mobile worker to prepare to send E-mail and faxes or print out files as if at the home office but store them in a buffer until the worker reconnects. Novell's Personal NetWare will provide several of these features, but no one has yet provided all of them.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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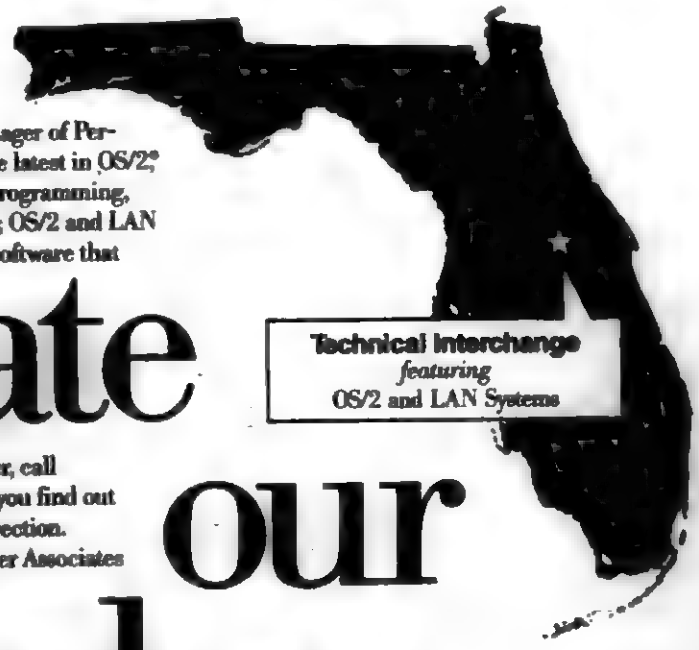

by Jim Cannavino, IBM Sr. VP and General Manager of Personal Systems; interactive elective sessions on the latest in OS/2,® LAN Systems, 32-bit graphics, object-oriented programming, multimedia, pen, database and communications; OS/2 and LAN labs; and an exhibit area with demos of vendor software that exploits PSP products. There will be special bonuses, product raffles and an active schedule that even includes a "special event."

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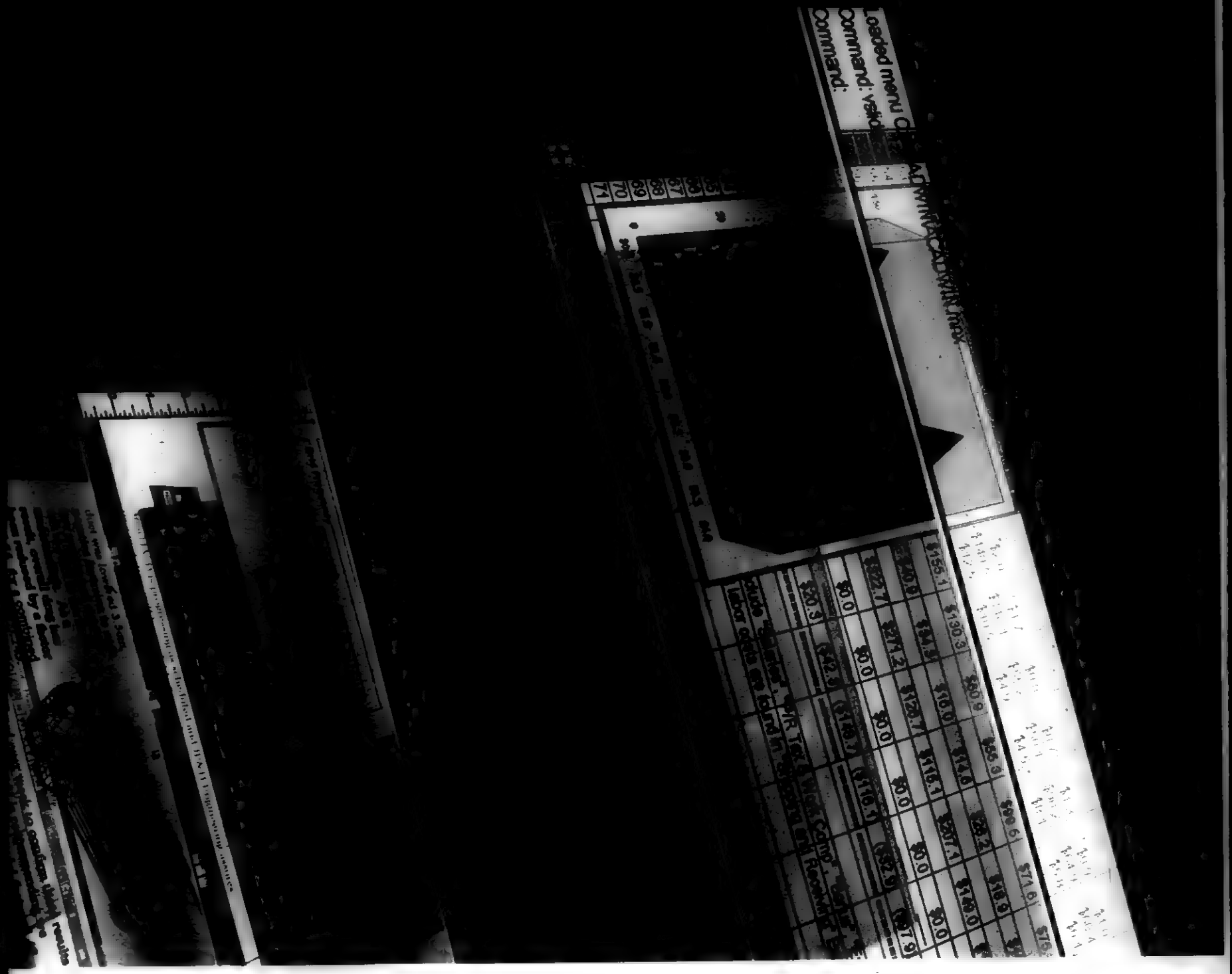

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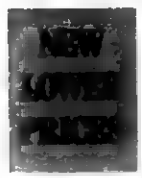

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Desktop Computing

New look for Microsoft Office, 44
Lotus does Windows right, 46

The wait goes on for color notebook buyers

By Michael Fitzgerald

Users interested in moving to color notebooks are experiencing deja vu: As with the desktop last year, demand has vanquished supply.

An angry Louis Kahn, chief network administrator at the Centers for Disease Control's National Immunization Program, said even though he wants only five LITE Lite 425Cs from his vendor, Compaq Computer Corp., and has a contract that guaranteed delivery of the products earlier this month, he has no idea when he will actually get the machines.

"They're blaming Sharp saying they can't get the screens," Kahn said. He added that Compaq has told him his machines are stuck in a 10,000 unit backlog that has no end in sight.

Analysts say users like Kahn are caught in a vise of component shortages and unexpected demand, and the problem extends across notebook vendors.

"Color demand has ramped up phenomenally — we threw out our initial forecasts for this year and have doubled them," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

Demand for color notebooks has created a backlog situation for several reasons: Only two vendors can ship the big 8.4-, 9.5- and 10.4-in. thin-film transistor (TFT) active-matrix color displays in volume — Sharp Corp. and Display Technologies, Inc. (DTI), the IBM/Toshiba Corp. joint venture. Of these two, DTI's supply is completely soaked up by IBM and Toshiba. NEC Corp. is expected to start a production line up, but not until early 1994. Also, more PC makers want to offer TFT color now, up from just a handful of vendors as recently as the middle of last year.

Caught off guard

The sharp rise in demand for TFT active-matrix color notebooks, spurred in part by IBM PC Co.'s aggressively priced ThinkPad product line, has also caught component suppliers by surprise. Vendor sources, speaking anonymously, pointed to color separation filter dyes as the main component problem.

However, only three vendors in the world supply components. These suppliers have told Sharp and DTI they will be unable to catch up with demand until the end of the year. Plus, DTI and Sharp have limited capacity, and the exceedingly complex manufacturing process continues to have low TFT yields, which exacerbate the problem.

Analysts said demand for smaller TFT screens that are easier and more profitable to build has worsened the supply of bigger screens.

"Japan, for instance, has a ton of pachinko parlors [gaming rooms], and more and more of these are using small LCD panels, which are more profitable to produce," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

"If the best of breed, big panels were widely available, this market would really take off," Stephen added.

Supply is also uneven. New York Life Insurance Co., for instance, can get color Versas from NEC Technologies, Inc. because it is NEC's largest notebook customer in the U.S. New York Life has temporarily removed the IBM ThinkPad from its product listing, though.

"We can't get our hands on the IBM notebooks, though they're saying we might be able to get a decent amount next month," said Victor Mutnick, New York Life's vice president of corporate information systems.

Mutnick said he was almost glad to hear about widespread supply problems for active-matrix color notebooks. "Our users hold us responsible for not getting those systems in, so it's good to see that it's an industrywide problem."

IBM PC Co.'s *ThinkPad 350C*

Graphics packages en route

Software Publishing to release Harvard Graphics update

By Michael Vizard
SANTA CLARA, CALIF.

▶ After having lost its dominance in the presentation graphics arena during its migration from DOS to Windows, Software Publishing Corp. plans to launch this week what observers view as its first credible effort in the Windows market.

Harvard Graphics 2.0 for Windows rewards users of the company's DOS product who remained loyal while Software Publishing struggled to take advantage of the Windows environment.

"I was concerned, but now I feel much happier about them as a product and a company. The new release is light-years faster and more user-friendly," said Willie Reichenstein, PC application specialist at American Savings Bank in Irvine, Calif.

Willing to wait

Reichenstein said he remained faithful to Harvard Graphics, despite the presence of better presentation graphics packages for Windows from companies such as Microsoft Corp. and Lotus Development Corp., because the costs of converting applications and retraining users were prohibitive compared with the benefits to be gained.

He also noted that while Lotus has symbols that make it easier to use, Harvard Graphics handles data imported from Lotus 1-2-3 spreadsheets better.

In addition to being a more robust Windows implementation, Harvard Graphics 2.0 includes an Advisor feature that offers design tips, a Quick Look feature that provides previews of charts as they are being built and a customizable icon bar.

But Reichenstein said his favorite feature is the ability to display a presentation on 64 different computer systems across a network. This desktop conferencing ability comes with a Chalk tool that allows users to make annotations online. American Savings Bank will use this feature to allow users to conduct an electronic meeting between its Irvine and Stockton, Calif., offices.

"We tried using a videoconferencing application for this, but you have to turn the camera on the PC screen and the image gets fuzzy," Reichenstein said.

Pricing for Harvard Graphics, which will ship at the end of this month, is $395. Upgrade pricing is $89 through the end of this year.

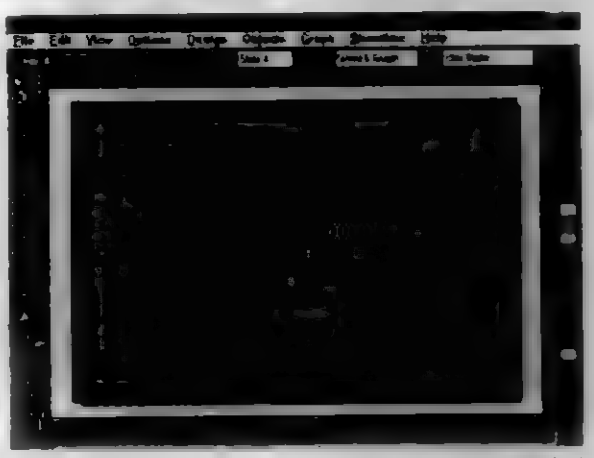
Alpha Software to enter Windows presentation graphics market

By Michael Vizard
BURLINGTON, MASS.

▶ After several months of manufacturing delays, Alpha Software Corp. is set to ship this month what is praised by one analyst as the most technically creative presentation graphics package available for Windows.

But whether Alpha Software has the marketing clout to support this package is very much in doubt, according to industry analysts.

Dubbed Bravo, the latest entry into the crowded presentation graphics market boasts a number of technical



Alpha Software's Bravo *allows users to import graphics that were created by other Bravo users*

achievements, including tight integration with spreadsheets and the ability to work with data from other presentations.

In addition, Alpha Software has chosen to aggressively price Bravo at $79, which is several hundred dollars less than competing packages from market leaders such as Microsoft Corp., Lotus Development Corp., WordPerfect Corp. and Software Publishing Corp. [CW, July 19].

"Technically, Bravo is a great product. The challenge for them will be marketing," said Jeffrey Henning, an industry analyst at BIS Strategic Decisions in Norwell, Mass.

To overcome this problem, Alpha Software intends to emphasize the technical merits of a low-cost Bravo package.

Alpha, *page 46*

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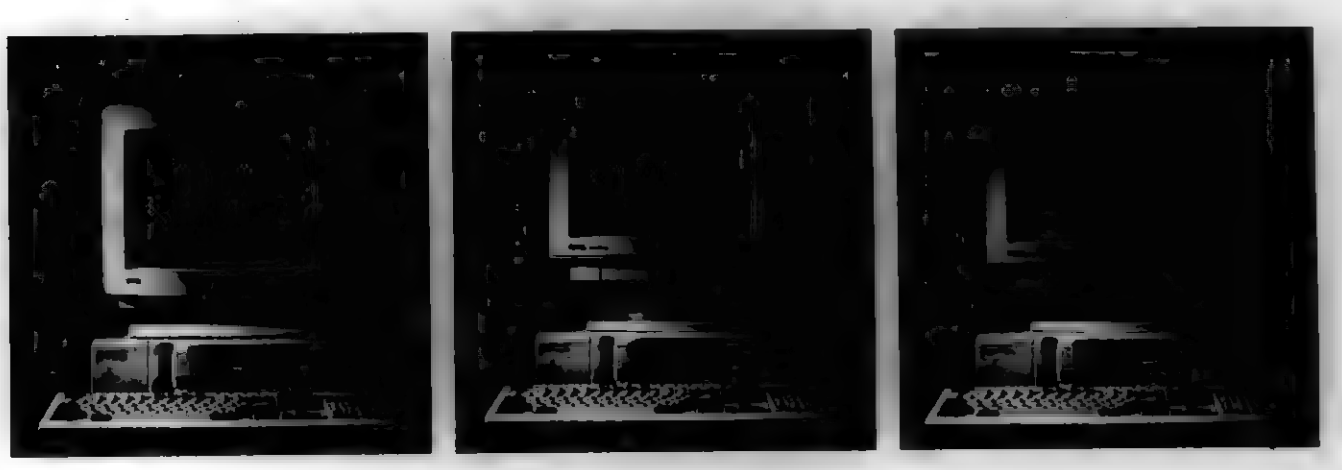

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†Survey was independently conducted by Reliability Ratings, Needham MA. The data is quoted from a 40-page report available for purchase through Reliability Ratings (617) 444-5755. Reliability Ratings, the research company, is not affiliated with Dell Computer Corporation and does not endorse its products. *Guarantees available in USA only for registered owners of Dell Performance Series systems purchased after 7/1/92. For a complete copy, please call our TechFax℠ line at 1-800-950-1329 or write Dell USA L.P., 9505 Arboretum Blvd., Austin TX 78759-7299. Attention Guarantees. **Source: Dataquest, Inc., Nov. 1992. *On-site service provided by BancTec Service Corporation. On-site service may not be available in certain remote areas. The Intel Inside logo is a registered trademark and i486 and Overdrive are trademarks of Intel Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1993 Dell Computer Corporation. All rights reserved.

Christopher Lindquist

NT users sound off

Windows NT is here!

OK, so it's not *really* here, but "Windows NT is going into production!" is too wordy. Of course, a sentence that accurately reflected just how long customers have been reading about Windows NT would go something like "Windows NT has finally, after several delays and a couple of years of ballyhoo, gone into the production phase where it will be transferred to CD-ROM and floppy disks, put in boxes with manuals and distributed to resellers and customers — in about three weeks."

Only Microsoft could create as much hype around a nonevent as this "release to production" will cause.

Say "NT" without the preceding "Windows" to a Microsoft person some day and watch his reaction. You'd think you were kicking his dog. Same thing happens if you say "DOS 6.0" instead of "MS-DOS 6.0." In that case, of course, you are kicking his dog.

Enough baseless pokes at Microsoft. I'll stop now. On to the pokes that have a base: the experience of users as shared on bulletin boards.

Long, long ago, NT was going to be a 32-bit version of Windows that everyone could use. Hardware requirements were going to be 8M bytes of memory on a 386DX machine. Anyone with such hardware could enjoy the benefits of working with a multitasking, multithreading, hard-to-kill version of Windows.

Now the word from Redmond is that the vast majority of people should stick with Windows 3.1 and wait for Chicago if they want a 32-bit operating system. Needless to say, this has some customers a bit perturbed.

Here's a sample from a San Francisco bulletin board service:

"I don't know if this is funny or sad. It seems that the faithful Windows users who want 32-bit processing are forever *waiting* for *something* from Microsoft! Many thought NT would be the answer and have been waiting and waiting for it. Now that the product is approaching shipping time and the positioning of the product is becoming more clear, those faithful users are suddenly being told that Win 4.0 is what they really want!"

That particular "faithful Windows user" is currently running OS/2.

And for those of you who are going to wait for what has been called Chicago, this bit from another board might be interesting:

"According to reliable sources, it appears that Chicago applications, while multitasked preemptively in relation to one another, will feature cooperative multitasking internally within the individual applications. That's right — no true multithreading; just some sort of cooperative kludge."

What does this mean for you? I'm sure Microsoft will have an answer by the time it releases Chicago to production.

I mentioned in a previous column that NT's architecture was death on devices that wanted to directly manipulate system hardware. One such piece of hardware: the "dongle" security devices that plug into a parallel port to prevent piracy.

However, it seems there is a workaround.

"What has to be done is that the software author has to register a .DLL under CONFIG.NT, and the .DLL tells NT that it can take care of these port addresses. Only then you can get the program running. If the manufacturer tells you what port addresses are being accessed, then you can write your own DLL to do this, but I suspect this is not what most end users want to do."

I suspect his suspicion is correct.

This next one is an adjunct to NT discussions, and it concerns Microsoft's Remote Access Services (RAS), which allow dial-in access to NT systems. Seems Microsoft is going to remove RAS from Windows for Workgroups. Some users are not pleased.

"[Microsoft], apparently, has made up its mind that it is going to drop RAS from [Windows for Workgroups] — a really dumb decision. . . . But, alas, they appear to have dug in their heels about this matter and are going to drop this critical feature regardless of how important customers feel that it is to their enterprise."

Ever feel that whenever Microsoft digs in its heels about something that it's standing on your back? You are not alone.

This will be my last column as a Computerworld *employee. Most of my electronic connections will be temporarily severed for the next few weeks as I settle into a new position as technical editor of a new IDG publication called* Electronic Entertainment. *Watch this space, however, and send any suggestions to my one permanent connection via Internet at chrisl@netcom.com.*

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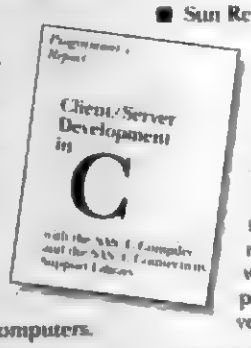

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Microsoft readies Office 4.0

By Michael Vizard

REDMOND, WASH.

As part of a long-term drive designed to make the Office suite its primary software application, Microsoft Corp. has started previewing a suite strategy that calls for applications to work in close cooperation with others.

Using Version 2.0 of its Object Linking and Embedding (OLE) interface, Microsoft intends to show that its applications are becoming integrated to the point where they are almost indistinguishable from one another.

"It's about breaking down the barriers between applications," said Kathleen Schoenfelder, Microsoft general manager for Excel.

Sneak previews

In an attempt to drum up excitement over its forthcoming generation of Windows applications, Microsoft has previewed some features that it will include in Excel 5.0 and Word 6.0.

The new releases are the core offerings in the Office 4.0 suite, which Microsoft will begin selling this fall, said Steve Ballmer, a Microsoft executive vice president.

However, delivery of the full Office 4.0 suite is likely to come in piecemeal as some applications in the suite become ready before others, he said.

Once they are delivered, however, Microsoft maintains that their level of integration will raise the bar for what users will expect from Windows applications.

"Users will be able to seamlessly move around all applications and use any function," said Mike Maples, a Microsoft executive vice president.

Visual Basic support

In addition to OLE 2.0, Office will support the use of Visual Basic as a common macro language; cross-application Wizards that automate specific tasks; context-sensitive agents, called IntelliSense, that will customize applications to a particular user's habits; and a Pivot table query tool that will let applications draw in data from external sources.

The agent technology that Microsoft is including represents the first in a series of agents that are expected to become more proactive as the technology matures, Schoenfelder said (see story page 31).

Meanwhile, Excel will also make use of Pivot tables to allow users to view data in different dimensions and to organize that data into workbooks.

"Unlike other multidimensional spreadsheets, you won't have to predetermine the range of data you want to work with in order to have that data included in the spreadsheet," Schoenfelder said.

"Making applications function as documents will become the definition of an application in 1994. Some of our competitors are just catching up to where Windows was three years ago. The world is about to shift again," Maples said.

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LAN READY, UH, UH, UH, SET, UH, WAIT A SECOND, UH, GO.

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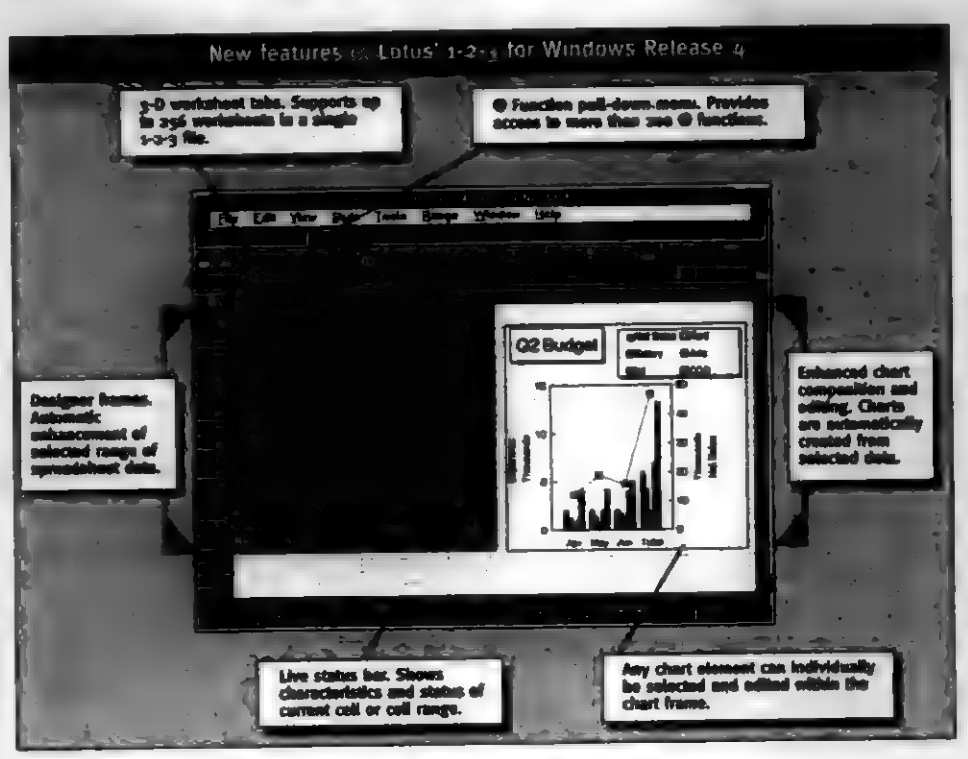
Lotus does Windows right

By Garry Ray



It has been nearly three years since Lotus Development Corp., the Cambridge, Mass.-based maker of 1-2-3, first began showing the Windows incarnation of its popular spreadsheet program.

Unfortunately, reviews and user reports on that first version of 1-2-3 for Windows were not flattering. 1-2-3 for Macintosh, released about a year later, was called "the spreadsheet that 1-2-3 for Windows should have been."

PRODUCT test DRIVE

Now, Lotus appears finally to have gotten things right. Its 1-2-3 Release 4 for Windows, which was announced in May, is a full-blooded Windows program that takes complete advantage of the environment's capabilities and, at the same time, adds a wealth of enticing features to the venerable spreadsheet. In fact, there are far too many new and enhanced features to cover here. Suffice it to say, Release 4 is now the product to beat in the ongoing spreadsheet war with rivals such as Microsoft Corp. and Borland International, Inc.

Full of features

Anyone experienced with previous versions of the program will be impressed with an initial run of Release 4.

Beginning with a revamped pull-down menu system, the enhancements include a variety of context-sensitive mouse pointers, Quick Menus to change the attributes of any spreadsheet object such as the font in a single cell and in-cell editing to make immediate changes to cell contents.

Other features, not so obvious as the above, have been added to improve the usability of 1-2-3. Release 4 finally makes available row and column selection simply by clicking on the row or column border; Microsoft's Excel has sported this feature for years.

Borrowed from other Lotus products — specifically, from Ami Pro — is the status bar appearing at the bottom of the spreadsheet. In addition to automatically displaying the style, font and numeric format of any selected spreadsheet item, the status bar makes it possible to easily change any of those attributes by clicking on the bar and selecting new attributes from its menu.

Also adopted from Ami Pro are a range of presentation and dialog box features. For example, selecting the option to change a background color brings to the screen a palette of the 256 colors available for such purposes. Along the same lines, the fonts and attributes dialog boxes include a preview mode that displays potential changes before they are made. The dialog box shows a listing of all available fonts, along with a sample display of the font being considered.

This new emphasis on usability and presentation carries over most effectively to the much-improved charting module.

In previous versions of 1-2-3 for Windows, creating and printing charts was a kludgey procedure. Release 4 simplifies the process by seamlessly integrating the charting and spreadsheet modules.

First, there is an "intelligent" charting mechanism that accurately derives chart labels, headings and data from a selected range; a user needs only to select the desired range and the Tools Chart command (or click on the associated 1-2-3 Smarticon) to create a graphic. This feature also works with "collections" of spreadsheet data, which are noncontiguous ranges of cells, columns or rows (collections being an equally important addition to Release 4).

Once a range is selected, the mouse pointer changes to a charting icon, prompting the user to position and size a chart window overlaying the spreadsheet. The chart that subsequently appears can easily be edited by double-clicking on any chart element. A separate drawing layer and drawing tools — originally introduced with 1-2-3 for Macintosh — can be used to enhance the chart or any other element in the spreadsheet.

Scenario swap

Users who share spreadsheet data with others, or who create multiple versions of a spreadsheet to accommodate various business scenarios, will be enthralled with the Release 4 "version manager." Based on Lotus' Chronicle technology, the version manager allows users to swap various scenarios in and out of the spreadsheet with only a few mouse clicks.

For example, a quarterly budget could contain best-case, likely case and worst-case scenarios. Using the version manager, these alternatives can be swapped in and out of the spreadsheet to determine their effects.

The version manager also supports local-area network-based users working on the same spreadsheet, while a related tool, the version manager index, allows users to create "scenarios" from a group of versions.

There is clearly a lot that is new to Release 4, although there is little room here to cover the more than 120 added @ functions and 250 macro commands, the macro translator that converts older spreadsheets to the new macro format and enhancements to 1-2-3 database functions.

In fact, there is so much added functionality that simple features descriptions do not do the program justice. What 1-2-3 Release 4 for Windows shows is that Lotus can remain true to its users, and, at the same time, lead the charge in the ongoing spreadsheet wars.

Alpha Software

CONTINUED FROM PAGE 41

said Tim Stein, Alpha software director of business development.

For instance, Bravo supports bi-directional links to spreadsheets using the Dynamic Data Exchange facility in Windows. As a result, adjustments to a graph in Bravo will automatically be reflected in either a Microsoft Excel, Lotus 1-2-3 or Borland International, Inc. Quattro Pro spreadsheet.

Bravo also allows a user to import graphs that were created by other Bravo users, with all template and background conversions handled automatically to match that user's current presentation.

Other key features include the ability to maintain size and point relationships during the editing of a graph, an outliner and sorter facility that can be linked to word processing packages, Smart Datapictures that automatically wrap around text, 10 drawing tools and text controls.

In addition, Bravo supports object manipulation and blending of images between two objects; the grouping of objects so that, for example, relationships on an organizational chart can be maintained as objects are moved; the ability to import multimedia files and several prepackaged pieces of clip art.

Quick study

"I used to be a Harvard Graphics user, but Bravo is much simpler to use," said Ed Pike, director of MIS for Leon County, Fla. "You can pick up Bravo and start making presentations. With [Software Publishing's] Harvard Graphics, I had to go to a two-day class to learn how to use it," Pike said.

"My only recommendation is that they bundle more clip art. You hate having to search for clip art," he added.

But Henning said Alpha Software, which until now has focused on databases, is not likely to leverage its existing database position in the presentation graphics arena.

"This is an incredibly crowded field that is dominated by software suites. Many people don't use presentation graphics packages every day, so they are willing to settle for a little less functionality as part of a suite," Henning said. "You wonder how serious Alpha Software is about this market," he added.

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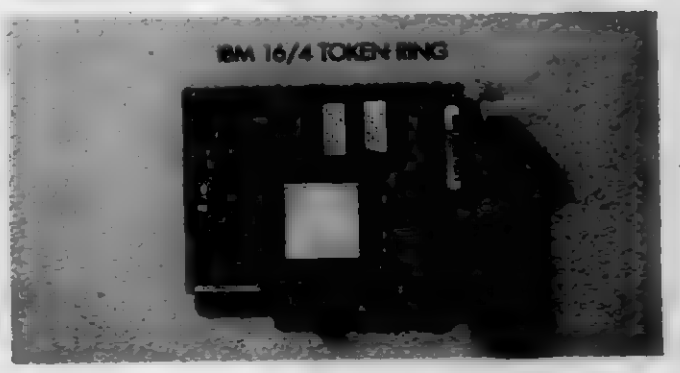

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[redacted]

Hardware

Data Technology Corp. has announced the DTC 3270VL VESA (VL bus), a Small Computer Systems Interface (SCSI) host adapter that provides compatibility with all SCSI and SCSI-2 peripherals.

According to the company, as many as seven SCSI devices, in any combination, can be connected to the DTC 3270VL, minimizing the use of motherboard slots by these devices.

Support is provided for hard drives, write-once and rewritable optical disc drives, optical scanners, CD-ROM drives and printers.

The product costs $169.

▶ *Data Technology*
1515 Centre Pointe Drive
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(408) 942-4000

Apple Computer, Inc. has introduced the Apple Personal LaserWriter 300, which the company said is a compact and energy-efficient laser printer.

Weighing less than 15 pounds, the Personal LaserWriter 300 can print up to 4 page/min. The product offers 300 by 300 dot/in. resolution and has gray-scale printing capabilities that generate a variety of gray shades for sharper images.

Apple's TrueType font technology is incorporated, and Apple's Grayshare printer software is used for ease of use.

Personal LaserWriter 300 costs $699.

▶ *Apple Computer*
20525 Mariani Ave.
Cupertino, Calif. 95014
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Software

Benesoft has released This Is My Computer Version 2.0, a software tool that creates a detailed printout of a user's computer system.

By pressing the letter "P," a user receives a map displaying configuration information, CMOS hard disk setup information, CONFIG.SYS, WIN.INI and SYSTEM.INI files, AUTOEXEC.BAT and a directory tree listing of the entire hard disk. The program can run under DOS and Windows; it costs $12.99.

▶ *Benesoft*
100 Aldworth Way
Folsom, Calif. 95630
(916) 983-2358

Passport Designs, Inc. has introduced Passport Producer Pro, real-time, interactive multimedia production software.

Improved graphics and text capabilities, path-based animation, interactivity, external devices control and video support are provided in this release.

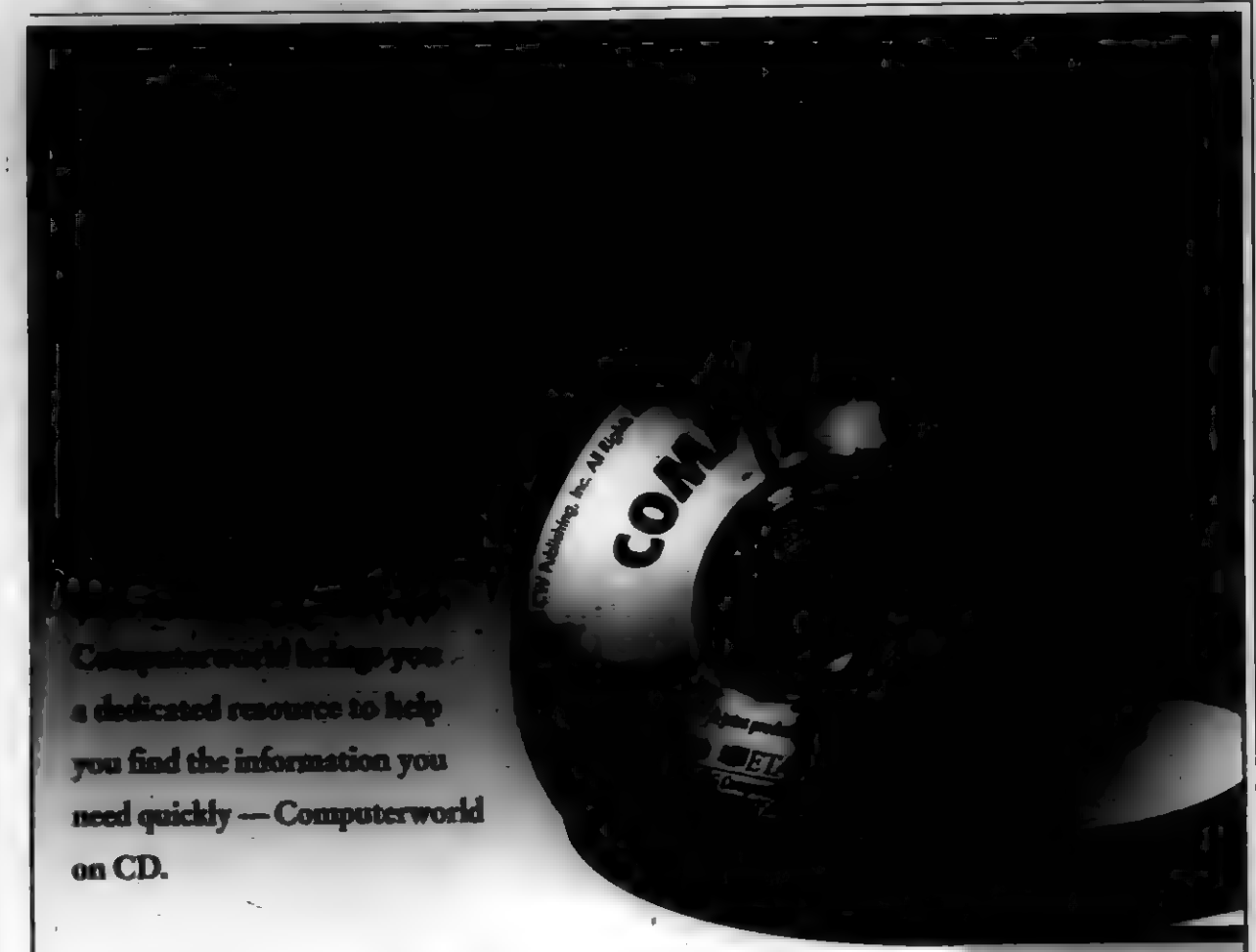
The product offers a visually oriented "drag-and-drop" user interface called the "Cue Sheet" that enables users to build professional-quality interactive productions with maximum flexibility, the company said.

The recommended configuration for Passport Producer Pro is a Macintosh Quadra with 12M bytes of random-access memory.

The product costs $1,495.

▶ *Passport Designs*
100 Stone Pine Road
Half Moon Bay, Calif. 94019
(415) 726-0280

E-Machines, a division of SuperMac Technology, Inc., has introduced Futura II and Ultura, two families of 24-bit color graphics cards. Both products offer large-screen color with extended features. Cost: Futura II starts at $499, and Ultura costs $1,299. E-Machines, Sunnyvale, Calif. (408) 541-6100. . . . **Avid Technology, Inc.** has introduced Release 2.0 for Media Suite Pro, a desktop video production system. Key features include new effects, an edit decision list output option and a 60-field option. Cost: $9,995. Avid Technology, Tewksbury, Mass. (508) 640-6789.



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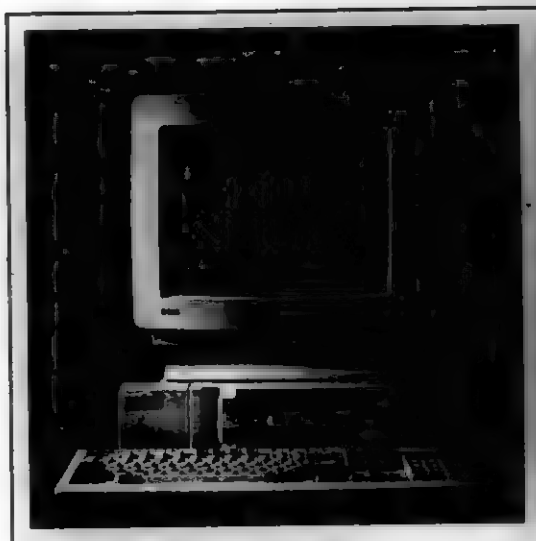

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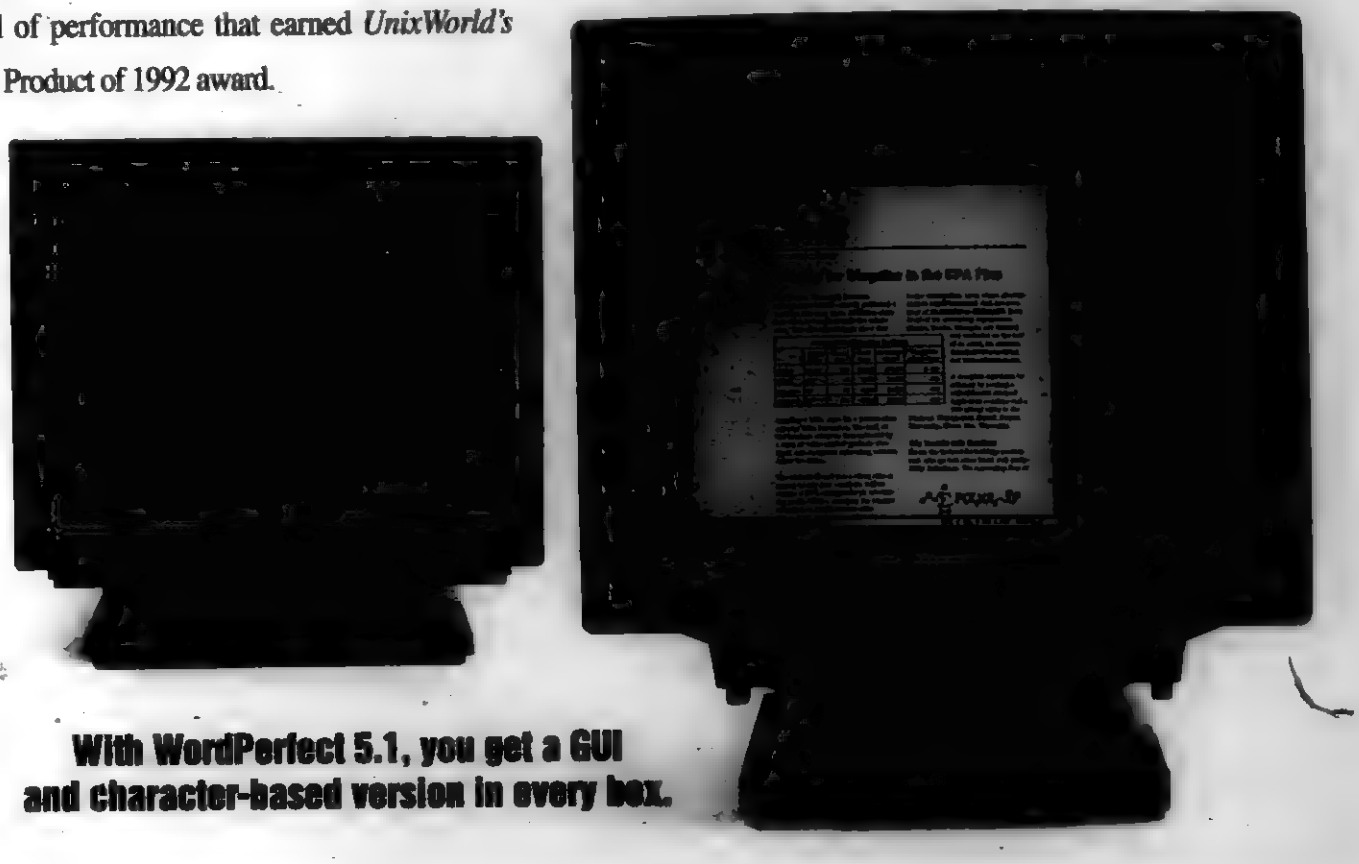

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Superservers

NCR boxes take charge at CNA

By Michael Fitzgerald
CHICAGO

The superserver market has developed slowly, but CNA Financial Corp. has put the big PC boxes at the core of its re-engineering project: It has purchased 20 NCR Corp. multiprocessors and plans to buy another 50 by year's end.

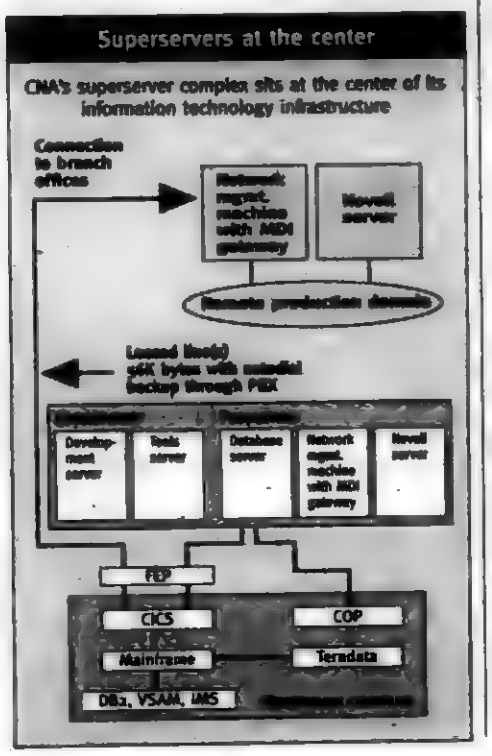
CNA built a superserver data center in its home office here as part of its strategic platform re-engineering initiative [CW, Aug. 2]. CNA's branch offices, which support the firm's coterie of independent insurance agents, connect to the servers in the center, which in turn connect to crucial corporate data on CNA's IBM mainframes.

Wall graffiti
CNA, the nation's eighth-largest insurer, began its move to distributed computing in 1987. John Lochow's re-engineering project began with a 30-foot wall that he papered from floor to ceiling with schematics diagramming the transition. It included roughly 100 projects.

The superserver data center has 20 NCR System 3000 superservers — 3410s, 3450s and 3550s running up to four processors. CNA created the server center as part of its effort to move its networks from IBM's defunct PC LAN Program (PCLP) network protocol to Novell, Inc.'s NetWare, though some of the superservers also run Unix.

Under PCLP, host connectivity was achieved by putting a 3270 emulation card in a PC server in each branch office. This server connected to

NCR boxes, *page 56*



LAN saves TV network $1M

Software licensing, maintenance costs drop in mainframe downsizing

By Michele Dostert
VIRGINIA BEACH, VA.

The Christian Broadcasting Network (CBN) has completed a 2½-year downsizing project that it estimates will save the network more than $900,000 a year.

The nonprofit religious broadcasting company downsized more than 35 applications — from studio scheduling to accounting software to contributor databases. CBN estimated the operational cost of downsizing to a PC-based local-area network at $1 million, most of it spent on retraining mainframe programmers, programming tools and contract programming services.

"The capital equipment expenditure didn't actually cost us anything; we discovered that buying equipment for the LAN would actually cost us less than upgrading our mainframe would have," said Jim Funari, CBN's MIS director.

"We were forced off of the mainframe by the rigid, exorbitant pricing schedules charged by IBM and Computer Associates," said Paul Flanagan, CBN's vice president of information services, citing the general expense of host-based processing and fees vs. costs for LANs.

Paul Flanagan (left) and Jim Funari *managed LAN move*

"Moving to the LAN, our software licensing fees dropped from $570,000 down to $120,000 yearly," he said.

CBN's LAN supports more than 625 users and spans eight servers, running applications such as office productivity and personnel as well as the contributor database. It uses Novell, Inc.'s NetWare v3.11 as its operating system. Client PCs are mostly MS-DOS-based, though there are a few Windows systems. Users log in and choose applications via customized menus built with Saber Software, Inc.'s SaberMenu software. Clients are connected via thin Ethernet cable to a Fiber Distributed Data Interface backbone.

CBN recently moved its last and largest application, an 8G-byte database of contributors' records, off its Hitachi Data Systems Corp. 9080 mainframe and over to its LAN. CBN now plans to sell that mainframe.

In addition to the $450,000 savings in software licensing, CBN estimated that downsizing will save it $110,000 in hardware maintenance and operations. "We won't need nearly as many people doing tape backup and the like," Flanagan explained.

Because CBN trimmed its staff via attrition throughout the project, the information systems department plans to cut only a few contractors and operations people from its payroll.

To move the contributor database down to the LAN, CBN programmers had to write a database management/transaction processing engine to manage the Microsoft Corp. FoxPro database.

"Originally, we planned to use Sybase as the back-end DBMS; FoxPro wasn't designed for 8G-byte databases," Funari said. "We thought when Microsoft bought FoxPro they would make it work with Sybase, but we couldn't wait any longer, and we had done so much in FoxPro we just went ahead and built our own engine."

Three parts

The CBN contributor database now resides on three 486/50-MHz Compaq Computer Corp. servers — one dedicated to transaction processing, one to the master data tables and a third to handle large selections and batch sweeps of the database. The transaction processing server uses a table-driven, list-directed process to route requests to the database itself; roll-back and roll-forward safeguards ensure data integrity in case of midtransaction failure.

Including re-engineering time, the CBN staff completed the database project in 20 months. Funari attributed the speedy completion to a limit on the re-engineering stage. "When you move applications, you have to identify the changes that have the most payback to the users and do them but not get trapped in making every little change someone suggests," he said.

The CBN staff said they had no qualms about the reliability of their LAN platform. "We only tolerate 0.5% downtime in our 18-hour-a-day, six-day work week, and we've had no trouble meeting that," Flanagan said. He credited conservative engineering in the cable plant, frequent segmenting, mirrored servers and Simple Network Management Protocol-based network management, as well as a staff experienced in network maintenance, for that reliability.

Microsoft demos fax integration

By Michael Vizard
REDMOND, WASH.

Microsoft Corp. recently demonstrated an implementation of its Windows at Work software running on a Ricoh Corp. fax machine and promised to integrate devices running Windows at Work with its peer-to-peer network services.

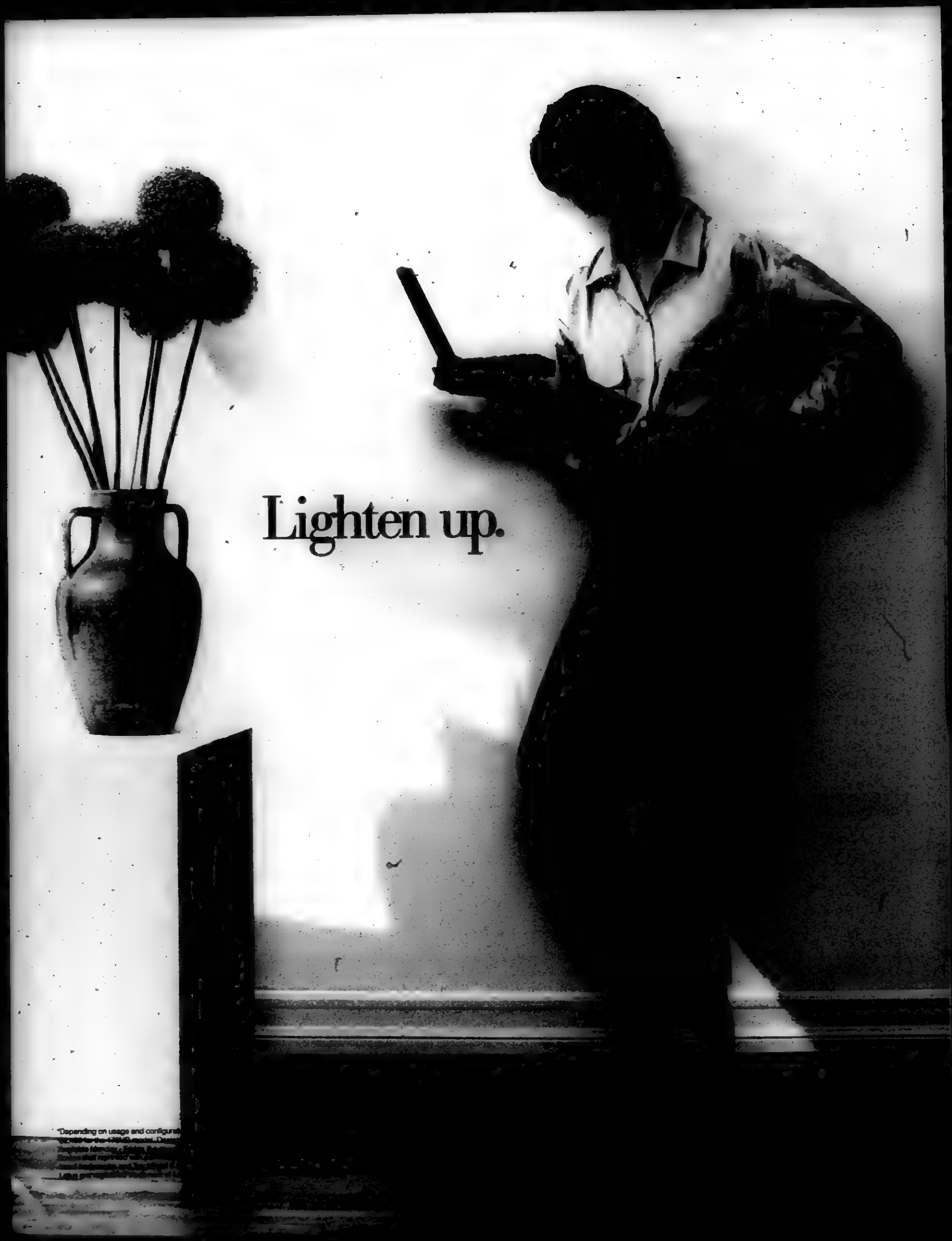
Separately, Microsoft announced that it has added wireless support to its remote mail client software.

"We weren't the first to announce a wireless client, but we are the first to ship it," said Mike Maples, executive vice president.

The integration of Windows at Work with Windows for Workgroups is particularly significant because Microsoft Chairman Bill Gates promised that it will allow users to exchange editable documents by fax transmission. Currently, users can send only bit-map images that cannot be edited across fax lines.

Windows at Work was designed to provide a graphical interface to office equipment. On the Ricoh fax, the software provided an interface to an icon that could send multiple faxes to a list of people, encrypt a fax for security purposes or program the fax machine to transmit at certain hours to take advantage of lower telephone rates.

By linking these devices to Windows for Workgroups, users will be able to control them through their PCs.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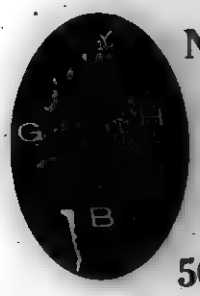

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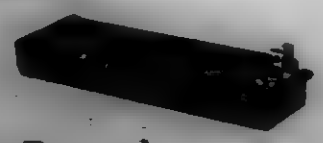

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Hard disk: 85MB or 170MB	Acres of file storage in your [illegible]
Price: $1,999 for 85MB*	[illegible]

Human by

NCR boxes

CONTINUED FROM PAGE 53

the mainframe via a cluster controller, a kludgy process that prevented host and local sessions from running on the same server.

The server center has also helped John Lochow, vice president of systems, retain productive staff members. Since the center was designed like a mainframe center with customized cases and monitoring data, CNA took employees who had tended master mainframe consoles and retrained them to handle the server data center. The superservers also connect the roughly 5,000 PCs in the home office with the mainframe, running data over a fiber-optic backbone.

Lochow said he has bigger plans for the NCR multiprocessors. In each of its 48 major branches the company wants to install a 3450 that has a single Pentium chip and runs Sybase, Inc.'s Sybase database. The NCR box would tie into IBM PC Co.'s Personal System/2 Model 95 that acts as the branch server.

This configuration, now in pilot stage, would give CNA branches "the ability to go to the central databases on the mainframes and query against that data, gaining instant access to it," Lochow said. "Currently, they can look up any piece of data they want, but to get a query or a report they have to go to the development community to write it."

Long-term measure

While putting the NCR boxes into the branches has a solid justification today, Lochow is betting it is a good move for the future as well. He said he thinks Novell will eventually meld NetWare with Unix, and CNA will then add processors to the NCR boxes to handle its server needs in the branch offices.

"The NCR is a design point. It gives us something we don't have right now but also offers us a potential next step," Lochow said. He said NCR's strong statement of direction concerning Novell and Unix and open systems helped cinch the decision not to buy IBM's Server 286 superservers, which, for instance, did not include Novell support until this year.

"NCR stated their architecture and desire for interoperability and coexistence with other architectures better than IBM," Lochow said. "IBM's our primary vendor, but we're doing this with our eyes open. [While] IBM is improving at [communicating]," it needs to get better.

DG adds tools for Aviion servers

By Craig Stedman
WESTBORO, MASS.

Data General Corp. is developing distributed document management and workflow capabilities for integration into Uniplex Ltd.'s OnGo office groupware suite, which DG recently introduced for use with its Aviion line of Unix servers.

William Zastrow, DG vice president of imaging and office systems, said the enhancements should be added to the company's AV OnGo offering this fall. The document-management tools will also be built directly into Uniplex's own OnGo code in 1994, he added.

Ronni Marshak, an analyst at the Patricia Seybold Group in Boston, said DG appears to be trying to fill holes left in OnGo at the enterprise level. Uniplex has been "derailed a bit" in its own development work on the product, she said.

DG will ship AV OnGo for Motif-based clients this month. Windows client support, which it also developed, should be added in the fourth quarter. Zastrow said DG also plans to market WordPerfect Corp.'s rival WordPerfect Office 4.0 software when that gets Unix support next year.

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WHY THE WORLD'S BIGGEST DATABASE COMPANY WANTS CONTROL OF YOUR BUSINESS.

Franco Vitaliano

Pumping up PC iron

The forthcoming 100+ MIPS "PCs" based on Pentium, Mips and Alpha chips are going to forever transform your organization. When networked together, the collective power of just several of these pumped-up PC systems will surpass even your biggest and mightiest hunk of mainframe iron. Soon you will be able to buy these "PCs-on-steroids" for less than $5,000. In short, the era of the "distributed PC mainframe" has arrived.

To ignore this magnum load of collective computer power is to doom your organization to strategic and competitive obsolescence. To take advantage of this opportunity, your downsizing mind-set needs to expand well beyond embracing just client/server SQL. You must now consider the strategic implications of bringing unheard-of amounts of cheap computer power straight into your departmental LANs.

But how do you implement and manage this newfound departmental power with the same level of control and security as your traditional big iron? You could, for example, dedicate a cluster of low-cost machines as distributed processing farms. If so, using Microsoft's Windows NT or a version of Unix such as Novell's UnixWare is just fine.

Alternatively, you might get a little antsy at the thought of a 100-or-so-MIPS machine sitting there while someone pecks away at his Pentium PC word processor. In that case, multiuser Unix on the desktop makes much more sense as a way of sharing those surplus cycles.

You will also want to carefully think about how to deploy your newly downsized computer servers. You can go the one-job/one-box route. Or maybe you can carve up one big mainframe job to execute in network parallel across several powerful PCs at once. A network message-passing approach such as Parallel Virtual Machine has an easy-to-implement C library that enables heterogeneous networked machines to cooperate in a loosely coupled way.

Conversely, forget about remote procedure calls for network parallel work, as they are inherently synchronous — i.e., the overall network computation can hang while one node blocks. Ditto, forget network-shared memory schemes: As you add more nodes, they will quickly saturate your network bandwidth.

New administration

Once you have downsized your big mainframe jobs, you have to administer the new systems. You will absolutely need some type of software to automatically ferret out idle network CPU cycles, and also a methodology for fairly allocating these resources to prevent a single greedy power user from sucking up every network cycle in sight. You will also need high-level systems managers to supervise and monitor the applications on your distributed PC mainframe.

Here, the new SNMP-2 protocol will probably come in just as handy for monitoring distributed applications as for managing network devices. Likewise, the greatly enhanced security features of SNMP-2 can surely be extended to include applications.

Or consider using the new RSA-based digital signature security systems that are now coming to market with support from Novell, Lotus and others. Besides securing documents and E-mail, digital signatures can be used for authenticating users when logging on to systems.

Lastly, your distributed PC mainframes most certainly need distributed file servers such as NetWare 4.0, NT Advanced Server or the latest Banyan Vines release. The perfect operations downsizing marriage will come about by mating your distributed PC mainframe with one of these network operating systems and several gigabytes of fast, cheap RAID.

So, as the saying goes with respect to this sudden abundance of cheap new cycles: Use it or lose it.

Vitaliano is a Boston-based writer specializing in distributed computing.

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Automation preserves jobs at manufacturer

By Thomas Hoffman
ASHLAND CITY, TENN.

Technophobes will argue that automation has stolen thousands of jobs from U.S. manufacturing workers in recent years. But unlike many of its peers, State Industries, Inc., a $350 million water heater manufacturer, has managed to retain — and even create — jobs through the savvy use of technology, including information systems.

By 1985, most of State Industries' competitors — including A. O. Smith Corp. and Rheem Manufacturing Co. — had moved their manufacturing plants to Mexico, where the labor rate at that time was approximately 75 cents an hour, or one-tenth the cost of labor here. To remain competitive, State Industries had two choices: move its manufacturing plant south of the border and lose most of its 2,000 employees or automate its U.S. operations.

To take the stateside option, the company would have to design a new-age water heater because its existing models did not lend themselves to automated production.

So State Industries developed a leading-edge product and kept its work force intact. Almost four years ago, the company began manufacturing the Duron water heater. Unlike older models, the Duron is made from two, rather than three, steel pieces and is lined with a plastic composite material. The single-weld design and composite liner also make the Duron tank virtually leak-proof because sediment cannot reach and corrode the welded steel.

On the Duron manufacturing line, eight workers oversee the robots and other automated devices that manufacture 1,200 tanks per eight-hour shift. That compares favorably to the production lines for the older-style glass-lined and porcelain tanks, which require 75 employees to manufacture 1,000 tanks in the same period.

Robots produce *a new type of water heater and receive their marching orders from an RDBMS*

The Duron robotics and automated devices receive information from an NCR Corp. 3450 multiprocessing server. The server, installed last month, runs on an Informix Software, Inc. OnLine 5.0 Unix relational database management system.

The server connects to an IBM 3090 mainframe over a 3270 link to receive a product requirements file and then uses Informix database applications to schedule production. The RDBMS downloads instructions to the robots, laser welders and other devices over an NCR-designed fiber-optic local-area network. The robots and automated devices receive instructions via RS-232 ports.

ON SITE

State Industries, Inc.
Ashland City, Tenn.

Challenge: To keep jobs in the U.S. by automating production of a new line of water heaters.

Technology: NCR 3450 multiprocessing servers, robots and Informix RDBMS.

Results: The new production line runs with only eight workers.

Towers out

The NCR 3450 server replaced two NCR Tower 750 machines. A single server has supplanted the minicomputers for several reasons, according to Michael Garrison, State Industries' manufacturing and industrial engineering manager.

"Because the NCR 3000s [made obsolete] the Towers and since NCR said there would be no further development of the Towers, it seemed logical," he said.

The single server will support a second Duron production line that went live Aug. 1. Annual maintenance for the server will cost State Industries about $10,000, compared with $16,000 for the two Tower systems, Garrison said. But he said those savings did not drive the decision to scrap the Towers. "It's easier to write programs for one machine instead of two, not to mention the administrative benefits," Garrison said.

Since the company began manufacturing the Duron tanks in October 1989, State Industries has shifted most of its line workers to manufacture the older-design tanks. It continues to produce as many of these as it did five years ago. In fact, the company has added 100 employees to its work force since then.

And though State Industries will phase out production of its glass-lined residential tanks, Garrison said, it will retrain its line workers to avoid layoffs.

Garrison insisted that the work force would remain intact, except for attrition and retirement. "My primary function has been to install automated equipment, and in my 17 years here, we've never laid anybody off due to automation, and we don't intend to," he said. "Technology in and of itself does not have to reduce jobs."

SNMP added to Ethernet adapters

By Lynda Radosevich

A recent round of vendor innovations added speed, easier installation and Simple Network Management Protocol (SNMP) capabilities to cheap Ethernet adapter cards.

The improvements let information systems managers eke ever more out of Ethernet technology. For instance, SNMP capabilities in new Ethernet cards from Ungermann-Bass, Inc. let network managers at the Physicians Health Plan of North Carolina in Greensboro detect lost network connections in file servers, gateways and print servers before end users "light up the phone," said MIS manager Phil Kurtiak.

Added adapters

Recent developments include the following:

•UB announced an SNMP agent for its MasterLAN line of Ethernet adapters. Including the management on the adapter rather than in the host frees up to 40K bytes of host memory, according to a company spokesperson. The cards cost $375, and customers can receive free upgrades.

•Standard Microsystems Corp. (SMC) in Hauppauge, N.Y., announced a line of 16-bit Ethernet adapters. Using a technique that immediately forwards packets of data before they are fully received into the adapter's buffer, SMC reduces data transfer times. However, critics of the $129 card said that method eliminates error-checking functions and could fail to detect bad packets.

•Accton Technology Corp. said it will ship this month a line of adapters, priced at $109 per card, that increase performance without eliminating error checking. Accton said its acceleration method increases performance by incorporating the network controller, bus interface and transceiver into a single chip.

•Kingston Technology Corp. in Fountain Valley, Calif., shipped a 32-bit Ethernet card for Extended Industry Standard Architecture bus computers. The $250 card uses a technique called Direct Bus Mastering to transfer data directly to and from the host system memory and improve operating speed.

[redacted]

Lotus Development Corp. has announced the availability of CC:Mail for OS/2 Workplace Shell Version 1.0, an object-oriented version of the company's electronic-mail program.

The version features multitasking capabilities and an object-oriented file management system. The E-mail environment includes a new graphical user interface based on the Workplace Shell; a draft folder for storing messages in progress and a trash folder for retrieving deleted messages; and spell checking.

A 10-user pack costs $345; a 25-user pack is $845; and a 100-user pack costs $3,295.

▶ *Lotus*
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Network Communications Corp. (NCC) has released software enhancements for Version 4.1 of the LANalyzer Network Analyzer, NCC's local-area network diagnostic software.

Running up to six times faster than Version 3.11A, LANalyzer 4.1 is said to be the first and only analyzer capable of testing and analyzing NetWare 4.0, according to the company.

Other features include an automatic name generator, post capturing filtering and enhanced protocol decodes. Prices start at $1,350.

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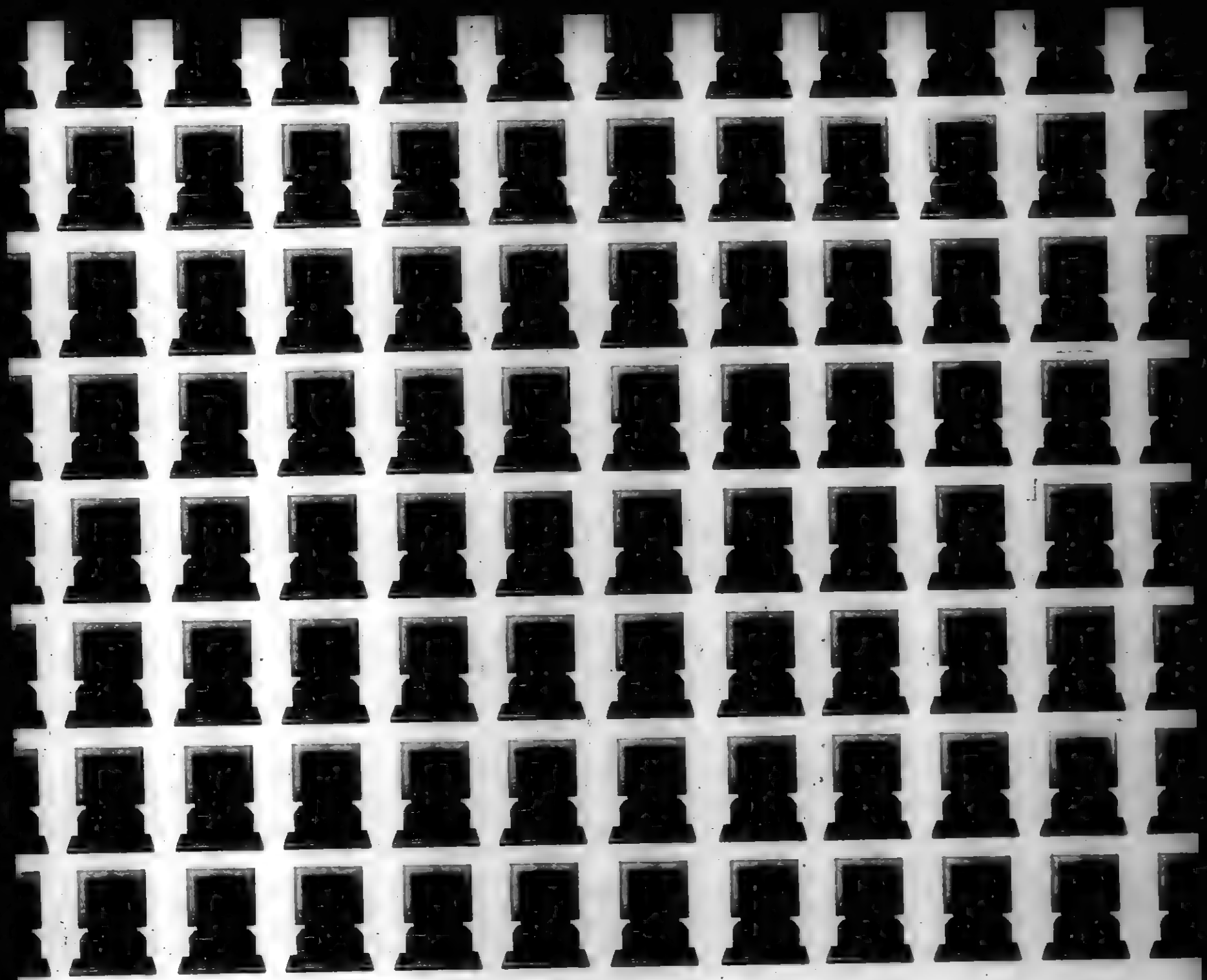
Product shorts

Lawson Software has announced the Open Enterprise Release, a client/server version of the Lawson Human Resources System. The system comprises Payroll, Personnel Administration and Flexible Benefits applications and runs on an assortment of client systems, hardware platforms and relational databases. Cost: Pricing begins at $24,000. Lawson Software, Minneapolis, Minn., (612) 379-2633.

JetForm Corp. has announced plans to ship a Macintosh version of its JetForm for E-Mail, a multiplatform, intelligent forms fill-in product that includes a set of work-flow tools and that can be used with standard electronic-mail systems. The first three Unix platforms it will support are Sun Microsystems, Inc.'s OpenLook, IBM's RISC System/6000 and Hewlett-Packard Co.'s HP 9000. Cost: ranges from $495 to $1,495. JetForm, Waltham, Mass., (617) 594-3026.

CARP Systems International has announced APS:Enterprise, a redesigned version of its Advanced Planning System that operates on Unix workstations. The product now offers an object-oriented, client/server-based management decision support system for logistics and business planning. A Windows-based version called APS:Solo was also introduced. Cost: An APS:Enterprise license starts at $95,000; APS:Solo starts at $25,000. CARP Systems International, Lexington, Mass., (617) 862-6706.



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Asynchronous Transfer Mode

IBM fills out plans for moving networks to ATM

By Joanie M. Wexler
WHITE PLAINS, N.Y.

Adding a splash of context to the high-level Asynchronous Transfer Mode (ATM) blueprint it laid on the table last month [CW, July 19], IBM has provided some details about how it will migrate users to enterprise networks destined to one day include ATM.

The ATM plans complement IBM's broader scheme for transitioning Systems Network Architecture (SNA) shops to distributed, high-speed computer networks, analysts said.

IBM views frame relay as a functional and technical stepping-stone to ATM networks; businesses can connect their gear to ATM local-area networks via frame relay with a mere software upgrade, said Bill Conklin, IBM director of networking subsystems. So the company plans to add frame-relay support throughout the next year to the 3172, 3174, Application System/400 and PC-based DOS bridge.

"ATM is the end result, but most customers won't be there for years," said David Passmore, vice president and service director at Gartner Group, Inc. in Stamford, Conn. "What will be offered by carriers will primarily be frame relay."

For the near term, Passmore said, users can put a frame-relay interface on their equipment, then just change the interface as ATM extends from the carrier backbone to their premises.

Role-playing

Meanwhile, IBM has mapped out the following roles for its existing SNA-oriented gear in tomorrow's networks:

- **The 3172 cluster controller** will gain a frame-relay interface within the month and eventually get interfaces into high-speed local and remote networks such as ATM, T3 (45M bit/sec.) and Switched Multimegabit Data Service. OS/2 Communications Manager software will be integrated into the 3172 this month.
- **The 3174 data concentrator** will gain increased connection speeds from today's 64K bit/sec. up to 128K to 256K bit/sec. via new adapters. It will also get frame-relay and Synchronous Data Link Control interfaces in the form of software upgrades to the adapters.
- **The 3745 front-end processor** is a candidate for the 25M bit/sec. ATM under development at IBM for local connections only.

Conklin also said IBM will eventually allow users to choose where they want their multiprotocol routing to take place: in the smart wiring hub, a stand-alone router or in IBM's Transport Network Node, a wide-area ATM switch due out in late 1994.

Meanwhile, he indicated that IBM's 6611 router would not be the last router product from the company; the device is not a candidate for an ATM interface.

4.0 put to the test

Grocery chain benefits from early NetWare move

By Elisabeth Horwitt
TORONTO

National Grocers Co. is not one of those wary firms that automatically holds off buying any major new release that ends in a ".0."

The grocery chain became a beta-test user and then an early implementor of Novell, Inc.'s NetWare 4.0 because "the bumps and glitches you get with new releases are minor compared to what they give you in terms of serving the customer," said Robin McCubbin, network planning analyst at the company. The rollout of the new version is expected to be complete by October.

Indeed, the grocery store chain already has some experience on the bleeding edge of Novell's network operating system: "We put in 3.0 when it first came out because we needed to get past that 100 connections [per server limitation]," McCubbin said. "Otherwise, we [would have] had to put in a second server."

Easy decision

The decision to implement NetWare 4.0 was basically a no-brainer, according to McCubbin. One feature of the new version that was important to the grocery chain was the ability for network administrators and users to access a group of servers with one log-in, instead of one server at a time. "We have 500 users in this building alone and three servers, so for them to get at all resources with one log-in was a major plus."

In addition, NetWare 4.0's disk compression and hierarchical storage management were important to National Grocers as a way to "take the pressure off our disk requirements," McCubbin said. The firm's servers now hold 3G bytes or more, and the new features save it from having to migrate to 4G bytes.

Easier implementation

So far, McCubbin and his group have found implementing NetWare 4.0 a lot less troublesome than commonly reported. "A lot of people say the global directory takes a while to get hold of," McCubbin said.

His group did spend two weeks getting up to speed on the NetWare Directory Services and its treelike directory

NetWare 4.0, *page 63*

Novell unveils host/LAN control

By Michele Doetert
PROVO, UTAH

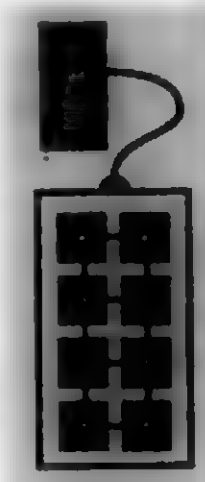
Novell, Inc. has unfurled software that will allow users of its NetWare for SAA product to monitor, maintain and control NetWare-to-IBM host sessions from the same console that oversees the rest of their interconnected local-area networks.

The product, called NetWare for SAA Services Manager 2.0, is an enhanced version of NetWare Communications Services Manager, a set of NetWare for SAA management utilities that Novell released in February.

The name has been changed to reflect the product's incorporation into Novell's NetWare Management System (NMS), a graphical user interface-based network management platform based on Windows. NMS was designed to allow users to automatically map, monitor, manage and control local or remote network devices and servers.

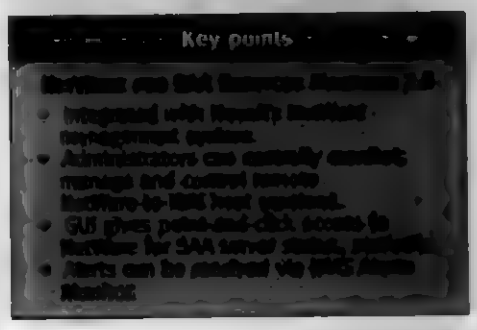
On the map

NetWare for SAA servers will now appear as icons on the NMS console map, with their status easily accessible. Customers can also view NetWare for SAA alerts in the NMS Alarm Monitor window. "It is vitally important that network managers know who their mainframe users are, what their network address is, where their mainframe connection server is," said Bernard Harguindegay, Novell's product manager for NetWare for SAA. "NetWare for SAA Services Manager provides a single, centralized point of management and control over remote LAN-to-host connections," he said.



Popularity contest

NetWare-to-IBM host connectivity software appears to be a popular tool; Novell claims to have sold more than 35,000 server licenses of its NetWare for SAA product in the last year.



NetWare for SAA users, especially those with remote sites, said they were pleased with the product. "We have NetWare for SAA installed in our branch offices; now, we can use the NetWare Management System installed at our central site to easily troubleshoot and manage all of those remote connections," said Clem Bowen, a systems analyst at Buck Consultants, an employee benefits consulting firm in New York.

Novell said NetWare for SAA Services Manager 2.0 is now shipping at a suggested list price of $3,495. It comes bundled with a runtime version of NMS.

Applications offer central net security

By James Daly

As any network security administrator can tell you, the distributed functionality provided by any client/server setup also means you distribute your points of vulnerability. Fortunately, a pair of new applications from PC Guardian and Trend Micro Devices, Inc. were designed to provide centralized security control for network administrators.

San Rafael, Calif.-based PC Guardian has just announced an upgrade to its Data Security security package that includes the Novell, Inc. Interface Module. The added component provides both centralized control of workstation access and a single log-in capability to the workstation and server, PC Guardian officials said.

In recent years, security personnel have faced the Sisyphean task of providing the same quality of service to more and more networked users. "As our LANs have grown, so has the complexity of their administration," said Mark Caduc, a security analyst and Interface Module beta-test user at Air Canada in Montreal. "We still have the same number of administrators, but now they have a lot more to manage."

The module works by allowing the workstation's access control functions to be managed and controlled by the Novell NetWare Syscon utility. When the workstation boots, users enter their Novell user name and password. Once they gain access, they can then log in to the network at any time without having to reenter their user name and password. As a result, users do not need to remember multiple user names or passwords.

The workstation access control functions that are controlled and administered from the Syscon utility also enhance security by demanding periodic password changes and a minimum password length.

In addition, the system administrator can manage all access control functions for the network from a remote location using a single interface and program provided by the Syscon utility.

The Novell Interface Module continually synchronizes the user name and password on the workstation with the user name and password on the network. If the network is down or not accessed, the user is still required to enter a valid NetWare user name and password to gain access to the workstation.

The suggested retail price of Data Security Plus with the Novell interface is $124.95.

In addition to providing centralized security control, the StationLock LANPack from Torrance, Calif.-based Trend Micro offers virus protection, access control, recovery control and encryption.

StationLock's NetWare Loadable Module server component allows a network administrator to set the configuration for each user or group of users, assigning node numbers and machine name relationships for access control, Trend Micro officials said.

The application also contains its own read-only memory BIOS, called X-DOS, which takes control of the workstation system prior to loading any operating system, thereby preventing all possible intrusions.

StationLock LANPack is scheduled for release in the fourth quarter. Pricing will be $99 per workstation and $240 for the server component.

Briefs

ATM cards on way

Network Peripherals, Inc. and SynOptics Communications, Inc. have agreed to develop adapter cards for Asynchronous Transfer Mode networks. Network Peripherals plans to deliver the cards by January 1994 for all cable types. Pricing was not announced.

Unix support

ProTools, Inc., based in Beaverton, Ore., has announced Unix support for its network analysis product, Foundation Manager. Availability is slated for the fourth quarter. The Unix version will be integrated with Ungermann-Bass, Inc.'s Net Director network management platform.

Concord enhances monitor

Concord Communications, Inc. has added a Backup Link feature to its Trakker internetworking monitor, which is said to use out-of-band signaling to give users access to Trakker network management information — even during a failure of the local-area network where a given Trakker workstation resides.

LAN monitoring program

The Certified Network Expert organization founded by Network General Corp. and Hewlett-Packard Co. recently began registration for network managers who want to be certified for specific types of LAN monitoring tools and skills. For Ethernet and Token Ring, the examination is $395.

The two vendors said they have received more than 1,000 calls from network managers and technicians. Companies including the AG Group, Inc., Microtest, Inc. and Wandel & Goltermann Technologies, Inc. recently joined the program.

Wireless nets not all alike

Carriers diverge in coverage, capacity, design

By Joanie M. Wexler
LEXINGTON, KY.

Information planners often do not care how a technology works as long as it does work. However, understanding an architectural design can sometimes help customers select alternatives more attuned to their applications.

This is especially true in choosing a wireless telecommunications service, as today's network-specific wireless modems make it difficult to change carriers. And wireless network service providers have different strengths, reflected in their network designs.

According to Ardis, 80% of its customers are in the field service or logistics business.

Ardis, for instance, employs a transmission scheme optimized for reliable in-building coverage, while packet competitor RAM Mobile Data and cellular carriers focus on network capacity.

Ardis' aim is to deliver data deep within buildings. Because steel walls and other obstacles can derail wireless signals, Ardis increases the likelihood that a given transmission will reach its destination, Tom Berger, Ardis' vice president of radio network and product technology, explained during a recent conference here.

The network does this by transmitting signals to multiple base stations — what analyst Rob Rich at Dataquest, Inc. in Framingham, Mass., called the "brute force" method of building reliability into wireless networks. Showering base stations with messages simply increases the odds of maintaining a connection.

RAM Mobile Data and the cellular carriers, on the other hand, send a given transmission to just one base station. This could lessen a signal's chances of being picked up, but it increases overall network capacity by reducing broadcast traffic.

A longer-term issue with the Ardis network is that, unlike RAM Mobile Data, there is no guarantee the company will be able to add bandwidth down the road. One day it will have to depend on existing spectrum licensees to "sell" capacity to Ardis, Berger acknowledged.

RAM Mobile Data was able to license directly from the Federal Communications Commission a significantly larger chunk of spectrum, which it can deploy as demand warrants.

Coveragewise, while the Cellular Digital Packet Data (CDPD) group has released Version 1.0 of its protocol for sending data over the widespread analog cellular network, it could take two years for CDPD coverage to equal that of the packet networks [CW, July, 26].

Andrew Seybold, editor of the "Outlook on Mobile Computing" newsletter, explained that McCaw Cellular Communications, Inc. plans to implement CDPD on just one channel out of six per cell, and only on certain cells by June of next year.

NetWare 4.0

CONTINUED FROM PAGE 61

structure. "Initially it was tough; if you try to take what you have [with v3.11] and manipulate around the differences, you will be in trouble."

Particularly challenging for the group was how to set up a directory structure that would give users easy access to whatever resources they wanted in the enterprise, without having to keep shifting from one directory "domain" to another, McCubbin said.

The approach settled on was to fit "the largest unit of your organization you can" into one domain. Users could then access one another's resources without shifting to a different organizational context, as defined by the directory.

The idea was to avoid taking up network administrators' time with updating the directory to reflect users' moves and changes between divisions and departments, McCubbin said. Someone makes a departmental move about once a day at any 1,000-person division within National Grocers.

The structure chosen by the chain comes with a caveat, however: Users must take responsibility for controlling who accesses their files. McCubbin's group is teaching users how to dynamically allocate access to their files and create subdirectories.

McCubbin ascribed his company's comparative lack of problems with NetWare 4.0 to the fact that it has pretty much gone by the book in implementing the system.

"We don't try to do wild things with scripts of network configurations in order to get an extra .03% in performance; it's when people do that that they get in trouble," he said.

Support needs

The one area that Novell needs to work on with its new enterprise-oriented system is disseminating information and support to users, McCubbin said.

"When you buy software for your IBM mainframe, once you pay the license your updates, changes and patches come automatically to your desk. The account manager assigned to you comes in once a month."

That level of support does not yet exist in Novell's organization, even for major accounts such as National Grocers, which runs a 1,000-station Novell network, McCubbin said.

However, Novell said it is working on getting its support up to the level that goes with an enterprise networking vendor, he added. "And they are getting some cross-pollination from their partnership with IBM."

Hewlett-Packard Co. has introduced two Windows-based software packages for managing local-area networks.

According to the company, HP's OpenView Workgroup Manager/Windows and HP OpenView Interconnect Manager/Windows were designed to reduce the effort and expense required to manage LANs as they expand.

The HP OpenView Workgroup Manager/Windows offers workgroup-level network management for PCs, printers, hubs and workstations. It can automatically discover what is on the network and draw a hierarchical network map, displaying the network topology, the company said.

A superset of the capabilities of Workgroup Manager is provided with Interconnect Manager, maintaining the same user interface.

Interconnect Manager performs router configuration via a Telnet capability, monitors and controls bridges and routers, and provides real-time trend analysis.

HP 28688E OpenView Workgroup Manager/Windows costs $2,000, and HP 27256E OpenView Interconnect Manager/Windows costs $4,000.

▶ *Hewlett-Packard*
3000 Hanover St.
Palo Alto, Calif. 94304
(415) 857-1501

Novadigm, Inc. has announced the Novadigm Enterprise Desktop Manager (EDM), a fully integrated systems management solution for managing the deployment and distribution of enterprise applications, including 3270, client/server and frontware on the desktop.

EDM consists of three distributed components. EDM:Manager controls desktop configurations, enterprise application components and policy relationships in a central database repository. Enterprise management functions are provided by EDM:Client, an enterprise desktop-resident facility that works on the desktop in conjunction with EDM:Manager. EDM:Administrator is a systems management facility that enables users to configure the EDM:Manager and distribute management services to authorized desktops, the company reported.

EDM costs $100 per user, $1,000 per administrator and $20,000 for the enterprise server.

▶ *Novadigm*
Park 80 West
Plaza 1
Saddle Brook, N.J. 07662
(201) 845-8888

Attachmate Corp. has announced Extra for OS/2 Release 1.0, a desktop-to-host product.

The new software connects OS/2-based PCs to IBM mainframes and is fully compatible with IBM's latest OS/2 2.1.

The company said it provides a workplace shell user interface and that Extra for OS/2 allows up to 26 simultaneous host sessions and supports 3270 screen sizes up to 27 lines by 132 characters.

The product was designed for client/host processing and can be configured to connect to the host in an assortment of ways, such as local-area network gateways, Token Ring, Ethernet 802.2 connections and 3270 coax links.

Extra for OS/2 costs $425.

▶ *Attachmate*
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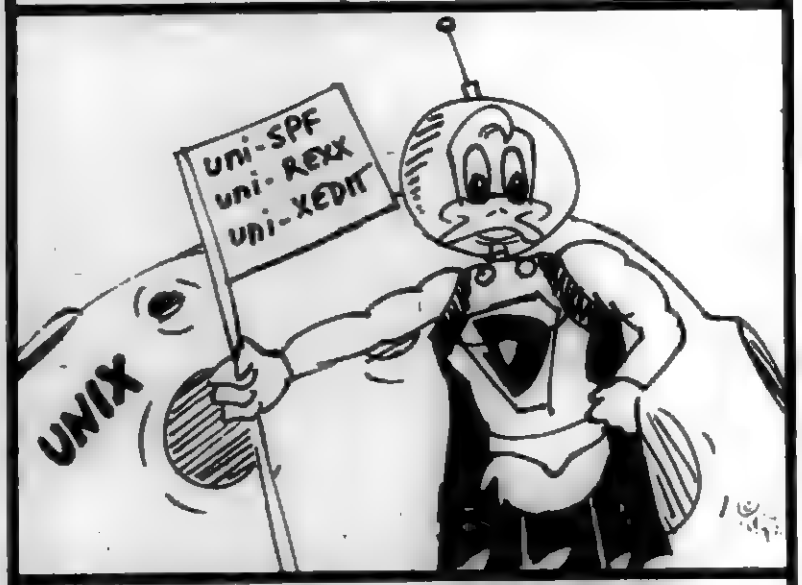

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Jeffrey N. Fritz

Falling for a technology

There is strange sociology in enterprise networking. I don't know if the implementation of an enterprise network has ever been studied, but it would make a great thesis topic. Here is the premise: Every new enterprise networking technology goes through a sociological cycle that is not unlike dating. It's no different from what happens when you catch the eye of someone interesting across the dance floor.

The relationship has six phases:

• **Phase one:** Eyes meet for the first time. This is the introduction of the new technology. Four-color product literature appears. Marketing leaks product specifications to the media and certain key users. The specifications astound the technology's own designers. Standards bodies, attempting to lead the implementation, begin the standards development.

• **Phase two:** The couple dances and begins to fall in love. This is the hype phase. The idea is to create excitement by pouring out semitruths and outright distortions disguised as facts. Hype flows freely. It flows from marketers, from early adopters and from the media. The sales force is deployed to promote the vaporware and secure a leading image in the marketplace. Standards bodies are in a fracas.

• **Phase three:** They look closely at each other. "Oh my gosh! He/she has zits!" Phase three is referred to as the panic phase. Alarms are sounded by rival technology vendors that fear being shut out by a perceived rush to the new technology. The rivals have fallen victim to the hype issued in phase two. Alarms are sounded by never-to-be-users (so they think), who fear losing out if the new technology makes it.

Alarms also come from the media, who are listening to never-to-be-users and rival technology vendors. Early adopters read the negative press and, fearing they backed the wrong horse, become defensive and lose confidence. The product appears in test deployments. Standards bodies are still in a fracas.

• **Phase four:** Prophets of doom predict the relationship will never last. Phase four is the death knell phase. Rival vendors announce that newer technologies (which, of course, they will develop) signal the death of the technology. The media reports the technology will never make it. Potential users are shaken and become unsure of their implementation strategies. (Interestingly, early adopters ignore phase four entirely.) Early products hit the market. Standards bodies are still in a fracas.

• **Phase five:** I'll take him/her, zits and all. Phase five is the boredom/realism phase. The media is bored with the technology and has stopped reporting on it. The sales force is bored with the technology (but still does not understand it). Users finally realize the technology may not be perfect (as initially advertised), but it does fill a need. Standards bodies become bored and move on to other technologies. Standards are still not set.

• **Phase six:** The couple becomes as comfortable as old shoes. Phase six is the product phase. During this phase, the product and its related products are available off the shelf. (It is easy to tell when a product or service has reached phase six: You can buy it at Radio Shack.)

Here is how I see today's network technology lineup. ATM has the honor of being both in phase one and phase two. SMDS is in phase three. FDDI shares phase four with frame relay, and ISDN is in phase five. Only modems have reached the coveted phase six.

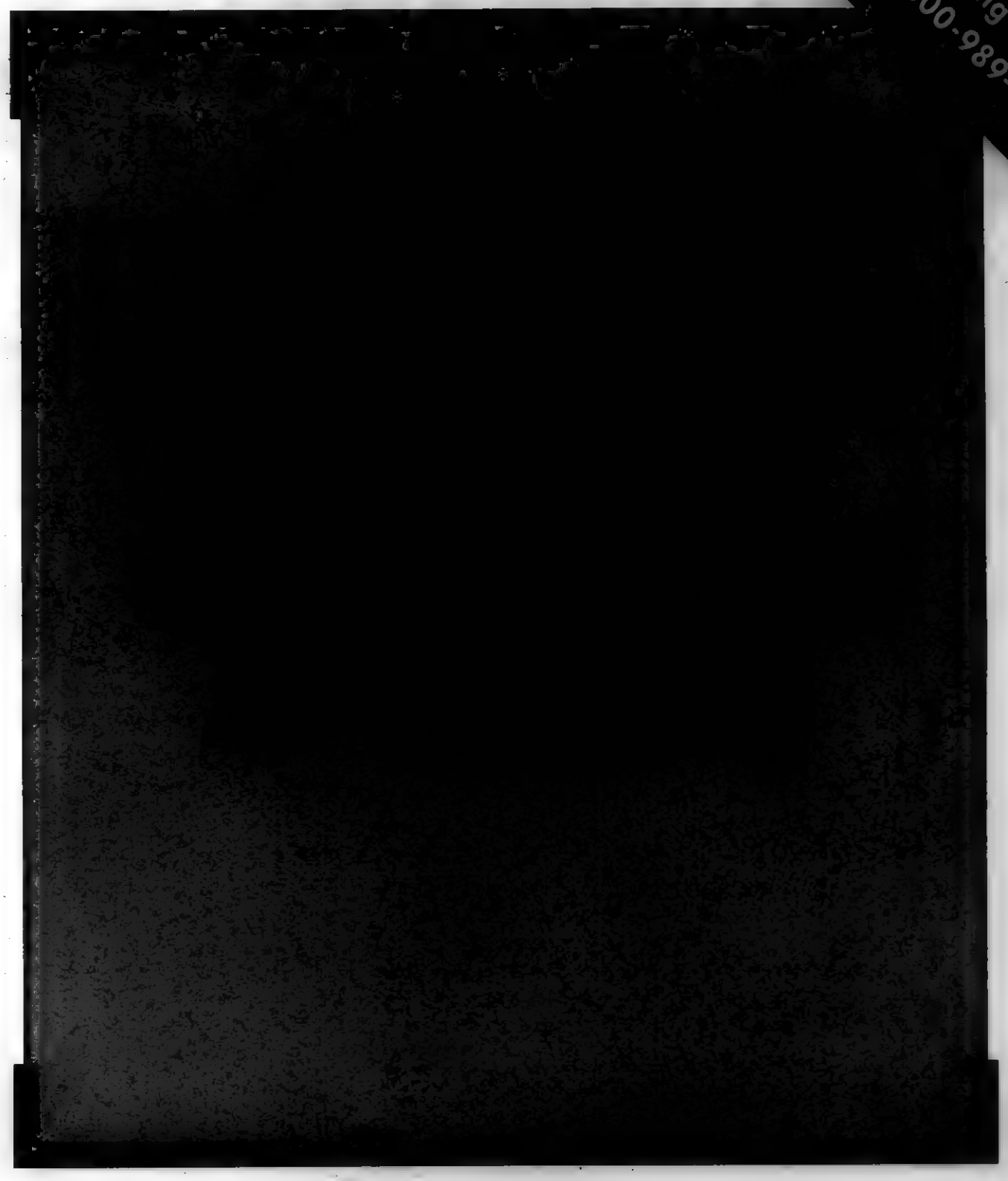
If you want to watch the cycle, pick a young technology and follow it. Watch ATM, for example. Listen carefully to the vendors that will sell it and those that think they won't. Read the media coverage as the technology progresses through each of the six phases. Pay particular attention to coverage of early adopters and antagonists. Watch carefully and you'll see the cycle. It happens every time and is fun to watch.

Although entertaining, the new technology dance does have a dark side. There is a tendency to be sold on what the marketers want, not on what the user needs. The user can be misled into avoiding certain technologies or falling into others. Armed with a good dose of reality, users can protect themselves from the technology dance. The key is to separate fiction from the reality of the product or service.

True love in a marriage occurs when both partners realize they married a person, not a fantasy. The same holds true in the new technology dance. Fall in love with what the product or service can actually do for your enterprise, not what the color brochures and marketers lead you to believe it can do.

The most amazing part of the technology dance is that it is cyclical. So even as we begin the dance with ATM, you can be sure that deep inside some lab somewhere, the technologists are hard at work creating tomorrow's next new love. You and I don't know anything about it yet, but, believe me, we soon will.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.



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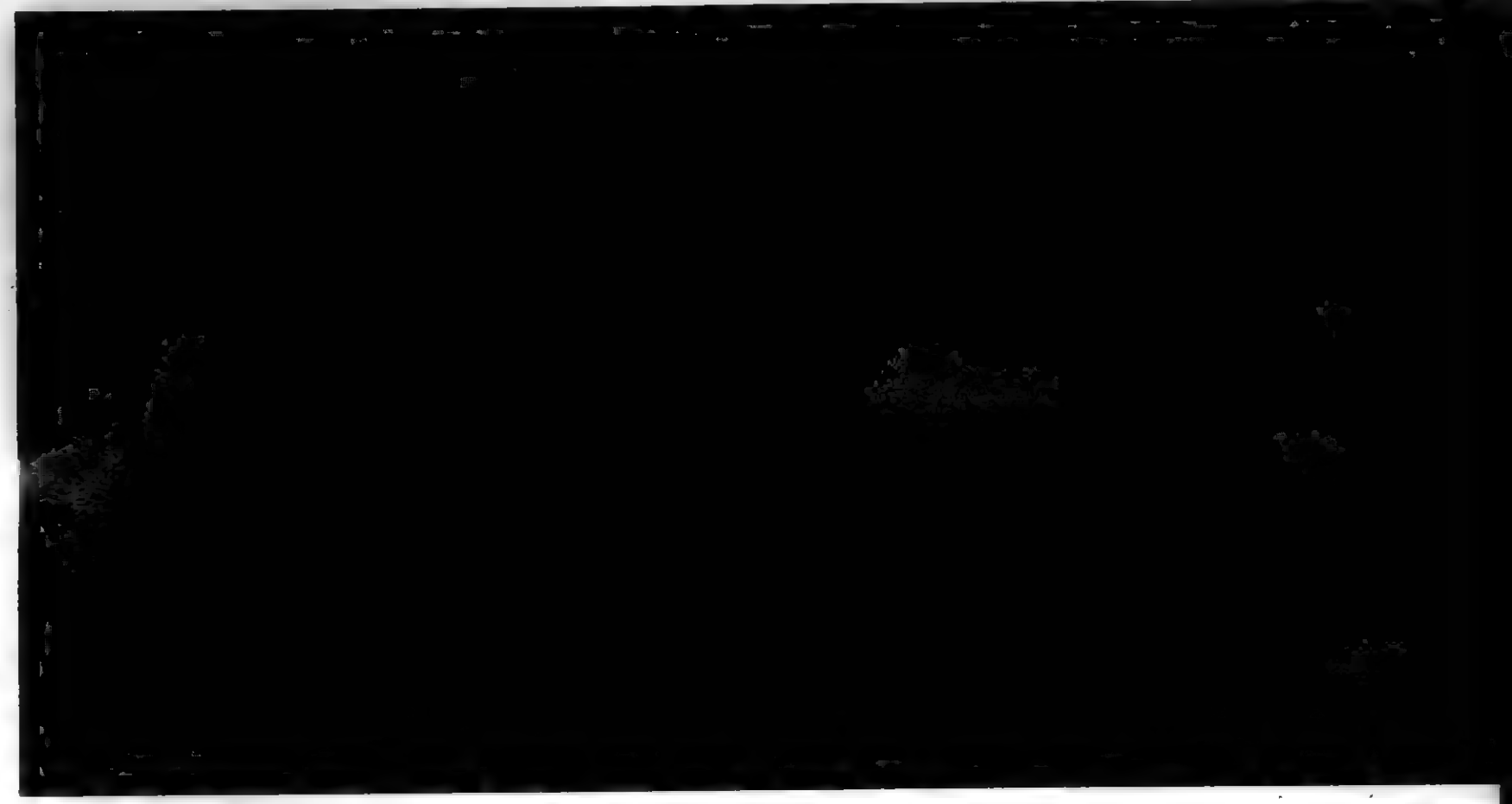

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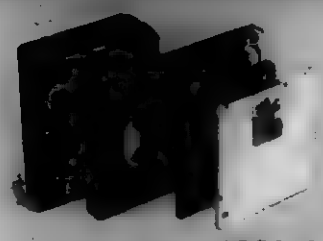

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U.N. group globalizes data modeling

By Thomas Hoffman
NEW YORK

Promoting the social and economic development of Third World nations is a noble cause. But carrying out that mission from more than 100 points around the globe is no easy task.

Such is the challenge facing the United Nations Development Programme (UNDP). UNDP is the world's largest multilateral grant development assistance organization: It supports 6,000 projects in 174 developing countries at any given time. The funding agency acts as the chief administrator of $1.7 billion for projects aimed at helping underdeveloped countries achieve self-reliance.

Of the UNDP's 6,000 staff members, 80%, or 4,800, are located in the field.

Over the years, UNDP has helped establish systems in each of its 120 field offices. Most of the 3,000 desktop devices used in the field are IBM-compatible PCs that run Cobol-based financial applications. The field offices administer funding for projects that are handled by U.N. agencies such as the World Health Organization.

The UNDP New York staff *(l to r): Renjay Yin, Tillie Ch'ien Eng, Malcolm Chisholm, Hossam Galal and David Joel*

But most of the UNDP field office systems are independent of one another and do not communicate well, according to Malcolm Chisholm, manager of data administration and systems development.

To better integrate these systems while reducing redundant data entry, the UNDP last year embarked on a project to develop a corporate data model. The project, which has cost the UNDP approximately $300,000 after 18 months of development, was designed to provide a logical framework for a corporate database so that all future systems can be designed for that database. In addition, the corporate data model would allow UNDP to retain its existing field systems.

The UNDP has decided to standardize

Data modeling, *page 74*

ON SITE

U.N. Development Programme
New York

Challenge: To facilitate information and reduce redundant data entry for use in field offices.

Technologies: Logic Works' ERWin, Microsoft's FoxPro, Sybase's Adaptive Server.

Situation: Migrating from field offices to share common systems, allowing the UNDP to retain its investments in existing systems.

HP plans to introduce large Unix servers this fall

Users reluctant to pay big bucks for big iron

By Mark Halper
PALO ALTO, CALIF.

Some recent modifications and price cuts by Hewlett-Packard Co. to its Unix line of minicomputers do more than underline the resistance HP has encountered from price-wary users balking at upgrading to the company's big iron.

HP's moves are also intended to clear room for a fall introduction of HP's largest-ever Unix systems, which will offer twice the number of processors and incorporate more powerful versions of HP's Precision Architecture-RISC chip.

HP introduced its Corporate Business Servers as the centerpiece of its mainframe-alternative strategy a little more than a year ago. In the last month, it slashed prices almost in half — from $668,500 to $360,000 for a four-processor version, for example — and began including software, such as databases, that previously cost extra.

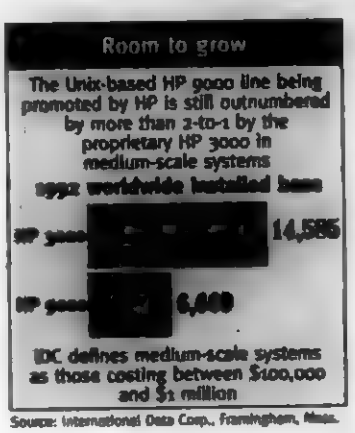
Around the same time, HP rolled out more powerful versions of lower-priced Unix machines, giving power users a less expensive option to the pricey Corporate Business Servers [CW, June 28].

The company confirmed that it plans to bring out more powerful machines "later this year," and analysts and users said they expect those machines to be priced no higher than the old Corporate Business Servers.

The new machines will house up to eight processors, compared with a maximum of four on the current Corporate Business Servers, which are also known by their old code name, Emerald. They are also expected to house the 7100 version of HP's PA-RISC microprocessor; today's models use less powerful editions of the chip.

Emerald got off to a rocky start last year when HP encountered manufacturing problems tied to one of its parts suppliers, which HP has never identified.

Once HP resolved the problem, it registered brisk shipments of Emerald systems. HP likes to boast that it delivered 200 by the end of last year. But the company is reticent when asked about shipments during the first half of this year, and all indications are that high-end business has slowed.



Ready for more power

The cut in orders seems to be the work of a double-edged sword. One main reason, according to Salomon Brothers, Inc. analyst John Jones, is to set the stage for a fourth-quarter announcement of the more powerful systems.

"They're posturing for a rollout of a second round of Emerald products in the October/November/December time frame," Jones said. HP declined to commit to a specific time frame.

Eric Fisher, principal at Fisher Systems Consulting in Groton, Mass., said he thinks HP will introduce the new systems before Oct. 31, which marks the end of the company's fiscal year.

"They'll be looking for an end-of-the-year kicker," he said.

The other factor apparently mitigating Corporate Business Server sales is user wariness over big ticket purchases. General economic conditions have not helped, analysts noted.

"Right now, not too many people are buying $400,000 machines, let alone $1 million machines," said S. G. Warburg & Co. analyst David Wu. "People have to have the money to spend."

"There's nothing wrong with the system. It's what's wrong with the world," observed Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco. "HP's strategy is targeted at IBM replacement. That market is sort of stuck because customers have been unclear what they want to do, and they don't always have the capital budget to do it."

Gordon Kerr, Hyatt Hotels Corp. senior vice president of MIS, further pointed out that when HP expanded the midrange of its Unix minicomputer line upward, it gave users less reason to pay hundreds of thousands of dollars more for the Corporate Business Servers.

Fisher agreed, pointing out that because the new midrange models use the 7100 processor, they could actually outperform the Corporate Business Servers for integer-intensive operations, although the Corporate Business Servers would still be more suitable for I/O-intensive transaction processing involving hundreds of users.

But while users have apparently been balking at buying today's Corporate Business Servers, a beefed-up product at about the same price just might make a difference, Fisher observed.

"When the 7100 gets into the Emerald, hold on to your horses," he said.

Power sells

Mark Shirman, president of Innovative Information Systems, Inc., a Norwood, Mass., integrator, added to that assessment, noting companies that are considering migrating from proprietary mainframes to Unix boxes may be more likely to make the switch if they trust the power of the replacement box.

"The more power that's there, the better it is for them," Shirman said.

His firm has been involved in many HP mainframe downsizing projects with customers including Paccar, Inc., Weyerhaeuser Co., Minnesota Mining & Manufacturing and Levi Strauss & Co.

Software conversion efforts are also less tedious when they are from a mainframe to a large Unix box than to several smaller Unix machines, Shirman said.

Re-engineering pays off at Cigna

By Thomas Hoffman
PHILADELPHIA

After completing about one-third of a four-year project to re-engineer one of its customer service units, Cigna Corp. is beginning to see impressive results, including a 35% rise in staff productivity through process changes, and it expects more gains through the use of new technology.

Seeking to provide faster and better response to customers' inquiries, Cigna combined what had been stand-alone customer service, billing, claims and other functions into a cohesive set of teams at its Voluntary Insurance Products Division.

An infusion of new technology will complement the team concept. Cigna replaced its rigid IBM 3270-type terminals with an OS/2-based Token Ring local-area network running IBM's LAN Server network operating system. By year's end, the OS/2 system will include Windows-based visualization software designed to enable customer service representatives to toggle between a slew of departmental systems.

Faster service

Empowered with information from billing, claims and other departments, the unit's customer service representatives were able to process 35% more inquiries in the year following the re-engineering than they did prior to the initiative, according to Benjamin A. Tomb Jr., senior vice president of Cigna's customer services.

Furthermore, Tomb said the unit, which handles 30,000 inquiries per month, stands to triple its productivity once the Windows-based system and a new work-flow strategy are implemented.

Eventually, he said, the company expects to reduce the costs of servicing its insurance products by 65%. Though he declined to disclose what the actual payback would be, Tomb said he expects the information technology implementation to contribute to three quarters of the cost savings.

Cigna revamp

PROBLEM AND SOLUTION
Customer service representatives used to have to check with other departments such as billing to answer inquiries. The new system allows them direct access to on-line information.

THE RESULT
35% improved productivity
65% lower cost for Cigna

Tomb would not speculate on when Cigna is expecting a return on its technology investment.

Such productivity gains, while startling, are not unusual. Most insurance firms are in the midst of re-engineering their customer service departments and one, United Services Automobile Association (USAA), has made significant strides, according to Catherine M. Weston, a partner in the insurance consultant practice at Ernst & Young in Boston.

Weston said USAA set a benchmark for the insurance industry when it re-engineered its customer service operations and pioneered the use of image technology at its San Antonio headquarters in the late 1980s.

"Insurers are taking cues from companies that do customer service well, including airlines and mail-order catalog companies like L. L. Bean, where a question gets answered on a first call," Weston said.

Voluntary insurance products, which include group universal life insurance and long-term care insurance, have been a hot ticket for Cigna. The company has seen annual revenue growth of 20% to 30% during the past four years, and these rates are expected to continue, analysts said. To meet that growth while improving customer satisfaction and curbing the unit's escalating costs, an overhaul of the division's operations was necessary, according to Tomb.

For example, in the past, when customers would call in with a billing problem, a Cigna customer service representative would have to request and receive information from the billing department before returning the client's call.

Cigna changed that by cutting out layers of bureaucracy. Now, the customer representatives are "generalists" who have been trained to handle new functions, including billing and claims.

"Re-engineering has given me the opportunity to learn a lot more about the product itself and expand the knowledge of everyone else who works here," said Valerie Pasalodos, one of Cigna's customer service representatives.

Satisfied customers

Before the re-engineering project began, Cigna's "first-call satisfaction" levels hovered at around 75%, Tomb estimated. But since streamlining these functions so that teams of customer representatives could answer nearly all inquiries on a first-call basis, call satisfaction has improved to greater than 90%, Tomb said.

That compares favorably to industry rates, which analysts put at 30% to 80%. To date, Cigna has been able to achieve these results solely through the transformation of the unit — before any technological changes have been put in place.

Cigna's productivity gains and cost savings are expected to rise even more once new technologies are added to the team concept. At the heart of the system, Tomb said, is a Windows-based visualization software package from Easel Corp. resold by IBM. The package allows customer service representatives to toggle between systems in other departments to gather account information more effectively.

Tandem leans on RISC for growth

By Jean S. Bozman
CUPERTINO, CALIF.

Tandem Computers, Inc. is betting on reduced instruction set computing (RISC) and open systems as avenues of growth for the $2 billion company, introducing a revamped RISC-based fault-tolerant computer line that analysts said could compete directly with general-purpose Unix servers from Hewlett-Packard Co., Sequent Computer Systems, Inc. and Pyramid Technology Corp.

That means the new NonStop Himalaya computers will carry much lower price tags than non-RISC Cyclone machines.

Tandem has traditionally charged a premium price for its fault-tolerant systems. Now it is trying to overcome a recent sales slowdown by focusing on overall price/performance. It optimized its NonStop operating system for Mips Technologies, Inc. RISC chips, boosting performance of the low-end and midrange NonStop machines by up to 30% and overall price/performance by up to 60%. The new high-end NonStop Himalaya K10,000 machine, a massively parallel processor, has twice the power of the current Cyclone machine, Tandem said.

Longtime Tandem users said they are happy about increased price/performance and lower price tags, but many said they have not yet considered putting Posix on their Tandem systems. "Cost is going to be a big deal for us," said one Midwest user who did not wish to be named. He said he is concerned that Unix processors at his site will not be as reliable as the older Tandem machines. "Once we have more experience with Unix systems, we will have evidence about whether Tandem's fault tolerance is easier to justify."

Hardware purchases

Consolidated Freightways, Inc. has just installed four Cyclone/R machines to replace eight older Tandem VLX machines in its Portland, Ore., data center, said Phil Seeley, vice president of administration and technology. It also purchased 48 CLX and CLX/R midrange processors that run Consolidated Freightways' image processing system for scanned documents. "We bought the CLXs that were coming off a three-year lease," he said. "The price was attractive, it's good technology, and they're reliable." Seeley said he has no plans to use Posix.

The new Posix option, which will allow users to write Unix-compatible applications that run on top of Tandem's proprietary Guardian fault-tolerant operating system, is intended to attract new sites. It is not a full Unix implementation, unlike Tandem's Integrity line of Unix System V Release 4 servers. That contrasts with competitor Stratus Computer, Inc.'s offering of separate VOS fault-tolerant and Unix System V.4 fault-tolerant versions of the same machine, both scalable.

However, analysts said the new Posix interface could broaden Tandem's appeal beyond the banking and telephone industries where its fault-tolerant system is already popular.

Client/server applications could also boost Tandem sales at new sites, analysts said. Tandem's new partnership with Unix System Laboratories, Inc. (USL) will allow many types of PC and Unix workstation clients to attach to Tandem servers via USL's Tuxedo transaction monitor, USL President Roel Pieper said.

The NonStop Tuxedo software will go into beta testing early next year and is slated to ship in late 1994, USL said.

Kernel of power

The power boost for Tandem's K100 and K1000 processors — enhanced versions of the current CLX/R and Cyclone/R machines — resulted mostly from changes to the NonStop Kernel fault-tolerant operating system, Tandem said.

The K100 and K1000 are 3.6 times as powerful as their non-RISC equivalents, said Chris Rooke, manager of Tandem on-line transaction processor systems marketing. The K100 and K1000 are due to ship in September. Entry-level prices will range from $25,000 for a K100 to $330,000 for a K10,000 model.

Tandem claimed that its K10,000 high-end machine, due to ship in December, would support more than 10,000 transactions per second if thousands of RISC chips are used. But most users will not install anything near the limit of 4,000 150-MHz R4400 processors due to space and price considerations.

Two processors will fit in a single cabinet, providing 100 transactions per second. A new fiber-optic link called ServerNet links up to 16 RISC processors to handle related tasks, Rooke said.

—Jean S. Bozman

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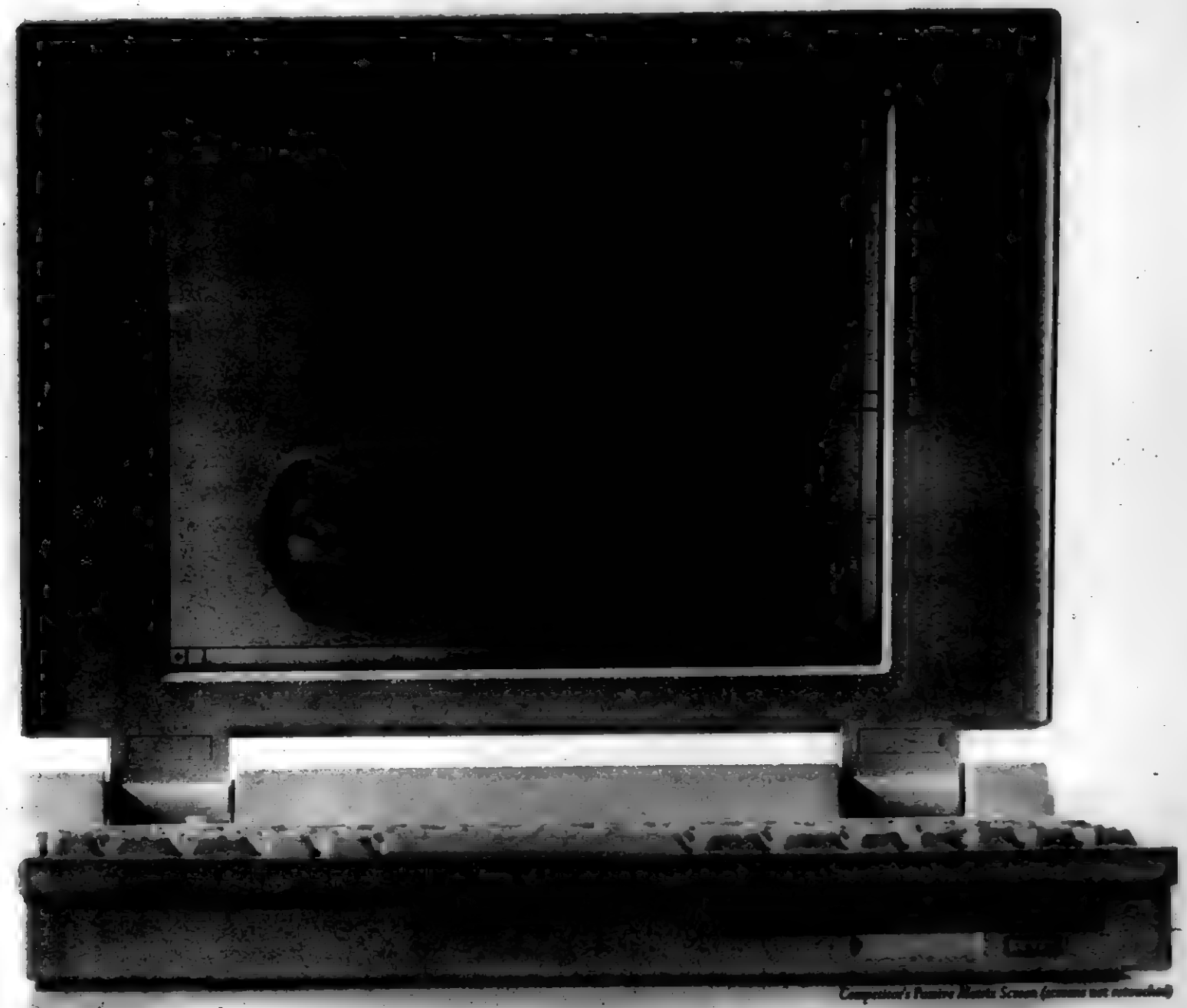

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Data modeling

CONTINUED FROM PAGE 69

its headquarters systems on SQL under Unix and Xbase in its field offices. Once the data model has been completed by the end of this year, a field office in Bolivia should be able to share an administrative system with an office in Ghana.

It will probably take years before all of the field systems are brought onto the data model, according to Chisholm. Still, the UNDP has made strides. For example, the agency plans to bring a full set of systems from its Latin American field offices onto the data model by the end of this year.

"What we're trying to do is develop one physical architecture worldwide for all field offices to build into," said Chisholm, who was unsure of UNDP's investment in existing systems.

Central to the UNDP data modeling project is Erwin, a database design suite from Logic Works, Inc. Staff members at UNDP's field offices are using Erwin to reverse-engineer data to run in Microsoft Corp.'s FoxPro application development environment. Meanwhile, systems specialists at UNDP's headquarters here are using Erwin to move data from a Computer Associates International, Inc. CA-IDMS relational database management system to a Sybase, Inc. 4.9 Unix RDBMS.

The data model has been designed so that file transfer between Unix or Xbase environments is seamless, Chisholm said.

UNDP, with a $10 million information systems budget for this year, considered standardizing all its field systems on Unix and SQL to achieve complete integration, but that plan would have been far too expensive and difficult to pull off at this time, according to David E. Joel, director of UNDP's Division of Management Information Services (DMIS). Joel said the agency will eventually make the transition to Unix, but it has not yet determined those costs.

Best for users

If carried out properly, data modeling projects can be quite effective for end users, according to Ronald G. Ross, editor/publisher of "Database Newsletter," which is published by Database Research Group, Inc. in Boston. "A data model is the best way we know today to make that translation of what users want from the business and a physical implementation of that," Ross said.

Selling the data modeling concept to UNDP's management was slightly more challenging, Joel said. "The idea of data analysis and data modeling was somewhat foreign to this organization," he added. "The concept that you would have data-organized structure between systems hasn't seemed to reach most business people."

But after explaining how data modeling could help UNDP better integrate its systems and cut down on redundant data entry, Joel and his staff were able to persuade the management committee to fund the project in February 1992.

DMIS began its implementation a month later in Costa Rica. At that time, the UNDP hired a consultant to train its Latin American field staff to identify and choose the best in each class of database applications they were running. Then, using Erwin, the staff members learned how to reverse-engineer their applications so the data could be incorporated into the model.

These efforts should be buttressed by planned communications enhancements. Currently, 75% of the field offices are connected to UNDP's headquarters using BT Tymnet's Dialcomm electronic-mail service through dial-up connections, according to Hossam Galal, who is responsible for systems delivery at DMIS. However, the dial-in connections will be phased out as UNDP increases the number of field office local-area networks and connects them to its headquarters.

Currently, 30 field offices have ArcNet or Ethernet LANs running Novell, Inc.'s NetWare operating system.

Wang program to offer imaging certification

By Craig Stedman

LOWELL, MASS.

Trying to boost demand for the imaging technology on which much of its future rides, Wang Laboratories, Inc. has set up a program to train resellers, consultants and systems integrators to design and install image systems.

Imaging sales have grown much more slowly than expected, and Wang blames that in part on a lack of imaging expertise in the market, said David Goulden, vice president of marketing.

He said Wang hopes to train 1,000 people during the next 18 months through the Wang Certified Image Consultant Program, which starts this month. About $2 million will be invested the first year, and the $4,700-per-person program is expected to break even during that period.

Goulden compared the program to Novell, Inc.'s certification training for NetWare engineers. While there is no requirement that participants agree to resell or work with Wang products, he said increasing Wang's market visibility "obviously is part of the objective."

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Softworks has announced CAT Scan 2.5, a flexible tool designed for reporting on Integrated Catalog Facility and VSAM catalogs.

Features for CAT Scan include a control card generator for VSAM Manager; a control card generator for DF/DSS Dump processing; generic selection of System Managed Storage data classes, storage classes and management classes; candidate volumes; selection; and display of fields such as last update date and time.

The ability to search through every catalog connected to the master catalog is also provided.

CAT Scan is compatible with IBM's MVS, MVS/ESA and MVS/XA operating systems. License fees begin at $4,450.

▶ *Softworks*
7700 Old Branch Ave.
Clinton, Md. 20735
(301) 856-1892

BGS Systems, Inc. has released Version 4.0 of the Best/1 for Open VMS capacity and performance management system for Digital Equipment Corp.'s Alpha AXP architecture.

The product offers daily performance reporting and performance prediction for VAX and Alpha AXP systems.

Features such as the ability to predict and report the system load on controllers, channels, interconnects and devices are provided. Best/1 for Open VMS can monitor performance and make choices about planning upgrades and determining optimum configurations.

Prices start at $20,000.

▶ *BGS Systems*
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Software Engineering of America has announced FastGENR 2.5 for MVS XA/ESA environments.

Escon support, System Managed Storage support, an unlike data set copy facility and a multiple I/O facility are new features and enhancements. Full exploitation of the MVS XA/ESA environment is also provided, the company reported.

Prices range from $9,900 to $36,450.

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1230 Hempstead Tvpk.
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Baber Information Services, Inc. has announced Reveal Job Scheduler for the IBM Application System/400.

Features for the product include multiple user-defined calendars, as many as 10,000 requests/executions per job event, conditional branching within job requests/executions and user-defined Date Parameters that can work as parameters or keyword values within job requests/executions.

The product provides future planning pictorial display/reports for work-load balancing, audit trail and tracking and reporting. Job completion messages can be tailored and sent to multiple users.

Every application can have its own user-defined calendar. Reveal Job Scheduler offers unlimited report regeneration and distribution capabilities, even across networks, the company said.

Reveal Job Scheduler has tiered prices ranging from $600 to $6,000.

▶ *Baber Information Services*
4417 N. O'Connor Road
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Xerox Printing Systems Division has introduced the Xerox Document Print Executive/400 (XDPE/400).

The print management software was designed to provide IBM Application System/400 computer users with automatic access to the full features of Xerox-intelligent, cut sheet laser printing.

With the product, unformatted data can be changed into professional-looking documents, the company said. Electronic forms, signatures, logos and fonts can be mixed with variable computer data to generate custom documents for applications, including accounts payable, general ledger, OfficeVision/400 and more.

Without any operator intervention at the printer, AS/400 users also receive access to Xerox-intelligent laser printer functions, which include capabilities such as two-sided printing.

A single copy of the XDPE/400 software for use with Xerox laser printers operating at 50 page/min. and lower output speeds costs $1,995. The XDPE/400 costs $4,995 for Xerox laser printers above 50 page/min. output speeds.

▶ *Xerox Printing Systems Division*
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Hardware

Computer Power, Inc. has released the Trimax II smart series Uninterruptible Power System.

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IBM pins AS/400 hopes on object-oriented

By Craig Stedman
ROCHESTER, MINN.

IBM has started shipping the first piece of a planned object-oriented application development environment that it expects will become the key development platform for Application System/400 computers by 1996. However, not everyone is convinced AS/400 users will be so receptive.

First out of the object-oriented gate from IBM at the end of last month was Envy/400, a client-level tool set based on the Smalltalk/V language and Ottawa-based Object Technology International, Inc.'s Envy/Developer cooperative development software.

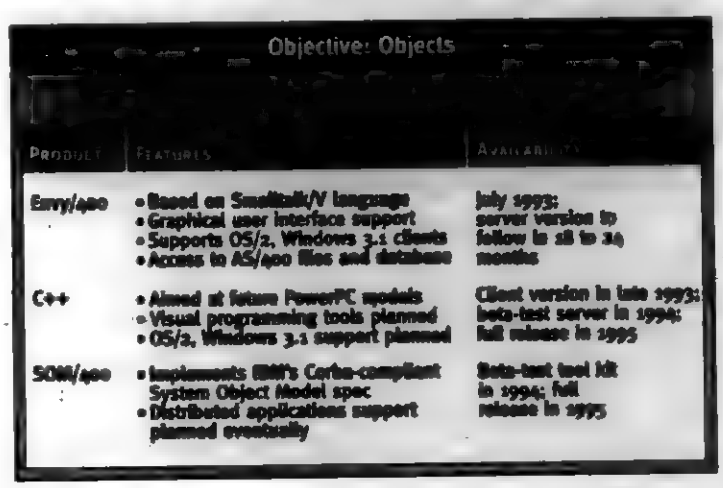
Following a two-pronged strategy, IBM said it plans late this year to add an initial C++ language implementation, again to write client applications that could access AS/400 files and programs. Full server versions of both products have been promised within two years.

John Swainson, manager of application development technology at IBM's Toronto software laboratory, said recently the company expects the object-oriented products to replace its RPG language as the dominant development medium for the AS/400 "by the mid-'90s at the latest."

However, analysts said they were skeptical about how quickly object-oriented technology will be embraced by AS/400 users, especially the proverbial mom-and-pop shops that make up much of the customer base.

Envy/400 has "a fairly significant learning curve," even for advanced users, said David Andrews, managing partner at ADM Consulting, Inc. in Cheshire, Conn.

"They will be selling snow cones in Hades before the installed base gives up on RPG," said Teresa Elms, president of Elms Information Services Group in San Diego. With IBM trying to remake the AS/400 into an open client/server platform, the object-oriented strategy appears to be aimed mainly at making it more attractive to new users, she said.



Jeff Broberg, vice president of research at Software 2000, Inc., a Hyannis, Mass., application vendor that beta-tested Envy/400, said it "has helped us immensely" in reducing development times. But he, too, said the object-oriented approach is not for everybody.

Envy/400 "takes a large commitment from an organization to produce the results you want to have," Broberg said. "This is really heavy-duty stuff here." Software 2000 set up a 30-person development group to work with the product, he noted.

Included in IBM's plan are object libraries that customers could use in building applications. Libraries supporting multiple visual metaphors are due out in late 1994, early 1995, and industry-specific libraries should follow one year later, IBM said.

Some large AS/400 shops said they are champing at the bit. "I'm pleased IBM is moving to objects because I think it's ready for the commercial market," said Scott Plumer, project manager for technical support at Gannett Co.'s data center in Silver Spring, Md.

Roger Finoli, manager of planning and technology at Dominion Textile, Inc. in Montreal, said he is interested in adopting an object-oriented approach. Its learning curve of three to six months is no longer than that of fourth-generation languages, he said.

However, Marc Cohn, senior vice president of information services at Enterprise Rent A Car Co. in St. Louis, said IBM's plan to add support for its Integrated Language Environment to RPG lessens his need to move away from that language. "To support the main flow of business, you don't need to construct a new model," Cohn said.

Price hurdles

An immediate block for Envy/400 is its price: $15,000 per user with a minimum three-seat requirement. "I couldn't even get near it" at that price, Plumer said. And Broberg described the cost as "nasty."

Jim Harens, director of development technologies at IBM's Application Business Systems unit, said the pricing and three-seat minimum were set "to make sure customers were serious" about using Envy/400. However, Harens acknowledged the expense, and he said a pricing change is in the works.

Envy/400 includes a tool for building graphical user interfaces and has built-in support for accessing AS/400 files and programs, IBM said. The Smalltalk/V product is intended for high-level application development, while the future C++ offering is expected to be used more for writing lower-level system software, according to both IBM and analysts.

Development tools

TI retools for client/server

By Johanna Ambrosio

Texas Instruments, Inc. has revamped its mainframe-based development tools to work in the client/server world.

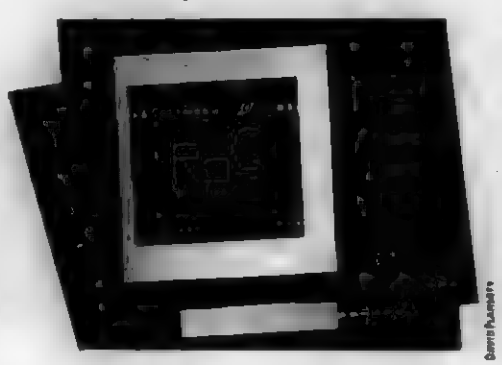
The Information Engineering Facility (IEF) for Client/Server will be delivered next month. New platforms include Microsoft Corp.'s Windows 3.1, OS/2, Hewlett-Packard Co.'s HP/UX operating system and Digital Equipment Corp.'s VMS operating system, among others. Additional platforms — including Microsoft's Windows NT and platforms from Sun Microsystems, Inc., Tandem Computers, Inc. and others — will be readied in the next year or two.

"We're losing our mainframe baggage," said Johnny Long, TI's director of IEF products and services. TI's existing customer base of 750 sites are exclusively mainframe-oriented.

TI, *page 80*

RPC tool kit takes hold at First Boston

By Jean S. Bozman
NEW YORK



First Boston Corp. started on the path to distributed computing years ago when it installed scores of Sun Microsystems, Inc. and other Unix workstations to support its trading activities.

But it took another step last fall when it began to use a remote procedure call (RPC) tool kit to distribute Unix client/server applications across the network.

The new tool, EZ-RPC from NobleNet, Inc., a small Southboro, Mass., start-up, has allowed developers to generate client and server "stubs" for distributed Unix applications. That way a trading application can incorporate real-time data feeds from stock market quotation services.

Linking old with new

The technology is a way to marry existing data-broadcast technology with emerging distributed computing networks. "We've got all these traders' workstations, and when a new price comes along, we want all these stations to receive it at the same time," said First Boston Chief Technology Officer Chip Steinmetz. First Boston uses Quotron Systems, Inc. technology to broadcast the real-time data feeds.

The RPC tool kit generates software that is in the fifth layer of the seven-tiered Open Systems Interconnect networking protocol stack, making it accessible to user applications.

"Now, instead of working at the transport layer, we're working at the session layer, so we have an easy interface for our programs," Steinmetz said. Applications can "grab" the updated trading data as it is broadcast over the Transmission Control Protocol/Internet Protocol network.

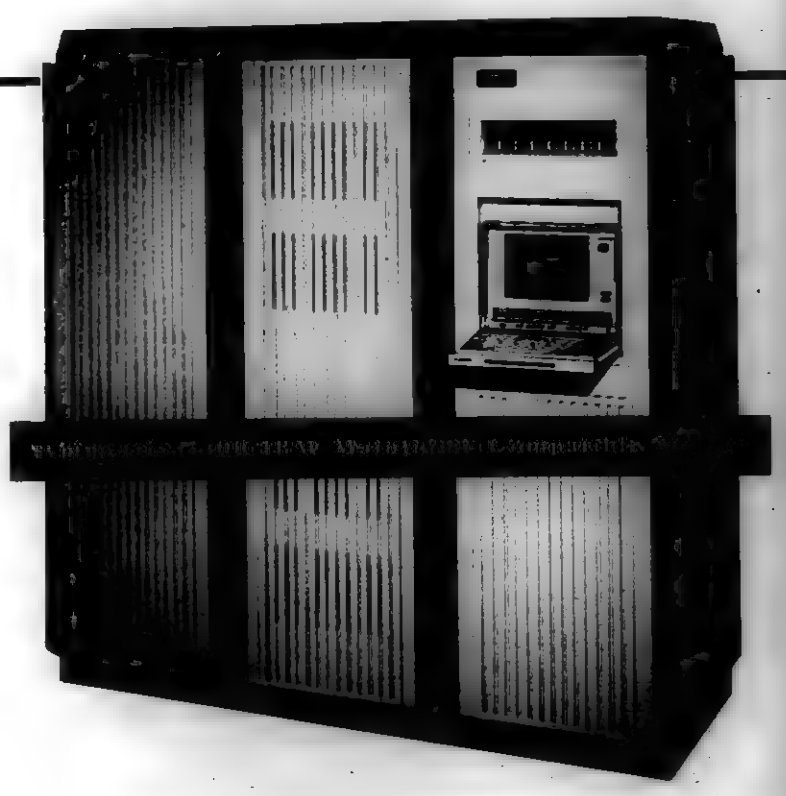
The pricing data originates in IBM mainframes running DB2, then crosses an IBM LU6.2 Systems Network Architecture gateway to reach the network of Unix machines.

The first release of EZ-RPC-based applications at First

Tool, *page 81*

Never be a disk storag fast been s

While other mainframe disk companies have been slow to deliver high data availability, the new Symmetrix 5500 ICDA™ from EMC was designed for IBM and compatible mainframe sites that need continuous operation – 24 hours a day, seven days a week. With redundant hardware now brings the unbeatable combination of superior performance and continuous operation to high-end mainframe computing. What's more, EMC is shipping this product today.



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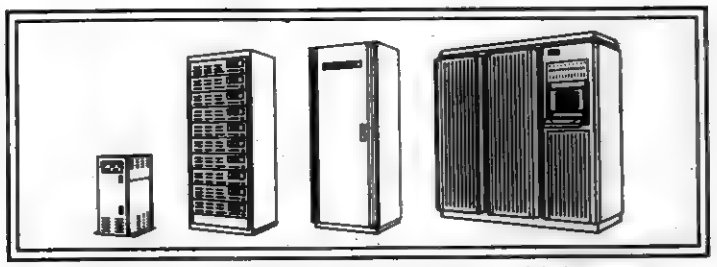

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TI retools for client/server

CONTINUED FROM PAGE 77

Key to the reworked tools is an encyclopedia that tracks all of the applications under development by teams of people in different departments or wherever they might be. New versions of the encyclopedia, based on the same one that now runs on IBM mainframes, will run on HP/UX and VMS as well as a local-area network under OS/2.

Software options

Another major difference in the new version is that it provides more options for users to develop software, TI managers said. With many development tools, users have to lump all the portions of the code into one effort: the interface, the core application logic and the data services.

With the new IEF, however, users can separate those components to develop them — and deploy them — on different platforms. In addition, TI sells a business modeling tool as part of the suite.

While some observers questioned whether TI's integrated set of development tools will make it in the plug-and-play world of client/server computing, customers seemed satisfied.

Michael Quintero, senior technical analyst at Blue Cross/Blue Shield in Jacksonville, Fla., was a user of the mainframe-based IEF. He said he has been using the new IEF version to develop a correspondent's system that will enable Blue Cross employees to send letters and other documents to clients about benefits changes and claims information.

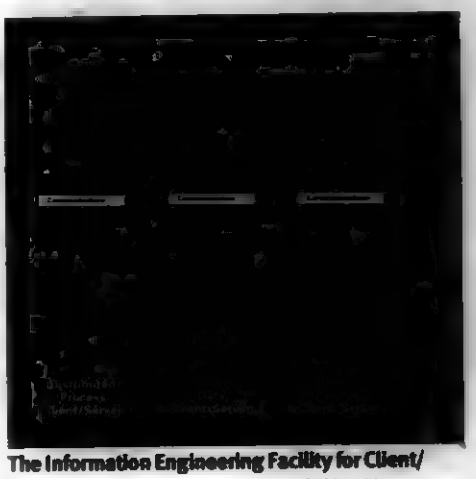
The application, which was in development about a month, runs in Microsoft's Word for Windows under OS/2. Whenever an employee needs an address or piece of information from the DB2 database sitting on the mainframe, he pulls down a Word menu. The request is sent and the information returned to the application.

"We can allow the user to stay in the environment he is used to and hit databases he doesn't even know exist," Quintero said.

Likewise, the development platform has been OS/2, although the company might develop for Windows NT.

Quintero said he likes using IEF because developers are already familiar with it. "It's stable, and we won't have to throw away the application in a few months."

The IEF-developed application at Union Pacific Technologies in St. Louis was a bit smaller in scale. For one thing, it was developed as "proof of concept" only and is not intended for production, said business systems consultant Don Black.



The Information Engineering Facility for Client/Server *supports many styles of client/server computing*

Second, the work involved replacing just the graphical interface portion of an application used in the information systems department — going from something written under the OS/2 Database Manager to using Windows and Oracle Corp.'s Oracle database.

Despite the relatively limited scale, Black said, "it was very time-consuming and very difficult. The next time should be easier." Still, he said, IEF for Client/Server "will be our development platform of choice going forward."

Uncertain future

Meanwhile, analysts were split on whether TI's integrated tool kit will prosper in the client/server environment, where many customers so far have opted for individual tools for specific needs rather than going with a one-stop shopping approach.

"The market has changed since the old mainframe days," said Ed Acly, an analyst at International Data Corp. in Framingham, Mass. "There are benefits to the integrated approach because the distributed world is more complex, but how successful TI is going to be remains to be seen."

Acly added that TI will likely make the biggest hit with mainframe customers who want to slowly evolve into client/server environments.

But Norton Greenfeld, an analyst at Computer Intelligence/Infocorp in Westboro, Mass., said, "TI is moving traditional CASE into the '90s. They have thought through the issues of what it takes for companies to move big systems to client/server."

CRAIG BROWN'S
OVERHEAD PRESENTATION
WAS SO IMPRESSIVE
NO ONE NOTICED THE
GUACAMOLE ON HIS TIE.

RPC takes hold at First Boston

CONTINUED FROM PAGE 77

Boston is in limited production, with just 10 traders using the distributed Unix software since late May. If the New York trial run of the distributed applications goes well, it will be expanded to other U.S. regional offices this month, Steinmetz said.

First Boston has about 700 Sun workstations and several Unix servers on its network.

The same technology will also be used to allow trading applications to interface with real-time data feeds from many information vendors, Steinmetz explained. "We've begun to create a generic broadcast protocol," he said. "We'll give it to the application programmers so they think they're calling a simple API."

Divide and conquer

NobleNet's EZ-RPC's compiler can divide application functions contained in a C language program. "It allows a C programmer to take any subroutine or API and break it apart from the application so that it can run on another machine," explained Dennis Ford, chief executive officer at NobleNet.

Unix System Laboratories, Inc. is incorporating EZ-RPC as its answer to a number of Open Software Foundation Distributed Computing Environment RPCs, industry analysts said. The RPC tool kit generates client and server "stubs" that allow users to distribute application functionality, said John Rymer, an analyst at the Patricia Seybold Office Computing Group in Boston.

"This technology makes RPCs a transport mechanism rather than a primary interface," Rymer explained. "You're defining little pieces of code that you link into your application." The net result is that application programmers can use the tool kit to generate RPCs automatically.

[redacted]

Mercury Interactive Corp. and Imperial Software Technology have announced product integration between Mercury's XRunner automated software testing system and Imperial's X-Designer graphical interface builder.

According to the firms, XRunner 2.0 uses a new object-oriented record and replay technology that generates test scripts that can be used for future releases and ports. The process of user interface design is automated by X-Designer, producing code that is portable across multiple platforms.

X-Designer coupled with XRunner's support for object-oriented testing permits X-Designer to generate applications that have built-in testability supported by XRunner, the companies said.

A single-user license of X-Designer costs $3,500.

▶ *Mercury Interactive*
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Watcom International Corp. has announced VX Rexx visual solution builder that enables users to develop graphical user interface (GUI) applications for OS/2.

VX Rexx includes a visual GUI form designer, a project management facility and an interactive source-level code debugger.

VX Rexx uses IBM's OS/2 Rexx, which is included with the OS/2 operating system, and it can be used as a scripting language for "Rexx aware" applications. The product also exploits multithreading and uses OS/2's 32-bit capability at design time and execution time.

Until Sept. 30, VX Rexx is available for $99. After that date, the product will cost $299.

▶ *Watcom International*
415 Phillip St.
Waterloo, Ontario
Canada, N2L 3X2
(512) 886-3700

STG, Inc. has released Axiom-SA, a Windows-based computer-aided software engineering (CASE) tool.

Support for Yourdon-DeMarco and Hatley-Pirbhai Structured Analysis is provided and, according to the company, the product is the first CASE tool to fully integrate requirements tracing, requirements analysis and documentation production into a unified environment under Windows.

Axiom-SA costs $1,495 per user.

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HOLD *on to your* HEAD

Despite a high number of CIO dismissals, *IS superstars such as Progressive Corp.'s Allan Ditchfield are in heavy demand*

Record-high CIO turnover is keeping execs — and companies — hopping. Here's why things aren't likely to get better and tips for surviving.

BY JULIA KING

Chief information officers hired within the past year can expect to stay in their current job between 18 and 24 months — slightly longer than the shelf life of a box of Shredded Wheat.

Unfortunately, despite some encouraging signs in the national economy, turnover among technology bosses is not expected to improve — and may worsen — during the remainder of 1993, according to consultants, executive recruiters specializing in information systems placement and CIOs.

Observers report a rise in job-changing activity that many believe will affect both individual careers and entire IS organizations and corporations.

"Turnover is accelerating. I can tell by the number of headhunters who call me," says Allan Ditchfield, CIO at The Progressive Corp., a $15 million insurance company in Mayfield Heights, Ohio. "They're not necessarily calling to buy me but to network."

In the last few weeks, Unum Corp. CIO John Alexander and Sprint Corp. CIO Ron Ponder topped the list of job-changing senior IS executives lured to more lucrative posts. (Alexander went to private consulting, Ponder to former rival AT&T.) Such superstars are lured by the promise of mega-compensation, which in Ponder's case topped $2 million a year.

Statistics support Ditchfield's experience. A recent Deloitte & Touche survey found that CIO turnover hit a record high in 1992, especially at large firms [CW, July 19]. At companies with revenue of $5 billion or more, the figure reached 25%. That's nearly a 100% increase from the average CIO turnover the previous year.

Overall, the consulting firm said that one-third of CIOs in 1992 took over from predecessors who had been dismissed or demoted.

That's quite a change from a couple of years ago. Back then, a CIO could safely assume that his job was safe, even a place to flourish professionally for three or four years. But corporate reorganization and downsizings, mergers and acquisitions, work-flow redesign and outsourcing continue to erode CIO tenures and security.

Other factors are also to blame, says Gary Kaplan, an executive recruiter in Pasadena, Calif. Several stem from the CIO's higher visibility and top management's higher expectations about what computers and networks can do.

In many firms, technology-smart senior executives voice a growing frustration over low payoffs from technology investments and initiatives. A *Computerworld*/Andersen Consulting study earlier this year found that more than half of 200 chief executive

CIO turnover, *page 86*

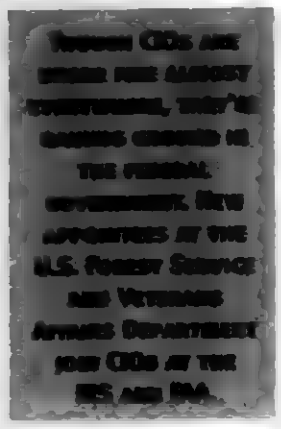
CIO turnover

CONTINUED FROM PAGE 85

officers, chief operating officers and chief financial officers surveyed were not satisfied with payoffs from their company's IS spending. Naturally, Kaplan says, they blame the IS chief.

Things further worsen when top managers begin to believe — fairly or not — that IS did not provide adequate information for key decisions. Their solution: Fire the CIO.

"When top management doesn't get what it wants from IS, the trend is to change top IS leadership to get its needs met," Kaplan says. "It's not so much that the incumbent CIO is incompetent — rather, that he or she is unable to take a company to its next stage of development."



More often than not, IS change involves hiring from outside the traditional IS ranks.

Technology itself is also a culprit, says Ted Standish, a former Gillette Co. executive who last July voluntarily left to join CSC Index, Inc., a Cambridge, Mass., consulting firm.

"Because technology changes so swiftly, the CIO must make more and more technology choices to move the company forward. Inevitably, a week later perhaps, some choices will be shown to be not as good as they could have been," Standish says.

It's a deadly dilemma. CIOs who are brave enough to keep up with technology risk having their decisions backfire, he notes. On the other hand, CIOs who wait until technology matures can find themselves in analysis paralysis.

Another big problem, adds Raymond Manganelli, president of Gateway Management Consulting in New York, is a potential clash between CEOs and CIOs.

The two, he notes, often have vastly differing mind-sets on important issues ranging from change, restructuring, IS cost-cutting (which CIOs generally consider far more important than their bosses) and business process re-engineering.

Staffs suffer, too

If accelerating turnover is alarming to CIOs, it's also unsettling to entire IS staffs. Whoever takes the IS reins, turnover at the top affects the entire IS organization.

"Change at the top is absolutely destabilizing," says Ditchfield, who left his post as senior vice president of systems engineering at MCI Communications Corp. to join Progressive in 1991. "When you come in from outside the company, there's at least one person who thinks he should have gotten the job and two others who are mad because that guy didn't get it. There's a real resistance."

He adds, "Like a comedian who's up on stage and being challenged to make the audience laugh, you're faced with a staff that's challenging you to show them how brilliant you are."

That's if you have a staff.

Larry Gunther didn't when he took over as CIO at Gillette North Atlantic Group in Boston. When Gunther hired on, Gillette was and remains in the midst of decentralizing its corporate IS staff and distributing personnel out to its divisions, he explains.

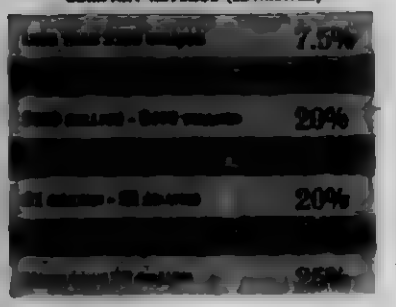
"Because I didn't inherit an organization, distrust on the part of staffers wasn't an issue. But there are other issues," he says. Chief among them: pent-up demand for IS services from functional managers and others who have little or no time to participate in key IS initiatives, including new systems for sales forecasting, distribution, requirements planning and customer service.

HOT JOBS, cold bodies

CIO TURNOVER

The percentage of new CIOs rose 25% — a significant increase.

CIO TURNOVER RATES BY COMPANY REVENUE (ESTIMATED)

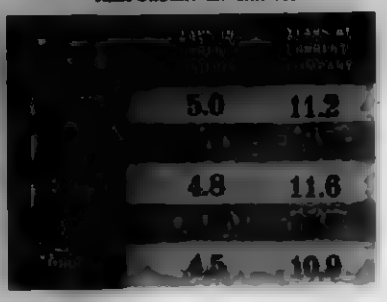


CIOs in large organizations were three times more likely to change jobs than counterparts in small firms.

REASON CIOs' PREDECESSORS LEFT

Despite a modest drop in firings, one-third of all CIOs left involuntarily. Some experts say that figure will worsen in 1993. Successors tended to be hired from outside the company when a CIO was dismissed or fired.

RESPONDENT EXPERIENCE



CIOs with longer tenure tended to fare better than newly hired CIOs, whose tenure averages 18 to 24 months. This supports an earlier Harvard Business School study showing 300% higher turnover for newer CIOs.

Source: Survey of 534 North American CIOs by Deloitte & Touche

"A lot of plans were put on hold pending the hiring of a CIO," Gunther explains. "Now there's a great demand to move forward with urgency, but there is a problem with getting adequate user involvement. We want the best resources available to staff projects, but the problem is that those people are busy running the business."

Standish is well-acquainted with Gunther's problem at Gillette. "When I left, there was a sizable effort going on trying to decide what the IS support strategy should be," he says. Three-hundred people were involved in IS, he says, with 100 of these at corporate IS, which essentially had its own agenda.

"It was like trying to command a convoy in the fog," Standish recalls, "and change direction with no communication between the ships."

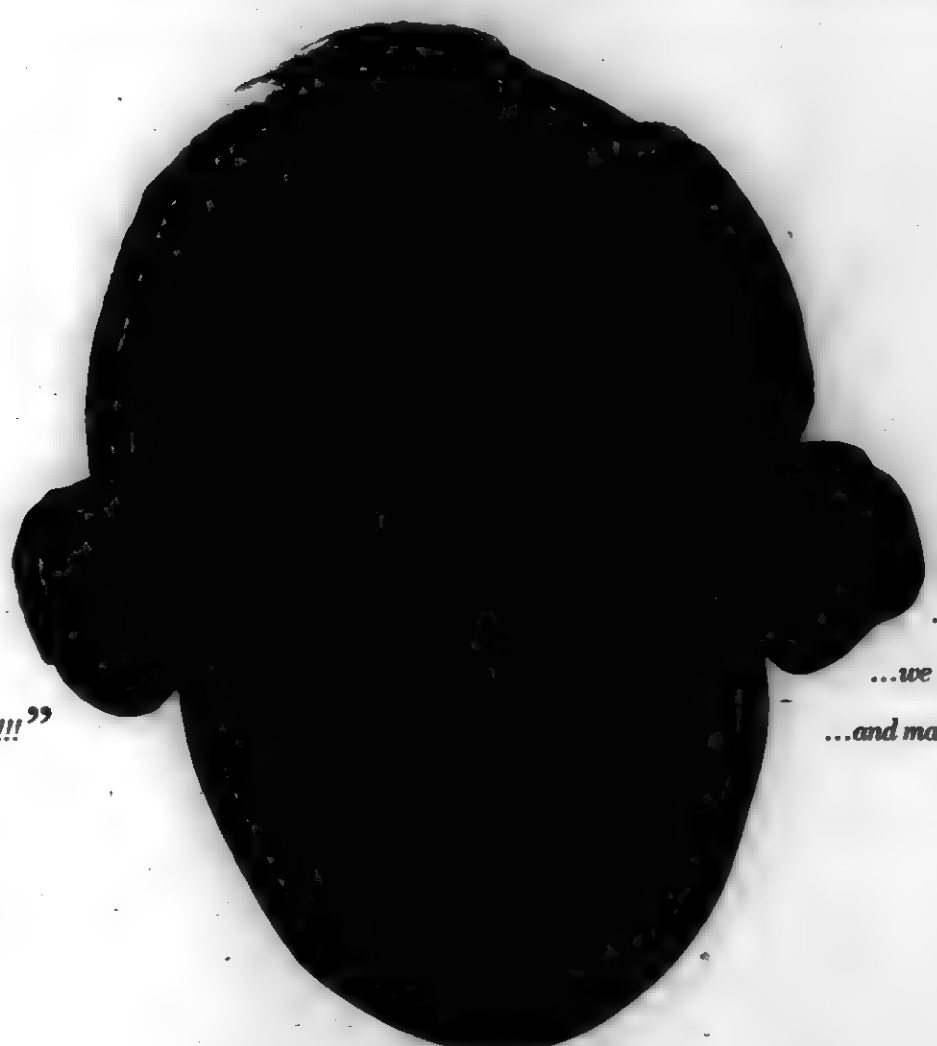
In general, Standish says, the role of the CIO is becoming much more political than ever because today's IS departments are trying to serve so many different constituencies — senior executives, user groups and so on.

For the IS chief, politicking involves keeping track of who has the most power (which is constantly shifting) and who should be served first. The political ramifications alone were enough to persuade Standish to leave.

"The new CIO is faced with trying to serve so many different constituencies that someone will invariably be unhappy," he says. "The question becomes: 'What is the strength of the person who is dissatisfied with IS?' If you're smart, you try to satisfy the major power bases and sacrifice the rest. But if the power

CIO turnover, *page 90*

Diagnosis: *Acute Demanditis*



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CIO turnover

CONTINUED FROM PAGE 86

base changes, you're in deep trouble," Standish says.

"The IS organization will continue to do what they think they're supposed to be doing, while the person on the top is constantly modifying direction, so there's always tension," he says.

All this politicking, he observes, makes for an unhealthy relationship between CIOs and IS staff members.

Some CIOs, like Standish, figure that it's just not worth it and leave. Some incoming CIOs try to heal the open wounds.

According to Ken Harris, vice president of worldwide information services at Louisville, Ky.-based Kentucky Fried Chicken, a division of Pepsico, Inc., time and honesty are the only cure-alls for alleviating tension and for building trust with IS staffers.

> According to a recent report on MIS Quarterly, high-level technology executives need to delegate better, avoid adversarial relationships, and language carefully and take adequate credit for...

"The first thing about stepping in brand-new is that you need to take stock of the internal IS customer base. You've got to know how happy they are. This will point up a lot of weaknesses and clue you in about where you need to focus your energy and resources," says Harris, who previously served as CIO at Taco Bell, another Pepsico company, and before that at Security Pacific Information Services Corp.

"After that, the most important thing is to be absolutely clear with IS about the goals of the company, your personal goals and your expectations of the people who work for you," he says. "People working for you will either fall out or accept the freedom and openness that comes from knowing the rules, and the relationship of trust builds over time."

Keep on talking

Other CIOs agree that communication is the best weapon to ease the high anxiety that inevitably accompanies high-level change in an IS organization.

"People always get anxious when there is a change, and communication is the best key to reassure people," says Susan Cramm, who moved into the CIO office at Taco Bell when Harris left. Part of her weekly routine is to meet one-on-one with IS staffers.

"The agenda doesn't have to be business. The idea is to let people get to know me personally," Cramm says.

Still, after 2½ years on the job, Cramm says staffers ask her when she will be leaving.

"It's almost as though they can hear a ticker running," she says. "Given the industry, there's not a lot you can do to convince them you're staying. There will always be this sense of underlying instability."

"IS staffers just think you're passing through," says a former CIO of a $4 billion technical services company in New York. "They get the same sense about their own jobs because it's happening to them, too."

Major downsizing

In his first year as CIO, for example, this CIO, who requested anonymity, says his company went through five downsizings as well as a major relocation from Massachusetts to New York. "We went from 110 people down to 50 people, and then we would hire staff for projects, then let them go when we had bad financials," he recalls.

In addition to communication, involving staffers in planning is critical to staff support, according to Kavin Moody, who was a CIO at Gillette and then Bank of Boston Corp. before becoming an independent consultant.

"Getting people involved and participating is probably the most important thing," Moody says.

In 1990, during the massive reorganization at Bank of Boston, which, among other things, involved the departure of former CIO John Rodgers, "we involved hundreds of people in the planning process, so there was a lot of buy-in," Moody recalls.

At this stage, few are willing to bet when CIOs' luck will change. Most say that these days CIOs, like politicians, need to consider re-election a full-time job. Some offer advice (see story page 86).

Master of all

The bottom line, according to Ditchfield and others, is the need to master technical, business and managerial disciplines.

"You can be the best technical person in the world and get systems engineering working, but without strong linkages with business, your vision remains just a vision," Ditchfield says.

And unfulfilled visions, he notes, are precisely the things that get CIOs fired. ■

King is a free-lance technology writer based in Ridley Park, Pa.

Calendar

AUG. 22-AUG. 28

Interop '93. San Francisco, Aug. 23-27 — Contact: Interop Co., Mountain View, Calif. (415) 941-3399.

AUG. 29-SEPT. 4

Annual International Gupta Developers Conference. San Francisco, Aug. 29-Sept 1. — Contact: Gupta Corp., Menlo Park, Calif. (415) 321-9500.

Fed Micro '93 CD-ROM and Multimedia Conference and Exposition. Washington, D.C., Aug. 31-Sept. 2 — Contact: Tom Lauterback, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Structured Development Forum. Philadelphia, Aug. 31-Sept. 2 — Contact: Espirit Systems Consulting, Inc., West Chester, Pa. (215) 436-8290.

SEPT. 5-SEPT. 11

Compuexpo '93. Las Vegas, Sept. 9-11 — Contact: UNSC Investment Group, Newark, Calif. (510) 657-3418.

SEPT. 12-SEPT. 18

Expo '93 East. Atlantic City, Sept. 14-15 — Contact: C.S. Report, Inc., Uwchland, Pa. (215) 458-6415.

Engineering Document Management Systems. Anaheim, Calif., Sept. 14-16 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 871-6808.

SEPT. 19-SEPT. 25

Mobile World. San Jose, Calif., Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Unix Expo '93. New York, Sept. 21-23 — Contact: National Blenheim Expositions, Inc., Fort Lee, N.J. (201) 346-1400.

Document World '93. Hartford, Conn., Sept. 22-23 — Contact: Key Productions, Inc., Hartford, Conn. (203) 247-8363.

SEPT. 26-OCT. 2

OOPSLA '93: Conference on Object-oriented Programming Systems Languages and Applications (OOPSLA). Washington, D.C., Sept. 26-Oct. 1 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

IS As A Service Organization. Columbus, Ohio, Sept. 27-28 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

Imaging Expo. New York, Sept. 28-30 — Contact: Comtek International, Wilton, Conn. (203) 834-1122.

OCT. 3-OCT. 9

The Ninth International Congress on Advances in Non-impact Printing Technologies/Japan Hardcopy '93. Yokohama, Japan, Oct. 4-8 — Contact: The Society for Imaging Science and Technology, Springfield, Va. (703) 642-9090.

OCT. 10-OCT. 16

Design/West. Anaheim, Calif., Oct. 10-12 — Contact: Karl Steidl, Reed Exhibition Cos., Stamford, Conn. (203) 964-0000.

Hypertext '93. Seattle, Oct. 14-18 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

CAD/CAM, CAE Reseller/Systems Integrator Strategy Workshops '93. Boston, Oct. 15-17 — Contact: Trish Griffin-Silva, Daratech, Inc., Cambridge, Mass. (617) 354-2339.

Intelligence Files

Pressing the people button

When it comes to implementing an imaging project, the strategic advantages are evolving from "having more" to "knowing more." With imaging, this knowledge is more than learning which button to push. It is a continuing search for functionality from the equipment and the people who use it. "Being smarter" is not something that happens all at once. It is part of an incremental process of improvement. Expect users to resist change, and try to educate them on the big picture rather than on simply how to use one part of the system.

Source: Special Report: Electronic Imaging's Impact on People, "Training: Programming the Peopleware," by Kathleen Hawk, Inform, January 1993.

Lip service

Customer service may be the battle cry of the 1990s, but a new survey of 100 top corporations shows there is a wide gap between business talk and business action.

A big majority of the corporate managers (87%) said they believe delivering value to customers is critical to success, but 70% said they judge customer service based on internal measures rather than customer measures (such as customer surveys). Furthermore, only 20% said employee compensation is tied specifically to customer satisfaction.

Source: Rath & Strong, Inc., Lexington, Mass., (617) 861-1700.

Blaming consultants

Take a good look at yourself the next time you plan to hire an outside consultant. Less-than-spectacular results on your last project may be your fault, not his.

To determine if you're ready to get the most from a consultant, make sure you're not one of the following problem types:

- **The carper:** Antagonizes consultants by communicating solely with derisive remarks.
- **The disappearing act:** Senior management and staff back off after the initial commitment.
- **The switcheroo:** Changing the company's point person breaks trust and slows progress.
- **The foolish miser:** Penny-pinching during implementation is always a bad idea.
- **The amnesiac:** Forgetting why the consultant was hired is always disastrous.

Source: "Bemoaning the Rotten Client" by Anne G. Perkins, *Harvard Business Review*, July/August 1993.

Hewlett-Packard computer systems helped Spalding's worldwide revenue grow four times faster than the industry average.

"Our HP 3000s have taken the worry out of daily operations and future growth. They leave us free to concentrate on customer service."

— Bard White, Spalding's CIO and Worldwide Director of MIS

Instead of investing in mainframes, Spalding looked for a better way to manage its growing business. A way that would make the 115-year-old sporting goods company more responsive to customer demands around the world and save money at the same time.

So HP developed a networked solution built around powerful HP 3000 Business Systems in a dozen data centers and distribution hubs worldwide. This gives Spalding instant global access to management information, helping them react quickly to changing consumer needs, and deliver products faster.

To learn more, call 1-800-637-7740, Ext. 7460 for our free video, *Strategic Computing*, starring some on-the-ball business leaders. It shows why you might want to rethink your company's game plan.

Think again.

HEWLETT PACKARD

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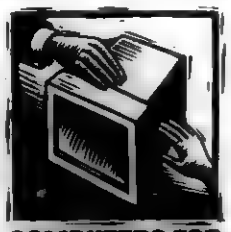

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   65. Communications Systems/Public Utilities/Transportation
   70. Mining/Construction/Petroleum/Refining/Agriculture
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
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   22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data/Tele Comm. Network Sys. Mgt., LAN Mgr., PC Mgr.
   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Programming Management, Software Developers
   41. Engineering, Scientific, R&D, Tech. Mgt.
   60. Sys. Integrators/VARs/ Consulting Mgt.

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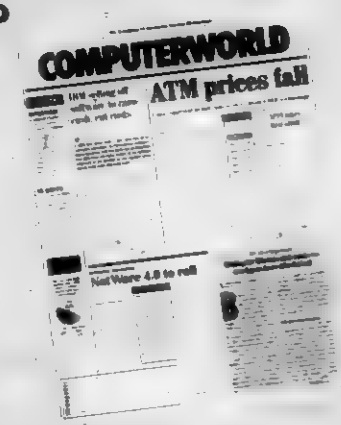

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   50. Business Service (except DP)
   60. Government - State/Federal/Local
   65. Communications Systems/Public Utilities/Transportation
   70. Mining/Construction/Petroleum/Refining/Agriculture
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   90. Computer/Peripheral Dealer/Dist./Retailer
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   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Programming Management, Software Developers
   41. Engineering, Scientific, R&D, Tech. Mgt.
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The CW Guide to LAN Disaster Recovery

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Next time, crash-proof your LANs with products that soften the blow and hasten business revival

COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

Cheyenne and Palindrome tape backup systems neck and neck in user satisfaction survey.
Page 99

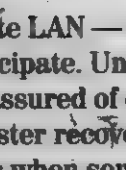
Bad things *will* happen to your corporate LAN — more things, unfortunately, than you can hope to anticipate. Unlike the mainframe environment, where you're assured of centralized control and can develop an airtight disaster recovery plan, there will always be an element of chaos when something on the local-area network fails.

The biggest problem is the variety of things that can go wrong: Is it a file server crash, a faulty hard disk, a LAN card or a workstation? Is it an application error or a problem with the network or desktop operating system? There's no one product on the market that can tell you.

Occasionally, the source of failure is clear, such as in the case of a natural disaster, theft or sabotage. But here more than ever, recovery involves many disparate elements that neither an individual nor a single team could carry out.

In this Guide, we present the products and services you'll want to have on hand in the event of a crash or disaster — from those that help avoid data loss, such as tape backup, RAID and power control devices, to those that help you get back on your feet, such as recovery services and utilities.

By no means are these products going to solve all your problems; many are just now evolving to meet the needs of LAN-based systems. What's more, much of LAN disaster planning involves not products but innovation and foresight. LAN experts and users say it's most important to stay flexible and be on the lookout for constant change.



Users of BusLogic's Chantal Disk Array Software especially like its nonproprietary nature.
Page 101

The blast went off

shortly after noon, shaking the World Trade Center towers at their foundation and plunging hundreds of people into smoky darkness. As David Diaz emerged from the building to the relative safety of Manhattan's sidewalks, the reality of the terrorist bombing began to take hold. Amid his other swirling thoughts, Diaz wondered if his recovery plan, implemented during the Persian Gulf war and tested several times since, would withstand the "real thing."

BY JOANNE CUMMINGS

Quick recovery is important to Dean Witter, Discover & Co., a brokerage firm in New York. With roughly 70 Token Ring local-area networks, all anchored by 486-based IBM Personal System/2 servers, Diaz, director of group information technology, had ensured that regular backups were done, tapes were stored off-site, power control devices were implemented and a contingency site was located should the building become inaccessible. But would it be enough?

Luckily for Diaz and his firm, the plan passed the test, and the firm emerged relatively unscathed. But for those schooled in mainframe recovery, Diaz's plan might appear less than bombproof. For instance, rather than regularly backing up every piece of data in the company, he backs up only the servers.

"We can't keep on top of everything," Diaz says. "We notify the users that they need to keep critical data on the servers. We own the servers and provide for off-site tape backup, but users are responsible for backing up their own hard drives."

Were the products available, Diaz could inventory each user's PC remotely and run the backup. But current automatic inventory software just can't deal efficiently with Dean Witter's thousands of end users and endless variety of PCs and configurations, he says.

As a result, some users learned a tough lesson. "Some people were backing up their PCs to a floppy they kept in their desk," Diaz says. "That didn't do them any good when we couldn't even get access to the building, which is really what they should have been planning for."

Diaz had made sure to manually collect PC configuration information from users to create a replica of its systems at another Dean Witter location. This was important since Diaz and his staff were allowed only limited access to the building after the bombing. "We do keep indexes on each server of server-resident files, and we do inventory the applications and hardware resident on each PC regularly. Then we can ensure that after a disaster, users can at least have the proper setup."

Mainframers who value continuous operations might also balk at how Diaz views uninterruptible power supplies (UPS). While the most critical servers are plugged into UPSs with surge protection, the battery backups will last for only about one hour. The goal is not continuous operation throughout a disaster; it is merely to allow for an orderly shutdown of the LAN servers.

Although Dean Witter was up

TIP

Cummings is a free-lance writer based in Marlboro, Mass.

12 TOOLS TO KEEP YOU UP AND RUNNING

A well-designed, carefully implemented network is the first line of defense against local-area network disasters. If something does go awry, though, you need to have the right tools in your kit to minimize downtime, recover data and reconfigure your LANs.

SERVER OR DISK REDUNDANCY

The major network operating systems support some level of file server or disk redundancy. For instance, Novell, Inc.'s NetWare SFT III provides server mirroring, where two file servers are linked via a high-speed connection so that if one server fails, the other keeps running.

Disk redundancy — where a disk drive failure does not stop file server operation — is less effective than server mirroring, but it costs less. There are two methods: disk mirroring and disk duplexing. Both provide redundant drives in a 1-to-1 ratio. Mirrored drives are usually attached to the same host bus adapter, while duplexed drives use separate adapters, providing extra redundancy.

Although the term RAID, or redundant arrays of inexpensive disks, covers disk mirroring and duplexing, it most often refers to drive systems that allow the loss of a single drive in an array of three or more drives. Depending on the RAID system and operating system, performance can increase or decrease.

Although RAID systems provide less redundancy than mirroring or duplexing (and cost more), they are better than none at all. RAID systems are now supplied by PC manufacturers such as Compaq Computer Corp. and Dell Computer Corp. and by disk system vendors such as Micropolis Corp., Legacy Storage Systems, Inc. and Core International, Inc.

DATA BACKUP

Backup is probably your most important tool for disaster recovery; if all else fails, you can at least get your data back. A data backup system allows you to copy data to a variety of media and then restore data that has been lost because of hardware failure, accidental file deletion, file corruption or other causes. The preferred medium is magnetic tape because of its low cost and high capacity.

Backup systems have a history of reliability problems; however, today's systems will provide reliable service as long as you follow proper procedures, including regular testing.

Traditional turnkey backup solutions — including a tape drive, a host adapter, cables and software — are available from vendors such as Mountain Network Solutions, Inc., Tecmar, Inc., Tallgrass Technologies Corp. and Conner Peripherals, Inc. (formerly Maynard).

Or you can build your own system by purchasing the software and adding your own hard drives. Major software vendors include Cheyenne Software, Inc., Palindrome Corp. and Legato Systems, Inc.

POWER BACKUP AND CONDITIONING

PCs seem to be more tolerant of power glitches than mainframes, but you still need power protection. Uninterruptible power supplies (UPS) are generally used with network file servers and other critical components to allow for proper shutdown in a power outage. Line conditioners and surge protectors protect equipment from power disturbances. Line conditioners "smooth out" and stabilize power, while surge protectors "clamp" extraneous voltages over specified values.

Unfortunately, nearly all available information about power protection is supplied by the power protection product manufacturers; there seems to be no good independent source of information. Major vendors of power quality products include Best Power Technology, Inc., American Power Conversion Corp., Network Security Systems, Inc., Clary Corp. and Panamax.

VIRUS PREVENTION AND DETECTION SOFTWARE

Scanning programs, combined with user education, can help limit your virus exposure. However, no single program will eradicate or prevent all viruses. New viruses appear every day, so keep your software up to date. The numerous virus protection vendors include McAfee Associates, Inc., Command Software Systems, Inc., Intel Corp., Central Point Software, Inc. and Symantec Corp.

and running within 24 hours of the bombing, there were some minor glitches, and Diaz has since tweaked his policy. "We had been doing backups twice a week," he says. "After the bomb, we realized that recovering even two or three days' worth of data was too time- and resource-intensive. Now we back every server up onto digital tape and ship it off-site every day. Then you're looking at losing maybe a half day to restoring the data, which is easier to deal with."

As Diaz and many others have found, preparing for and rebounding from disasters affecting LANs is a whole different ballgame from the mainframe environment. With mainframes, you have centralized control and, should a problem occur, can fairly quickly determine the source of the problem. Not so in the fragmented, distributed LAN environment, where you just can't hope for the same level of prevention and quick recovery. Software to remotely monitor and inventory PCs — as well as to back up and restore data — on distributed LANs just does not exist. In addition, the disaster prevention products available for the mainframe world, such as UPSs, tape backup devices and fault-tolerance features, are still evolving to support the fluid nature of LANs.

"The mainframe environment was simpler, simply because it was more controlled," says Houghton LeRoy, principal network engineer at The Foxboro Co., a manufacturer of process control systems in Foxboro, Mass. The company recently downsized from mainframes to about a dozen Unix LANs. "You knew exactly where the data was stored, which made it a lot easier to back up and recover in the event of a disaster," he says.

Perhaps the biggest difference in prepping for LAN disasters is that the master plan doesn't stay the same for long. Applications, configurations and critical data change so rapidly on a LAN that recovery plans can become obsolete within weeks of their being written.

"You constantly have to be testing your assumptions and revisiting the plan," says Dennis Sullivan, vice president at Scudder, Stevens & Clark, an investment firm in New York. "You test that you have the right telephone numbers for your contact people and that they know what to do in an emergency. You also have to test whether this tape restores to this piece of hardware, and after that's done, can my users do their transactions? You test to see if your data looks good and if your reports reconcile."

At Dean Witter, exhaustive testing helped close holes in the recovery plan before disaster struck. "Basically, they were human problems," Diaz says. "People would save an old copy and lose the latest."

For some people, testing can reveal serious problems. Lee Tydlaska, president of Computer Conversations, Inc., a disaster recovery vendor in San Diego, says one of his clients was backing up its LAN servers daily, but the information saved was less than timely.

"The administration thought all the critical source code was on the network server and was being backed up nightly," he says. "We found out that the source code on the network was over a month old. The programmers said the LAN was too slow and was affecting their productivity, so they were keeping all of their data on their own workstations."

No company is exempt from this phenomenon: Users have so much control over LAN applications that it's not unusual for critical data to change physical location rapidly without warning.

"You have to tell end users, 'If we don't have this application, how will you get by for a day or two without it?' " Sullivan says. "You need a procedure so you can do that for every new application."

Disaster recovery, *page 96*

BY PATRICK H. CORRIGAN

DOCUMENTATION TOOLS

Keep up-to-date records of your LAN configurations and procedures to follow when recovering from a crash. Useful products to this end include LAN inventory software such as Brightwork Development, Inc.'s LAN Automatic Inventory, programs that report user and security information and programs for writing disaster recovery plans.

Powerful, specialized documentation tools with long or difficult learning curves are easily forgotten and may be ultimately less effective than simpler tools, such as standard word processors and simple drawing programs.

OFF-SITE STORAGE

Companies that provide off-site tape storage for mainframes now provide that service for LANs. Off-site storage providers will pick up your tapes, store them in a secure, temperature- and humidity-controlled building, then return them when needed. Response times vary, depending on your contract terms. Companies that offer this service include DataSafe.

EMERGENCY EQUIPMENT ACQUISITION PROGRAM

Most hot sites operate on a first-come, first-served basis. That's why in a major regional disaster, you should have an emergency equipment acquisition plan in place. This is usually accomplished by negotiating with vendors in advance and having open purchase orders ready to avoid delays. When formulating your plan, consider the effect a regional disaster would have on potential suppliers.

DISK AND VOLUME REPAIR UTILITIES

These are the first line of defense for disk-related problems. Some utilities, such as Novell's VRepair, are shipped with your network operating system. VRepair is used for repairing damaged NetWare volumes. Others are third-party packages, such as NetUtils from OnTrack Data Recovery, which recovers data from damaged NetWare server disks. Symantec's Norton Utilities and Central Point Software's utilities repair DOS volumes and recover deleted files. A word of caution: Always back up a disk or volume before a repair.

DIAGNOSTIC AND TROUBLESHOOTING TOOLS

An abundance of these tools are available for PCs and LANs. Consider the following categories: PC diagnostics, such as Micro 2000, Inc.'s Microscope or Touchstone SoftWare Corp.'s CheckIT; cable scanners such as those from Microtest, Inc. and John Fluke Manufacturing Co.; Simple Network Management Protocol-based network management systems; protocol analyzers such as those from Network General Corp., Novell and Intel.

HOT SITE SERVICES

A hot site is a place to set up shop if your site is unavailable. A few traditional mainframe service providers, such as Comdisco, Inc. and Sungard Recovery Services, Inc., are beginning to provide for LANs. A hot site is generally equipped with a network, a file server, PCs and communications capabilities. Because LANs are generally more heterogeneous than mainframe systems, a LAN hot site may require significantly more planning. Keeping it up to date could also be costly.

SPARE SYSTEMS AND COMPONENTS

Keeping available spare disk systems, file servers, hubs and workstations gets you up and running quickly following a disaster or crash. Keep spare components such as LAN interface cards and disk host adapters available to effect system repairs as quickly as possible.

DATA RECOVERY SERVICES

The average failure rate of disk and tape systems is 100%; they will eventually all fail. If their failures occur at one time, you could have a major data loss. Services such as those from OnTrack can often restore data from damaged disks or tapes. One note: Line these services up before disaster strikes. Also, make sure the service is experienced at recovering data from the formats and operating systems that you use.

Corrigan is the managing director at The Corrigan Group, a consulting and training firm in Sausalito, Calif. He is writing a book called LAN Disaster Prevention and Recovery (Prentice Hall). He can be reached via CompuServe at 75170,146.

As damaging as floods, earthquakes and fires are, the more mundane disasters — power fluctuations and electrical outages — are more likely to take you out. That's where products such as UPSs, line protectors and power conditioners come in.

"We had a major thunderstorm come through, and we got a direct hit of lightning somewhere along the power lines," says Brad Hartz, systems administrator at Food Service Equipment, Inc. in Fort Wayne, Ind. "But because we had the UPSs in place on the PCs and the phones, customer service remained operational until power was restored."

The one unprotected computer lost its hard drive, Hartz says. "The rest of the LAN didn't have a problem because we were able to isolate it with line suppressors." Line suppressors are units located on the cabling between each LAN device that isolate the devices if they detect power surges or drags.

UPS vendors are working to make their devices more responsive to specific LAN needs. For instance, many UPSs, including those from American Power Conversion, Inc., Tripp Lite and Best Power Technology, Inc., include software designed to close files, log out users and gracefully shut down the LAN.

UPS software also increasingly allows some degree of power management from a single centralized location. Robert Frowenfeld, business systems manager at House of Seagram, a division of Joseph E. Seagram & Sons in White Plains, N.Y., uses optional Novell, Inc. NetWare Loadable Module software that allows him to remotely monitor server power levels and unit temperatures.

However, says Patrick H. Corrigan, managing director of The Corrigan Group, a LAN consultancy in Sausalito, Calif., some holes remain. "They won't update partially updated databases. If

Make sure you . . .

- Document your procedures (such as backup and restore, user setup, etc.) and systems in such a way that nontechnical people can use them during an emergency. Include names and phone numbers of key staffers and technical support personnel.
- Write a recovery plan that addresses the effects of disaster more than the causes. For example, concentrate on what you must do if your office or building becomes unavailable instead of what to do in the event of a flood, earthquake or fire.
- Test, test and retest your system backups to be sure the backup copies of your data are usable.
- Use disk or server redundancy if you cannot afford more than a few hours of downtime.
- Maintain system security, not just to prevent unauthorized access or sabotage but to avoid accidental damage.

But don't ever . . .

- Trust your data backup systems. Test them regularly and occasionally back up critical files to alternate media.
- Rely totally on redundant servers or drives. Even with the best-laid plans, the unexpected can happen. Make sure you have a repair plan in place.
- Use repair utilities or operations — such as partitioning, formatting or initializing — on hard disks until you verify the viability of your backup tapes. Data recovery services can often recover data from damaged disk drives. They cannot recover that data, however, if it has been removed or overwritten.
- Go overboard on security. Effective security requires the cooperation of users. Going overboard will prevent you from getting that cooperation.
- Assume your mainframe disaster recovery techniques will apply to LANs. The data center is an entity in itself, whereas LANs are interlaced with business operations. They are a data highway, not a data resource.

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Modular protection for the client/server WAN

The challenge: eliminate the tough installation, burdensome service contracts, high lifecycle costs and threat of a single point failure that plague existing midrange UPSes.

The solution: Go to pieces. Package premium power protection in an innovative modular design.

Small footprint and low weight (each module can be shipped overnight) means Matrix can be hot-swapped out by even untrained personnel without the cost or delays of a service call.

Matrix modularity means reliability

In some midrange UPSes, a small internal failure can bring down the whole UPS, and your system with it.

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Matrix modularity means low lifecycle costs

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Provides unmatched power protection and full VA capacity of multiple loads, even while in bypass.

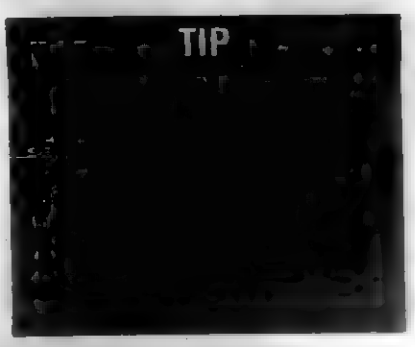
Unlike older ferro-based designs, Matrix is compatible with servers which employ power-factor corrected power supplies. Standard 3-wire 208V input means no re-wiring

you have workstations updating database files, you have to make sure the application can deal with a partial update." Users must program rollback capabilities into their database applications.

UPS vendors are lagging in support for the Simple Network Management Protocol (SNMP). While they support their proprietary MIBs, or Management Information Bases, they have yet to agree on a standard, cross-platform MIB.

With falling prices, it's becoming more practical to put UPSs on the LAN. "You can get a no-frills UPS with 10 minutes of battery time for maybe $100," Frowenfeld says. "But a really good UPS with the software and everything costs maybe $400 to $900. It makes sense to spend a little extra and get the protection."

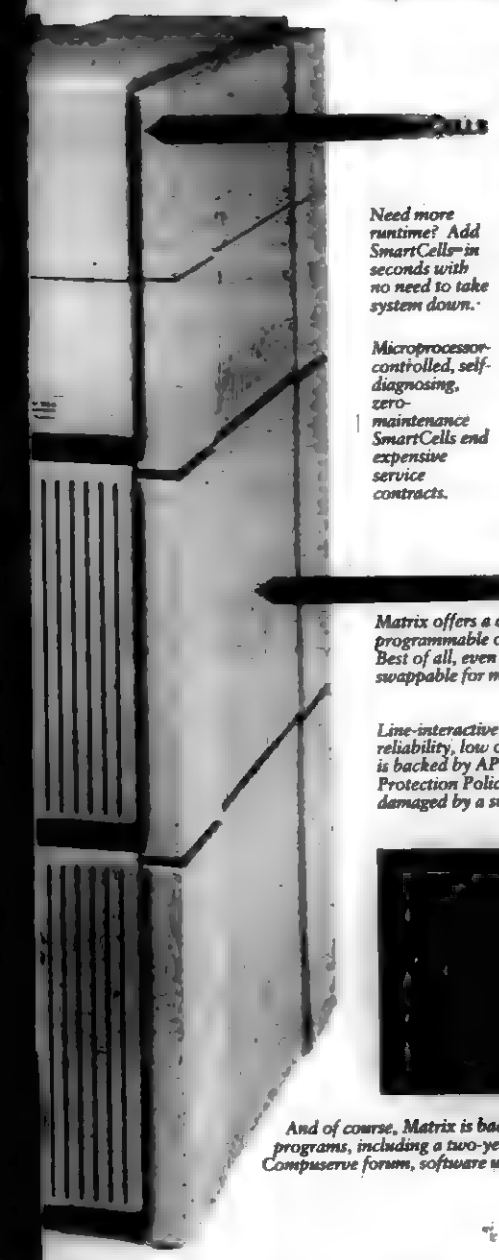
Once the disaster is over, users and consultants say the recovery products needed are straightforward.



"Whatever you had in place for the LAN installation is all you need to bring it back up," Diaz says. "It's really not that complicated if you have the proper UPSs, backup tapes and equipment in place."

But recovering from a disaster is less a matter of service firms and products than planning. You can have perfectly backed-up data, but if you can't restart the business, you could lose it. Disaster planning is a lot like defensive driving: Always leave yourself an alternative. ■

neers for a midrange UPS
) % lower lifecycle costs,
to pieces...



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4 Sun 4/490s	5000	11

For midrange systems...

2 DEC Vax 4000-800s	3000	12 minutes
3 HP 9000s	5000	11
IBM AS/400	3000	13

inc.9406 E45 proc., 9337 DASD, 7208 tape, 3477 dis.

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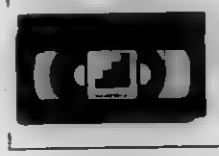

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Line-interactive design with online inverter means high-reliability, low operating costs. The unit's surge protection is backed by APC's $25,000 ABSOLUTE Downstream Protection Policy which will repair/replace any equipment damaged by a surge while protected by Matrix (see details).

Matrix provides auto-shutdown support of all major network, and midrange OS. The SNMP-compatible Matrix also supports APC's Measure-UPS which meters temperature and humidity, and monitors smoke, fire, water, and security detectors.

The Matrix heritage: more awards than all other UPS vendors combined...

And of course, Matrix is backed by a suite of award-winning support programs, including a two-year warranty, 24X7 toll-free tech support, a Compuserve forum, software upgrades, and more.

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Now's the time

When should you start developing a disaster recovery plan? When you start engineering the LAN environment. If you wait, recoverability becomes a monster.

For most companies, a distributed network environment grows out of smaller systems, each engineered by someone different, and then the decision is made to tie them all together. Only then does someone ask, "What will we do when it crashes?"

Just imagine if you started planning from the beginning. If all the LANs in the internetwork were compatible, there would be little difference between recovering operations in a small LAN environment and in a large distributed environment. There would be less documentation than with a vast distributed network.

If all the systems were compatible, you could plan for one environment and, with minor tweaking, have a plan for the whole distributed network.

Many of us don't have the luxury of starting from scratch, of course, which means we struggle with complexity and incompatibility. Luckily, there are some products that try to make our lives easier, such as network monitoring tools. These tools monitor disk capacity, transfer rates and hardware status and let you know if things are getting out of hand so you can take appropriate action.

As you're reading this, there's a good chance that your computer is down. Just think — if you'd had some network monitoring equipment, you might be up and running. Not to mention that you're probably paying now in unbillable time what it would have cost to purchase some of this equipment.

William Kwasik is assistant vice president of management planning services at Chubb Services Corp. He recently spoke on this topic at the Downsizing Conference in Santa Clara, Calif.

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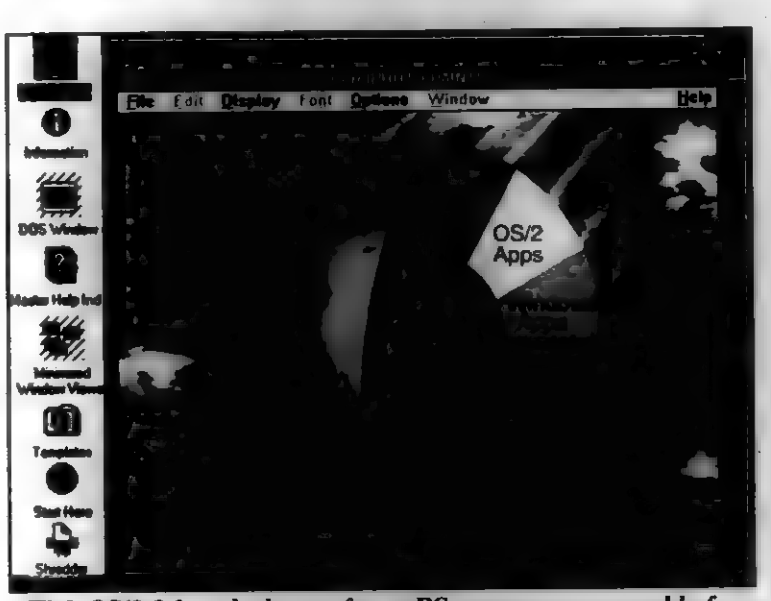

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COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

Cheyenne's backup software rates highest in overall user satisfaction

By Kevin Burden

Backing up your data is one of the most important steps in complete disaster recovery. A lightning bolt may take out your file server, but if you've made sure you've done your backup right — which requires testing, testing and testing again — you can at least restore what you've lost.

But only 20% to 30% of local-area network users make a concentrated effort to do backup properly, according to estimates by consultant Patrick H. Corrigan at The Corrigan Group in Sausalito, Calif.

Among those users who take backup seriously, reliability is the No. 1 attribute they want in their LAN backup software, according to 178 respondents to our Buyers' Scorecard survey on LAN backup products.

The following market-leading products were included in the survey: Cheyenne Software's ARCserve, Palindrome Corp.'s Network Archivist, Maynard Electronics' MaynStream and Emerald Systems Corp.'s Xpress Librarian.

Intel Corp.'s new backup program, Storage Express, is likely to pose a challenge because of the vendor's marketing power, but the product has not been in the market long enough to build the sizable user installation required for inclusion in this Scorecard.

Setting its sights on the reliability requirement, ARCserve received the highest overall satisfaction ratings from its users, with a score of 73. Network Archivist received the second highest overall score, 72. MaynStream scored third-highest with 66, and Xpress Librarian came in fourth with a score of 61.

Cheyenne's ARCserve scored its highest rating in the category of reliability: an 8.2 on a 10-point scale. Users rated the product high for its support of multiple tape drives. ARCserve is capable of controlling up to seven drives via one Small Computer Systems Interface adapter. Users also said the product had major strengths in its ability to keep multiple copies and track the history of a file.

Palindrome's Network Archivist scored a reliability rating of 8.7 — the highest of the four competing products. Accompanying its high reliability mark was a similarly strong rating for error handling, another critical feature cited by users in which Network Archivist posted a 7.5.

Topping only one specific rating area — quality of vendor support — Maynard's MaynStream produced average marks down the line. Users noted that the product is sometimes sluggish and clumsy in accomplishing restoration of files, and it lacks the ability to effectively back up multiple drivers.

Emerald's Xpress Librarian scored lowest in data integrity and error handling. But it did post the highest rating of the four products for its ability to simultaneously back up multiple servers and clients.

Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned a 1-to-10 rating based on their satisfaction with their LAN backup software in 17 categories. All categories were factored into the final scores. The scores for each product in the six most important categories are listed in the charts. ■

Overall scores

Cheyenne Software's ARCserve
SCORE 73

Palindrome's Network Archivist
SCORE 72

Maynard Electronics' MaynStream
SCORE 66

Emerald Systems' Xpress Librarian
SCORE 61

METHODOLOGY

User names were obtained from nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 178.

Users rated their satisfaction with their installed products and were not asked to compare or rate one product directly against another.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for all remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers were rounded off where necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and firms for their assistance in preparing this Buyers' Scorecard: *Computerworld* Database Division; Fara Yale, Dataquest, Inc.; Steve Lewis, Systems Audit Group.

Cheyenne Software's ARCserve

RESPONSE BASE: 50 USERS

8.2 Data integrity/reliability
8.2 Unattended or automatic backup
7.6 Security
7.1 Error-handling capabilities
7.1 Time required to perform a complete restore
6.3 Responsiveness of vendor service

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

LIKELY — REASON: Fast, reliable — 7 / 43 — UNLIKELY — REASON: Problems with workstation backups

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Palindrome's Network Archivist

RESPONSE BASE: 50 USERS

8.7 Data integrity/reliability
8.7 Unattended or automatic backup
7.7 Security
7.5 Error-handling capabilities
7.1 Time required to perform a complete restore
6.8 Responsiveness of vendor service

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

LIKELY — REASON: Can see file history — 7 / 43 — UNLIKELY — REASON: Lack of support

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Maynard Electronics' MaynStream

RESPONSE BASE: 50 USERS

7.7 Data integrity/reliability
7.3 Unattended or automatic backup
6.7 Error-handling capabilities
6.6 Security
6.6 Responsiveness of vendor service
5.9 Time required to perform a complete restore

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

LIKELY — REASON: Product works, easy to use — 12 / 38 — UNLIKELY — REASON: Slow at restoring

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Emerald Systems' Xpress Librarian

RESPONSE BASE: 28 USERS

7.4 Unattended or automatic backup
7.2 Data integrity/reliability
6.2 Responsiveness of vendor service
6.2 Security
5.9 Error-handling capabilities
5.2 Time required to perform a complete restore

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

LIKELY — REASON: Easy to retrieve backup data — 8 / 20 — UNLIKELY — REASON: Inflexible tape management system

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

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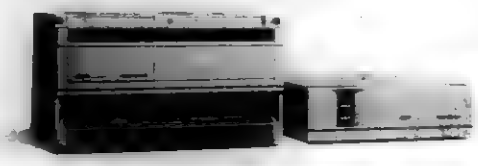

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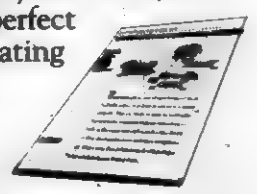

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FIRING LINE

BusLogic's Chantal offers inexpensive RAID capability with high performance, reliability

Chantal Disk Array Software

- **Evaluators said BusLogic, Inc.'s Chantal Disk Array Software provides inexpensive and reliable RAID-5 performance with a range of Small Computer Systems Interface (SCSI) disk drives and SCSI host adapters.**
- **While generally pleased with the Chantal software, evaluators wished for better documentation and more management options.**

It was only five years ago that the now-familiar concept of redundant arrays of inexpensive disks (RAID) was first proposed by researchers at the University of California at Berkeley. The idea caught on quickly, and today dozens of manufacturers offer a multitude of RAID alternatives.

Of course, systems managers, not academics, drove the movement toward RAID. The reasons are simple: better performance, robust data security, improved data redundancy and fault-tolerant operation. By definition, RAID provides a significant alternative to off-line tape backup systems (see Scorecard, page 99).

So why doesn't everyone use RAID? Unfortunately, many RAID offerings are packaged solutions of hardware and software that suffer from an insurmountable problem, at least in the eyes of users: They are proprietary "black boxes." And anything smacking of "proprietary" does not play in Peoria these days.

Fortunately, a handful of companies are offering software-only RAID solutions that take advantage of another trend in hard disk storage: the ubiquitous SCSI. Combine standard SCSI hard drives with good RAID software and you can have a plug-and-play, homegrown RAID system.

For this Firing Line, *Computerworld* surveyed four evaluators working with current and beta-test versions of San Diego-based BusLogic's Chantal Disk Array Software. The software, which supports Novell, Inc. NetWare v3.11 servers, is due for a major upgrade to Version 4.0 this month. The new version will support NetWare 4.01 and will offer a number of new performance and maintenance features.

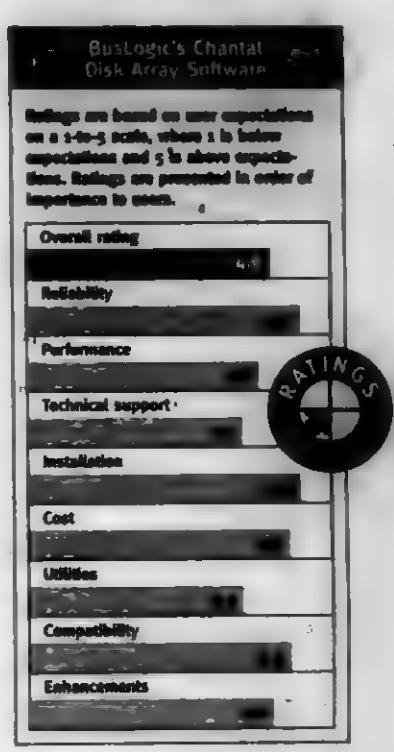
Chantal RAID Version 3.0 supports RAID levels 0, 1 and 5 on NetWare v3.11 servers. RAID-0 provides better performance than conventional disks through a technique called "striping," which interleaves data across an array of conventional SCSI disks. All disks appear as a single unit. RAID-1 provides a real-time data backup in the form of "mirroring," which automatically writes a second image of all disk data to a set of backup drives.

RAID-5 provides high-data redundancy and fault tolerance through striping and other techniques. Typically, RAID-5 is used when total reliability is at stake. RAID-5 systems will automatically switch to a backup drive should the primary drive fail and will also attempt to reconstruct the faulty drive on a spare backup unit.

The evaluators participating in this survey included technical staff at a university, an auditing services firm, a petroleum company and a large hospital. All were using Chantal RAID in NetWare v3.11 environments for six months to two years and were supporting from 25 to 800 users.

In all, the evaluators gave Chantal RAID an overall rating of 4.0, meaning that the software delivered better performance than expected.

The format for this survey was created with the assistance of Howard Rubin Associates and Technology Investment Strategies Corp.



SITE PROFILES

Installation descriptions for users who evaluated Chantal Disk Array Software

	Hospital	University	Petroleum company	Auditing firm
Total NetWare servers	4	3	1	2
Total RAID storage	28G BYTES	4G BYTES	16G BYTES	12G BYTES
Length of use	6 MONTHS	1.5 YEARS	6 MONTHS	2 YEARS
Using beta as for	1 MONTH	1 MONTH	PREPARING	PREPARING
SCSI controllers in use	ADAPTEC 1742	ADAPTEC 1742	ADAPTEC 1742	ADAPTEC 1742
SCSI drives in use	MICROPOLIS 2112	FUJITSU, MICROPOLIS	MICROPOLIS 1924	SEAGATE
RAID levels used	5	5	0, 5	0, 5
Applications under RAID	PATIENT ACCOUNTING, QUALITY ASSURANCE	DESKTOP APPLICATIONS	DESKTOP APPLICATIONS	DESKTOP, AUDIT APPLICATIONS
Users on RAID servers	800	180	150	50

Reliability

Although RAID implementations are generally deemed far more reliable than conventional storage systems, questions have been raised in the storage industry about the integrity of homegrown, software-based RAID systems. The evaluators disputed these concerns, saying that Chantal RAID had consistently delivered reliable performance. All of the evaluators had experienced at least one hard disk failure, with Chantal RAID recovering from the error as expected.

Hospital: "Version 4.0 is an improvement. It never died on me or gave me a data error."

Petroleum company: "I would have expected problems with software RAID because it requires serious code, but the problems didn't exist."

University: "During the course of setup, I pulled the plug many times, sometimes on purpose and once or twice by accident. [The server] still came up. No user was aware of a problem."

Performance

Only the university evaluator had run formal benchmark tests on Chantal RAID and found performance to be adequate. The petroleum company evaluator was running RAID-0 (using data striping) solely to increase performance on a 16G-byte desktop application server. He said he was pleased with the results. Performance took a backseat to reliability and data integrity for the auditing firm and the hospital.

Hospital: "I have yet to push it

Chantal, *page 102*

Evaluators say Chantal RAID installation is simple but better documentation is needed

CONTINUED FROM PAGE 101

because there has been no bottleneck at the RAID software."

University: "I did some Norton [Utilities] benchmarks and other throughput tests. It's faster when you have multiple users."

Auditing firm: "Under RAID-5, performance dropped. RAID-0 was 25% to 50% faster than Novell's striping capability."

Technical support

The evaluators were very pleased with technical support, saying that calls were handled efficiently and accurately. The hospital and university evaluators concurred that improvements in technical documentation would reduce their needs for telephone technical support. Nonetheless, they agreed that support was very good.

Hospital: The support technicians "always answer questions concisely. But calling them once every two weeks does get tedious."

Petroleum company: "I have high expectations of [vendor] support, and they met those expectations. Very helpful, and they understood my questions."

University: "They were notably good at following up, which puts them immediately into the top 20% of any vendor I've dealt with."

Installation

None of the evaluators required more than a few hours to configure and install the Chantal RAID software. Any installation overhead was caused by locating the required parameter information for hard disks and controllers; additional time was needed to format the hard disks used in the system. None of the evaluators considered this to be part of the Chantal RAID installation, per se.

Hospital: "It was a breeze. Easier to install than Word for Windows."

Petroleum company: "Novell add-on products are, as a rule, easy to install, and this was no different. It took four hours."

Hospital: "It took about 1½ hours. You have to know EISA configurations, port addresses and the drive types you have. Actual installation once you know all of these parameters is 10 minutes."

Auditing firm: "A piece of cake. Tops is 30 minutes. You could do it following the manual step by step."

Chantal features

- Supports RAID 0, 1 and 5.
- RAID levels can be mixed on a single server.
- Hot Spare feature allows on-line rebuild to back up drives.
- Supports most standard SCSI drives and SCSI host controllers.
- Runs with Novell NetWare v3.11 and 4.01.

Cost

The hospital, university and auditing firm acquired Chantal RAID either through hardware bundling deals or through site licensing. Thus, the evaluators had no detailed measure of actual costs. The petroleum evaluator considered the software very inexpensive compared with proprietary RAID systems, as did the three other evaluators.

Hospital: "We got it as a bundle with our [storage] hardware.

Petroleum company: "It's dirt cheap if you have the disks in-house already. A packaged system still delivers proprietary software that may not decrease in price as the price of disk drives goes down."

Utilities

Evaluators said Chantal RAID came with sufficient tools, utilities and diagnostic programs. The university, hospital and auditing firm evaluators wished for a better disk-rebuilding utility. They said the current version takes too long to operate (approximately 20 to 50 minutes), during which time users are barred from using the server.

Hospital: "It went into off-line rebuild mode, which took 50 minutes to complete. [During that time], my users were down, which I thought was less than acceptable."

Petroleum company: "The configuration program is not as robust as desired. The menuing conforms with standard NetWare utilities."

Auditing firm: "They're sufficient. There are 10 other command line utilities which we hardly ever use, but they're good for diagnostics if you need them."

Compatibility

Compatibility with industry-standard SCSI drives and controllers was the primary reason for using Chantal RAID, according to the evaluators. They reported it was slightly more compatible than expected.

Hospital: "It didn't care what the disks were."

Petroleum company: "We chose it specifically because of its compatibility with any SCSI drive and multiple SCSI adapters."

University: "It was fussy with the controllers, and you have to be careful with the configuration. But the really fantastic thing is that we can pick our own drives."

Auditing firm: "With software RAID, you can use anybody's drive and anybody's [SCSI] card."

Enhancements

The primary enhancement to be made to Chantal RAID Version 4.0 is support for NetWare 4.01. All evaluators were anticipating an eventual move to the new network operating system. The evaluators also expressed interest in reported improvements in rebuild times and better reporting and statistics to be delivered with Version 4.0 diagnostic programs.

The new Hot Swap feature will allow Chantal RAID users to swap in a spare drive should an operating drive fail.

Petroleum company: "It does its job, and it does what RAID software is supposed to do."

University: "They made it a little bit more idiot-proof [in Version 3.0], which I didn't like. I want to have more control."

Auditing firm: "We'll use the Hot Swap in RAID-5. Otherwise, you have to shut the whole thing down to install a new drive." ■

Reported and written by Computerworld *senior editor Garry Ray.*

BusLogic responds

BusLogic officials provided the following responses to issues raised in this evaluation:

▶ **Software-based RAID:** BusLogic's Chantal Disk Array Software is a proven fourth-generation RAID product that delivers exceptional features and complete fault tolerance to the customer. In addition, its performance is highly competitive with any hardware solution on the market.

▶ **NetWare 4.01 and Chantal RAID:** Chantal RAID, Revision 1.0, will comply with NetWare 4.01. The final version will shortly be made available to our users. Because the changes are minor, there are no differences to the user in performance or operation.

▶ **Adoption of software RAID:** BusLogic ships as much disk array software as any hardware RAID manufacturer in the market. Comparing our shipment number with the latest Disk Trend RAID report, our installed base is as large as or larger than any hardware product on the market today. Therefore, it is our customers' strong acceptance of software-based RAID that has positioned Chantal RAID as the market leader in disk array software technology.

▶ **RAID-5 limitations:** RAID-5 is ideally suited for transaction-oriented applications. RAID-5 involves extra checking whenever new data is written, and it may slow down some operations. RAID-0, on the other hand, can produce faster performance but does not provide the fault tolerance required in an enterprise computing environment. Compared with most RAID-5 solutions, Chantal RAID is an exceptional performer because it uses Intelligent Stripe Job Combination. Aside from this technical trade-off, there are no reasons not to choose RAID-5, especially if affordable fault tolerance is the prime consideration.

▶ **Usage profile:** Chantal RAID is currently in service at major banks, airlines, television stations, law firms, stock exchanges, oil companies, automotive manufacturers and elsewhere.

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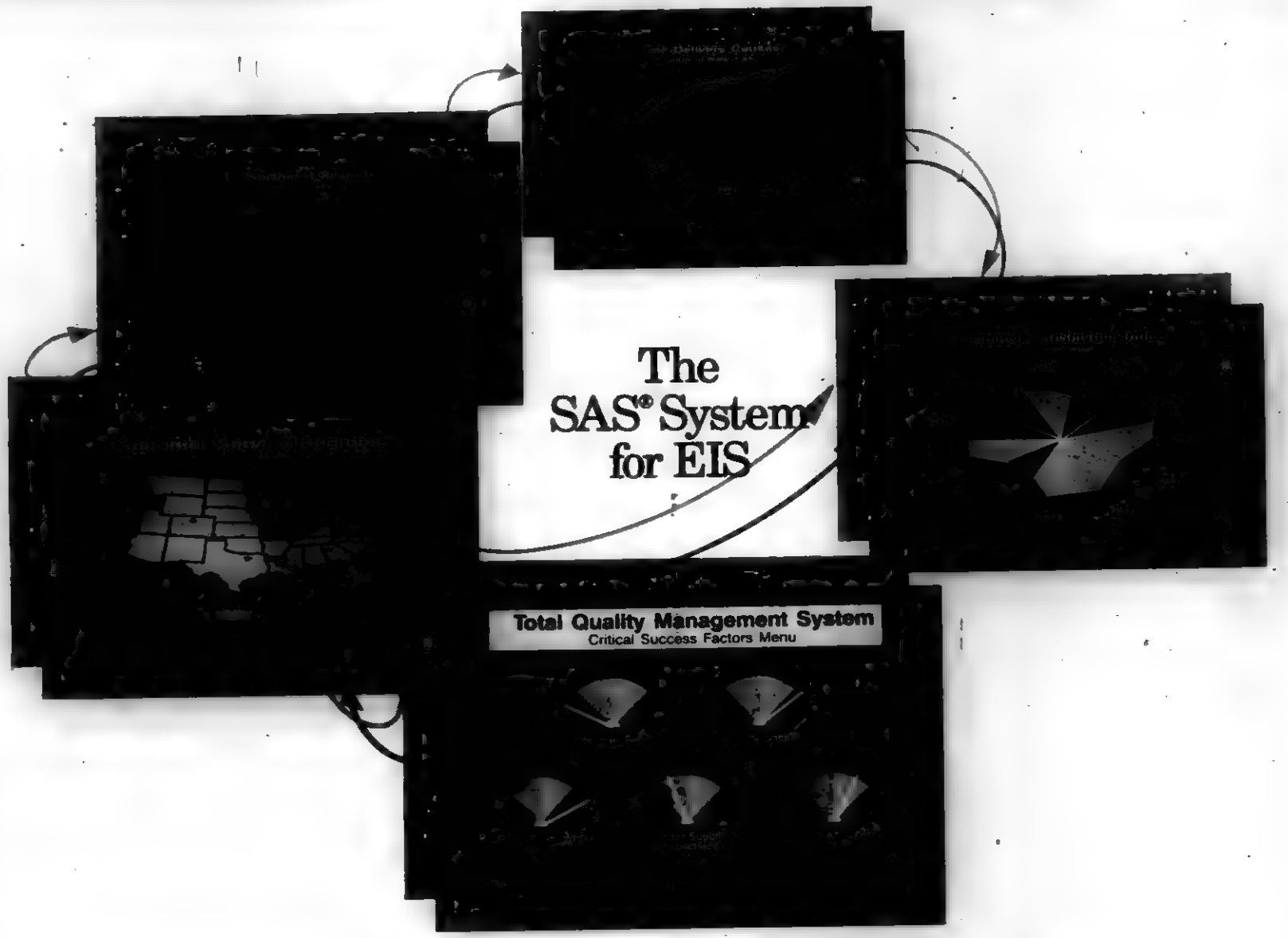

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LOOK WHO WANTS YOUR SERVICE BUSINESS

PC retailers are aggressively moving into the ranks of soup-to-nuts desktop service and support providers. Their pitch? A keen understanding of LAN and WAN issues and cost-savings over large outsourcers.

By Gilles Guignat

When Steelcase, Inc. was looking for a third party to help it set up and manage a wide-area network that included 4,000 workstations, 26 operating systems and several networks, it didn't turn to the EDSs and Andersen Consultings of the world. Rather, the office furniture supplier went with a PC retailer-turned-service provider.

Steelcase's experience isn't unique, and companies like it have helped spur PC retailers' transition in the last five years from primarily PC hardware and software sellers to purveyors of setup, support and service for PCs, local-area networks and WANs.

Players such as MicroAge, Inc. in Tempe, Ariz., JWP, Inc. in Rye Brook, N.Y., and Computerland Corp. in Pleasanton, Calif., hope to capitalize on corporate customers' interest in desktop expertise.

Unlike the "big outsourcers," these companies tackle problems from the bottom up, an important point as LANs, WANs and client/server computing proliferate. Customers may have turned to these providers initially for large quantity purchases of PC hardware and software and returned when these wares needed to be linked together or with larger machines.

For instance, Steelcase, which is using MicroAge on its WAN project, has been a customer since 1985. It bought 2,000 PCs through the company in the last 12 months and plans on buying another 2,000 in the next 12 months.

Companies want specialists who can handle the soup-to-nuts care of what are small systems but big investments. (A 1993 Gartner Group, Inc. study revealed that while a PC, including software, might cost a company $5,000 initially, when you factor in costs for maintenance, network integration, design, installation, support and training over five years, that price tag jumps to $40,000.)

Service businesses, *page 106*

MANAGER DEMANDS

When it comes to service provider skills, technical managers want problem solvers

TOP ISSUES IN PROVIDING NETWORK MANAGEMENT SERVICES:

1. Fault isolation and resolution.
2. End-user support management.
3. Performance measurement and management.
4. Configuration and reconfiguration management.

Base: 450 corporate network managers

Source: International Data Corp., Framingham, Mass.

Service business

CONTINUED FROM PAGE 105

Cost is also an issue. Large systems integrators have built their organizations on 30% to 35% gross margins, says Ed Drohan, a consultant who has compared service provider costs for the banking industry for 18 years. Providers that come from retail have margins more on the order of 20%. Slimmer margins translate into lower costs for users, says Joel Orr, a consultant and president of the Virtual Worlds Society.

Chuck Boll *wanted a partner with desktop experience*

A unified team

For some firms, a one-stop contact point for the myriad desktop issues provides great relief.

"We wanted to get out of this mode where we are negotiating each PC deal and pitting each vendor against each other," says Chuck Boll, lead information center specialist in the information services group at Cummins, Inc., a $4 billion engine manufacturing company in Indianapolis.

What Cummins wanted was a partner that had desktop experience to handle PC- and LAN-level issues and that could sit in on meetings and planning sessions.

Some IS managers "don't have enough resources to deal with the complexity of migrating to new environments at the PC level, as well as managing the details," says Glenn Miller, vice president of client services at JWP. "You don't want to burn out [IS] managers tracking serial numbers on 2,000 PCs."

Besides taking the load off personnel, Cummins looked to the service provider to cut costs. Through the company, Cummins was able to negotiate a volume purchase agreement with Microsoft Corp. that saved it $200,000. Furthermore, in the first month of its contract, Cummins consolidated companywide billings on a monthly basis and freed up the time of three Cummins purchasing clerks. "The old system was out of control," Boll says.

According to Orr, some companies turn to these PC and LAN experts for help in keeping up with the rapid rate of change on the desktop, which can include swapping out machines every 12 to 18 months. "In-house bureaucracies can be inefficient," Orr says. Sometimes it takes an outsider to work around entrenched layers and get things done faster.

Take Rumger Insurance Co. "Doing business with us was a long, agonizing process," says Dustin Cole, vice president of marketing at Rumger, a malpractice insurance firm in Orlando, Fla. It took three weeks to complete a sales cycle, which encompassed the time from a salesperson's first client contact to delivery of the policy paperwork.

While the company was in the fortunate position of having a lot of prospects, the paper chase it put them through drove some away. When the company decided to try Lotus Development Corp.'s Notes to streamline the process by developing a telesales and telemarketing system, the IS department handed responsibility to a third-party retailer for the job. The service provider handled hardware and software purchasing and training, as well as implementing interfaces to the company's IBM Application System/400.

The system, which included faxing forms directly into Rumger's system, was up and running in less than 90 days, Cole says. The speed with which the project came together had a lot to do with the provider's "outside" status.

Today, it takes only one hour for a salesperson to cement a deal and finish the paperwork, he says.

Sleazy service providers?

The heat is on in the services segment of the market, but customers need to watch that they don't get burned. Some providers may do anything to get a piece of the services market pie, which, according to International Data Corp. (IDC), is expected to reach $81 billion by 1997. Small systems integrators (a group that includes retailers) have high hopes: They want 40% of their 1994 revenue to come from network services, an IDC study revealed.

"You have to shop for quality when you choose," Orr says.

Boll agrees. Whenever he is choosing a third party, which typically takes about eight months of research, quality is high on his list. Boll has created a literal list of "bombs" — key provider snafus during the evaluation process that destroy any interest Boll may have in using them (see story below). ■

Guignat is a free-lance writer and marketing specialist in Scottsdale, Ariz.

Not everybody's good at service

At minimum, you should look for the following expertise in a retailer/service provider:

Procurement. A good company will help lower procurement costs by automating ordering and billing. The company can help save time and money on procurement by providing on-site purchasing specialists to assist clients in product selection, configuration and price quotes as well as using electronic ordering systems and electronic data interchange capabilities.

Configuration, logistics and installation. You should be able to get PCs configured any way you want, delivered to your desks and installed.

Other configuration services often include LAN/WAN testing, in which the provider tests newly configured equipment on a customer's WAN before it is boxed and shipped. Customers should be able to specify specialized packaging and shipping procedures, asset tagging and software licensing reporting.

Some providers are certified by hardware manufacturers to manufacture their products to order from subassemblies. This reduces the delivery cycle time of configured systems.

Adherence to quality procedures: Quality procedures are critical in configuration services and in delivering orders at a specific time and in specific configuration. Look for visibly active quality initiatives. Before awarding a supply contract, Cummins went to visit each supplier. "They all talked about quality and service," IS staff member Chuck Boll says, "but our team wanted to go to their facilities to see whether that was really the case."

National service. The provider should have a network throughout the U.S. that can provide maintenance for any customer site.

Also important is a single point of contact for dispatching other service organizations to do mainframe, midrange or other systems maintenance. This approach consolidates and simplifies the support for users.

Technical support. The provider should be able to give comprehensive technical briefings about emerging technologies, new products and their impact.

It should be able to provide LAN/WAN recommendations and do product evaluations, as well as provide project consulting, remote diagnostic support, a direct line into manufacturer technology lines and help desk support.

Specialized services. Efforts might include project management for pilot efforts, branch automation, international project and services support, customized reporting, asset management and strategic planning support.

Bombs away!

Chuck Boll and his group at Cummins have become masters at selecting service providers.

With the ranks of retailers that now claim to be service providers swelling, Boll says picking carefully has become vital.

Boll, lead information center specialist in Cummins' information services group, credits Toyota Motor Corp. and its quality methods with inspiring him to select only those prospective service providers that pass muster.

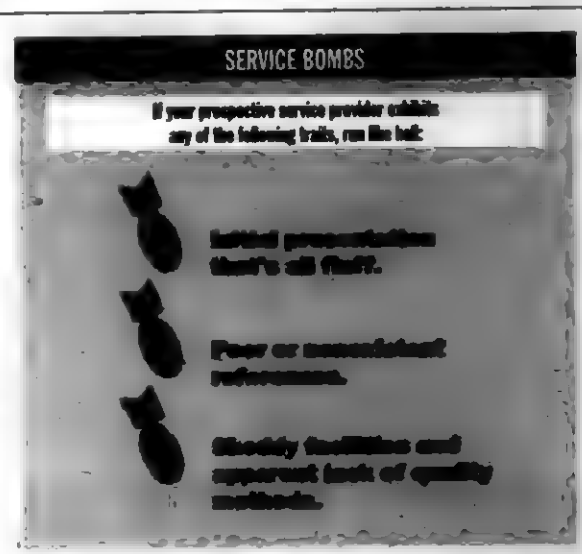
Cummins' six- to eight-month selection cycle can be scuttled if the vendors do the following:

•Hold fluff-filled initial presentations. The warning sign is if the vice president of marketing is in charge of giving the talk. If, however, the company brings in a management team, preferably the people who will actually handle the account, that's a positive.

•Offer weak references. Boll tells the story about going on-site at one reference company that slammed the provider. In fact, that disgruntled reference ended up flying to Cummins to learn about its selection techniques.

•Show lack of on-site quality. Boll goes on-site to any provider he is serious about. Does the site adhere to ISO 9000? Does it let the user load and run software from the site? Is the manufacturing facility a clean-room environment? Will service include 24-hour access to all equipment in the right configuration?

Perhaps the biggest burden, however, rests with the evaluator. Boll says it is imperative that companies know what they want so they don't contract for what they don't need.



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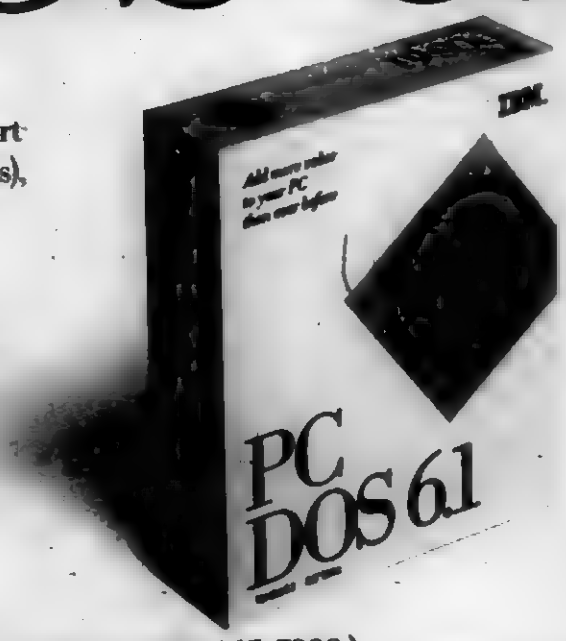

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Blazing network trails

Jobs in

By Joe Panepinto

UNTIL RECENTLY, network management was the kind of career that information systems personnel stumbled upon when looking for something else. In fact, many of the folks managing networks today are pioneers of a sort — the first generation of IS personnel to set sail for the great glass house and get tangled in coaxial cable along the way.

Recognizing that these veterans have presided over the many technological transformations that have led to the networked environments of today, *Computerworld* asked a few of them about the changes they have seen and how they have managed to stay afloat.

Renee Held
Network manager at
Fleisher Manufacturing, Inc.
in Columbus, Neb.

RECENT CHALLENGE

Held's trial by fire and progression toward becoming network manager of a 24-node Novell, Inc. network began almost immediately after she was hired by Fleisher to write Cobol code for its mainframes. Six months after coming on board, the data processing manager resigned, leaving her alone at the controls.

Held brought herself up to speed by reading manuals and taking vendor courses.

She also says she feels fortunate that her company let her grow into each new technology — one transition was a move from Apple Computer, Inc. AppleTalk to Novell NetWare. Held found AppleTalk and NetWare similar to manage but says she felt the PCs that came into the building with the Novell network were much harder to configure. With the Macintoshes, setup is done in the system file but with PCs, there are .INI files (initialization files) all over the place, she says.

Today, Held continues to do a little Cobol programming in a terminal emulation window on her PC while monitoring the NetWare network in another. Fleisher also recently expanded the network to another building via fiber-optic cable.

"The main way my life has changed is the number of users I support," she says. "When I started there were only four terminals, and we shared them. Today there are close to 50 devices on our network in two buildings." As a result, she spends more time doing help desk-type work.

"The job I have now would be very difficult to walk into because of the variety of things I've picked up over time," she says.

Scott Baker
Network manager at Jeanette
District Memorial Hospital
in Jeanette, Pa.

RECENT CHALLENGE

When Baker was earning his bachelor's degree in computer science in the mid-1980s, he took just about all the computer-oriented classes offered — none of which had anything to do with networking or network management.

Since then he has taken a wide variety of training classes. And, because Jeanette will be cutting over entirely to NetWare 3.1.1, Baker will soon begin Certified NetWare Engineer (CNE) classes as well.

"I was the computer operator on a VAX 8000-class machine when the need for a network manager came up about five years ago," Baker says. Currently, he supports roughly 85 networked devices ranging from leftover IBM 8088 machines to brand-new Intel Corp. 1486-based PCs. He is still working to become an "all-purpose PC and networking guy," he says.

Baker got started in network management through the help of the consulting firm that installed the networks.

Vance Everett
Network manager at Brigham Young
University's Law School
in Provo, Utah

RECENT CHALLENGE

Even though Everett's background contrasts sharply with Held's, how he ended up riding shotgun on a 200-plus node Novell network of IBM PCs, Digital Equipment Corp. VAXs, communications and database servers is eerily similar.

"I don't know if you really train to be a network manager so much as you fall into it," Everett says. "You get into a job and people say they need someone to manage the network. They look around, say 'You're it,' then you take classes to learn the new technology while learning on the job."

Everett has a programming-oriented degree, has taken graduate-level classes in networking and has earned CNE status from Novell.

"One of the nice things about network management is it's becoming a lot easier than it used to be," Everett says, pointing to management standards for networked devices such as Simple Network Management Protocol. He relies on a network management system from Network General Corp. called NetMon and starts troubleshooting only after it flags a problem. He can also use Network General's Sniffer packet analyzer if he and NetMon are stumped.

Panepinto is a free-lance writer in Amherst, Mass.

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Learning the graphical way

By David Baum

It's no secret. Users are demanding graphical, forms-oriented applications for their new PCs and Macintoshes, and information systems professionals must step up to the plate to deliver them — fast. But how can an average corporate developer hope to create in-house applications that compare with the slick, well-designed commercial ones to which users have become accustomed?

IS departments are wrestling with a slew of new graphical development environments that bear little similarity to the procedural languages they grew up with. Event-based application processing requires a fundamental shift, both technically and psychologically, that many procedural programmers find difficult to make.

"One of the biggest adjustments to graphical, nonprocedural tools is that you can't print out your whole program in linear fashion," says Jim Fawcette, editor of the *Visual Basic Programmers Journal* in Los Altos, Calif. "There is code hiding behind your forms that you can't see. Developers must take it on faith that these black boxes will work as specified."

By black boxes, Fawcette means predefined functions that can't be tinkered with and whose code is hidden from view. These out-of-the-box functions can be plugged into applications with minimal effort but cannot be changed or analyzed.

Automating events

Event-driven programming automates the total combination of events that can take place when an application is run. Procedural programming is more static: The developer must write code for each step that has to take place, and programs execute in a linear fashion. Therein lies the major difference between the two worlds, Fawcette says.

Ann Shukla, director of worldwide marketing at Uniface Corp., has watched many of her company's customers struggle with these issues as they learn to use the Uniface event-driven fourth-generation language environment. The key to getting past the hurdles, she says, is a comprehensive training program.

"We have found that it is very important to address all the fundamentals of the new computing landscape," Shukla says. "In addition to training in our application development environment, we touch on related topics, such as relational theory, object modeling and design, graphical screen designing and conceptual data modeling."

Others have a slightly different approach. Tim Nelson, chief scientist at SHL Systemhouse, Inc., a systems integrator specializing in application development issues, for instance, finds that introducing a language-oriented workbench, such as MicroFocus, Inc.'s MicroFocus Cobol Workbench, eases the transition. This development environment integrates a familiar mainframe syntax within the graphical operating system of workstations and PCs, making it much easier for programmers to feel comfortable with the new machines.

"Because the same set of tools can be used in the same fashion on different platforms, companies can make a smooth transition off of the mainframe to a variety of PC and Unix environments without becoming overwhelmed by the complexities of those environments," Nelson says. With this comfort comes the confidence to exploit the workstation environment in new ways.

Cobol migration

There are also ways to encapsulate existing Cobol procedures into Dynamic Link Libraries using the MicroFocus Cobol tools. Programmers migrating Cobol applications to a windowing environment may find them helpful because they don't have to start from scratch. The tools also give them a sense of the black box concept, using procedures they have written and tested.

Meanwhile, Fawcette recommends that procedural programmers become familiar with Microsoft Corp.'s Visual Basic and its many add-on tools.

"For a Cobol programmer moving into Windows, these tools are a godsend," Fawcett says. "Without them, you would have to master the Windows API, which would be a very difficult task."

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.

EVENT-DRIVEN VS. PROCEDURAL PROGRAMS

EVENT-DRIVEN PROGRAMS

- Automate the total combination of events that can take place when an application is run.
- Make use of predefined components and libraries of high-level functions.
- Rely on "black box" objects that can be used interchangeably in many applications.
- Run primarily on workstations and PCs.
- Can be prototyped quickly without much attention to a formal methodology.
- Incorporate sophisticated graphical interfaces.
- Used primarily for tactical departmental and workgroup applications where performance is not the leading concern.

PROCEDURAL PROGRAMS

- Execute in a linear fashion.
- Require the developer to write code for each step in an application.
- Run on all types of machines, from mainframes to PCs.
- Usually created with a structured programming methodology.
- Geared for character-mode screens.
- Commonly used for corporatewide, mission-critical applications where performance is a leading concern.

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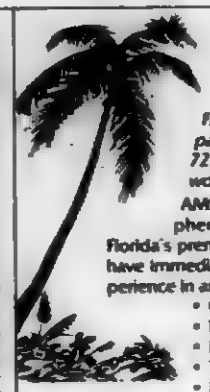

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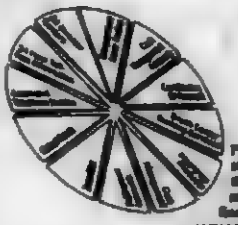

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- **Performance Management** - Requires knowledge of shared DASD complex, I/O subsystems, DB2, CICS, ISC and MRO essential, along with a minimum of 5 years performance tuning on large mainframe. Programming skills in SAS/MICS desirable. (Response Center P68-D66)
- **Library Management** - Requires 3+ years experience with DMS, DFDSS, Endeavor, JCL, TSO/ISPF, SMS and standard IBM utilities. (Response Center L68-D66)
- **Production Support** - Requires 3+ years experience with CA7, CA11, JCL, TSO, Infopac, Endeavor, DB2, Pfirsil, Omegamon, and SAR. (Response Center P68-D66)

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- **On-Line Services - IDMS/DB2** - Requires 7-10 years data processing experience in a large scale IBM/MVS environment and senior-level IDMS and DB2 skills. A background in Release 3.3, Assembler and CICS preferred. (Response Center IDMS-D66)
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SYSTEMS PROGRAMMERS

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SOFTWARE ENGINEER wanted. Duties: Analyzing the requirements for data access and retrieval for an auto diagnostic system and providing the data manipulation functions in C language as an application programming interface to a customized library. Development and maintenance of Object Oriented Database Mgmt System for auto diagnostic application in C language under OS/2 presentation mgr environment. Need a Bachelor's in Computer Sc and 3 mos in the job offered or as an Eng., Programmer or Customer Support Exec. Related exp (in whole or in part), or 1 univ crs must include each of the following: development & implementation of object oriented database mgmt system with GUI using C++ language; using Appl. Foundation; Oracle Tools; SQL*ReportWriter, SQL*Forms and SQL*Plus; development of Case Tools using the object oriented paradigm; & computer networks and protocols. Must have 3 univ crses in software engg.; 2 univ crses in database mgmt system; & 1 univ course in computer graphics, and computer networks. Pay is $34,000/yr. 40 hrs/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #92593. Employer Paid Ad.

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Midwest

PROGRAMMER ANALYST (REF. #46483) to consult with clients to ascertain & define their business req or problem areas & utilize technical expertise to provide solutions to clients' needs, incl analysis, design, development & implementation of comp s/ware for clients' EDP sys. Incl an integrated welfare sys incl processes/aids flow design, data modelling identification, technical support, overall design & development of Work Program part of the sys. Technical support for design of app using IMS/DC on IBM 3090 using IBM 3090, IBM PC/AT, MVS/ESA, IMS/DC, TELON, COBOL, DB2, ADW used for sys design & ADM/MS. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, development & implementation of comp s/ware using IBM mainframes, MVS ESA operating sys; DB2 & COBOL. Pay is $34,000/yr. 40 hr/wk.

SR SOFTWARE ENGINEER (REF. #36668) to analyze, design, develop & implement comp s/ware for clients' EDP sys, incl enhancing & customizing the CHESS (an MRP pkg) incl redesigning its modules, database modifications & sys testing. Duties: porting s/ware to various platforms incl UNIX, VMS, & MVS; integration of various modules & integration testing; customizations & user training using IBM RS 6000, VAX 6000, AIX, PRO-IV & C under UNIX & VMS. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: s/ware design, development, integration & testing, user training; & using PRO-IV, VMS, C & UNIX. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER/ANALYST (REF. #25259) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Incl a centralized on-line CORPORATE MIS REPORTING sys and data flow design, data analysis, data modelling, database & app design & tech support for developing & implementing insurance business sys. Technical support provided will be on the IBM 3090, 4361 & IBM PS/2 h/ware & the following s/ware & languages: MVS/ESA, CASE TOOLS, DB2, TSO/ISPF, APPLICATION SYS/AS), FOCUS, VM/SP, SOL/DS, DMF, SPUFI, IBM JCL, CICS, UACR, REXX, CLISTS, PERSONAL APPLICATION SYS EASYTRIEVE, MicroSoft EXCEL, LOTUS 1-2-3. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, development & implementation of Corporate MIS sys & using IBM 4361, VM/SP, SOL/DS, REXX & FOCUS. Pay is $34,000/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF. #25480) to consult with clients to ascertain and define their business req or problem areas & utilize the tech expertise to provide solutions to clients needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. One specific duty includes development, installation & maintenance of MVS/ESA operating sys & s/ware products on IBM ES 9000 series of processors using CBIPO & CBPDO s/ware packaging methods; & development of productivity tools. Duties require using IBM ES 9000 series, 3090, 4361, PS/2, MVS/XA, MVS/ESA, Graphical Interface BOSS on SINTRAN, C, COBOL, JCL, DOS, JES2, SMP/E, DITTO, CMS, CICS & DB2. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, developing application s/ware; & using IBM 3090, ES 9000, MVS/ESA, MVS/XA, CBIPO, CBPDO, DITTO, DB2, CICS, C, BOSS & SINTRAN. Pay is $33,155/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF. #33783) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl designing, developing, analyzing, maintaining, customizing & supporting financial app using Unisys A & V series sys, COMS, DMS II & VCS s/ware, COBOL, Unisys medium sys assembler & Motorola 68000 assembler, enhancing & implementing IPS & GPS or other Unisys financial app s/ware. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, application s/ware development, financial sys customization; sys implementation; & using UNISYS A & V series, COMS, DMS II, VCS, COBOL & medium sys & Motorola 68000 assemblers. Pay is $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #33883) to consult with clients to ascertain & define their business req'or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys incl enhancing & customizing the BAMCS (Business & Manufacturing Control Sys) & CASTS (Computerized Accounting & Student Terminal Sys) packages and redesign of modules, database modifications & sys testing. Duties require using UNISYS A-series & B-29 comp, COMS, CANDE, DMS II & SDF s/ware, COBOL, LINC II & WFL languages. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, app design & development for manufacturing & accounting sys, module design, customization & enhancement of BAMCS; & using UNISYS A-series, B-SE, COMS, CANDE, DMS II, SDF, LINC II & WFL. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF. #36193) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to client's needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys incl an Integrated Public Assistance & Child Support Welfare sys. Duties: analyses, design & development of batch programs; sys testing & implementation; & providing tech support to end users using Structured anal & design methodologies & techniques & IBM 3090, IMS DB/DC, DB2, VS COBOL II, MVS JCL, FILE-AID, TELON, IMS-XPERT, PANAPT, ABEND-AID, Info-Manager, REXX, CLIST, CICS, OAM & CAF. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, design, development, testing & implementation of app & batch sys; providing technical support to end users; & using IBM 3090, IMS DB/DC, VS COBOL II, DB2, CICS, JCL, REXX, CLIST, OAM, CAF, Structured Anal & design techniques. Pay is $34,000/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF. #36293) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, including analyze, design, develop & implement comp s/ware for clients' EDP sys, incl analyses, design & development of manufacturing information sys using object oriented methodologies; including object oriented design, C++ programming, creating graphic user interfaces based on the Motif architecture & creating SQL queries to access the relational database; writing test programs for testing sys before releasing & using VAX system VAX/VMS operating sys; Rdb/VMS relational database, UNIX, 3GL, Motif & C++. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, Scientist or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, graphics s/ware design; writing test programs, & using UNIX & C++. Pay is $34,000/yr. 40 hr/wk.

SYSTEMS ENGINEER (REF. #36380) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl installation, enhancement & customization of BAMCS (Business & Manufacturing Control Sys) incl redesign of its modules, database modifications & sys testing. Duties require using Unisys A Series with COMS, DMSII s/ware under MCP/AS operating environment & COBOL & ALGOL programming languages. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, Anal or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, development, installation & customization of manufacturing control app sys incl BAMCS; & using UNISYS A series, COMS, DMS II, MCP/AS, COBOL & ALGOL. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF. #36683) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl a development, database design & development of a directory publishing sys. Duties: end-user interviews for req dsgn., data modelling using E-R modelling techniques, & tech support for design of apps using VAX $5520, VMS 5.5, Oracle RDBMS 6.0, SQL*FORMS 3.0, PL*SQL, SQL, PRO*C, SQL*REPORTWRITER, SQL*MENU 5.0 and Oracle Case Tools (CASE*Dictionary & CASE*Generation) & involves Database Admin Activities (DBA). ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, development of app sys using VAX/VMS, Oracle RDBMS, Oracle CASE*Tools (CASE*Dictionary and CASE*Generation), SQL*Forms, PL*SQL, and PRO*C. Pay is $34,000/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF. #36883) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl development, enhancements & maintenance of Combustion analysis toolkit pkg which is a collection of programs for transforming, analyzing & reducing data acquired from high sampling rate measurement sys. The toolkit pkg developed on VAX/VMS using C & ported to MS-DOS includes tools for data filtering, Fourier transformation, ensemble statistics & knock signal analysis using various knock algorithms; installation & maintenance of PATHWORKS & basic system management of VAX converting existing RS/1 routines to C to increase overall efficiency of the pkgs; & using Micro VAX, PC, VMS, DOS, RS/1 & C. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, app development & enhancement; algorithms development; sys installation; & using VAX, VMS, C & DOS. Pay is $34,000/yr. 40 hr/wk.

SOFTWARE CONSULTANT (REF. #40193) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, including analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl design & development of document processing sys. Duties incl design, development, tech support of the check processing sys & meetings with users to gather reqs & using Unisys B39, U6000 & PM2 workstations, Interview 4800 & HP protocol analyzers. CTOS, DOS, MS WINDOWS & UNIX operating sys, PLM, PASCAL, C & INTEL ASSEMBLY languages, SNAP (SNA Primary) & NPPS (Network Payment Processing Sys). ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, app design & using Unisys 639, U6000, CTOS, UNIX, PLM, PASCAL, C & Intel Assembly Language. Pay is $43,900/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #13883) to analyze, design, develop & implement comp s/ware for clients' EDP sys, incl the Integrated Accounting Sys. Responsibilities: analyzing user reqs, process flow design, developing billing algorithms; tech support & data modeling identification. Tech support: for design of apps using SLR, VSAM on IBM 3090 using IBM 3090, MVS/XA, VM CP/CMS, TSO, SLR, VSAM, PL/1, REXX & ASSEMBLY. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: must incl design & development of business app s/ware; & using IBM 3090, VM, CP, CMS, TSO, PL/1, REXX & maintenance of VSAM. Pay is $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #14083) to analyze, design, develop & implement comp s/ware for clients' EDP sys, incl on-line & batch business app s/ware for a financial sys using IBM 3090 mainframe. S/ware s/ware CICS, CSP, DB2, IMS DB/DC, PL/1, CLIST, JCL & utilities & MVS/XA. Duties: design & development of on-line accounting & billing modules using DB2, CICS & CSP. Analyze the clients data processing req & then design, develop & maintain batch processing modules using DB2, IMS DB/DC & PL/1. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: design & development of on-line app & financial app sys; using IBM 3090, MVS/XA, CICS, DB2, IMS DB/DC, PL/1, CLIST, JCL & utilities. Pay is $33,155/yr. 40 hr/wk.

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Staff Scientist: Research and develop algorithms for use in production of computer image processing systems for industrial purposes. Will combine one or more central processing boards, real-time pipelined image processing hardware and design total system solutions for various applications in a real-time environment using the OS9 operating system, including algorithms and software development as well as system integration. Will use the resulting system for analysis of products through depth or brightness criteria including implementation of Canny and Markov random field model-based edge detectors in hardware, to insure accuracy of product and conformity of dimensions with production specifications. Requires Ph.D degree in Computer Science. Also requires two months experience in the job to be performed or two months experience as an intern. If experience in related field, experience must be in the implementation of an entire image processing system used for inspection of industrial objects. Education to include completion of a Ph.D. thesis in image processing involving detection of low level features in images using Markov random field model-based and Canny edge detectors, OS9 operating system and programming using multiprocessors. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week at $46,000 per year salary. Please send two copies of resume to: Madison Job Service Office, 206 North Broom Street, Madison, Wisconsin 53703, ATTN: Chris Richard, Case #9307185, An Employer Paid Ad

SOFTWARE ENGINEER - Perform requirement analysis and develop design alternatives that satisfy requirement specifications. Estimate time and resources needed to complete project. Develop software design based on requirements and preliminary design. Perform coding and testing documentation. Troubleshooting and customer support for projects. Salary, $789.00 per week 40 hours per week (8:00 a.m. - 5:00 p.m.) Requirements, Bachelor of Science in Computer Science or Electronic Engineering, applicant must have completed the following graduate level courses - Introduction to Operating Systems; Advanced Operating Systems; Computer Networks, Algorithms, and File Systems. Send resumes to MESC, 7310 Woodward, Rm 415, Detroit, MI 48202 (Ref. #51793). Employer paid ad.

Computer Programmer/Analyst

Responsible for assisting clients in the analysis, installation and maintenance of engineering design systems. Provides and supports client with specific solutions on design and implementation. Must be able to demonstrate competent use of Auto CAD, Rel E, Analog and Digital circuit design, low noise circuit design, printed circuit board design, and PSpice. B.S. in Electrical Engineering or Computer Science. One year's experience or one years experience in engineering. 40 hpw. 9-5pm. $31,200.00 pa. Must have proof of legal authority to work permanently in the U.S To apply send TWO copies of resume to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605, Attention Maxine Counts. Ref. #V-IL 10838-C. NO CALLS. AN EMPLOYER PAID AD.

SYSTEMS ENGINEER - 40 hrs./wk., 8am-5pm, $43,500/yr. To analyze user requirements and prepare functional specifications. Implement computer systems and networks. Design and develop computer software systems utilizing CASE Tools and RDBMS. Require Master's degree in Computer Science, Computer Applications or Electrical Engineering, 3 yrs. exp. in job offered or 3 yrs. expr. as Systems Analyst/Programmer/Engineer/Consultant. Programming experience utilizing X-Windows, C, AGL, RDBMS required. "Employer paid ad" E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 69393.

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The scoop on imaging VARs

By Joe Panepinto

If you're in the market for a document imaging system, you may end up dealing with a value-added reseller (VAR). Imaging vendors use VARs more and more often to sell and support their products, especially system components or smaller turnkey systems that list for less than $500,000.

Unfortunately, the mark-up on such services can be as steep as 30% to 40%. So what can you expect to pay?

Pinpointing the price of a typical document imaging system is nearly impossible because most solutions include a range of equipment. For instance, scanners run from $2,000 to more than $10,000, depending on processing speed. Optical storage subsystems can be erasable or write-once read-many, stand-alone or jukebox and range from roughly $5,000 to more than $200,000. Monitors run from around $2,000 to nearly $10,000.

Software is generally the cheapest — you can get some PC-based imaging software for less than $100 per seat — but the average is $500 to $1,000.

How much you allocate for each piece depends on your needs, but some believe there are general rules for buying from a VAR. Don Gillette, president of CEG Technologies, Inc., a systems integrator in Anaheim, Calif., says the price of a VAR-installed document imaging system should be 25% hardware and 75% software and services. Since the real advantages of imaging come from the way it is implemented rather than the technology itself, software and services should predominate, Gillette says.

On the other hand, David Rose, document imaging product marketing manager at Sigma Designs, a document imaging display vendor that sells largely through VARs, says just the opposite — end users should pay roughly 75% for hardware and 25% for software and services.

As expected, the ratio of hardware to software and services in real-life contracts falls somewhere in between. The city of Houston's personnel department, for example, installed a fairly large ($500,000 to $1 million) document imaging system, the cost of which was 62% for hardware and 38% for software and services.

The department started from scratch. The employment records of 21,000 current and 18,000 former employees (more than 4 million files) were stored in hard copy on floor-to-ceiling racks and accessed by hand. The department decided to skip over microfiche and go directly to a local-area network-based document imaging system with optical storage.

The resulting request for proposals was very specific about the capabilities of the hardware, the LAN and the software. It detailed what the department expected from the VARs in terms of training and installation time frames.

"Whether you're going through VARs or anyone else, I recommend you make them show you a whole system in actual operation," says Darrell Malone, senior personnel administrator. "There are vendors and VARs out there that like to sell you things that don't exist or don't work."

Panepinto is a free-lance writer in Amherst, Mass.

PUSH FOR THE EXTRAS

There are at least two dozen services that a buyer should demand from an imaging VAR. These include:

Requirements definition

VARs should help define the problems you want solved with a document imaging system, including the following:
- Problem definition.
- Work-flow volumetrics.
- Organizational structure analysis.
- Backup.
- Record management.
- Return on investment requirements.

Opportunity analysis

Implementing a document imaging system can severely affect networks as well as work and paper flow. VARs should provide potential clients with:
- A technology investigation.
- Work-flow alternatives.
- Alternative organizational structures.
- An analysis of the impact of imaging on all of the above.

Vendor selection

End-user companies should clearly outline vendor selection criteria, such as software capabilities, scanner quality, storage capacities and retrieval rates. The VAR should also clearly spell out each vendor's acquisition and contract requirements.

Proposed solution

A final proposal from a VAR should include not only the system specifications and cost, but also the manner in which the change from existing document practices to the new system will be accomplished.

Source: CEG Technologies, Inc., Anaheim, Calif.

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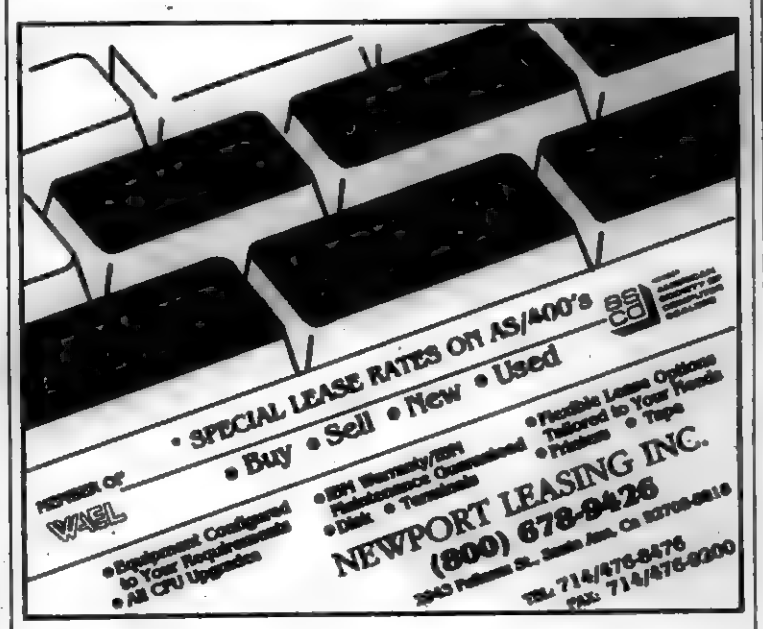

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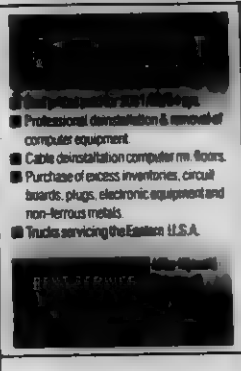

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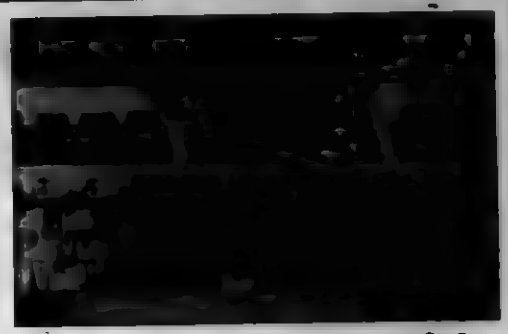

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U.S. Department of Energy 16
U.S. Environmental Protection Agency 2,24
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W

Wandel & Goltermann Technologies, Inc. 62
Wang Laboratories, Inc. 16,74
Watcom International Corp. 81
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X

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Y

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Gainers

Percent

Telxon Corp.	46.7	Gateway Communications(L)	-25.0
Bolt, Beranek & Newman(H)	37.8	Read Systems	-22.1
Communications Corp.	27.9	Eagle Corp.	-17.9
Atmel Corp.(H)	25.9	Tyrone Corp.	-13.3
Network Equipment Tech.	25.6	Biomedi	-13.1
Lattice Semiconductor	24.7	Mentor Corp.(L)	-11.9
BMC Corp.(H)	23.6	Gupta	-10.5
Compaq Inc.	20.8	Banyan Inc.	-8.8

Dollar

Cabletron Systems	11.88	Read Systems	-2.38
DSC Communications(H)	7.50	Computer Task Corp.	-2.25
Progress Software Corp.	7.25	Powersoft	-2.13
Motorola Inc.(H)	7.13	Gupta	-2.13
Atmel Corp.(H)	6.88	Bellsouth Corp.(H)	-2.00
EMC Corp.(H)	5.63	Software Spectrum Inc.	-1.75
American Power Conversion	5.50	Oracle Corp.	-1.75
Intel Corp.	5.50	Lotus Dev. Corp. H.V.(H)	-1.63

Systems software struggles

Investors must be dizzy by now. Many mainframe systems software stocks have gone up and down like a roller coaster during the past several months — most notably Legent Corp. (LGNT) and BMC Software, Inc. (BMCS).

Analysts said the sector presents several excellent investment opportunities, but they were less than unanimous on which companies have the best prospects and when valuations would more permanently turn upward.

Legent, which filed its quarterly report last week (see story next page), has suffered the most. Legent shares sank more than 10 points in one day last month when the company previewed its earnings. The company closed Thursday at less than half of its February 52-week high. Earlier in the year, BMC issues bounced from a high of more than 84 points to a low of about 38 points. The stock has since regained 20 points.

Some observers pin the blame squarely on the rumored demise of the mainframe. However, Wall Street analysts said recent evidence suggests the software market is quite solid. The analysts pointed out that a number of systems and utilities software vendors recorded excellent results in the most recent quarter.

For example, BMC's $.05 per share earnings easily eclipsed analysts' expectations. Boole & Babbage, Inc. (BOOL) scored a 70% increase in net income, and Compuware Corp. (CPWR), 4th Dimension Software, Inc. (DDDDF) and Platinum Technology, Inc. (PLAT) also fared well.

For the most part, stocks in the sector have responded sluggishly, indicating that investors remain somewhat skeptical. However, such pervasive success argues that the mainframe software market is still vital, according to Terence Quinn, managing director at Furman-Selz, Inc. "Two quarters ago, people would have said it's dead," Quinn said. "But BMC's and Legent's shortfalls were due to execution problems not sector problems."

Legent likely has further sales force and product line transitions to undergo before its issues turn around, analysts agreed.

Among other stocks, SoundView Financial Group analyst James Mendelson recommended BMC and Platinum Technology as good short-term opportunities, while Compuware provides strong long-term prospects. Compuware's shares were dragged down earlier in the year when Legent's problems began, but they have largely recovered.

Quinn recommended purchase of Computer Associates International, Inc. (CA) and BMC, while Mendelson rated CA as Neutral.

— Derek Slater

Exch	52-Week High	52-Week Low		Aug. 6 3 PM	Wk Net Change	Wk Pct Change
Networking/Communications						
OTC	40.00	10.25	3 COM Corp.	22.50	0.38	1.7
NYS	82.25	63.38	American Info Techs Corp.(H)	82.25	1.00	1.2
NYS	65.00	40.63	AT&T	62.63	-1.00	-1.6
OTC	4.06	0.75	Aritel Communication Corp.	2.81	0.44	18.4
OTC	24.50	10.25	Banyan Systems Inc.	19.75	2.75	16.2
NYS	60.13	44.50	Bell Atlantic Corp.(H)	58.13	-1.50	-2.5
NYS	58.88	46.75	Bellsouth Corp.(H)	56.00	-2.00	-3.4
NYS	52.75	3.63	Bolt, Beranek & Newman(H)	12.75	3.50	37.8
OTC	18.50	9.50	Brooktrout Technology	12.75	-1.00	-7.3
NYS	134.25	52.13	Cabletron Systems	114.25	11.88	11.6
OTC	26.50	5.88	Certigram Communications	26.50	1.50	6.0
OTC	51.00	19.00	Chipcom Corp.	51.00	4.50	9.7
OTC	57.25	22.13	Cisco Systems Inc.	56.50	4.50	8.7
OTC	16.38	5.50	Compression Labs Inc.	13.63	0.63	4.8
OTC	36.00	13.00	CrossComm	28.25	2.13	8.1
OTC	4.63	1.38	Data Switch Corp.	2.88	0.00	0.0
NYS	19.88	12.38	Digital Comm. Assoc.	13.38	0.00	0.0
OTC	12.75	4.00	Digital Systems Int'l Inc.	4.50	0.25	5.9
OTC	62.25	5.88	DSC Communications(H)	62.25	7.50	13.7
OTC	9.50	4.75	Fibronix Int'l, Inc.	5.69	0.13	2.3
OTC	24.00	8.75	Fibernet Corp.	12.25	0.25	2.1
OTC	4.38	1.50	Gandalf Technologies Inc.	2.75	-0.13	-4.3
OTC	2.06	0.84	Gateway Communications(L)	0.84	-0.28	-25.0
NYS	15.75	2.88	General Datacomm Inds.	9.50	0.00	0.0
ASE	3.75	2.00	Go Video	2.44	0.06	2.7
NYS	37.75	32.38	GTE Corp.	35.25	-0.75	-2.1
NYS	90.75	62.75	ITT Corp.(H)	89.75	1.00	1.1
OTC	29.88	16.06	MCI Communications Corp.(H)	28.50	0.50	1.8
OTC	6.50	1.50	Microcom Inc.(L)	1.88	0.00	0.0
OTC	24.25	3.50	Netrix Corp.(L)	4.00	0.25	6.7
OTC	19.00	7.00	Network Computing Devices(L)	7.75	0.25	3.3
NYS	15.00	5.38	Network Equipment Tech.	9.25	1.88	25.4
OTC	20.13	8.00	Network General	11.63	0.13	1.1
OTC	15.75	6.88	Network Systems Corp.(L)	7.25	0.13	1.8
OTC	59.75	7.50	Newbridge Networks Corp.(H)	59.75	4.00	7.2
NYS	46.00	21.38	Northern Telecom Ltd.	24.38	0.63	2.6
OTC	35.25	17.63	Novell Inc.	23.00	2.25	10.8
NYS	92.50	79.00	Nynex Corp.	88.38	-1.75	-1.9
OTC	30.00	14.50	Octel Communications Corp.	22.00	-1.63	-6.9
OTC	6.13	3.38	Perini Data Comm Networks	4.00	-0.25	-5.9
OTC	30.50	10.25	Picturetel Corp.	17.25	-0.50	-2.8
OTC	15.25	3.63	Proteon Inc.	4.00	-0.13	-3.0
NYS	35.00	16.34	Scientific Atlanta Inc.	34.13	3.63	11.9
NYS	60.75	31.75	Southwestern Bell Corp.	60.38	0.13	0.3
NYS	36.63	22.25	Sprint Corp.(H)	35.50	-0.88	-2.4
OTC	27.00	11.38	Standard Microsystems Corp.	18.13	0.75	4.3
OTC	18.50	7.75	Stratacom Inc.	12.50	0.50	4.2
OTC	42.75	10.75	Synoptics Communications	30.38	4.13	15.7
OTC	7.00	3.75	Telebit Corp.	5.50	1.75	46.7
OTC	9.88	2.25	Telematics Int'l Inc.	9.88	0.75	8.2
OTC	28.50	14.00	US Robotics(H)	28.00	0.75	2.8
NYS	47.75	35.25	US West Inc.	46.25	-0.75	-1.6
OTC	55.50	17.50	Wellfleet Communications	53.75	2.25	4.4
OTC	17.25	7.25	Xircom	16.25	0.75	4.6
PC and Workstations						
OTC	5.56	2.50	Advanced Logic Research	3.00	-0.25	-7.7
OTC	65.25	25.25	Apple Computer Inc.	30.25	2.25	8.0
OTC	24.25	11.25	AST Research Inc.	14.63	-0.38	-2.5
NYS	9.50	2.50	Commodore Int'l.	3.50	0.25	7.7
NYS	61.75	27.75	Compaq Computer Corp.	49.75	2.63	5.6
OTC	49.88	13.50	Dell Computer Corp.	19.88	-0.25	-1.2
NYS	89.25	50.25	Hewlett Packard Co.	71.50	-0.50	-0.7
NYS	39.75	17.63	Silicon Graphics	34.38	0.13	0.4
OTC	41.00	24.00	Sun Microsystems Inc.	29.13	-0.50	-1.7
NYS	32.38	22.25	Tandy Corp.	29.50	1.00	3.5
OTC	7.00	2.75	Zeos International Ltd.	3.25	0.25	8.3
Mainframes						
ASE	15.13	4.63	Amdahl Corp.	5.25	-0.13	-2.3
NYS	8.75	3.75	Convex Computer	3.88	0.00	0.0
OTC	6.13	2.25	Cray Computer	2.63	-0.16	-5.6
NYS	30.88	19.00	Cray Research Inc.	21.13	-0.50	-2.3
NYS	13.88	7.63	Data General Corp.	8.00	-0.50	-5.9
NYS	49.25	30.38	Digital Equipment Corp	36.50	0.63	1.7
NYS	43.38	28.38	Harris Corp.(H)	42.25	1.75	9.7
NYS	89.13	41.13	IBM	43.25	-0.75	-1.7
OTC	22.00	5.50	Kendall Square Research	18.50	1.50	8.8
NYS	129.50	83.00	Matsushita Electronics	129.50	4.50	3.6
OTC	23.75	8.25	NetFrame	14.75	-0.25	-1.7
OTC	17.25	9.25	Parallan Computer	15.75	-0.38	-2.3
OTC	21.00	6.00	Pyramid Technology	19.00	0.75	4.1
OTC	24.00	11.25	Segment Computer Sys.	14.25	1.38	10.7
OTC	8.75	1.38	Sequoia Systems Inc.	2.00	0.06	3.2
NYS	48.38	21.00	Stratus Computer Inc.(L)	22.63	0.75	3.4
NYS	16.88	9.63	Tandem Computers Inc.(L)	10.00	-0.38	-3.6
OTC	23.50	10.63	TriCord Systems	18.00	-1.50	-7.7
NYS	13.88	7.75	Unisys Corp.	10.25	0.13	1.2
Software						
OTC	74.00	25.25	Adobe Systems Inc.	53.75	3.63	7.2
OTC	20.75	10.25	Aldus Corp.	12.75	0.13	0.7
OTC	13.88	5.50	American Software Inc.	6.63	0.25	3.9
OTC	28.13	9.50	Ask Computer Systems(L)	10.50	0.13	1.2
OTC	56.75	38.63	Autodesk Inc.	46.00	5.00	12.2
OTC	10.50	2.50	Bachman Info. Systems	3.38	-0.25	-6.9
OTC	43.00	31.00	BGS Systems Inc.	32.25	1.25	4.0
OTC	84.13	38.75	BMC Software Inc.	58.00	2.50	4.5
OTC	28.25	18.00	Boole & Babbage	23.50	-1.00	-4.1
OTC	49.00	17.25	Borland Int'l Inc.(L)	18.25	-0.25	-1.4
OTC	5.13	2.88	CE Software(L)	3.13	-0.06	-2.0
ASE	34.88	7.75	Cheyenne Software Inc.	32.88	2.25	7.3
OTC	19.50	8.25	ChipSoft	9.50	-0.25	-2.6
OTC	8.88	5.63	Cognos Inc.	8.75	0.25	2.9
NYS	31.38	13.00	Computer Associates	29.88	1.50	5.3
NYS	12.38	2.75	Computervision Corp.	3.13	-0.25	-7.4
OTC	34.25	19.25	Compuware Corp.	26.25	-2.25	-7.9
OTC	14.75	5.75	Conshare Inc.	9.75	1.63	20.0
OTC	19.25	10.75	Corel Corp.(H)	18.50	-0.50	-2.6
OTC	15.25	5.00	Easel Corp.	5.75	-1.25	-17.9
OTC	29.25	12.00	4th Dimension	18.50	-0.13	-0.7
OTC	19.50	5.25	Frame Technology	7.50	0.13	1.7
OTC	19.00	8.38	Group I Software	10.00	-0.50	-4.8
OTC	35.25	14.50	Gupta	18.13	-2.13	-10.5
OTC	10.25	4.13	Hogan Systems Inc.(H)	9.25	-0.13	-1.3
OTC	25.75	11.25	IMRS	20.50	1.25	6.5
OTC	38.00	21.00	Information Resources	36.25	1.25	3.6
OTC	27.25	8.81	Informix Corp.	21.88	0.38	1.7
OTC	16.75	8.75	Intergraph Corp.	9.00	-0.38	-4.0

Exch	52-Week High	52-Week Low		Aug. 6 3 PM	Wk Net Change	Wk Pct Change
OTC	13.63	6.00	Interleaf Inc.	7.00	0.63	9.8
OTC	18.00	4.75	Intersolv Inc.(L)	5.38	-0.13	-2.3
OTC	16.00	7.75	Knowledgeware Inc.	11.25	0.00	0.0
OTC	54.75	15.50	Legent Corp.	20.88	0.88	4.4
OTC	37.00	14.75	Lotus Development	36.63	0.13	0.3
OTC	23.00	5.75	MathSoft(L)	6.75	0.50	8.0
OTC	23.25	4.50	McAfee Associates(L)	6.50	0.25	4.0
OTC	11.63	2.00	Meca Software	4.75	-0.38	-7.3
OTC	12.00	5.25	Mentor Graphics	9.25	0.75	8.8
OTC	46.00	26.63	Micro Focus	27.25	-1.00	-3.5
OTC	13.25	4.38	Micrografx Inc.	6.13	0.06	1.0
OTC	98.00	68.00	Microsoft Corp.	74.75	1.00	1.4
OTC	53.00	15.75	Oracle Corp.	53.00	2.50	5.0
OTC	37.13	18.38	Parametric Technology	37.13	2.13	6.1
OTC	40.50	22.50	Peoplesoft	31.25	1.00	3.3
OTC	7.13	3.50	Phoenix Technologies	4.50	0.13	2.9
OTC	40.00	22.00	Powersoft	28.75	-2.13	-6.9
OTC	41.50	17.00	Platinum Software	36.88	3.38	10.1
OTC	25.00	10.75	Platinum Technology	12.50	0.00	0.0
OTC	61.50	32.25	Progress Software Corp.	50.75	7.25	16.7
OTC	7.38	2.56	Quarterdeck Office Sys.	3.00	-0.19	-5.9
OTC	32.00	14.25	Rainbow Technologies Inc.	25.00	-0.50	-2.0
OTC	10.75	4.00	Rasterops	8.50	0.25	3.0
OTC	15.25	3.63	Ross Systems	8.38	-2.38	-22.1
OTC	27.75	9.63	Sapiens Intl., Corp. N.V.(H)	25.13	-1.63	-6.1
OTC	14.50	5.50	Software Publishing Corp.(L)	5.75	0.13	2.2
OTC	12.75	7.38	Software Toolworks Inc.(H)	12.50	0.50	4.2
OTC	2.88	0.75	Spinnaker Software	1.38	0.13	10.0
OTC	13.00	3.25	State of the Art(H)	11.00	-1.00	-8.3
NYS	24.63	15.00	Sterling Software Inc.	22.25	-0.13	-0.6
OTC	21.50	8.00	Struct. Dynamics Research	20.63	0.88	4.4
OTC	77.50	26.50	Sybase Inc.	73.50	2.50	3.5
OTC	19.25	5.88	Symantec Corp.	15.13	1.63	12.0
NYS	12.50	5.25	Systems Center Inc.	10.25	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	22.00	2.00	10.0
OTC	6.38	2.75	Telelec Corp.	3.25	-0.50	-13.3
OTC	22.75	10.00	ViewLogic Systems	22.00	1.00	4.8
OTC	23.50	5.50	Walker Interactive Systems(L)	6.50	-0.25	-3.9
OTC	3.19	1.31	Wordstar(L)	1.34	0.03	2.4
Semiconductors						
NYS	32.88	8.38	Advanced Micro Devices	27.88	4.13	17.4
NYS	23.63	9.38	Analog Devices Inc.(H)	23.13	1.25	5.7
OTC	53.38	7.63	Atmel Corp.(H)	53.38	6.88	25.9
OTC	5.50	2.75	Chips and Technologies	4.13	0.38	10.0
OTC	39.75	13.00	Cirrus Logic	25.63	0.00	0.0
NYS	15.50	7.88	Cypress Semiconductor Corp.(H)	15.50	0.50	3.3
OTC	17.63	9.38	Dallas Semiconductor	17.63	1.88	11.9
OTC	60.63	27.13	Intel Corp.	57.00	5.00	9.6
NYS	18.38	6.88	LSI Logic Corp.(H)	18.38	2.00	12.2
OTC	22.75	11.66	Lattice Semiconductor	22.75	4.50	24.7
NYS	49.38	14.38	Micron Technology(H)	49.38	3.88	8.5
NYS	97.38	41.38	Motorola Inc.(H)	97.38	7.13	7.9
NYS	17.75	9.88	National Semiconductor	12.75	1.38	8.4
OTC	15.75	6.50	Sierra Semiconductor	7.13	0.13	1.8
OTC	51.00	23.00	SynOptics	51.00	2.00	4.1
NYS	76.50	36.75	Texas Instruments	75.13	4.13	5.8
OTC	12.88	6.25	VLSI Technology(H)	12.88	1.13	9.6
OTC	12.63	2.63	Weitek	10.88	-0.88	-7.4
ASE	9.63	3.63	Western Digital Corp.	4.88	0.75	18.2
OTC	41.50	14.50	Xilinx	41.50	1.50	3.8
OTC	33.00	15.34	Zilog Inc.	28.50	4.00	16.3
Miscellaneous Computer Subsystems						
OTC	45.00	15.00	American Power Conversion	45.00	5.50	13.9
OTC	20.16	15.50	Banctec Inc.	18.50	0.25	1.4
OTC	18.00	4.00	Cambex Corp.(L)	4.25	-0.25	-5.6
ASE	18.38	9.88	Cognitronics Corp.	5.88	1.25	27.0
NYS	25.50	9.00	Conner Peripherals	11.75	0.50	4.4
OTC	38.50	10.75	Creative Technologies Inc.	20.88	-0.38	-1.8
OTC	30.75	11.00	Data Race Inc.	16.50	1.75	13.7
ASE	15.38	6.75	Dataram Corp.	9.13	-0.25	-2.7
NYS	29.63	5.06	EMC Corp.(H)	29.63	5.63	23.4
OTC	10.50	3.38	Emulex Corp.	6.13	-0.38	-5.8
OTC	19.00	13.25	Evans & Sutherland	16.25	0.25	1.6
OTC	30.38	7.50	Exabyte	8.75	0.00	0.0
OTC	28.75	7.09	Intelligent Info. Systems	25.00	0.25	1.0
OTC	8.88	3.63	Iomega Corp	3.63	-0.13	-3.3
OTC	15.75	5.75	IPL Systems Inc.	8.88	-0.13	-1.4
OTC	34.00	14.00	Komag Inc.	20.00	-0.50	-2.4
OTC	19.63	4.63	Maxtor Corp.(L)	4.63	-0.63	-11.9
OTC	10.75	5.75	Micropolis Corp.	6.13	-0.13	-2.0
NYS	117.00	97.00	3M Corp	106.88	0.88	0.8
OTC	7.75	4.00	Pinnacle Inc.	6.25	-0.13	-2.0
NYS	17.25	6.88	QMS Inc.	9.63	0.63	6.9
OTC	17.88	9.50	Quantum Corp.	10.88	-0.25	-2.2
OTC	10.88	3.13	Radius Inc.	3.88	-0.38	-8.8
NYS	16.50	7.88	Recognition Equipment	13.25	1.25	10.4
OTC	13.88	3.75	Rexon Inc.	3.88	-0.25	-6.1
OTC	22.38	12.00	Seagate Technology	20.00	0.50	2.6
NYS	45.00	18.00	Storage Technology	26.63	-0.63	-2.3
NYS	27.88	17.63	Tektronix Inc.	26.38	0.63	2.4
NYS	88.88	70.25	Xerox Corp.(L)	73.00	0.00	0.0
Systems						
OTC	23.75	14.88	American Mgmt. Systems	16.25	0.25	1.6
NYS	4.75	2.38	Amacomp Inc.	2.88	0.00	0.0
OTC	35.75	16.25	Analysts Int'l	30.75	3.00	10.8
NYS	56.13	43.00	Auto Data Processing	50.13	0.25	0.5
NYS	17.25	12.50	Ceridian Corp.	15.25	0.25	1.7
NYS	17.38	13.13	Comdisco Inc.	14.50	0.13	0.9
OTC	9.00	4.50	Computer Horizons	8.63	-0.38	-4.2
NYS	87.25	63.13	Computer Sciences(H)	86.13	2.25	2.7
NYS	9.25	6.00	Computer Task Group(L)	6.13	0.00	0.0
NYS	40.50	19.00	Comusa Inc.(L)	24.25	3.63	17.6
OTC	14.25	6.00	Corporate Software	10.00	1.25	14.3
OTC	12.75	6.75	Egghead Discount Software(L)	6.75	-0.25	-3.6
NYS	35.88	26.00	General Motors E (EDS)	28.38	0.75	2.7
OTC	25.50	10.50	Imacon Corp.	21.75	-0.25	-1.1
OTC	16.25	8.13	Intelligent Electronics	15.13	-0.50	-3.2
OTC	33.13	6.63	Mentor	10.75	-1.63	-13.1
OTC	23.75	5.75	Microage Inc.	22.75	0.50	2.2
OTC	63.75	24.50	Paychex(H)	63.75	1.00	2.3
NYS	87.25	25.25	Policy Management Sys.	27.63	0.13	0.5
NYS	41.38	20.38	Reynolds and Reynolds	40.63	-0.25	-0.6
OTC	17.25	11.00	SEI Corp.	16.75	-0.25	-1.5
OTC	24.38	17.50	Shared Medical Systems	21.75	1.50	7.4
OTC	12.63	5.75	SHL Systemhouse	10.75	0.38	3.8
OTC	30.75	20.00	Software Spectrum Inc.	24.25	-1.75	-6.7
OTC	39.00	23.25	Sungard Data Systems(H)	39.00	2.75	7.6
NYS	4.38	1.13	Ultimate Corp.	3.38	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

AST posts loss

AST Research, Inc. last week posted fiscal fourth-quarter sales of $409 million, up 54% from the comparable period last year. A $125 million restructuring charge related to its purchase of Tandy Corp.'s computer business gave AST an $87 million loss in the period, compared with an $18.6 million profit in the same quarter last year. For the year, AST lost $53.7 million on revenue of $1.4 billion. Last year, the Irvine, Calif., company earned $68.5 million on revenue of $944 million.

Legent earnings drop

As expected, Legent Corp. reported fiscal third-quarter earnings of $9.2 million, down 29% from the same period a year ago, on sales of $100 million, which were also down about 3% from the same period last year. Legent said the dip in performance for the period ended June 30 stemmed from a shortfall in new license revenue in North America and Germany [CW, July 19].

Chip maker sees red

Chips and Technologies, Inc. reported a fourth-quarter loss of $9 million, which widened its fiscal 1993 deficit to $49.1 million. The fiscal 1993 loss included $23 million in restructuring charges. Fourth-quarter sales were $55 million, off 36% from the same period last year. Fiscal 1993 sales plunged 31% to $97.9 million. The San Jose, Calif., chip maker lost $63.9 million in fiscal 1992.

SHORT TAKES Northgate Computer Systems, Inc. eked out a $527,000 second-quarter profit on sales of $21.4 million. . . . Edward E. Faber, Computerland Corp.'s founding president, has joined the board of Humbolt, S.D.-based Interactive. . . . A class-action suit alleging securities law violations has been filed against The Santa Cruz Operation, which denied the charges.

Midrange getting hotter for CA

By Thomas Hoffman
ISLANDIA, N.Y.

Computer Associates International, Inc.'s impressive first-quarter results were, as usual, buoyed by an increase in its host systems software sales. But although CA's mainframe revenue grew 11% to $331 million for the period ended June 30, systems software revenue as a percentage of overall sales shrank to 78%, down from 81% of total sales in the year-earlier quarter.

The changes, though minor, may indicate that CA's attempts to make inroads into Unix, desktop and distributed software markets are beginning to have an impact. For example, sales of CA's midrange products, including its IBM Application System/400-based CA-PRMS manufacturing cache, catapulted 131% last quarter to $37 million.

Because CA has filled a niche with CA-Unicenter by offering what many analysts consider the most comprehensive systems management product available for multivendor distributed operating environments, the company could be well on its way to making midrange product sales 25% of total revenue within the next five to 10 years. "CA is making out better than anyone else in that business," said Charles E. Phillips, a financial analyst at Kidder, Peabody & Co. in New York.

Maybe midrange

Even though midrange sales contributed a mere 9% of overall sales for the first quarter, analysts said they believe revenue could triple if shipments of Unix and networked and desktop versions of CA's Unicenter systems management package begin making an impact during the next six to 12 months.

For example, CA has delivered 4,000 copies of its CA-Unicenter for Unix package to Hewlett-Packard Co. since July 8. The software, which is being bundled into HP 9000 Model 800 Unix machines as part of a one-year promotional push, could generate revenue approaching $100 million during the next few quarters at $20,000 to $25,000 per license, according to Terence Quinn, a managing director at Furman-Selz, Inc. in New York.

Noncommittal users

However, because CA-Unicenter for Unix is being offered on the HP boxes with a 120-day free license, not all users will necessarily commit to the package, cautioned Timothy R. McCollum, a financial analyst at Dean Witter Reynolds in New York.

CA executives said it is still too early to forecast what kind of impact the Unicenter orders will have on the company's bottom line.

Quinn said CA will have a better grasp of Unicenter revenue potential once it begins shipping versions to Sun Microsystems, Inc., Novell, Inc. and IBM in December for their respective SunOS, NetWare and AIX and OS/2 software.

Not that CA's mainframe revenue is expected to shrivel up any time soon. Quinn forecasted that CA's systems software sales should continue to experience "low double-digit growth for the next two years."

Analysts said they believe CA's flexible software licensing programs, which the company rolled out in April 1992, have had a favorable impact on the vendor's revenue. "The change in the pricing strategy allows CA to do a better job of servicing their customers and sell more mainframe software," said Andrew C. Brosseau, a principal at Cowen & Co. in Boston.

Furthermore, Quinn said he believes CA's licensing changes have had a double-edged effect. He said the moves have improved the company's relationships with its customers. As a result, the licensing initiatives have adversely affected competitors that historically have preyed on perceived problems between CA and its installed base, most notably Legent Corp., which last quarter suffered a dramatic dip in earnings (see story at left).

"The list of customers who had been angry with CA is gradually getting shorter as CA's licensing structure has helped improve customer relations," Quinn said.

Add-on revenue

The bulk of mainframe revenue reportedly comes from customers adding systems management software and utilities. Brosseau said as much as 50% of the most recent mainframe revenue is derived from maintenance.

CA's desktop sales also continued to make gains, posting a 9% increase to $38 million for the quarter. CA's strategy of delivering desktop versions of its systems management tools should help buttress future sales, Brosseau said.

Some analysts were less enthused about CA's desktop revenue potential compared with its future with Unix products. "CA will pick their niches [for desktop products], but we don't envision them going up against Lotus or Microsoft," Quinn said.

3 up, 1 down

The following is a breakdown by platform of CA's first-quarter revenue for the period ended June 30. (Gains and losses compared with first-quarter 1992).

- Mainframe software revenue: $331 million (11% increase).
- Midrange software revenue: $37 million (131% increase).
- Microcomputer software revenue: $38 million (9% increase).
- Other product revenue: $17 million (5% decrease).

Cognos to target client/server

By Melinda-Carol Ballou
BURLINGTON, MASS.

Cognos, Inc., purveyor of the PowerHouse fourth-generation language (4GL) and other tools, is pushing to reinvent the company later this year, when it plans to unwrap a new generation of products at its fall user conference. However, it will have to demonstrate better timing and overcome a tendency to undermarket itself, analysts said.

Cognos will be targeting the client/server market with tools for creating distributed applications that will ship in the first half of next year, officials said. The company seeks to capitalize on the need for more robust tools and stronger languages for client/server development.

A new marketing slant will begin with a different product name to complement the new series, which will include a full PC version and graphical developer's tool. Cognos will also announce multiple relational database management system support for the Unix versions of PowerHouse.

After two consecutive years of losses — approximately $8 million for fiscal 1993 and approximately $5 million for fiscal 1992 — revenue increased 2% for Cognos' first fiscal quarter of 1994. Net income, however, was $100,000 compared with $200,000 for the same quarter in 1993.

Ron Zambinini: *Cognos needs to make 'serious changes'*

Incoming Chief Operating Officer Ron Zambinini (formerly vice president of research and development) earlier this year spearheaded a now-completed reorganization, which eliminated about 150 positions.

Analysts said while Cognos' 4GL offering is strong, as are its desktop products such as Impromptu and PowerPlay, the firm has been perceived as an "ancient 4GL" vendor for the proprietary market. Cognos was hurt by a late, poorly marketed entrance into the Unix arena, said Judith Hurwitz, president of Hurwitz Consulting in Newton, Mass.

Zambinini seemed aware of these problems, noting the company needs to make "serious changes" to avoid its problems in the Unix market and to effectively target the client/server arena.

Wysiwyg

Who is your personal hero?

While working at Paramount Pictures on a project, I recently got to meet my personal hero, Jonathan Frakes, better known as Commander Riker, second in command of the Starship Enterprise on *Star Trek*. He is the executive commander of a spaceship, and he has to deal with a lot of the same things I have to deal with at my job. We are both battling with the competition, and we both need to manage our people. Perhaps these similarities can allow all of us to look at what we do in a less serious way.

Saverio Merlo
Senior vice president of marketing
Boole & Babbage, Inc.

Vladimir Nabokov, who was a Russian author, would be one of my personal heroes. He wrote a variety of fictional novels on life's challenges and personal relationships that earned him notoriety in both Russia and throughout the world. He wrote such novels as *Pin*, *Pale Fire* and *Speak Memory* (autobiography).

Mike Walsh
Senior vice president
Comdisco Systems, Inc.,
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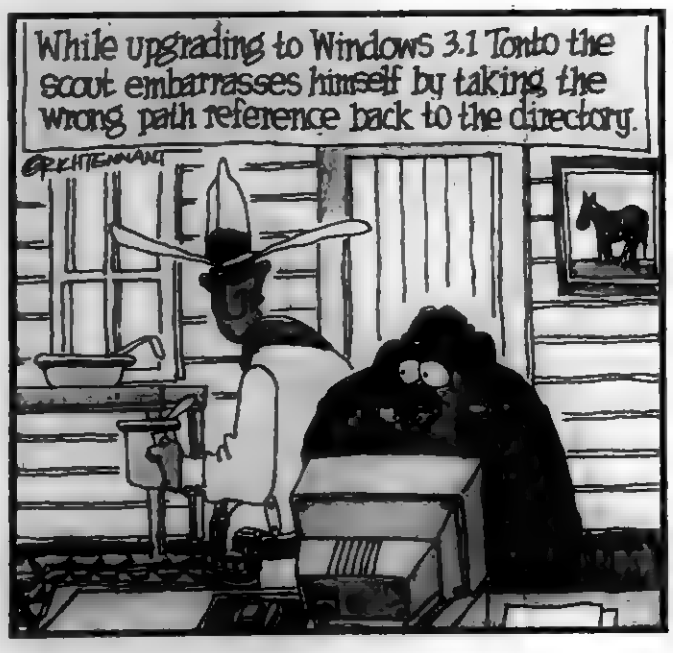
The 5th Wave *by* Rich Tennant



Inside Lines

No strings attached?

Sources close to Compaq said the company will today announce Prebate, a program that will see it send out 75,000 checks worth $10,000 to IS managers and another 500,000 checks starting at $250 to consumers. The promotion is aimed at pushing various bundles of Compaq's LTE Lite 4/25C, which features an active-matrix monochrome screen and an unconstrained supply. For those who take Compaq's offer, price savings can amount to more than 7% of the bundle cost, the sources said.

No stopping innovation

Compaq's Innovate '93 conference, which starts Sept. 13, will feature major product rollouts, including the successor to SystemPro [CW, June 14] and a combination pen and keyboard notebook. Sources briefed on the new servers said there will be three models, all of which will use either the 50-MHz 486DX or Pentium chips. The configurations include a single-processor box, along with either a two- or four-processor box.

DASD on the way

The next major products out of IBM's Adstar storage subsidiary are expected in early 1994 and will include a high-performance disk drive that attaches directly to the processor instead of a controller in both RAID and non-RAID versions. There will also be a somewhat slower model that requires a controller. The first model will handle up to 120G bytes of memory at under $5 per megabyte, predicted International Data Corp. analyst Robert Callery. The other unit, which will sport a scheme to protect data, will go for $6 to $7 per megabyte.

Follow the leader

DEC hopes to get the Alpha AXP version of Windows NT into manufacturing next week, three weeks after Microsoft started production work on NT releases for the Intel and Mips Technology architectures [CW, Aug. 2]. DEC begs to differ with Microsoft intimations that Alpha NT may be as much as 60 days behind the Intel and Mips versions. DEC expects to hit the streets with NT within a month of the others.

Rhyming objects

Poet Software in Santa Clara, Calif., plans to unveil later this month what it claims is the industry's lowest-cost object-oriented database. The product is targeted at lone programmers using Windows-based C++ products from Borland and Microsoft, according to a source at Poet. The company is expected to discount the product's $129 list price to $99 until December.

Coming clean

At a briefing last week Novell firmed up its AppWare release dates and finally admitted Banyan's Vines to the ranks of network operating system environments that AppWare client applications will hook into [CW, July 5]. Expect the first developer release of AppWare at Networld+Interop in Dallas in October and general availability in May 1994.

Meanwhile, users beta testing NetWare for Internet Protocol have learned, to their discomfort, about the "dark side" to using TCP/IP as the sole transport protocol for NetWare installations, according to Novell's Darrell Miller. Apparently users discovered they had to manually assign TCP/IP addresses to each PC on each of their LANs — which caused them to come back, much chastened, to IPX as their LAN client/server protocol, Miller said. While TCP/IP makes a fine backbone protocol, IPX is better for the LAN environment because it allows you to assign addresses to your PC users "on the fly," Miller said. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2412, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8565.

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COMPUTERWORLD

Cisco waves white flag, changes SNA strategy

By Elisabeth Horwitt
MENLO PARK, CALIF.

The yearlong battle of the Systems Network Architecture internetworking standards officially ended last week.

Cisco Systems, Inc. renounced its efforts to develop a protocol to compete with IBM's Advanced Peer-to-Peer Networking and is moving forward to equip its routers with IBM's SNA internetworking architecture.

APPN could be the key to open SNA internetworking. See story page 12.

The fracas, however, resulted in a clear win for users, observers said. It forced IBM to make APPN a far more open multivendor protocol, said Nancy Vandell, information architect at Chevron Information Technology.

Initially proposed by Cisco about 10 months ago, the Advanced Peer-to-Peer Internetworking protocol was being developed by Cisco and its allies in the APPI Forum. APPI was to provide users with the same intelligent routing and directory functions that APPN provides for SNA devices but on existing Transmission Control Protocol/Internet Protocol backbones.

This would have saved users from having to implement yet another proprietary IBM protocol on their internetworks, Cisco said. However, APPI had trouble gaining user interest and vendor support, particularly from major router vendors other than Cisco and Proteon, Inc. [CW, March 15].

Meanwhile, IBM has taken several steps to make APPN more open, including making patents and licenses for the technology

Cisco, *page 12*

Sybase to unite tool set

Seeks to grab app development back from third parties

By Kim S. Nash
EMERYVILLE, CALIF.

Notoriously weak in the application development arena, Sybase, Inc. plans to disclose Aug. 30 a scheme to house its disparate tools under one roof, sources close to the company said last week. The firm is also expected to unveil an object-oriented tool that has been more than a year in the making.

Building blocks

Sybase's major application development products

	Function	Key data
APT Workbench	4GL for building applications and forms under Unix, VMS and DOS	Added Motif support in June
Bayt	Application modeling and analysis tool	Acquired March 1991
Gain-Momentum	Object-oriented tool set for building multimedia programs	Acquired September 1992
Calvino	Object-oriented modeling suite	To be announced

Sybase's unification strategy hinges on building links between tools in an otherwise disconnected set. Until now, third parties such as Uniface Corp. and Powersoft Corp. have filled the gaps Sybase left open — something Sybase encouraged. But gradually dropping database prices combined with a growing tools market enticed Sybase to enter the development arena, analysts said.

"They're leaving money on the table" with every database sale that does not include tools, said Rob Tholemeier, an analyst at Meta Group, Inc. in Burlingame, Calif.

For example, Chevron Canada Ltd. bought Microsoft Corp.'s Visual Basic when it could not get the Windows tools it wanted from Sybase, said Bill Soper, manager of information services at the oil company in Vancouver, British Columbia. "If we can get it all from Sybase, and

Sybase, *page 10*

Whither wireless security?

By James Daly

While the growing use of wireless voice and data transmission technology has mobile executives salivating for its anywhere, anytime communications capabilities, the thought of sensitive data skittering unfettered over the airwaves has made some security managers nervous. They wonder if the benefits are worth the potential for abuse.

"I have to admit that it makes me a little jumpy," said Brian Redler, director of security and operations at National Securities Clearing Corp. in New York. "It's still too early to tell if an outsider could pick off our data."

The arrival of personal digital assistants such as Apple Computer, Inc.'s Newton MessagePad and EO, Inc.'s Personal Communicator, coupled with skyrocketing sales of cellular phones, packet radio modems, sky pagers and wireless electronic-mail devices, has created new points of vulnerability for electronic data interchange, experts said.

"None of us would ever leave a confidential memo lying on a restaurant table, but then we turn around and don't think twice about transmitting data electronically without a safeguard," said Bob Geisler, a senior consultant at CCT, Inc., a consultancy in Minneapolis.

Wireless, *page 8*

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Groupware applications

Notes leads, but flaws cited

By Michael Vizard
SAN JOSE, CALIF.

Lotus Development Corp.'s Notes may be groupware's top dog today, but the company needs to adjust the product's pricing and overcome integration problems for it to remain dominant, observers said at last week's Groupware '93 show.

For Notes to succeed long term, Lotus must adopt a pricing model for the product that is akin to those used by operating systems vendors rather than the PC application model it now uses, analysts said. This will make it less expensive for users to adopt Notes company-wide.

Second, while Notes applications can be integrated across multiple platforms, third-party applications cannot be easily integrated into Notes because there are no common application programming interfaces. This is likely to make Notes' cross-platform architecture a less than compelling issue.

Users and resellers, meanwhile, are pressuring Lotus to deliver a runtime version that will allow applications developed using Notes to be deployed on remote systems inexpensively.

"We have a Notes pilot project that could go to 500 licenses tomorrow. But without a Notes runtime, we'll probably take a year to deploy it. And by that time, who knows what Microsoft will have?" said Carolyn Coughlin Weissberg, Notes engineer at Genesnoor International in San Francisco.

Lotus is resisting a runtime license option because such licenses would preclude end users from developing their own applications, noted Cliff Connelghton, director of Notes marketing.

Weissberg noted, however, that most companies do not have or want end users capable of developing robust Notes applications.

Groupware headaches. The electrifying growth of groupware applications in business units is creating a whole new set of headaches for IS. Front-line IS managers, such as Max Burgstahler of Illinois Power Co., say political hassles and integrating SQL databases and back-office operations are among the biggest problems. *See story page 85.*

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ALAN LEVENSON

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COMMENTARY

■Paul Strassman says that under the fancy trappings, re-engineering is the same bitter medicine we've always had to take for overindulgence. *Page 33*

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■Asynchronous Transfer Mode isn't perfect, Charles Babcock says, but there are good reasons why network suppliers are suddenly going gaga over it. *Page 36*

■Personal digital assistants aren't toys, Jeffrey Henning writes. Eventually, they'll be an important part of corporate computing. *Page 49*

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Executive Briefing

It's time to start thinking about security issues with wireless technology. New products and services hitting the market have great end-user appeal but introduce considerable new risks, according to experts. *Page 1.* **And risks will only increase as providers start to roll out very high-capacity wireless nets that rival fiber-optic capacity.** *Page 63*

The lure of groupware is also strong but somewhat risky. The market is proving irresistible for many vendors. Apple just announced a groupware initiative, and even companies such as DEC and Eastman Kodak are getting in on the act. *Page 14.* **And customers are finding plenty of applications. For example, American Airlines plans to expand its Sabre reservation system to accept reservations via fax or E-mail, with E-mail confirmation.** *Page 14.* **But there's a downside. Users complain that integration of multiple E-mail systems is often difficult** *(page 85)*, **and many are losing patience with vendors' inability to agree on standards.** *Page 16*

In the meantime, vendors are pushing groupware into a spectrum of new areas, including client/server, object orientation, multimedia and video *(page 14)*, **blurring lines in a manner not unlike what's happening in the convergence of multimedia applications and cable-based interactive television.** *Page 89*

The practical intersection of computer and consumer technology may seem a long way off, but it has already started to affect careers. The promotion of Viacom CIO Henry Leingang to senior vice president at that company signals the growing importance of technologists in the mass-media business. *Page 24.*

At somewhat less elevated levels, the explosion of new computer/media combinations has touched off a mini hiring boom for multimedia specialists and holds promise for many more other types of IS professionals, including network and database administrators. The best qualification is knowledge of C++ because most new authoring systems for multimedia are object-based. *Page 89*

Microsoft is reportedly hoping to use its 32-bit version of Visual C++ as an extra tie to bind users to Windows and Windows NT. Competition is heating up, and the theory is that whoever controls the development environment will control the operating system. *Page 8*

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—Richard Fitzgerald and James Daly

Motorola eyes NT for PowerPC

Takes license, but IBM drags feet on port

By Michael Fitzgerald

Microsoft Corp.'s Windows NT is sneaking through the back door into the PowerPC alliance formed by Motorola, Inc., IBM and Apple Computer, Inc. But, politics being what they are, none of the companies involved are talking about it through official channels.

Sources close to the deal confirmed a published report that Motorola has licensed NT from Microsoft. But neither company officially confirmed the agreement, in part because IBM so far is refusing to say it will announce a Windows NT-based version of PowerPC in its initial PowerPC workstations, according to sources.

Observers were split on the reasons behind IBM's reluctance to come out strongly in favor of NT on PowerPC. The PowerPC will be used in systems ranging from IBM's RISC System/6000 workstations to low-end portables expected sometime in 1994.

"There's a lot of questions in the market about whether NT will do anything on the desktop, so why should IBM help it out?" said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass.

NT needed

Other analysts disagreed, saying NT support was crucial to PowerPC's future.

Part of the problem is "IBM has multiple groups needing to buy in, instead of just one," which is slowing NT's acceptance within Big Blue, said Frank Dzubeck, president of Communication Network Architects, Inc. in Washington, D.C. "It's not a question of [OS/2 operations czar Lee] Reiswig saying not to do that," Dzubeck added.

Sources close to IBM said the company fully intends to support NT, but it will let Motorola take the lead in porting it to PowerPC. Both Motorola and IBM recognize how important it is to PowerPC's future for NT to run on the chip, the sources said.

But IBM has focused its development resources on WorkPlace OS, which will run both AIX and OS/2. It is an environment that will lead users to Taligent, IBM and Apple's joint object-oriented operating system venture.

A Microsoft Corp. spokeswoman said it is in Microsoft's best interest to make sure any company that licenses NT succeeds with its port.

"It's a pretty amazing deal for Microsoft — they get something that really helps NT, which is performing slowly on Intel platforms, and got Motorola to pay for it," said Jesse Berst, publisher of the "Windows Watcher" newsletter in Redmond, Wash.

Subnotebooks

Smaller, but better portables arrive

By Michael Fitzgerald

Small packages are starting to contain better things.

Gateway 2000, Inc. highlighted this trend last week by introducing a version of its 2.9-pound HandBook with an Intel Corp. 1486 chip in it, joining IBM PC Co., Hewlett-Packard Co., Zeos International Ltd. and CompUSA, Inc.'s Compudyne subsidiary, among others, in the subnotebook category. Sources said Zenith Data Systems will upgrade its Z-Lite subnotebook to include a 486 chip later this month, and Compaq Computer Corp. will follow in the fourth quarter with a 3.8-pound subnotebook that uses Intel's 25-MHz SL-enhanced 486SX.

The Compaq box will come in two versions: one with an 85M-byte hard drive and one with a 125M-byte hard drive. It will also compete head-to-head with the HandBook in terms of pricing, the sources said. The HandBook costs $1,495 with a 25-MHz 486SX processor, and a HandBook with a 20/40-MHz DX2 chip and a 130M-byte hard drive will cost $1,995. The unannounced Compaq product is expected to cost $1,499 with the 85M-byte hard drive and $1,699 with the larger drive.

Compaq will also address one of the main usability problems of subnotebooks by building a battery-powered 3.5-in. floppy that can be attached to the machine's Personal Computer Memory Card International Association slot, the sources said. The box will also offer an integrated trackball on the lower-right corner with the buttons built into the side of the screen.

Sources said the box is similar in size to the PC Co.'s 10.1- by 7.5-in. ThinkPad 500, with a "90% keyboard."

Compaq officials refused to comment.

Pleasing options

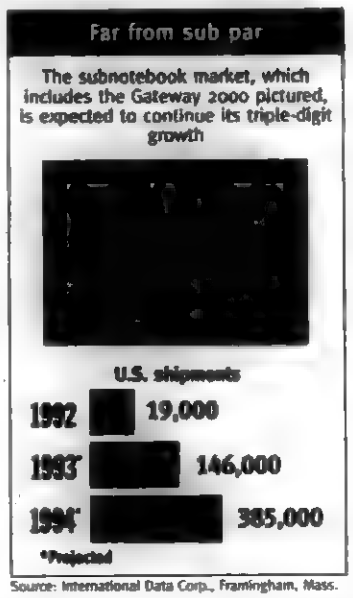
Analysts said they like the new crop of machines. "We have some good products in the market now, and users can choose from an array of Windows machines instead of receding-edge technologies like 286s and CGA screens," said Bruce Stephen, director of PC hardware and pricing research at International Data Corp. in Framingham, Mass.

Some users said they were looking seriously at the subnotebook category, which has drawn only nominal interest but is poised for a growth surge (see chart).

"We have a group with a need for 50 laptops and with having to carry a printer as well, subnotebooks could be ideal," said Roger Rush, microsystems manager at Diversey Corp., a chemical manufacturer in Livonia, Mich.

"I would expect we'll use both notebooks and subnotebooks here, depending on our user needs," said John W. Good, manager of information technology at The Turner Corp., a multinational construction company based in New York. Good said the activity in the subnotebook market had him interested in evaluating the products, to see whether less heavy-duty computer users would prefer the lighter, floppy-less subnotebooks over their heavier cousins.

Other users said they felt the products on the market were still not quite ready for prime time.



Source: International Data Corp., Framingham, Mass.

"I like anything that's lightweight, and I like that they're coming with 486s. At some point I would like to assign these to my people," said Stephen Ades, director of information systems at States Nitewear, Inc. in New Bedford, Mass. Ades cited small screens and hard drives as reasons why subnotebooks were still "not really workable. They're getting better, but for the extra couple of pounds I'll stick with notebooks for now."

The new class of subnotebooks varies according to vendor. HP's OmniBook 300, for example, uses a 486 processor and backlit screens. Analysts said it was still not clear whether the OmniBook's numerous features, such as read-only memory-based software, wireless communications and the ability to run on alkaline batteries, would help it beat systems built with faster processors and brighter screens.

Subnotebooks appear to be an important developing category and one that IS managers should adopt a proactive stance toward, analysts said.

"IS will really have to pay attention to these because they'll be so cheap that a lot of individuals will buy them, and all of a sudden IS will see this menagerie of boxes that people will want to have them support," said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Users and analysts were not clear how subnotebooks will fare against pen-based systems such as the AT&T EO Personal Communicator. But declining subnotebook prices will likely create more user interest.

"They're still too expensive for a computer that doesn't have the full capabilities of a notebook," said Enrique Crespo Jr., manager of corporate sales systems at The Torrington Co., a bearing maker in Torrington, Conn.

Corrections

- Because of an editing error in the Aug. 9 issue, the chart on page 16 was mislabeled. Commercial data processing makes up the lion's share of parallel processing.

- A story in the Aug. 9 issue incorrectly stated that Standard Microsystems Corp.'s new 16-bit Ethernet adapters do not perform error-checking.

RANK 1992	1991	COM
1	1	GE MOTORS Detroit
2	2	N Irving, Texas
3	3	FORD MOTOR Dearborn
4	4	INTL. BUSINESS MA
5	5	GENERAL ELECTR
6	6	MOBIL Fairfax, V
7	7	PHILIP MO
8	8	E.I. DU P
9	10	CHEVRO
10	9	TEXACO W

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News Shorts

IBM software chief resigns

Earl Wheeler, a 38-year IBMer and for the past five years general manager of IBM's Programming Systems business, will retire on Aug. 31. Stepping in as head of Programming Systems is Steven Mills, who has held various jobs at the division. Wheeler, 59, is heading to Hilton Head, S.C. Wheeler said he foresees no major reorganization of the division.

Feds award $50 million in contracts

American Management Systems, Inc. (AMS), a software and services firm in Arlington, Va., won two information systems contracts with the U.S. Department of Defense that could amount to $50 million over five years. One contract is with the headquarters of the Department of the Army for systems development and management. In the other, AMS will help the Defense Information Systems Agency centralize, standardize and streamline systems throughout the Defense Department.

CFO survey supports IS outsourcing

A survey of some 365 chief financial officers conducted by DePaul University's School of Accountancy found 92% planned to continue or increase IS outsourcing at their company. Cost savings is not the reason CFOs are smiling — access to expertise stood out as the greatest benefit of outsourcing, followed by concentration of management's attention on main business issues. Savings from staff reduction, software licenses and space reduction all rated lower.

Dealing with CA: The report

Saying it is responding to an undercurrent of unrest among customers of Computer Associates International, Inc., International Computer Negotiations, Inc. in Winter Park, Fla., has released a 304-page report titled "Dealing with Computer Associates." The $795 report contains exhaustive analysis of CA licensing policies, sales techniques and corporate organization and recommends specific tactics that customers should take to control the negotiating process. Chief recommendation: Get everything in writing.

They're ba-a-ack, at DEC

Several members of Digital Equipment Corp.'s original Alpha development team are returning to the company, including Jim Montanaro, Gary Hoeppner, Ray Stephany and Gerry Cheney. They will join Rich Witek at the Palo Alto (Calif.) Design Center when it opens next month to focus on the development of low-power, low-cost Alpha AXP microprocessors for the mobile and wireless computing markets.

KnowledgeWare losses narrow

KnowledgeWare, Inc. posted fourth-quarter net profits of $2.7 million, narrowing its fiscal 1993 loss to $25.8 million. The loss was due in part to third-quarter restructuring charges. The Atlanta applications tools company earned $2.3 million in last year's fourth quarter. Revenue for the fourth quarter ended June 30 was up 15% to $40.4 million. Fiscal 1993 sales were $128.7 million, up 9% from the year-earlier period.

SHORT TAKES AT&T and its NCR Corp. subsidiary have developed an agent that is said to allow Simple Network Management Protocol-based systems to manage AT&T's Definity Communications System line of digital private branch exchange systems. . . . In the latest step in a pungent court battle, Microsoft Corp. asked a federal court to enjoin Stac Electronics, Inc. from selling its latest release of Stacker 3.1 for Windows and DOS, claiming theft of trade secrets.

More news shorts, *page 16*

DOD IS revamp at crossroads

New IS chief reaffirms CIM plan despite funding, CASE setback

By Gary H. Anthes
WASHINGTON, D.C.

Lt. Gen. Emmett Paige Jr., the Pentagon's new information systems chief, said last week that despite apparent backpedaling, the U.S. Department of Defense (DOD) remains strongly committed to its mammoth systems modernization effort.

Paige, who was officially sworn in two weeks ago as assistant secretary of defense for command, control, communications and intelligence, said the concepts behind the Corporate Information Management (CIM) initiative enjoy broad support among top civilian officials and military officers.

Asked about rumors that CIM is in danger of collapsing, former communications specialist Paige responded by tapping out in Morse code an eight-letter barnyard expletive.

Doubts abound

Despite the reaffirmation, recent events have called into question the Defense Department's wholehearted commitment to the program — put together during the Bush administration — which is intended to save billions of dollars through software standardization and reuse, facilities consolidation and business process re-engineering [CW, June 8, 1992].

Asked about CIM being in danger of collapsing, the new IS chief responded by tapping out in Morse code an eight-letter expletive.

Two weeks ago the House Armed Services Committee recommended that Congress withhold $315 million from the Pentagon's IS budget request for next year. The committee said the Defense Department had not presented a persuasive cost-saving plan for CIM, and, it said, "There are growing indications the department is moving to dismantle major portions of the initiative."

As acting IS chief, Paige, in June, reversed a September 1992 order to consolidate the software development facilities of the military branches under a new central agency. The decision was made in response to complaints that the consolidation would move applications support too far away from users. However, he let stand an order to consolidate data processing facilities and reaffirmed an earlier commitment to reduce the number of legacy systems throughout the department.

In May, Deputy Defense Secretary William E. Perry signed a memo, drafted by Paige, that downsized plans for a huge initiative called Integrated Computer-Aided Software Engineering (ICASE). A cornerstone of CIM, ICASE was to have instigated a half-billion dollar purchase of CASE technologies that would become the standard tool box for the entire Defense Department. Instead, Paige said the procurement would be limited to pilot tests of CASE tools, worth perhaps only $20 million.

"Over half the CIM program is being either canceled or crippled," said Paul Strassmann, CIM architect and former director of defense information. He said the decision not to consolidate the software activities will make it more difficult to achieve the standardized architecture and interoperability that are at the heart of CIM. "They just went back to the status quo, without any plan," he added.

An official at the General Accounting Office (GAO), which is studying the issue, said the recent pullback is troubling.

"If you don't have centralized control of applications, the services are just going to go ahead and do what they have always been doing, and money is going to keep getting spent on redundant systems," said Frank Deffer, assistant director of the GAO's Accounting and Information Management Division.

'Total baloney'

Strassmann labeled as "total baloney" an assertion that CASE technology is not sufficiently mature to justify a huge Defense Department commitment at this time. "ICASE was a very important part of the technological glue for CIM," he said. "But ICASE is crippled; it's being nibbled to death by ducks."

Denis Brown, former director of the Center for Information Management at the Pentagon, said there is a natural loss of momentum in big programs when top management changes, but he predicted that Paige would pursue the core concepts of CIM.

Brown said it was a good idea to move ahead with the data center consolidations while holding off on the software facilities, giving the military services "a chance to gain some acceptance of the concept of consolidation and to see that it can work and can save money."

On the warpath

Lt. Gen. Emmett Paige Jr. offered his thoughts on the following:

On the data standardization effort under CIM: "I'm told we don't yet have a single data element standardized in all of DOD. I will not accept that as an answer."

On the importance of business process re-engineering: "If I were president, I would just issue an executive order: Thou shalt do it."

On Defense Department-wide megaprocurements: "I do not favor the large procurements like Desktop IV. I'd prefer to see the military departments given the authority to do their own procurements."

On mainframes: "We hope to migrate away from mainframes. Client/server will stand quite well" for new applications while mainframes remain for the legacy applications.

On the DOD's Ada mandate: "Ada is not dead. I don't intend to kill the Ada mandate, and I don't intend to let Ada stagnate."

On computers at the Pentagon: "I'd hate to tell you what I'm using. Office automation at the Pentagon is the worst I have ever seen."

—Gary H. Anthes

GTE names Systematics sole outsourcer

By Jean S. Bozman
ATLANTA

GTE Corp. is consolidating multiple contracts for data center services, back-office support and software development into one outsourcing contract.

GTE's $4 billion Telecommunications Products and Services Group said last week that it will consolidate two outsourced data center operations that separately handle bill processing for its Contel Cellular, Inc. and GTE Mobilnet, Inc. cellular customers. The data centers also provide processing cycles for several outside software development groups.

Systematics Telecommunications Services, Inc. in Little Rock, Ark., a $579 million outsourcing firm owned by cellular provider Alltel Corp., gained the 10-year GTE outsourcing contract for an undisclosed sum. The billing system will track the accounts of 1.3 million GTE cellular telephone customers.

"Systematics is offering us a complete front-end to back-end billing service, and we think we will benefit from economies of scale," GTE spokesman Jeff Keller explained.

GTE will enhance Systematics' Virtuoso billing and customer service system to support GTE's cellular business. Virtuoso is used by Alltel, three Canadian companies and two small U.S. firms.

George Kerns, assistant vice president of cellular information management operations, said the consolidation was planned when GTE acquired Contel in 1991. Most traditional information systems functions for the $1 billion cellular business unit have already been outsourced. "We're looking to drive down information systems costs as a percentage of revenues," Kerns said.

Kerns' 190-person information management staff will handle systems design and analysis for GTE's cellular business. "Our [information management] group will always be the interface between the business operations and the outside vendor," he said.

Staffers at other GTE units in New York and Dallas that handled the former cellular billing contracts will be redirected to other projects or join Systematics.

The transition to a merged back-office operation could take 12 to 18 months as Contel's billing applications are hosted on Digital Equipment Corp. VAXs and must be converted to run on IBM Application System/400s and mainframes.

Borland loses macro round in copyright suit

By Mitch Betts
BOSTON

A federal judge ruled late last week that a key compatibility feature in Borland International, Inc.'s Quattro Pro spreadsheet software that allows it to run user-written Lotus 1-2-3 macros infringes on Lotus Development Corp.'s copyright.

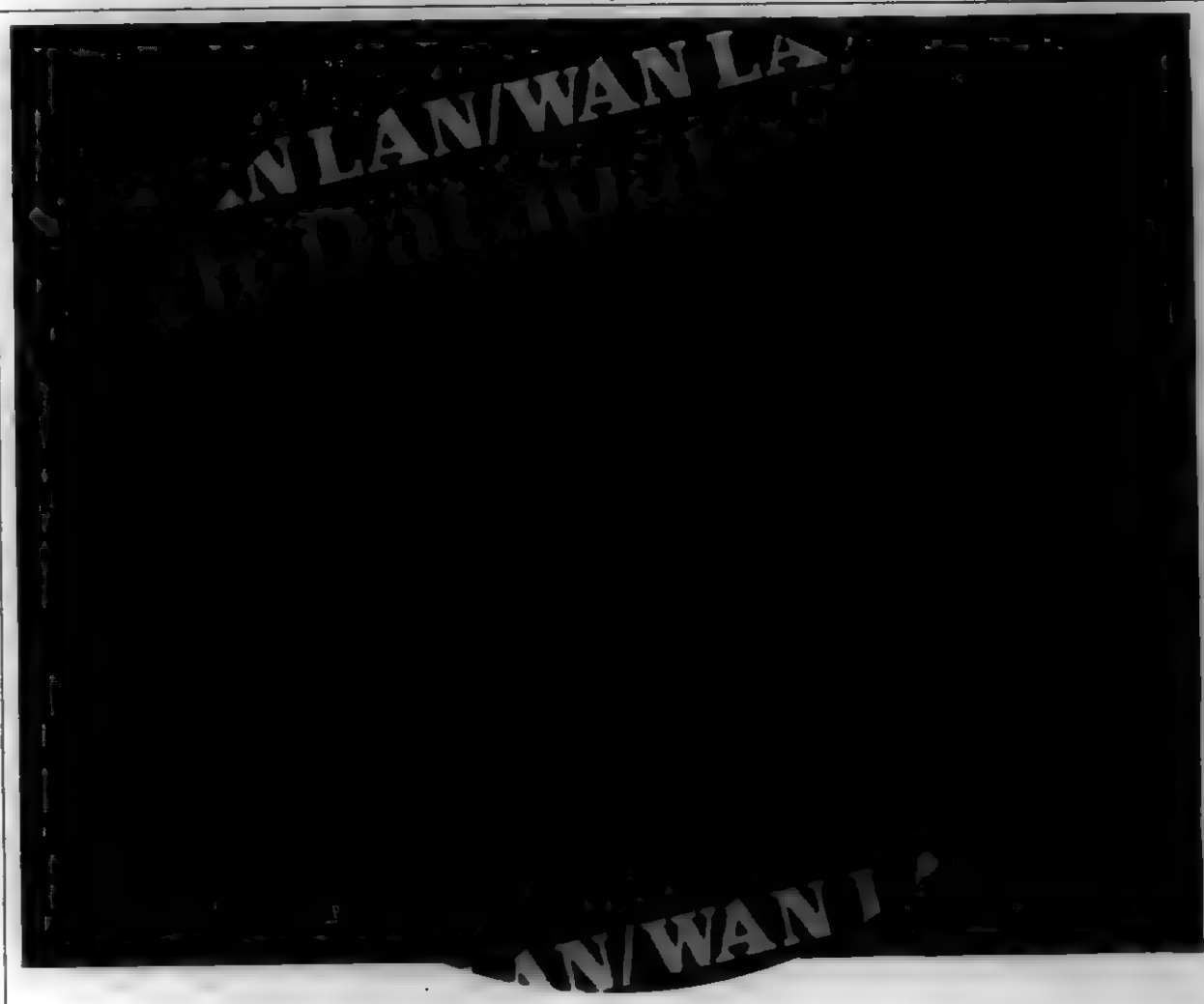
Borland characterized the ruling as a "broadside attack on consumers' rights to use compatible software products," but Lotus said it merely means the "macro key reader" in Quattro Pro is illegal.

Quattro Pro users with 1-2-3 macros are not in any legal jeopardy because they did not copy the software feature, said J. T. Westermeier, a partner at Fenwick & West in Washington, D.C., and an expert on computer law. If the decision stands, Borland will have to pay damages and either remove the feature or replace it with a noninfringing equivalent.

The ruling by U.S. District Court Judge Robert E. Keeton was the last in a series of pro-Lotus decisions in the suit filed in 1990. Borland called it an "unprecedented overexpansion of copyright law" and said it plans an immediate appeal.

"Most legal commentators believe Judge Keeton has gone a little too far in pushing the copyright edge," Westermeier said.

Borland said last week's decision means users cannot use their own 1-2-3 macros in non-Lotus products. But Lotus denied that statement and said Borland is trying to sow confusion.



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Sparks fly in C++ development battle

By Melinda-Carol Ballou

Microsoft Corp. and Symantec Corp. will up the ante in the C++ wars when they officially unveil their 32-bit development environments. Borland International, Inc., meanwhile, is quietly preparing a counterattack that targets Microsoft with a 32-bit version expected to ship this fall, industry sources said.

Users praised the competition, saying it can only improve the quality of the tools.

New with the 32-bit edition of Microsoft's Visual C++ are the following features: debugger support for multithreaded applications and for Windows NT-style exceptions, Win32s libraries to run applications on Windows NT or on Windows 3.1 and an integrated profiler.

The 32-bit version of the product is "almost identical" to the 16-bit version in other ways, and moving applications is straightforward, a beta-test user said.

However, controls available with 16-bit Visual C++ and with Visual Basic have not yet been ported, he said. Other users criticized the lack of exception-handling and templates with both Microsoft Visual C++ versions.

"Exceptions are really important because what happens if the application fails?" asked Don MacDonald, information systems officer at Chemical Banking Corp. in New York. "We need to be able to throw an exception in and get the machine back to a stable state."

Other tools, including those from Symantec, Borland and Watcom International, Inc., offer support for templates. Watcom also does exceptions.

The desktop mix

C++ vendors and the desktop operating systems supported

Borland	✗	✗	✗	✗ +	
Metaware	✗	✗ •	✗	✗ +	
Microsoft		✗	✗	✗ +	
Symantec	✗	✗ •	✗	✗ +	✗
Watcom	✗	✗ •	✗	✗ +	

• = Extended 32-bit + = Win32s

Symantec's C++ Professional 6.0 is compatible with Microsoft Visual C++ and Borland Application Frameworks 3.1, enabling users to migrate their applications. It supports Microsoft Foundation Classes with its C++ compiler for 16- and 32-bit code generation and offers the Win32s system hosted on Windows 3.1.

Three versions of the Symantec environment are available for different expertise levels. The product includes an integrated development and debugging environment and multiple independent views of the applications, as well as a graphical user interface to Intersolv Corp.'s PVCS version control software, visual prototyping and code-generation tools and a linker.

Borland C++ for Win32s will offer full C++ exception handling and ObjectWindows 2.0, an application development framework for Windows and Windows NT that will include high-level controls and visual tools and ObjectWindows Class Library 2.0. Sources said Borland is talking to other C++ vendors (excluding Microsoft) to allow ObjectWindows applications to be portable across multiple compilers, as are Symantec's and Watcom's.

The implications of the C++ battle go much further than a tit-for-tat fight over features to include the wider industry conflict over future operating systems.

Whichever vendor controls the development environment will control the operating system, and therefore, Visual C++ makes it very easy to get into the Windows environment and much more difficult to get off, said Michael Schneider, a vice president at Gartner Group, Inc., a consultancy in Stamford, Conn. "What Microsoft is hoping is that Visual C++ users will remain married for life to Windows and Windows NT," he said.

Borland, Symantec, Watcom and Metaware support a greater range of operating systems than Microsoft (see chart). Borland also describes a more generic windowing environment with its class libraries. This is attractive to users seeking greater independence from Microsoft, but others want the close affiliation with Windows.

Whither wireless security?

CONTINUED FROM PAGE 1

Because all methods of wireless data transfer are accomplished by devices that are essentially radio transmitters, anyone with the right receiver can tune into your voice or data transmission. "Ask Princess Diana how problematic it can be if someone is tapping into your phone conversation," Geisler said.

Grabbing data out of the air can be a simple task. For about $1,800, a voice and data traffic monitoring system can be set up using the Icom Corp. R7000 receiver and Advanced Electronic Applications, Inc.'s Packrat decoder, according to Bob Hatter, retail manager at the Electronic Equipment Bank in Vienna, Va.

Hatter sells the setup to shortwave radio operators and reminds them of the illegality of abuse. "People shouldn't be out there vacuuming the atmosphere looking for every scrap of information about everyone," he says.

Security experts said the best way to safeguard sensitive data — whether it is transmitted over the airwaves or not — is to encrypt it. "It doesn't matter if someone can pick up your signal if they can't read it," said David Frankland, vice president of Digital Ocean, Inc., a wireless products provider in Overland Park, Kan.

Still, users should proceed cautiously. "Don't kid yourself: You're not going to duplicate the type of security you have on a mainframe," said Tom DeWald, manager of technical development at Mastercard International, Inc. in St. Louis, who is encrypting data sent via wireless devices.

Within a local area, infrared and spread spectrum are the most common methods of wireless connectivity. Both broadcast only a short distance, so an eavesdropper has to be close. Control the personnel flow within a transmission zone and you effectively control who sees the information. "It's not quite airtight, but it's workable," Geisler said.

Safe and scattered

The nature of spread-spectrum technology requires the data transmitted to be broken up and spread over a range of radio frequencies, rather than broadcast at a single frequency. The data is then reassembled at the receiving end. Some spread-spectrum network vendors claim it is technologically more difficult to decode a spread-spectrum broadcast than it is to read encoded network packets transmitted through traditional cabling systems. That is because the signals are scattered over many frequencies and have to first be decoded, then reassembled for the data to make sense.

Communications strategies that involve a network carrier — for example, cellular phone networks — are also fraught with danger. Although illegal, many people scan the cellular frequencies and listen in on voice frequencies in the same way people scan police and fire frequencies.

Radio IDs

Some companies are exploring other options, such as the Ardis packet radio data network, which is widely available throughout the U.S. This type of network identifies each radio by its unique identification number and only connects with packet radio systems on the user's authorization list.

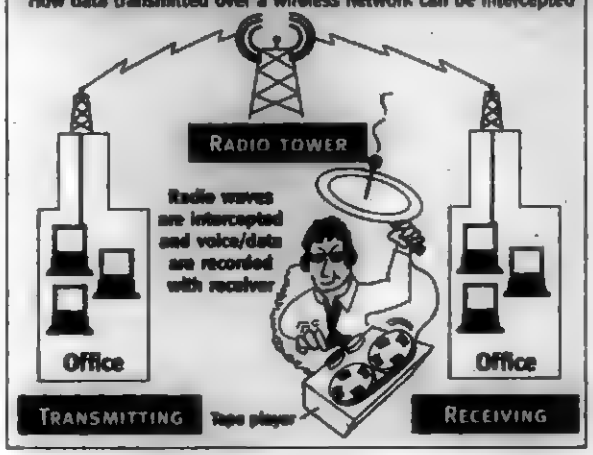
In addition, the radio transmission is broken up into data packets that the system reassembles back into a meaningful data stream. Because these packets may arrive intermixed with those from other subscriber units, it makes random interception of data substantially more difficult, Geisler said.

But there's a downside: The randomness of the arrival of the data packets can give slow response time when using an application online. Cellular transmissions can also be noisy and cause data errors or prolong the connect time.

Ultimately, wireless security awareness must be emphasized at an end-user level. "Users need to take control of their own environment by encrypting data and making sure that they take safeguards in its transmission," said Fritz Wagner, manager of corporate electronic information security at Du Pont Co. "The IS guys can't do it all."

Invisible predator

How data transmitted over a wireless network can be intercepted

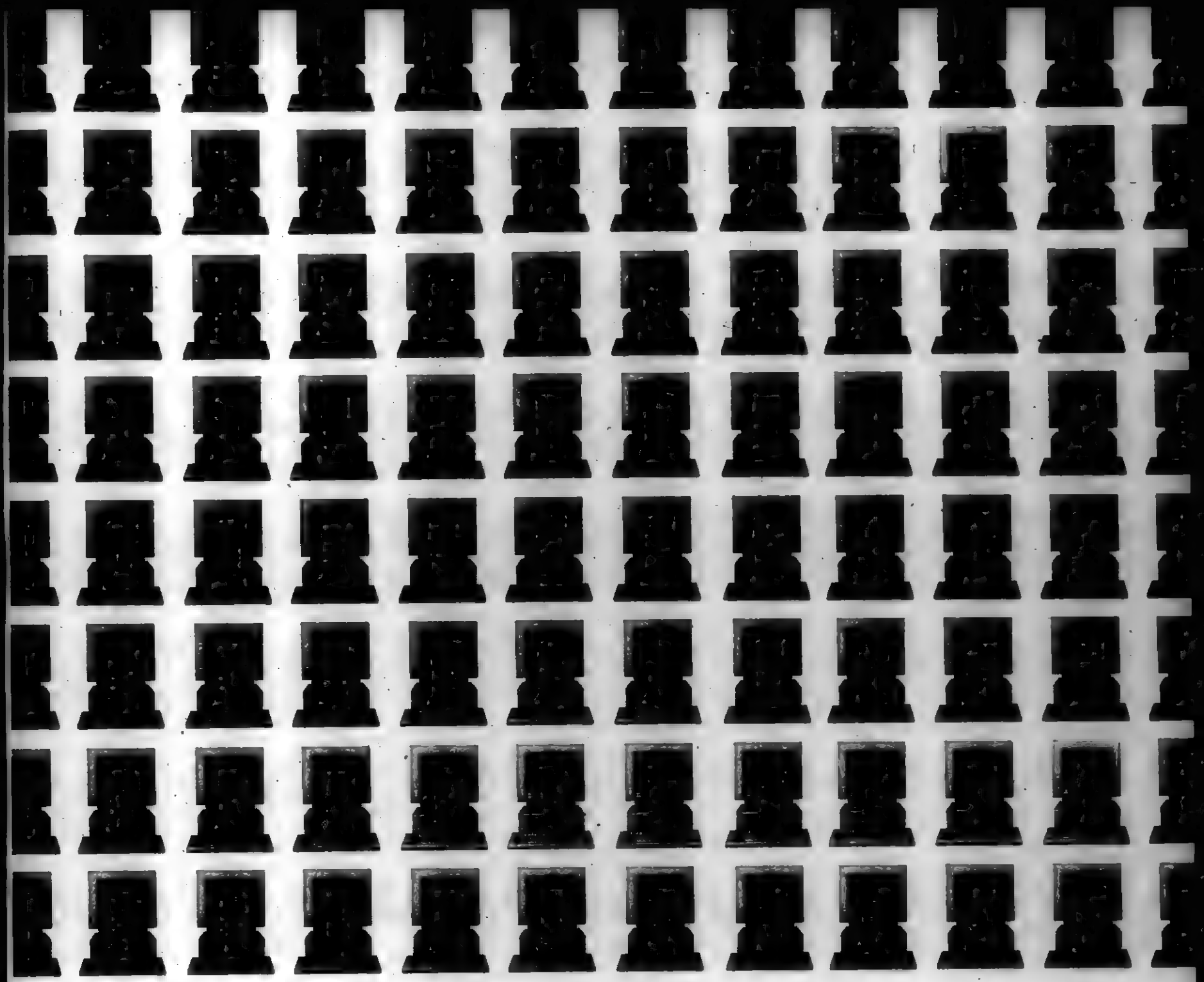


Worry-free wireless?

Dennis Walicsek does not think much of the theory that wireless data transmission is inherently more dangerous than traditional land-line methods. At least he is not going to stand in the way of a good thing.

"It's not like we're transporting state secrets," said Walicsek, the vice president of information systems at Dry Storage Corp. in Des Plaines, Ill. Walicsek has 200 trucks with handheld wireless machines from Telxon Corp. that dispatchers use to keep close tabs on the whereabouts of goods being trucked across the country.

Password protection is their only form of security, but Walicsek does not seem to mind. "The advantages are too great to be hobbled by the possibility of what might happen," Walicsek said. In *fact*, he claims that a wireless network can be more secure than a land-line system. "Wireless is a lot less susceptible to the casual hacker," he said. —*James Daly*



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Sybase tool set

CONTINUED FROM PAGE 1

it looks like we can, we'll probably move back," he said.

Windows support is key for Chevron, Soper said. Sybase's unification plan includes a Windows-compliant graphical user interface builder to update character-based APT Workbench applications.

Sybase is also expected to do the following:

•Link Deft front-end modeling and design tools to application generators from computer-aided software engineering makers such as Texas Instruments, Inc. and Intersolv, Inc. by publishing application programming interfaces.

•Extend object-oriented functions with a product, code-named Calypso, designed to add front-end analysis, design and modeling features to recently acquired object-oriented tool GainMomentum.

•Offer re-engineering functions to help users reverse-engineer existing Sybase applications into a central repository. The programs could then be regenerated into object technology.

Sybase declined to comment on the upcoming announcement, but a spokeswoman acknowledged that pieces will be released in phases until the end of 1994. GainMomentum 2.0, which shipped last month, is the first component.

However, at least some terrain that Sybase has allowed third parties to take is likely gone for good.

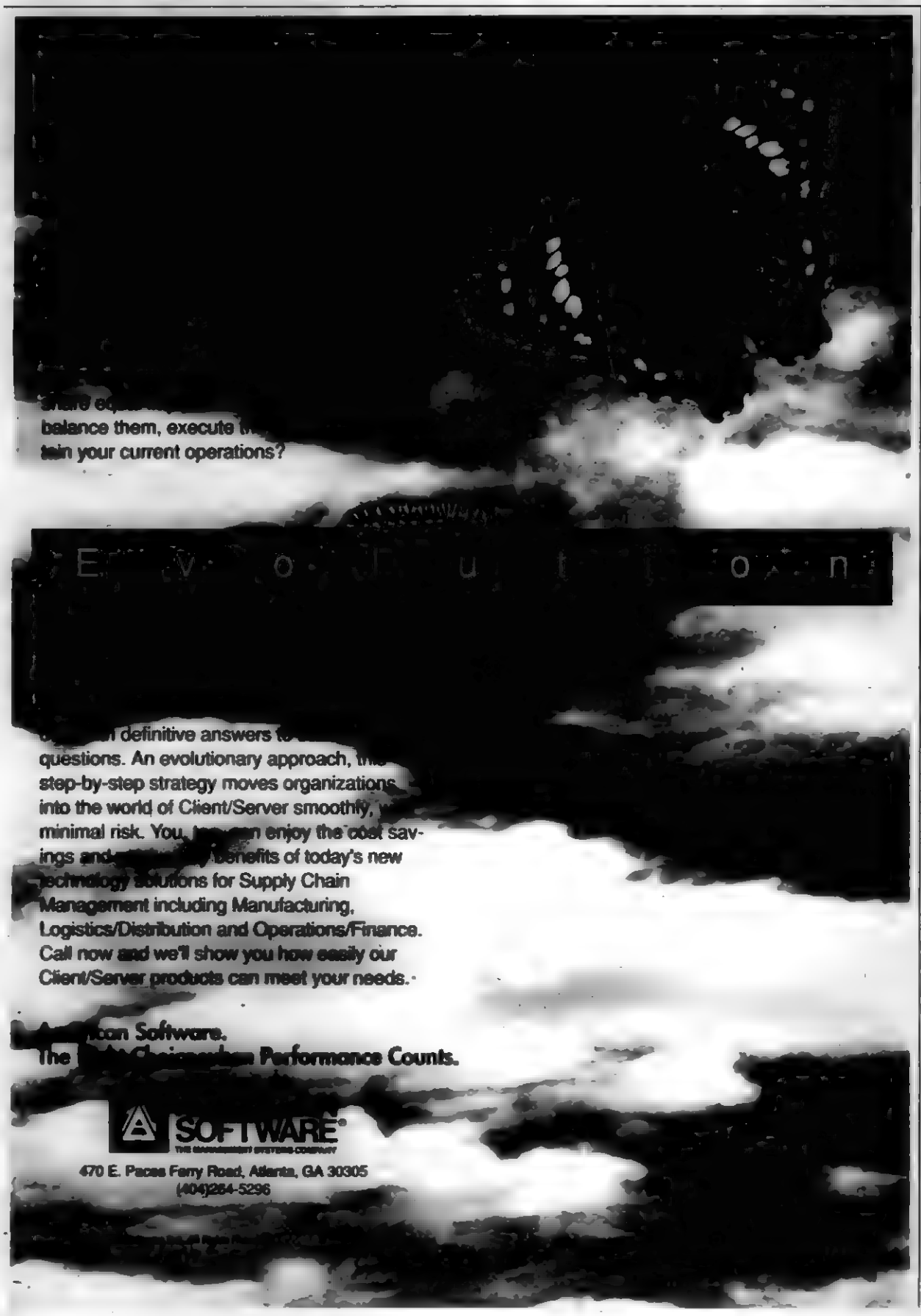
United Grain Growers Ltd. bought $200,000 worth of Powersoft's PowerBuilder application at the behest of Sybase.

"I see no logical reason to switch now," said Terence Light, manager of systems development. "We're committed to PowerBuilder." The Winnepeg, Manitoba, agricultural firm is in the middle of a $2 million client/server project anchored by Sybase's SQL Server.

Nevertheless, ballooning demand for tools means enough room for Sybase, analysts agreed. Development aids are like cars, according to Herb Edelstein, principal at Euclid Associates, a consulting firm in Potomac, Md. Each has its own nuances and strengths, and no single product is "right," he said.

Sybase's overarching strategy is similar to Oracle Corp.'s Cooperative Development Environment in that both plans cover soup-to-nuts development, said David McGoveran, president of Alternative Technologies, a consultancy in Boulder Creek, Calif. "Presumably, these tools from database companies will be more integrated with databases than those from third parties," he said, "but that remains to be seen."

Meanwhile, Oracle lacks an object-oriented counterpunch to Sybase's GainMomentum, Edelstein noted. "Gain gives them a real step up."



'Windows first'

In what it acknowledged is a "change of direction," Oracle plans to ship a complete set of Windows-based development tools before it ships Unix versions of comparable products.

Windows editions of all the dozen or so tools under Oracle's Cooperative Development Environment (CDE) banner, announced in March, are in production except for two: SQLForms and Oracle Designer. They are scheduled to ship before Oracle's user conference at the end of next month, said Dennis Moore, director of CDE product marketing.

CDE is an umbrella term Oracle coined for a set of 14 existing and new application development tools.

Oracle's "Windows first" attitude is an attempt to appease Oracle database users who are looking to build Windows-based client/server applications, said David McGoveran, president of Alternative Technologies in Boulder Creek, Calif.

Also at the user show, Oracle is expected to announce Microsoft Windows NT versions of SQLForms and other tools; however, Moore declined to comment.

—Kim S. Nash

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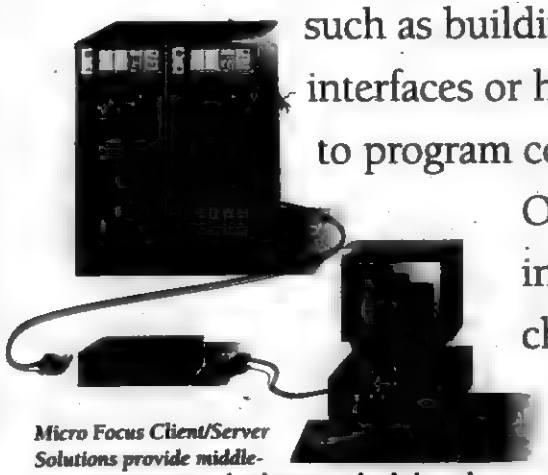

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Cisco changes SNA strategy

CONTINUED FROM PAGE 1

generally available, at a price many vendors call reasonable.

This step was "the death knell for APPI" because it finally quieted vendor fears that IBM would exact huge financial levies from third-party APPN providers, said James Tretter, a telecommunications manager at MultiFoods in Minneapolis.

Vendors' hands tied

IBM's licensing arrangement effectively throttled APPI in a much more direct way because it forbids vendors from enhancing or significantly changing the APPN protocol without IBM's approval, said Cisco SNA product manager Michael Zadikian.

Cisco originally announced its intention to build APPI without using APPN patents; later, however, it acknowledged that certain key capabilities demanded by users, such as interoperability between APPI and APPN nodes, would require the use of APPN code.

> Another key IBM move toward APPN openness has been the creation of the APPN Implementors Workshop, a forum that lets vendors participate in the development of APPN enhancements.

Another key IBM move toward APPN openness has been the creation of the APPN Implementors Workshop, a forum that allows vendors to participate in the development of APPN enhancements, according to IBM. Vendors also receive APPN enhancements, such as High Performance Routing, in time to compete effectively against IBM's own APPN offerings.

Chevron originally hoped to see the APPI Forum provide this type of free interchange around SNA internetworking; however, that hope was dashed when IBM did not join the forum, Vandell said. Now, IBM seems to be "working legitimately and honestly with vendors" within the APPN Implementors Workshop, she added.

Overwhelming support

Vendors have shown their belief in the sincerity of IBM's perestroika by rushing to support APPN on their products (see story at right).

Some big users, too, are planning to give APPN a much closer look now that it seems to be turning into something like a true industry standard.

"We have no need for [a protocol like] APPN now, but we will as we move into more distributed systems and Application System/400s," Vandell said. However, what the company really wants IBM to provide is a seamless way to support SNA and TCP/IP, possibly through its upcoming Asynchronous Transfer Mode (ATM) products, she added.

"We are really excited about ATM and may move to it without going to APPN first," Vandell said.

Indeed, many users are still looking to run SNA over their TCP/IP backbones rather than using APPN, however open. MultiFoods, for example, uses APPN to interconnect its AS/400s, but it has no plans to implement the protocol on its routers, Tretter said. "For routing, we just use frame relay, and our Wellfleet routers encapsulate SNA on top of IP," he explained.

Cisco hopes to announce router support for IBM's APPN Network Node around the second half of next year, as was originally announced in a statement of direction a year ago, Zadikian said. The router vendor said it will propose to the APPI Forum that it either halt development on APPI or further pursue the opening of APPN.

Meanwhile, Cisco will work with a vendor group within IBM's APPN Implementors Workshop to develop an industry standard based on IBM's Data Link Switching protocol, Zadikian said. Cisco announced plans to implement the forthcoming standard on its routers by mid-1994 [CW, Aug. 9].

All for naught

▼ SEPTEMBER 1992
Cisco announces it is developing APPI, an alternative to IBM's APPN protocol.

▼ OCTOBER 1992
Cisco announces the APPI Forum, a group of 13 vendors formed to develop and standardize APPI. One goal is to give the Internet Engineering Task Force (IETF) a full APPI specification by mid-1993.

▼ MARCH 1993
APPN and APPI square off at Interop '93 Spring. Attendees feel APPN is the stronger protocol.

▼ APRIL 1993
IBM hosts the APPN Implementors Workshop (AIW), a forum to involve vendors in APPN development.
Cisco initiates the formation of an AIW working group to develop an IETF standard based on IBM's Data Link Switching (DLS).

▼ AUGUST 1993
Cisco announces it will support DLS. Cisco discontinues APPI efforts and licenses APPN.

Vendors eager to hop on board

With IBM's APPN and Data Link Switching (DLS) protocols rapidly moving toward industry-standard status, a bevy of networking vendors see support of those protocols as a passport into corporations' SNA internetworking installations.

Announcements include the following:

- Some 25 vendors, including all major router vendors, have announced plans to support APPN, which provides intelligent routing and directory protocols for interconnecting resources across a peer-to-peer SNA network.
- Next week at the San Francisco Interop '93 August show, 12 vendors will demonstrate how their products can communicate via a multinode APPN network. Brixton Systems, Inc., IBM, Systems Strategies, Inc. and 3Com Corp. products will run APPN protocols in the demo. Other participating products will access the network via IBM's LU6.2 and T2.1 peer protocols, an IBM spokesman said.
- Support for APPN End Node will be part of the next release of NetWare for SAA, Novell, Inc.'s LAN-to-host gateway product, according to Gerry Machi, vice president and general manager of Novell's interoperability group. The product is due out in the first half of 1994. Novell will participate in the APPN demonstration next week.
- Proteon last week said it will ship in the first quarter of 1994 a product based on DLS, IBM's protocol for routing SNA and NetBIOS over TCP/IP. Proteon plans to implement APPN Network Node on its routers probably sometime in 1995, a company spokeswoman said.
- 3Com is slated to ship an APPN End Node product by year's end.
- Sync Research, Inc. plans to announce late this year or early next year an APPN End Node server product that will allow PCs on a LAN to participate in an APPN network without needing to run either APPN or T2.1 protocols, according to Sync Research Chief Executive Officer John Rademaker.
- Microsoft Corp. said it will release a software development kit for its SNA server for Windows NT at the Interop show.

— Elisabeth Horwitt

Novell expands host gateway strategy

By Elisabeth Horwitt
PROVO, UTAH

Novell, Inc. is preparing several initiatives designed to significantly expand the capabilities of NetWare for SAA, a NetWare Loadable Module (NLM) that provides local-area network clients with connections to the full range of IBM hosts.

Novell will announce a more enterprise-oriented version of NetWare for SAA in the first half of 1994, said Gerry Machi, vice president and general manager of Novell's interoperability group. The new version will scale up to support thousands of sessions, in contrast with the current product's 500-session limit.

It will provide more integration with Novell NetWare 4.0 NetWare Directory Service, enabling client systems to address IBM Logical Unit names, host and application names and specific data links from other LANs across the enterprise, Machi said.

The new release will also support IBM's Advanced Peer-to-Peer Networking (APPN) End Node, which will allow the gateway to automatically connect LAN clients with resources across an APPN network, Machi said.

Novell expects NetWare for SAA to bring in $80 million in revenue for fiscal 1993.

Next week at the Interop '93 August show in San Francisco, the vendor will announce an NLM that acts as a LAN gateway to Digital Equipment Corp. hosts, according to Machi. Scheduled for November shipment, the product will accept Transmission Control Protocol/Internet Protocol, Apple Computer, Inc. AppleTalk and Novell IPX traffic, and it will translate it into DEC's Local-Area Transport client-to-host protocol.

Fibre Channel switches into high gear

By Ellis Booker

Lawrence Livermore National Laboratory in Livermore, Calif., last week said it has deployed the first working prototype of the Fibre Channel implementation developed by Hewlett-Packard Co., IBM and Sun Microsystems Computer Corp.

> Fibre Channel supports bidirectional data speeds up to 1G bit/sec.

Fibre Channel supports bidirectional data speeds of up to 1G bit/sec. over distances of up to 10 km.

Livermore, a longtime proponent of optical networking, will use Fibre Channel to connect a wide variety of computers, ranging from workstations to supercomputers.

Currently, some of the lab's most complex simulations require 160M bytes of data to be transferred from a supercomputer to a workstation, a process that takes up to 40 minutes over the center's Ethernet. The prototype Fibre Channel will reduce this to eight minutes; when full gigabit speeds are supported under Fibre Channel, this will be reduced to a mere two seconds.

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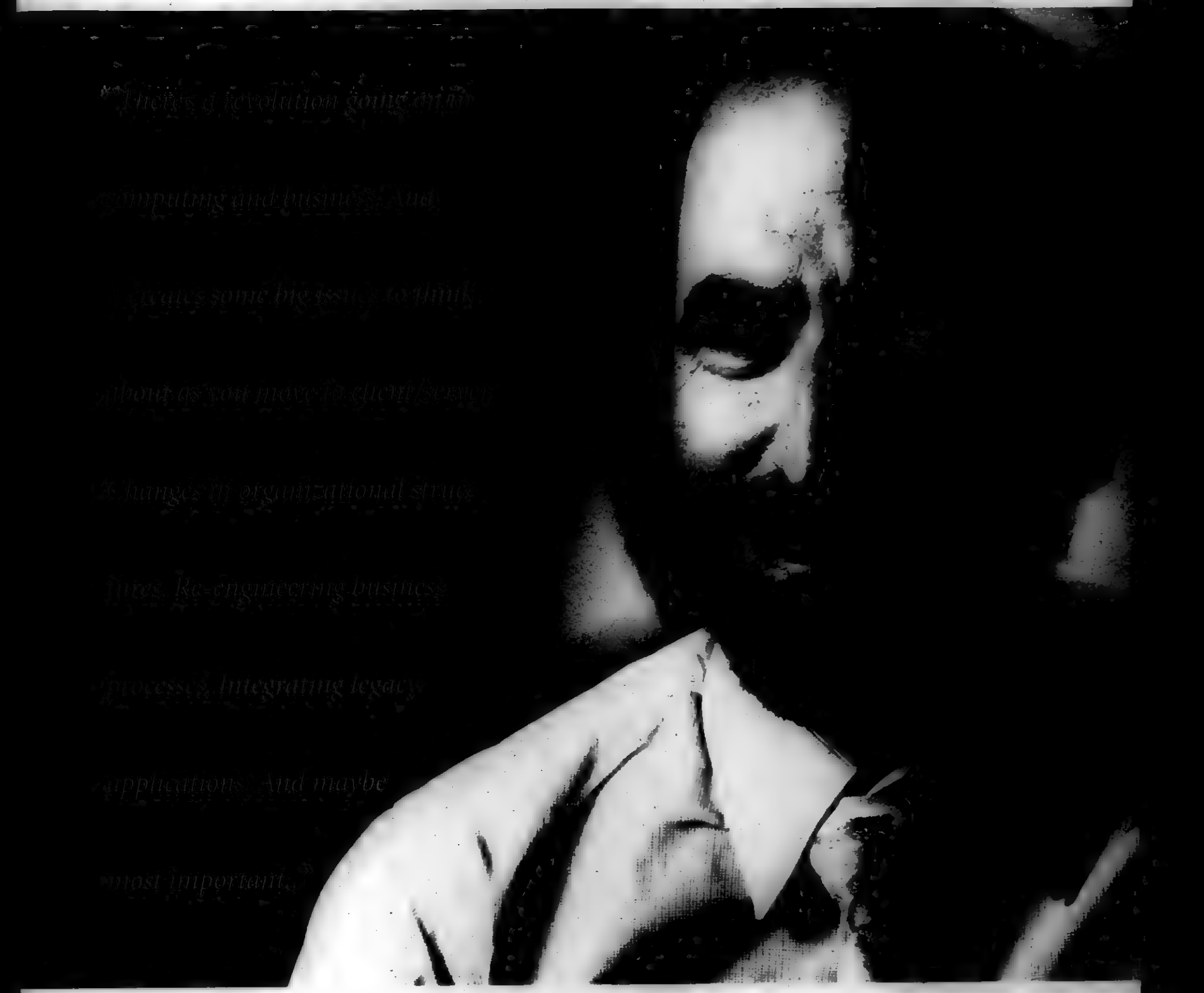

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Reporter's Notebook

American Airlines is in the midst of a project to expand its Sabre airline reservation system. It plans to allow customers to make airline reservations using fax machines or PC systems running E-mail. After making the reservation, users will receive their itineraries either by fax or E-mail, said Sabre President Terrel Jones.

One of the more interesting observations to come out of the panel discussions at Groupware '93 last week was from Sheldon Laube, national director of information technology at Price Waterhouse. "With groupware, we're basically trying to reinvent the wheel. Mainframes always had groupware, but the PC companies are pretending that they invented the entire idea and that no one has done this before," Laube noted.

But then again, even companies like DEC are jumping on the groupware bandwagon. DEC announced last week that it will develop and market groupware applications based on the Virtual Notebook System (VNS) from The ForeFront Group in Houston. VNS is a distributed client/server application for Windows and Macintosh systems that supports real-time groupware activities using a document metaphor.

ForeFront also announced that its software can run simultaneously with a videoconferencing application from ViewPoint Systems in Dallas.

Meanwhile, imaging companies are starting to join the groupware drive. Last week, Imagery Software, a unit of Eastman Kodak that makes imaging software resold by Lotus and Novell, announced a $99 stand-alone PC application that can also be linked to imaging server applications. At the same time, SoftSolutions Technology Corp. in Orem, Utah, announced that it will support imaging software from Watermark Software in Burlington, Mass., in its document management software package.

Apple offers groupware preview

Will embed E-mail services into operating system

By Michael Vizard
SAN JOSE, CALIF.

■ Looking to leverage a Macintosh graphical interface that is tightly integrated with the System 7 operating system, Apple Computer, Inc. last week outlined a groupware initiative at Groupware '93 that it intends to launch in the next few weeks.

Consisting of what company executives described as PowerTalk services and PowerShare servers, the Apple groupware effort seeks to directly layer several system services, such as electronic mail and shared directories, into the System 7 operating system.

Ultimately, these services will be layered on top of other environments, including Windows, they said.

This approach differs dramatically from Lotus Development Corp.'s Notes effort in that Notes is a separate database with which applications must be integrated, said Gursharn Sidhu, technical director for collaborative systems at Apple.

In contrast, the Apple strategy, which is part of the company's Open Computing Environment architecture, calls for deploying a universal mailbox in System 7 that supports multiple E-mail systems. Each user will be able to click on an icon to access any of the mail systems, which will include systems from Apple, Novell, Inc. and Microsoft Corp. as well as X.400 and fax support, without having to have a separate log-on and directory services for each mail transport.

"Users will have a single log-on password through which all system services will be addressed," Sidhu said.

Personal directories

In addition to the universal mailbox, Apple will allow users to create individual catalogs, otherwise known as directories, that contain specific types of documents and data. These directories can then be accessed using icons and a series of templates that Apple will provide.

Apple will also add a mailing label to all documents to make it easier to send documents, and any document sent through the system will be automatically encrypted.

On the server side, the Apple strategy calls for deploying two PowerShare servers, one of which handles E-mail; the other is described as a catalog server. This latter server will support replication across distributed servers, will include indexes to make it easy to find documents in catalogs and will support multilanguage translations of documents, time synchronization and RSA security.

Initial reactions to the Apple strategy have generally been very positive.

"What Apple is doing is excellent. I always thought the Macintosh was a real computer," said Michael Young, a consultant at Computer Sciences Corp. who is working on projects at Brooks Air Force Base in Texas.

According to Young, Windows is currently the dominant platform at Brooks, but he expects the new capabilities in System 7 will get some units to shift to the Macintosh.

Notes leads, but flaws cited

CONTINUED FROM PAGE 1

Currently, Notes has a list price of $495 and a street price of about $280. Resellers note that when you add the cost of Notes to the cost of an application built on top of it, along with the installation and ramp-up costs, the total cost of a Notes installation can be prohibitive.

Lotus contends that Notes is currently priced to compete with other PC applications and databases.

But analysts and users said this strategy is misguided.

"Lotus is applying a PC model to an IS issue. They are a desktop vendor moving up the curve into a territory that used to be dominated by IBM. As such, they are still experimenting with the pricing and channels," said Dave Marshak, an industry analyst at the Patricia Seybold Office Computing Group in Boston.

Lotus, meanwhile, hopes to resolve some of the Notes integration issues by pressuring IBM to support Microsoft Corp.'s Object Linking and Embedding (OLE) API, said Lotus Chief Technology Officer John Landry. "We want IBM to support OLE and the Windows API to minimize the impact of supporting OS/2. Right now it's a hard port," he said.

Suite pulling

Lotus this fall will update 1-2-3 Release 4 with support for the Application Field Exchange facility used to integrate applications in its office suite with its Notes environment. Using OLE Version 1.0 to tie 1-2-3 Release 4 with its office suite will give Lotus a short-term advantage over rival Microsoft. That advantage is likely to be overturned when Microsoft releases Office Version 4.0 at year's end, which is expected to include a suite of applications that support OLE Version 2.0. Lotus, meanwhile, is expected to support OLE 2.0 sometime next year.

As for integrating with Unix applications, Ray Ozzie, president of Iris Associates, a Westford, Mass., engineering firm that builds Notes for Lotus, said that while Unix has some OLE-like facilities, the differences in those facilities make it difficult to integrate Windows applications with Unix applications.

Rivalry heats up

Many observers gave Lotus an 18-month lead over its nearest competitor, Microsoft, mostly because Microsoft's groupware strategy relies heavily on undelivered products.

Among the key components of Microsoft's groupware strategy are a document-centric implementation of Windows 4.0; an electronic-mail server based on an object database running on Windows NT (see story page 15); and replication services that will be included in its E-mail systems, file systems and SQL databases.

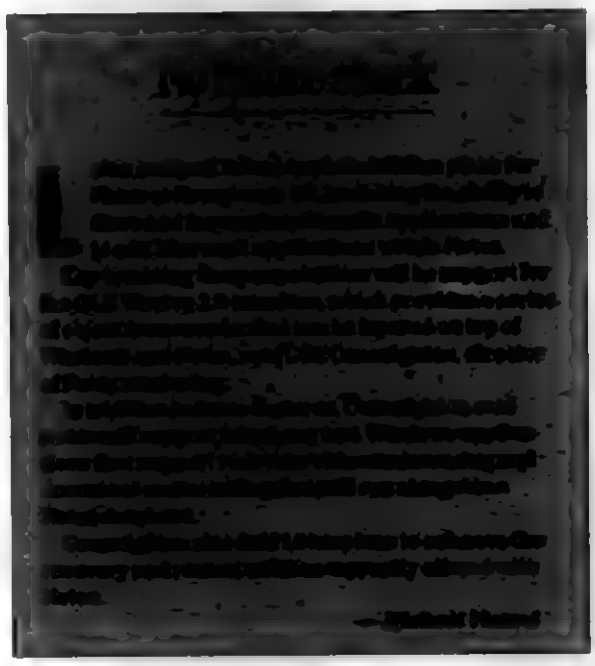
Lotus has already implemented a document-centric architecture that can be used to incorporate PC applications inside Notes discussion databases complete with bidirectional replication in the Notes databases. But users and resellers said Lotus is missing an opportunity to lock up the market before Microsoft can get started.

To fend off Microsoft, Lotus must focus on providing more robust development tools for Notes in short order. Most of the Notes applications are relatively simple applications tied to discussion databases. Lotus is expected to resolve this problem through alliances with third-party tool developers and the creation of a graphical user interface development tool, dubbed Notebook, expected later this year.

Cheapskate

In the Computerworld Test Center in the July 19 issue, Cliff Creighton, director of marketing for Notes, addressed the pricing concerns of the surveyed evaluators, who claimed $495 for a single license was higher than the price of other Windows applications.

"$495 is a good and fair price for a software product that has demonstrated a 400% customer return on investment," he said.



Objects pitched to simplify E-mail management

By Michael Vizard
SAN JOSE, CALIF.

Microsoft Corp. and Lotus Development Corp. are getting their respective houses in order as they move to client/server electronic-mail systems that will rely heavily on object technology.

The basic idea behind the object-oriented systems is to simplify administration headaches that have long been the bane of information systems directors coping with different E-mail protocols.

Meanwhile, some users said they are losing patience with the dogfight between the Vendor Independent Messaging (VIM) coalition led by Lotus and Microsoft's Mail Application Programming Interface (MAPI) standards, and are taking different tacks to solve the problem.

"The vendors should be locked in a room until they come to an agreement," said Art Beckman, manager of information technology services at Pacific Gas & Electric Co. (PG&E) in San Francisco. "Without an agreement, the users are taking it in the shorts and the vendors are losing revenue."

Until some accord is reached, however, the vendors are going their separate ways. According to industry sources, Microsoft is expected to deliver its promised Electronic Messaging Server (EMS) in the second quarter of next year. This server offering, which will run on top of Microsoft's Windows NT, will use an object database to tie any MAPI-compliant front-end mail system into EMS.

Self-service

Some IS shops are taking object-oriented E-mail into their own hands. Waste Management of North America in Lombard, Ill., is building an object database on top of an E-mail gateway from Soft-Switch, Inc. in Wayne, Pa.

The goal is to use object technology to make it easier to add users to a heterogeneous network of E-mail systems. Simply pointing and clicking on an object will update a directory service that is shared by MAPI-compliant front-end mail systems.

Meanwhile, Lotus is continuing to pursue a course that calls for the integration of CC:Mail and Notes Mail under a common transport. Under this evolving strategy, Lotus plans to use Notes Mail, which has a client/server architecture, as the primary back-end service, while giving users a choice of CC:Mail, Notes Mail or other VIM-compliant front ends.

Ultimately, Lotus will build an object database on top of the Notes Mail services, said Jane Eisenberg, senior product marketing manager at Lotus.

Trend toward object-oriented

In the meantime, vendors are advising customers and other developers to write to the object-oriented versions of their respective application programming interfaces to prepare for the future.

Managing multiple E-mail systems remains problematic. Beckman said his company requires all mail services to be compatible with the directory services in the Vines network operating system from Banyan Systems, Inc. However, if there was a common mail transport, he might open PG&E to other mail products.

For similar reasons, Price Waterhouse decided to replace CC:Mail with Notes Mail when it moved to Notes, and American Airlines has decided to deploy WordPerfect Office 4.0 rather than wrestle with multiple E-mail systems.

According to Terrel Jones, president of American's Sabre Computer Services, WordPerfect Office will be deployed on multiple platforms in place of 6,000 HP Desk licenses, 3,000 IBM Professional Office System licenses, 4,000 Microsoft Mail licenses, 500 CC:Mail licenses and 200 VMSmail licenses.

But while these IS directors apparently have the clout to enforce standards at their own companies, most IS shops are expected to wrestle with multiple E-mail systems far into the future and will likely have to wait for the next generation of object-based E-mail systems to resolve the administration issues.

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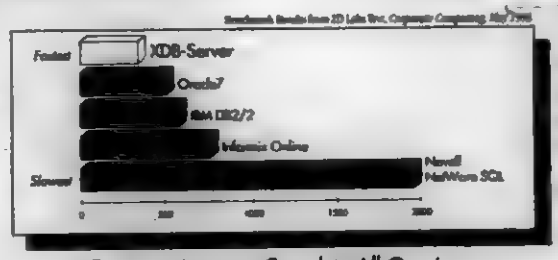

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News Shorts

LAN meets WAN in switch

LightStream Corp., a joint venture between Bolt Beranek and Newman, Inc. and Ungermann-Bass, Inc., last week unveiled what analysts said is the first integrated local- and wide-area network backbone Asynchronous Transfer Mode (ATM) switch to reside in a single box. The switch, with throughputs of up to 2G byte/sec., is due late next month.

CSC wins software deal at Rockwell

Rockwell International Corp. has awarded a $3.6 million contract to **Computer Sciences Corp.** to install a common Unix-based ordering and logistics system across Rockwell divisions. Rockwell uses a variety of inconsistent mainframe-based parts-numbering and tracking systems.

Third-party tools arrive for Borland

Users of **Borland International, Inc.**'s InterBase database no longer have to rely on Borland for compatible development tools. New York-based **Jyacc, Inc.** announced last week JAM/Database Interface for InterBase, a tool set that runs under Windows and DOS. The product was designed to let users build PC applications that can access data on Unix or VMS servers running InterBase Version 3.3 or higher. A DOS version costs $990; a Windows edition sells for $1,780.

Management software is upgraded

Cabletron Systems, Inc. has announced Version 2.0 of Spectrum, its enterprise network management platform. Included is a feature that allows users to export management data from the Spectrum database so SQL environments and spreadsheet applications such as Lotus Development Corp.'s 1-2-3 can use the data in graphs and reports. The company also announced Spectrum for Open Systems, which is said to enable leading Simple Network Management Protocol-based management platforms such as Hewlett-Packard Co.'s OpenView and Novell, Inc.'s NetWare Management System to manage Cabletron hubs.

Cisco profits soar for Q4, year

Internetworking vendor **Cisco Systems, Inc.** last week posted fourth-quarter net profits of $53.7 million, a 97% increase over the corresponding period last year. Revenue in the period ended July 25 rose 65% to $205.2 million. For the year, Cisco earned $171.9 million on sales of $649 million, increases of 104% and 91%, respectively.

Unisys, disk drive maker settle lawsuit

Unisys Corp. has settled its copyright infringement lawsuit against **Macro Computer Products, Inc.**, a Rochester Hills, Mich.-based computer disk drive manufacturer and reseller of used Unisys equipment. Under terms of the settlement, Macro has agreed not to use counterfeit Unisys parts, to license all software for Unisys computers it uses and to return or destroy all proprietary Unisys information and software in its possession. Additionally, Macro made an undisclosed payment to Unisys.

SHORT TAKES **Mobius Computer Corp.** said last week it started shipping three clones of **Sun Microsystems, Inc.** SPARCstation 10 machines, priced from $8,995 to $10,995. . . . **NCR Corp.** this week will throw its hat into the ring of aspiring ATM vendors. The company's forthcoming ATM products will focus on optimizing local- and wide-area bandwidth for data, video and voice transmissions at speeds reaching 3.2G byte/sec. . . . **IBM** is suing **Conner Peripherals, Inc.** for infringement of nine IBM magnetic disk storage patents.

Peer LANs target big business

Vendors push reliability, administrative features to woo wary IS

By Elisabeth Horwitt

IBM, Novell, Inc. and Microsoft Corp. are all expected this fall to launch peer network operating system products aimed at the corporate market. Their intent is to beef up what have traditionally been low-end, small company local-area network systems with enough reliability, power and administrative features to attract wary corporate information systems managers.

It could be a hard sell. "Most corporations are scared to death of peer-to-peer systems," said Jamie Lewis, president of The Burton Group, a consulting firm in Salt Lake City. "It's anarchy, with every user his own network administrator."

Peer network operating systems such as Artisoft, Inc.'s LANtastic, Novell's NetWare Lite and Microsoft's Windows for Workgroups enable desktop systems on a LAN to share files, printers and applications directly, without the formality of going through a server.

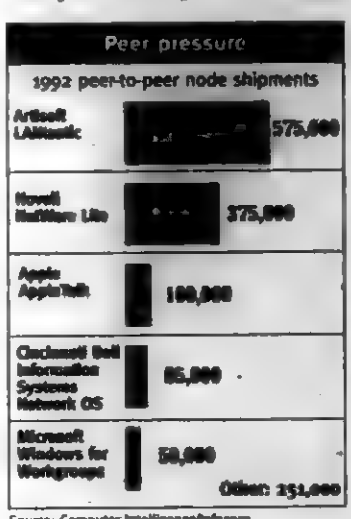
Positives and negatives

Such systems are said to be less expensive and easier to implement. However, the absence of a server also makes it harder to ensure consistency across duplicate data sets and to administer user access rights, vendors and analysts agreed.

A recent IBM market survey found that "the value of a peer-level connection is high at two users and almost gone at seven to eight users," said Art Olbert, IBM's Personal Systems director. After that, he said, IBM customers reported "they had to introduce a server, [or else] keeping track of access rights, passwords and files gets out of hand."

Announcements this fall will attempt to win corporate hearts by providing a hybrid system that can connect with equal ease to other peer systems and to a popular server such as Novell's NetWare (see story below).

Hybrid products also provide workgroups with an easy migration path from peer to client/server environments as their numbers grow, according to vendors.



Source: Computer Intelligence/Infocorp, Santa Clara, Calif.

There could be a corporate niche for such hybrids, analysts said. "I think the old NetWare 2.X market of 45 to 99 users is where the more robust peer network products will fight it out," said Stan Schatt, director of LAN services at Computer Intelligence/Infocorp in Santa Clara, Calif.

One potential corporate niche for peer software is as an add-on system that makes it much easier to network the average desktop workstation, Lewis said. Windows for Workgroups, for example, is "network-ready, with electronic mail and scheduling included," just like a Macintosh, he said. "It took me five minutes to install the Mac on NetWare and all day to install Windows."

High hurdle

However, vendors will first have to combat some well-entrenched preconceptions of peer networking as a product for tiny companies.

"I'm not taking NetWare Lite seriously; it's redundant when you have full NetWare," said Glenn Fund, president of the Boston Area Novell User Group who is in charge of networks for a large New England defense contractor. NetWare v3.11 is no more complex to set up than NetWare Lite, Fund said. "The complexity comes from having to assign lots of rights to lots of users."

Even value-added resellers (VAR) seem to steer clear of recommending such systems.

Kim Reggio, a network administrator at Bay State Gas Co., suggested to one VAR that NetWare Lite would work well for the New England Gas Association, "which has a small office." The consultant countered by recommending a 10-user version of "full-blown NetWare."

In addition, when Microsoft ships its Mail Application Programming Interface (MAPI), Windows for Workgroups will potentially tie any application to any E-mail system supported by MAPI, Lewis said.

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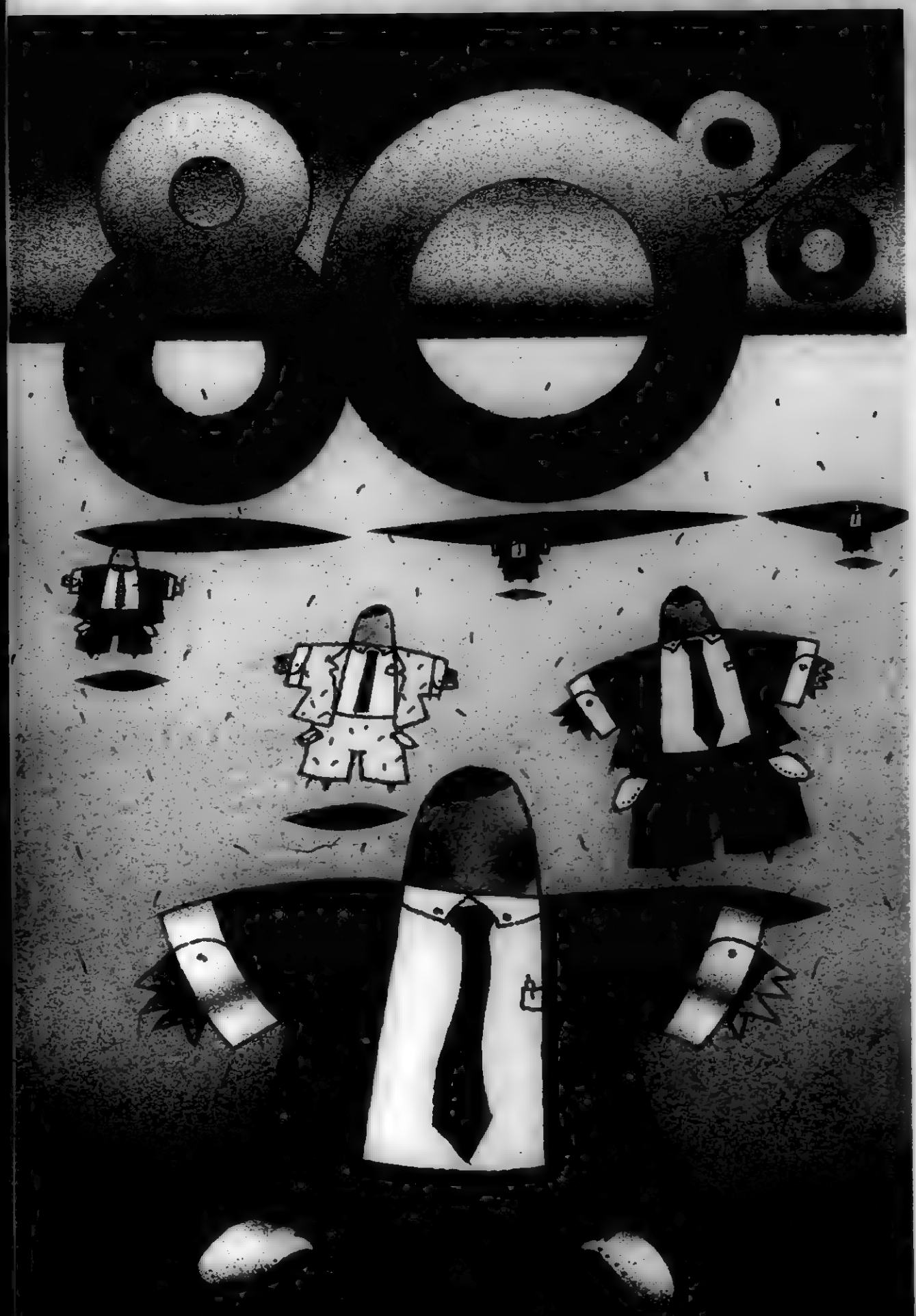

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Unisys restructures as president exits

By Thomas Hoffman
BLUE BELL, PA.

Unisys Corp. last week consolidated five units into three, in an attempt to increase revenue as opposed to simply cutting costs.

At the same time, company President and Chief Operating Officer Reto Braun departed.

With seven consecutive profitable quarters behind it, Unisys has entered what Chairman and Chief Executive Officer James A. Unruh defined as "Phase II" of its restructuring. The $8.4 billion company's three major divisions now include Information Services and Systems — which Unruh will oversee — Government Systems and Computer Systems.

By flattening its organization, Unisys eliminated the need for Braun, a 24-year company veteran.

Analysts and company insiders said they were not surprised by Braun's departure because he had been pining to run his own outfit for years. "Plus, it reflects how companies are restructuring these days, from the top down instead of from the bottom up," said Barry F. Bosak, a financial analyst at Smith Barney Shearson, Inc. in New York.

Braun promptly landed a top spot as chief executive and president at Moore Corp., a $2.4 billion business forms producer in Toronto.

Most analysts, including Bosak, were unenthused by the restructuring, given the spate of reorganizations sweeping the industry.

Deja vu

And Unisys has restructured before. But despite nearly two years of consistent profitability, the company's revenue growth has remained flat. To help pump life into its stagnant sales, the company last week also created two integrated business units that will focus on information services and client/server systems.

Unruh said the changes at Unisys should be viewed as attempts by the firm to enhance "profitable" revenue growth. Many analysts had blamed Unruh's predecessor, W. Michael Blumenthal, for seeking revenue growth at the expense of long-term stability, which nearly drove the firm to bankruptcy by 1990.

Unruh is continuing to reposition Unisys as less of an equipment company and more of a services and technology solutions provider for the four primary markets the company serves: financial services, airlines, telecommunications and the public sector.

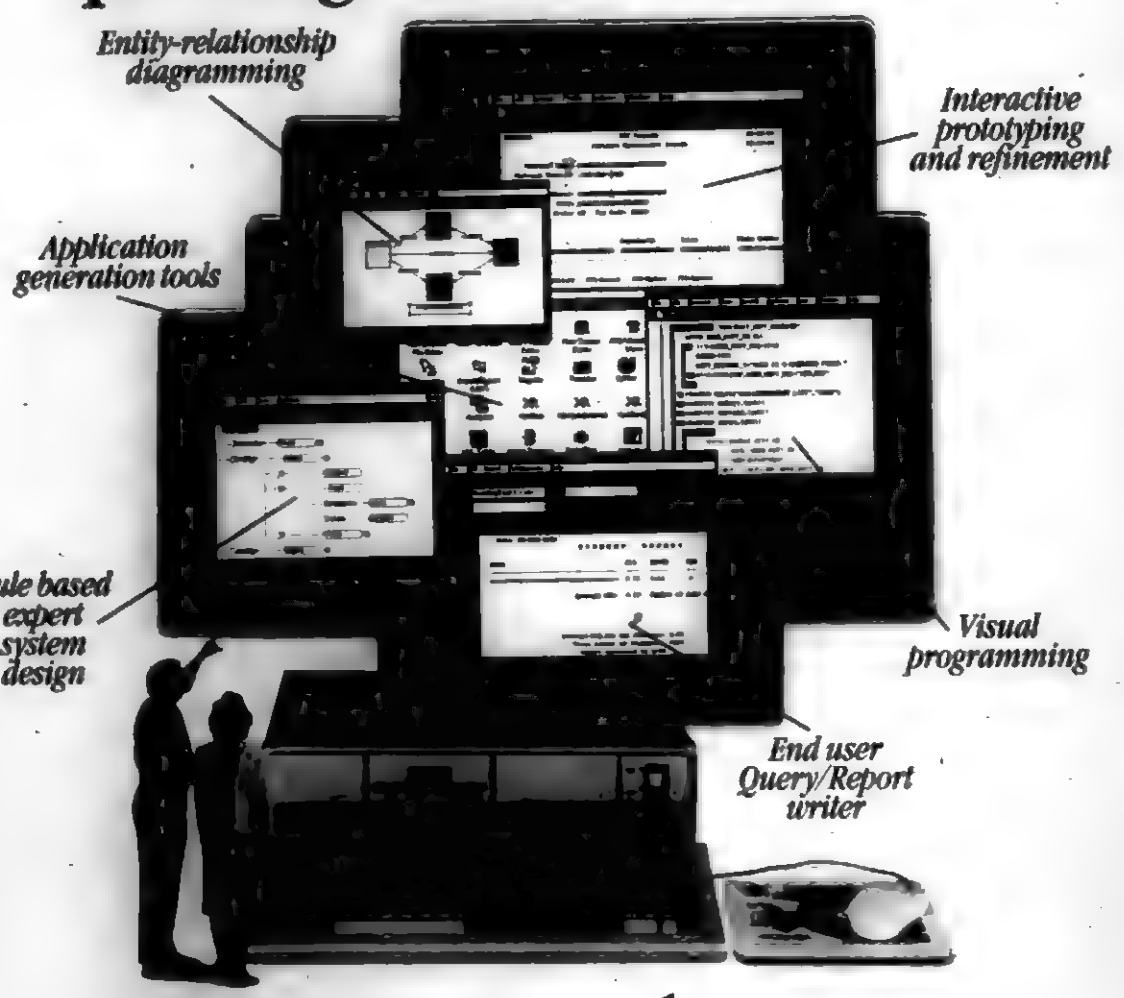
Most users said they would give the new organization time to settle in before evaluating its performance. Still, several Unisys customers said they hoped the restructuring would result in improved support and training.

"I've had some ups and downs with customer service," noted Rick Zizak, an information systems manager at The Millcraft Paper Co. in Cleveland. Millcraft, which purchased a Unisys U6000/35 Unix machine last year, has since experienced trouble getting answers to technical questions from Unisys representatives. Zizak said he believes strong demand for the Unix machines has stretched the vendor's slender support staff even thinner.

"I had found that I did not get the Unix support that I got from the A series [mainframe] support team. They need to get more people over on that side of the fence," Zizak said.

Maintaining proper staffing levels among business units will be just one of the new challenges facing Al Robbins, whom Unruh last week named as vice president of organizational change and development. Robbins, who hails from the company's human resources department with a Ph.D. in organization development from Stanford University, will also be charged with addressing corporate training and enacting cultural change during the transformation.

"Wow, that's what I call pushing the boundaries..."



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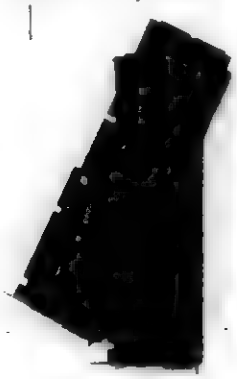

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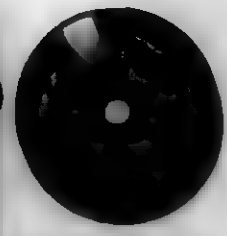

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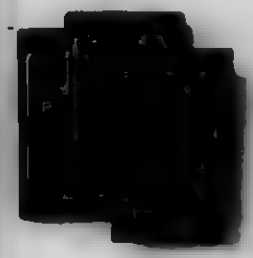

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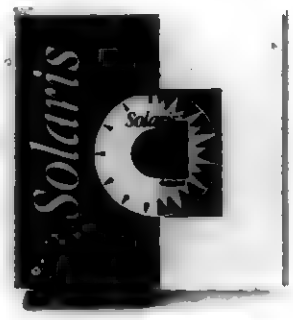

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TOCK

Viacom CIO climbs corporate ladder

By Allan E. Alter
NEW YORK

Viacom International, Inc., the $1.9 billion media company that owns the MTV, Nickelodeon and Showtime networks, last week elevated its CIO to the upper echelon of the corporation.

Henry J. Leingang, who has held the title of chief information officer since joining Viacom in 1990, has been promoted from vice president to senior vice president. He continues to report to Frank J. Biondi Jr., Viacom's president and chief executive officer.

"The promotion elevates me to peer level with other functional executives in the company," such as the chief financial officer or the head of the legal department, Leingang said.

Leingang's ascension reflects the changing nature of the mass-media business. Having an astute technologist involved in business strategies is critical, given how quickly the entertainment, computer and communications industries are converging. The promise of multimedia and interactive TV presents new business opportunities, which could go untapped without a clear understanding of information technology.

No longer back-office

The promotion also reflects the elevation of the role of the information systems organization at Viacom from a back-office function to "an enabler of operating strategies," Leingang said. "The information systems and technical function is becoming more important to the company. With the trends going on in our industry — regulation, [corporate] alliances, competition and technology — we need good information systems and a good technology infrastructure so we can respond quickly to changes in the marketplace," Leingang said.

Investing within

Viacom has expanded the IS organization and increased its information technology investments

1990	60	400
1992	110	1,700
1993	130	2,500+

After joining Viacom in 1990 as its first CIO, Leingang led a major overhaul of Viacom's information technology infrastructure while simultaneously decentralizing and expanding the IS function. The company has moved from a centralized IBM mainframe environment, running MVS on an IBM 3084, to one that uses 10 IBM Application System/400s as servers for more than 2,000 PCs.

Four of Viacom's major business units, as well as its New York headquarters, are each served by their own IS organization; the vice presidents of these IS organizations report to both Leingang and the CEO of their business unit.

With the restructuring effort behind him and a wide-area network in place, Leingang is focusing on improving service to the cable operators and advertisers that make up much of Viacom's customer base and enabling and promoting cooperation between Viacom's business units.

"As the [information technology] infrastructure grows, it supports the way things flow between groups, as opposed to supporting specific functions within the company," Leingang said.

He declined to discuss specific applications but said he expects to see the creation of tools that would help advertisers select advertising spots and coordinate advertising across Viacom cable TV networks.

In the more distant future, the network may be the means by which work flows between producers of TV programs and the distributors who deliver such programs to viewers. For example, *Roseanne* could be transmitted over the network, or a producer could send a video clip to a network executive as an attachment to an electronic-mail message, Leingang said.

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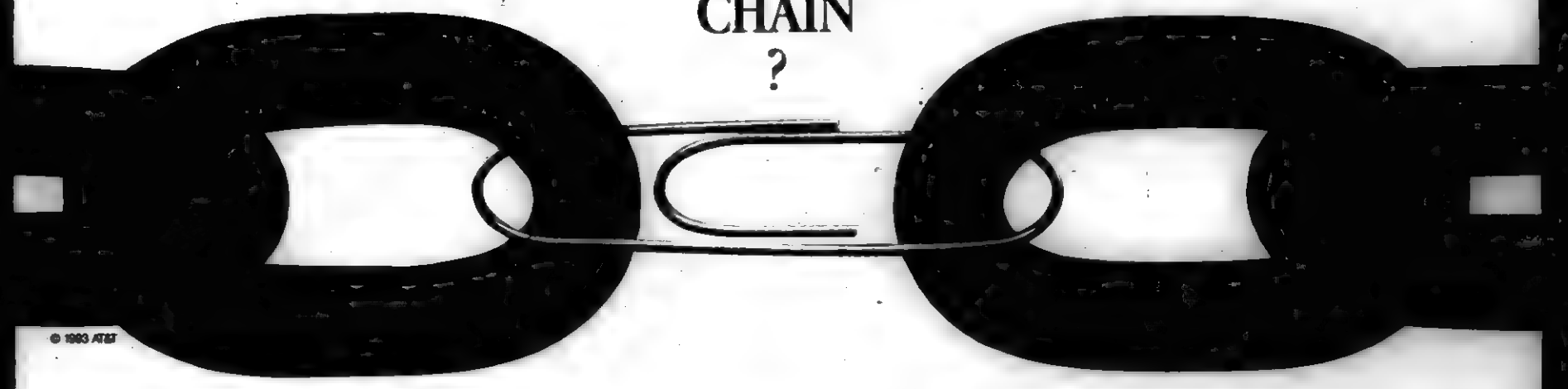

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Bombs go away

By Ellis Booker

Last month was the 48th anniversary of Trinity, the first nuclear bomb test, conducted on July 16, 1945.

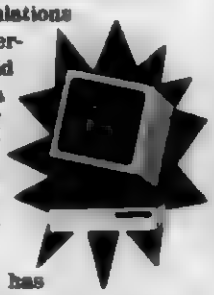
But a great deal has changed since that day just before dawn in the desert in Alamogordo, N.M.

For one thing, the end of the Cold War and a recent U.S. commitment to suspend underground nuclear tests (at least through September 1994) has prompted the makers of mass destruction weapons to turn to alternative ways of testing.

Enter a variety of planned projects to simulate nuclear blast tests. (The U.S. conducted its last underground nuclear test in September 1992.)

However, bomb designers are not all that confident that computer models alone are sufficient.

"By and large my feeling is these computer simulations are vastly overrated," said Steve White, a technical staff member at Los Alamos National Laboratory in New Mexico.



White, who has 10 years of experience in weapons research, said the trouble lies in nuclear physics and the equations used to understand it.

"As far as our fundamental understanding of the physics, we're at mesh resolutions that are two to three orders of magnitude too large," he said. In other words, calculations of these complicated equations are still not detailed enough to predict outcomes.

White said even when aided by the most sophisticated computers — Los Alamos uses both Cray Research, Inc. supercomputers and Thinking Machines Corp. massively parallel processor systems — scientists still must "evolve" the computer code to make the results match the observed reality.

Nevertheless, bomb-simulation efforts are going forward. Along with computer models, planned Pentagon projects call for the construction of specialized centers for simulating aspects of bomb blasts such as X-ray radiation and heat using non-nuclear materials.

Proponents of simulations said these systems will accurately gauge the bombs' explosive potential and their impact on different targets and answer questions about the shelf life of warheads.

Thought impersonators

Program applies humanlike reasoning power to draw analogies

"A native talent for perceiving analogies is ... the leading fact in genius of every order."
— Psychologist William James, 1890

By Mitch Betts

When we read about a new episode of official misdeeds, shredding documents and lying to Congress, we immediately call that a "cover-up" or "another Watergate." We may even give it a name ending in gate, such as Contragate.

This subconscious ability to draw an analogy — a resemblance between something we know and something new — has intrigued researchers who want to give computers humanlike intelligence.

In a new book, *Analogy-Making as Perception* from MIT Press, researcher Melanie Mitchell describes a computer model called Copycat that attempts to mimic humans' analogy-making ability, albeit in the limited domain of the English alphabet.

Copycat is an intelligent program that constructs analogies by matching patterns it sees in a string of letters (see box).

And how does Copycat compare with human efforts to solve letter-string analogy problems? The computer program matches two-thirds of the answers that are commonly given by three or more people, according to Mitchell, who is an assistant professor at the University of Michigan.

ANALOGY PROBLEMS

PROBLEM 1
abc → abd
ijk → ?
Humans and the Copycat computer program typically answer: ijl. The rightmost letter is replaced by its successor.

PROBLEM 2
abc → abd
ijkk → ?
Humans and Copycat typically answer: ijll. The rightmost group is replaced by the successor group.

PROBLEM 3
abc → abd
xyz → ?
Most humans answer xya, which assumes the alphabet is circular. Copycat is not programmed with that assumption, so it fails to arrive at that answer. Another creative answer is wyz, which treats xyz as the mirror image of abc and then replaces the leftmost letter with its predecessor.

The program's biggest shortcoming is that when it hits a brick wall, it keeps banging its head. For example, when it tries to find the successor to *z* in Problem No. 3 above, it goes into a state of "mindlessly loopish behavior" because its program does not allow for a successor to *z*, she said.

Copycat tries again and again (nine times in a row) to find the successor to *z*, whereas a human would give up after two or three failures, Mitchell wrote.

Not quite human

The fundamental problem is that Copycat lacks the human trait of "self-awareness," or monitoring its own processes, according to Douglas R. Hofstadter, the intellectual godfather of Copycat and director of the Center for Research on Concepts and Cognition at Indiana University.

"Humans do not get caught in obvious loops; they quickly perceive the pointlessness of loopy behavior and jump out of the system," he wrote in the book's afterword.

Giving a computer such self-awareness would bring it closer to having humanlike consciousness and even creativity, Hofstadter said, because creativity requires the ability to "avoid falling into mindless ruts."

Hofstadter said he hopes Copycat can evolve into a more creative program, dubbed Metacat, that would have a better sense of what it is doing, perhaps even "engage in banter of sorts with a human about the merits and demerits of a given solution."

Ideally, he said, Metacat would also be able to store its past experiences in episodic memory to help it tackle new problems, see analogies between analogies and move beyond solving puzzles to making up new ones.

Hofstadter said research at Indiana University is moving toward that long-term goal, but he acknowledged that "these wildly ambitious ideas are unlikely to ever be realized in full."

Tech Talk

Auto safety

A Swedish professor whose daughter was killed by a drunk driver has developed an electronic card-car computer system that would allow only authorized persons to operate cars.

Unveiled earlier this month, the proposed system would ban drunk drivers from the road by invalidating their electronic cards. The system could also reduce car theft, said Swedish officials who funded the work.

On another front, two months ago, Toyota Motor Corp. announced a prototype "advanced safety vehicle" featuring computer-based systems for preventing collisions.

The safety devices, which the Japanese carmaker said might be built into future commercial car models, include a system that automatically dims or reorients headlights to avoid blinding oncoming traffic; a wristband that monitors a driver's heart rate and stops the car if he dozes off; an alarm that sounds when the car comes too close to a vehicle ahead (and will even put on the brakes if the driver fails to take action); and a flight recorder-type system for recording events just before a crash.

Car content rules

Meanwhile, U.S. automakers race to develop tools to help their 10,000 suppliers comply with vehicle content reporting rules to be imposed under the North American Free Trade Agreement. Earlier this month, a task force from Chrysler Corp., Ford Motor Co. and General Motors Corp. was established under the auspices of the Automotive Industry Action Group (AIAG). The group was charged with developing a common content reporting format; the AIAG has also developed an electronic data interchange transaction set for content information.

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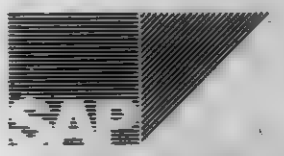

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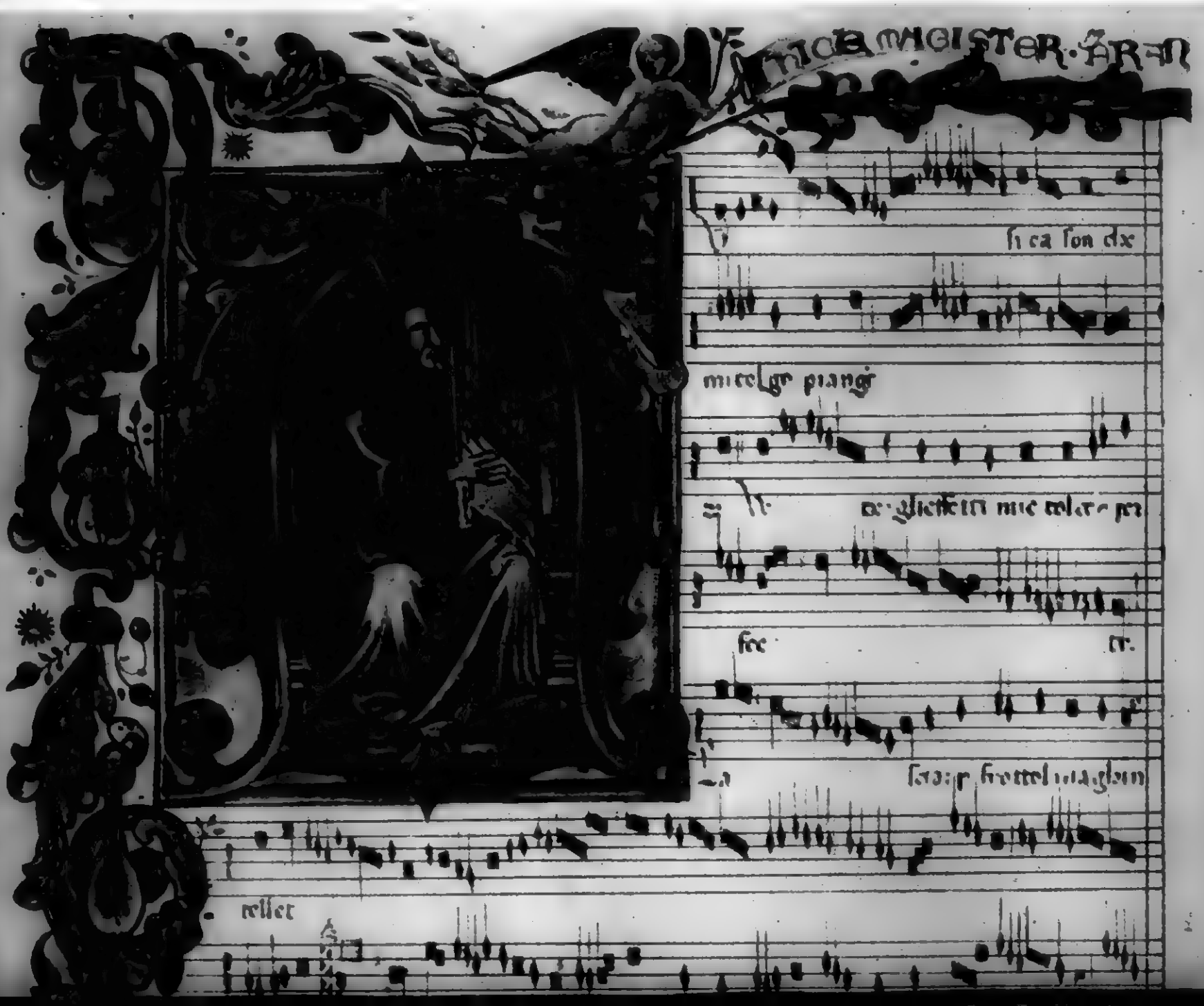

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Vows and wows

During a chat last week with an industry CEO, the conversation turned to the issue of promises made, promises broken. It's a conversation I've had with a number of executives in recent months, and the talks have had a surprising similarity.

Usually I'll point out that companies get upset when reporters drag out old press releases detailing some profound product strategy the vendors had unleashed. Reporters, being reporters, then note discrepancies between all the promises made and what actually transpired a year or two later. You hear it all.

"Things changed. All that client/server stuff popped up. The economy went South. Buyers became smarter. Buyers got dumber. There was a meteor shower that portended a change in our strategy. We got a new CEO."

Vendors will then often point out that flexibility is a hallmark of a nimble, adaptive company. Or that no one can foresee the impact that a change in one sector of the industry will have downstream on another seemingly unrelated sector. For example, as one software executive noted, the rapid decline in PC hardware prices spurred laptop sales, which in turn gave renewed life to stand-alone productivity software packages and (get this) might also slow the planned introduction of improved network versions of the same packages.

OK, so we accept that things change and most major market-shaping trends are never adequately foreseen. Still, corporate users continue to be pulled along one path or another by various statements of direction, usually in the name of giving the customer a clearer vision of what's to come.

Not to pick on anyone, but go through your files and see what IBM was going to bring forth with SAA, namely one big coherent distributed processing system. It will bug IBM to see me dredging up this sore spot.

The fact of the matter is, however, that when SAA was announced in 1987, IBM was absolutely dominant. So IS managers bought into the SAA concept lock, stock and barrel. The de facto proprietary nature of SAA that lurked beneath the covers would have a vicelike grip on many users several years later, as more open computing environments emerged.

In time, the marketplace sorted out the winners and losers, with the proprietary-based companies following a road to ruin. But the way was also littered with customers who bought the vision.

A flip response would be "buyer beware." If you're so naive to buy into any vendor's long-term vision at a time when no one can clearly foresee the industry landscape more than a year out, then you'll get the trouble you deserve.

An appropriate response is to ask for more socially responsible, politically correct behavior from leading vendors. Meanwhile, we'll continue to carefully monitor the promises made and weigh them carefully against the promises kept and the promises broken.

Bill Laberis

Bill Laberis, *Editor in chief*

Structure sought

After reading Joanne Kelleher's editorial "Quick isn't dirty" [CW, July 19], I felt a little amused. Surely, few would take such naivete seriously. But then I began to think — some people really do believe you can engineer an application without any structure. Engineer a process without any structure?

The real problem with her article is the underlying management philosophy I refer to as "short-termism." The key words of this philosophy are "fast and cheap." Corporations that let these two words drive their information management direction will quickly lose the competitive battle.

In today's competitive environment, risk management is critical. There are many ways to fail and few to succeed as any entrepreneur knows. Of course, I tend to define success by how long you stay in business and how well you maintain or gain market share through product innovations, and not by how much money you made last quarter. Quick isn't necessarily dirty, but without a structure it will quickly become that way.

Jim Bennett
Kansas City, Mo.

Perhaps the term "structured methods" is a bit too rigid to use in the context of today's PC-to-mainframe range of software development. Joanne Kelleher's observation that development is devoid of or "spurning anything that smacks of a structured framework" is disturbing.

Her example of the "IS exec" who trashes the whole idea is no executive I'd like to have in my organization. Likewise, "by-the-book sorts" are as antiquated in modern IS departments as they are in the business world today.

The only real differences we are discussing are the development platform, the degree of user sophistication and whether the software needs professional IS attention. I defy any CEO, COO or CIO to achieve anything remotely resembling successful use of computer automation in either the near or longer term if they persist in churning out glossy, colorful, piecemeal, tick-off, hit-and-miss "applications."

H. James Bronson
Frankenmuth, Mich.

Joanne Kelleher reports the demise of structured methods. She should know they have evolved into object-oriented design, and as such are proving very successful wherever people are solving difficult problems such as real-time simulation and control, especially where safety and reliability are paramount.

Even electronic bookkeeping systems benefit from an appropriate level of design, and these methods work for those who know how to use them. IS has rarely shown much interest or competence in design, resulting in generally poor quality and long development cycles of existing systems. It is fallacious to blame this situation on methods not used.

Andrew Raybould
Jersey City, N.J.

Let court decide

I was surprised at Paul Gillin's argument in his editorial "FTzzzzz" [CW, July 26] that the current fierce competition for the desktop is proof that the Federal Trade Commission investigation of Microsoft "is a waste of time." His position reads more like a statement from Microsoft than an editorial in an independent industry journal.

We are led to believe the presence of powerful alternatives to Windows (e.g., IBM's OS/2) and Microsoft applications (e.g., Lotus' SmartSuite) is evidence that Microsoft does not "monopolize" the industry.

But, perhaps, the fierceness of Microsoft's competitors in the face of (allegedly) unfair practices is more a statement of their competitive persistence rather than a statement of Microsoft's innocence. No one denies that competition exists, but the fundamental question remains unanswered: Does Microsoft engage in anticompetitive practices and, if so, what would be the competitive effect of legally ending those practices?

The "final word on the Microsoft case" should be heard from the courtroom, not from the editorial pages of *Computerworld*.

Paul A. Rostick
Wayne, Pa.

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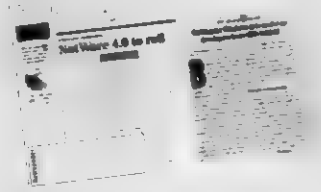

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Re-engineering: An emetic in a perfume bottle?

Paul A. Strassmann

There's nothing new or original about business process re-engineering. It's just a lot of old industrial methods, recycled and repackaged to seem like the latest in management science. The only thing new about it, aside from its fancy trappings, is the situation that occasioned its revival.

Early in 1993 an epochal event took place in the U.S. For the first time ever, white-collar unemployment exceeded blue-collar unemployment, giving lie to the entrenched belief that a college education entitles you to a job with superior earning potential, long-term job security and the opportunity to climb a career ladder.

Large white-collar unemployment should not come as a surprise. The information work force has increased steadily since 1979 and now stands at 54% of total employment. This amounts to 40 million more information workers since 1960.

What do these people do? Mostly, they perform functions that would be categorized as corporate or social overhead — as lawyers, consultants, managers, executives and experts of all sorts. And nowhere are they more heavily settled than in government, which now employs more people than manufacturing.

Who pays for this overhead? Everybody does. Some of what we pay is extracted from increased taxes. Most of it used to be paid from increased prices. As long as U.S. firms could raise prices, there was always room for more overhead. That ceased to be true about a decade ago.

Blue-collar labor went first, as jobs were either outsourced to foreign lands or rationalized, using proven industrial engineering methods. But by the mid-1980s, major cost cuts could only come from overhead reductions.

Early attempts to reduce white-collar labor were botched. Layoffs, preceded by announcements of 20% plus across-the-board job cuts, misfired. The most valuable experts left first. The next wave was even more wasteful. Cutting overhead by imposing arbitrary targets magnified disorientation and demoralization.

Companies resorted to these crude methods because they had no interest in assessing the value-added of information workers. They knew how to do this for blue-collar employees, but built-in bias did not tolerate subjecting management processes to this kind of scrutiny. This is where business process re-engineering came in. It rebottled well-known industrial engineering methods of process analysis, activity costing and value-added measurement.

Re-engineering excels more in its packaging than its substance. Its purpose is to make the purging of past staffing gluttony more palatable to managers. It is important that this process be palatable because, if you recall, budget cutters really can't know the consequences of their actions when it comes to management jobs. Unless they want to cut blindly, they need the tolerance and assistance of those who know something about how things work.

The cure is now administered in large doses to businesses that must keep up profits to survive. Despite ornate pronouncements about re-engineering from government leadership, it remains to be seen if the government will be willing to take the medicine. An emetic will always be an emetic, regardless of the bottle it comes in. And it only works for those who take it with the resolve to eat only what they can afford to chow.

Strassmann has served as a corporate information executive for General Foods, Kraft, Xerox Corp. and the U.S. Department of Defense.

What is your company's operating system?

OPEN MIND *by* Esther Dyson

I'm not talking about your computer systems, but your company itself. Is it single-tasking or multitasking? Modular or monolithic?

Robb Wilmot, chairman of re-engineering company Oasis (and the man who turned around the UK's ICL), considers his firm's task to be designing new operating systems for clients' companies, not their computers.

You can argue with this point of view, but it offers a useful framework: It makes sense to assess a company's operations *before* you think about what computer systems it might need.

That's the idea behind back-to-basics, zero budgeting re-engineering. And it makes sense strategically, too. A company needs to run on a smooth platform before it can worry about the details of its products, services or strategies.

Much as the operating system world developed on PCs (and, in ancient times, on mainframes), most companies start out with a single focus. There's hierarchy of management, one product line and one set of customers. The entire resources of the company are focused on the single task of serving those customers. You can't really do two things at once, but you don't need to.

Then the company decides to go into a second business, and it usually develops a parallel, separate structure for that second business. That's like building a second operating system to run a second set of applications.

There's not a lot of connection between the two operations. Functions may be duplicated. But it seems easier than trying to coordinate the sharing of functions, especially because each group has its own way of doing things that's particularly suited to its target market and style of operations. (Do I hear "incompatible protocols" in the background?)

Growth spurt

But then the company grows some more. Now it has 10 different units, each with its own way of doing things. It adds new functions that it used to buy from the outside. Of course, each unit is a special case with its own market and style, and it *certainly* couldn't share, say, a marketing campaign or a personnel policy with another group. (Doesn't this sound just like some proprietary operating systems that have their own complex file structures, graphics standards, protocols for storing information and communications protocols?)

Suddenly sales slow and management starts looking at costs. "We're using 10 times more resources than we need!' say the accountants. ("Resource constraints.") The overload of coordination among different units is a killer. ("Middleware.")

Management would like to contract some of the work out, reduce overhead and have single cross-unit services for common functions such as purchasing, hiring, marketing and invoicing.

It will take a struggle, but that's what is needed. Services that were unit-specific (operating system-dependent) need to be separated out as services that can be used by any unit in the company.

The analogies aren't perfect, but they make the point. It is sensible to make common functions more generic (standard?) so they can be used by any function in any unit of the company. Understand your company's operating system and appropriate modules first. Then think about representing them in software and systems.

Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets in Eastern Europe.

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Charles Babcock

Attuned to ATM

With little preamble, a half-dozen key network suppliers advanced plans earlier this year for new lines of networking products based on Asynchronous Transfer Mode (ATM). For some, ATM has displaced 100M bit/sec. FDDI and CDDI as our salvation in a world gone mad for network bandwidth. Why the switch?

For one thing, ATM has those other options beat with speeds that go to 155M bit/sec. or higher. But IBM's first ATM product is likely to be a 25M bit/sec. ATM

adapter card for workstations, so speed is not the only factor at play.

ATM is also an example of a technology that can be used in both small and enterprisewide systems. By taking the three primary forms of data — computer, voice and video — and converting each into short, 53-byte cells, ATM is able to offer a simple connection-to-connection networking approach that does what ISDN was supposed to do, only faster.

ATM switch capacities can be increased as network loads increase, guaranteeing each user a set capacity rather than dividing up the same pipeline among more and more users.

Another factor in ATM's favor is that it's one of the few networking approaches that can link multiple LANs and transmit data to the WAN. Theoretically, ATM can someday serve as both the WAN and the LAN.

These characteristics persuaded the Pacific Stock Exchange in San Francisco to convert to ATM next year for high-speed transaction and multimedia data feeds to brokers. ATM establishes a temporary end-to-end connection for each transmission, like a telephone call. A virtual circuit route is computed prior to transmission, which then allows the fixed-length packets to be transmitted, multiplexed and switched in silicon rather than through software. This is not only faster but more secure, which is a big concern for the stock exchange.

Older packet switching methods and LANs use variable-length packets that tend to be much longer than ATM's and subject to delays as each packet is routed through software. The delays make it difficult to transmit voice and video.

One of the pieces missing from a future dominated by ATM is ATM-carrying capacity in the public phone companies.

There is, however, a notable collaboration of three telephone companies under way in North Carolina, where the state government is establishing a regional ATM network to link research facilities, universities, schools and government offices for exchange of image and video files. They are cooperating to provide ATM-carrying capacity, an example that more phone companies may emulate.

ATM also lacks a multiple user access methodology, such as IBM's token passing or the collision storm detection on Ethernet. And the backbone net must possess capacity to satisfy all potential demand. If 25 users come on-line, each needing 100M bit/sec., the ATM switch will choke, even if it has a backplane capable of supporting 2.4G bit/sec.

The early uses of ATM will be for intermediate backbone functions. Bob Metcalf, the inventor of Ethernet and publisher of *InfoWorld*, believes one of ATM's first opportunities will come where it can act as a facility backbone to legacy LANs. And Joel Snyder, a principal at the Mosaic Group in Tucson, Ariz., predicts ATM will provide the bandwidth for future client/server applications. "When you try to blow big databases out of a central computer, you need a bigger network" than existing LANs, he said.

These are only interim roles, however. As the use of client/server computing grows, greater throughput will be demanded of the network, and ATM will begin to fill more of the gap between desktop and global net.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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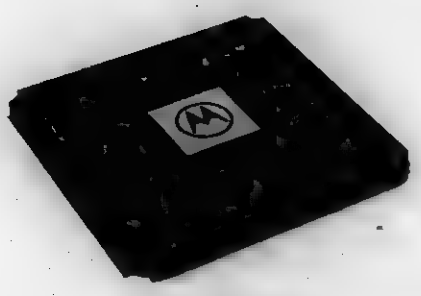
Speed comparisons are based upon press reports of performance of the 66MHz version of the Pentium as announced by Intel, and Motorola's announced simulation performance of the 66MHz version of the MPC601. Thermal comparison is based upon preliminary Intel specification for the 66MHz Pentium, and the performance of samples of the 66MHz version of the MPC601.



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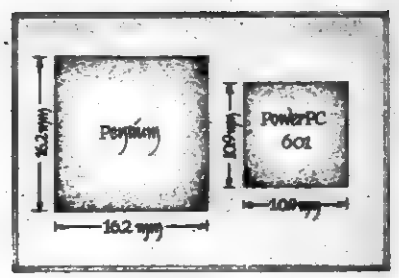

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Software integration: Vendor goal for the '90s

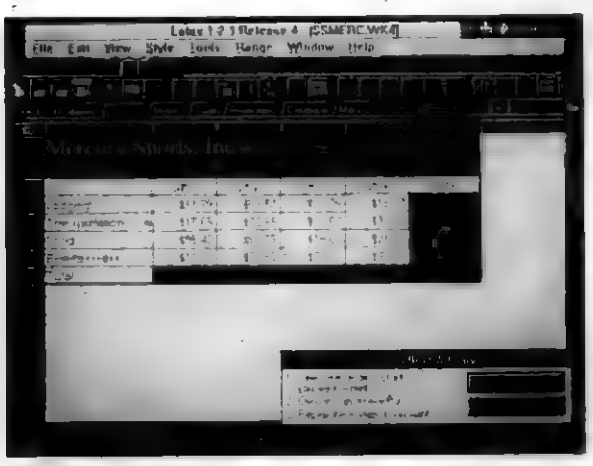
By Michael Vizard

If the major application software vendors can fulfill the technological vision they have laid out during the last several months, the day when applications cease to be distinct entities will be at hand.

Using a variety of enabling technologies, the major PC software vendors are racing to respond to user demands for greater levels of integration among PC applications.

closer OK
Word processors

"The vendors are lagging the end users in terms of demand for greater integration," said Krystyna Filistowicz, an industry analyst at Dataquest, Inc.



Integrating applications *such as Lotus' 1-2-3 with the Ami Pro word processor is the wave of the future*

And because word processors are the applications that users tend to run on their desks most of the time, the drive toward integration will lead to the creation of an integrated suite of applications where the word processing package will often be the primary link to other applications.

"The word processor isn't a word processor anymore. It's a document you use to create proposals that include spreadsheets and presentation graphics," Filistowicz said.

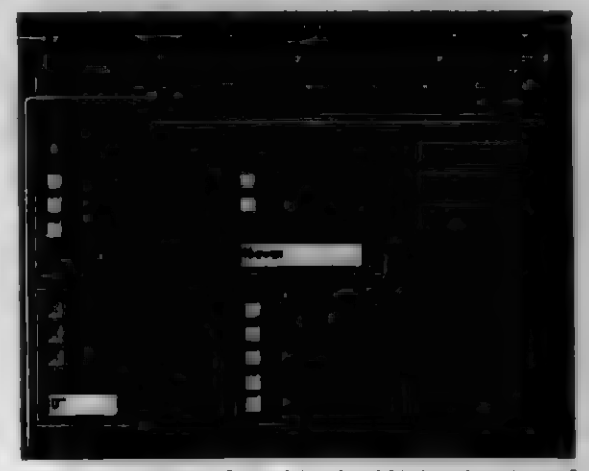
Foremost among the technologies intended to break down the barriers between applications is Microsoft Corp.'s Object Linking and Embedding (OLE) Version 2.0, which provides an object-oriented application programming interface designed to help one application take control and manipulate another application in a Windows environment.

For example, a user of a word processing package will soon be able to invoke a spreadsheet using OLE 2.0. Once invoked, the user interface will automatically switch over to the the familiar command interface of the spreadsheet.

Probably the first major applications to take advantage of OLE 2.0 will be Version 6.0 of Microsoft's Word word processor and Version 5.0 of its Excel spreadsheet, both of which are due to arrive this fall. WordPerfect Corp. in Orem, Utah, and Lotus Development Corp. in Cambridge, Mass., are also expected to add support for OLE 2.0 within the next 12 months.

But OLE, along with predecessor technologies such as OLE 1.0, the Dynamic Data Exchange facility and Clipboard, are only enabling technologies that will pave the way for a host of other enhancements that promise to make PC computing easier by creating a document metaphor, as opposed to the somewhat less than intuitive Windows environment that currently exists.

For example, Microsoft intends to use its Visual Basic programming language as a common programming language for its applications. By marrying Visual Basic with OLE 2.0, Microsoft will give users a tool for building macros that can then be applied across multiple applications using the OLE automation facility included in OLE 2.0. Similarly, Lotus has outlined a strategy that calls for a Lotus Script language, which is a derivative of Basic, to be embedded in its applications.



The upcoming Microsoft Word 6.0 *should take advantage of OLE 2.0*

User knowledge

"Having more sophisticated macro languages will be important because the users have moved beyond what word processors and spreadsheets can do on their own," Filistowicz said.

Right now, Filistowicz said Lotus enjoys a small edge over Microsoft because it has thus far made greater use OLE 1.0 to integrate its SmartSuite application package with Notes. But that edge is likely to disappear as Microsoft gears up to launch Version 4.0 of its Office suite this fall [CW, Aug. 9].

Meanwhile, the challenge for WordPerfect will be whether it can keep pace in an industry that is already dominated by software suites. "Over 70% of the applications people buy are purchased from one vendor," Filistowicz noted. And as these suites become more integrated, WordPerfect will increasingly have to rely on alliances with other vendors to sell its word processing software.

For example, WordPerfect is working closely with Borland International, Inc. in Scotts Valley, Calif., to integrate its word processing software with the Borland Office suite of applications, which is built around the Quattro Pro for Windows spreadsheet and Paradox for Windows relational database.

In addition, WordPerfect plans to focus more of its efforts on making sure WordPerfect is tightly integrated across multiple platforms using the OpenDoc technology that is being jointly developed by WordPerfect, Novell, Inc., Apple Computer, Inc., IBM and Borland [CW, July 5]. In contrast, both Microsoft and Lotus are putting most of their resources behind Windows and OLE 2.0.

Intelligence gains

Integrating applications using technologies such as OLE and OpenDoc may go a long way toward reducing the number of steps required to access data, but the effort to make software easier to use by making it more intelligent is a separate initiative that will rely on agents that will be scripted to perform tasks.

For example, Microsoft will use IntelliSense agents in the next version of its applications to automate certain repetitive tasks. Using this type of technology as a base, vendors are researching more intelligent agent technology that will be able to monitor a user's actions, and based on that data, automate a specific task commonly performed by the user [CW, Aug. 9].

"Part of the problem is that creating a document-centric environment won't add any simplicity. It will be important to add customization that is task-oriented," said Dave LeFevre, a WordPerfect product manager.

Software integration, *page 49*

Support for the future

For information systems directors, the increasing complexity of PC applications means they will have to focus on building an infrastructure to run them, while also providing the necessary levels of user support.

"I like the idea behind this type of integration, but I can wait. We have to gear up to build the infrastructure first," said Meyer Feig, president of International Business Applications, Inc., a systems integrator in New York.

In fact, the increasing complexity of supporting PC applications software has led Johnson & Higgins, a New York insurance provider, to outsource PC software support to Corporate Software, a reseller in Canton, Mass.

Today, Johnson & Higgins runs several different types of Windows applications in conjunction with Notes. Vice President William Wilson said he figures outsourcing is immediately saving the cost of one full-time person. However, Wilson said that as software becomes more complex and users discover the relatively quick response Corporate Software will provide, the real value of the contract will be equivalent to five to seven people working full time.

The good news for IS shops, however, is that while software may become more difficult to support in the future, the drive toward tightly integrated modular applications may make software easier to support.

"Rather than buying a single 100Mbyte monolithic application, people will only buy modular functions that they need to create their document," said Dave LeFevre, a WordPerfect product manager.

And when that happens, users will be much more proficient, which in turns means they will require less support from IS, according to Krystyna Filistowicz, an analyst at Dataquest.

"The software is becoming much more idiot-proof," she said.

—Michael Vizard

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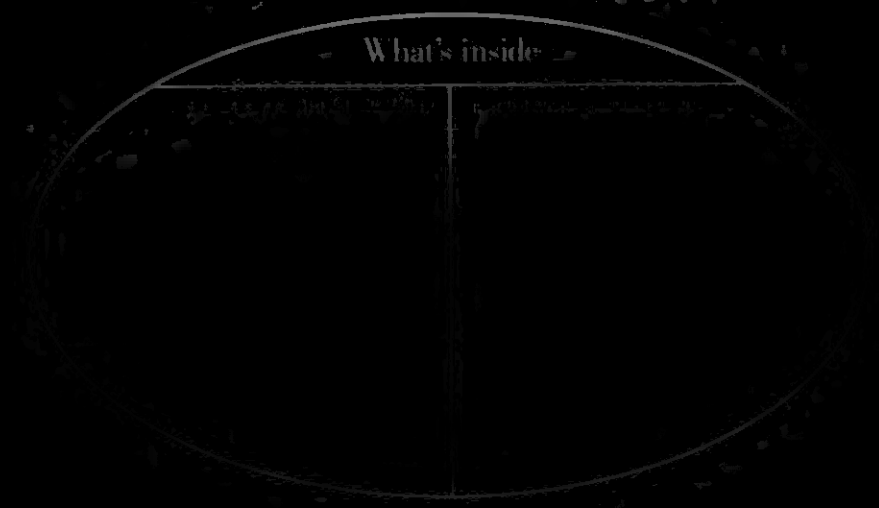

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Heavy portables carry multimedia hopes

By Michael Fitzgerald

Amidst all the hype over personal digital assistants, some very heavy portables continue to draw interest in the market.

Toshiba America Information Systems, Inc.'s recently introduced T6600 multimedia portable weighs 18 pounds, but users are interested in it for its heavy-duty data capabilities. They are not pleased, however, that it has been delayed twice since it was announced. Toshiba said delays in getting master disks of software bundled with the box have slowed its ability to ship, and it now predicts a mid-September delivery.

"We have a very data-intensive business," said Michael Bennett, director of systems marketing at Nielsen Marketing Research in Port Washington, N.Y. "The products that we market to ad agencies use multiple CD-ROMs, and we have flowchart graphics that we really want to show in color."

Bennett said Nielsen's sales force currently travels to client sites with either a Compaq Computer Corp. 486C luggable or an IBM PC Co. ThinkPad 700C. Neither will accommodate in one package what Nielsen wants to do next — run segments of commercials during presentations.

"That's when I start to need different sound and data compression boards available in the Toshiba," Bennett said. The T6600 has built-in speakers and two slots to support extra boards.

Love at first sight

CB Commercial, formerly Coldwell Banker, already uses multimedia portables to make presentations. The commercial real estate broker has more than 40 T6400s, the T6600's predecessor, spread across its offices. It started using the T6400 two years ago, after seeing Toshiba make a presentation using the box.

"We got involved in a couple of presentations from Toshiba and another vendor, and when we saw how they were doing it, we really got interested," said Afshin Khoddam, vice president of application development, network technical support and telecommunications at CB Commercial in El Segundo, Calif. He added that in CB Commercial's case, the company had little interest in multimedia beforehand. "It was a case of seeing it to love it," Khoddam said.

Currently, CB Commercial uses Troy, N.Y.-based MapInfo Corp.'s MapInfo mapping software and spotlights latitudinal and longitudinal points from the U.S. Census Tracts to develop better ways to sell or lease commercial real estate. Using scanned-in photos and voice-overs, combined with an information management system on its various properties, salespeople have a handy and relatively lightweight way to tote around their presentations. CB Commercial also uses Lotus Development Corp.'s Freelance and Aldus Corp.'s PageMaker software for presentations.

Toshiba's T6600C *has caught users' attention*

When CB Commercial gets a T6600 in hand, Khoddam said he expects "we can absolutely make good use of it" to store megabyte-munching pictures on CD-ROM and run them more effectively. Khoddam also said CB Commercial is testing full-motion video as a sales tool and can use the slots in the T6600 for this.

Flexibility key

Khoddam said the T6600 will be more usable than CB Commercial's fleet of T4500Cs for making presentations.

"Its flexibility is in letting you load so much. It isn't limited because of the power of the machine," he explained.

Bennett called the new multimedia box "an enabling technology" that will let Nielsen get data off of its desktop PCs and in front of clients. This is important because "a lot of clients want to see it before they'll buy anything."

Apps take stage at MacWorld

By James Daly

BOSTON

The four-day MacWorld Exposition earlier this month allowed hundreds of Macintosh software developers to trumpet their latest and greatest wares.

Apple Computer, Inc.'s newly introduced Newton MessagePad was a popular target for a good amount of this percolating creativity, but developers also unveiled a wide variety of Macintosh-related products and initiatives that will arrive this fall. Among the announcements were the following:

➤ **Oracle Corp.** officials gave the MessagePad a nod of approval, saying they would link the Oracle 7 cooperative server database and Oracle Office messaging systems to the MessagePad via their Glue technology. Glue is an application programming interface capable of connecting diverse databases, mail systems and file systems on a variety of platforms.

The integration will enable customers to access Oracle databases wherever the user may be, according to Oracle officials. For example, an insurance company's field representative will be able to use the MessagePad and Glue to easily access a claims database at the corporate office.

No availability date was announced.

➤ Software developer **Ex Machina, Inc.** unveiled two applications that will allow the MessagePad to communicate with hundreds of on-line databases and receive wireless messages from desktop computers.

PocketCall, a terminal emulation program, allows a MessagePad user to respond to queries from host systems by simply handwriting text on the screen of the MessagePad or popping up an on-screen keyboard. The basic PocketCall application will ship in October for approximately $100.

Ex Machina's Notify for PowerTalk is a messaging service access module that works to provide wireless messages to the MessagePad. Notify will also ship in October for about $149, company officials said.

➤ **Motorola, Inc.** also jumped on the MessagePad bandwagon with the introduction of the Newton Messaging Card, a lightweight credit-card-size receiver that allows MessagePad users to receive wireless messages, data and news services virtually anywhere they go.

When not inserted into the Newton, the Messaging Card can be carried in a pocket or purse and can continue to receive and store messages wherever it is. Upon receiving a message, it notifies the user with a beep or a flashing light. The user can then insert the card into the Newton's Personal Computer Memory Card International Association Type II slot to download the message for viewing the information. The product is expected to ship in early September; no pricing was announced.

➤ **CE Software Holdings, Inc.** announced QuickAccess, which will allow Newton users to send and receive mail from a mailbox on a number of local-area network-based mail system transports, including CE's own QuickMail, Novell, Inc.'s NetWare and Apple's Apple Open Collaboration Environment (AOCE).

Officials from the West Des Moines, Iowa-based company did not announce pricing or availability.

➤ On the non-MessagePad front, **WordPerfect Corp.** announced WordPerfect 3.0 for Macintosh, a new version of its popular word processing package that is in beta testing and expected to ship this fall. Version 3.0 includes support for Apple's latest technologies, including AOCE, AppleEvents, AppleScript, WorldScript and the Quicktime multimedia platform. Version 3.0 will retail for $495, WordPerfect officials said.

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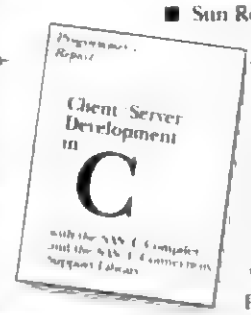

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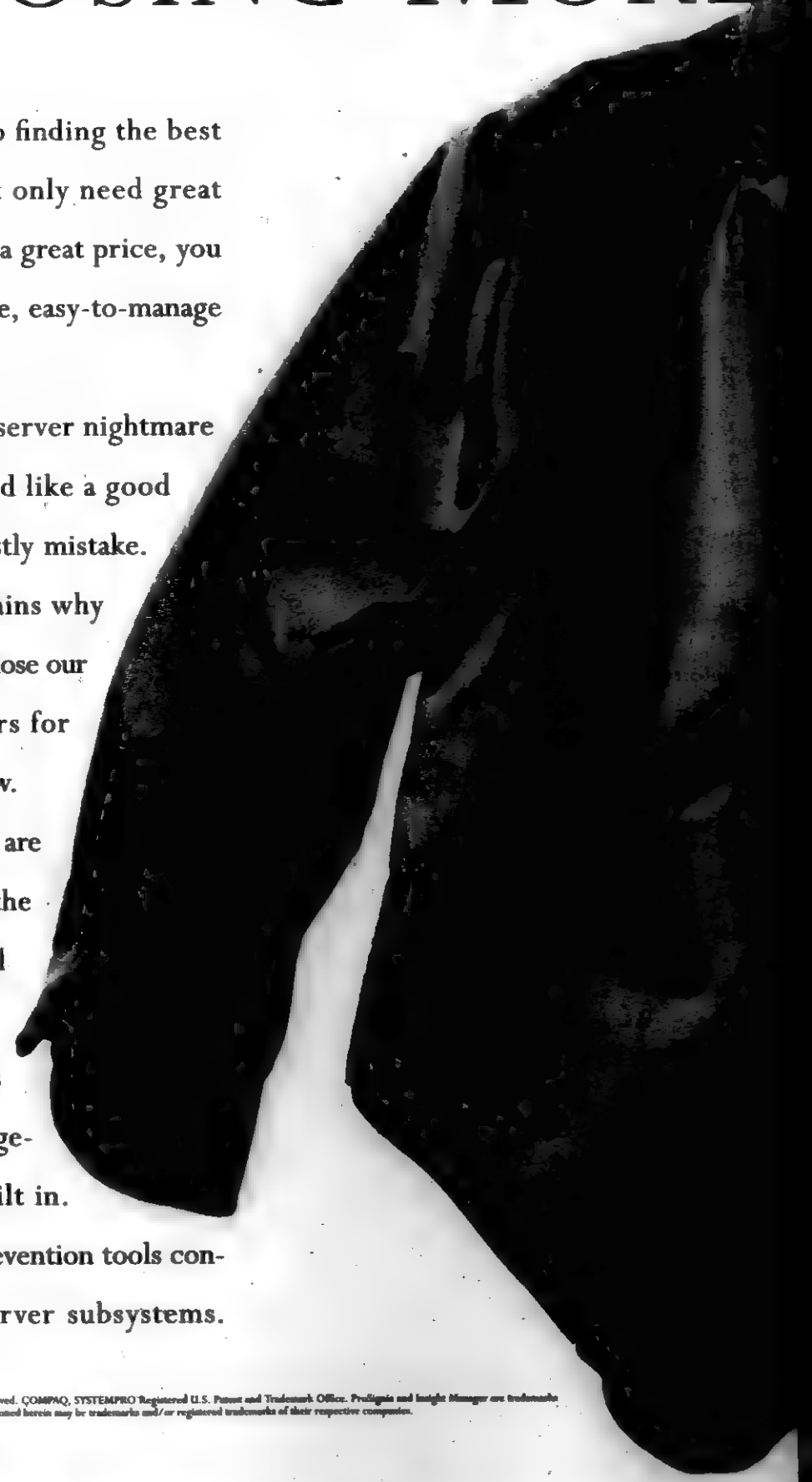

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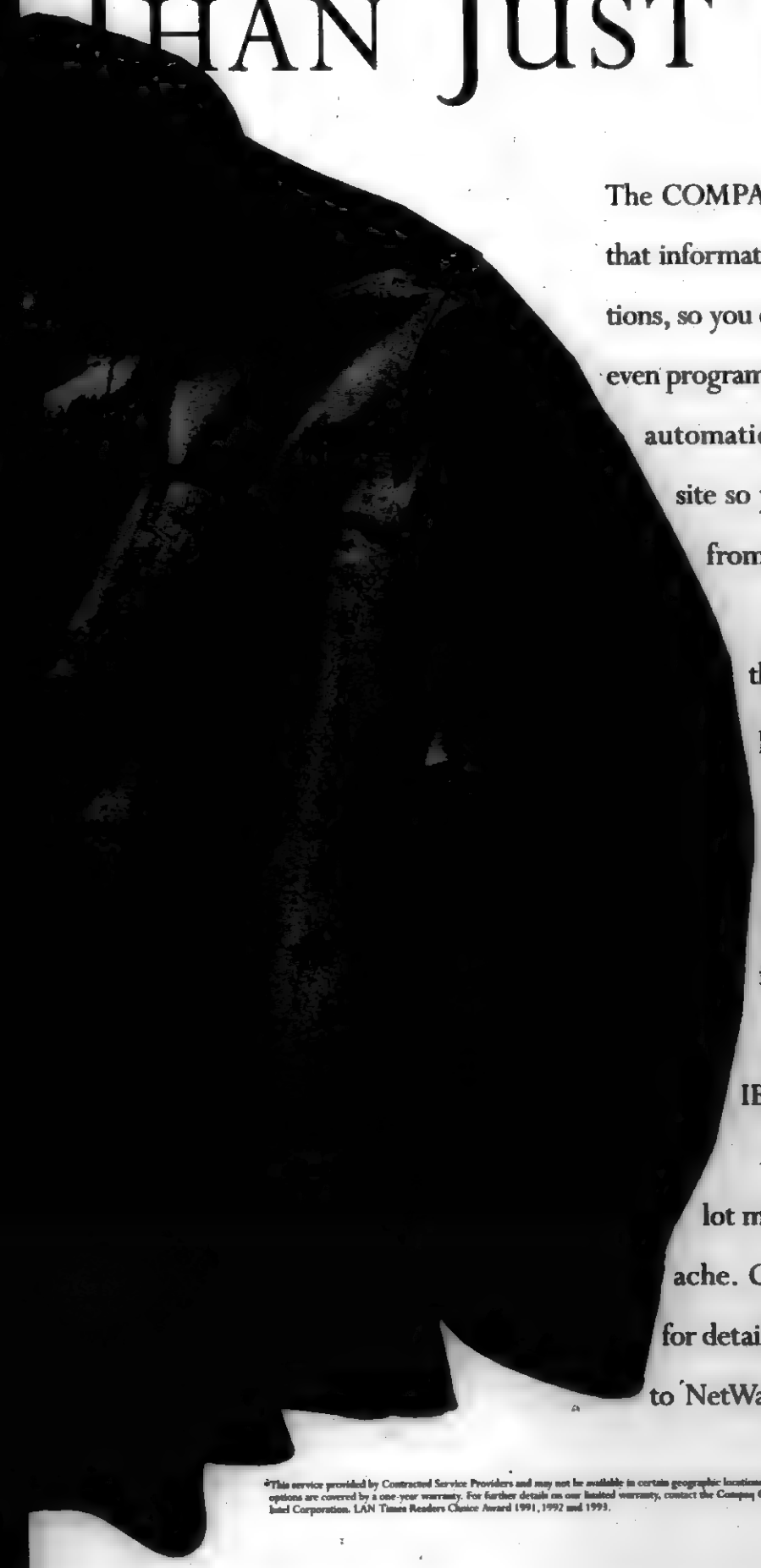

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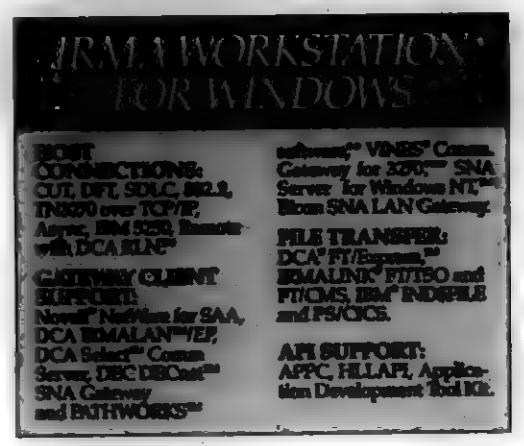

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Jeffrey Henning

PDA revolution

It can be tempting for the IS manager to dismiss personal digital assistants (PDA) — products such as the Apple Newton and Tandy Zoomer — as nothing more than toys. After all, the Zoomer even comes loaded with games and has built-in game keys. Meanwhile, the IS manager has more immediate technical issues to sort through, such as evaluating 32-bit operating systems.

Unfortunately for the busy IS manager, a number of factors place PDAs on the list of technologies under consideration. First, an IS manager's company may adopt PDAs with or without his blessing. Second, PDAs will satisfy some users' needs better than portable PCs do. Third, PDAs will gradually change the way traditional PCs are used.

If only performance is considered, a PDA like the Tandy Zoomer, with its 8086-like CPU, is a toy compared with any notebook PC. Of course, strictly going by performance, the first IBM PC was a toy when compared with the most prevalent computer of the time, the mini. Data center managers who dismissed PCs 10 years ago found themselves forced to confront PCs once those devices came in the backdoor. PDAs not only will come in by the backdoor, they will come in the back pocket.

Rather than be forced to develop a strategy for supporting PDAs after the fact, IS managers must make sure they have a hand in defining how their organizations integrate PDAs with existing information systems.

PDAs do offer genuine benefits. The principal benefit, despite press reports, is not organizer functionality. No company or department is going to adopt PDAs for that purpose alone when paper-bound daytimers and address books provide comparable functionality for a few dollars.

More compelling than "keeping organized" for most users is "keeping in touch," which is why AT&T refers to its PDA-like devices as personal communicators and why Apple named its first Newton the MessagePad. In the round-the-clock world market of the 1990s, time is money, and timely information is money. Voice communications are often not enough for remote workers; they need to send electronic mail, transfer files and transmit faxes.

While portable PCs provide this functionality, they are too hard to use for some workers, too bulky to be "unconsciously" portable and too expensive for widespread deployment. PDAs are therefore more suited for workers who have not yet used computers.

Interface interrupt

However, PDAs are going to change the face of computing. The interface, that is.

Apple's Newton Intelligence — the operating system of its just-released PDA — is as revolutionary as the GUI of the Apple Lisa. Newton Intelligence is the fullest incarnation of an interface called — get this! — the STICI (pronounced "sticky," what else would succeed the "gooey?").

STICI stands for Self-Teaching and Interpretive Communicating Interface. Where the GUI was a more personable interface than what went before, the STICI is a more personal interface. "Self-teaching" means the STICI customizes itself for each person that uses it; "interpretive" means the interface stores and recognizes personal information; "communicating" means the interface provides seamless management of person-to-person communications. All of these features make the STICI even easier to use and more productive than the GUI.

IS managers who dismissed the Macintosh as a cute toy found themselves behind the curve when it came time to move their organizations to the Windows GUI. They lost the competitive advantage of being able to deploy custom GUI applications ahead of competitors.

Similarly, IS managers who dismiss the STICI will be behind the times when vendors such as Apple eventually incorporate STICI functionality into PC operating systems. The STICI will make it to the PC, even as the GUI eventually made it to the minicomputer.

In the long run, PDAs will become an important part of corporate computing. Any IS manager who treats PDAs as toys may be toying with his own future.

Henning is a senior industry analyst at BIS Strategic Decisions in Norwell, Mass.

Windows boost for optical character recognition

By Ellis Booker
SUNNYVALE, CALIF.

Calera Recognition Systems, Inc. put its latest optical character recognition (OCR) engine on two Windows-based desktop products last week when it announced that WordScan 2.0 and WordScan Plus 2.0 will employ the next-generation technology.

In April, Calera unveiled Adaptive Recognition Technology (ART) for its high-end OCR systems. ART, a 32-bit software system, is said to use a more sophisticated and accurate neural networking technology than previous Calera engines, reducing recognition errors by 35%.

> All OCR vendors are grappling with how to do accurate recognition on hard-to-read documents.

"Nobody's OCR has trouble with clean, laser-printed text," said Kristy Holch, director of scanning market strategies at BIS Strategic Decisions in Norwell, Mass.

Rather, all OCR vendors, she said, are grappling with how to do accurate recognition on hard-to-read documents, such as incoming faxes or "10th-generation photocopies."

Back in 1990, Calera was the first OCR vendor to offer Windows-based OCR packages. Desktop systems now account for a third of its worldwide business, according to Calera executives, who said they anticipate increased activity in this category based on the mounting sales of fax modems, which have zoomed from 4,000 in 1990 to 850,000 this year.

"We estimate 70% to 80% of the images people will need to [use OCR with] will be faxes," said Wes Rose, Calera vice president of sales and marketing.

Along with an improved Windows interface and a rudimentary forms recognition capability, the new desktop products are the first OCR packages to support Microsoft Corp.'s Object Linking and Embedding (OLE) 2.0 standard. For instance, a user can drag the icon of a fax (from an OLE-compliant fax application) and drop it onto the Calera WordScan icon to initiate the OCR conversion.

WordScan 2.0 and WordScan Plus 2.0 are available through Calera's distributors for $295 and $695, respectively. Both products require 4M bytes of random-access memory, a 386-class or higher PC, DOS 5.0 or above and Microsoft Windows 3.1.

An upgrade policy for current users of WordScan is available through Oct. 31.

Software integration

CONTINUED FROM PAGE 41

These efforts will eventually lead to the creation of truly context-sensitive software that to some degree will anticipate what task a user is trying to perform.

As part of that effort, users will probably see dramatically changed user interfaces. Rather than being presented with a large selection of icons and menus, they will see a series of cascading icons that are brought into play as the user moves through a task.

Typewriter mentality

"We're at the beginning stages of rethinking what a word processor should look like. Word processors were modeled after typewriters, but now we can look at how we actually use documents," said Bill Jones, Lotus' director of product management for the Ami Pro spreadsheet.

In fact, intelligent software is likely to incorporate sophisticated logic that will provide it with the cognitive ability to check the logic of a piece of text and to incorporate speech recognition. With this in mind, Microsoft has a five-year project aimed at incorporating speech recognition with Office, said Chris Peters, Microsoft general manager for Word. This capability will be supplemented by a cognitive reasoning capability.

For example, Peters said Microsoft has a prototype Word application that knows about 100,000 facts about the world, taking up about 100M bytes of random-access memory. Microsoft hopes to teach the software the relationship among these facts, while also reducing the resources required to support this capability. Microsoft plans to then create more sophisticated grammar checkers that could evolve into devices that can essentially take dictation.

"Up until now, all the enhancements in processor speed have gone into the user interface of the application. But people don't want to learn software, so we have to make these machines easier to use," Peters said.

The challenge for software vendors will be to make effective use of hardware to accomplish these goals.

"These kind of features require very high linguistic and computational capabilities," Jones noted.

"The concept of having the computer do a lot of the thinking is the way the industry is going," LeFevre added.

Aldus Corp.'s consumer division has announced Aldus IntelliDraw 2.0.

According to the company, IntelliDraw 2.0 is an upgrade to Aldus' cross-platform drawing program. It was designed for the Macintosh and Windows.

Version 2.0 enhancements include expanded file support and connectivity, new drag-and-drop templates and special effects for objects and text.

It enables users to create technical diagrams, business or engineering graphics, flow charts, organizational charts, space plans, architectural renderings and more. A new Attribute Control Panel monitors and alters the size, position and line attributes of an subject, the company said.

The Macintosh and Windows versions of Aldus IntelliDraw 2.0 will be available during the fourth quarter and will cost $199.

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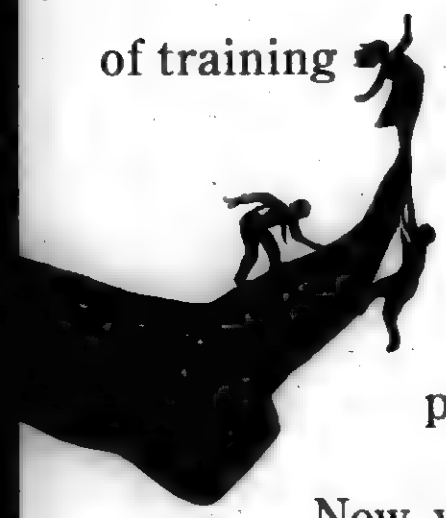

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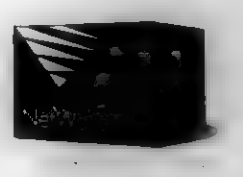

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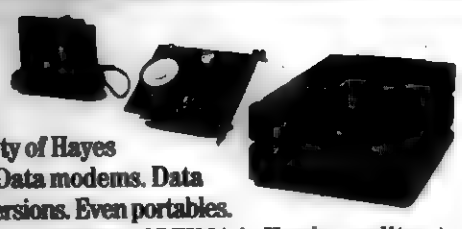

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SunSoft boosts NFS features

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

SunSoft, Inc. has launched the first rewrite of its Network File System (NFS) in five years, revamping overall system performance and security of the distributed file system.

The software, which supports distributed computing among Unix workstations, PCs, Novell, Inc. NetWare-based servers and IBM mainframes, among other systems, should be installed at user sites in 1994.

Industry analysts said Sun is making the move to keep NFS current with the Open Software Foundation's (OSF) Distributed File System (DSF) and the Andrew File System used by some systems vendors. Major systems vendors, including IBM and Hewlett-Packard Co., began shipping DFS as part of OSF-compatible Distributed Computing Environment tool kits this summer.

Key distribution

SunSoft estimates there are approximately 4 million users worldwide who access files in distributed systems using Sun's NFS software. NFS is a key component of the Open Network Computing distributed computing software in SunSoft's Solaris 2.X operating system.

NFS Version 3.0 could be installed as an upgrade at hundreds of thousands of NFS sites worldwide, industry analysts said. Among key improvements, Sun said, are better performance, support for high-bandwidth networks, reduced server overhead and enhanced security.

Several analysts said client/server response time will be improved by NFS Version 3.0's expedited handling of routine confirmation messages. "Not having to wait for the confirmation that a 'write' was completed will speed things up," said Paul McGuckin, a Gartner Group, Inc. Unix analyst. Security has been improved with a new authorization process for client machines, he said.

Easy upgrade?

Users want to be able to upgrade easily to Version 3.0 — something they cannot put to the test until systems vendors ship NFS-compliant products next year. But initial reaction was positive. "It's got a lot of features that improve its reliability and its speed," said Stan Hanks, president of the Sun User Group and president of Technology Transfer Associates in Houston. "Right now, doing a write in NFS is about equivalent to scratching your nose by reaching around your back and over your shoulder. You've got to send a lot of different server requests and wait for them all to clear."

Users critical of security lapses at some sites have blamed weaknesses in NFS. Those who have seen early versions of NFS 3.0 said Sun has added Kerberos security software and tightened access to remote servers.

Workstations serve host data

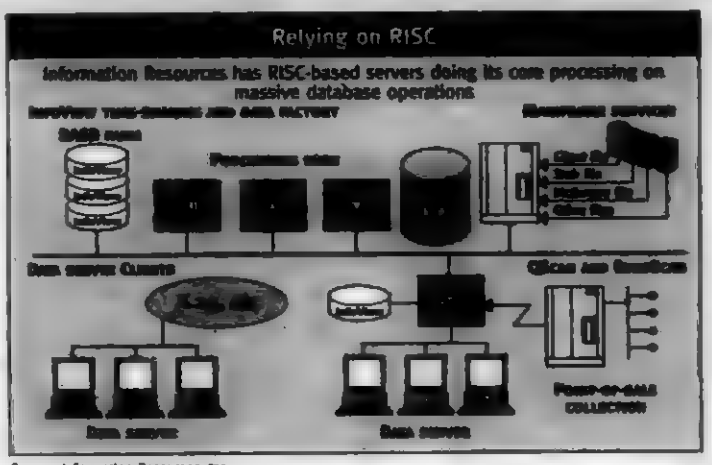
IRI offers data slices to grocers through distributed Unix system

By Jean S. Bozman
CHICAGO

Where does all the data go after your groceries have been checked through the supermarket scanner?

It usually ends up in a very large mainframe database at one of a handful of market analysis firms that sell the accumulated information to product manufacturers and retail grocery chains [CW, May 31].

One of those suppliers, Information Resources, Inc. (IRI), provides a data service called InfoScan that draws on consolidated sales data from more than 2,500 supermarkets. The resulting database at IRI headquarters is about 1.7 terabytes. Stored on IBM-compatible mainframes, the data can be accessed by end users via a custom client/server application called Express that runs on PCs.



Source: Information Resources, Inc.

Slicing up the data

Now IRI is launching a way to provide those data "slices" to retailers without first having to process the accumulated sales data from thousands of stores. Early this year, it began deploying a Unix workstation to give grocery chain managers a window on chain-specific data. That data shows sales patterns in sales at each of the chain's stores and includes a built-in decision-support database for grocery store managers (see diagram below).

A retailer's merchandising business unit uses the Unix system, based on an IBM RISC System/6000 workstation, to pinpoint products as winners or losers in the race for shelf-space placement. Because profits in the grocery business are just a few percentage points of total revenue, a detailed and timely analysis can boost profits, said John C. Mather, vice president of data systems at IRI, who heads the firm's applied technology group.

The new Unix-based QScan system is in use at 20 sites and is expected to be in place at more than 75 sites by year's end. Several IRI users refused to comment publicly on the Unix systems they are evaluating or installing, citing competitive concerns. Among them are major grocery chains in Chicago and Los Angeles, industry sources said.

Installing Unix servers and PC clients is one way $276 million IRI hopes to build market share in grocery stores, where demand for such data is booming.

The decision-support software allows managers to fine-tune supplies to local shopping patterns. IRI already has an extensive customer base for its mainframe services at the manufacturing giants that supply soap, soft drinks and canned goods to retail outlets, as does its archrival, A. C. Nielsen Co. in Northbrook, Ill.

IRI executives said the move to Unix servers for in-store analysis stems from the workstations' capacity and speed, compared with PC servers, and from the portability of Unix code to many types of hardware used worldwide. But competitive pressures are also a factor, as other firms move to supply retail chains with in-store decision-support applications.

Future versions of QScan may be ported to Unix servers from Hewlett-Packard Co., Sun Microsystems, Inc. and NCR Corp., IRI said. The firm is also launching a drive to grow its business in Europe, where Unix is popular, based on new IRI data servers installed in the UK, Germany and France.

Workstations, *page 58*

Databases

Help sources multiply

By Kim S. Nash

Database users looking to go client/server have more sources than ever from which to buy software and consulting help as firms such as Sybase, Inc. and The ASK Group, Inc. sign up systems integrators, value-added resellers (VAR) and other third-party vendors.

More choice means users can better tailor consulting packages to individual projects. For instance, for a major, multidepartment client/server initiative, a user may want to call on a systems integrator directly, instead of Sybase or ASK, to ensure dedicated, full-time help. In creating a smaller departmental system, on the other hand, users might be able to get away with buying a contained, turnkey application from a local reseller.

VAR partners

Sybase and The ASK Group's Ingres Products Division recently outlined plans to add at least 200 VARs, integrators and independent software vendors to their partner lists during the next year. Sybase, for example, recently announced an agreement with SHL Systemhouse Ltd. under which SHL will resell Sybase SQL Server databases and related products.

Channel sales are growing faster than direct sales right now, in part because customers are looking for customized consulting help as they plow into unfamiliar client/server territory, according to Bill Shattuck, an analyst at Montgomery Securities in San Francisco.

Although Sybase and others are smart to strengthen indirect strategies, the moves "aren't crucial" in the near term, Shattuck said.

Sybase and Ingres want to expand both the high-end systems integrator side of the indirect market and the low-end independent software vendor arena (see chart page 58).

Plus, the firms plan to partition off a section of staff to deal only with partners. Ingres plans to add about 30 peo-

Help sources, *page 58*

Xerox unit brings mainframe publishing tool to PCs

By Michael Vizard
SAN DIEGO

Looking to leverage the horsepower available on desktops in order to run a publishing application more economically, Document Sciences Corp., a unit of Xerox Corp., has ported its mainframe-based publishing software to PCs running Microsoft Corp. Windows.

The migration of the high-end CompuSet publishing package, which is aimed at high-volume applications that normally would have required typesetters, is driven by the desire to offload as many applications as possible from expensive mainframes.

Document Sciences President Tony Domit said he expects most of his current customers to deploy PCs essentially as coprocessors that will be used to create documents. The documents will then be transferred to mainframe systems that have more sophisticated print-spooling software to drive high-volume printers.

To create these documents on PCs, Document Sciences has provided the CompuSeries, a set of design tools that work under Windows. These tools include CompuBuild, which enables users to view documents before they are printed; CompuSpec, which is a style generation tool; and CompuMerge, which sets rules by which elements of a document can be merged with other types of information.

Finding new customers

However, while Document Sciences is predominantly targeting its existing base of 600 sites for the PC version of the product, the company is making some headway with customers who did not have CompuSet running on a mainframe before they adopted the PC package.

Chain Store Guide, a unit of Lebhar-Friedman in Tampa, Fla., that publishes directories of retail stores, recently adopted CompuSet on a 66-MHz 80486 from Dell Computer Corp. to speed the process by which it publishes 20 1,000-page directories each year.

> The move is driven by the desire to offload as many applications as possible from expensive mainframes.

"With CompuSet, we can print a 1,000-page directory in 12 minutes and index it in another 15 to 20 minutes," remarked Mary Barnich, manager of new technology.

Barnich said the adoption of CompuSet means Chain Store Guide can now move toward a publishing on-demand business model that will allow it to create segments of its directories for specific markets. Following that effort, Barnich said Chain Store Guide will begin looking at distributing those directories on CD-ROM drives.

"Essentially, we're moving toward perpetual updating. CompuSet was the fastest and easiest to learn of the packages we looked at. With other packages, the learning curve was too high, or we would have had to pay someone to come in and build one for us," Barnich said.

Specifically, Barnich said, CompuSet was easy to learn because its typesetting commands are based on derivatives of standard publishing commands.

"It also gives us tools to view the documents in a Windows environment," she added.

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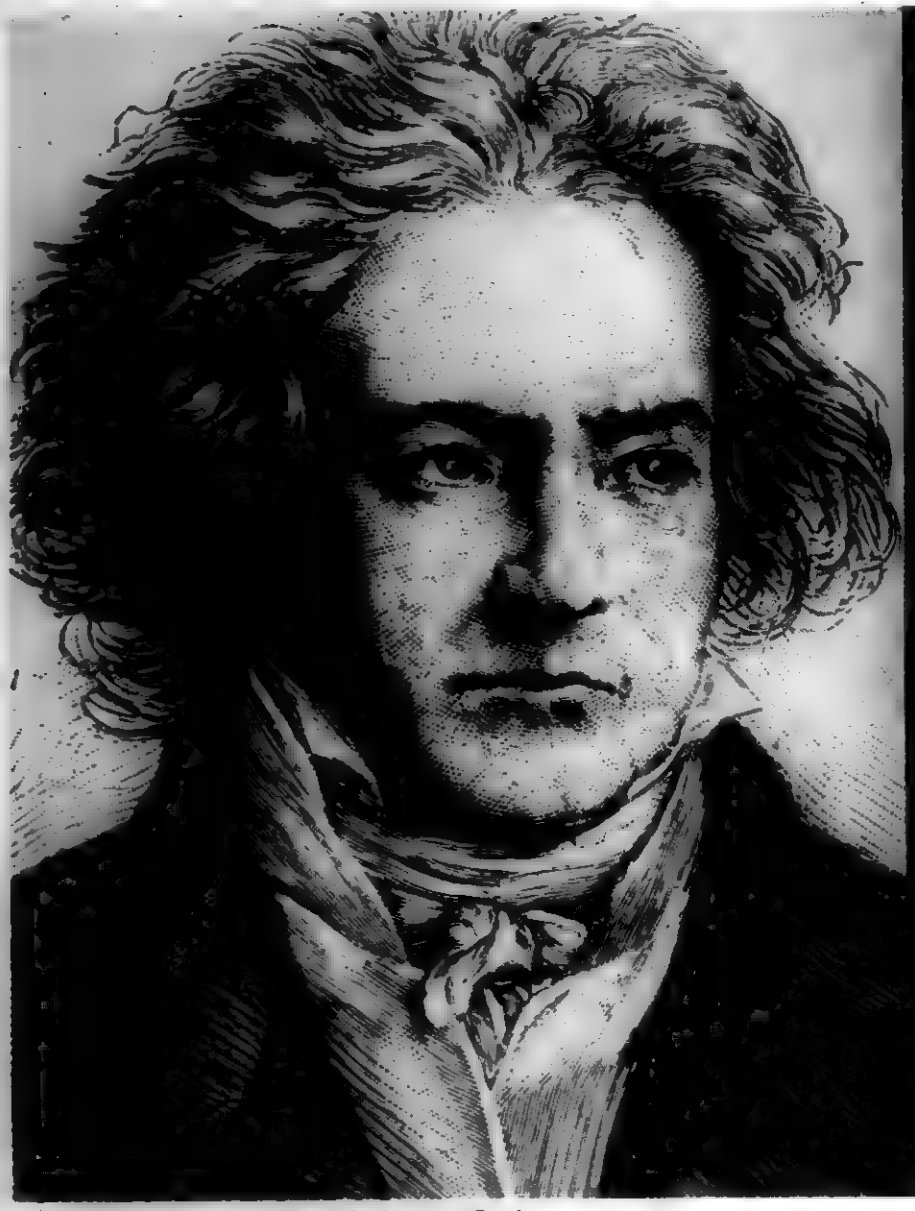

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Beethoven /THE BETTMANN ARCHIVE. Buddy Holly courtesy of Curtis Management.

Help sources

CONTINUED FROM PAGE 53

ple this summer dedicated to working with outside partners, bringing the total to 41, said John Humphreys, channels marketing manager.

Likewise, Sybase has built special product training and technical support programs dedicated to third-party partners, said Carole Louie, Sybase's channels development group manager.

Extending force

Both Ingres and Sybase hope to expand their sales by increasing the number of channel partners this year

	Sales (most recent fiscal year)	Percent of sales from indirect channels	Number of channel partners	Number of partners expected to be added this year
Ingres	$261M	15% (future projections not available)	300	200
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Commission revamp

Both companies said they are revamping the commission structure of their respective sales forces to encourage cooperation with outsiders. For example, one part of Ingres' Management By Objective plan calls for paying sales representatives as the VARs they work with reach specific milestones in end-user sales, Humphreys said.

Overall, as the newly expanded indirect strategies take hold, a division is likely to emerge between the kinds of customers who buy from resellers and those who go through database vendors directly, Shattuck said.

Corporate information systems groups equipping their firms for large-scale enterprise-size projects prefer to work directly with software and hardware companies. Departmental-level project managers historically do more business with VARs and independent software vendors selling turnkey systems, he explained.

Given that phenomenon, database makers are smart not to rely too heavily on one avenue or the other in the market share race.

Informix Software, Inc., which has traditionally depended on resellers to move its products, has made a concerted effort during the past two years or so to beef up direct sales.

Chief Executive Officer Phil White told attendees at the company's annual user conference last month that direct sales surpassed indirect for the first time this year as a percent of total revenue.

Workstations serve host data

CONTINUED FROM PAGE 53

Unix systems are a "rightsizing" alternative to mainframe database systems that cost less to build and to operate, industry competitors said.

"A Unix solution gives you more bang for your buck," said Bill Alton, national sales manager at start-up ALH Group, Inc., an IRI competitor in Manhattan Beach, Calif.

"You put your big database on Unix servers, and you've got horsepower that you could only replicate on a mainframe, and at much higher cost." Meanwhile, end users can access the Unix server's database from their desktop PCs, Alton said.

Mather said the Unix servers are already proving to be cost-effective. It takes fewer people to develop Unix code than mainframe code and less time to complete projects. The Unix QScan project began only last year. "We're growing our business at 20% or more a year, and we're trying to keep our support costs from growing at that same rate."

Offloading

High-powered Unix servers have the potential to offload some of the data processing from IRI's five IBM-compatible mainframes.

"We believe the mainframe has a well-defined place in our architecture and will for the foreseeable future," said Ned Heinbach, president of IRI's Data Systems Division. "But we're attempting to stem [its] rate of growth because it's three to four times more expensive."

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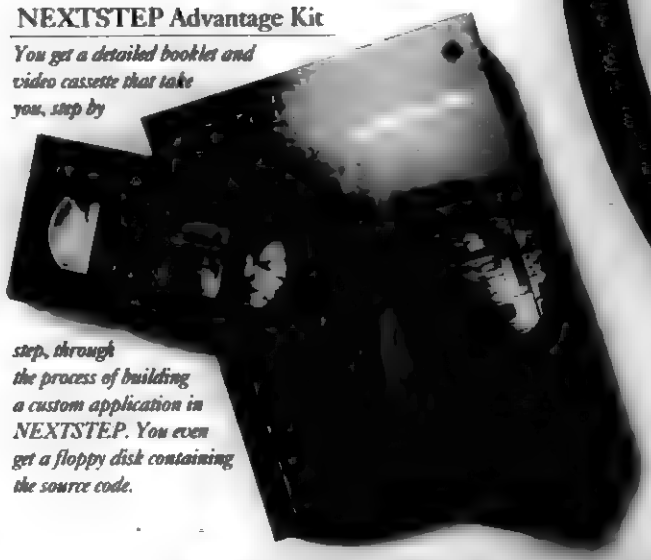

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[redacted]

Hardware

Winchester Systems has announced FlashServer, a family of controllers, disk subsystems and file servers.

According to the company, the family targets Novell, Inc. NetWare and Unix networks with growing user populations and client/server applications that demand data reliability and high-performance servers.

FlashServer achieves 6,000 I/O operations per second by combining redundant arrays of inexpensive disks reliability and multichannel, multiprocessor I/O performance, the company said.

Prices start at $6,075.

▶ *Winchester Systems*
400 West Cummings Park
Woburn, Mass. 01801
(617) 933-8500

Alphatronix, Inc. has announced the availability of its Inspire III family of optical libraries.

According to the company, Inspire III is based on the 1.3G-byte double-density disk format; it offers 20G to 100G bytes of storage. The product uses a native storage device driver that was designed for trouble-free operating system upgrades. The driver also provides application software compatibility.

Inspire III library systems are available for IBM RISC System/6000, Digital Equipment Corp., Sun Microsystems, Inc., Scitex Corp. and Macintosh platforms.

Prices start at $14,900.

▶ *Alphatronix*
Suite 315
4022 Stirrup Creek Drive
Durham, N.C. 27713
(919) 544-0001

Interphase Corp. has introduced the Performance Networking Power Kits, Fiber Distributed Data Interface (FDDI) packages targeted at Hewlett-Packard Co. and Sun Microsystems, Inc. workstation users.

Four FDDI adapters, software drivers and the company's workgroup M800 FDDI Concentrator are included in each kit. Prices range from $10,175 to $26,955.

▶ *Interphase*
13800 Senlac
Dallas, Texas 75234
(214) 919-9000

Software

Unidata, Inc. has started shipping Release 3.1 of the UniData relational database management system and application development environment.

Full standards-based integration with third-party PC client-side interactive tools is provided, according to Unidata. On the server side, UniData Release 3.1 was designed to offer full access to Ingres Corp., Informix Corp., Oracle Corp. and other databases, the company said.

Prices range from $315 to $610 per user.

▶ *Unidata*
Suite 3050
999 18th St.
Denver, Colo. 80202
(303) 294-0800

Network Imaging Corp. has announced its Hierarchical Storage Manager client/server software.

According to the company, the software automatically migrates the oldest inactive files on a PC hard disk to file libraries stored on tape or optical-disc storage systems attached to either Novell, Inc. networks or Unix.

A file can be accessed and retrieved once it has migrated to the file library and transported back to a magnetic hard disk, providing users with instant access to information.

The software is capable of reducing on-line data storage costs by 75%, the company said.

Prices range from $15,000 to $60,000.

▶ *Network Imaging*
500 Huntmar Park Drive
Herndon, Va. 22070
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Product shorts

General Automation, Inc. has released the A500 and the A500XL computers, two additions to its Advantage Series family. The products are offered in compact tower enclosures and include the R91 Enhanced Pick Application Environment, its advanced implementation of Pick Systems' Pick relational database system. Cost: The A500 is $68,000; the A500XL is $109,000. General Automation, Tarzana, Calif., (818) 757-0070.... **Siren Software Corp.** has introduced Siren Editor, a Motif-based text editor that runs on several Unix platforms. It has a shell facility, multifile windows management, a column-mode editing capability and auto-save, auto-backup and auto-recovery facilities. Cost: $249. A five-user license is $695, and a 10-user license is $1,795. Siren Software, Menlo Park, Calif., (415) 322-0600.... **Blueridge Technologies, Inc.** has announced Optix PC View, Windows client software for the Optix Network multiuser electronic document management system. According to the firm, the product enables IBM-compatible workstations running Windows to access the Optix Network Unix/SQL-based document imaging and text server. Cost: Starts at $75,000. Blueridge Technologies, Flint Hill, Va., (703) 675-3015.

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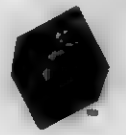

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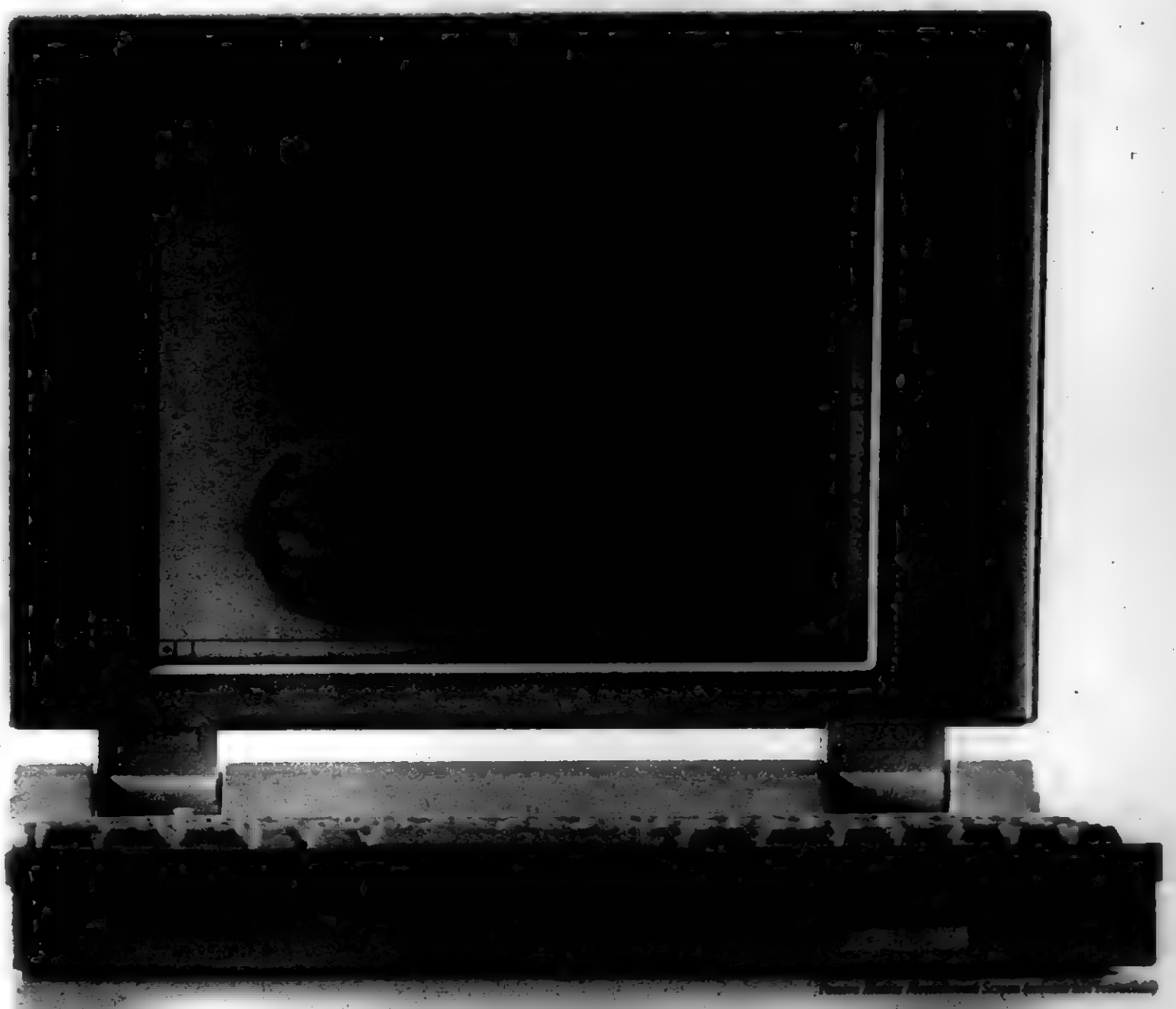

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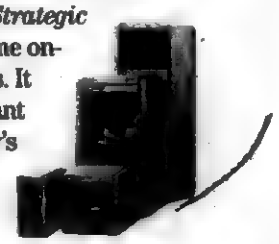

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Wireless starts to rival fiber speeds

By Joanie M. Wexler
NEW YORK

Users worried about traditional low-speed wireless technology's ability to handle tomorrow's bandwidth-guzzling applications may find solace in the promise of emerging wireless techniques reputed to rival fiber-optic capacity.

CellularVision of New York, Inc., for one, plans to soon roll out its 1G bit/sec. wireless network, also called CellularVision, in the New York area. Regional Bell operating company Bell Atlantic Corp. will operate the network, the firms announced earlier this month.

CellularVision affords high enough speeds for interactive cable television and other multimedia applications, according to the vendor. The company's ability to deliver the technology is the result of its success in fanagling large amounts of bandwidth in the 28-GHz frequency range from the Federal Communications Commission last December [CW, Dec. 21, 1992].

The spectrum had been reserved for point-to-point communications but was largely sitting idle, said Bernie Bossard, company co-founder and inventor of the CellularVision technology.

CellularVision already provides wireless cable TV services to 200 customers through a test in Brooklyn's Brighton Beach for $29.95 per subscriber. It plans within two years to cover 75% to 80% of the New York territory for which it has a license, said Shant Hovanian, CellularVision president, who added that the company hopes to begin commercially marketing services next year. The area includes the five boroughs of New York and a few surrounding counties.

"This is an electronic superhighway alternative for New York customers who have not been supported up to now," Hovanian said.

Business issues

However, for business, it might be "difficult to operate on a consistent basis," said Jeff Marshall, senior managing director of communications technology at Bear, Stearns & Co., a New York brokerage firm.

This is because there are security issues surrounding the integrity of the bandwidth, Marshall said. "We need some guaranteed delivery mechanism" regardless of whether lightning or other havoc-wreaking weather conditions strike, he explained.

Marshall did say, however, that high-speed wireless "might make a good alternate route" for backing up cabled networks and should serve the last leg of residential cable routes "where fiber leaves off at the curbside and wireless goes into the home."

Meanwhile, Zenith Electronics Corp. in Glenview, Ill., demonstrated its Z-View protocol, formerly used for real-time interactive services running on cabled networks, over the airwaves at the Wireless Cable Convention in Orlando, Fla. The firm demonstrated a two-way video-on-demand ordering application that traveled 16 miles each way in about five seconds.

Zenith expects to have its 45K bit/sec. technology deployed internationally in production networks within six months, said Barry Hardek, product manager for Zenith's Cable Products Division.

Hardek said the main reason for using wireless as a cable alternative is its dramatic cost savings. He estimated a new cabling system would cost about $1,200 per subscriber to build, while a wireless version would run about $500 — savings that would presumably be passed on to subscribers.

Zenith also demonstrated a prototype of a modem attached to a home computer for wirelessly accessing Prodigy Services Co. bulletin board services.

Diagnostic agents to tie to central console

By Elisabeth Horwitt

Harried network administrators may find relief in a trend toward the linking of increasingly intelligent local-area network diagnostic agents to domain and enterprise network management systems.

The ideal, which is not quite reality for most products, is for such agents to act as local monitoring and diagnostic systems for one or more segments, gathering valuable data about the status of LAN traffic, error levels and devices and returning it to a network administrator's console.

ProTools, Inc. recently announced that its Network Control Series LAN diagnostic tools will be able to provide high-level LAN diagnostic information to IBM's NetView/6000 and LAN NetView, Hewlett-Packard Co.'s OpenView, AT&T/NCR Corp.'s StarSentry and Ungermann-Bass, Inc.'s Windows- and Unix-based NetDirector.

The Beaverton, Ore., vendor's Cornerstone Agent uses the Remote Network Monitoring (RMON) protocol to monitor LAN segments. A diagnostic engine can act as a standalone management system, analyzing the information collected and sending key alerts up to a central enterprise management system such as OpenView, according to ProTools President and Chief Executive Officer Ed Snyder. The engine/agent can also send diagnostic data to ProTools' own domain network manager, Foundation Manager.

Getting smarter

ProTools is also working to add intelligence to its Network Analysis Engine, which sits on its Foundation Agent and does local processing of LAN data, Snyder said. The engine will be able to interpret incoming diagnostic information about all seven layers of the protocol stack with increasing intelligence: For example, it will determine that an error at the user layer means a printer just went down, Snyder said.

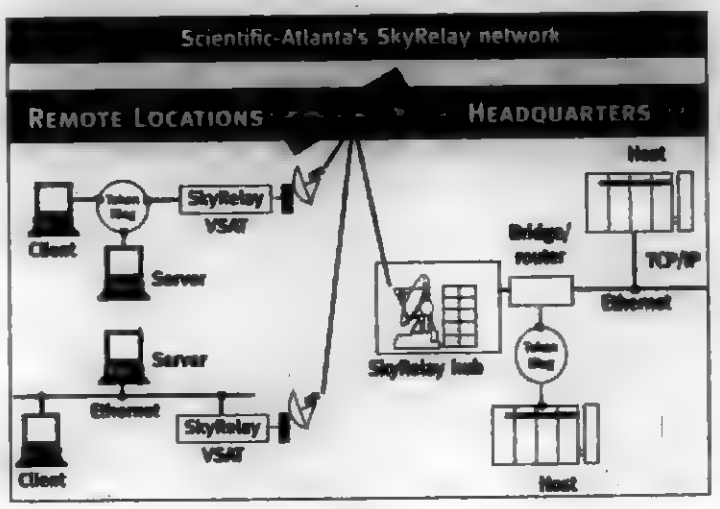
Diagnostic agents, *page 65*

VSAT system offers bridging, routing

By Gary H. Anthes
ATLANTA

Scientific-Atlanta, Inc. announced a VSAT satellite system geared for wide-area internetworking among heterogeneous local-area networks.

The company said its very small-aperture terminal (VSAT) system, called SkyRelay, was designed especially for companies with distributed computing at 100 or more sites, including firms in the retail, automotive, distribution, financial and travel services industries.



SkyRelay will support mission-critical applications requiring remote file access, file manipulation and large file downloads, Scientific-Atlanta said. Companies buying it are also likely planning to add broadcast video and audio communications to their data networks, according to the firm.

The satellite-based system supports Ethernet and Token Ring LANs and is the first VSAT product to provide both bridging and routing capabilities. The SkyRelay bridge/router supports a number of internetworking approaches such as source routing, transparent bridging and Internet Protocol routing.

SkyRelay uses a frame-relay backbone protocol that the company said is more efficient than the X.25 protocol used in an earlier VSAT product. It is ideally suited for the "bursty" traffic typically seen in LAN interconnections.

The product includes network management software for automated command and control, performance monitoring, traffic analysis and trouble ticketing, all consolidated on a single Unix workstation.

SkyRelay systems can be configured to provide up to 256K bit/sec. bandwidth outbound from headquarters and up to 128K bit/sec. for inbound traffic. In addition, optimization features allow for "bandwidth-on-demand" to economically budget for peak transmission needs, said John Russell, marketing manager.

Russell said Scientific-Atlanta will sell SkyRelay as a turnkey wide-area network. He said a company with 500 locations would spend $300 to $400 per month per location for SkyRelay, assuming a five-year amortization of hardware and software and a normal allowance for recurring costs such as operations and maintenance.

That cost estimate assumes a representative mix of communications, including interactive traffic, client/server applications running over the network, file transfers and downloads and messaging.

SkyRelay will be available by year's end. There is one beta-test user, a retail chain with 200 to 250 outlets, but Russell declined to name the company.

Stratus' Unix systems to act as SNA hosts

By Craig Stedman
MARLBORO, MASS.

Stratus Computer, Inc. plans in the first half of 1994 to add capabilities to its Unix-based fault-tolerant computers enabling them to act as full hosts in IBM Systems Network Architecture (SNA) environments, where Stratus machines are now used mainly as front ends to mainframes.

Stratus hopes the Primary SNA support will position its high-end XA/R Unix systems as downsizing platforms for offloading mission-critical mainframe applications. That would complement a new low-end client/server strategy that the company embarked on this month.

Full SNA support has been built into Stratus' proprietary VOS operating system for several years, but that is not attracting much downsizing business, acknowledged Christine Carlson, Stratus' SNA product manager. "It didn't necessarily make as much sense to move from one proprietary system to another" as it does to go to Unix, she said.

Full speed ahead

Stratus' FTX Unix derivative is expected to account for 20% to 25% of sales this year and become a larger seller than the proprietary VOS operating system in 1995, said Barbara Babcock, vice president of corporate marketing. FTX should become "very comparable" in functionality to VOS within six to nine months, she added.

With lower-cost conventional systems becoming more reliable, Stratus is facing tougher competition at the front-end level, noted Richard Schreiber, president of ATB Associates, Inc., a Wellesley, Mass., consultancy. "They're trying to carve out a new niche for themselves" with the host strategy, he said.

Target VOS

Schreiber and other analysts were uncertain how much downsizing business Stratus will attract. Peter Kastner, an analyst at Aberdeen Group in Boston, said he expects the main target market for the Unix SNA products through 1994 to be Stratus' own VOS installed base.

However, he added that VOS customers still appear to be concerned about the reliability of Stratus' FTX Unix derivative, despite the company's rewriting of the Unix kernel to make it more robust. "The answer we hear is 'Show me,'" Kastner said.

"Whether justified or not, FTX is regarded as less reliable," agreed Omri Serlin, publisher of the "FT Systems" newsletter in Los Altos, Calif. "And if FTX is not perceived as rock-solid, that kind of blows away the whole marketing rationale" for using it as an SNA host.

A VOS user at a major U.S. bank, who asked not to be identified, said he has no plans to switch to FTX, partly because of the reliability issue. The bank is not having problems with the VOS version of SNA but still views the Stratus machines as best-suited for front-end uses, he added.

Stratus officials said they hope to make FTX as reliable as VOS in the next release. Initial SNA capabilities were introduced this month for FTX such as FTX Secondary SNA, which allows Stratus systems to act as a remote 3270 cluster controller, and FTX APPC, which supports IBM's Advanced Program-to-Program Communication (APPC) protocol.

Both products and the FTX Primary SNA software due out next year are based on SNA code licensed from IBM. Carlson said Stratus is developing its own network routing software for controlling terminals and printers attached to mainframes from an FTX-based system. That software is also due out in the first half of 1994, she said.

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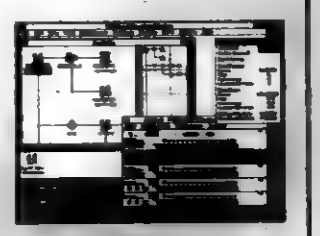

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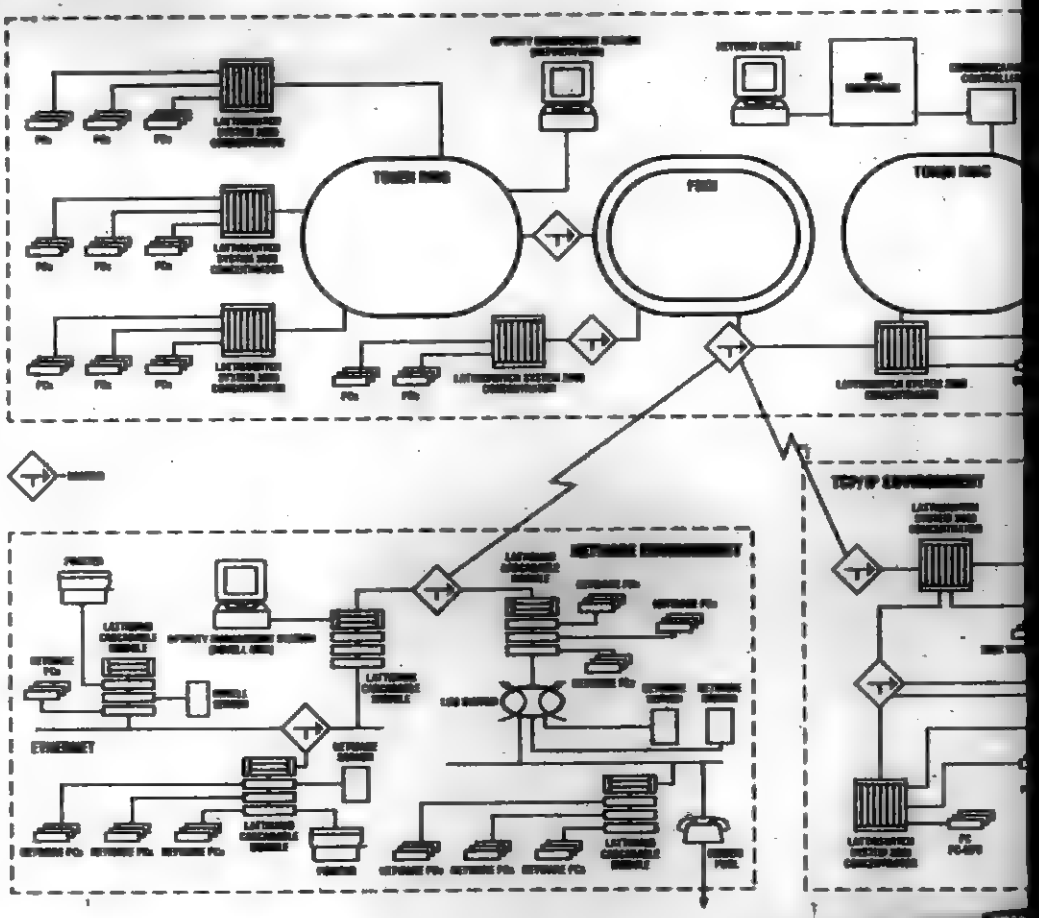

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Diagnostic agents tie to central console

CONTINUED FROM PAGE 63

This high-level interpretation can be of use to companies that cannot afford to put a network expert at each LAN segment. It also can save bandwidth by sending the results of diagnoses, rather than raw diagnostic data, Snyder said. The data can be sent directly to the databases of the enterprise network management system or can be displayed on its console.

Rochester Gas & Electric Corp. currently uses two Foundation Managers and 12 Agents. The distributed diagnostic system was a welcome change from ProTools' early portable diagnostic tools, according to Al Oliver, lead analyst for the Rochester, N.Y., utility. "The interface is easy to use and even when you have an intelligent person to do the analysis, [the old product required that person] to throw it over his shoulder and wander hither and yon" to fix problems on distributed LAN segments.

With the Foundation Manager and Agents, Oliver said, "I can sit at my desk and perform analysis on an operation 45 miles away." Also, the Agents generate alarms in real time and use history logs to capture snapshots of Ethernet and Token Ring events according to preset parameters, so Oliver can do trending, he said.

The utility is currently evaluating which enterprise network manager to implement, with IBM's LAN NetView, an OS/2 LAN management system, a strong contender, Oliver said. He is currently using the OS/2 version of the ProTools product, which he said is easy to maintain using IBM's Configuration, Distribution and Installation product.

Still to solve, however, is the problem of updating and maintaining the distributed machines that run the diagnostics, Oliver said. ProTools promised to provide the ability to upgrade agents remotely with the upcoming Version 1.4, he added.

Does Windows and OS/2

The company also announced recently that Foundation Manager and Agents will support, besides the current Unix version, OS/2 and Windows 3.1 versions. This addresses those users who are accustomed to OS/2 or Windows and resist dealing with a Sun Microsystems, Inc. SPARCstation running Unix just to have local network management, Snyder said.

HP, Sun and Novell, Inc. are all working on similar systems of their own. HP's LANprobe, an RMON-based diagnostic tool, can feed information to OpenView. Over the longer term, a more intelligent LAN diagnostic tool from HP acquisition Metrix, Inc. will feed data into OpenView, an HP spokesman said.

Novell's answer to users' distributed LAN diagnostic needs will be based on a long-promised RMON version of its LANalyzer product, which will feed into Novell's NetWare Management System (NMS), a Novell spokesman said.

Originally expected at Interop '93 Fall in San Francisco later this month, the product, which is said to be integrated with the upcoming NMS Version 2.0, is now likely to appear at the NetWorld show in Dallas in October, a Novell spokesman said.

Meanwhile, Network General Corp. last week announced Notebook Sniffer Analyzer, a notebook version of an expert system-based LAN diagnostic tool. The product enables LAN administrators to carry their LAN diagnostic tools in a much lighter-weight box that can also perform regular Windows and DOS applications, a spokesman said. It is due out next month, priced at $9,995.

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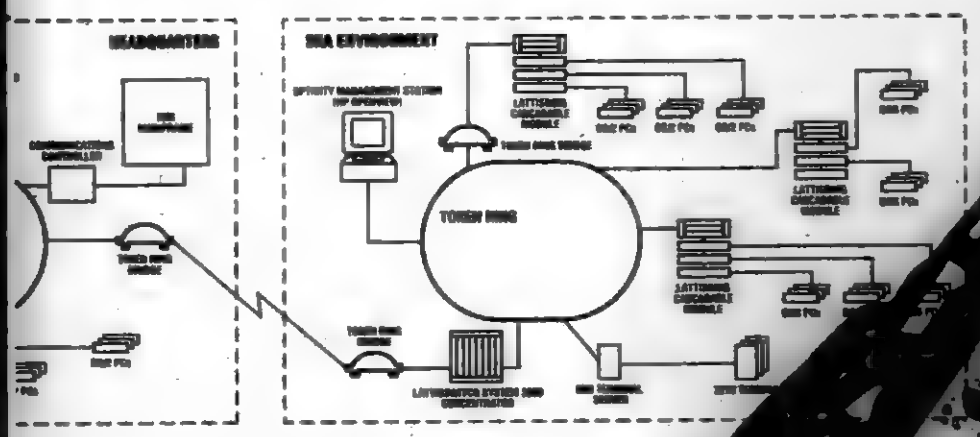

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Fibermux Corp. has announced five Token Ring I/O modules that increase user connectivity and the fault tolerance of networks built using Crossbow multi local-area network hubs.

According to the company, the modules consist of two 12-port, unshielded and shielded twisted-pair cable modules, an all-fiber module and two mixed-media modules that have 10 ports for user connectivity with fiber-optic ports for backbone connections.

The modules are said to increase network availability and feature state-of-the-art retiming circuitry.

Prices for the modules range from $1,395 to $1,895.

▶ *Fibermux*
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Dayna Communications, Inc. has announced TokenPrint and TokenPrint Plus, LocalTalk-to-Token Ring bridges designed to connect LocalTalk printers and other devices directly to Token Ring networks.

Up to two LocalTalk devices can be connected to a Token Ring with TokenPrint, and TokenPrint Plus will connect up to four LocalTalk devices.

Both TokenPrint and TokenPrint Plus have one DB-9 port for Type 1 Token Ring, one RJ-45 port for Type 3 Token Ring and one mini-din 8 LocalTalk port.

All types of LocalTalk devices are supported, with the exception of routers, the company said.

TokenPrint and TokenPrint Plus cost $699 and $899, respectively.

▶ *Dayna Communications*
Sorenson Research Park
849 West Levoy Drive
Salt Lake City, Utah 84123
(801) 269-7394

Farallon Computing, Inc. has introduced InterRoute/5 and StarRouter, new versions of the company's high-performance LocalTalk-to-Ethernet hardware router/gateway products.

According to the company, InterRoute/5 and StarRouter now support Apple Computer, Inc.'s AppleTalk Update-based Routing Protocol and Simple Network Management Protocol over AppleTalk, providing users with products that ease network management and enhance integration in larger networks.

Other new features include flexible seeding options. InterRoute/5 connects as many as four LocalTalk networks to each other and to a backbone or Ethernet network. The StarRouter can connect 12 LocalTalk users to an Ethernet local-area network.

InterRoute/5 costs $3,499, and StarRouter costs $3,290.

▶ *Farallon Computing*
2470 Mariner Square Loop
Alameda, Calif. 94501
(510) 814-5100

Product shorts

OpenConnect Systems, Inc. has introduced the OC/FTP Client and the OC/FTP Server, two turnkey solutions designed for small installations interoperating IBM Application System/400s with other systems on the Transmission Control Protocol/Internet Protocol enterprise network. Cost: Support for 16 or 32 logical units is provided by the two packages for $5,000 and $6,500, respectively. OpenConnect Systems, Dallas, Texas, (214) 484-5200.... **CIS** has introduced RoboMon Version 5.1, a product designed for Digital Equipment Corp.'s OpenVMS Automated Operations and Performance Advising & Tuning. According to the company, RoboMon 5.1 provides sites with the ability to automate the detection and correction of systemwide and application-specific operational problems. Cost: Prices range from $825 to $20,000. CIS, Newton, Mass., (617) 527-1550.

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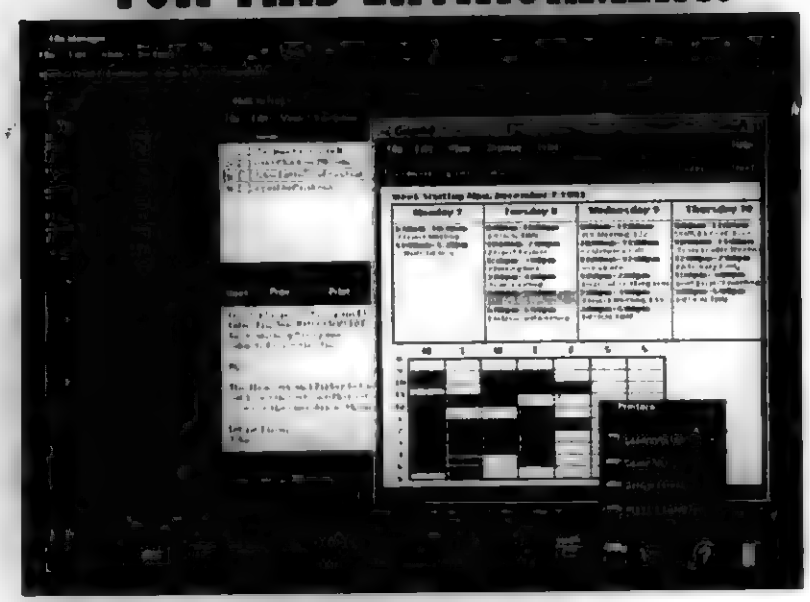

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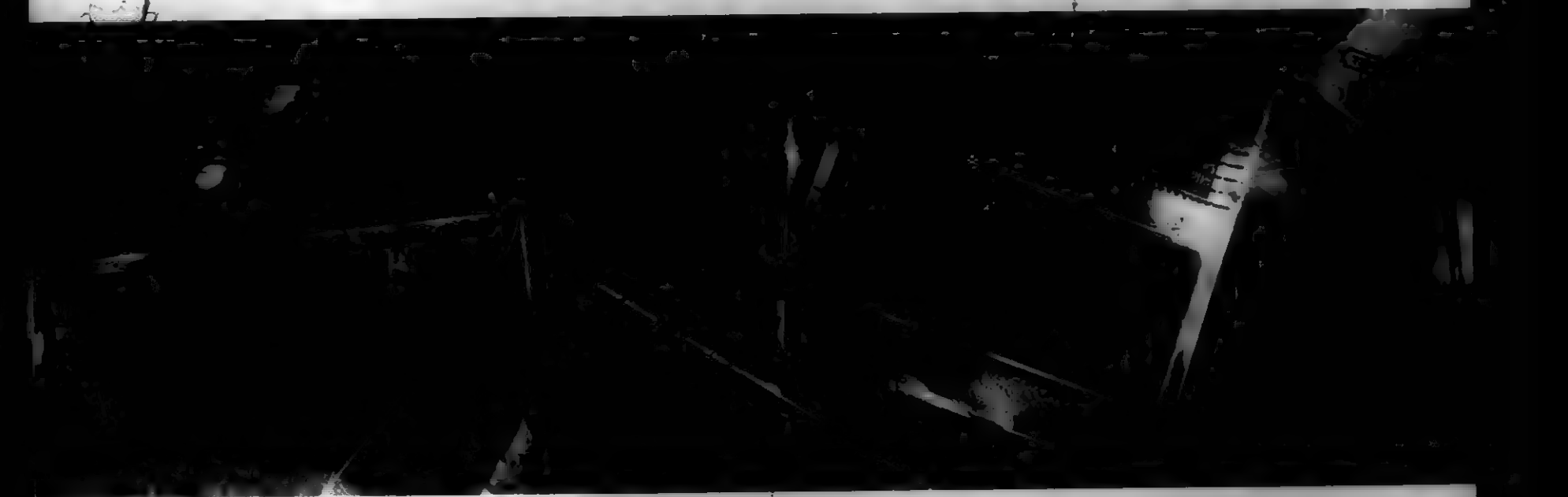

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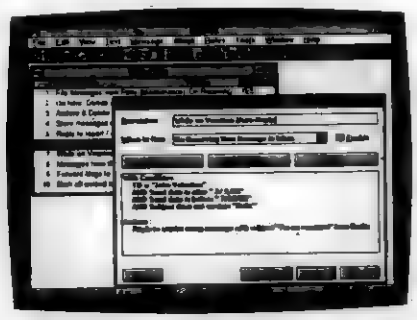

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IBM Business Partner

IBM software helps mainframes back up non-IBM workstations

By Johanna Ambrosio

■ IBM has introduced a second software package that allows customers to use their mainframe to back up PCs and networks, even those not from IBM.

But there are some differences in the products, namely the platforms they run on and support, and their functionality. The newer of the two, called the Adstar Distributed Storage Manager (ADSM), comes out of IBM's Adstar storage unit. It runs on a range of nonmainframe platforms and allows customers to treat the backup data as they would any mainframe-generated data. In other words, the backup data can be stored on mainframe-attached disk drives for a predetermined time and then moved to tape.

New feature

Customers can also preset backup times, so end users only need to leave their PCs turned on.

The older product, Workstation LAN File Services (WLFS), does not allow for such sophisticated data setup. Introduced by the Enterprise Systems Division that makes mainframes, WLFS provides basic backup in addition to other functions. These include centralized security for the attached workstations and allowing the attached local-area networks to share information by passing it through the mainframe.

Other differences include the platforms the packages run on and support. The older software, WLFS, runs under the IBM VM and MVS systems and supports DOS, OS/2, IBM AIX, Macintosh and Sun Microsystems, Inc.'s SunOS as clients.

The newer package, ADSM, runs under — or will by year's end — MVS, VM, AIX and OS/2 as servers. Clients supported include Novell, Inc. NetWare, AIX, SunOS and Solaris, Windows, OS/2, the Macintosh, DOS and Hewlett-Packard Co.'s HP/UX. The Santa Cruz Operation's SCO version of Unix will be added to the client roster in 1994.

Database support includes Oracle Corp.'s Oracle; Sybase, Inc.'s Sybase; Borland International, Inc.'s Paradox and dBase; and The ASK Group, Inc.'s Ingres, in addition to IBM's own DB2/2 and DB2/6000 systems.

Pricing is also different. WLFS is priced at $250 per attached server per month, whereas ADSM is priced at $420 per month for the server and $5 per month for each attached client.

The data services manager at a large insurance company, who requested anonymity, started using ADSM in May. Eventually, he expects to back up 2,000 OS/2 workstations with the mainframe; he now backs up 24. While things are going well with the product, he said, this process does raise some issues. Among them are performance and the need for additional disk capacity attached to the mainframe to handle the increased volume.

"What happens to the network when we're backing up 2,000 workstations?" he asked. "Especially if we do this during the day, in background mode on the PCs, how will that impact the interactive applications?" He added that one answer to that may be to do backups at night.

Betz Entec takes client/server plunge

By Mark Halper
HORSHAM, PA.

In five attempts to jump the 20-foot waterfall near the end of West Virginia's raging Big Sandy River, Betz Entec, Inc. information systems chief Anthony Martin has been tossed from his raft four times.

He said he hopes his success rate is a little higher as he leads his water-treatment chemicals company on a client/server plunge, an adventure he considers riskier than any of his white water undertakings.

"If I miss in the waterfall, I can get physically hurt, but I can't hurt my career," Martin mused in a recent interview at the company's headquarters here.

Martin's ideal rafting technique is not unlike his approach to the client/server implementation: Just as he likes to hit the waterfall with a rush to ensure an intact landing, he is picking up the pace on his efforts to rely less on Betz Entec's central Hewlett-Packard Co. HP 3000 and to push more of the processing on to some 100 Novell, Inc. NetWare connected PCs in Horsham.

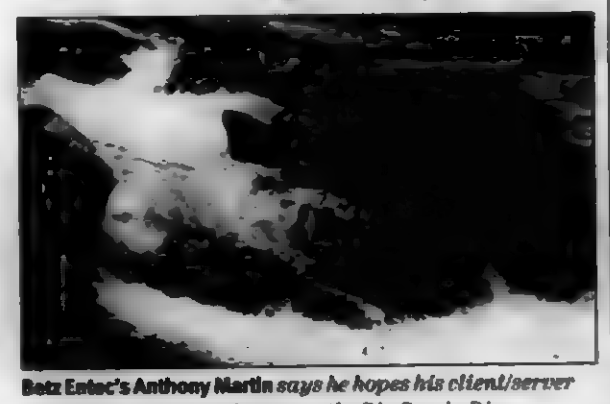
While many of the PCs already run the Windows operating environment, about 90% do not yet have Windows applications and are still running mostly under HP 3000 terminal emulation.

Picking up the pace

But an outbreak of populist demand for Windows applications has quickened a three- to five-year conversion schedule into a one- to three-year plan. User hubbub spread after Betz parent Betz Laboratories, Inc. required all human resources users to tie into a Windows-based PeopleSoft, Inc. human resources application. People in other departments wondered why they, too, could not run programs that would cut down on the time they spent communicating with the HP 3000.

"They're tired of having to know seven different ways of accessing information," Martin said. By moving out of terminal emulation and into Windows, they can standardize on the Windows interface, he noted.

To facilitate the switch to client/server operations, Betz



Betz Entec's Anthony Martin *says he hopes his client/server conversion is not as choppy as the Big Sandy River*

Entec is replacing rudimentary terminal emulation software with a combination of Walker Richer & Quinn, Inc. software for emulation and Omnidesk, Inc.'s Omnidex software, which permits multiple access paths to the HP 3000's HP Image SQL database.

Besides heeding the call of the computing masses, Betz Entec has plenty of other reasons to convert to a distributed computing scheme.

As Martin noted, it is much cheaper to develop client/server programs using Microsoft Corp.'s Access database management system than by using expensive fourth-generation language (4GL) tools in an HP 3000 environment.

Martin said this became clear earlier this year when Betz Entec upgraded from an HP 3000 935 to a 957. With that change, 4GL supplier Speedware, Inc. charged an $18,000 upgrade fee and $5,000 extra for maintenance on the more powerful platform. In comparison, Microsoft charged $400 per copy for Access, and Betz Entec needed only six copies.

Betz Entec will also save on hardware upgrade costs, Martin said, because it will have to beef up its HP 3000 less often — every seven or eight years instead of every three or four. Martin has two developers working full-time with Access on PCs, which has lightened the load on the HP 3000.

Still, old habits die hard. While Martin is easing the processing load on the HP 3000, he has no plans to sell it.

IBM shifts service units

By Thomas Hoffman

Earlier this month, IBM quietly transferred its IBM Consulting Group from the company's application solutions unit to IBM North America, the firm's marketing arm. By doing so, Big Blue has effectively brought all three of its services divisions under a single mantle.

The move, according to observers, should eliminate much of the confusion that customers had earlier experienced when dealing with the IBM Consulting Group and Integrated Systems Solutions Corp. (ISSC), IBM's outsourcing unit.

In the past, customers had three avenues into IBM for service: IBM's trading areas, for systems integration; IBM Consulting Group, for management consulting; and ISSC, for outsourcing services. Each of the three divisions regularly submitted bids on the same customer contracts, a process that was often baffling for clients, analysts said.

"It was very confusing for customers," said Julie Schwartz, associate director for professional services at Dataquest Worldwide Services Group in Framingham, Mass.

United front

Schwartz said she believes the new services arrangement will create synergies between the services divisions and will help customers differentiate between the range of services offered by each group. "Now there will be a uniform front to the customer. The idea behind this is that there's more control over setting incentives so the competition [among divisions] doesn't happen," Schwartz said.

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†Survey was independently conducted by Reliability Ratings, Needham MA. The data is quoted from a 40-page report available for purchase through Reliability Ratings (617) 444-5755. Reliability Ratings, the research company, is not affiliated with Dell Computer Corporation and does not endorse its products. *Guarantees available in USA only for registered owners of Dell Performance Series systems purchased after 7/1/92. For a complete copy, please call our TechFax℠ line at 1-800-950-1329 or write Dell USA L.P., 9505 Arboretum Blvd., Austin TX 78759-7299. Attention: Guarantees. **Source: Dataquest, Inc., Nov. 1992. *On-site service provided by BancTec Service Corporation. On-site service may not be available in certain remote areas. The Intel Inside logo is a registered trademark and i486 and Overdrive are trademarks of Intel Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1993 Dell Computer Corporation. All rights reserved.

DEC readies storage array controller

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp.'s recent introduction of a new storage array controller for connecting Small Computer Systems Interface-2 peripheral devices to OpenVMS-based VAX and Alpha AXP clusters drew mostly favorable notices from users for bringing DEC more up to date in the high-end storage market.

The HSJ40 is due to ship in late September along with six new StorageWorks subsystems. While the first version does not match the raw I/O throughput of DEC's earlier HSC controllers, the company said it costs much less, particularly for purchases of 50G bytes or more.

Customers have "perceived us as expensive when they wanted to add a lot of storage," acknowledged Bruce Baird, StorageWorks product marketing manager. But the cost of a 76G-byte setup is $2.08 per gigabyte with the HSJ40, down from $4.73 per gigabyte using an HSC unit, he said.

Attention-grabber

The promised price break caught the eye of George Reid, MIS director at Sanford C. Bernstein & Co. in New York. He considered shifting to solid-state storage for some of his VAX-driven database applications but said the HSJ40 "could allow us to do it in a much more cost-effective manner."

The HSJ40's support for redundant arrays of inexpensive disks (RAID) technology and the modular approach DEC is taking with StorageWorks are appealing, Reid added.

"This is the kind of packaging DEC should have been doing the last 10 years and didn't," he said.

Reid said he expects to buy HSJ40-equipped subsystems late this year. Frank Brake, director of international operations for technology business development at Newport News Shipbuilding and Drydock Co. in Newport News, Va., said he also will likely purchase some over time.

However, PacifiCare Health Systems, Inc. in Cypress, Calif., chose rival MTI's FailSafe RAID subsystem in a recent buy.

At the controls

Features of DEC's new HSJ40 storage array controller for OpenVMS clusters

Capacity
- Handles up to 36 SCSI-2 disk drives via six separate SCSI-2 buses.
- Maximum of 76G bytes, using DEC's 2.1G-byte, 3 1/2-in. drive.

Supports
- VAX and Alpha AXP clusters using DEC'S CI interconnect.

Performance
- 1,100 I/O requests per second (2,200 for dual-redundant configurations).
- 4M byte/sec. bandwidth per controller.

RAID capabilities
- RAID-0 and RAID-1 supported; RAID-3 and RAID-5 planned.

Pricing and availability
- $28,900; late September.

One shortcoming of StorageWorks is its lack of support for non-DEC disk drives, said Matt Holdrege, senior network specialist at PacifiCare.

Baird said DEC's storage business unit plans to add support for third-party drives as part of its long-term StorageWorks strategy. However, he added that he has "not seen a timeline for accomplishing that."

The StorageWorks strategy appears sound, and DEC's pricing is "very competitive," said Dennis Waid, president of Peripheral Research Corp., a market research firm in Santa Barbara, Calif.

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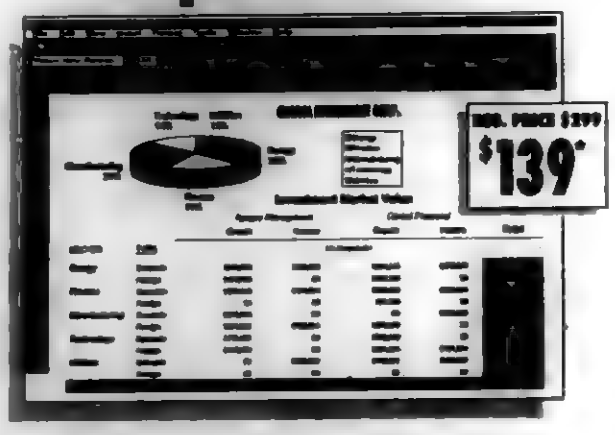

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EMC Harmonix keeps on growin'

By Stephen P. Klett Jr.

Adding fuel to the debate over which storage method provides the best bang for the buck in the Application System/400 market, EMC Corp. in Hopkinton, Mass., recently unveiled new additions to its Harmonix series of direct-access storage device products aimed at bringing AS/400 shops into the mirroring fold.

EMC took the wraps off two new models — the entry-level HX3C and high-availability HX3HA — and expanded the cache capacity of its flagship HX3 product to 256K bytes of write cache and 512M bytes of read cache. The line offers 1.7G to 6.8G bytes of storage capacity, transaction speeds averaging 5msec. to 10 msec. and board-level upgradability. Prices range from $25,000 to $73,000.

The Harmonix line is based on mirroring technology, or redundant arrays of inexpensive disks (RAID)-1.

Reluctance for RAID

While mirroring offers the highest level of data protection, users have been reluctant to commit to it because of its high cost. RAID-5 is being pushed as a happy medium, giving users a similar level of data protection at a lower price, although at a slight performance trade-off.

EMC claims the HX3HA's price point, which ranges from $47,000 to $73,000, positions it to compete directly against RAID-5 products such as IBM's 9337 storage subsystem. And users, including true-Blue shops, appear to be listening.

For example, Chelsea Community Hospital, a longtime all-IBM customer in Chelsea, Mich., is beta testing the HX3HA. While the system has only been installed for a few weeks, the 37-bed rural hospital plans to replace all of its IBM disks with EMC equipment, according to Jim Davis, assistant director of information systems.

While Davis was impressed by the price/performance level of the HX3HA, he said it was EMC's service and support that was the primary differentiator.

"We can't get IBM to respond to us since it's had troubles," Davis said. "All the people we dealt with in the area have been laid off." Davis acknowledged that Chelsea Community Hospital is a small customer site with two AS/400s and roughly 125 PCs and that IBM "is in a state of flux and it's easy for people to drop through the cracks."

EMC offers Harmonix customers a service option called the Remote Maintenance Program, which enables it to monitor the performance and threshold levels of customers' systems from its headquarters. Every HX3 product can be configured with the service at prices starting at $3,000 for up to eight ports.

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intel inside

IBM services

CONTINUED FROM PAGE 71

IBM's services shift, announced internally to employees earlier this month, includes the creation of IBM Business Transformation Services, North America. The new unit represents an expansion of business process re-engineering services that had been offered by the IBM Consulting Group, according to Sam Albert, an independent consultant in Scarsdale, N.Y.

Albert said the re-engineering unit is taking a "mass customization" approach with its customers or "crafting and customizing enterprise solutions for each individual customer," Albert said.

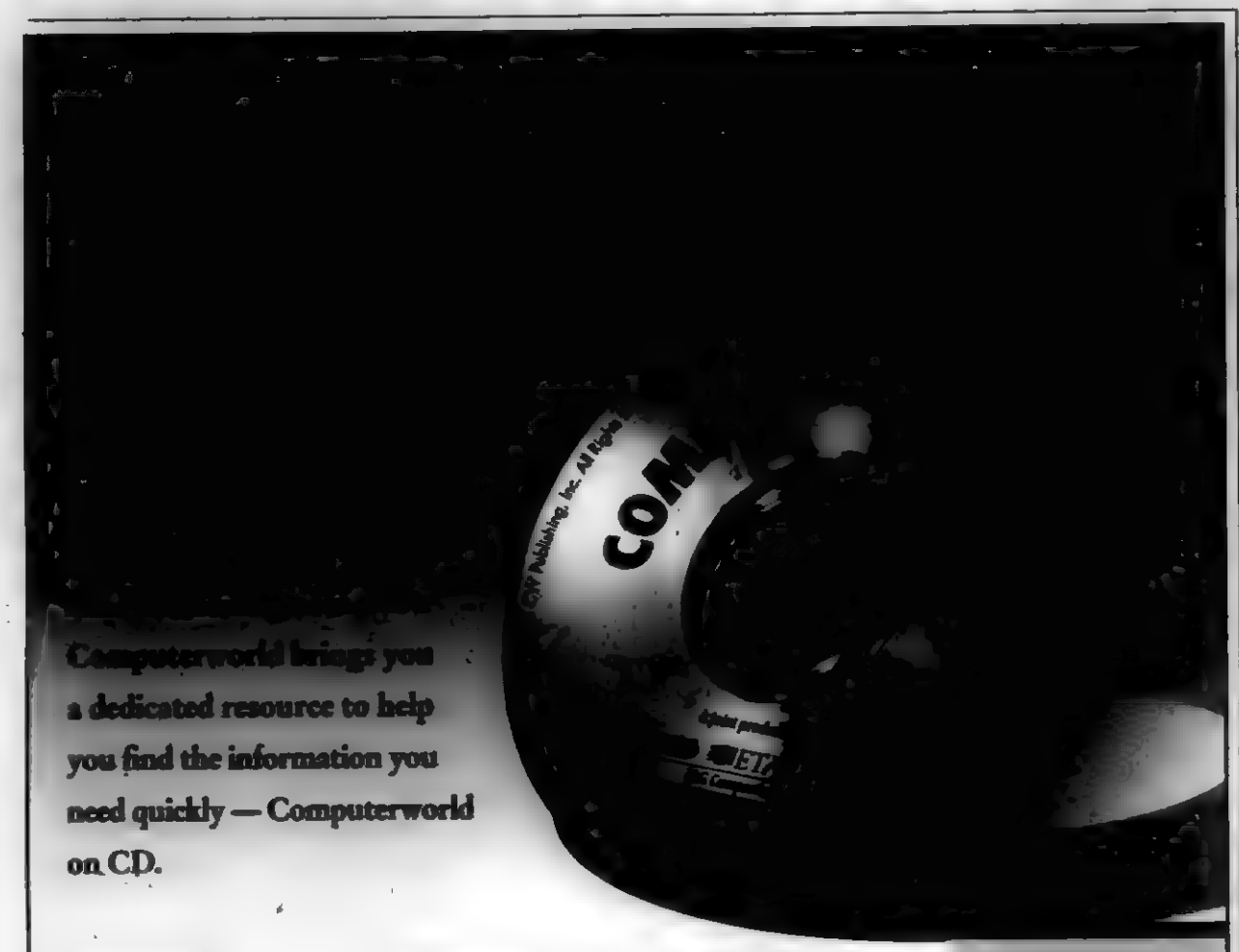
In the market

In addition, the IBM Consulting Group is planning to add banking, health care, insurance and other industry professionals to its ranks to provide customers with additional expertise in their specific markets, Albert said.

A spokesman for IBM would not directly confirm those reports but added, "IBM has been clear in the fact that we intend to expand our expertise in specific industries."

Other markets that the IBM Consulting Group caters to include telecommunications, retail, manufacturing, transportation and utilities. By forging closer ties with IBM's marketing arm, the consulting group should gain further knowledge of its clients' industries, analysts said.

Although the IBM Consulting Group now reports to IBM North America, the reporting structure has not changed for consultants working abroad. Consultants in Europe and Asia will continue to report to their regional units and will send "dotted-line" reports to the IBM Consulting Group in the U.S.



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Briefs

Oracle tops Unix market

Oracle Corp. leads the Unix relational database market with 44% of 1992's $2 billion in worldwide sales, according to market research firm International Data Corp. (IDC) in Framingham, Mass. Informix Software, Inc. was next in line with 18%, followed by Sybase, Inc. with 12% and The ASK Group, Inc.'s Ingres Products Division with 9%, IDC said.

Norwest buys NCR system

Norwest Bank Minnesota, N.A. has purchased NCR Corp. image-based item processing systems for its wholesale lockbox processing operations in Minneapolis. Terms of the agreement were not disclosed.

VMark to port PI/Open

VMark Software, Inc. has agreed to port its PI/Open database management system to Digital Equipment Corp.'s Alpha AXP systems and the DEC OSF/1 operating system. DEC will make VMark's DBMS products available through DEC sales channels, the firms said.

ProSMS gets IBM support

Boole & Babbage, Inc. recently said its ProSMS suite of storage management products will be supported by IBM in terms of on-site services for implementing IBM's Data Facility Storage Management Subsystem (DFSMS) platform. The ProSMS products are tools designed for planning and performing DFSMS conversions and monitoring and controlling storage subsystems.

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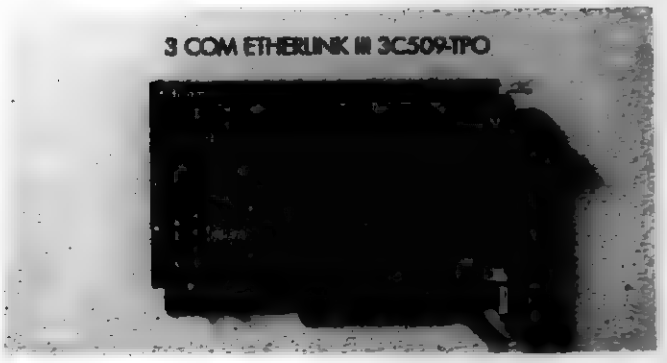

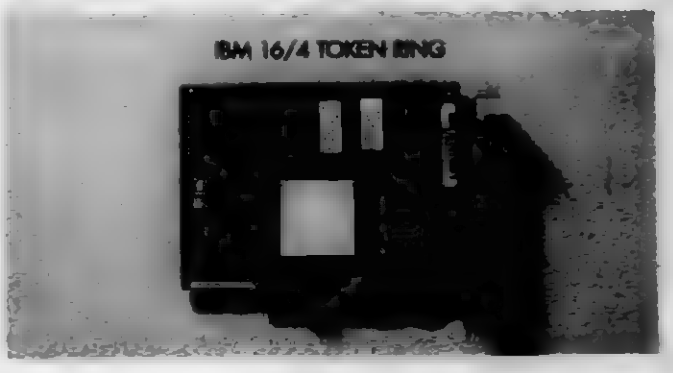

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[redacted]

Software

Ross Systems, Inc. has announced the Human Resource CS Series, a client/server-based system designed for complex human resources and payroll departments.

According to the company, the Human Resource CS Series provides split processing and supports a mixture of client programs. Optional capabilities include laser check-printing features, payroll tax filing, imaging and a 24-hour benefit hot line for employee inquiries.

The company also offers Macintosh, Motif and Windows implementations with the same native look and feel and application features for each graphical user interface.

User-based prices for the series start at $35,000 per module.

▶ *Ross Systems*
555 Twin Dolphin Drive
Redwood City, Calif. 94065
(415) 593-2500

BMC Software, Inc. has announced Ultraopt/IMS, a product designed to improve response times and increase IMS message throughput by reducing the size of data streams and redirecting congested message traffic.

According to the company, Ultraopt/IMS reduces the length of outbound data streams by 50% to 85% and inbound streams by 40% to 90%. IMS throughput can be increased by up to 20% by redirecting message traffic from an overloaded Task Control Block to Service Request Blocks, the company said.

The product works transparently to the user and does not require any modifications to VTAM or other system components.

The need to install an optimization product for each IMS subsystem is eliminated because Ultraopt/IMS installs once per CPU and works for all IMS control regions at the same time, the company reported.

A perpetual license of Ultraopt/IMS costs $46,000.

▶ *BMC Software*
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

BlueLine Software, Inc. has added support for Novell, Inc.'s NetWare HostPrint to its Multiprint/VM print routing software.

Multiprint/VM was designed to permit organizations using the IBM VM operating system to print mainframe output on local-area network printers without adding hardware or software.

The company said the product can access any printer enterprisewide with support for HostPrint running under NetWare for SAA. Printing options now include Epson America, Inc.'s dot-matrix printers, Hewlett-Packard Co.'s LaserJet printers, ASCII printers and other LAN-compatible hardware.

A permanent license for Multiprint/VM ranges from $7,500 to $14,350.

▶ *BlueLine Software*
Suite 690
5775 Wayzata Blvd.
Minneapolis, Minn. 55416
(612) 542-1072

Hardware

XL/Datacomp, Inc. has introduced the Nearline ACS 9709 ½-in. square tape Automated Cartridge System.

The product works in conjunction with the company's Nearline DMS Data Management Software and Nearline LCU 9701 Library Control Unit, which make up XL/Datacomp's Nearline ½-in. tape library system.

The ACS 9709 stores up to 86G bytes of uncompressed or 256G bytes of compressed data on a maximum of 288 extended-length, ½-in. tape cartridges, the company said.

An automated robotic device, a rotational eight-sided carousel with three magazines per side and a bar-code reader are included.

Pricing for the Nearline ½-in. tape library system starts at $108,825.

▶ *XL/Datacomp*
908 North Elm St.
Hinsdale, Ill. 60521
(708) 323-1200

Computer Power, Inc. has announced the Computersave Mark II Uninterruptible Power System.

The product offers a Novell, Inc.-approved file server interface and includes features such as complete power line conditioning, 92% efficiency, 150% overload capacity and a two-year electronics warranty.

RS-232 communications power, extended runtimes of up to eight hours and rack-mount configurations are options. Capacities range from 900VA to 19kVA, the company said.

Prices begin at $1,600.

▶ *Computer Power*
124 W. Main St.
High Bridge, N.J. 08829
(908) 638-8000

Acknowledge, Inc. has announced a tape backup option for its Alice family of on-line direct attach optical storage products.

According to the company, the Optical Backup Solution uses either a single or dual high-density helical scan drive embedded in the optical controller. Each cartridge can house at least 10G bytes with Improved Data Recording Capabilities data compression.

Users can back up one optical platter or a complete optical library. Because it is performed off-line, backing up a 20G-byte jukebox with rewritable media takes one-tenth the time of going through IBM's Application System/400, the company said.

Support for off-line tape operations for IBM 3995 libraries is provided.

A single-drive, 10G-byte unit costs $8,350. A dual-drive 20G-byte drive costs $12,750.

▶ *Acknowledge*
251 West Central St.
Natick, Mass. 01760
(508) 650-3630

On-Line Power, Inc. has introduced the Power-Reg line of three-phase power conditioners.

According to the company, the Power-Reg line provides protection against common mode and normal mode noise, single-point grounding and complete isolation.

A Regulation/Isolation Only switch is featured that permits the unit to be operated in either mode. Twelve models are provided with power ratings from 15kVA to 300kVA.

Prices range from $8,000 (15kVA) to $43,000 (300kVA)

▶ *On-Line Power*
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It's all time high, wiping out more tha[n] billion in shareholder value.

'Steep Learning Curve'

Those pressures leave little time for a new boss to master IBM's business. Fully 51% of IBM customers surveyed by Computerworld magazine say IBM needs to hire a CEO with a technology background. With Mr. Gerstner lacking such a pedigree, "he's going to be on a very, very steep learning curve," says David Hanna, a former IBM executive who is now president of Hanna Group, a computer-consulting

THE WALL STREET JOURNAL
March 25th, 1993

Computers & Automation

"Information systems managers are grasping onto this as a Holy Grail," said Paul Gillin, executive editor of Computerworld, which is just one of many industry trade publications that spotlight reengineering on a regular basis. "It is an important leap for corporations."

The hype should reach crescendo in May, when a new book by reengineering consultants Michael Hammer and James Champy will be [pub]lished "Reengineering the [Cor]poration: A Manifesto for Business Revolution."

Investor's Business Daily
March 25th, 1993

Their question: Where are the productivity savings?

The New York Times
April 25th, 1993

CORPORATE executives appear to be more knowledgeable about computer technolgy than ever before, but they have also become more demanding and less forgiving, a new survey has found. While they believe information technologies are the key to competitive advantage, they also say that they have not been getting their money's worth.

The survey, conducted by the computer industry newspaper, Computerworld and Andersen Consulting, also found that 81 percent of top executives are personally using computers in their daily jobs, nearly double the percentage reported when the survey was first taken four years ago.

More than 200 chief executives, chief operating officers, and chief financial officers, representing a broad range of businesses, participated in the study, the results of which were published in **Computerworld** last week. Annual company sales ranged from $250 million to $20 billion.

CUSTOMERS HAVE THEIR SAY TOO

■ IBM directors should forget about hiring another salesguy to replace John Akers as CEO. And whoever he is, Aker's successor should fire a whole lot more people. So says a Computerworld survey of executives at 100 companies that spend at least half their computer budgets on IBM products. The participants, who work at the likes of **Kmart** and **Parker Hannifin**, a maker of pneumatic and hydraulic components, also said IBM's reorganization into smaller business units should go further. Computerworld, in addition, interviewed various computer industry luminaries, including Steve Jobs. The Next CEO marveled that none of IBM's machines from mainframes to PC's uses the same software. Says Jobs: "IBM's troubles stem from the fact that they approach everything from a hardware strategy, and the Nineties is a software decade."

Not everybody agreed that breaking up is the way for IBM to go. Said Larry Ellison, CEO and co-founder of **Oracle**, a software company: "This is the

[...] and his [...]her, Richard is a retired I.B.M. vice president.

A survey of some 100 of I.B.M.'s largest customers by Computerworld magazine found that 51 percent preferred someone with a technical background to be the computer giant's new chief executive, while 36 percent said technical expertise was not essential and 13 percent had no opinion.

But some industry sources say technology know[-how] is a

[...]93 FORTUNE 11

FORTUNE
April 5th, 1993

EEK, THERE'S A MOUSE in the corner office. The percentage of executives who regularly use computers nearly doubled in four years, to 81% from 42% in 1989, says a study by Computerworld magazine and Andersen Consulting. Fewer than half think they are getting their money's worth from corporate computer systems.

[sys]tem[s] wer[e] larg[e] private[ly] owned, real-tim[e] comput[er] netw[orks] Been [to]

The New York Times
March 25th, 1993

THE WALL STREET JOURNAL
April 20th, 1993

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   23. Dir./Mgr. Sys. Development, Sys. Architecture
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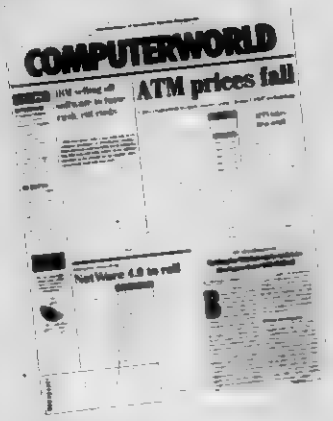

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   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Programming Management, Software Developers
   41. Engineering, Scientific, R&D, Tech. Mgt.
   60. Sys. Integrators/VARs/ Consulting Mgt.

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Application Development

Taking a byte out of crime

Phoenix police use CASE, other tools to speed work

By Thomas Hoffman
PHOENIX

The City of Phoenix Police Department needed a break in its pursuit of the elusive Yogurt Bandit, an unidentified suspect authorities had linked to 15 robberies of yogurt shops, convenience stores and banks over a three-month period in 1990.

Some savvy detective work and helpful automation gave them that break and led to an arrest. Using a Field Interrogation (FI) database, a Phoenix detective matched the description of a person seen in the area with a description of the Yogurt Bandit. The vehicle license plate of the suspect matched a partial plate number that witnesses had given police.

After searching through apartment complex parking lots in the identified area, the detective found a car that nearly matched the witnesses' descriptions. Police staked out the parking lot until the culprit walked into their trap.

The city is the desert *could see a 20% rise in police reports by 1997, which Michael Barry will help the Phoenix Police Department handle with computers*

Fast-paced tracking

The detective who tracked down the Yogurt Bandit used a system called PACE, or Police Automated Computer Entry, which was developed using Unisys Corp.'s LINC II computer-aided software engineering software. It includes the FI subsystem, a database that stores data from the reports patrol officers file when they question someone who is acting suspiciously but is not arrested.

The PACE system has provided the police department with benefits beyond those seen by the detectives. For example, reports were once handwritten by the department's 2,100 officers and usually took 45 minutes to complete. Now officers telephone information to data entry clerks who enter the information on Unisys CTOS workstations and complete the reports within 20 minutes. Moreover, the PACE application, powered by a Unisys A15 mainframe, prompts the data entry clerk to ask the reporting officer for additional information if needed.

The system, developed during an 18-month
Byte, *page 82*

PowerBuilder 3.0 gets the nod

By Melinda-Carol Ballou
BURLINGTON, MASS.

Beta-test users and consultants familiar with Version 3.0 of Powersoft Corp.'s PowerBuilder, which is slated to ship next month, gave the new release high marks in comparison with Version 2.0.

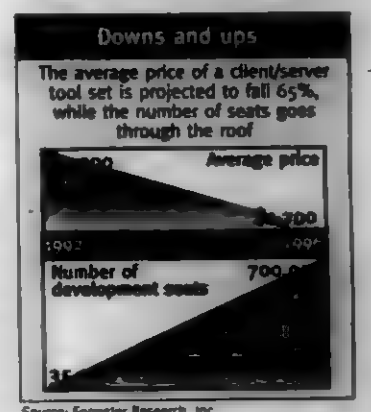
However, they cited concerns about the ability of this and comparable products to help develop complex, compute-intensive and mission-critical on-line transaction processor applications in client/server environments.

Version 3.0 contains a range of new features, some of which the company said will strengthen users' ability to develop such large-scale applications. These include repository enhancements to allow developers to define graphic behavior associated with data and performance improvements.

Other features

Links to other products, such as Intersolv, Inc.'s PVCS, will help users to centrally manage applications. Open application programming interfaces to PowerBuilder libraries have allowed computer-aided software engineering tools vendors such as Bachman Information Systems, Inc. to connect to PowerBuilder.

Configurable tool bars and shared result sets across multiple DataWindows, as well as drop-down data windows, smooth the development process, Powersoft officials said. This release will also offer support for the Watcom International Corp. SQL database for building stand-alone applications or for working with server-based applications while detached from the network, they said.



Source: Forrester Research, Inc.

Improvements to reporting capabilities include business graphics, cross-tabs and labels and an object query painter, which lets users visually create database query objects that offer business views of database information.

PowerBuilder, *page 83*

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CSA supports COBOL II®, OS/VS®, Micro Focus®, CA-Realia®, ANSI-74 and ANSI-85.

CTC

Byte out of crime

CONTINUED FROM PAGE 81

period and fully operational since April 1991, is expected to help the Phoenix police tackle the city's steady growth in crime. Mike Barry, assistant administrator of the department's computer services bureau, said the department anticipates a 20% rise in police reports over the next four years, based on studies of crime growth trends of the past 20 years.

ON SITE

Phoenix Police Department
Phoenix

Challenge: To replace paper police reports with computerized records.

Technologies: Unisys LINC-II CASE software, Aeg mainframe, CTOS workstations; PCs; HP 3000 minicomputers, Motorola 9100-386 mobile data terminals.

Benefits: Reduces the time to generate and distribute police reports; allows new data matching capabilities; saves $75,000 per in maintenance.

"Using PACE, our officers can file reports faster and spend more time in the field where they're needed," Barry said.

Once data entry clerks finish a report, they send it electronically to the appropriate bureau, such as homicide; it is simultaneously reviewed by the reporting officer. The reports are stored on a case management subsystem that compiles supplements to the original case such as laboratory reports and letters to insurance companies.

Before PACE, the department relied on the manual delivery of color-coded, paper-based police reports to different divisions. It often took three days or more for detectives to receive the reports on their cases. With PACE, detectives receive the reports as soon as they have been completed.

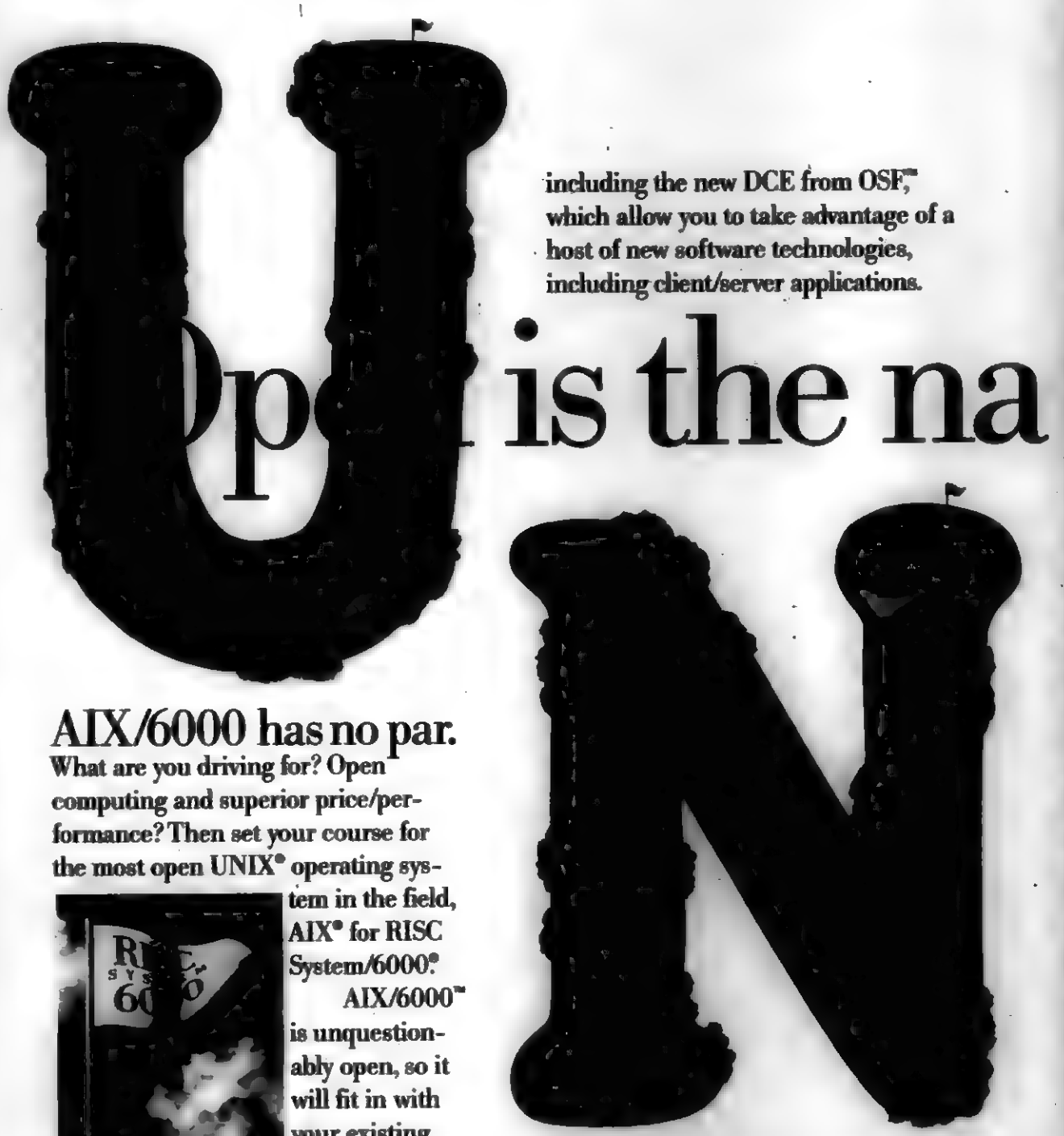
PACE will be supported by other planned systems upgrades and additions. The police department is in the midst of replacing an aging minicomputer-based computer-aided dispatch/mobile data terminal (CAD/MDT) system with a network of 150 Intel Corp. 80386- and 1486-based PCs. The PCs will be connected to three Hewlett-Packard Co. HP 3000 minicomputers via host-to-terminal links.

The new CAD/MDT system cost the department $9.2 million and is scheduled for full operation in January 1994. It will route calls for patrol officers and will eventually send detailed information to police cars equipped with Motorola, Inc. 9100-386 mobile data terminals.

The Motorola terminals are expected to provide patrol officers with critical information about any crimes in progress that they are assigned to while alleviating the work load of the department's radio dispatchers. Since most of the department's patrol cars are staffed by just one officer, the mobile data terminals will act, to some degree, as their partners.

For example, with the Motorola terminals, officers will receive a detailed sketch about a convenience store robbery in progress, including whether the assailant has a gun and a physical description of the premises. The data terminals will be installed in 675 patrol vehicles and some unmarked cars beginning in mid-January.

The CAD/MDT system will eventually feed into geographic information systems (GIS) being developed by the city of Phoenix, which is using GIS tools from Environmental Systems Research Institute, Inc. in Redlands, Calif., to construct GIS applications [CW, June 14]. Tying into the GIS systems with their Motorola mobile terminals, officers eventually will



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be able to receive detailed information about building plans and situations such as hazardous materials at emergency scenes.

Use of GISs is on the rise at other police departments — San Diego and Baltimore, for instance — and has enhanced their crime-solving capabilities, said Wilpen L. Gorr, a professor of public policy and MIS at the Heinz School of Public Policy and Management at Carnegie Mellon University in Pittsburgh.

PowerBuilder

CONTINUED FROM PAGE 81

In addition, Powersoft will ship two scalable products on the low end — PowerMaker and PowerViewer. Features include the ability for end users to access data and create queries and reports.

Users and consultants praised the new capabilities.

"There are a lot of advanced features with 3.0 that just aren't available with 2.0, so we've been using the new version to convert our Prime mainframe applications," said Joe Horecny, a project leader at Chrysler Systems, Inc., a subsidiary of Chrysler Corp. in Oakbrook, Ill., and a beta-test user of 3.0. Horecny said tool bar objects and improved reporting facilities were particularly helpful to his group.

The new release is a big step from the current version, according to Donald de Palma, an analyst at Forrester Research, Inc. The data connections are better than they were, he said, and the Watcom database allows for local prototyping before deploying algorithms out to Sybase, Inc. or Oracle Corp. databases.

Also, the ability to link to third-party components strengthens PowerBuilder by making it "more of a pegboard" as opposed to a discrete, proprietary tool.

What about the high end?

But de Palma and others raised questions about the ability of PowerBuilder to handle high-end, transaction-intensive applications, since the scalability of tools like PowerBuilder and Gupta Corp.'s SQL Windows for that kind of development is as yet unproved. PowerSoft is addressing some of those issues, but client/server development has so far been in "toe-dipping, single-department mode," de Palma said.

Fourth-generation language vendors such as Progress Software Corp. and Cognos Corp. are beginning to target client/server development, and they have the advantage of years of experience with large-scale applications. The current crop of Windows-based tools have not had as long to mature, de Palma said.

In a Forrester Research study of software development at 59 companies:
- 92% of the projects accessed a single database.
- 60% were single-department, decision-support projects.
- 70% were deployed to 50 or fewer users.

While this version improves on earlier releases of PowerBuilder, said Terrence Oi, a manager at KPMG Peat Marwick in Boston, the product has been a bit slow for applications with a strong data entry and transaction processing focus, particularly when compared with traditional mainframe CICS applications.

But at Standard Commercial Tobacco Corp., the five or so users of one data entry application, who handle about 40,000 transactions per day, have found PowerBuilder's performance to be sufficient, said Randy Rabbin, a programmer.

On the low end, Windows-based tool makers compete with Microsoft Corp.'s Visual Basic. "Visual Basic is every tool vendor's nightmare and threatens to become the universal programmer's Swiss Army knife of the '90s — nearly every site is equipping developers with Visual Basic as one tool they will use," de Palma said.

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▶ Illinois Power's Max Burgstahler: *'People's minds are just starting to click' about the need for SQL connectivity*

POWER TO THE PEOPLE?

SURE, GROUPWARE IS GREAT. BUT THE ELECTRIFYING GROWTH OF NOTES AND OTHER PRODUCTS POSES HUGE NEW INTEGRATION HASSLES. HERE'S HELP.

As groupware projects within organizations proliferate, information systems directors face mounting challenges that require the diplomatic skills of an ambassador and the technical savvy of a helicopter mechanic.

Groupware applications in individual business units have multiplied like rabbits. Unfortunately, that has left IS directors faced with scores of applications that must be integrated with organizations' overall system resources.

At Illinois Power Co. in Decatur, Ill., for example, SQL connectivity has captured the imagination of the utility's personnel. The utility plans to build an application linking a Notes database for engineers with a SQL database containing engineering parts numbers.

"People's minds are just starting to click [about the need for SQL connectivity]. They see it as something with real potential," says Max

Groupware, *page 86*

Groupware

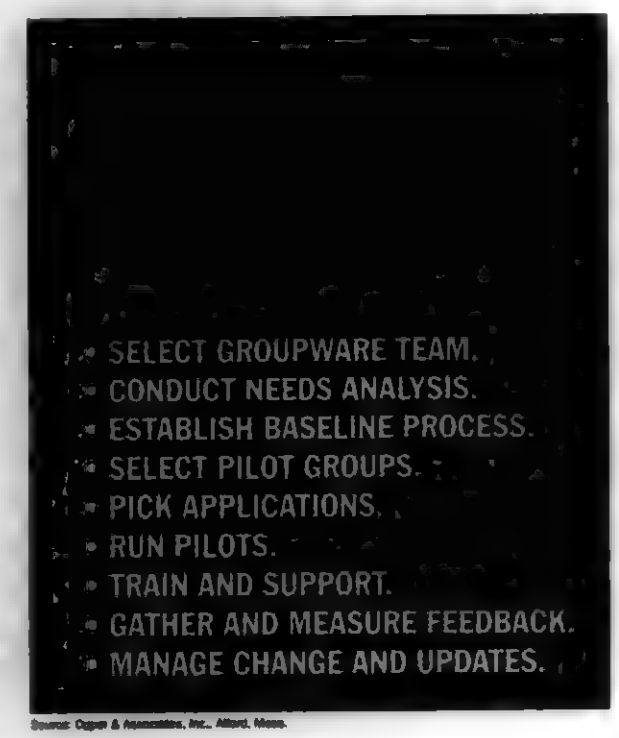
CONTINUED FROM PAGE 85

Burgstahler, Illinois Power's information technology supervisor.

"Integrating Notes with SQL databases is the biggest problem we have," says Kevin Danehy, senior business analyst at Millipore Corp., a filtration equipment manufacturer in Bedford, Mass. "There's a lot of data that the sales force has using Notes that needs to be analyzed."

In addition, Danehy says, salespeople must be able to attach a query to an electronic-mail message that would then access a customer list on a SQL database to provide a profile of that customer.

To solve this problem, Millipore is beta-testing a custom-built product, called DataMover, that will link a SQL database to Notes using Dynamic Link Libraries, Danehy says, allowing Notes users to run queries as background tasks.



Source: Cygnet & Associates, Inc., Alford, Mass.

Getting a jump

However, Millipore is way ahead of its IS brethren in terms of integrating Notes with SQL databases, with most IS directors just now beginning to consider the implications of integrating two completely diverse environments.

"Sooner or later, we're going to need to feed all this [groupware] data into the existing mission-critical applications," says Jeff Held, a partner in the technical services practice of Ernst & Young in Vienna, Va.

Unfortunately, integrating a host of sundry applications poses a problem. Many IS personnel simply don't possess the language skills required to manage diverse groups or departments that have created groupware applications using PC application development tools.

So one of the first orders of business for IS directors — who tend to be schooled in Cobol language and SQL databases applications — is to become fluent in a PC world dominated by macros and @Commands working directly against documents and forms.

"Groupware is such a different beast for information technology that it's like speaking a completely different language for which they have no common base to understand," Held says.

Because of these issues, IS personnel must change the way they think about computing, especially in the realm of application development.

"Groupware has taken the same path as local-area networks in that it has come out of the field. The problem is that the people in the glass house are discovering to their horror that these applications can now affect their corporate data and they have no control over them," Held adds.

Moreover, because IS personnel tend to be focused on procedural languages such as Cobol and C, they tend to be poor programmers in groupware environments that tend to be based on PC programming techniques running against applications based on a document metaphor.

"If I have two people with equal pay, and one is a Cobol programmer and the other is a spreadsheet programmer, I'll take the spreadsheet programmer every time," says Norman Weizer, president of Weizer Associates, Inc., a consultancy in Lexington, Mass.

"The best candidates are business operations people with technical backgrounds who can look at a process and automate it — someone who has been both a business and systems analyst," adds Randal Zahora, president of Workgroup Productivity Corp., a consultancy in Oak Brook, Ill.

Although groupware application development is likely to be the province of individual departments, the coordination of the activities of these departments will require the orchestration of an IS director who can set up hierarchical naming services and enforce standards and practices.

"Groupware is a technology that can easily get out of control and turn into a real nightmare. Ideally, you want to bring IS in early because most organizations will go crazy when they first get started," Zahora says.

"You need to involve people who know both IS and groupware systems. With groupware, you can fall down a hole and find yourself going to hell in a handbasket in a hurry," Weizer adds.

Without IS support, in fact, customers will find themselves with an implementation that's either poorly used or not used at all, he adds. Some IS staffs are at odds with some users because of a fear stemming from the loss of control implied by groupware.

"IS people need to change how they think. They tend to think in terms of outer joins, rows and columns. End users live in a world of documents," Held says. "Ideally, you would want IS people to be out ahead of the users, but we've found that IS people just don't get it, and the reaction is pretty negative."

Aggressive adopters

But several IS shops have adopted proactive stances toward groupware applications. Bankers Trust Co., for example, has completely reorganized its IS department by pushing responsibility for application development down into the individual business units, with IS maintaining the company's overall IS infrastructure.

Held argues that the Bankers Trust model essentially blesses the existing state of affairs within most organizations today.

"Every department has its dBase application or some other set of applications that has been covertly created that IS has no idea about," Held says. In fact, he adds, moving responsibility for application development down into

GET READY FOR CULTURE CLASHES

Although groupware's cultural impact on an IS organization is at first likely to be a pivotal concern for the IS director, the real challenge to an IS chief's management skills will come from his or her dealings with individual departments.

Once an IS department decides to evangelize the adoption of groupware within the organization, there are a number of political and psychological hurdles that they are likely to encounter among users.

"Technologists tend to be blind to certain business issues," notes Bob Halperin, executive director for coordination science at MIT.

Salespeople, for example, are likely to be the most resistant to a groupware application, Halperin says, because most salespeople view their worth as directly tied to the number of sales contacts they have.

"Salespeople tend to view sales leads as their domain, and they take them from company to company as they switch jobs. They may not want to put that information into a shared database," he says.

▶ Randal Zahora *sees an aversion to groupware products*

At the same time, IS people must apply their systems-analysis skills to groupware, especially when automating what was an inefficient paper-based process.

"When you automate a bad process, what you get is a fast, bad process that's widely distributed," says John Dwyer, a systems engineer at Corporate Software, Inc., a reseller in Canton, Mass.

In addition to psychological issues, IS directors are likley to encounter middle managers who may feel threatened by groupware.

Fear of technology

At Illinois Power in Decatur, Ill., for example, information technology supervisor Max Burgstahler ran into some managers who resisted the flattened organizational structure that groupware promotes by giving all members of the organization access to shared data.

"It can be threatening to anyone who doesn't see themselves in a flattened organization. Fortunately, we have a pretty strong empowerment culture that is committed to increasing communications throughout the chain of command," Burgstahler says.

"It's a cultural issue, but people are becoming a lot more open these days," adds Paul Dunton, director of technology planning at Pacific Gas & Electric in San Francisco.

Finally, IS must assume the role of educator.

"A lot of times we'll hear from IS people that their executives simply won't use products like Notes," says Randal Zahora, president of Workgroup Productivity in Oak Brook, Ill.

To address this, Halperin says IS must get closer to the business units so those units can witness for themselves the real payoff from technology.

—Michael Vizard

individual business units is the only winning strategy available to IS shops.

"When you have a centralized IS, it's always going to be hit by more demand than it can service. So as far as somebody is concerned, IS is always going to make a wrong decision. If you move application development down to the business units, it's their responsibility to fund development," Held says.

Another road traveled

Some organizations have opted to bring the expertise of the business units into the central IS organization. Such was the strategy used by Johnson & Higgins, a New York insurance carrier that brought William Wilson III from a field office into its IS shop as a company vice president.

Taking a more middle-of-the-road strategy is Pacific Gas & Electric Co. (PG&E) in San Francisco. The IS shop provides departments with a series of standard Notes applications that can be deployed alongside any custom Notes applications that are developed by departments. To do this, PG&E has set up a specific task force within its IS organization that is dedicated to office computing.

"About 10 years ago, we saw that it would be futile to resist PC technology. So we set up a group within IS that would be enthusiastic about it and create a manageable environment," says Paul Dunton, director of technology planning at PG&E.

The IS group at PG&E will evaluate the quality of any Notes application that might be distributed across different departments, where 40 servers now support 1,700 users.

"Typically, we show them why a particular application might not have the performance they are looking for across a WAN," Dunton says.

But organizations such as PG&E and Bankers Trust tend to be the exception, not the rule. Persuading IS shops to facilitate groupware applications, not fight them, represents one of the great cultural roadblocks to the adoption of groupware. "A lot of IS people are going to go into this kicking and screaming," says Susanna Opper, president of Opper & Associates, Inc. in Alford, Mass.

After all, she says, groupware applications require IS people to navigate a large number of social, political and business issues for which they are poorly prepared. "We no longer live in a bifurcated world where there are separate business and computer shops. Groupware is the way business will be done," Opper says.

In addition to the social issues involved, IS people tend to look askance at groupware because of their technical training.

Specifically, groupware applications tend to de-emphasize security, testing and standardization issues in favor of solving an immediate business problem across what many IS people consider to be unstable networks.

"The programmers and working-level people at IS shops tend to get very nervous. They find it totally confusing because a lot of the concepts they have learned simply don't apply," Weizer says.

"IS people tend to look at groupware as something done by a bunch of cowboys," Opper says.

Despite these issues, just about everyone involved with groupware reports that getting IS behind a project is still a critical requirement.

"IS gets excited once they're involved. It's an opportunity for them to really shine and to be proactive. It's also a new technological challenge, and they know it's going to be mandated whether they like it or not," Zabora says.

Re-engineering is a big driver. "As we keep moving toward the virtual corporation, it will become more important for IS to put business goals through an [information technology] prism to see ... what the technology will allow," says Bob Halperin, executive director for coordination science at MIT in Cambridge, Mass.

The big picture

As most of the growth — which includes technologies ranging from distributed databases such as Notes, work-flow routing, calendaring and scheduling software and other E-mail-enabled applications — is being widely deployed, it is being done on an ad hoc basis with little overall care for strategic architecture.

Even PG&E, which is on the cutting edge of groupware development, is just getting its arms around these issues. "We've just started a strategic planning group that makes sure our long-range business plans will be linked to our [information technology] plans. Individual groups have pursued these links before, but we want to make sure the company has a bidirectional link," Dunton says.

"Companies need IS people to be the architects and long-range planners for them," Weizer notes. ■

AN ACTION-PACKED SQL: LINKING DATABASES

One of the biggest challenges currently facing IS directors who have already opted to deploy Notes packages is the integration of this groupware offering with SQL database services.

"Notes is still relatively young, but the need for this integration is going to become apparent in the next couple of months," says Norman Weizer, president of Weizer Associates, a consulting firm in Lexington, Mass.

But pulling that integration off is likely to provide a significant challenge to IS personnel.

"The texture of the data is quite different. SQL databases are rows and columns, while Notes is a text-oriented environment with lots of discussion databases and graphics," notes Max Burgstahler, supervisor for information technology at Illinois Power in Decatur, Ill.

Despite these differences, the integration of the two environments is still a worthwhile project. Since an individual Notes database is only 1G byte in size, developers have begun working on Notes applications that will take advantage of a dbLookup facility in Notes to access lists on much larger SQL databases.

For example, a Notes user will be able to look up a mail list kept on a SQL database in order to find which users should participate in a particular Notes discussion. To facilitate such applications, Lotus is working on providing a series of DataLens drivers for Notes Version 3. Those drivers, however, are still undergoing beta testing.

▶ Norman Weizer: *Need for integration becoming apparent*

In the meantime, some Notes sites have been working with a Data Pump tool from Trinzic Corp. in Portsmouth, N.H., which provides a tool that allows data to be exchanged between Notes and a SQL database in batch mode.

In addition to the Data Pump, some of the more adventurous Notes sites have worked with the Notes application programming interface (API), which is written in C language, to link Notes to SQL databases.

Lotus Development Corp. is also currently working with a variety of SQL database tool vendors to support Notes with their application development tools, according to Notes product manager John Bartlett. This work should eventually allow a Notes user to update a SQL database.

"Linking SQL application development tools with Notes is a natural. There's a synergy because there is a lot of structured and unstructured data in Notes," adds Brownell Chalstrom, president of Chalstrom Consulting, Inc. in Oakland, Calif.

However, working with the Notes API is not for the faint of heart. "I tend to stay away from the Notes API; it's not easy to use," says John Dwyer, a systems engineer at Corporate Software, Inc., a reseller in Canton, Mass.

—*Michael Fitzgerald*

Calendar

AUG. 29-SEPT. 4

Annual International Gupta Developers Conference. San Francisco, Aug. 29-Sept. 1 — Contact: Gupta Corp., Menlo Park, Calif. (415) 321-9500.

Worldwide OS/2 and LAN Systems Conference. Lake Buena Vista, Fla., Aug. 29-Sept. 2 — Contact: Joshua Weinberg, Technology Solutions, New York, N.Y. (212) 505-9900.

Fed Micro '93 CD-ROM and Multimedia Conference and Exposition. Washington, D.C., Aug. 31-Sept. 2 — Contact: Tom Lauterback, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Structured Development Forum. Philadelphia, Aug. 31-Sept. 2 — Contact: Espirit Systems Consulting, Inc., West Chester, Pa. (215) 436-8290.

SEPT. 5-SEPT. 11

Compucorp '93. Las Vegas, Sept. 8-11 — Contact: UNSC Investment Group, Newark, Calif. (510) 657-8418.

SEPT. 12-SEPT. 18

Penn Tech '93. Philadelphia, Sept. 13-14 — Contact: Pennsylvania Technology Council, Pittsburgh, Pa. (412) 687-2700.

Engineering Document Management Systems. Anaheim, Calif., Sept. 14-16 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 871-6606.

Omnicom Week Conference. San Diego, Sept. 14-17 — Contact: Sherri Ross, Omnicom PPI, Philips Business Information, Inc., Potomac, Md. (301) 424-3338.

SEPT. 19-SEPT. 25

Business Excellence For Top Management. Kansas City, Mo., Sept. 21-23 — Contact: Joanne Gordon, Sandra Cone Associates, Inc., Chicago, Ill. (312) 327-0092.

Mobile World. San Jose, Calif., Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Second IEEE Network Management and Control Workshop. Tarrytown, N.Y., Sept. 21-23 — Contact: Hart Rasmussen, Workshop/Tutorial Registration, CATT, Hawthorne, N.Y. (914) 347-6942.

Unix Expo '93. New York, Sept. 21-23 — Contact: National Blenheim Expositions, Inc., Fort Lee, N.J. (201) 346-1400.

Document World '93. Hartford, Conn., Sept. 22-23 — Contact: Key Productions, Inc., Hartford, Conn. (203) 247-6363.

SEPT. 26-OCT. 2

Association of Banyan Users International Vendor Conference and Expo. Ottawa, Sept. 26-29 — Contact: Association of Banyan Users International, Chicago, Ill. (312) 644-6610.

IS as a Service Organization. Columbus, Ohio, Sept. 27-28 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7873.

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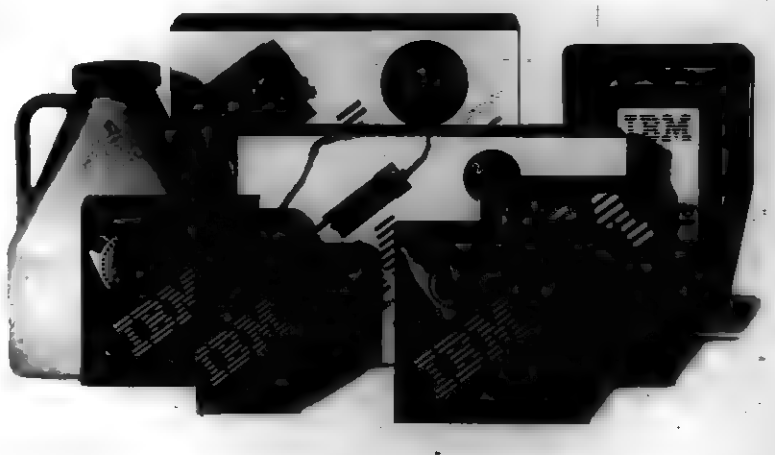

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The convergence of TV and computers . . .

Consumer and computer technology is coming together to produce a "communicopia" of interactive TV and multimedia applications. This merger is also creating a

demand for the IS "techno-artist" — a person with the development and artistic skills to bring these applications alive.

By David Baum

HOW IT WORKS

It's pretty much been that machines have known their place. Users go to their computers to power up their word processing program, do a little spreadsheet work, stuff like that. For entertainment, they turn to the television, maybe watch a little Letterman and hope to catch his latest Top 10 list.

Faster than you can say "*Star Trek* reruns," however, things are changing. There's a shift happening that is blurring the lines between computer and consumer technologies. The same TV through which you can tune in to CNN will be able to deliver an on-line newspaper or let you order a pizza.

Best of all, this convergence of technologies — computers, TVs, cable, telephones — is creating job opportunities for "information systems like nothing you've seen in a long time (see story below).

Brave new world

The killer apps in this brave new world are known collectively as "interactive multimedia," computer-based applica-

Convergence, *page 90*

. . . creates new job opportunities for IS

WHAT it MEANS

The convergence of consumer and computer technology means great opportunity for computer professionals, as well as for a new breed of managers to work with them.

This burgeoning area will require a slew of software developers, hardware designers, systems analysts, network administrators, digital audio/visual specialists, database administrators, communications gurus and other professionals to build the infrastructure that brings multimedia productions to market.

Creative people are needed to put together the interactive products and services that people will use.

Currently, there are as many as 100,000 people working full-time in the multimedia field, says Doug Millison, editor of *Morph's Outpost on the Digital Frontier*, a new magazine for multimedia professionals.

Certain industries have rushed headlong into hiring multimedia specialists. Publishing companies such as Time Warner, Inc., The Walt Disney Co. and Paramount Communications, Inc. are "gearing up for the information highway in a big way" as they prepare for a populace that will quickly demand new forms of entertainment, according to Marc Canter, head of San Francisco-based Canter Technology, which is working on interactive television and multimedia applications.

Job opportunities, *page 90*

Convergence

CONTINUED FROM PAGE 89

tions that combine text, graphics, video, audio and animation into a media experience for users.

Interactive computer technology will give formerly passive viewers (or users, if you will; the terms are becoming interchangeable) almost total control over what they see, when they see it and what they do with it, predicts George Gilder, author of the book *Life After Television*.

Interactive TV is finding its way into mainstream business applications. Today's retail giants, for instance, are eyeing the approximately $70 billion that U.S. consumers spend on catalog shopping each year. What if that service could be made even easier? Toys R Us, Inc. is creating a private TV network and experimenting with video compression technology to sell products via an on-line, on-demand shopping network.

Meanwhile, the New Jersey Department of Education is creating an interactive TV system where students use remote control to respond to a lesson, and results are automatically tabulated for the instructor's immediate review.

Health care companies such as Blue Cross/Blue Shield of Massachusetts are investigating the concept of "desktop docs," kind of a house call with a high-tech twist. Interactive TV would enable patients to contact practitioners through video, getting medical advice on the fly, says Martin V. Joyce, executive vice president of the client services group at the Boston-based company.

Branching out

For its part, the entertainment industry will take on elements of computing that until now have been available, in a rudimentary fashion, only on advanced workstations.

While watching a nature show, for instance, a viewer could pop up a map of an animal's habitat or select more data from a list of facts.

Video-on-demand would let a viewer use his remote control to scan a menu of titles on the TV, searching and selecting movies.

It's an ambitious vision of pick-as-you-go use. With the market expected to reach $3.5 trillion worldwide by 2001, according to John Sculley, Apple Computer, Inc. chairman, it's no wonder some heavyweight companies in the computer (Apple, IBM), cable (Tele-Communications, Inc.) and entertainment industries (Time Warner, Inc., Paramount Communications, Inc.) are aggressively involved.

Vital moves

What will make this grand vision of interactive communications possible? These technical advances are vital:

- **The ability to translate all audio and video communications into digital format.** A variety of computer and electronics companies are hard at work on this area. The list includes Apple, IBM and Canter Technology, a San Francisco developer of interactive TV and multimedia applications.

The work, which is reminiscent of assembly programming, may be the "easiest" part; what will be daunting is the effort to digitize existing information resources, such as art archives.

- **The ability to transmit digital signals over high-bandwidth fiber-optic lines or via ultra-high-frequency wireless.** This new digital highway will, in the words of John Segall, GTE Corp. vice chairman, "tie the world together in a hush of photons." Almost every large telecommunications and cable company is working on it, including GTE in Stamford, Conn., BellSouth Corp. in Atlanta, Tele-Communications in Englewood, Colo., and Time Warner in New York.

However, Corning, Inc., which makes optical fiber, predicts that rewiring networks and substations will take until 2037.

- **New compression and storage methods.** Companies are furiously at work on digital storage for complex multimedia objects on special computers called video servers, from which they can be dished out on demand to TV users.

Right now, storing data digitally is a crushing demand, too much for today's disk drive to handle. Help may come in the form of CD-ROM enhancements, in which double-speed, quadruple-density CD-ROMs will provide the bandwidth to carry two hours of good quality audio and video objects on compact disc, according to Walt Klappert, head of technology at Warner New Media, the interactive multimedia subsidiary of Time Warner.

Others envision a home cable box or chips built directly into TVs that will enable digital functionality for interactive TV. Massive amounts of data will be sent down a fiber-optic wire or via satellite transmission, with chips in the home to decode, interpret and display the data at speeds greater than 100 million instructions per second. ■

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The sky's the limit for tomorrow's technology

Hewlett-Packard Co. is one of the players in interactive TV, as a producer of microprocessor-based "boxes" that send and receive information to enable users to order pizza, check a bank balance and so on from their homes.

Lew Platt, president and chief executive officer of HP, recently discussed where the industry is heading with free-lance writer Joe Panepinto.

HP's Lew Platt: 'We see a future where computing is pervasive'

"We see a future where computing is pervasive, where computing, communications, consumer electronics and, eventually, education and entertainment come together.

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- Your children's education will benefit. For example, when your daughter prepares a report on American history, she will download a document from the Library of Congress on to your home PC.

"People want to be free of time and location constraints."

Creates new jobs

CONTINUED FROM PAGE 89

"All the word processing machines and spreadsheet machines have been bought," Canter says.

He points out that growth in the productivity software area, for one, is sluggish, consisting of upgrades by the same 5% of users. "If you want to go hit the other 95% of the world," Canter explains, "you'd better figure out how to integrate with television, with entertainment markets, with intelligent devices and services of all types."

Rise of techno-artist

The challenge, in Canter's view, is not building the enabling technologies — the wiring, the new TVs, the super-density compact disc drives — but producing the snazzy interactive productions that people will tune in to once these capabilities have been put in place.

Canter, who is not only a businessman and software developer but also an opera singer and computer graphics creator, says he envisions the emergence of a "techno-artist," the equivalent of a film auteur. This person would be able to combine the talents of a storyteller, musical director and software developer with the management experience to direct large multimedia projects.

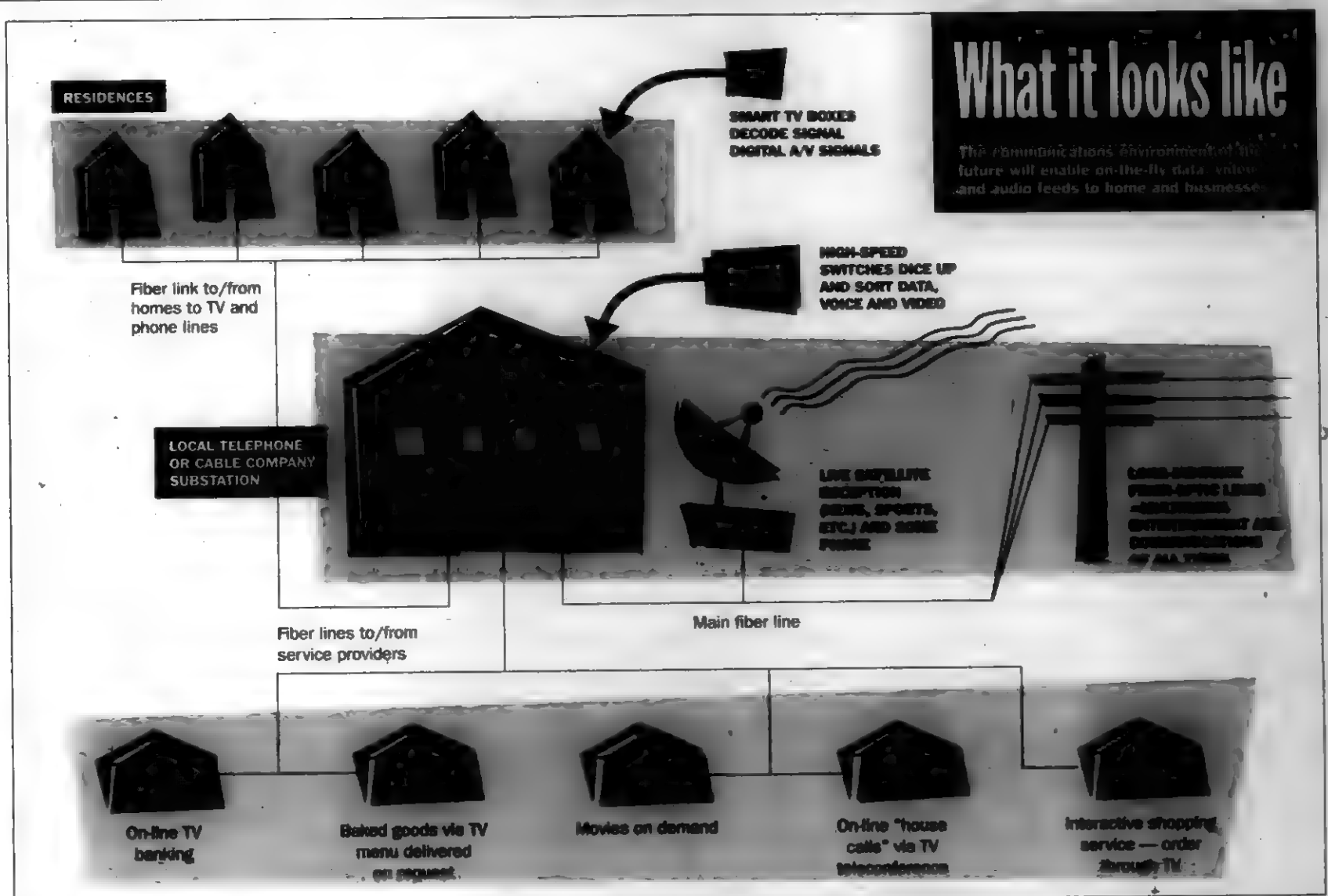
Millison agrees. "It takes an individual with a broad understanding of both the technical and artistic sides to create entertaining multimedia productions." Millison says such an information systems person might have a graphics design background or may have done a stint in film school.

Such skills will open doors to new types of work. For example, to help sell vacation homes, one Los Angeles real estate company recently hired an advertising agency whose IS people had to devise a multimedia kiosk application that would enable users to "walk" around the grounds of the new development, viewing homes from various angles and even browsing from room to room in the new homes.

Users can hear voice-overs on everything from construction elements to the specifications on kitchen appliances and hear the sound of waves crashing as they look out windows to take in the ocean view.

"Personality tests used to classify [IS types] as extremely rigid, meticulous, follow-the-directions people," says Billy Brackenridge, a programmer/engineer at Echo Speech Corp. in Carpinteria, Calif., who designs chips and algorithms for sound cards to use in Apple Computer, Inc. PCs. "But that is no longer the case. The new breed of [IS people] are not just techies but liberal artists."

At Echo Speech, for example, an understanding of music is essential to the creative process. In fact, the job requirements for one recent pro-



gramming position included being able to play a musical instrument.

"There will always be a need for hardware designers and software engineers," Millison says. "But these careers will begin to blend with the creative disciplines as technology changes and evolves."

The topics in Millison's own publication reflect this blend of the practical and the creative. Among some of the articles in the premier issue are "Building multimedia databases" and "Designing instructional ISDN," but also "Making money as a title brewer."

A 'techno-artist' would be able to combine the talents of a storyteller, musical director and software developer with the management experience to direct large multimedia projects.

The one to watch

One technology evolution to watch is in old software languages, which are changing to handle the requirements of this new field. The foundation of multimedia development is today's new authoring systems, which help IS structure the interactive multimedia experience along a time line or through iconographic representation.

Authoring tools are generally based on object-oriented scripting languages, such as Script X from Kaleida, a joint venture between IBM and Apple.

Another Apple authoring tool, Apple Personal Intelligent Electronics (PIE), includes a media kit for nontechnical people and a programming environment for software developers.

A "nontechnical" creative director at an advertising agency, for instance, could use the media kit to create a rough prototype of an application. Apple PIE then generates the scripting code, which is tailored by a skilled software developer to create a slick-running program. Other tools of this type are popping up for Windows and Unix platforms.

"If you want to get in at the core of this, you'd best be learning C and moving quickly on to C++," Canter advises. "The glue that binds it all together is object-oriented technology, with its ability to treat abstract entities like real-world objects."

Multimedia professionals will also have a much more interesting array of interface technologies to work with: voice recognition, holographic interaction with three-dimensional characters and virtual reality interfaces.

"The switch from static, character cell screens to graphical, event-driven environments is just a shadow of what user interface programming will soon entail," Millison predicts.

Every screen will be a window into a massive network. Computers will respond to commands that are spoken, scribbled and pointed at, as well as typed. Users may reach for a mouse or may prefer their remote controls.

This means application developers will have to master new kinds of interfacing techniques, where an "event" might just as easily be triggered by someone someday pointing to a sensitive area in a 3-D holograph as it is by someone today moving the mouse arrow to a sensitive area of the screen.

In the communications area, skill in telecommunications, infrared technology and fiber optics will be important. As companies race to put the emerging high-bandwidth infrastructure to work, "there will be a welcome reception for network administrators who can apply these new sciences to the complexities of wide-area and internetwork connectivity," Millison predicts.

Get back to the basics

But all this glitz and glamour doesn't mean that core skills don't cut it. Understanding how a computer is put together, how a disk drive works, what makes a good software program and how to configure a network optimally are still vital skills.

"Those things aren't going to go away no matter how well-insulated we become from them through modern languages, graphical user interfaces and all the other squishy-feely stuff," Brackenridge says.

He pauses, searching for an example. "Sure, we hired a musician to fill a position, and part of his job description is to play video games. But he also happens to be an acoustical engineer and have a degree in physics." ■

Reading & resources

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Baum is a free-lance writer based in Santa Barbara, Calif.

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COMPUTERWORLD

SQL: A crucial building block

By Joe Panepinto

THE VERDICT IS IN, and it's as close to unanimous as you can get. If you are an information systems professional building database or client/server applications today, you are going to use some implementation of ANSI/ISO-standard structured query language (SQL). And, according to database professionals, these skills are in demand across all vertical industries.

"SQL skills are almost a necessary prerequisite if you're looking for a job in database or client/server development today," says Jeff Tash, database consultant at Database Decisions in Boston.

The level, amount and type of SQL knowledge needed is going to vary widely from situation to situation. For example, SQL commands are divided into Data Manipulation Language (DML) and Data Definition Language (DDL). Recently, the SQL Access Group in Weymouth, Mass., published two extensions to SQL aimed mainly at client/server development: SQL Call Level Interface and SQL Remote Database Access.

Most power users can learn from basic tutorials or manuals much of the necessary DML command structure and syntax to retrieve [Select] and edit [Update] tables. But for IS professionals, DDL knowledge is more important and more difficult to learn because it involves the design and creation of the databases themselves — the columns, rows and tables that comprise a SQL database. Database professionals may be able to pick up the necessary know-how from books, or more likely, from vendor-sponsored training aimed at commercial SQL implementations or even SQL training centers such as QED Information Sciences, Inc. in Wellesley, Mass.

Who needs to know?

"The amount of SQL you need to know to hit on a database is pretty limited," says Steve Roti, president of Olympia Software in Seattle. "The amount the database administrator needs to know to set up the tables and make the joins is much more substantial."

Most users see screens with predefined views of the data and can run simple Select queries against it; database administrators need to know what's going on behind the scenes. That means making sure the "joins" necessary to fulfill a Select statement are specified correctly or else power users could easily write ad hoc SQL queries that could take hours to run and consume valuable disk space, Roti says.

In contrast to Cobol, which relies on procedural programming for data manipulation, SQL is nonprocedural and based on "set" theory, Roti says. In Cobol, a programmer combines the data in two tables sequentially by reading the data out of the first table, then doing look-ups on the second table. In SQL, the request is made for "sets" of data (columns of data that can be in different tables) that are then written into a temporary table or "cursor." In theory, the user need not care which tables the data comes from.

"Some people trained in Cobol have to unlearn some things before they can understand SQL," Roti says. "SQL is all about set processing and set mathematics, which presents a different conceptual model for data processing in comparison with sequential record processing."

This leads to a picture of SQL as a somewhat stripped-down, straightforward language that requires in-depth database and data structure knowledge to implement effectively.

Herb Edelstein, a principal at Euclid Associates in Potomac, Md., emphasizes the importance to SQL programmers of basic database design knowledge. While many database application development programs automatically generate SQL code and identify the correct data paths based on graphical depictions of the database, database administrators should know the data paths and double-check their accuracy.

Also, every SQL statement that retrieves or updates data generates locks that can affect other queries or overall throughput, Edelstein says. He recommends that database administrators come up to speed in three areas: general database design, the idiosyncrasies of their particular relational database management system and SQL.

Panepinto is a free-lance writer in Amherst, Mass.

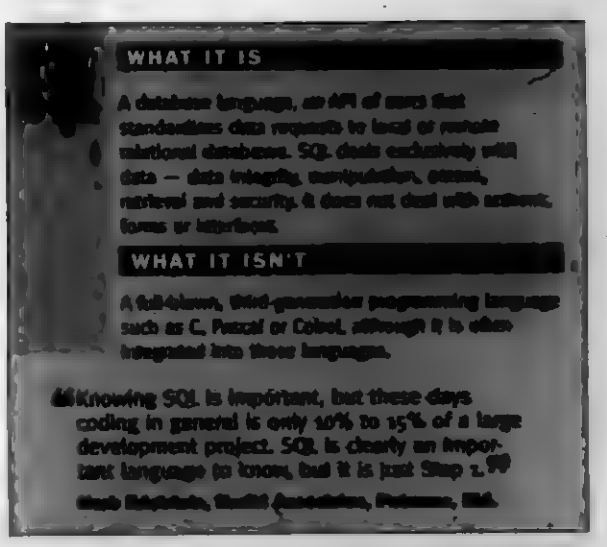
BOOKS

Introduction to SQL by Rick Van der Lans, Addison Wesley, Reading, Mass.

A Guide to the SQL Standard: A Users' Guide by Chris Date, Addison Wesley, Reading, Mass.

The Database Experts' Guide to SQL by Frank Lusardi, McGraw Hill, New York

A Visual Introduction to SQL by Harvey Trimble, Wiley, New York



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KEEPING UP

BY ROBERT W. HARRISON

Harbison is owner of Network Integration Consultants in Sausalito, Calif. He is an independent network consultant specializing in the design and implementation of local- and wide-area networks and multiplatform connectivity.

Q. What options are available from public and private packet-switched carriers, and what kind of performance can be anticipated?

A. Public packet-switched networks are available in two basic types, X.25 and frame relay. X.25 networks offer low- to medium-speed performance beginning at 1.2K bit/sec. and progressing up to a maximum of 56K bit/sec.

The X.25 carriers provide for a single connection to their switched packet network, allowing the user to connect to many different sites. This one-to-many type of connection is appealing to users with numerous locations. X.25 networks are available worldwide.

An improvement on the X.25 packet service, known as frame relay, is available from a growing number of worldwide carriers. Frame relay is very similar to X.25 in that it packetizes data with a source and destination address and places the packets on the network where the internal network switches send them to the correct destination.

Frame relay, however, begins service at 56K bit/sec. and provides variable rates up to 2.048M bit/sec. It can be implemented on most existing routers and many bridges simply by adding the software to properly packetize the data and communicate with the carrier network.

Q. What are some of the slower and less expensive ways to connect remote users to LANs or to provide LAN-to-LAN connections?

A. At the low end, standard asynchronous modem communications can handle low volumes of occasional data with speeds up to 14.4K bit/sec. and with data compression enhancements that can bring performance up to 56K bit/sec.

Another method is through the use of the Integrated Services Digital Network (ISDN) Basic Rate Interface. This uses standard telephone circuits in a switched-type connection that offers performance up to 128K bit/sec. Some ISDN equipment provides additional compression techniques that boost ISDN Basic Rate performance up to 400K bit/sec. Most telephone companies are beginning to offer ISDN Basic Rate service in many areas but not all.

Q. What are point-to-point WAN connections and what kind of performance can be expected?

A. When larger volumes of data need to be communicated, dedicated lines can be leased from the telephone carriers in a point-to-point connection with performance between 56K bit/sec. and 1.544M bit/sec.

This type of connection provides for good LAN-to-LAN interconnection as well as performance. The lines are always connected, and they provide a fixed monthly charge.

Be aware of these basic guidelines: A 56K bit/sec. circuit is roughly 175 times slower than a normal Ethernet LAN. And the faster 1.544M bit/sec. connection (known as a T1 circuit), although 27.5 times faster than the 56K bit/sec. circuit, is still 6.5 times slower than the Ethernet performance.

Point-to-point leased line connections must be made for each site you wish to connect to and are billed on a circuit speed flat-rate fee plus an additional per-mile charge; they can be expensive for long distances.

Q. What are the newer communications technologies that are referred to as "fast packet" communications?

A. Fast packet services are based on a cell-switching technology that packetizes all data types such as voice, video and fax into 53-byte cells of information that are forwarded over a cell switching network. Asynchronous Transfer Mode (ATM), broadband ISDN and Switched Multimegabit Data Services (SMDS) all use a common network switching technique known generically as "cell relay."

Each cell is of equal length regardless of data type, thereby providing consistent network performance. Frame relay's variable length data structure is not very adaptable to or suitable for time-sensitive data such as phone or video information. Cell relay, however, can forward virtually all types of data without time variations.

SMDS is available only in large metropolitan areas and is still limited to only a few carriers. ATM and broadband ISDN are on the drawing boards of many carriers, but actual service is generally not available to the average user and probably will not be for at least another year or two. Availability is expected to be spotty at best for the next three or four years.

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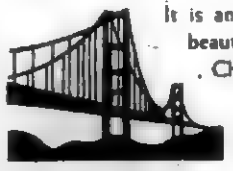

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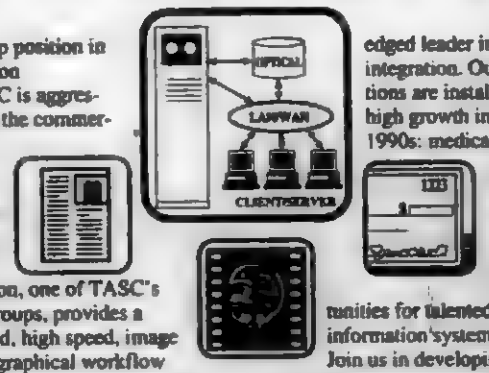

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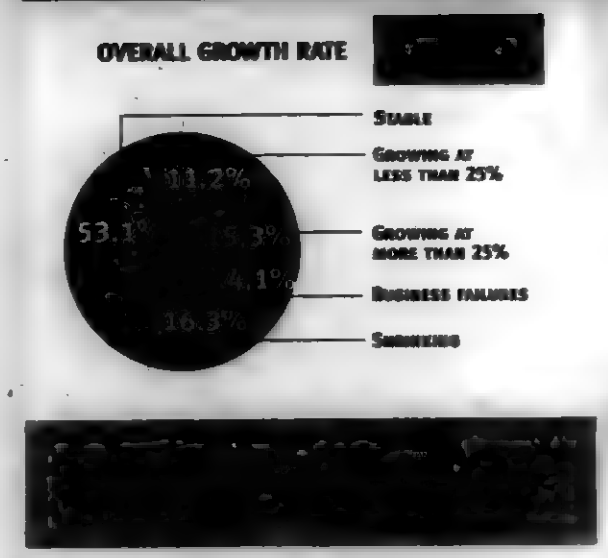

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NETWORK INVENTORY MANAGEMENT SOFTWARE

'My vendor didn't tell me that. . .'

shopper alert!

By Alice Bredin

Network professionals are not insulated from bad buys. They often learn on the job about troublesome product characteristics that were never mentioned during presale discussions with the vendor.

These problems can be inconvenient, but more important, they can result in poor network performance. In a recent poll, network professionals shared their complaints, frustrations and advice on purchasing network inventory management software.

'. . .the software isn't compatible with older PC models.'

■ When network administrator Barbara Vernon Ryan bought network inventory software for her San Francisco-based employer, Specialty Brands, Inc., she did not get what she hoped for. Although she was told the software was designed to run on any Intel Corp.-based 80386 PC, it did not run on some of the company's older networked 386s.

When it did, the PCs froze, making it necessary to modify the network scripting to exclude the older systems from the software. Unfortunately, the vendor had neglected to mention this quirk.

Vernon Ryan now knows that even though software is compatible with a certain system type, that does not mean it will run on every one.

"Now I ask for a database of known problems with the software. I also want to be put in touch with a customer that has an almost identical network so I can uncover the problems myself," Vernon Ryan explains.

'. . .the software won't let me choose the frequency of network scans.'

■ One of the features Sandra Duphily, a local-area network administrator at Ocean Spray Cranberries, Inc. in Middleboro, Mass., wanted but did not get was the freedom to designate how often the inventory package scans the system to determine what software is running. Some packages have this capability, but others mandate a search every time the system is turned on. Duphily has learned that vendors do not necessarily mention this difference because it is a significant drawback.

"You may want the machine to execute the process of checking what's on the system only once a week because you don't want the user to spend 10 minutes logging on each time," she says.

'. . .the software only accepts user IDs to identify users on the network.'

■ Some packages identify the user by a user identification; others use a network interface card address. A package relying on user IDs will prevent a company from keeping track of its systems because it logs the user onto all systems on the network.

The problem with this method is that it registers the user as having all of the network's software on his desktop. Network interface card addresses reflect only what software is contained on the system a person is working on.

"We need an automated process that accurately reflects inventory so we don't have to walk around to every desk and see what each person has," Duphily explains. "This way, when your boss asks, 'What does Mary Jo have on her desk?', you know."

'. . .the quality of the report printouts is poor.'

■ Roscoe Floyd, LAN specialist at Humiston Keeling Co., a pharmaceutical distributor in Calumet City, Ill., says his vendor failed to tell him the network inventory package he bought does not generate polished reports.

Although Floyd says that he is pleased with the package's systems monitoring capability, the hard copy reports are unfortunately not suitable for widespread use.

When the vendor was called to task, it acknowledged the weakness.

"I now have to plug the inventory information into WordPerfect to make nice-looking reports. Next time, I will ask to see an example report to check the quality," Floyd says.

'. . .the software inventories by file name only.'

■ Wayne Robertson, network administrator at Saint Agnes Medical Center in Fresno, Calif., has also learned a lesson from the school of hard knocks. He purchased a network inventory package and discovered that it did inventories by file name only, rather than by examining the code.

"The problem with this approach is that if I name a file WP, the system may think it's WordPerfect if it doesn't examine a few lines of the file's code," Robertson says. "These packages are operating on guesswork instead of closely examining files."

Robertson says he learned how to ask the right questions when he finally determined he could not assume anything. "Vendors are delivering a functional piece of software, but just because it runs doesn't mean it's going to meet all my needs," Robertson says. "I used to make a lot of assumptions. Now I make a lot of enemies for asking so many questions."

Bredin is a free-lance writer in New York.

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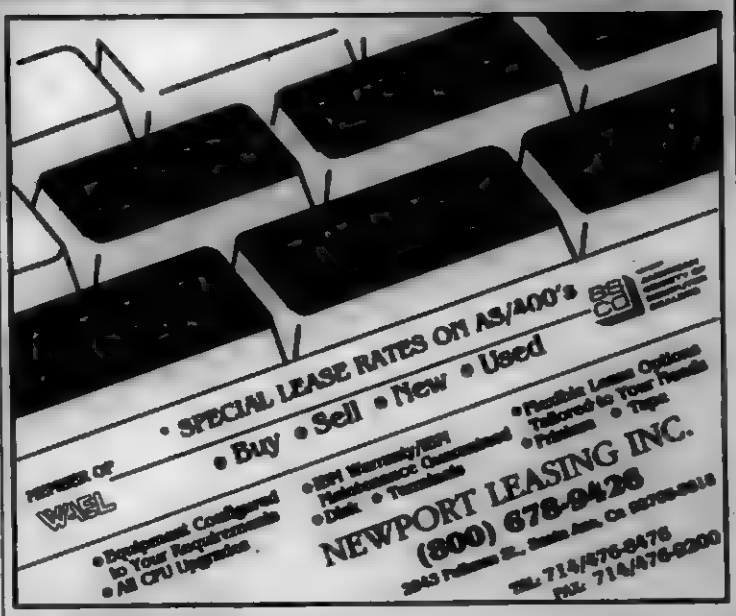

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Cray Computer	28.6	Policy Management Sys.(L)	-16.7
Aztec Communication Corp.	24.4	Borland Int'l Inc.(L)	-12.3
Basel Corp.	21.7	DSC Communications(H)	-12.0
Mecca Software	21.1	Bolt, Beranek & Newman(H)	-11.8
TeleCard Systems	19.4	Walker Interactive Systems	-11.5
Bowne Discount Software(L)	18.5	McAfee Associates	-11.5
General Datacomm Inds.	18.4	Chips and Technologies	-9.1

Dollar

Hewlett Packard Co.	3.75	DSC Communications(H)	-7.50
TeleCard Systems	3.50	Policy Management Sys.(L)	-4.63
Group I Software	3.00	SynOptics(H)	-3.00
Compaq Computer Corp.	2.88	Wellfleet Communications(H)	-3.00
Intel Corp.	2.75	Cisco Systems Inc.(H)	-2.75
Matsushita Electronics(H)	2.50	Sybase Inc.	-2.63
PeopleSoft	2.50	Sun Microsystems Inc.	-2.63
Powersoft	2.50	Autodesk Inc.	-2.63

[redacted]

Street favors Parallan . . .

Parallan Computer, Inc. (PLLN) seems to be the investment analyst favorite among superserver vendors right now.

Parallan's local-area network servers are sold through IBM (IBM), providing access to IBM's superior marketing muscle and excellent resources for research and development. IBM recently announced that it will fund development work for Parallan servers running Microsoft Corp.'s (MSFT) interminably awaited Windows NT operating system.

As a result, Parallan found its way onto the Focus List at Needham & Co. and the Best Picks list at Volpe, Welty & Co. Both Wall Street firms said they like Parallan's long-term prospects and recommend purchase of Parallan shares.

Volpe, Welty analyst Paul Bloom noted that a narrow revenue shortfall in Parallan's most recent quarter was due solely to the way Parallan elects to recognize revenue from IBM.

Other technology companies that made the Focus List include the following: Cisco Systems, Inc., because of the phenomenal demand for high-end routers; Informix Corp., which Needham & Co. said is still undervalued among relational database management system manufacturers; Sybase, Inc., the leader in earnings per share growth; and PeopleSoft, Inc., which has maintained an early lead in client/server software.

. . . and transaction processors

Credit-card transaction processors First Financial Management Corp. (FFM) and Envoy Corp. (ENVY) have also drawn attention from Wall Street in recent weeks.

Donaldson, Lufkin & Jenrette Securities Corp. initiated coverage of First Financial Management with a rating of Very Attractive. Market leader First Financial Management handled roughly $43 billion in merchant credit-card transactions last year and is ready to jump into the lucrative health care processing field.

Smith Barney Shearson, Inc. analyst Keith Mullins upgraded Envoy's rating to Buy in an Aug. 6 report. Having completed the difficult assimilation of two major accounts (totaling 70 million transactions annually), Envoy should begin to pick up steam.

The company is well-positioned in credit-card processing and electronic prescription claims processing. Trends in both arenas point to strong growth potential for Envoy, Mullins said.

—Derek Slater

Exch	52-Week High	52-Week Low		Aug 13 3PM	Wk Net Change	Wk Pct Change
Communications & Networking						
OTC	40.00	10.25	3 COM Corp.	22.38	-0.13	-0.6
NYS	82.88	63.38	American Info Techs Corp.(H)	81.50	-0.75	-0.9
NYS	65.00	40.63	AT&T	62.13	-0.50	-0.8
OTC	4.06	0.75	Aztec Communication Corp.	3.50	0.69	24.4
OTC	24.50	10.25	Banyan Systems Inc.	18.75	-1.00	-5.1
NYS	60.13	44.50	Bell Atlantic Corp.	58.13	0.00	0.0
NYS	58.88	46.75	Bell South Corp.	56.00	0.00	0.0
NYS	14.50	3.63	Bolt, Beranek & Newman(H)	11.25	-1.50	-11.8
OTC	18.50	9.50	Brooktrout Technology	11.75	-1.00	-7.8
NYS	119.00	53.00	Cabletron Systems(H)	115.75	1.50	1.3
OTC	28.00	5.88	Centigram Communications(H)	27.50	1.00	3.8
OTC	54.25	19.00	Chipcom Corp.(H)	50.88	-0.13	-0.2
OTC	59.25	22.13	Cisco Systems Inc.(H)	53.75	-2.75	-4.9
OTC	16.38	5.50	Compression Labs Inc.	13.63	0.00	0.0
OTC	36.00	13.00	CrossComm	26.75	-1.50	-5.3
OTC	4.63	1.38	Data Switch Corp.	3.00	0.13	4.3
NYS	19.88	12.38	Digital Comm. Assoc.	13.88	0.50	3.7
OTC	12.75	3.75	Digital Systems Int'l Inc.(L)	4.25	-0.25	-5.6
OTC	60.63	5.88	DSC Communications(H)	54.75	-7.50	-12.0
OTC	9.50	4.75	Fibronix Int'l Inc.	5.25	-0.38	-6.7
OTC	24.00	8.75	Frenet Corp.	12.50	0.25	2.0
OTC	4.38	1.50	Gandalf Technologies Inc.	2.63	-0.13	-4.5
OTC	2.06	0.81	Gateway Communications(L)	0.88	0.03	3.7
NYS	15.75	2.88	General Datacomm Inds.	11.25	1.75	18.4
ASE	3.75	2.00	Go Video	2.44	0.00	0.0
NYS	37.75	32.38	GTE Corp.	36.13	0.88	2.5
NYS	93.00	62.75	ITT Corp.(H)	92.13	2.38	2.6
OTC	29.88	16.06	MCI Communications Corp.	28.75	0.25	0.9
OTC	6.50	1.50	Microcom Inc.	1.75	-0.13	-6.7
OTC	24.25	3.50	Netrix Corp.	3.88	-0.13	-3.1
OTC	19.00	7.00	Network Computing Devices	7.25	-0.50	-6.5
NYS	15.00	5.38	Network Equipment Tech.	9.25	0.00	0.0
OTC	20.13	8.00	Network General	11.38	-0.25	-2.2
OTC	15.75	6.88	Network Systems Corp.	7.75	0.50	6.9
OTC	61.13	7.63	Newbridge Networks Corp.(H)	57.38	-2.38	-4.0
NYS	46.00	21.38	Northern Telecom Ltd.	23.63	-0.75	-3.1
OTC	35.25	17.63	Novell Inc.	21.50	-1.50	-6.5
NYS	92.50	79.00	Nynex Corp.	90.50	2.13	2.4
OTC	30.00	14.50	Octel Communications Corp.	21.50	-0.50	-2.3
OTC	6.13	3.38	Perrin Data Comm Networks	3.75	-0.25	-6.3
OTC	30.50	10.25	Picturetel Corp.	18.13	0.88	5.1
OTC	15.25	3.63	Proteon Inc.	4.00	0.00	0.0
NYS	35.00	16.84	Scientific Atlanta Inc.	33.75	-0.38	-1.1
NYS	41.88	31.75	Southwestern Bell Corp.(H)	41.88	1.50	3.7
NYS	36.63	22.25	Sprint Corp.	35.25	-0.25	-0.7
OTC	27.00	11.38	Standard Microsystems Corp.	19.50	1.38	7.6
OTC	18.50	8.25	Stratacom Inc.	12.50	0.00	0.0
OTC	42.75	10.75	Synoptics Communications	29.25	-1.13	-3.7
OTC	7.00	3.75	Telebit Corp.	4.50	-1.00	-18.2
OTC	10.75	2.25	Telematics Int'l Inc.	10.75	0.88	8.9
OTC	28.50	14.00	US Robotics	28.00	0.00	0.0
NYS	47.75	35.25	US West Inc.	45.88	-0.38	-0.8
OTC	56.00	17.50	Wellfleet Communications(H)	50.75	-3.00	-5.6
OTC	18.00	7.25	Xircom	18.00	1.75	10.8
Personal Computers & Peripherals						
OTC	5.56	2.50	Advanced Logic Research	5.25	0.25	8.3
OTC	65.25	25.25	Apple Computer Inc.	27.75	-2.50	-8.3
OTC	24.25	11.25	AST Research Inc.	14.50	-0.13	-0.9
NYS	9.38	2.50	Commodore Int'l	3.75	0.25	7.1
NYS	61.75	27.75	Compaq Computer Corp.	52.63	2.88	5.8
OTC	49.88	13.50	Dell Computer Corp.	19.63	-0.25	-1.3
NYS	99.25	50.25	Hewlett Packard Co.	75.25	3.75	5.2
NYS	39.75	17.63	Silicon Graphics	33.13	-1.25	-3.6
OTC	41.00	24.00	Sun Microsystems Inc.	26.50	-2.63	-9.0
NYS	32.38	22.25	Tandy Corp.	29.00	-0.50	-1.7
OTC	7.00	2.75	Zeos International Ltd.	3.00	-0.25	-7.7
Large Systems						
ASE	15.13	4.63	Amdahl Corp.	5.25	0.00	0.0
NYS	8.75	3.75	Convex Computer	3.75	-0.13	-3.2
OTC	6.13	2.25	Cray Computer	3.38	0.75	28.6
NYS	30.88	19.00	Cray Research Inc.	20.63	-0.50	-2.4
NYS	13.88	7.63	Data General Corp.	8.25	0.25	3.1
NYS	49.25	30.38	Digital Equipment Corp.	36.25	-0.25	-0.7
NYS	43.38	28.38	Harris Corp.	43.13	0.88	2.1
NYS	89.13	41.13	IBM	41.50	-1.75	-4.0
OTC	22.00	5.50	Kendall Square Research	19.75	1.25	6.8
NYS	132.00	83.00	Matsushita Electronics(H)	132.00	2.50	1.9
OTC	23.75	8.75	NetFrame	15.00	0.25	1.7
OTC	17.25	9.25	Parallan Computer	15.00	-0.75	-4.8
OTC	21.00	6.00	Pyramid Technology	19.00	0.00	0.0
OTC	24.00	11.25	Sequent Computer Sys.	14.63	0.38	2.6
OTC	8.75	1.38	Sequoia Systems Inc.	1.91	-0.09	-4.7
NYS	48.38	20.25	Stratus Computer Inc.(L)	23.88	1.25	5.5
NYS	16.88	9.63	Tandem Computers Inc.	9.63	-0.38	-3.8
NYS	23.50	10.63	TeleCard Systems	21.50	3.50	19.4
NYS	13.88	7.75	Unisys Corp.	10.88	0.63	6.1
Software						
OTC	37.00	12.63	Adobe Systems Inc.	27.25	0.38	1.4
OTC	20.75	10.25	Aldus Corp.	16.50	-1.25	-7.0
OTC	11.25	5.50	American Software Inc.	7.50	0.88	13.2
OTC	20.13	9.50	Ask Computer Systems	10.63	0.13	1.2
OTC	56.75	38.63	Autodesk Inc.	43.38	-2.63	-5.7
OTC	10.50	2.50	Bachman Info. Systems	3.63	0.25	7.4
OTC	43.00	31.00	BGS Systems Inc.	31.50	-0.75	-2.3
OTC	84.13	38.75	BMC Software Inc.	57.50	-0.50	-0.9
OTC	28.25	18.00	Boole & Babbage	24.00	0.50	2.1
OTC	49.00	16.00	Borland Int'l Inc.(L)	16.00	-2.25	-12.3
OTC	5.00	2.75	CE Software(L)	2.88	-0.25	-8.0
ASE	34.88	8.59	Cheyenne Software Inc.	32.13	-0.75	-2.3
OTC	19.50	8.25	CimSoft	10.00	0.50	5.3
OTC	8.88	5.63	Cognos Inc.	8.75	0.00	0.0
NYS	31.38	13.00	Computer Associates	29.50	-0.38	-1.3
NYS	12.38	2.75	Computervision Corp.	3.13	0.00	0.0
OTC	34.25	19.25	Compuware Corp.	27.75	1.50	5.7
OTC	14.75	5.75	Comshare Inc.	9.00	-0.75	-7.7
OTC	20.38	10.75	Corel Corp.(H)	20.38	1.88	10.1
OTC	15.25	5.00	Easel Corp.	7.00	1.25	21.7
OTC	25.25	12.00	4th Dimension	19.25	0.75	4.1
OTC	19.50	5.25	Frame Technology	8.13	0.63	8.3
OTC	17.50	8.38	Group I Software	13.00	3.00	30.0
OTC	35.25	14.50	Gupta	18.00	-0.13	-0.7
OTC	10.25	4.13	Hogan Systems Inc.	9.75	0.50	5.4
OTC	25.75	11.25	IMRS	21.25	0.75	3.7
OTC	38.00	21.00	Information Resources	35.75	-0.50	-1.4
OTC	27.25	9.06	Informix Corp.	20.00	-1.88	-8.6
OTC	16.75	8.50	Intergraph Corp.(L)	9.25	0.25	2.8

Exch	52-Week High	52-Week Low		Aug 13 3PM	Wk Net Change	Wk Pct Change
OTC	13.63	6.00	Interleaf Inc.	6.88	-0.13	-1.8
OTC	18.00	4.75	Intersolv Inc.	6.00	0.63	11.6
OTC	16.00	7.75	Knowledgeware Inc.	11.63	0.38	3.3
OTC	54.75	15.50	Legent Corp.	20.38	-0.50	-2.4
OTC	60.13	14.75	Lotus Development(H)	56.00	-0.63	-1.7
OTC	23.00	5.75	MathSoft	6.50	-0.25	-3.7
OTC	23.25	8.50	McAfee Associates	5.75	-0.75	-11.5
OTC	31.63	2.00	Mecca Software	5.75	1.00	21.1
OTC	12.00	5.25	Mentor Graphics	9.00	-0.25	-2.7
OTC	46.00	26.63	Micro Focus	27.00	-0.25	-0.9
OTC	13.25	4.38	Micrografx Inc.	6.50	0.38	6.1
OTC	98.00	68.00	Microsoft Corp.	74.75	0.00	0.0
NYS	53.75	15.75	Oracle Corp.(H)	51.38	-1.63	-3.1
OTC	38.50	18.38	Parametric Technology(H)	37.00	-0.13	-0.3
OTC	40.50	22.50	Peoplesoft	33.75	2.50	8.0
OTC	7.13	3.50	Phoenix Technologies	4.38	-0.13	-2.8
OTC	40.00	22.00	Powersoft	31.25	2.50	8.7
OTC	41.50	17.00	Platinum Software	37.50	0.63	1.7
OTC	25.00	10.75	Platinum Technology	13.88	1.38	11.0
OTC	61.50	32.25	Progress Software Corp.	52.50	1.75	3.4
OTC	7.38	2.56	Quarterdeck Office Sys.	2.94	-0.06	-2.1
OTC	32.00	15.00	Rainbow Technologies Inc.	27.00	2.00	8.0
OTC	10.75	4.00	Rasterops	8.50	0.00	0.0
OTC	15.25	3.63	Ross Systems	8.88	0.50	6.0
OTC	27.75	9.63	Sapiens Intl. Corp. N.V.	23.75	-1.38	-5.5
OTC	14.50	5.50	Software Publishing Corp.	6.00	0.25	4.3
OTC	13.63	2.50	Software Toolworks Inc.	13.63	1.13	9.0
OTC	2.75	0.75	Spinnaker Software	1.31	-0.06	-4.5
OTC	13.00	3.25	State of the Art	11.25	-0.25	-2.3
NYS	24.63	15.00	Sterling Software Inc.	23.25	1.00	4.5
OTC	21.63	8.00	Struct. Dynamics Research(H)	20.13	-0.50	-2.4
OTC	77.50	26.50	Sybase Inc.	70.88	-2.63	-3.6
OTC	18.63	5.88	Symantec Corp.	16.25	1.13	7.4
NYS	12.50	5.25	Systems Center Inc.	10.25	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	25.00	1.00	4.5
OTC	6.38	2.25	Tenzic Corp.	3.38	0.13	3.8
OTC	23.25	10.00	ViewLogic Systems(H)	21.88	-0.13	-0.6
OTC	23.50	5.50	Walker Interactive Systems	5.75	-0.75	-11.5
OTC	3.19	1.31	Wordstar	1.31	-0.03	-2.3
Semiconductors						
NYS	32.88	8.38	Advanced Micro Devices	29.88	2.00	7.2
NYS	24.25	9.38	Analog Devices Inc.	24.25	1.13	4.9
OTC	35.00	7.63	Atmel Corp.(H)	31.63	-1.75	-5.2
OTC	5.50	2.75	Chips and Technologies	3.75	-0.38	-9.1
OTC	39.75	13.00	Cirrus Logic	27.25	1.63	6.3
NYS	16.38	7.88	Cypress Semiconductor Corp.(H)	15.38	-0.13	-0.8
NYS	17.88	9.38	Dallas Semiconductor(H)	17.88	0.25	1.4
OTC	60.63	27.13	Intel Corp.	59.75	2.75	4.8
NYS	19.25	4.88	LSI Logic Corp.(H)	17.25	1.13	6.1
OTC	23.50	11.66	Lattice Semiconductor(H)	21.88	-0.88	-3.8
NYS	50.00	14.38	Micron Technology(H)	49.50	0.13	0.3
NYS	98.50	41.38	Motorola Inc.(H)	95.88	-1.50	-1.5
NYS	18.88	9.88	National Semiconductor(H)	18.38	0.63	3.5
OTC	15.75	6.50	Sierra Semiconductor	8.00	0.88	12.3
OTC	51.75	23.00	SynOptics(H)	48.00	-3.00	-5.9
NYS	78.13	36.75	Texas Instruments(H)	75.88	0.75	1.0
OTC	14.25	6.50	VLSI Technology(H)	14.25	1.38	10.7
OTC	12.63	2.63	Weitek	12.63	1.75	16.1
ASE	9.63	3.63	Western Digital Corp.	5.25	0.38	7.7
OTC	64.00	16.50	Xilinx(H)	62.00	0.50	1.2
OTC	33.00	15.34	Zilog Inc.	30.25	1.75	6.1
Peripherals & Systems						
OTC	45.25	15.00	American Power Conversion	45.25	0.25	0.6
OTC	20.16	15.50	Banctec Inc.	18.63	0.13	0.7
OTC	18.00	6.00	Cambex Corp.	6.00	-0.25	-5.9
ASE	5.88	872.00	Cognitronics Corp.(L)	5.88	0.00	0.0
NYS	25.50	9.00	Conner Peripherals	11.13	-0.63	-5.3
OTC	38.50	13.88	Creative Technologies Inc.	21.00	0.13	0.6
OTC	30.75	11.00	Data Race Inc.	14.00	-0.50	-3.4
ASE	13.25	4.75	Databank Corp.	8.75	-0.38	-4.1
NYS	31.88	5.06	EMC Corp.(H)	30.00	0.38	1.3
OTC	10.50	5.38	Emulex Corp.	6.75	0.63	10.2
OTC	19.00	13.25	Evans & Sutherland	16.50	0.25	1.5
OTC	17.25	7.50	Exabyte	9.13	0.38	4.3
OTC	28.75	7.09	Intelligent Inpu. Systems	26.75	1.75	7.0
OTC	8.88	3.63	Iomega Corp.	3.63	0.00	0.0
OTC	15.25	5.75	IPL Systems Inc.	8.50	-0.38	-4.2
OTC	24.00	14.00	Komag Inc.	20.50	0.50	2.5
OTC	19.63	4.38	Maxtor Corp.(L)	4.88	0.25	5.4
OTC	10.75	5.75	Micropolis Corp.	7.13	1.00	16.3
NYS	117.00	97.00	3M Corp	108.25	1.38	1.3
OTC	7.75	4.00	Printronix Inc.	6.88	0.63	10.0
NYS	17.25	6.88	QMS Inc.	9.25	-0.38	-3.9
OTC	17.88	9.50	Quantum Corp.	11.63	0.75	6.9
OTC	9.75	3.13	Radius Inc.	3.88	0.00	0.0
NYS	16.50	8.00	Recognition Equipment	12.88	-0.38	-2.8
OTC	13.88	3.75	Reton Inc.	4.25	0.38	9.7
OTC	22.38	12.00	Seagate Technology	19.13	-0.88	-4.4
NYS	45.00	18.00	Storage Technology	24.88	-1.75	-6.6
NYS	27.88	17.63	Tektronix Inc.	26.13	-0.25	-0.9
NYS	88.88	70.25	Xerox Corp	74.00	1.00	1.4
Services						
OTC	23.75	14.88	American Mgmt. Systems	17.75	1.50	9.2
NYS	4.75	2.38	Amdocs Inc.	2.88	0.00	0.0
OTC	35.75	16.25	Analysts Int'l	31.00	0.25	0.8
NYS	56.13	43.00	Auto Data Processing	50.88	0.75	1.5
NYS	17.25	12.50	Ceridian Corp.	15.00	-0.25	-1.6
NYS	17.38	13.13	Comdisco Inc.	14.63	0.13	0.9
OTC	9.00	4.50	Computer Horizons	9.00	0.38	4.3
NYS	88.13	63.50	Computer Sciences(H)	88.13	2.00	2.3
NYS	9.25	6.00	Computer Task Group	6.13	0.00	0.0
NYS	40.50	19.00	Compulsa Inc.	24.38	0.13	0.5
OTC	14.25	6.00	Corporate Software	11.00	1.00	10.0
OTC	12.75	6.63	Egghead Discount Software(L)	8.00	1.25	18.5
NYS	35.88	26.00	General Motors E (EDS)	30.25	1.88	6.6
OTC	25.50	10.50	Macom Corp.	20.75	-1.00	-4.6
OTC	16.63	8.13	Intelligent Electronics	16.63	1.50	9.9
OTC	13.13	6.88	Microsil	12.38	1.63	15.1
NYS	24.50	5.75	Microage Inc.(H)	22.00	-0.75	-3.3
OTC	43.75	24.50	Paychex	43.25	-0.50	-1.1
NYS	87.25	23.00	Policy Management Sys.(L)	23.00	-4.63	-16.7
NYS	42.88	20.38	Reynolds and Reynolds(H)	42.88	2.25	5.5
OTC	17.25	11.00	SEI Corp.	16.50	-0.25	-1.5
OTC	24.38	17.50	Shared Medical Systems	20.88	-0.88	-4.0
OTC	12.63	5.75	SHL Systemhouse	10.75	0.50	4.9
OTC	30.75	20.00	Software Spectrum Inc.	23.00	0.75	3.3
OTC	59.25	23.25	Sungard Data Systems(H)	59.00	0.00	0.0
NYS	4.38	3.13	Ultimate Corp.	3.75	-0.13	-3.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

PC integrator returns

Entex Information Services, Inc. rose last week from the ashes of JWP, Inc.'s $1.2 billion information services division [CW, May 24]. The Rye Brook, N.Y., company, which is focused on integrating PC networks at large corporations and government agencies, is led by Dort A. Cameron, principal investor and chairman, and John A. McKenna, former senior executive vice president of JWP Information Services.

PC maker gets cash

Packard Bell Electronics, Inc. has completed arrangements for a $70 million recapitalization with Congress Federal Corp. of New York. The money will be used by the Chatsworth, Calif., PC maker to refinance its existing debt and provide additional working capital. The refinancing comes weeks after Groupe Bull purchased a 19% stake in Packard Bell [CW, July 26].

Artisoft profits down

Artisoft, Inc. posted fourth-quarter profits of $2.2 million, off 50% from the same period last year. Sales in the period were off 9%, to $19.6 million, the Tucson, Ariz., networking vendor said. For the year, Artisoft earned $9.4 million on revenue of $84.6 million. Those figures were down 29% and up 16%, respectively, from fiscal 1992.

SHORTTAKES Sapiens International Corp. posted second-quarter net earnings of $1.1 million, up 7% from the same period last year. Revenue increased 62% in the period to $12 million, the Cary, N.C., application tools vendor said. . . . Sequoia Systems, Inc. in Marlboro, Mass., said it has reached a global settlement with all claimants that supersedes previous agreements resolving all suits arising from restatements of the company's financial results. A court hearing on the settlement is scheduled for Sept. 10.

Land of software opportunities

Israeli technologists find money market niches in the U.S. after Gulf war

By Jean S. Bozman
LOS ANGELES

They came from Tel Aviv, Galilee and Jerusalem. They moved to the U.S. to generate sales and working capital. "They" are a growing contingent of Israeli software firms that have found growth and promise in the U.S. computer market.

In many cases, the Israeli firms first expanded operations to Europe in the late 1980s, translating their software products into many languages, including English.

But a further expansion into the U.S., including the establishment of U.S. headquarters, was made in recognition of the growth in client/server, database and open systems software in recent years. Gaining access to U.S. capital was another major attraction for many of these firms. Israel's software industry association lists about 150 software houses, which had combined sales of approximately $550 million in 1991.

Among the Israeli software firms operating in the U.S. are Magic Software, Inc. and 4th Dimension Software, Inc., both in Irvine, Calif, and Sapiens International Corp. in Cary, N.C. Sapiens and 4th Dimension, a purveyor of systems management software, went public last year. Magic went public in 1991. LanOptics Ltd., a $7 million networking software firm near Haifa, Israel, that went public last year, has plans to open U.S. offices but has not yet done so.

Successful moves

Growth has accelerated for many that came to the U.S. in recent years. Magic Software, which makes database application development tools, projects that 1993 sales will grow 60% over 1992's $10 million in revenue. Sapiens, which makes rapid-prototyping tools, has seen revenue jump from $19 million in 1991 to $39 million last year, for example.

Magic Chief Executive Officer David Assia, who was president of the Israeli Association of Software Houses, said many Israeli executives feel that company growth within the borders of their small country, which is approximately the size of New Jersey, is limited. But money began chasing some promising Israeli firms after they collaborated with U.S. companies during the Persian Gulf war.

"There was no venture capital in Israel until after the Gulf war because people didn't believe that software was a technology Israeli people could market successfully outside the country," Assia said. "After the Gulf war, all of a sudden, Wall Street started looking at some potential peace agreements, and venture capitalists started coming here."

The Israeli government also began some incentive programs to boost the country's software industry, Assia said. Israel provides substantial tax incentives for exporters, reducing some Israeli software firms' taxes to less than 10% of revenue, although the standard corporate tax is several times that, some Israeli executives said. The Israeli government is encouraging an influx of dollars and other hard currencies for international trade.

Magic CEO David Assia: *'After the Gulf war . . . venture capitalists started coming'*

Promised land

Israeli firms are expanding their horizons in the U.S. Some examples:

Company	1992 sales	Year went public in U.S.	Primary product
Artisoft	$20 million	1991	Peer-to-peer network software
Sapiens	$39 million	1992	Rapid application development tools
4th Dimension	$30 million	1992	Systems management software
LanOptics	$7 million	1992	Networking/ hub software

Making the transition to the U.S. was not easy. Two months after 4th Dimension took over operations for its U.S. distributor in Orange County, Calif., it had to stage a user group meeting in San Diego.

"We had to rent office space, set up the computers and buy office furniture all at once," President Dalia Prashker said.

Technical support was handled by several Israeli programmers who flew in for the switch-over to U.S. operations. Follow-up trips to the firm's home base in Israel, which took 25 hours to complete, were frequent at first.

Troubles of another sort date back to 4th Dimension's founding in Israel in the late 1980s. Roni A. Einav, one of the principal stockholders, faces a personal claim from a former business partner. The Israeli investor said he wants to annul the formal dissolution of his financial agreements with Einav now that 4th Dimension is a success, the company said last week. A 1992 prospectus for the firm states: "A former stockholder of ECS [Einav Computer Systems Ltd.] has recently written a letter to Mr. Einav asserting that he is entitled to a 50% beneficial indirect interest in the equity of ECS. Mr. Einav has advised the company that he believes the assertion is without merit."

Israeli firms suffered during the 1980s, when inflation was running high and firms outside the country were fearful of military attack, Israeli executives said. Back then, the Israeli government fostered cooperation among Israeli and U.S. firms, providing tax incentives for joint ventures. More recently, Israel's economy has stabilized with low rates of inflation. Listings on Tel Aviv's stock exchange boomed by 30% last year.

Government incentives

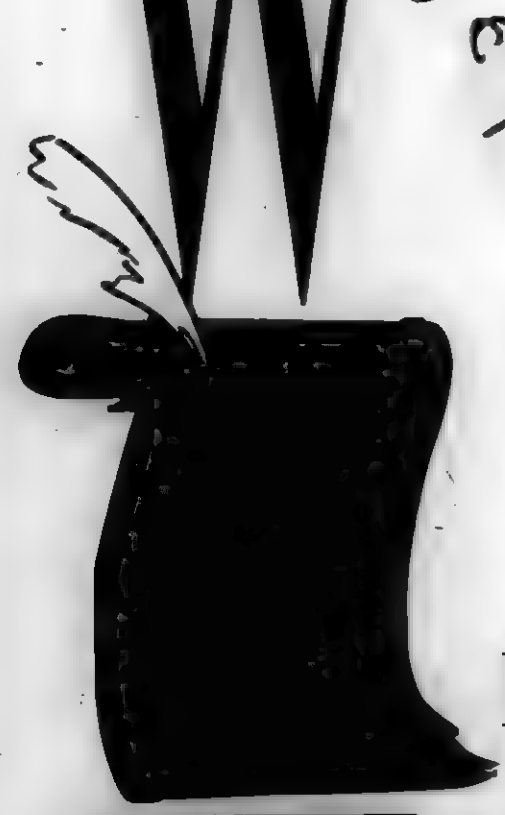
Substantial tax reductions and rebates on capital expenditures still motivate Israeli firms to market in the U.S., said Koby ben-Zvi, president of Sterling Software, Inc.'s storage management division in Rancho Cordova, Calif. In 1991, Sterling acquired the Tefen Lab in Galilee, a storage software firm ben-Zvi helped found in the mid-1980s.

But it is Israel's small size that is forcing many Israeli firms to seek capital in the U.S. "The [Israeli] market is still very small, with just 4.5 million people," ben-Zvi said. "So the [Israeli] companies go public in New York to try to get investors' attention."

The future for these firms is to market globally, Prashker said. "Right now, the U.S. is the leader in software and hardware," she said. "But in 10 years, the worldwide market is going to be bigger than the U.S. market."

Israeli firms have not limited their plans to U.S. shores. Some are already charting plans for Pacific Rim and South American markets as established businesses re-engineer their computer systems and small ones buy computers for the first time. "Countries like Brazil, Argentina and Mexico are awakening to some prosperity," Prashker said. "But right now, the American market is the most important market in the world."

Wysiwyg



GREAT NAMES

Peter Coad
Co-author of the book
Object-Oriented Programming
(Prentice Hall, 1993)

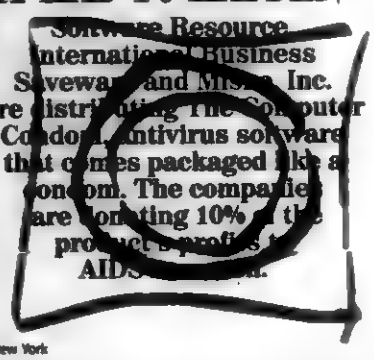
Feeee-lings,

nothing more than

feeee-lings

Tandem recently unveiled an on-line application to help karaoke bars solve space problems with storing laser discs, according to *Computerworld Hong Kong*. Tandem customer Andrew Wong, manager of the Corner II Club in Hong Kong, says it helps him stock many more songs — from Cantonese opera and pop songs to English oldies to the latest hit from Taiwan. *New York, New York*, anyone?

IT HAD TO HAPPEN



Sources: *BusinessWeek*; Scientists' Institute for Public Information, New York

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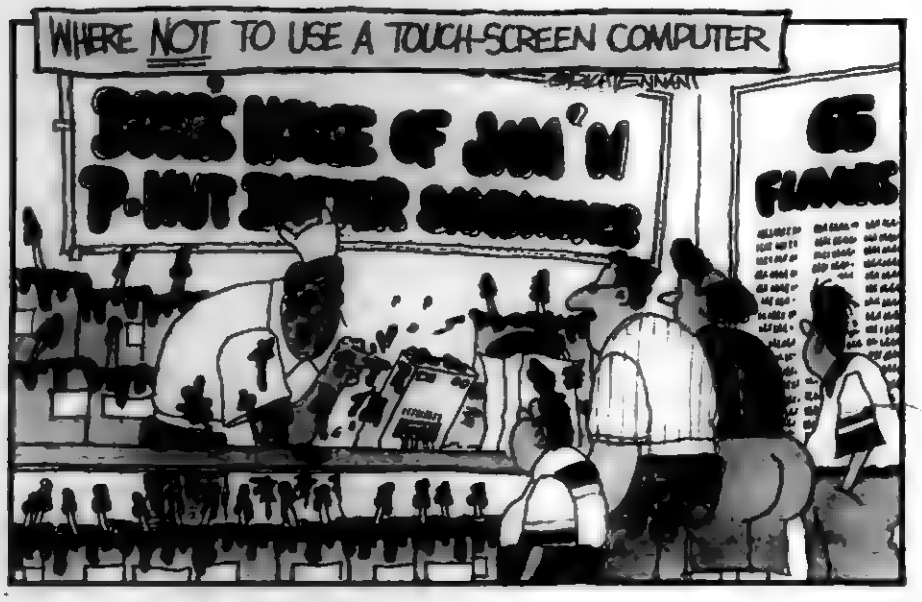
The 5th Wave *by* Rich Tennant



Inside Lines

Opening the pipeline

IBM is expected this week to put more meat on the bones of Multi-Protocol Transport Network (MPTN), its architecture for allowing applications written for one network protocol to run over a backbone based on another. IBM will add NetBIOS to the MPTN artillery, allowing NetBIOS applications to run over either TCP/IP or SNA. Also to be announced is an alliance with PeerLogic that will allow applications written to PeerLogic's Pipes middleware product to run over MPTN links.

Pumped-up notebook

Look for Apple to beef up its PowerBook line tomorrow with the introduction of the PowerBook 165, a 33-MHz Motorola 68030-based portable that offers a monochrome, backlit, supertwist, passive-matrix display. With the dual-display mode of the 165, users can display one image on the 165 and a different image or another application on an external monitor concurrently, sources familiar with the machine said. Retail prices will start at $1,999 for a model with 4M bytes of RAM and an 80M-byte hard disk.

Pass along

Novell is apparently offloading some fairly strategic product development to Attachmate. The E-mail and SNA gateway vendor already has Novell's NetWare for SAA client software; this week Novell is expected to announce that it is selling to Attachmate Network Navigator, a software distribution system developed by Novell subsidiary Aantech. A Novell exec recently said Navigator is a key element of Novell's centralized network management strategy and will shortly become a NetWare Loadable Module.

Foiled again

Novell and Microsoft are expected this week or next to set yet another shipment date for their jointly developed Windows NT requestor, which will allow Microsoft NT clients to access Novell servers. A Novell spokesman attributed the repeated delays to the fact that NT has "only recently stabilized."

Touché!

Microsoft will enhance DOS 6.0, bringing out Version 6.2 (to trump IBM's PC-DOS 6.1) in October, according to sources. Microsoft will tweak the product, particularly its DoubleSpace compression utility, and will also let users deinstall DoubleSpace, the sources said. While DOS 6.0's DoubleSpace has drawn attention because of a well-publicized suit with Stac Electronics and questions regarding the stability of the technology, sources close to Microsoft say that it was not the driving force behind the revision. Microsoft intends to add utilities such as write caching, which would make data management more efficient.

James Treybig is free, man. The CEO of Tandem, parent company of Ungermann-Bass, last week refuted long-standing industry scuttlebutt that his company is interested in selling its networking subsidiary. In a letter to customers, prospects and business partners, Treybig bluntly stated: "The plain and simple truth is Ungermann-Bass is not for sale." In an interview, Treybig reiterated that while Tandem would entertain equity investments in UB, the networking vendor remains critical to his company's enterprise client/server strategy. Treybig also questioned the accuracy of a statement made by Cabletron Chairman Craig Benson that he was approached by investment bankers interested in putting together a deal for UB [CW, Aug 2]. Treybig said neither he nor his board authorized any investment banker to solicit offers for UB. Treybig pointed out that unauthorized investment bankers often put out feelers. Benson said the investment bankers, whom he declined to name, appeared to be more than just fishing around. He did, however, acknowledge that the solicitation did not come from Dillon Read or Donaldson Lufkin & Jenrette, UB's authorized investment banker. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2473, respectively. Or try Computerworld's 24-hour voice mail hotline at (508) 820-8554.

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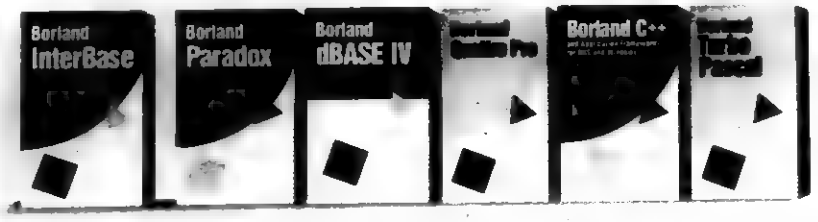

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COMPUTERWORLD

Users decry Novell's distance

Enterprise issues force service push

By Elisabeth Horwitt
PROVO, UTAH

■ If Novell, Inc. is going to successfully pitch itself to the Fortune 500 as an enterprise system vendor, it will have to provide service and support on a par with IBM, according to several major customers of both vendors.

During the past year Novell has introduced support offerings that seek to provide users with the kind of direct, ongoing, comprehensive support they will need as they move from server-centric NetWare to enterprise-oriented NetWare 4.0, Novell spokesmen said.

The vendor's biggest innovation so far is a Master License Agreement, a comprehensive package of direct support offerings for large accounts. For example, Boston Edison Co. got a Novell systems engineer assigned to it, "which is excellent; it gives us direct technical support locally," said John Dubiel, manager of planning and technology at the utility.

Exclusive club

However, Novell users complained that the MLA program is closed to many major Novell customers. Also, it does not address one of their biggest demands: to have more proactive, ongoing communication with Novell about its product directions and how the products can fit together into an enterprise system.

A few large companies such as United Parcel Service, Inc. have a special relationship with Novell, which they have earned by being major NetWare shops for many years and by providing their ex-

Novell, *page 16*

AT&T/McCaw ties may boost wireless

Acquisition also seen as ploy by Ma Bell to re-enter local loop; competitors wary

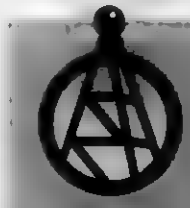
By Joanie M. Wexler
NEW YORK

■ Telecommunications managers agree that the staunch commitment AT&T made to wireless networking last week when it redefined its deal with McCaw Cellular Communications, Inc. will accelerate the deployment of new technologies. It could also ease cross-product connectivity headaches.

However, they also said AT&T's revised $12.6 billion plan to acquire the cellular giant rather than spend $3.8 billion for a 33% stake — the stated intention since last November — is partly an AT&T ploy to tiptoe back into the local telecommunications market. This could impede progress toward opening up competition in that segment of user networks, the users said.

The acquisition is expected to take a year to complete while the two carriers collect regulatory approvals. The deal could ultimately deliver easier-to-coordinate cellular services in the form of "one vendor, one rate, one service and possibly one point of contact," said Larry Gessini, president of the International Communications Association user group.

For example, users would be able to leverage volume discounts rather than purchase pockets of cellular service from different carriers at individual rates, he said — a bottom-line plus for large customers.



In the May 31 issues, Fortune valued McCaw at $7.1 billion. AT&T will pay $12.6 billion for the company. Why the premium? "AT&T is buying access into a whole new market," said Mark Langner of TeleChoice, Inc. in Verona, N.J.

The McCaw acquisition is yet another component of AT&T's overall strategy to enable users to communicate anywhere, anytime by gluing together various wired and wireless networks, primarily through the company's EasyLink messaging network [CW, April 26].

The deal is "good for very large firms creating virtual offices and requiring leading-edge technologies," said David Eisenlohr, vice president of systems operations and telecommunications at the Pacific Stock Exchange in San Fran-

AT&T/McCaw, *page 8*

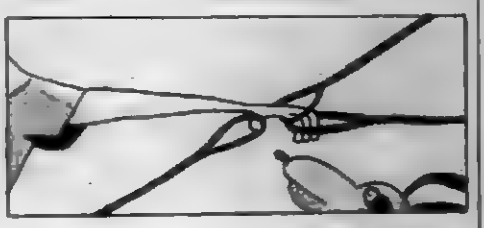
In Depth

Bye-bye, blue sky

Companies cannot afford blue-sky advanced technology groups anymore. For IS chief George Kenney at Swiss Bank Corp. in Chicago, this means choosing technologies that further business strategies. Beginning on page 135, Kenney and five of his peers probe what makes advanced technology groups viable.

Distributed nets elude IS control

Tech, cost concerns block way



By Johanna Ambrosio

Building client/server applications may be a snap compared with actually managing them once they are up and running. The technology for doing so is immature at best, and most users lack the needed skills and companywide procedures for taming the distributed systems management beast.

Indeed, many customers are just getting started in their search for the right architecture and associated tools. At Nike, Inc. in Beaverton, Ore., "We're in the process of maturing our thinking about distributed systems management, and we have a project going," said Dan Croft, manager of computing services.

What everyone is looking for, many customers agree, is a sane way of managing geographically dispersed computers and network

Distributed nets, *page 14*

Client/server may eclipse Sun

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Sun Microsystems, Inc. is caught in a major client/server squeeze.

Already successful on the desktop, Sun needs to boost the power of its high-end servers if it wants to be a provider in the robust client/server network market, users and observers said.

And that is not all Sun needs to do.

Users at some of its largest sites said the leading Unix workstation vendor must beef up its systems integration and support services to compete with much larger server rivals IBM and Hewlett-Packard Co. for corporate downsizing projects.

Challenges facing Sun:

Strategic: Users are demanding improved integration and support services.

Technology: The SPARC architecture has run out of steam.

Financial: Profits are declining as workstations become a commodity.

Moreover, open systems have turned workstations into a commodity. This means Sun cannot count on repeat workstation business, even from its most loyal customer sites (see story page 12).

At the same time, Sun's share of the workstation market is flattening. IBM and HP have made inroads in the high end of the general-purpose segment, while Silicon Graphics, Inc. has eaten into Sun's graphics business, according to analysts.

Sun, *page 12*

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August 23, 1993

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Executive Briefing

There's lots of agreement that developing client/server applications is tough, but maintaining them is likely to be tougher (*page 33*), and managing the diversity across geographic stretches could be the hardest part of all. One of the biggest complicating factors for those trying to manage client/server is the diversity of frameworks, products and services now emerging. *Page 1*

Recent additions to the profusion of client/server vendors include **Ross Systems**, with a new version of its Gembase 4GL that targets both legacy and client/server environments (*page 102*); and **Intersolv**, with a new version of its Excelerator analysis and design tool. *Page 20.* Meanwhile, a small vendor, **Xtree**, jumps into the network and network server management fray, announcing a set of applications that manage a full range of network devices and systems via SNMP. *Page 81*

Novell is trying hard to provide one-stop shopping for corporations seeking an enterprise networked computing strategy. So far, users and analysts like what they see, as the vendor rolls out services. *Page 77.* Customer service and support will weigh heavily in the final decision. Customers who buy from both **Novell** and **IBM** say Novell will have to match IBM's standard in these areas if it wants to be their primary enterprise system vendor. *Cover 1*

In his Viewpoint column this week, John Gantz bemoans the lack of CASE tools for client/server. *Page 33.* No sooner said than done: **Exsel** now offers Enterprise Workbench, which has the ability to integrate upper-level CASE tools from companies such as **Bachman, KnowledgeWare** and **TI**. *Page 101*

And just about the time we get all this client/server confusion figured out, pundits are predicting a new challenge called "social computing." What they are talking about is a revolution in how products are marketed and sold, resulting from the emergence of interactive video, wireless communications, groupware and other "democratizing" technologies. *Page 78.* Anticipating this trend, the U.S. government is increasingly doing business and making information available on-line through the **Internet**. *Page 77.* This week brings conflicting commercial signals about how long it might take to tie everyone into a vast networked computer web. Users anxiously awaiting a developer's kit so they can create applications for **Apple**'s Newton are told they'll have to wait a while longer. *Page 101.* **Oracle** is hard at work on the massively parallel databases that some say are necessary to make **AT&T**'s manifest wireless ambitions a reality. *Page 8*

Users ho-hum about DOS 6.2

By Michael Fitzgerald
REDMOND, WASH.

■ A forthcoming update of Microsoft Corp.'s DOS 6.0 operating system has raised little excitement among users, many of whom continue to say that the value of utilities in DOS is not enough of a reason to upgrade.

DOS 6.2, which is slated to debut in October, is expected to sport a boosted version of Microsoft's DoubleSpace compression utility and better write-caching (CW, Aug. 16). Microsoft will also tweak its MEMmaker memory management utility and fix some segments of its defragment utility, according to sources. Among the things Microsoft is expected to do is add a checksum feature and a diagnostic and repair utility.

Information systems managers at Du Pont Co. said their company never moved to DOS 6.0 because it felt the release was buggy.

"We'll look at it if they fix the bugs," said one manager at Du Pont, who did not want to be named.

Bloat so far

Bugs or not, research by WorkGroup Technologies, Inc. shows that DOS 6.0's early acceptance has made it Microsoft's most successful operating system release. "We believe that it has a deinstallation rate of about 5% on a base of 5 million installed copies," said John Dunkle, WorkGroup's president. Dunkle said that was better than any previous version of DOS.

Microsoft has steadfastly denied that DOS 6.0 has bugs, though it did post on CompuServe a fix for certain Sharp Corp. notebooks that froze when they tried to run DoubleSpace. Microsoft also posted an update of its SmartDrive disk cache utility.

Other users, such as John Mathy, vice president of technology management at Provident Bank in Baltimore, said a new version of DOS 6.0 mattered little to the bank because it did not see the utilities in DOS 6.0 as enough of a reason to move up from DOS 5.0. However, it is not pulling DOS 6.0 off its new machines.

Not just a bug fix

But while the next revision of DOS looks like a bug fix, Microsoft will not position it as one, sources close to the company indicated. Instead, Microsoft will bill it as an enhancement to the operating system, the sources said.

"Since DOS 6.0 went out, we've talked to customers, and there are some issues. And they have made suggestions as to things that will advance parts of the product, like DoubleSpace," said Tony Audino, director of marketing for the MS-DOS group at Microsoft. "You will not look at it and say 'Oh, they've fixed x and y bugs.'"

Audino declined to comment on specific changes "until our plans are firm," though he did say that one thing customers wanted was the option to deinstall DoubleSpace.

Adding to the controversy over the compression utility is the lawsuit against Microsoft from Stac Electronics, Inc., which makes the Stacker compression utility.

Spreadsheet wars

Borland to change Quattro Pro

By Michael Vizard
BOSTON

Borland International, Inc. said it will this week outline changes in the next release of its Quattro Pro for Windows spreadsheet, Version 5.0, that were designed to ensure the application will not violate any of the copyrighted technology in Lotus 1-2-3.

The changes follow a series of rulings against Borland made in a copyright violation suit brought by Lotus Development Corp. The court ruled earlier this month that Borland's use of a key reader feature to make macros compatible across Quattro Pro and 1-2-3 spreadsheets violated Lotus' copyright, and, at Borland's request, issued an injunction against its further use or sale of the infringing technology. The injunction allows Borland to proceed immediately to the Appeals court, and puts off a damage trial until Oct. 3, 1994.

As a result, the next release of Quattro Pro, slated to ship in September, will not make use of the key reader technology. Instead, Borland has devised another method, which it declined to comment on last week, to provide macro compatibility with Lotus spreadsheets, the company said.

In a teleconference last Friday, Jack Blount, Borland's newly appointed senior vice president of business development, said users of existing Borland products will encounter no compatibility problems with the changes made in 5.0.

He said the key reader substitution will affect only the small number of Quattro Pro users trying to use 1-2-3 macros, whether written in 1-2-3 or using a 1-2-3 interface. They will have to rekey those features into Quattro Pro 5.0.

Last week, a Lotus spokesman said the company believes Borland can provide macro compatibility with 1-2-3 without violating any of Lotus' copyrights.

While the latest macro ruling is expected to create minor hassles for users, it might have a chilling effect on software development in the long term, said attorneys and users alike.

"The court is sending a message to the software industry that it can't embody any representation of another product without risking this kind of case," said Lee Gesmer, a partner at Lucash, Gesmer and Updegrove, a Boston law firm that publishes the "Technology Law Bulletin."

In the meantime, users said they are more concerned about the long-term implications of the suit than its effect on Borland.

"I hate to sound callous, but to me Borland is irrelevant," said Jerry Schneider, a consultant in Washington, D.C., and a former president of the Capitol PC Users Group. "But I still find the ruling to be very frightening. It has the potential to change the way we do business in the software industry."

Echoing Schneider's concerns, the Capitol PC User Group, the Long Island PC Users Group, the Sacramento Users Group, the Twin Cities Users Group, the Kentucky-Indiana User Group, the Pinellas IBM User Group, the Central Florida Computer Society and the Santa Barbara PC User Group will jointly file a "friend of the court" brief advocating an appeal.

In an industry that requires compatibility across diverse applications to survive, Schneider said, the latest ruling implies that software products may not be as compatible in the future because every application in some way embodies or uses code from another application.

Borland and industry analysts said the court's ruling on this aspect of the case is not consistent with rulings from other court cases. "You have to view this ruling in context. The judge in this case showed his true colors early on," Gesmer said.

Lotus and Borland last week offered conflicting takes on the court's rulings. Borland Vice President Jack Blount said that Judge Keeton's injunction only required that a letter be sent to its partners and resellers, informing them that they can no longer sell applications with the infringing technology. A spokesman at Lotus said Borland is required to terminate any existing licenses, distribution pacts or other deals.

Microsoft upgrades Profs link

Michael Vizard
REDMOND, WASH.

Microsoft Corp. last week released an enhanced version of its PC-to-host mail gateway that, for the first time, includes the ability to share meeting requests between Microsoft's calendaring and scheduling software and IBM's mainframe-based Professional Office System (Profs) and OfficeVision environments.

"In terms of IBM gateways from PC LAN vendors, Microsoft has taken the lead at this point," said David Ferris, president of Ferris Networks, Inc., a consultancy in San Francisco.

At the same time, Microsoft has created a mail driver that, when attached to a Windows client, will allow a single PC to talk to IBM mail environments.

Both offerings were designed to entice IBM mainframe customers considering the move from Profs to OfficeVision to eschew that approach in favor of lower-cost electronic-mail systems running on local-area networks.

"As IBM customers look at the cost of moving from Profs to OfficeVision, they are asking themselves if they should just bite the bullet and go over to PC mail. It's much cheaper to run E-mail on a PC in terms of cost per seat than on a mainframe," Ferris said.

For example, Southern Company Service, Inc. in Atlanta plans to make a staged migration to Microsoft's Mail from its IBM mainframe. As part of that effort, Southern will initially move from Profs, which IBM no longer supports, to OfficeVision.

"In the long term, we are moving to get rid of the mainframes. But we can't afford to put a PC on everybody's desk, so we're moving to OfficeVision first," said Brian Hays, an E-mail specialist at Southern.

Southern has adopted the Microsoft Mail gateway to Profs and OfficeVision. Microsoft has enhanced its links to these systems by allowing users to share meeting requests between Microsoft's Schedule+ scheduling software for Microsoft Mail and Profs. The gateway also synchronizes directories, converts Mail into a Profs format and supports the encapsulation of a Mail message across a Profs backbone.

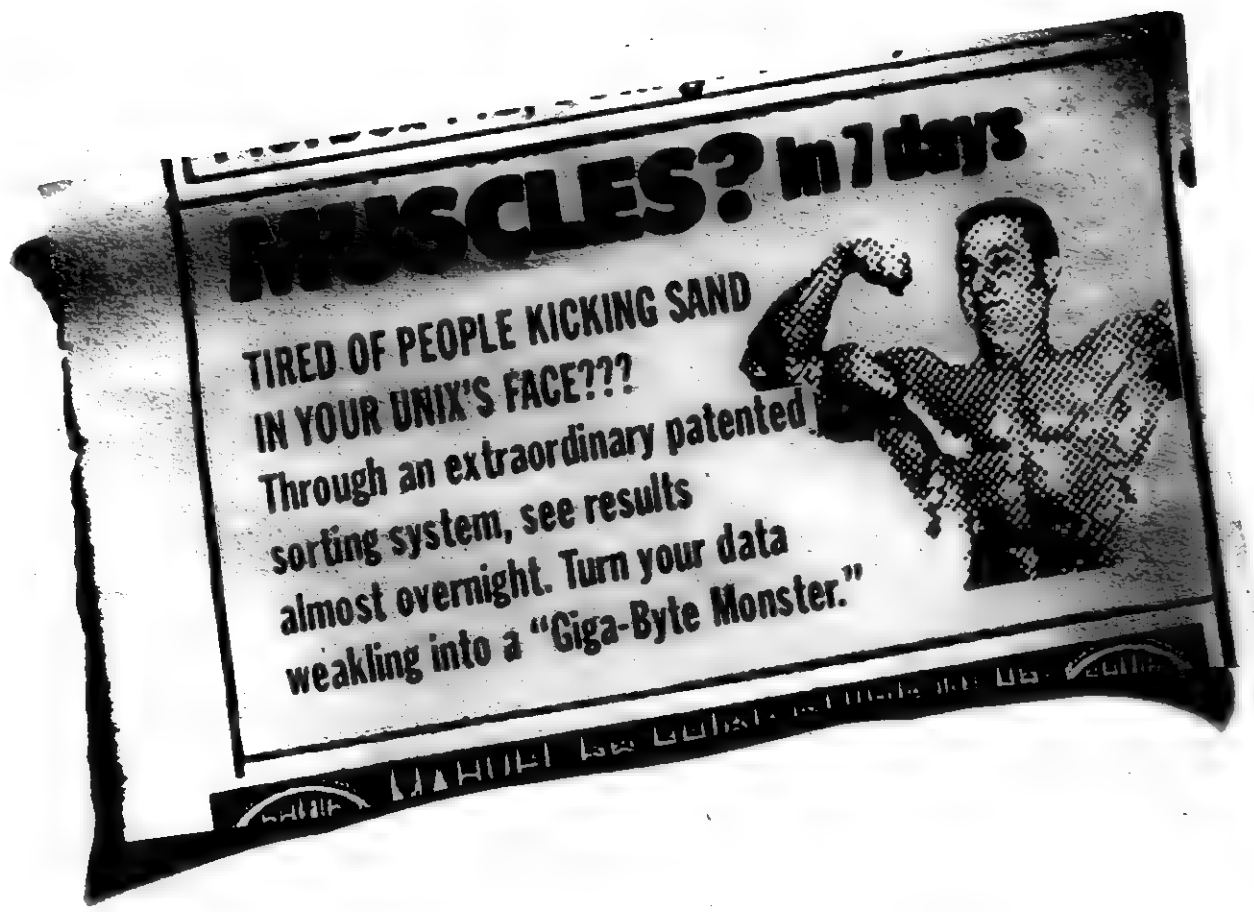
Sacrifice required

But Ferris noted that while the gateways from all the PC E-mail vendors have improved, Profs users will still have to sacrifice some functionality as they move to PC-based systems.

For example, while users can send meeting requests between Schedule+ and Profs, a Profs user can see only that a Microsoft Mail user has a conflict. In contrast, under a Profs-only system, a manager could see what a particular meeting is about and override a subordinate's meeting schedule.

The Microsoft gateway is priced at $4,995. Microsoft Mail Host Access software for an IBM mainframe is priced at $14,995. If users want to connect LANs running the gateway with other LANs, the price of a Gateway Access Component is $995.

The drivers, meanwhile, can be purchased through Microsoft Consulting Services for a $30,000 installation fee on the host, plus $15 per driver, provided there is a commitment to purchase at least 2,000 drivers.



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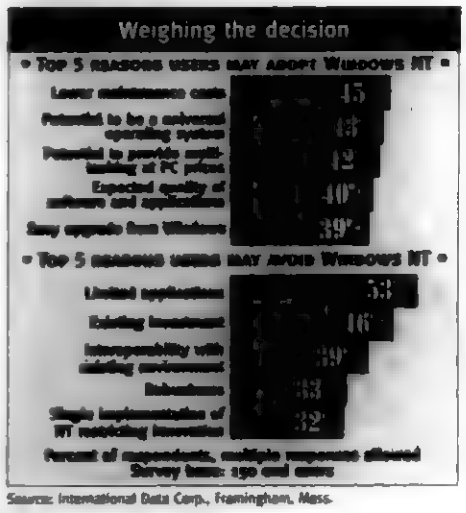
NT readies for prime time

Beta-test users report stability, ramp up for production

By Michael Vizard
REDMOND, WASH.

While Microsoft Corp. begins the long-awaited rollout of its Windows NT operating system, the dividends from a protracted beta-test period are beginning to pay off as early adopters gear up to move NT into production.

Historically, the first release of an operating system is usually accompanied by an extensive pilot project period. But early adopters of NT are reporting that it is now stable enough to begin moving into production.



Source: International Data Corp., Framingham, Mass.

For example, Nordstrom, Inc. in Seattle has already deployed 15 Windows NT servers in a production environment using beta-test NT code. And the department store plans to deploy as many as 54 Windows NT Advanced Server editions using the general release version of NT by the middle of next month.

"We expect that the general release code has fixed any of the stability problems we have," said Larry Shaw, PC coordinator at Nordstrom.

Meanwhile, Paragon Trade Brands, Inc., a manufacturer of diapers in Federal Way, Wash., is deploying Windows NT as a server in its manufacturing plants. It will then feed data to an IBM Application System/400 system in the company's headquarters.

At the same time, Paragon will deploy some NT workstations, which will be used by managers to compare more than 100 different diaper specifications as part of a drive to improve quality control, said Rich Matthews, Paragon's chief information officer.

"It used to take us five to 10 days to get this kind of information back to the shop floor using a central processor. Now we're trying to get this information back to the shop floor in the same shift," said Matthews, who expects to deploy the system by the first quarter of next year.

In general, early adopters reported they are satisfied with the performance of Windows NT, whether deployed as an application server or as a file server. In fact, a Microsoft spokesman said the company recommends that customers purchase either Novell, Inc.'s NetWare or Microsoft's LAN Manager if they are looking only for a file server, as these products are faster file servers that are dedicated to this task.

But NT adopters said they are willing to accept this performance trade-off because they do not want to deploy dedicated file servers.

"Our customers don't want dedicated file servers. A server has to be able to do a lot of other things," said Mike Alfano, president of PanData, Inc., a developer of software systems in Flemington, N.J.

"It was more important to us to have a system that can be easily managed remotely since we're not putting network specialists in at each site. Right now the performance is acceptable, but we made sure NT is scalable in case we have to add more applications later," said Shaw, who is deploying NT as both an application and a file server in a tracking system for Nordstrom buyers.

Missing the point

In fact, some users said people who focus on file-server performance on Intel Corp. systems are missing the point.

"If you're worried about performance on Intel platforms, then you're overlooking one of NT's biggest assets. NT is a scalable operating system, so you can put it up on a R4400 RISC box that is four to eight times faster than an 1486 solution for the same price as a Pentium," said Ted Vegvari, a network design specialist at Bank of America Corp. in Torrance, Calif..

Bank of America, which already has OS/2, NetWare, Banyan Systems, Inc.'s Vines and LAN Server implementations, is currently evaluating Windows NT. "Right now, I'm looking at it as a mail server, and some others are evaluating NT as a client/server environment," Vegvari said.

PanData is also moving some of its operations from OS/2 to NT. "With OS/2, we always felt we were working with beta software, and we didn't know what IBM was going to do next," PanData President Mike Alfano said.

PanData plans shortly to adopt the Advanced Server edition of Windows NT because that version of NT supports multiple domains. "You need to get operational data out to the business side," Alfano said.

Both Paragon Trade Brands and Bank of America intend to deploy the Advanced Server edition for similar reasons, but neither company plans to completely standardize on NT. "We're looking at NT on a per-application basis," Matthews said.

Corrections

- In the "Human Resources" portion of the diagram on page 119 this week, both LAN chassis should connect to the bridge/router, not to each other.
- Because of a reporting error, the story "Cisco waves white flag, changes SNA strategy" in the Aug. 16 issue incorrectly stated which product 3Com Corp. will ship by year's end. 3Com will ship APPN Network Node.
- Because of an editing error, a story on Hewlett-Packard Co.'s OmniBook 300 in the Aug. 16 issue incorrectly said the notebook has a 486 processor and a backlit screen. The story should have said it lacks these components.

DEC to push Rdb beyond OpenVMS boundaries

By Craig Stedman
BOSTON

Digital Equipment Corp. plans next month to start moving its Rdb relational database beyond the OpenVMS operating system, but it has stopped short of committing to port Rdb to outside hardware — a step analysts said is needed for DEC to keep up with other database vendors.

At an Rdb conference here last week, DEC said a software developers kit supporting its DEC OSF/1 operating system will ship next month as a prelude to a full OSF/1 release of the database next June.

Also planned is a Microsoft Corp. Windows NT version, due out in kit form in early 1994 and as a full product at the end of that year, the company said. However, both releases are being promised only for DEC's Alpha AXP hardware at this point.

"We have our plate full now with OSF/1 and NT [for Alpha]," said Rose Ann Giordano, DEC vice president of information systems software. "After we've successfully done all that, I think we can look again at the issue of non-Digital hardware."

Robert Rice, a research specialist at Ohio State University in Columbus, said the OSF/1 and Windows NT versions of Rdb should reduce "complaints that it's a proprietary database running on a single system," even without support of non-DEC platforms.

Analysts, though, said that an Alpha-only Rdb strategy would not provide enough revenue for DEC to match the engineering investments of vendors such as Oracle Corp. and Sybase, Inc. As part of its turnaround attempt, DEC is already cutting back sharply on its overall research and development budget and is weeding out projects deemed to have uncertain prospects for financial payback.

The company, in fact, planned at one time to move much of its software to other platforms, but that strategy was one of the items placed on the back burner after William Strecker took over as vice president of engineering in late 1992 with the mandate to lower spending by at least 15%.

Pricing battle looms

Wes Melling, an analyst at consultancy Gartner Group, Inc. in Stamford, Conn., said an expected database price war will make it even more difficult for DEC to keep pace with other vendors. "In a commodity market, the rule is you need volume," he noted. "If you design yourself out of 90% of the market, you've broken the rule."

Rdb is competitive technically now, but it "suffers from a very strong attachment to Digital and its products," added Chris Christiansen, an International Data Corp. analyst. "Users who want hardware independence don't even consider Rdb," he said.

Following a recent reorganization, DEC is now focusing most of its software development on "frameworks" rather than individual applications [CW, Aug. 9]. One such product due out later this year is DB Integrator, which will link different databases into a single logical view.

DEC still views Rdb as its lead database, said Nelson Hsu, client/server and database marketing manager. Hsu added, though, that DEC is not looking to displace third-party vendors that support its hardware. "There are some considerations" given to maintaining good relations with those companies, he said.

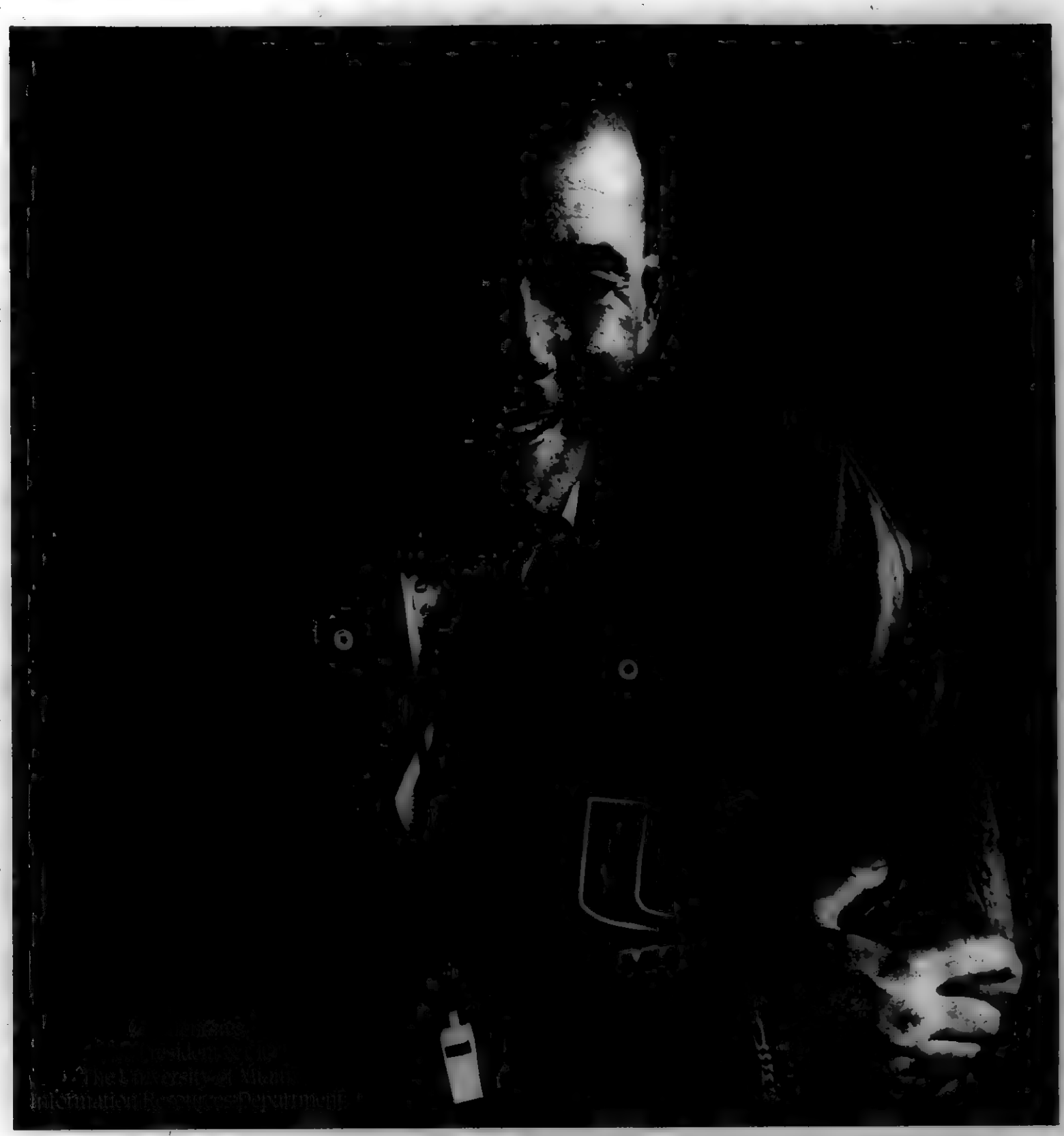
Multiple version deluge

In addition to the DB Integrater multidatabase manager, DEC has several Rdb-related products due out in the next six months, including two new Rdb releases for its OpenVMS operating system.

Expected early next month, Version 5.1 of Rdb will offer Open Database Connectivity compliance, DEC said. Following in December will be Version 6.0, a major release supporting multistatement procedures, stored procedures and other new functions.

Also on tap is DEC DBA Workcenter, which will group the company's database administration tools into a single product. A release combining existing design, tuning and performance monitoring packages is due late this year, and DEC said new performance analysis and maintenance tools should follow by mid-1994.

The company also plans to increase the size of databases Rdb can support from 50G to 100G bytes with Version 6.0, executives said.



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News Shorts

SCO licenses Novell technology

The Santa Cruz Operation (SCO) last week said it has licensed client/server software from its biggest competitor in the desktop Unix arena. **Novell, Inc.'s** NetWare Unix client technology will let SCO workstations act as clients to NetWare servers, SCO said. SCO also revealed a series of alliances with **Computer Associates International, Inc., Lotus Development Corp., Wyse Technology, Inc.** and **Informix Software, Inc.**

PC marketing chief resigns from IBM

Sam M. Inman III, president of **IBM PC Co. Americas**, has resigned to become president of **Ingram Micro, Inc.** Bruce L. Claflin, former general manager of mobile computing at the PC Co., was promoted to take his place. The PC Co. has not hired a replacement for Claflin. Anthony E. Santelli, who was named president of IBM PC Products, will temporarily take on Claflin's job and continue to run his own division, Consumer Systems, until a replacement is found.

Microsoft server in final test phase

Microsoft Corp. last week announced that Microsoft SNA Server for Windows NT has entered its final beta-test phase. The local-area network gateway to IBM hosts has added support for clients using Novell's IPX/SPX protocol, in addition to its existing support for Transmission Control Protocol/Internet Protocol and NetBEUI client access, Microsoft said. The product should be generally available within 90 days, according to the company.

Compaq to release consumer PC line

Compaq Computer Corp. is expected Thursday to announce Presario, a new, consumer-oriented line of desktop computers. Presario will initially come in two configurations, one an integrated 14-in. monitor with a 25-MHz 1486SX CPU, the other a 33-MHz 486SX with three slots and three bays and an unattached monitor, according to sources. The integrated, plug-and-play version of Presario will fetch a street price of $1,400, while the faster but unintegrated model will be priced at $1,300. There will be some overlap with ProLinea for a while in consumer electronics stores and other outlets. A Compaq spokesman refused to comment.

SHORT TAKES James Champy, president of **CSC Consulting** and co-author of the best-selling book *Reengineering the Corporation*, has been promoted to corporate vice president of **Computer Sciences Corp.**, the consulting firm's El Segundo, Calif., parent. Champy remains chairman of its **CSC Index, Inc.** unit but will be replaced as chief executive officer by David Robinson, who now serves as president of the Cambridge, Mass., consultancy. . . . **Apple Computer, Inc.** equipment is five times more likely to be stolen than IBM PCs and their clones, according to an upcoming report by the Stolen Computer Registry. . . . **Elcon Technology Corp.** in Montreal is expected next week to announce wide-area network services for NetWare, which is said to be the first product to provide wide-area connections for both Novell's Multi Protocol Router and NetWare for SAA gateway to IBM hosts. . . . **Wang Laboratories, Inc.** said it passed another milestone in its Chapter 11 bankruptcy restructuring process, signing an agreement in principle for a new credit line with Congress Financial Corp. The deal provides for Wang to get an interim credit line of up to $40 million that would be replaced by a $30 million lending facility after the company emerges from Chapter 11.

More news shorts, *page 16*

Wellfleet enters WAN world

First LAN vendor into telecom arena hopes to beef up public services

By Joanie M. Wexler
BILLERICA, MASS.

Taking a key step toward providing users with wide-area data services on a par with those found on local-area networks, Wellfleet Communications, Inc. last week became the first LAN vendor to cross over into the telecommunications market.

The router company made generally available its Backbone Node Switch (BNX), a modified version of its Backbone Node LAN internetwork router. The BNX is already serving as an access point on the fringe of MCI Communications Corp.'s and Canadian carrier Stentor Resources, Inc.'s networks.

The goal with the BNX is to stretch Wellfleet's expertise with multiple data protocols into the wide-area network so the services users have on their premises match those inside the carrier network, explained David Yates, Wellfleet's BNX product marketing director.

This is also a long-term objective with Asynchronous Transfer Mode networks, which will eventually run both as a LAN and as a WAN.

Some of the potential services carriers could deliver through the switch, according to Yates, are per-packet billing options for frame-relay services, which today are usually billed on a flat-rate basis; T3 (45M bit/sec.) access into carrier backbones; native LAN-speed services across the WAN; and the ability to open a management window into the public network to users.

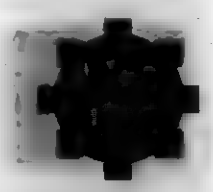
MCI spokeswoman Pam Small said MCI is already implementing the frame-relay, usage-sensitive pricing in its HyperStream service and Simple Network Management Protocol management capabilities via the BNX.

According to one analyst, "there's meat on them bones" with the Wellfleet strategy.

Private LAN internetworks exist because "the carriers did a bad job of knowing how data services were going to evolve," said Jay Batson, an analyst at Forrester Research, Inc. in Cambridge, Mass.

For example, "if AT&T could provide you with a private IP network that you could buy and plug into, you'd be happy," he said.

The BNX provides a stepping-stone for carriers heading in that direction, Batson said.



A step further
Wellfleet's BNX occupies a position in a carrier's network similar to that of Cascade Communications, Inc.'s and Stratacom, Inc.'s frame-relay access switches. Observers pointed out that these vendors' switches merely provide a way to transport electrical signals from one point to another, not the software needed to deliver LAN-like services.

What remains to be seen, however, is whether the LAN vendors can rival traditional telecommunications equipment providers at building extremely scalable equipment to serve thousands of lines.

"Wellfleet's architecture is best-positioned to do that," Batson said. He was referring to the distributed nature of the Backbone Node, which allows network modules and corresponding processing power to be added incrementally with no drain on any centralized components.

"The question is whether the carriers want to provide LAN-like services," Batson said. "If they do, they need extra software. And the router vendors have it."

IBM plugs blueprint gaps, lets users mix and match

By Joanie M. Wexler
WHITE PLAINS, N.Y.

IBM kept its nose to the grindstone last week in its endeavors to ease users' interoperability and management frustrations with multiprotocol networking.

The vendor filled in several areas of its Networking Blueprint, the official IBM strategy to help companies bring harmony to a mix of networks, systems and protocols. The company's product announcements focused largely on broadening the role of OS/2 in the enterprise, blending IBM and other protocols into a single wide-area backbone and stretching the scope of IBM's Unix-based distributed management system.

Such moves "help users begin to get their hands around the many combinations of protocols that are in their enterprises today," said Mark Pozefsky, Multi-Protocol Transport Networking (MPTN) product and systems manager at IBM.

In the area of mixing and matching existing applications with non-native transport networks, IBM enhanced its AnyNet product line. AnyNet software represents the product implementations of IBM's MPTN strategy, which is to build software that allows applications written for a specific transport network, such as Systems Network Architecture (SNA), to run across other networks, such as Transmission Control Protocol/Internet Protocol (TCP/IP).

Plans and products

Among IBM products and statements of direction announced last week were the following:

- AnyNet/2 for OS/2 on disk. This allows IBM Advanced Program-to-Program Communications applications to run over TCP/IP and OS/2-based TCP/IP applications to run over SNA. Previously, users could get the capability by downloading it from an MVS host. Available Sept. 3 for $150.
- A statement of direction to run NetBIOS-based applications such as Notes over SNA networks, eliminating today's necessary gateway function.
- X Window System client software for OS/2 for delivering OS/2 host applications to windows on user desktops.
- A frame-relay link for the 3172 cluster controller for combining multiple protocols onto one wide-area network link.
- Availability of IBM's System Monitor on Hewlett-Packard Co. workstations and the ability to manage Unix networks connected to System/390 mainframes using NetView.

Also, IBM said it will begin beta-testing next month to allow NetView/6000 to capture IP topology data and pull it into Sybase, Inc. and Informix Corp. databases. It will begin testing Oracle Corp. database support by the end of the year. This capability is already available with The ASK Group, Inc.'s Ingres Products Division databases.

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1	1	GE MOTORS Detroit
2	2	ON Irving, Texas
3	3	FORD MOTOR Dearborn
4	4	INTL. BUSINESS MA
5	5	GENERAL ELECTRI
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Oracle solving wireless puzzle

By Kim S. Nash

REDWOOD SHORES, CALIF.

Oracle Corp. has done much of the groundwork necessary for building viable massively parallel databases, which are required to make wireless dreams such as those of AT&T and McCaw Cellular Communications, Inc. come true, analysts said last week.

Several test sites are running massively parallel Oracle 7 on a variety of machines, including those from Thinking Machines Corp., NCR Corp., NCube and Encore Computer Corp.

Furthermore, Oracle is providing the database and development tools necessary for US West, Inc. to deliver interactive wireless and cable services. Oracle said it hopes its US West experience will lead to a partnership with other telecommunications companies, including AT&T, according to Tim Negris, Oracle's senior director for server product marketing and corporate strategy.

Delayed reaction

Although Oracle CEO Larry Ellison vowed a September demonstration of several planned wireless interactive applications with US West, broad-scale pilots will not be enacted until late 1993 or early 1994, an Oracle spokesman said.

Oracle already has ties to McCaw via a 1991 joint development deal for cellular desktop technology that could open the door to a partnership with AT&T. The venture, dubbed Oracle Data Publishing, was an attempt to deliver libraries of published information to PC users over cellular networks. However, no commercial products emerged from the pact. "The fact that the project is over doesn't preclude us from working with AT&T or other communications companies," Negris said.

Administering service and billing of the combined AT&T and McCaw will require large-scale multiprocessing software to manage terabytes of data and thousands upon thousands of queries.

Massively parallel databases are "key to getting these grand schemes off the ground," said Ira Brodsky, president of Datacomm Research Co. in Wilmett, Ill. "But I don't see AT&T going after that kind of complex application right away."

The waiting game

More likely, the company will put off developing new kinds of data and video services that would require immediate substantial software investment, Brodsky said. Instead, AT&T will repackage existing services, such as Dow Jones Newswire, with a customized AT&T interface.

Meanwhile, Oracle and US West are working to build a worldwide digital network — prototypes are promised by the end of the year — to be managed by massively parallel versions of the Oracle 7 database [CW, May 17]. That deal calls for the firms to build a network of massively parallel computers and software to manage the terabytes of data expected to be generated by blue-sky concepts such as video-on-demand and home multimedia services.

AT&T/McCaw ties may boost wireless

CONTINUED FROM COVER 1

cisco. While the exchange is itself embarking on virtual office plans, it has made no wireless decisions yet because of perceived security problems with the technology.

Large companies "will see more and more nifty services" because AT&T will likely pile its financial and development resources higher on the table with its larger-than-planned — and biggest-in-history — acquisition, Eisenlohr predicted. AT&T's 1991 purchase of NCR Corp. cost a paltry $7.4 billion in comparison.

"Wireless will get more play with AT&T now than if the company just owned a third [of McCaw]," agreed Rob Rich, an analyst at research firm Dataquest, Inc. in Framingham, Mass.

Problem-solver

Meanwhile, some predicted that AT&T's end-to-end wireless suite, which has now added wireless network service to its repertoire of chips, modems and wireless-equipped notebooks (see time line), will "ease the connectivity problem of building the network and getting the various components to talk to each other," said Peter Caserta, chairman of Information Technology, Inc. in Manhasset, N.Y., a wireless technology company with a systems integration subsidiary.

On the other hand, the McCaw deal could also allow AT&T to put smaller cellular operating companies out of business, Eisenlohr said. He predicted most of those carriers "will not survive" when pitted against AT&T's financial muscle.

Phil Evans, director of telecommunications at Perot Systems Corp. in Dallas, agreed that AT&T is probably looking "to save lots of money bypassing the local-exchange carriers and providing direct access" into their network.

However, AT&T Chairman Robert Allen assured the industry in a prepared statement that "AT&T is not interested in re-entering the local telephone business" and stressed that cellular services enhance, rather than replace, local telephone service.

Competition is fierce

McCaw, said to have garnered about 29% of the cellular market, faces prime competition from MobiLink, a consortium of local carriers that last month collectively launched a cellular voice network spanning 80% of the U.S. and Canada. MobiLink members include the regional Bell telephone companies, which still fall under the AT&T divestiture's regulatory restrictions, and GTE Corp.

MobiLink President Andrew Burroughs said the AT&T/McCaw turn of events "validates our strategic plan to combine our resources and launch [our network] in July." However, the playing field is not level, he said, in that AT&T "has all the advantages of packaging goods and services internationally, while our members can't do that."

But he said he would rather see the Bells opened up than AT&T restricted. "We'll stand our own ground," he said, "but the regulators must look at this closely."

AT&T said the merger will result in no job losses at either company and that it intends to fuel the innovative, entrepreneurial McCaw spirit.

"There will be a similarity to how we approached the NCR deal," said Jim Cosgrove, AT&T's vice president of data communication services. "You don't spend that much money to buy a company, then tear the organization apart."

AT&T's wireless milestones

October 1991
AT&TMail is delivered to pagers on SkyTel one-way satellite messaging network.

November 1991
AT&T obtains FCC license for spectrum in the 6-GHz range for personal communications system trial; begins testing in Atlanta, Boston and Los Angeles. How trial will fit with McCaw cellular network is still undecided.

November 1992
AT&T reveals plans to acquire 33% equity in McCaw. AT&TMail is integrated into the EO, Inc. two-way, cellular-capable personal communicator.

February 1993
AT&TMail is delivered to pagers on Embarc one-way satellite messaging network.

June 1993
Intel Corp. bundles AT&TMail software into its modem for wireless transmission.

August 1993
AT&T signs $12.6 billion acquisition agreement with McCaw.

September 1993*
Users of AT&TMail on AT&T EasyLink wired network and RAM Mobile Data's packet radio network can exchange messages.

*Planned

Source: AT&T

CW Chart: Dave Marshall

Data over cellular

Cellular networks have to date primarily handled voice communications. Last April, however, McCaw spun off a Wireless Data Division focused on honing the Cellular Digital Packet Data (CDPD) protocol that allows data to run over cellular networks in the "empty" bandwidth created by voice pauses.

CDPD technology competes with packet radio networks for transporting data. McCaw's stated goals have been to bring data services to 50% of its network this year via CDPD and to the other half in the second quarter of 1994. But McCaw will not implement data service on all channels or all cells in these initial phases, so coverage will not be as pervasive as voice for some time. — *Joanie M. Wexler*

EO on the Go

AT&T's positioning of its mobile troops does not leave off with the sweeping McCaw acquisition.

As a participant in the gamut of wireless-oriented markets, from equipment to network services, AT&T quietly merged its EO, Inc. personal communicator organization on Aug. 12 with Go Corp., a Foster City, Calif., pen-based operating system developer in which it held an equity stake.

AT&T had become a majority owner of EO in an agreement consummated last month. The goal of the Go merger is to more tightly integrate the communications functions being developed by EO and AT&T Bell Laboratories for the personal communications system with those created by Go for its mobile PenPoint operating system, AT&T said.

However, in the meantime, AT&T has cut half of Go's staff, and some of the company's visionaries have left in the wake of the deal: Founder Jerrold Kaplan resigned, as did development guru Robert Carr. Bill Campbell, Go's former president, also left but will remain on the board of the new entity.

The EO is AT&T's chosen platform for its personal communications system, an emerging product category that combines pen technology, computing, voice and data communications and personal productivity functions in a portable, tablet-size device.

AT&T's EO, with a cellular telephone and cellular data link, costs up to $4,200, according to AT&T spokesman Steve O'Donnell. The device comes with nine standard personal productivity applications.

Users can purchase the EO without communications capabilities for $1,999, he said.

— *Joanie M. Wexler and Michael Fitzgerald*

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IBM throws lot in with OSF's standard

Novell, Banyan also choose DCE, but only for linking networks to Unix hosts

By Elisabeth Horwitt
ARMONK, N.Y.

IBM is betting its client/server strategy on the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) as a network operating system standard, company spokesmen said at a teleconference last week.

Toward that end, IBM will next week disclose DCE client support for OS/2, along with plans to roll the middleware standard across all IBM systems by the end of 1994, said Art Olbert, IBM Personal Systems director.

Currently centered in the Unix world, DCE defines how distributed, peer-to-peer multivendor systems can share resources and applications. IBM sees DCE as a way of providing "industrial-strength" local-area network platforms on which users can safely and confidently rightsize applications, Olbert said.

While IBM may have turned to DCE support to differentiate its own client/server system, LAN Server, from competing products, it may be more difficult to persuade rival network operating system companies to adopt the OSF standard, said David Strom, president of David Strom, Inc., a consultancy in Port Washington, N.Y.

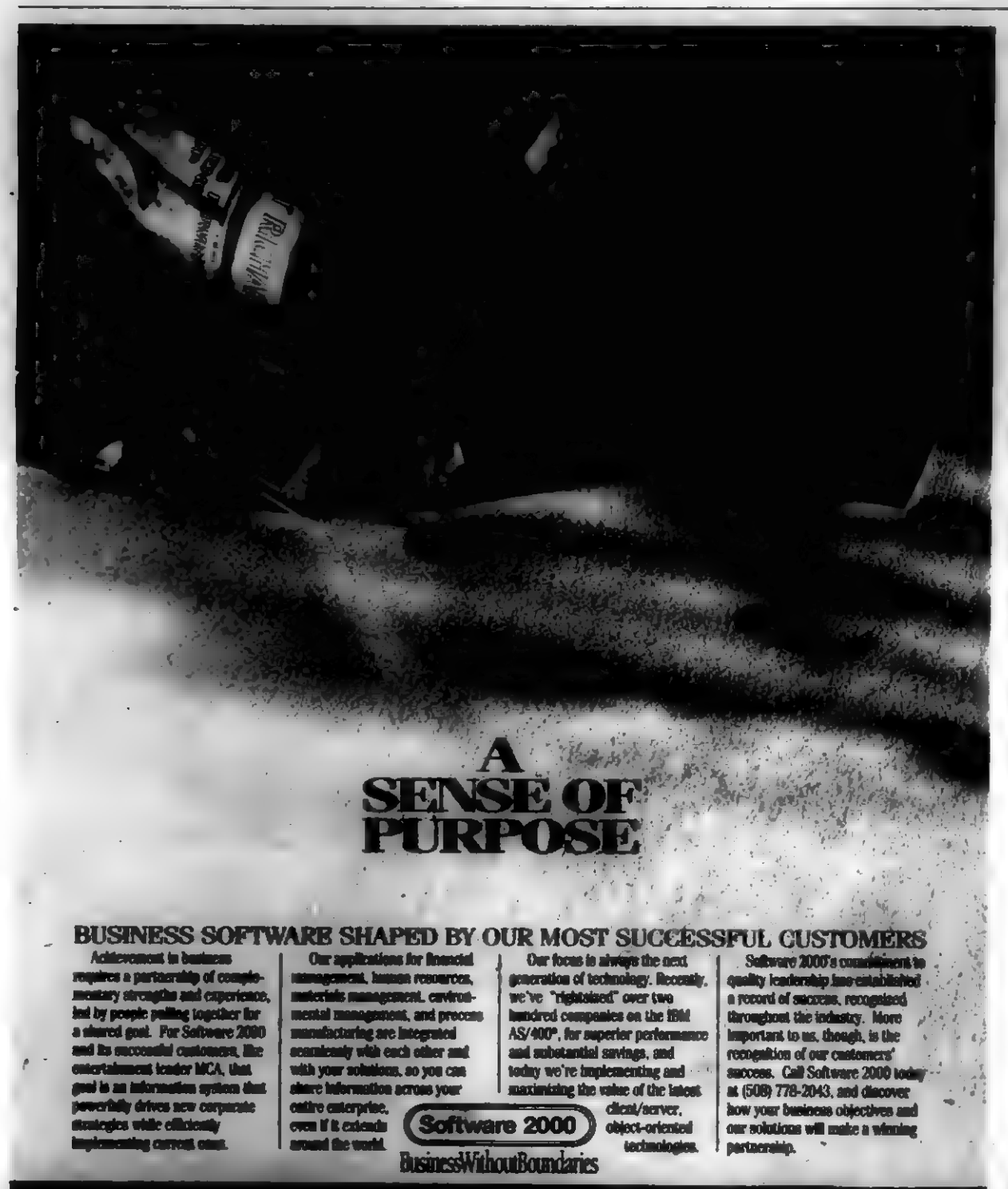
Taking sides

So far, Microsoft Corp. has studiously ignored DCE, while Novell, Inc. and Banyan Systems, Inc. have said they will support the OSF standard primarily as a way of linking to Unix hosts but not necessarily as a way for clients to link up to their own servers. The primary reason, analysts said, is that DCE's underlying peer-to-peer services compete directly with the services that network operating system vendors provide on client/server platforms.

So far, Microsoft has studiously ignored DCE, while Novell and Banyan have said they will support the OSF standard.

This leaves IBM a clear field in the DCE-based client/server market, where it plans the following announcements and demonstrations, spokesmen said:

- A DCE client for OS/2, at the Interop '93 August show this week in San Francisco, which would provide the first Intel Corp.-based DCE platform.
- A demonstration, also at Interop, of LAN NetView, an OS/2-based platform for managing DOS, Windows, NetWare and OS/2 systems. A shipment date will be announced by early fall.
- Another Interop demonstration, this one of a prototype of LAN Distance, software said to enable remote Windows, DOS and OS/2 clients to access a NetWare or LAN Server system over a dial-up telecommunications link — and get the same level of performance as they would if they resided on the LAN.
- An announcement by year's end of a shipment date for a Windows DCE client and DCE support for LAN Server. IBM plans to have DCE support on all its major computing platforms by the end of 1994; it already supports DCE on AIX.



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In best of all open worlds, users want even more options

In an open systems world, users can opt to replace aging Unix equipment with products from a variety of competitors, especially when pricing from all the major vendors is extremely competitive. This environment could prove particularly dangerous to Sun, which may be losing its hold on key accounts for other reasons.

Earlier this month, Sun's $75 million bid to outfit the National Security Agency (NSA) with a secure Unix workstation system was suspended after several other workstation vendors questioned Sun's benchmarks [CW, Aug. 9]. The contract for the super-secretive NSA, for which Sun is reportedly the dominant workstation supplier, could be worth $200 million over a five-year period.

Early users of Sun workstations for scientific and technical applications are among those likely to consider other platforms. One of the largest Sun sites, the Jet Propulsion Laboratories in Pasadena, Calif., has an open bid on a contract for systems compliant with Unix System V Release 4.

Others, such as the Woods Hole Oceanographic Institute in Woods Hole, Mass., are mixing Sun machines with Silicon Graphics workstations for some imaging applications. "I don't see an exodus from Sun to SGI," said Robert C. Groman, director at the institute's Information Systems Center. "But people want to keep their options open."

To keep users happy, Sun is playing to its strengths, such as financial analysis and networking, in its systems integration and consulting business. On Wall Street, Sun is paying attention to loyal users of its "trader" workstations with the SMCC Professional Services Group, said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

The plan appears to be paying off: "It's probably not on the level of its competitors," Iams said, "but it's making inroads." —*Jean S. Bozman*

Sun eclipse

CONTINUED FROM COVER 1

These glaring weaknesses are coming into focus as the highflier of the 1980s comes down to earth. Sun's revenue grew 20% for the year ended June 30, reaching a record $4.3 billion. Profits, however, fell almost 10% to $156.7 million for the year (see chart).

Sun controller Mike Lehman attributed the profit lag to delayed delivery of products based on high-end SuperSPARC chips.

Seeking to block any further signs of a slide, the company is busy attacking key problem areas, starting with servers.

Sun will make its high-end servers more attractive by year's end by letting users take full advantage of the 20 processors on board the SPARCcenter 2000 and by adding power to the eight-CPU symmetrical multiprocessor SPARCserver 1000. But the addition of more horsepower requires a new release of the Solaris 2.X operating system — Release 2.3 — which is set for this fall, Sun said.

Some industry analysts said they also expect Sun to power up its servers by "teaming" Scalable Processor Architecture (SPARC) CPUs with new architectures such as clustered systems. This may be the only way Sun can boost systems power short of adding chips even faster than SuperSPARC. The company is also developing a 64-bit SPARC implementation with Intergraph Corp.

In battles where performance requirements exceed its high-end offerings, Sun often recommends SPARC-compatible systems from other vendors. Sun Chief Executive Officer Scott McNealy said, "If you need something bigger, with more floating points or more vectorization, it's all the same operating system and the same chip."

Cray Research, Inc. will begin marketing a Unix superserver based on SPARC chip technology and the Solaris 2.X operating system, industry analysts said.

Sun's Scott McNealy: *'You need one architect to build a house'*

Servers with a smile

Server sales — currently just a fraction of Sun revenue — should grow and boost profit margins at the same time, Sun CEO Scott McNealy said. "I think servers grow at a very aggressive rate for us — probably faster than any other part of the business," he said, referring to record fourth-quarter sales. Sun introduced its high-end SPARCcenter 2000s in November and the symmetrical multiprocessor SPARCserver 1000s in May. Both machines will support more processors when Solaris 2.3 ships this fall, Sun said.

But as Sun pushes high-end servers, the company is bumping up against IBM and HP again, both of which are much more experienced at managing projects involving complex commercial applications and legacy systems. "Sun is able to respond to competitors, but when you have assaults from multiple directions from well-heeled competitors, there's only so much turf you can expect to hold," said Gary Smaby, president of Smaby Group, Inc. in Minneapolis.

Wearing a new hat

Sun's recent foray into systems integration services with its Sun Networks consultancy [CW, June 28] is aimed at leveling the playing field. Shooting to keep overhead as low as possible, Sun Networks will work with outside vendors such as Electronic Data Systems Corp., Andersen Consulting and value-added resellers to meet information systems' integration needs.

> The promised land of high-end servers will not be reached without accommodating user preferences for other vendors' standards.

"We don't want to go in and implement; we only want to go in and architect," McNealy said. "You need one architect to build a house, and you need 100 people pounding nails."

Getting users to adopt Transmission Control Protocol/Internet Protocol networks is Sun Networks' goal, McNealy said. "Then we can start hanging nodes off it left and right: SPARCcenter 2000s, SPARCserver 1000s or departmental network servers," he added.

Even so, the promised land of high-end servers will not be reached without accommodating user preferences for other vendors' standards, as Sun did by supporting the Open Software Foundation's Motif user interface, users said.

And some said Sun still has a lot to learn about systems integration, support and the scalability of back-end production systems.

"The truth of the matter is, they need to get a little more customer-driven," said Michael Prince, director of IS at Burlington Coat Factory, Inc.'s data center in Aetna, N.H., which has 300 Sun workstations. "If you're going to be in the data center doing MIS-kinds of applications for your customers, then you've got to be a different guy than when you were selling workstations to engineers."

Prince, who uses six Sequent Computer Systems, Inc. machines for back-end processing of Oracle Corp. database applications, said he worries about round-the-clock performance and support no matter who sells the system. "There really is a level of commitment one gives to the strategic, mission-critical data of a corporation that just isn't there with the applications — that [manipulate] that data," he said. "When that server goes down, the whole company's paralyzed."

This winter, Burlington Coat Factory will put Oracle 7 Parallel Server on its Sequent clustered systems as its primary production database system. Sun does not sell a similarly configured system, though Sun systems do run Oracle.

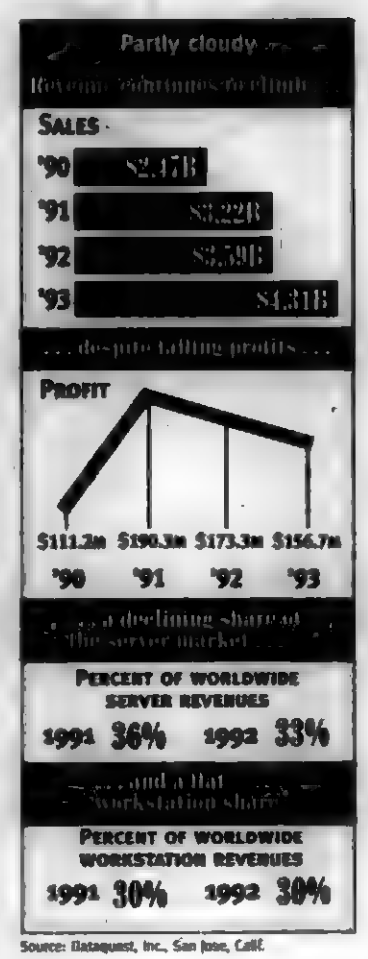
Some improvements

Users acknowledged progress in Sun's service offerings, which used to be the firm's Achilles' heel with commercial IS sites. Last month, Sun spun off a SunService global service division to handle multivendor computing sites.

Sun has also simplified its site maintenance contracts, noted James Stikeleather, director of systems development at Kash n' Karry Food Stores, Inc., a $1.2 billion Tampa, Fla., grocery chain. "It's recognition that, in the commercial environment, things are more centralized," Stikeleather said. "When I've got 300 machines sitting out there, I don't want to have 300 different maintenance contracts."

But users and industry analysts said they are convinced that Sun will have to make a much bigger effort as a systems integrator and service provider at large corporate sites if the high-end servers are to succeed with IS managers from mainframe shops.

"They're starting to broaden their scope and to try to solve broad business problems beyond their own product set," said Bruce Merkis, director of workgroup computing at Nynex Science & Technology, Inc., a Nynex Corp. research subsidiary in White Plains, N.Y. "But when you talk to other consultancies, such as those in IBM, you see they're way ahead in having the skills and knowledge to provide those services."



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Distributed nets

CONTINUED FROM COVER 1

gear from multiple vendors. Most of the functions needed for this world boil down to new twists on old ideas used in the mainframe and minicomputer environs; concepts such as capacity planning and electronic software distribution are relatively new.

Not helping matters is the confusion engendered by the diversity of products, frameworks and services now emerging from a raft of vendors that are approaching the problems from different perspectives (see story below). "Vendors all use different terms," said Mitchell Kramer, an analyst at the Patricia Seybold Office Computing Group in Boston. "That makes it hard to compare and contrast products."

This situation will likely take at least three years to fully shake out, industry watchers said. In the meantime, customers are advised to start choosing products and platforms that are available, that can work with whatever they already have in-house and that are at least promised to work within proposed industry standards such as the Open Software Foundation's Distributed Management Environment. Some larger information systems shops, particularly Wall Street brokerages, have started writing their own tools.

Management needed

It would be suicidal to wait for the market to settle down completely before doing something, observers cautioned. "Over half of all client/server projects fail, and 90% of them because the right systems management structure was not put in place," said Jeremy Frank, an analyst at Gartner Group, Inc. in Stamford, Conn. "The ability to deploy client/server is way ahead of the ability to manage it."

Mike Costa

Nike started with the basics: polling its end users to figure out the gaps in its service coverage, Croft said. It came up with a list of 10 hot buttons that would be applicable to any Fortune 1,000 company and is working to identify tools to address them. Among them were the following:

- Electronic software distribution: sending new releases of PC software to hundreds or thousands of workstations.
- Backup and recovery of local-area networks.
- Critical resource management: looking at what computers and networking resources are needed for a particular application.

Another key component in distributed systems management is configuration management or knowing exactly what every end user has in his computer and being able to change that configuration from a central spot, adding user identifications, for example.

"Some of the functions mirror what you do with a host, but the process is very different," said Mark Armentrout, manager of network services at Atlantic Richfield Co. in Plano, Texas. In the host environment, for example, there may be thousands of users sharing one resource. In distributed systems, the issues are, for example, should servers doing essentially the same thing — all the electronic-mail servers, say — be grouped together on one network, or should they be put on separate LANs because of bandwidth problems? Organizational issues come up as well. For example, the vast majority of IS shops are still segmented along technology lines — with experts in PC hardware, mainframe systems software and networking — when what is needed is a more team-oriented approach where all the gurus work together to solve the problem. (*Computerworld* will address organizational issues related to managing distributed systems in a Management article in the Sept. 6 issue.)

But that is often difficult to put into practice. "Members from each organization often wind up pointing fingers at each other," said Russ Prina, director of computer operations at US West in Albuquerque, N.M.

"A lot of little fiefdoms have grown up, people protecting their jobs around the technologies," said Bjorn Larsen, president of Votek Systems Ltd., a software vendor in Richmond Hill, Ontario. Often, he said, the IS organizations cannot agree on even the definition of a problem, much less how to report it and resolve it. "All the barriers have to come down," he said.

And even when there is agreement, there must be vigilance. "Sometimes you find out what you thought was taken care of was not," even for things as seemingly straightforward as how to handle user log-ins, said Andre Prive, a staff member at a defense contractor that cannot be identified.

Productwise, "things are a lot better than they were a year ago," Croft said. "But in the good old Nike spirit of just doing it, we will have to be our own systems integrator initially."

Double trouble

The world of distributed systems management will not be cheap. Jeremy Frank, an analyst at Gartner Group, Inc. in Stamford, Conn., estimates the typical mainframe data center spends about $2 million each year on systems software. He said it will cost about twice that to provide similar functions for distributed computers.

Show becomes interoperability guide

By Joanie M. Wexler
SAN FRANCISCO

As organizations plunge ahead in their frenzy to glue heterogeneous network islands into cohesive distributed computing environments, technology managers are searching for proof of product interoperability and multiprotocol education anywhere they can find it.

Enter this week's Interop '93 August trade show, a changed beast from the onetime haunt of technowizards who rolled up their sleeves, shook hands and just made things work.

Now, according to several campuslike organizations, Interop has also become an invaluable resource in an industry where education and large-network prototypes are hard to come by.

For example, Marian Dowling, the Internet manager at the Naval Research Laboratory in Washington, D.C., said she leveraged some router performance benchmark results distributed at a recent Interop show to confirm that the agency was likely to take a performance hit if it hooked up its Proteon, Inc. router to a T1 (1.5M bit/sec.) circuit.

The results came from Harvard University consultant and tutorial instructor Scott Bradner, who performs vendor-independent performance benchmarks on router products running various protocols over different network types.

His results, distributed as part of his tutorial session, indicated the Proteon router "had a problem with small packets back to back" over T1s, Dowling said. The laboratory has since swapped out its external router to a Cisco Systems, Inc. AGS+, she said.

Haunted by the past

Organizations such as Dowling's are at the mercy of the multiprotocol whims of various departments or business units, which have traditionally made their own networking choices and are now looking to central information systems departments for internetwork connectivity and management.

At the University of Maryland/Baltimore County, for example, "one of our biggest questions is how to manage the mishmash of networking," said Daniel A. Dinkin, network manager.

At Interop '93 Spring in Washington, D.C., Dinkin attended an introductory course on the Simple Network Management Protocol (SNMP), "which gave me a basic understanding of how it works and relates to everything in my network," he said.

He said he learned that SNMP is being extended beyond Transmission Control Protocol/Internet Protocol networks, "which is important to us because our protocols are always changing, and we always have many."

Dinkin and others said they are largely convinced of the product interoperability demonstrated by Interop's various showcase networks running different vendors' products.

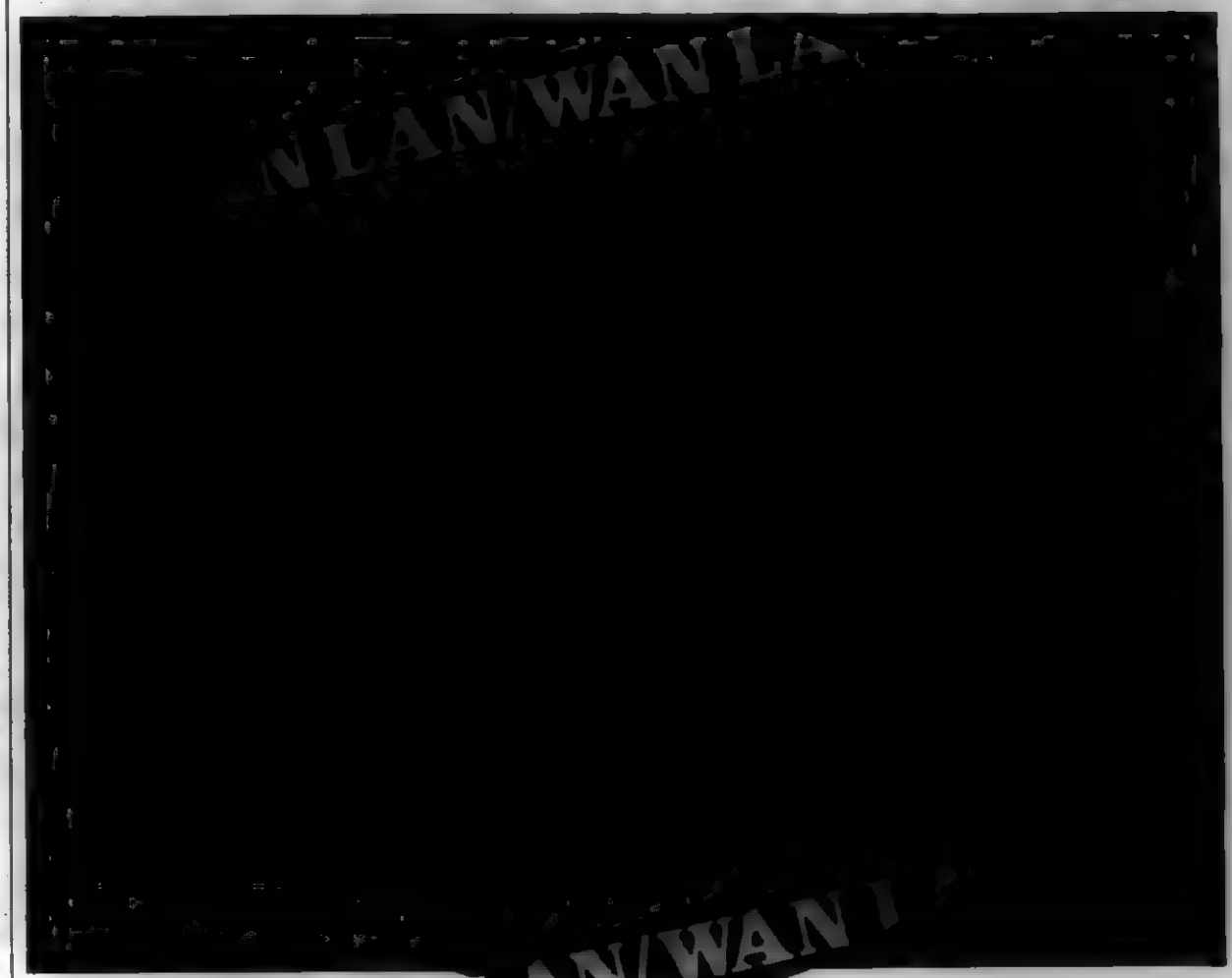
"The show has proven to me that you don't have to make everything fit by having all your equipment from one vendor," Dinkin said.

"The proof is in the pudding," added Barbara Jennings, project leader for mail connectivity at Sandia National Laboratory in Albuquerque, N.M. As a contractor to the U.S. Department of Energy, Jennings explained, Sandia falls under the federal mandate that all new procurements comply with Government Open Systems Interconnect (OSI) Profile standards.

"We're all new to OSI," she said. "To address the government mandate, we're having to test a variety of products that are not yet proven. This would take us a lot of time and money to do on our own."

Jennings, who describes herself as a "networking neophyte," said Interop is the only networking show she attends. "My focus is to get interoperability established between heterogeneous mail applications and hardware platforms" and to make sure they are X.400- and X.500-compliant, she explained.

"When something is new, it's important to have a huge network like that — a working model of what works," Dowling said.



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News Shorts

Wang sues Microsoft

After successfully forcing numerous makers of single in-line memory modules to license its patented technology, **Wang Laboratories, Inc.** has filed a new lawsuit charging **Microsoft Corp.** and a smaller software company with infringing on two patents awarded during the past year. The suit, filed in U.S. District Court in Boston, alleges infringement on patents covering object managers and a composite PC-based document scanner and processor. Wang would not identify the Microsoft products at issue or say whether it plans to try to invoke the patents on a wider basis, as it did with the memory module technology.

Routers on speaking terms

Networking bigwigs **Cisco Systems, Inc.** and **Novell, Inc.** last week said they have teamed to ensure interoperability among their router products. The efforts include Cisco support of Novell's NetWare Link Services Protocol, an algorithm that enables routers to exchange network information. The two companies said they will demonstrate their products working in harmony at this week's Interop '93 August show.

McAfee reorganizes execs

Only 10 months after going public, the board of security vendor **McAfee Associates** has repositioned the role of co-founder John McAfee and brought in a new chief executive officer to head up the antivirus software maker. Bill Larson, a former SunSoft, Inc. vice president, was last week named CEO of the firm. McAfee will assume the position of chief technical officer and remain chairman of the board. The Santa Clara, Calif.-based company recently signed a letter of intent to acquire database developer Buttonware.

Hold on to your PC software in L.A.

More software gets pirated in Los Angeles than in any other U.S. city, the **Software Publishers Association** said last week. The group counted the number of legal actions taken this year, and Los Angeles came in first, followed by New York, San Francisco and Houston.

Industry teams on infrared link

A nonprofit organization has formed to standardize wireless connectivity between mobile and desktop PCs and peripherals using an infrared link. Among the 75 initial **InfraRed Data Association** members are **AT&T, Apple Computer, Inc., Hewlett-Packard Co., Microsoft Corp.** and **Motorola, Inc.**

Bachman posts Q4, year-end loss

Bachman Information Systems, Inc. announced a fiscal fourth-quarter loss of $4.7 million, widening its 1993 deficit to $14.7 million. Included in the loss was a $4.6 million restructuring charge, the Burlington, Mass., tools vendor said. Bachman earned $2.8 million last year. Fourth-quarter and year-end revenue nosedived 35% and 25% to $9.9 million and $36 million, respectively.

SHORT TAKES Several consulting organizations have banded to form the **RightSource Group**, whose aim is to provide client/server services nationwide. . . . **Hewlett-Packard** last week announced the availability of LAN Manager for Unix for the HP 9000 Version 2.2, an enhanced version of networking software that lets PC users share applications and resources on HP 9000 Series 800 business servers and HP Apollo 9000 Series 700 workstations. . . . **Apple** has announced the Macintosh Hardware System Update Version 2.0, a troubleshooting update that, among other things, manages fonts more effectively and addresses possible floppy and hard disk problems.

Novell preps support for TCP/IP

Users will be able to access protocol over LANs or WANs

By Elisabeth Horwitt
PROVO, UTAH

Novell, Inc. is preparing to announce its first full native support of Transmission Control Protocol/Internet Protocol (TCP/IP) on its upcoming release of NetWare 3.12, according to a user who is scheduled to shortly receive a beta-test version of the package.

Novell has long had an ambivalent relationship with TCP/IP. Novell Chief Financial Officer Jim Tolonen recently claimed that Novell is the No. 1 shipper of TCP/IP products worldwide, excluding its Unix Systems Group division.

Yet Novell's support of TCP/IP on NetWare is currently limited to encapsulating IPX commands inside TCP/IP packets, said George Powers, Novell's director of internetworking product development. Encapsulation enables clients to access a NetWare server via TCP/IP but can hurt response time.

TCP/IP instead of IPX

NetWare over IP, now in beta testing, will enable clients to access NetWare servers using TCP/IP instead of IPX over a local- or wide-area network, Powers said.

Novell will provide the above capability to NetWare v3.11 users in the next 3.x release, according to Charles Tilbury, a network analyst at the University of Texas M.D. Anderson Cancer Center.

Tilbury said he expects to receive his beta-test copy shortly. Novell would not comment on the unannounced NetWare 3.12.

M.D. Anderson hopes to use the product to replace IPX with TCP/IP as a way of linking more than 100 NetWare servers, Tilbury said. This would enable the center to link its Novell servers to higher-end systems that support TCP/IP but not IPX. In addition, TCP/IP generates less traffic than IPX because the former is a "connectionless protocol" that goes ahead and sends without first checking to see whether the recipient is there, Tilbury said.

Novell has been addressing the problem of overhead in NetWare communications through its NetWare Link Service Protocol (NLSP), which reduces NetWare traffic overhead by an order of magnitude, Powers said. NLSP is slated to ship in first-quarter 1994.

Users decry Novell's distance

CONTINUED FROM COVER 1

pertise as beta-test sites, according to Marc Dodge, the package handler's telecommunications manager. Such companies learn early about upcoming strategic announcements and can call high-level Novell technicians for help in pinpointing the source of multivendor network problems, Dodge said.

However, most other companies do not get this kind of treatment, Dodge said. "I've heard other companies complain about how difficult it is to get questions answered about networking problems and on how to use NetWare to support their applications."

No guarantees

Being a large Novell shop does not guarantee satisfactory support, users said. "Our IBM rep is on site once a week; everyone knows him. Novell reps show up on the rare occasions when I ask about a new product," said Glenn Fund, president of the Boston Area Novell Users Group and head of networking at a New England-based defense contractor. "Last time we talked with Novell, they wanted guarantees of $250,000 [in Novell purchases per year], then you get special discounts and briefings."

"I want the latest patches and updates [to existing NetWare products] coming into my desk automatically, and I'd like to learn what they do without having to go chasing through NetWire," Novell's on-line CompuServe bulletin board, said Robin McCubbin, a network planning analyst at National Grocers, Inc.

The Ontario grocery chain's total Novell installed base is valued somewhere between the $150,000 minimum Novell originally required for its MLA program and the $250,000 the vendor is now asking, McCubbin said.

This is frustrating because the figure changed while National Grocers was considering the program, he added. "We'd prefer that they say, 'Pay this, and you get these services.'"

Boston Edison's John Dubiel *wants information faster*

"I feel like I should become a Platinum reseller" to get Novell's full attention, McCubbin said.

Customers that do not make Master License status can purchase several of the program's services for a fee, a Novell spokeswoman said. For example, non-MLA members can purchase from Novell the services of an assigned account technician to provide "personalized support" for $15,000 per year, plus an additional $15,000 for an unlimited support contract with the vendor.

A lack of directional information from Novell also puzzles information systems managers. In particular, several corporate users said they are peeved that the only way to get advance information on hot, upcoming announcements from Novell is to become a beta-test site for such products.

"We read about announcements in the press," Dubiel said. "This makes it difficult to plan the direction of our networks and corporate computing infrastructure."

A Novell spokeswoman said the vendor does not plan to change its briefing strategy. However, it may disclose information more informally during "dialogue with national accounts," she added.

Users in the dark

Novell may be losing potential converts to its enterprise strategy through its failure to provide regular briefings that help users understand its strategy as it unfolds. "Give us your vision and tell us how the pieces fit together, [Novell]," Dubiel said. "AppWare was a huge announcement and will become available next May, which is pretty quick. But right now I don't understand its significance or how we take advantage of it."

As a result, some corporate users said they are willing to pay Novell, as they increasingly pay IBM, for high-level, on-site support from systems engineers.

That is the direction in which Novell is heading with the MLA umbrella of services. The program provides options such as an assigned or dedicated Novell systems engineer; lower prices; a streamlined ordering process; and access to the Network Support Encyclopedia, a CD-ROM compilation of recent Novell introductions that is updated monthly.

"One of the main reasons we signed up for the program is to get a Novell engineer assigned to our account," Dubiel said. "We felt we needed it to get a better response to our problems."

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IBM LAN Server	**802.3*
	Token Ring (4/16 Mbps)
AppleTalk	**LocalTalk*
	**EtherTalk*
*HP-UX***	**Ethernet*
*SunOS***	**Ethernet*
*Solaris***	**Ethernet*
SCO UNIX®	**Ethernet*

*Standard in the HP LaserJet 4SI MX printer. **For operating HP-UX, SunOS or Solaris, a one-time purchase of $199 in configuration software is required. Adobe and PostScript are trademarks of Adobe Systems Inc. which may be registered in certain jurisdictions. Microsoft is a U.S. registered trademark of Microsoft Corporation. UNIX is a registered trademark of UNIX System Laboratories Inc. in the U.S.A. and other countries. †In Canada call 1-800-387-3867, Ext. 7299. © 1993 Hewlett-Packard PE12353

Multiple environments are no longer worlds apart. Even if you have Novell Netware on one network, HP-UX on another and EtherTalk on a third, the new HP LaserJet 4Si MX printer easily connects across platforms. Automatically.

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What's more, HP's LaserJet 4Si MX printer is ready to handle whatever needs come down the

that adapts to multiple environments.

pike. More operating systems? No problem. As your network system continues to evolve, the capabilities of this printer are no longer just impressive. They're indispensable.

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But what if you don't need the full capabilities of the HP LaserJet 4Si MX printer right away? HP offers another printer that's probably a perfect fit. The HP LaserJet 4Si printer delivers the identical 17 ppm performance and superb 600 dpi print quality. It also has room to grow. The two MIO expansion slots let you add HP JetDirect network interface or third party cards. And you can add on Adobe's genuine PostScript Level 2 software and SIMM memory modules, as you need them.

To find out more about the multiple-network HP LaserJet 4Si MX printer and the upgradable HP LaserJet 4Si printer just call 1-800-LASERJET, Ext. 7299.† Capabilities this advanced make a world of difference—in any environment.

HEWLETT PACKARD

Client/server

Intersolv boosts Excelerator, adds road map

By Melinda-Carol Ballou
WASHINGTON, D.C.

Intersolv, Inc. is rallying into the client/server analysis and design market with a version of its Excelerator tool that adds a new diagram editor, support for data-, process- and event-driven design and links to relational database management systems.

Also new with Excelerator II is an application guide that provides users with a road map into the morass of client/server development.

During the past several months, the Rockville, Md., company has received attention from Powersoft Corp. and Gupta Corp. Both client/server tool specialists are seeking group development support and have announced links between Intersolv's PVCS version control product and their development products.

Intersolv Chief Executive Officer Kevin Burns said the relationships make sense because users require both high-end development and the ability to mix client/server and legacy applications. "Everyone's focused on client/server graphical development and has lulled themselves into thinking that team development, control and scalability are not required," he said.

Burns said he hopes Excelerator II will change that thinking by taking these concepts one step further. The package addresses the performance and usability issues that concerned users of the earlier release.

Computer-aided software engineering (CASE) "is not dead; it just has to change, and Excelerator II is an example of that," said Ed Acly, director of software at International Data Corp., a Framingham, Mass., consultancy. "It's a definite misconception that you no longer need to do CASE. You still need to do business analysis and structured design."

But will Excelerator II get the nod? "For people who are still deciding [about CASE tools], it's a 'me too' announcement. But [Intersolv is] finally positioning itself to take a place in this market," said Peggy Ledvina, an analyst at Meta Group, Inc., a consulting firm in Stamford, Conn.

Thumbs-up

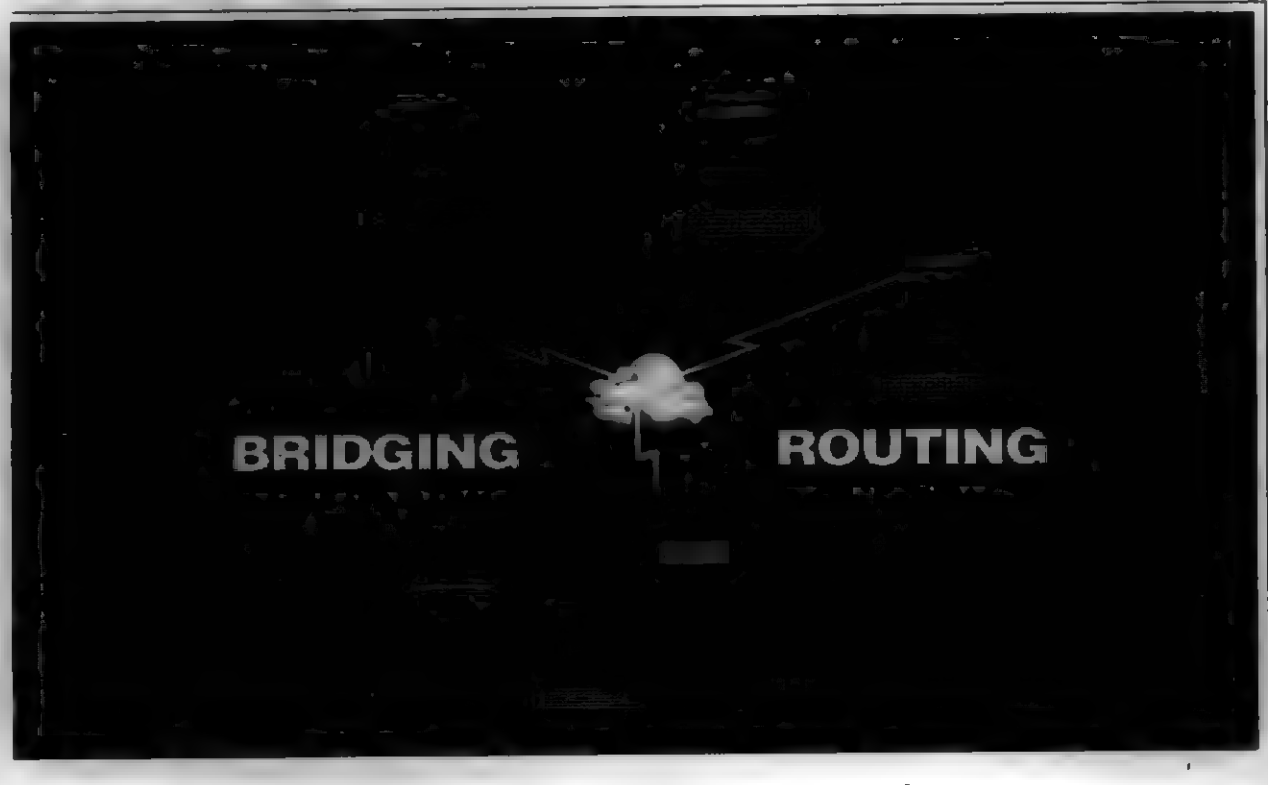
Users were positive in their assessments of the new version of Excelerator.

Penzoil Co., a Houston-based petrochemical company, performed a 75-point evaluation of a half-dozen tools after scanning the market. It opted for Excelerator II because of the tool's repository and because it allows groups of programmers to share objects. While Penzoil said it appreciates the performance improvements in Excelerator II, the real focus of the release is a rewritten diagram editor that fixed problems in the old editor, according to Debra Marinelli, manager of data administration.

"The old editor required a lot of work on the part of the user. [Intersolv] totally rewrote it, knowing what to avoid, and now we will be able to get work done a lot faster," she said.

Intersolv expects to ship a full object-oriented tool set in November, officials said. Next year the company hopes to release server support for Microsoft Corp.'s Windows NT.

Excelerator II is shipping now and is priced at $6,500. Links to Powersoft and Gupta products will ship by year's end.



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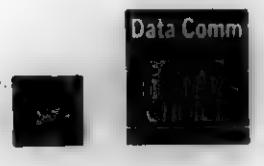

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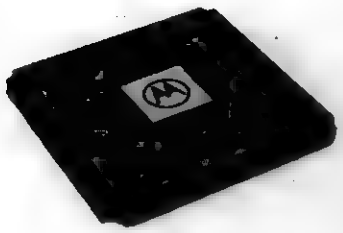

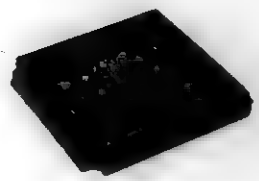

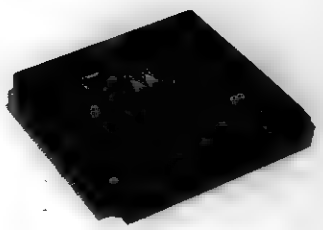

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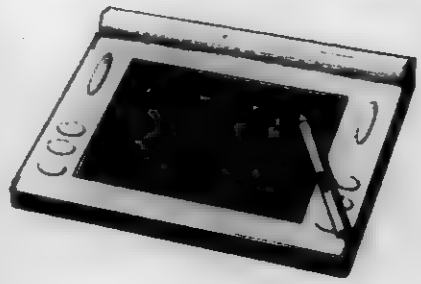

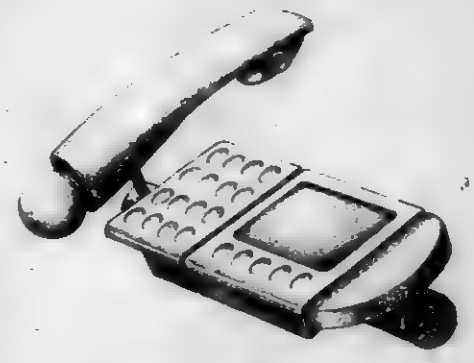

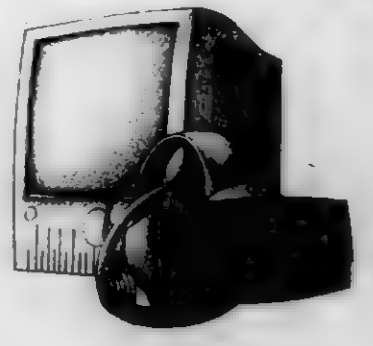

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MOTOROLA

Feds urged to raise export limit on processing power

By Gary H. Anthes
WASHINGTON, D.C.

After years of waiting, computer makers are hoping the U.S. Department of Commerce will take a major step toward overhauling its 45-year-old export-control regimen this week. Industry has long contended that existing regulations, which were conceived to keep powerful computers out of the hands of unfriendly weapons-builders, cost billions of dollars in lost sales and contribute little to national security.

However, industry expects the government to relax controls on many exports that must now undergo a laborious licensing procedure if a government report slated for release Thursday finds that computers available from foreign makers exceed the power of censored U.S. units.

Last week, the American Electronics Association (AEA) called on the government to raise the threshold below which computers can be freely exported from the 12.5 million theoretical operations per second (MTOPS) to 210 MTOPS. MTOPS is a government-devised measure of processing power. Few computers made in the U.S. today fall below 12.5 MTOPS, approximately the power of an Intel Corp. I486-based PC.

The AEA quoted Commerce Department figures suggesting that 8,700 export-license applications last year worth $10.5 billion would have been freed up under the 210 MTOPS threshold. Billions more in export sales may be lost to smaller companies that are unwilling or unable to fight the export bureaucracy, the AEA said.

Loosen up

The government is expected to raise the current microprocessor export ceiling from 12.5 MTOPS to 210 MTOPS

U.S. microprocessors available for export:

	MTOPS
Intel i486, 33 MHz	12.5
Intel Pentium	67
Sun SPARC	66
DEC Alpha	135-258
PowerPC (Motorola/Apple/IBM)	67-107

Source: American Electronics Association

According to Sun Microsystems, Inc. Vice President Mike Morris, it takes just minutes for clone makers in Taiwan and Korea to add a motherboard with four Scalable Processor Architecture chips — which individually can be exported under current U.S. rules — to a chassis to produce a workstation rated at 206 MTOPS, or a machine 16.5 times more powerful than the finished models Sun may export (see chart).

MTOPS abroad

Greg Garcia, the AEA's manager of international trade affairs, said the Commerce Department recently told the AEA that it has found "foreign availability" above 12.5 MTOPS but has not said at what level it found the computers, nor has it indicated whether it plans to raise the 12.5 MTOPS threshold in any case.

Under current law, the performance limit for exports to friendly countries will be raised immediately to whatever level the Commerce Department finds to be generally available from foreign suppliers. For exports to the former Eastern Bloc countries and unfriendly states, the government could raise the export limit unilaterally, but it is more likely to do so only with the agreement of its closest allies.

But no matter what the export limit may be, Garcia said, the industry is troubled by the government's apparent refusal to anticipate imminent technological improvements.

"It's not rocket science," he said. "You can look at industry trends; you can look at chip shipments and see that computers using those chips will be available [in foreign countries] a few months later. The government is constantly looking in a rearview mirror."

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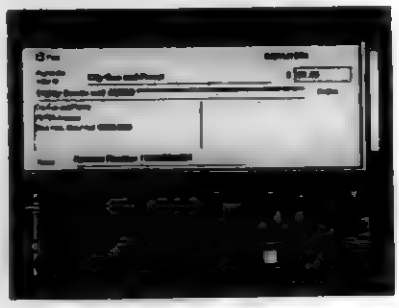

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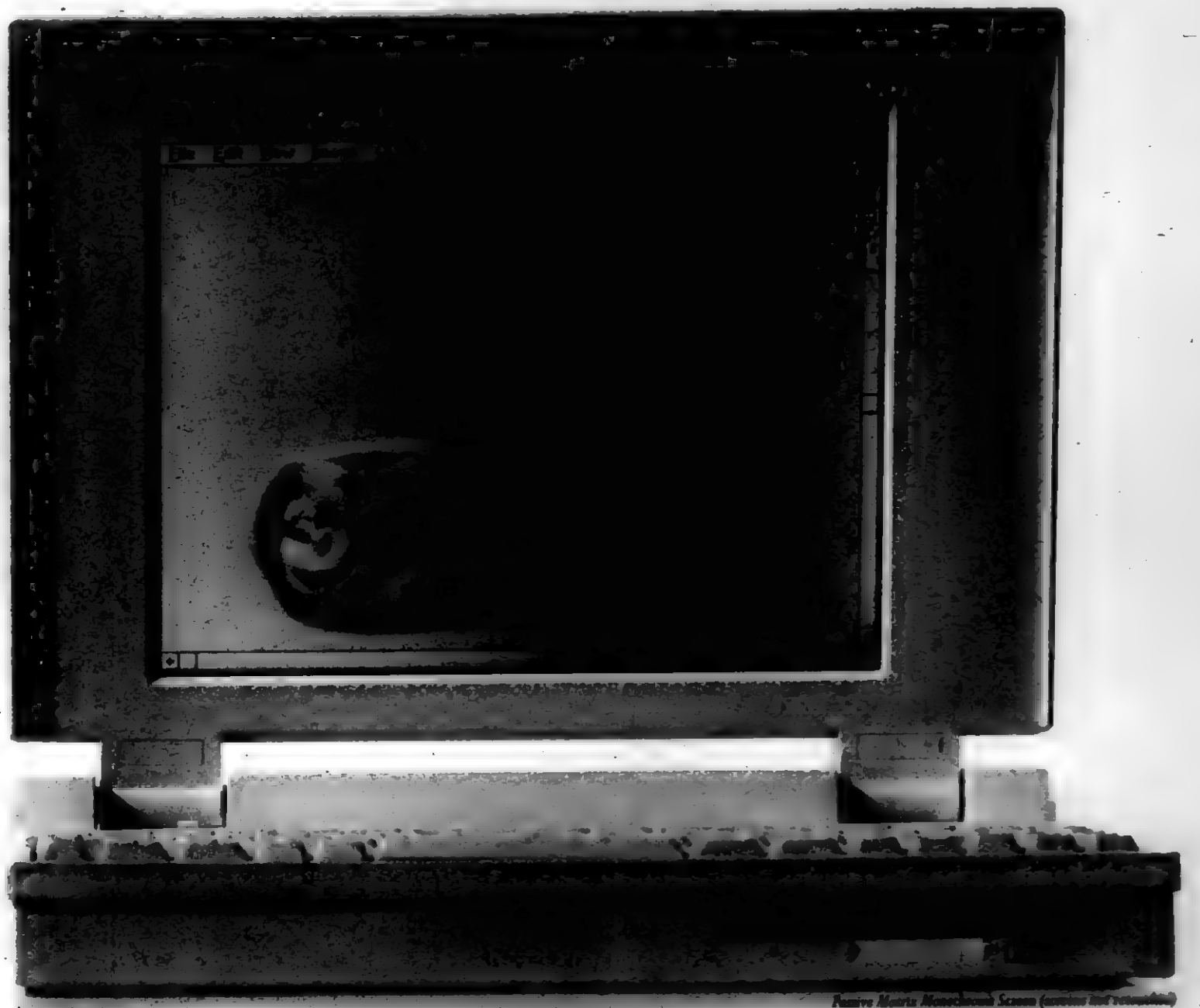

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Innovative input

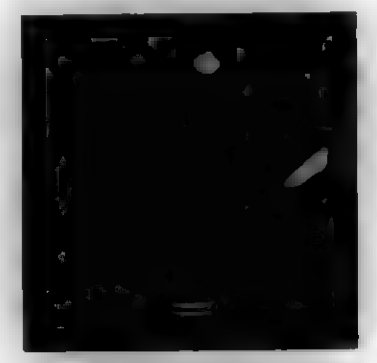
Will interactive mice and voice recognition kill the keyboard?

By Stephen P. Klett Jr.

Although the bulk of industry resources and energies has focused on developing the fastest microprocessor or slickest operating system, more and more mindshare is turning to the evolution of the computer interface.

Advancements in the areas of input devices, voice processing and virtual reality could lead to fundamental changes in the way humans and computers interact.

"The technological battlefield of the future will be adding layers between the user and the raw machine to make the interface as invisible as possible," said Pierluigi Zappacosta, president and founder of mouse pioneer Logitech, Inc. in Fremont, Calif.



Logitech's Cyberman *detects motion in six directions and provides output as well as input, such as vibrations in an action computer game*

Zappacosta said he believes the way the industry currently views interfaces — as a component between computer and user — is fundamentally wrong. This perception exists, he said, because technology has not advanced enough to look at it otherwise.

"In reality you don't want an interface," Zappacosta said. "For example, I often refer to my son as a 'nice boy with a difficult user interface.' Get rid of the interface and all you have is a nice boy."

Logitech released the first sound-activated trackball roughly three years ago and a three-dimensional mouse and eye-tracking device for high-end workstations used for engineering applications last year. Last week, the company started shipping Cyberman, the first 3-D mouse aimed at low-end users.

Marketed as an interactive gaming tool, Cyberman detects motion in six directions: x, y, z, pitch, yaw and roll. The device is also unique in that it offers output as well as input. For instance, it provides tactile feedback in the form of vibrations that can be linked to events in software. Sensations such as being shot or hitting a wall in a game can now be felt as well as heard.

"It's amazing when you think that our most advanced supercomputers still rely on an input device (the keyboard) invented in the 1800s," said John Oberteuffer, president of Voice Information Associates, Inc. in Lexington, Mass.

"The key element in the evolution of the interface is the integration of different input modalities," Oberteuffer said. He said he believes advancements in input devices and speech technology will combine to replace the keyboard as the input device of choice, possibly within the next 10 years.

Not so easily disposed of

However, the industry differs on how long the keyboard will reign as the No. 1 input device. Sharad Singhal, director of speech recognition research at Bell Communications Research Corp. in Livingston, N.J., says he does not believe the keyboard can be so easily replaced.

"You'd have to add significant functionality beyond the keyboard and mouse — such as a single voice command able to perform an operation requiring a complex sequence of keystrokes," Singhal said. "But as a direct replacement for the keyboard and mouse, I do not see much use for voice for a while yet."

Oberteuffer acknowledged that the industry has to overcome the perception "that voice is the wave of the future and always will be." But he pointed to explosive revenue growth in the voice market as a sign of success. For example, he projects the value of the automatic speech recognition market to reach $647 million by 1997, up from $159 million in 1992 and $17 million in 1986.

Oberteuffer listed price — a basic speech recognition system costs about $5,000 — and accuracy as the primary factors keeping people from embracing the technology. "Price is coming down rapidly, but the trouble of finding an application that is powerful enough for people to overlook accuracy problems remains," he said.

Meanwhile, Zappacosta is watching for even more exotic means of interacting with computers.

For example, he recently tried out an eye-tracking system under development at a small firm in Palo Alto, Calif. The system uses electrodes to detect facial muscles' electrical impulses caused by eye movement and converts them into digital signals for input into a computer. For instance, when he looked to the left, the screen cursor moved left. While the system did not work as well as the average mouse, Zappacosta said it had "enormous potential."

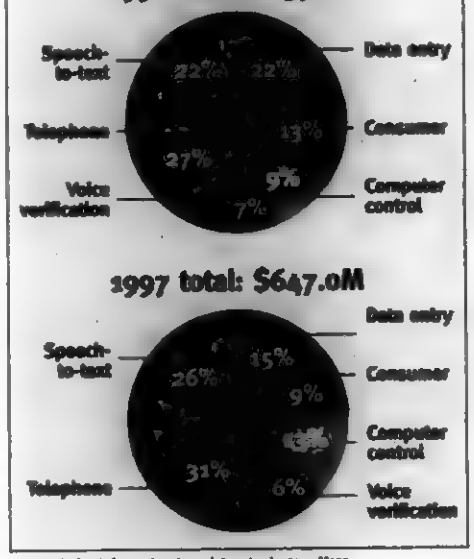
In Japan, he said, research under way aims at enabling computers to distinguish between "yes" and "no" from human brainwaves.

"It's not so strange to think computers will allow us to make our next evolutionary step by expanding our brain power — we will become part of it and it part of us," Zappacosta said.

Speak up

Voice technology is expected to play a major role in the next wave of computer interfaces

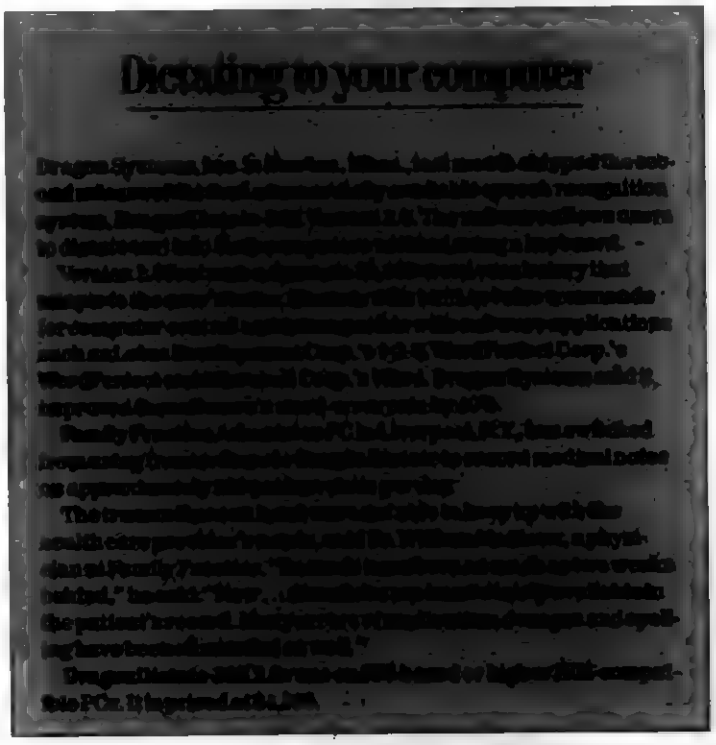
Revenue from computer-related voice-technology sales



Source: Voice Information Associates, Lexington, Mass.

A number of developers, Logitech included, remain convinced that virtual reality represents the next evolutionary step for the interface. While also limited to entertainment use so far, virtual reality is creating a great deal of enthusiasm as an interface, Zappacosta said.

"Virtual reality has raised the interface to the level of superstar," he said.



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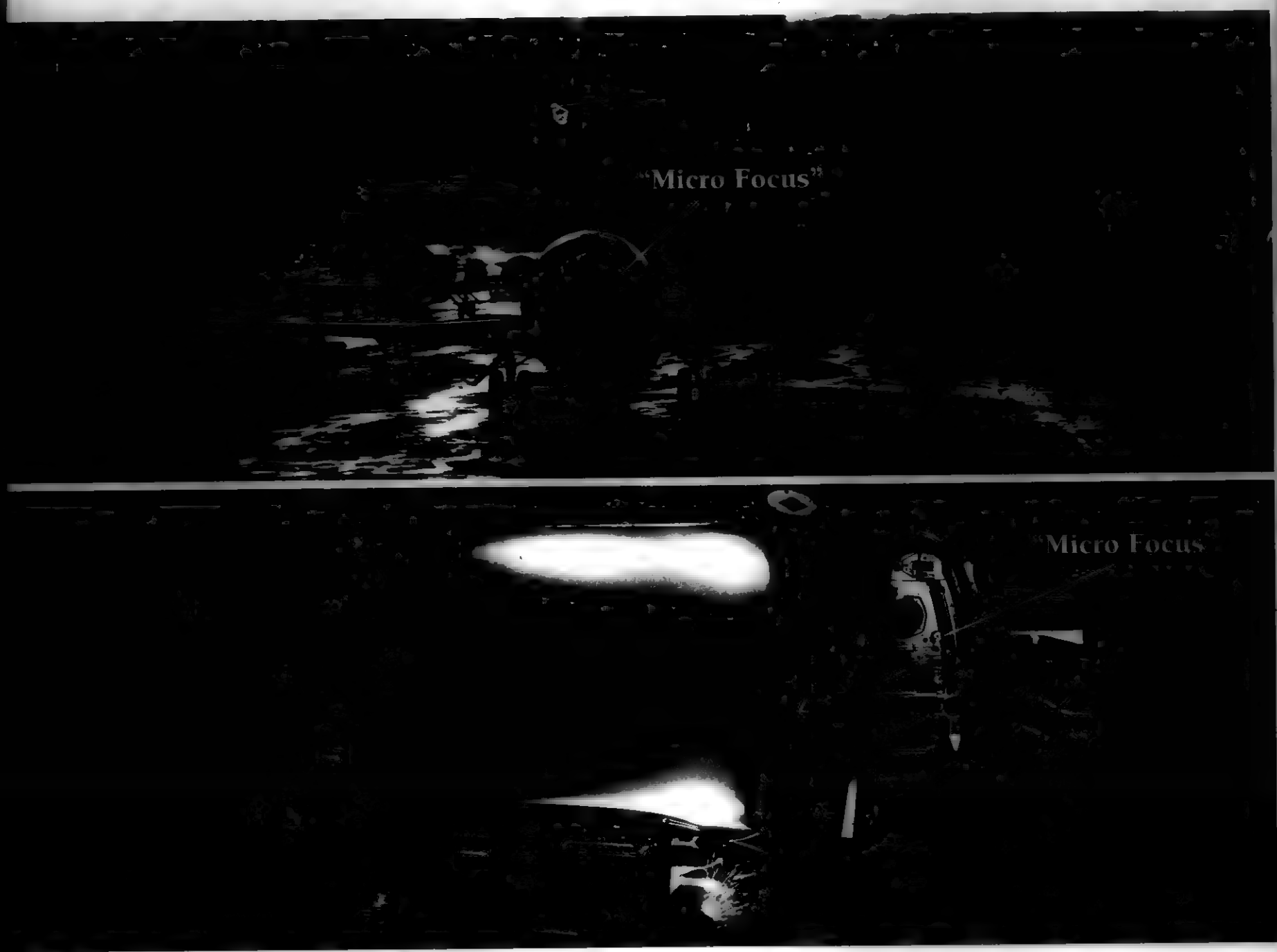

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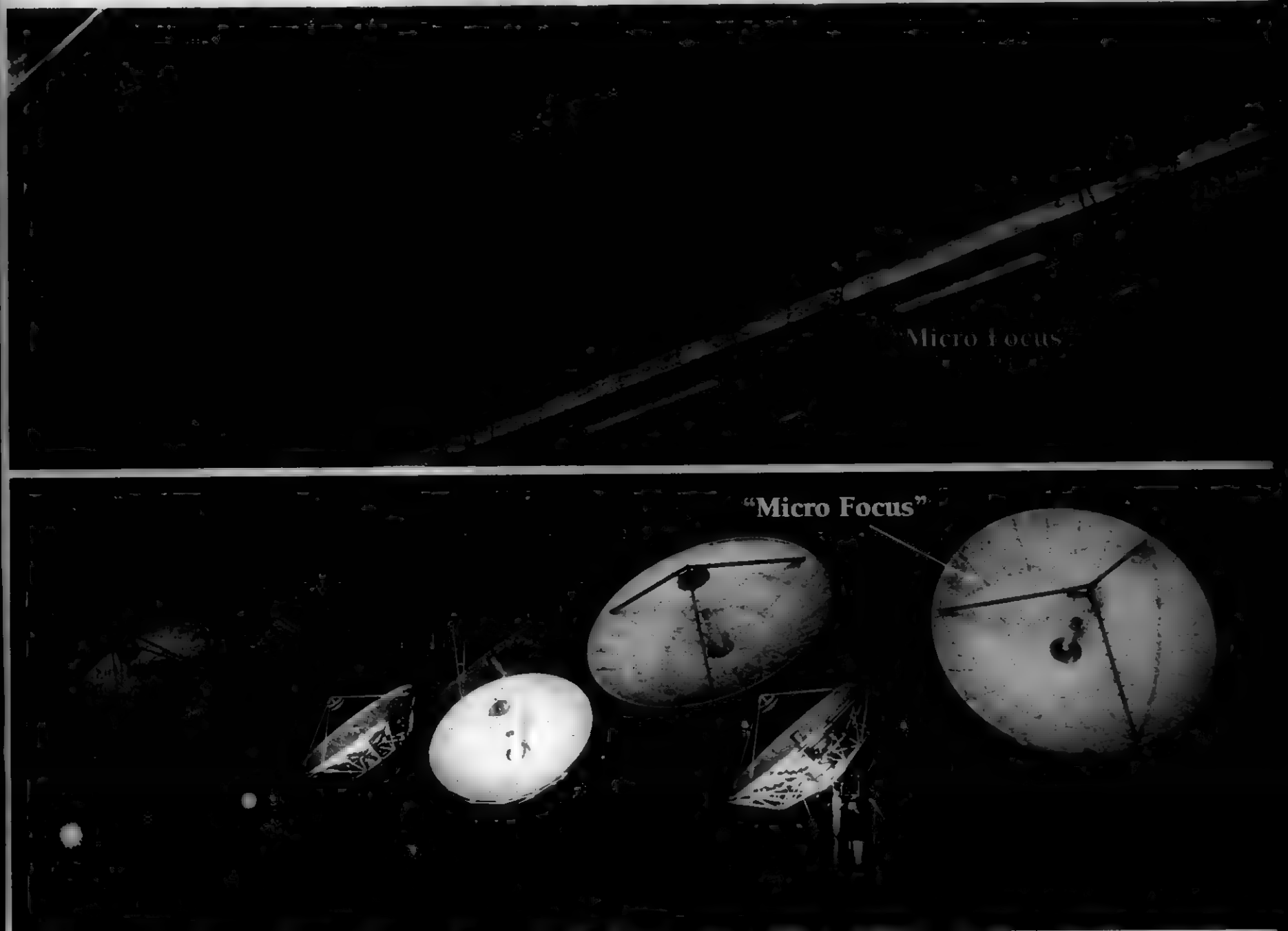

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Baby giants

I'm not that old, honest, but I do remember a time when talking long distance was a really big deal. You'd call someone, and an office assistant would say, "Sorry, I can't interrupt because she's on a long-distance call." Read: This is an important call. An expensive call.

That was in the days when there was only one communications company. Very few people called it by its real name, the American Telephone and Telegraph Co., or by its call letters, AT&T. No, to most folks it was just the phone company. *The* phone company. A very non-innovative megalith that annually added up all its costs and then negotiated a rate that guaranteed a return to its investors, whether the company was efficient or not. It was not.

Enter the feds in 1981. Against strident opposition from the phone company, the government 1) broke apart the megalith into a long-distance piece and seven local service pieces and 2) created a landscape that fostered competition.

The rest, as they say, is history. During the 1980s, competition flourished, rates nosedived, services expanded exponentially, and everyone selling these services made plenty of money.

Soon the federal regulators will consider actions that will further spur competition and expansion of telecommunications services. No, I'm not talking about the approval of AT&T's purchase of McCaw Cellular. That's going to be a no-brainer that, long term, will do more than any other single event to promote the reality of the virtual office.

Instead, the seven Baby Bells, which are hardly babies, will want to compete in the long-distance market, and they will also want to have the restrictions lifted forbidding them from manufacturing hardware.

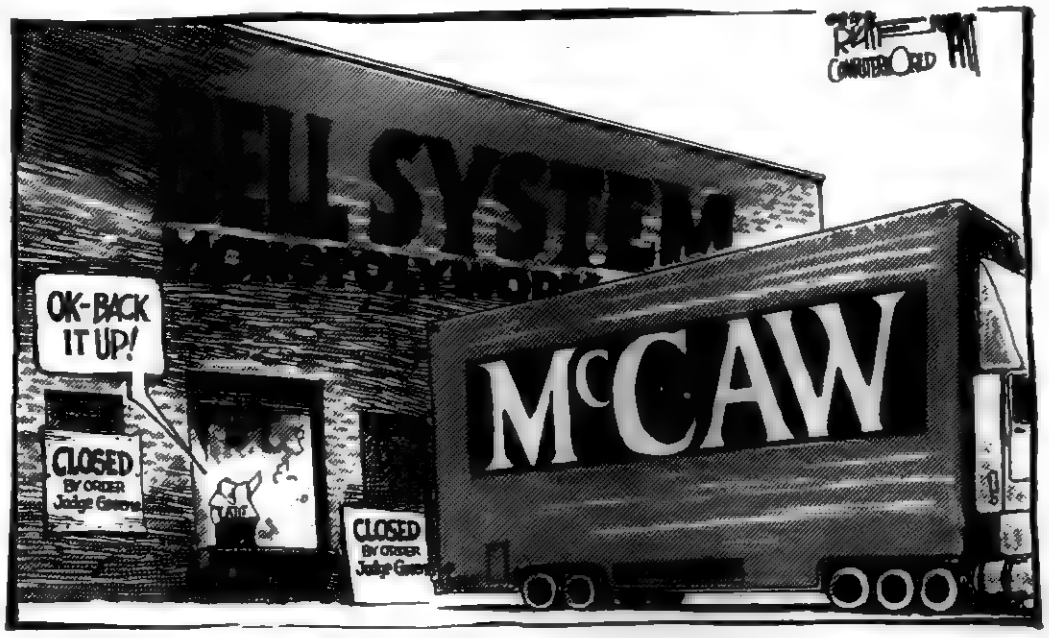
If there's one lesson to learn from the past, it is that competition flourishes when there's money on the table. And no one can doubt the value of competition to the consumer.

And if there's a lesson to learn about the future, it is that the future is going to be wireless. The Baby Bells justifiably fear their franchises falling prey to local wireless providers such as AT&T — maybe not tomorrow but certainly by decade's end. Such fears are not groundless.

AT&T is a far better company today than it was a decade ago because of competition, not despite it. It can and will play a major role in the development of the "national data highway" concepts (certainly better them than the federal government).

Bill Laberis

Bill Laberis, *Editor in chief*



Take it slow

Congratulations on your editorial "Jurassic lark" [CW, July 12]. The "stark reality of user-as-integrator" to which you referred in many cases occurs because downsizing is thrown "over the wall" from IS to the end user. The company I worked for avoided this pitfall by a gradual transition.

George Graham
Putnam Valley, N.Y.

OOP objections

After reading Charles Babcock's article "Relational backlash" [CW, June 28] and C. J. Date's previous article, "A fruitful union" [CW, June 14], about the merits of object vs. relational DBMS, it is my opinion that neither Mr. Date nor Mr. Babcock is completely correct.

The bottom line is not whether one technology is better, but which technology best supports the requirements of the system being developed.

I do agree with Mr. Date's statement that "relational vendors should do everything within their power to extend their systems to include proper domain support." However, his assertion that this would allow relational systems to do everything object-oriented DBMSs are capable of just isn't true: A domain and an object class are not the same!

True domain support would still not allow the complex data types found in object-oriented systems. It would also not provide a mechanism for defining the valid methods for an object class. It would also not support object class hierarchies, which are the foundation of an object-oriented approach.

Mr. Date's suggestion that relational is the better technology because it has a solid theoretical foundation and object oriented does not is not a valid point. Object oriented may not have the same mathematical foundation; however, it's a more natural representation of the way people think and organize objects in the real world.

James R. Barnett
Deerfield, Ill.

Jilting a gender?

Regarding Pamela J. Steele's letter in the July 26 issue: I am sick of the current obsession with "political correctness."

Anyone who gets so livid over some imagined slight in *Computerworld*'s use of "he" rather than "he/she" or use of necktie-wearing men to symbolize high-technology workers has a self-image problem (hey, I've been known to wear a tie on occasion!).

Ranting in print about this kind of trivia diverts attention from the truly important issues facing women in the workplace — like equal pay for equal work and promotion above the glass ceiling.

Using "she" instead of "he" isn't going to put these inequities right until we women prove our competence again and again, in large numbers and over time.

Wasting precious energies and time on trivial outbursts rather than working to correct the real problems only gives ammunition for dismissing working women as a bunch of superficial whiners who don't deserve the equal consideration we demand.

Karen Goertzel
Herndon, Va.

A defect dilemma

Larry D. Runge's article, "'Do unto others' applies to us, too" [CW, July 26], makes a good point for testing software but misses another: Even the best "structured testing" is still inefficient.

Capers Jones reported in a paper in 1987 that the various "phases" of testing (unit, function, integration, system) have a defect-removal efficiency of around 25% per phase.

Obviously, the solution is to not put defects in in the first place. Failing this, we should remove them quickly through a "life cycle" pattern of reviews, walk-throughs, Fagan-style inspections (which have a defect removal rate of more than 60%, per Capers' study) and thorough testing.

The bottom line is that developers must deliver systems with low-defect rates; they cannot depend on testers to find all the defects. That's just passing the buck.

Rodger Drabick
Eastman Kodak Co.
Rochester, N.Y.

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NT: Not totally

Peter Shaw

I was going to title this editorial "NT: *No thanks*," but that would have been hypocritical. NT is not the villain. It is the cry, "only NT," that is troublesome.

Still, if adopting NT means forfeiting all the advantages of proven technologies and making all our operating system software dependent on a single shop (Microsoft or anyone else), then we *should* say, "No thanks!" It makes no sense to throw away what's been achieved in IS' long fight for open systems.

We need to stay open, so we never have to see press announcements like the following:

•REDMOND, WASH. — Microsoft today announced further cuts in development system support for NT applications from competitive software companies. "By limiting the ability of outsiders to 'screw around' with our software, we can assure a better computing environment for everyone," said a Microsoft spokesperson.

•WASHINOTON, D.C. — Under intense pressure from Redmond-based lobbyists, the federal government today moved to replace Posix requirements with a new specification patterned closely after an internal Microsoft specification. A government spokesperson said, "We cannot afford the risk of major systems errors in mission-critical applications by trying to maintain an open systems environment without Microsoft's endorsement."

There is a better way. We can insist on maintaining an open environment in which heterogeneous systems efficiently communicate, interact and support one another. And we can use the X Window System protocol as the basis for open computing.

NT has been called the "killer of the X Window System." *Nice try.*

The idea of comparing X to NT is ludicrous. X doesn't claim, nor does it aspire to be, an operating system. By the same token, NT isn't a distributed, multiplatform graphical environment that is operating system-, network- and hardware-independent. X currently runs not just on Unix, but on DEC's VMS and IBM's MVS; not just on TCP/IP, but on Novell's IPS/SPX. It can be used on hardware platforms ranging from 80286-based PCs to supercomputers. Now that's what I call open!

NT can play in this sandbox. But, depending solely on NT would be like being stuck in the sandbox without a pail, shovel or even any sand. NT *and* X, however, is a different story.

X and NT can and will complement one another. X industry vendors have recognized NT's open systems shortcoming and are developing products to allow NT to participate in the whole world, not just the Microsoft world. Implementations of X for Microsoft will allow NT (and Windows) systems to access Unix, as well as other open systems applications.

Let's not confuse "dominant" with "open." Microsoft, with its Windows and future NT products, may become dominant, but it certainly won't be open. History has shown us that dominance hinders, while openness fosters rapid improvements.

Let's keep our industry growing. NT yes, but *not totally*.

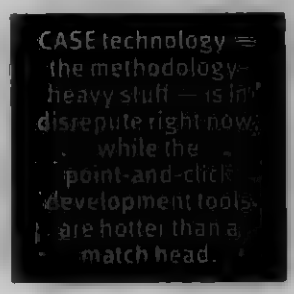
Shaw, president and chief executive officer of AGE Logic, Inc. in San Diego, serves as treasurer and secretary of the X Industry Association.

Where's CASE when we need it?

FIRE WATCH *by* John Gantz

I recently participated in a workshop on client/server application development for medium- and large-scale IS organizations. What I saw and heard convinced me that in our eagerness to adopt new client/server development tools, we're moving into uncharted waters and may sail right off the edge of the earth.

The crux of the problem is that structured development tools and CASE technology useful for large-scale applications don't readily lend themselves to client/server applications. And the current crop of client/server development tools, such as PowerBuilder from Powersoft Corp. and Visual Basic from Microsoft, don't lend themselves to large-scale applications.



Complicating the issue is the fact that CASE technology — the methodology-heavy stuff — is in disrepute right now, while the point-and-click development tools are hotter than a match head.

Question is, how many people are going to get burned?

At the workshop, an IS manager from a manufacturing company told of a major order-entry and order-tracking application built in six weeks using PowerBuilder, a relational database and a couple of RISC-based Unix boxes.

The original spec for the project, based on traditional Cobol development tools and conventional thinking, was 10 to 14 months. But pressure from the top caused the IS group to rethink that approach and led to radical change. Parts of the application were developed concurrently. Testing was started before design and coding were complete. Training started before the application was done, etc. The development prototype became the system. And, oh yes, the project team put in superhuman hours.

This was clearly an example of a breakthrough approach and a major success story. But for how long?

The IS manager, now an evangelist for visual development tools and rapid prototyping, admitted after the meeting that he wasn't sure how maintainable the application would be. At the moment he didn't care. The system has been running for six months, top brass is happy, and IS is covered in glory. If and when redesign and maintenance problems occur, maybe it will be somebody else's watch.

Nobody wants to hear about costs that might occur two years down the line because an application was designed with a particular type of development tool and without detailed organization or process modeling. And nobody wants to wait around while vendors figure out how to blend the best of CASE with the best of client/server development tools or work their way toward agreement on the Portable Common Tools Environment. There's too much pressure from above to come up with short-term solutions.

Fair enough, but what that means is a lot of organizations are going to run into big problems. About the time they fully wean themselves from the painstaking, methodical application development process — the one with 24-month backlogs — they'll start seeing some of the fruits of their early fast-track projects crash and burn.

When that happens there will be much gnashing of teeth, second-guessing of past choices and fretting over careers. And the phrase, "managing user expectations" will take on a whole new meaning.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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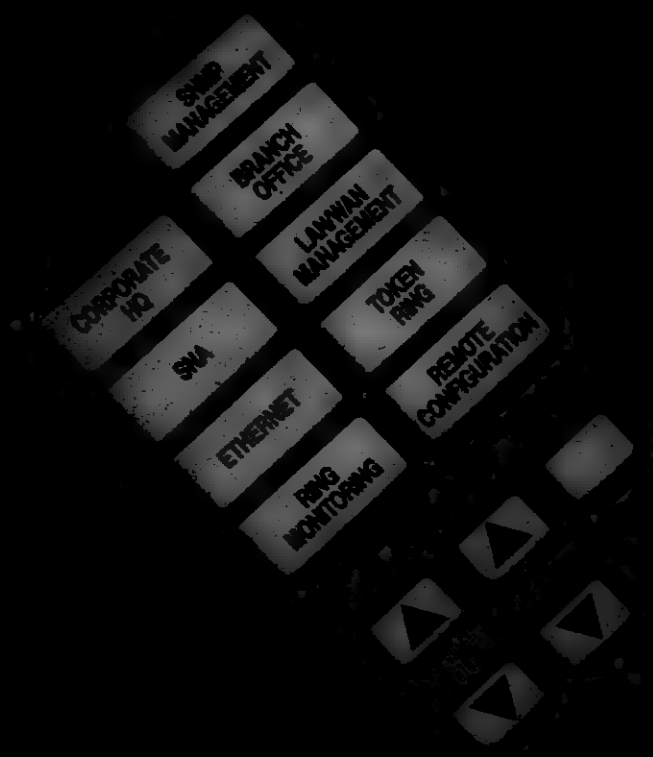

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Charles Babcock

The smart subsystem

If powerful PCs are ever going to live up to their potential, they will need an I/O interface like SCSI. The Small Computer Systems Interface is one of the few standard technologies to move out of the domain of minicomputers and workstations down to PC turf.

The move hasn't been a smooth one. SCSI devices still cost more than the I/O devices DOS is geared to handle — the Enhanced Small Device Interface or integrated drive electronics disks. And, because of the lack of PC operating system support, SCSI devices require drivers.

On the other hand, SCSI has evolved beyond the SCSI-1 stage that followed its adoption as an ANSI standard in 1986. At that time vendors embraced different portions of the SCSI command set in their device drivers while claiming to be SCSI-compliant. Hence, two different SCSI peripherals might not work with the same SCSI expansion card (or host adapter, as it is known in the minicomputer world).

Sensing that user frustration was building, suppliers of SCSI-1 devices finally got together to seek greater compatibility, according to Mike Casey, vice president of storage industry research at Computer Intelligence/Infocorp in Santa Clara, Calif. Most incompatibilities have disappeared with today's SCSI-2 devices.

In addition, a part of the SCSI-2 standard known as Fast SCSI doubled the data transfer rate from 5M to 10M byte/sec., while Wide SCSI increased the data path from 8 to 16 or 32 bits. Teaming up Fast and Wide SCSI over a 32-bit path yields a 40M byte/sec. transfer rate, a bandwidth that can stand up to the heaviest demands of PC applications.

SCSI is now one of those technologies that allows you to start small and scale up to the system you want. Starting from a single disk drive, a SCSI-equipped PC could add up to seven peripherals of various kinds — say, a mix of disk drives, a CD-ROM, rewritable optical and tape. SCSI may one day be a requirement rather than an option for PCs to be multimedia-proficient. It's also possible for one of the peripherals to be a secondary SCSI adapter, allowing another seven devices to be nested in the control of the primary adapter. (Caveat emptor: A little custom programming is required to do this.)

In the meantime, buyers with an eye to longevity might be wise to consider SCSI as the I/O bus of choice for the more powerful PCs they purchase. Unlike standard PC peripherals, SCSI devices are bidirectional — they can send and receive commands through the host adapter.

SCSI thus allows greater use of the multithreading, multitasking power of the 32-bit operating systems, such as OS/2 or Windows NT. The operating system can handle requests from several different devices attached to the SCSI bus at the same time. Or the operating system can process several commands to the devices, feeding them into the host adapter at one time, instead of sending one command and waiting for a reply.

And the 32-bit power is more fully realized with desktop Unix — Solaris, UnixWare and the Santa Cruz Operation's Open Desktop — as support for SCSI is built into the operating system kernel. Special drivers do not need to be added.

The Macintosh is one of the few examples where SCSI is standard across the product line. The SCSI underpinning is one of the reasons why Macintosh applications work together more consistently than those in the DOS/Windows world, Casey said.

Buying into SCSI for Intel-based PCs is more expensive initially — a Fast SCSI hard disk drive will cost $200 or $220 more than a non-SCSI drive. But what the extra money buys is a more intelligent subsystem that is better able to support the needs of the desktop of the future.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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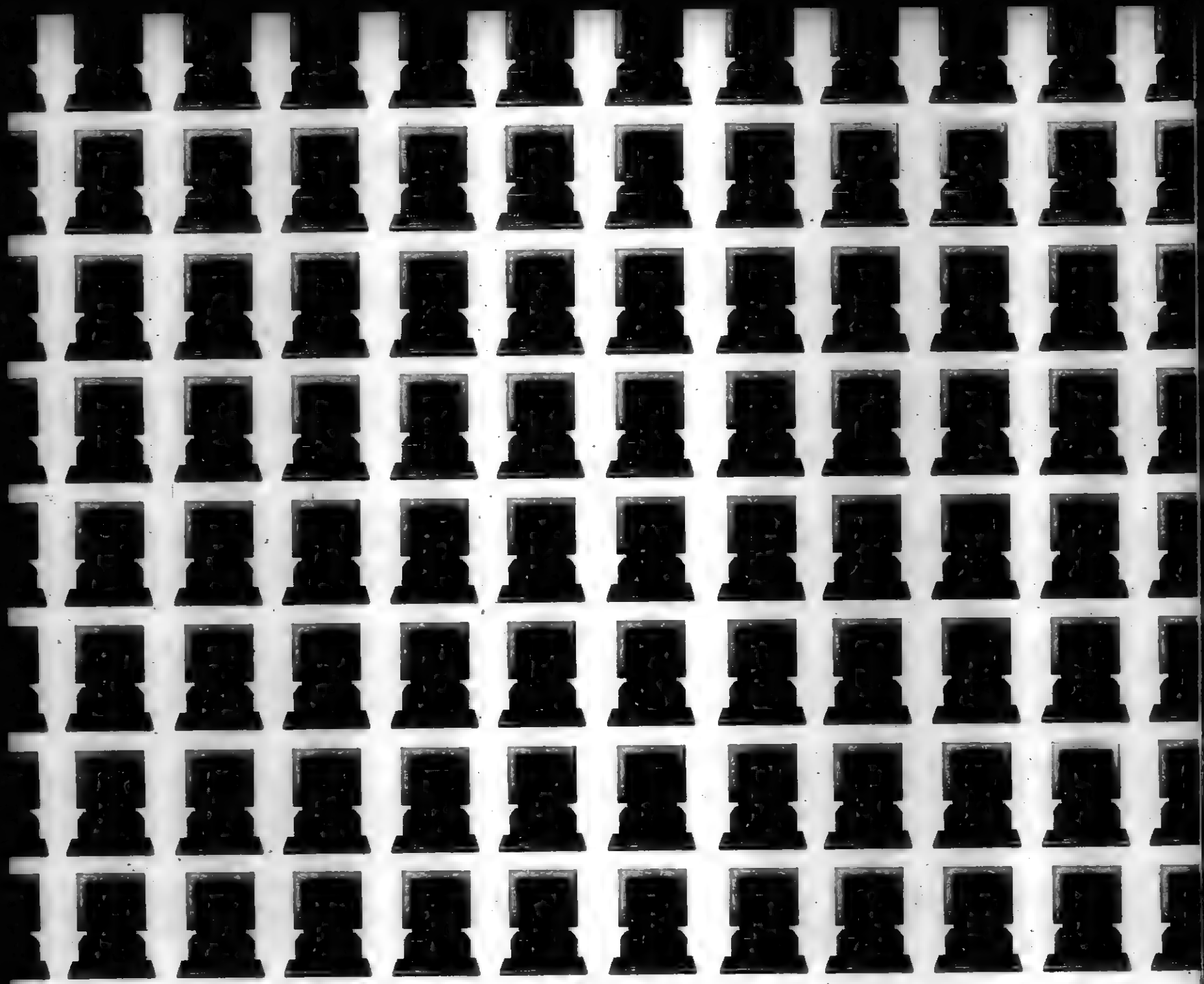

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Cyrix ups power of PC

Pop-in chips simplify upgrading from 386 performance to 486

By Michael Fitzgerald
RICHARDSON, TEXAS

The 6 million-plus installed base of Intel Corp. 80386DX-type PCs has kept Cyrix Corp. busily pursuing a way for users to upgrade these machines to 1486-class power simply by popping in a new chip.

Cyrix has been after this market for about a year and a half, introducing a variety of chips on a board to try to claim the market. Its newly announced CX486DRX2 chip is a step simpler than its predecessors because it simply pops into the socket of a 386DX chip that runs at 16, 20 or 25 MHz. The chip will not perform a similar function for Advanced Micro Devices, Inc.'s Intel clones because they are soldered on the motherboard.

The new Cyrix chip has three versions: a 16/32-MHz version for $299, a 20/40-MHz version for $349 and a 25/50-MHz version for $399. These will be available from retail stores or Xerox Corp.'s Customer Service Organization.

Cyrix claims the chips will outperform the ones they replace by 1.7 to 2.7 times, depending on the application.

Beta-test users who have been working with the Cyrix chip technology for almost a year said Cyrix has satisfied their concerns with the DRX2 chips.

Eric LaFortune, regional electronic systems coordinator at a large petroleum firm, has been involved in Cyrix's beta-test program since it started and called the new chip "outstanding — I haven't been able to get this new version to go down at all; I could get every version down except this one." LaFortune said he has already installed 50 Cyrix upgrades and has another 50 on order.

Another beta-test user, John Woods, a PC systems specialist at Chevron Information Technology Co., the information systems division of Chevron U.S.A., Inc. in San Ramon, Calif., said the new chip fixed a problem that had stopped him from using the previous daughterboard versions of the chip.

"On motherboards without clearance, the old way wouldn't fit, and it constrained our ability to install them," Woods said.

Woods added that he expects Chevron's user departments to order at least 200 chips and perhaps as many as 2,000.

Woods and LaFortune cited the same reasons for looking at the Cyrix chip upgrade: getting 386 users up to 486 performance without buying a new 486-based system.

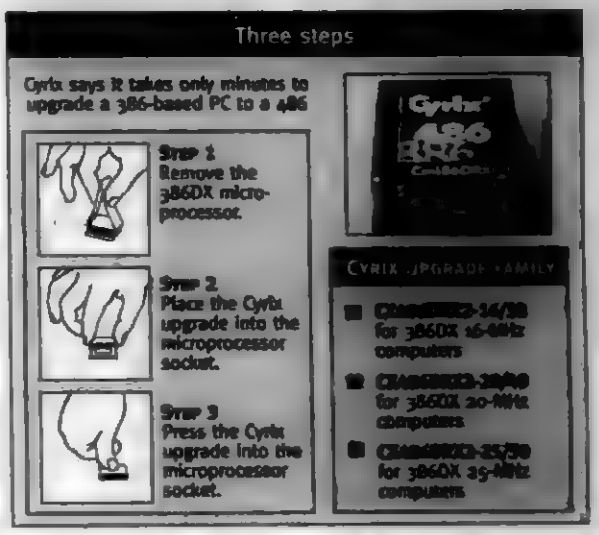
"It's a quick, easy and cheap way for me to get my users up to basically a 25-MHz 486SX environment," LaFortune said. "It costs me $500 to $600 to go out and buy a new 486-based motherboard, and this is half that."

Woods said some of the machines that Chevron has purchased are on eight-year depreciation cycles, which makes the chip upgrade a helpful way to improve the machines while keeping them on the books.

James Chapman, vice president of marketing at Cyrix, said the company has sold 20,000 of its various upgrades. This leaves Cyrix well short of its goals for the chip, though Chapman said that if even 1% of 386 users upgrade, "it's a viable product for us."

Cyrix said its strained relationship with Texas Instruments, Inc. will not affect its ability to supply the DRX2 upgrade because SGS-Thomson Microelectronics will be building the chips for it.

Chapman also said Cyrix hopes by Christmas to have a chip that will allow the vast market of 386SXs to upgrade. Cyrix has a prototype now that includes a mechanical adapter that will let the SX upgrade clamp down on top of a system's 386SX, most of which were soldered onto the motherboards. The Cyrix chip will disable the SX processor after it is clamped on.



Chip tricks

Tom Selgas, director of emerging technologies at Cyrix, developed the chip-level upgrade. He noted three issues Cyrix had to overcome:
- Cache coherency — the 386 chip did not have on-board cache.
- 486 timing — the upgrades run faster.
- Clocking — doubling the internal speed sent the wrong signal to some boards.

HP's OmniBook shows design innovation

PRODUCT test DRIVE

By Garry Ray

There's something baffling about a notebook computer industry that can't get things right. Puny battery life, unreadable displays, bulky power supplies and inconvenient mouse substitutes are the dead ends that many notebook manufacturers can't seem to avoid.

And then there is Hewlett-Packard Co.'s OmniBook 300 subnotebook portable.

Released in June, the OmniBook 300 is another example from Palo Alto, Calif.-based HP that advanced engineering pays off. Although it is far from perfect, the OmniBook 300 is one of the most clever and innovative portable computers yet to be offered to the traveling user.

The OmniBook seems to answer a single question: What could we do if we discarded dated PC notebook technology and designed a portable unit around leading-edge components?

The answer is a 2.9-pound portable stuffed with software, including MS-DOS, Windows 3.1, Microsoft Corp.'s Word for Windows 2.0 and Excel 4.0 and Traveling Software, Inc.'s LapLink.

This software, alongwith HP's own Appointment Book, Phone Book and Financial Calculator, is packed into read-only memory, leaving the unit's 40M-byte hard disk or 10M-byte Personal Computer Memory Card International Association (PCMCIA) 2.0 flash disk available for data and other applications.

There is a caveat: Initial shipments of the OmniBook have produced a rash of problem reports, such as failed power supplies. Our unit did not have any problems.

Installation and configuration

Getting the OmniBook up and running is a snap. In the first minutes of use, we referred to the manual for only two reasons: to determine the proper placement of the rechargeable nickel cadmium battery pack (one can use standard AA batteries with the flash card unit), and to align the mouse pointer on the Windows display. Other than that, configuring the OmniBook is intuitive and straightforward.

The OmniBook mouse is a unique design solution to the mouse-pointing problems wrought by Windows. While most portable manufacturers have been building awkward trackballs into their notebook housings and keyboards, HP designed a more-or-less-standard mouse that is permanently affixed to the OmniBook case. To use HP's pointer, you press a button that releases the mouse from the housing, use two simple motions to align the pointer on the Windows desktop and begin to work with a device that feels more or less like a standard desktop mouse.

HP's OmniBook *takes advantage of leading-edge components*

Configuring and using the embedded LapLink Remote Access software was not so simple, although it certainly is not beyond the ken of any savvy PC user. Although HP did not originally offer an external floppy disk drive for file transfer and storage, one is apparently in the works. It was not available at the time of this review.

For the time being, then, the fun begins after connecting the OmniBook to a desktop system with an included serial cable. Additional twiddling is needed to install the LapLink remote software module on the desktop PC. Once installed, the desktop system and the OmniBook can be placed in communication mode with a single mouse click, with all drives (including logical network drives) appearing as physical drives on the OmniBook.

Unfortunately, the OmniBook

OmniBook, *page 42*

Carol Patton

Growing pains

Evolution is hell, especially in the software business. Take the case of Polaris Software in San Diego and Packrat, its personal information manager.

Packrat is a powerful Windows 3.1 tool that couples time and billing features with schedulers and telephone lists. Polaris shipped its much vaunted 5.0 Rat upgrade in mid-July.

Almost immediately, there were problems: Users were losing data whenever Packrat compressed files. Some lost addresses and phone numbers at random; others lost everything their Packrat files contained. When the backup files (the ones placed in \Packrat\backup) were used to restart the program, even those records were gone. Between Packrat's newfound ability to corrupt program files and its appetite for devouring compressed data, the upgrade had become a disaster.

What do you do when your only happy customer is someone whose upgrade was lost in the mail? Polaris founder Jack Leach decided to stop shipping and fix his product fast. It took guts, but Leach did the ethical thing, hoping to minimize damage.

In late July, Polaris shipped maintenance upgrade "D," which should correct all of the problems.

The Packrat debacle is every developer's nightmare. In Polaris' case, the timing couldn't have been worse. New entries such as Ecco from Arabesque Software in Bellevue, Wash., and Commence from Jenson-Jones in Red Bank, N.J., are heating up competition in the Windows personal information manager arena.

In fact, Packrat 5.0 isn't an upgrade at all, but a next-generation product that introduces a paradigm shift to object-oriented technology. Will Polaris be forgiven for an overly ambitious thrust at the edge of the envelope? My guess is yes.

Less than perfect

Revolution is also hell. Take, for example, a brand new product category — digital publishing. Several products can now translate (and transmit) entire typeset documents across different kinds of computers. Unfortunately, what you get at the other end is just a bit-map — printable but not editable.

For example, the forte of Acrobat from Adobe Systems in Mountain View, Calif., and Common Ground from No Hands Software in Belmont, Calif. — currently on the Macintosh platform but coming to Windows — is turning the document's fonts into *your* fonts. Unfortunately, performance is slow and the size of the files produced makes them impractical for reproducing large documents.

Another problem: Fonts are rendered badly. Common Ground, for example, prints at 300 dot/in. but shows up on your screen at 72 dot/in. Although Common Ground offers a free viewer, there is no zoom feature and the page rendering is practically indecipherable. (Optometrist, anyone?) Acrobat's Reader is proprietary and pricey, a fact that will surely hobble its spread. (A single copy of Reader sells for about $50.)

Just how promising is this new area? With Hypertext extensions in the wings, it is very promising. But there is one caveat: Microsoft's recently announced Windows at Work architecture, which includes something called "smart" file transfers (planned for both Windows for Workgroups and Chicago), promises binary file transfers of TrueType documents at 300 dot/in. or greater. If this product is delivered, where is the market for Acrobat and Common Ground?

Evolution is painful, but as Charles Darwin observed, the alternative may be extinction. I prefer the observation of 18th century naturalist Chevalier de Lamarck. He believed birds don't fly because they have wings; rather, they have wings because they want to fly.

Patton is president of the Meadham Technology Group in Meadham, N.J., which produces two-day Client/Server Summits for corporate strategists. She is writing two books on computer software. Her MCI Mail address is 401-4869.

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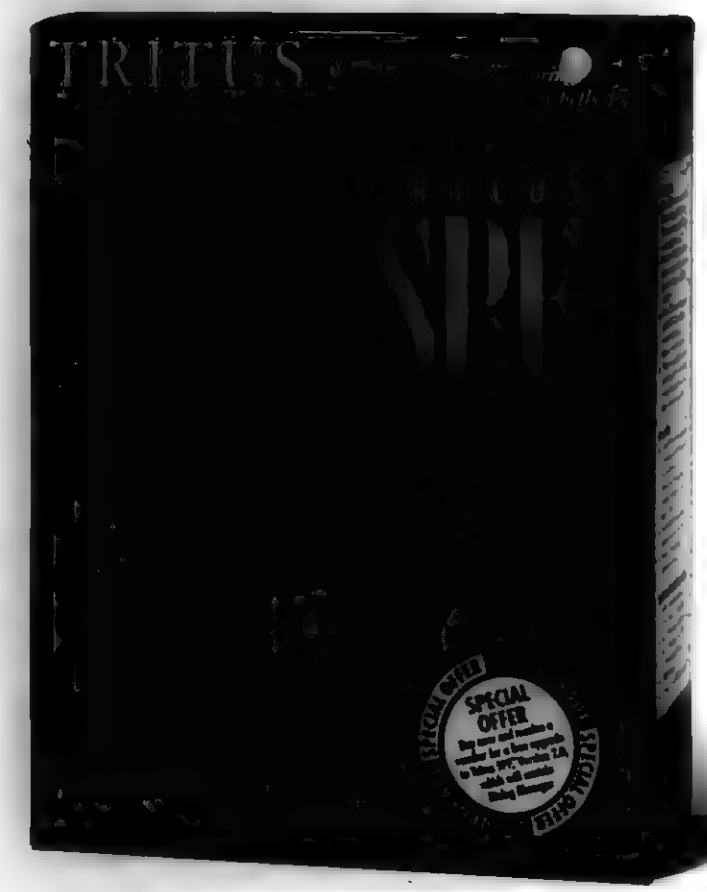

Make no mistake about it, only Tritus SPF 1.2.5 has unlimited UNDO/REDO. Tritus SPF is the powerful PC version of the mainframe editor ISPF/PDF and uses the same keystrokes. Features include modifiable panels, keyboard mapping, and integration with Micro Focus Workbench and WorkFrame/2.

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Tritus SPF 1.2.5 is available now for $99 plus shipping and includes a free upgrade to version 2.0 with Dialog Manager. Also included is an OS/2 32-bit version and over 600 pages of documentation. The Prentice-Hall REXX Language book is available for an additional $25.

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Briefs

Desktop ODBC access

Microsoft Corp. announced a set of Open Database Connectivity (ODBC) drivers to let Windows applications access desktop databases such as Access, Foxpro and other products that support ODBC formats. Targeted at third-party software makers, Desktop Database Drivers 1.0 will be available in several weeks. The products will be priced at $49 each, Microsoft officials said.

Frankston joins Microsoft

Bob Frankston — one of the creators of VisiCalc, computing's first spreadsheet — has joined Microsoft's advanced technology group.

Windows NT on Unisys

Unisys Corp. announced that it will deliver Microsoft's Windows NT operating system for its PW2 PC customers by the end of next month.

Toshiba licenses PenRight

Toshiba America Information Systems, Inc. and AST Research, Inc. announced that Toshiba is licensing AST's PenRight operating environment for use in Toshiba's DynaPad T100X pen-based computers. AST said the move will make more than 600 PenRight applications available to DynaPad users.

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OmniBook

CONTINUED FROM PAGE 39

software mandates that file transfers from one system to the other be performed through the poorly designed Microsoft File Manager, which does not support synchronization of remote and OmniBook drives. That is a strange omission for a diskless notebook system. Nonetheless, the method does work once properly configured.

Performance

With its 3.3V 386SXLV processor running at 20 MHz, the OmniBook seems merely to sip energy from the AA battery set. We were able to operate the unit for more than six hours with less than a 50% power drain, according to the built-in battery monitor. This is a notebook computer that would easily survive a red-eye flight from Boston to San Francisco.

Performance, especially in loading programs from ROM, was good, although a slightly slower processor might have produced unacceptable performance. Although we did not run any formal benchmark tests, performance of all applications (including some that we installed on the 40M-byte hard disk) was well within an acceptable range.

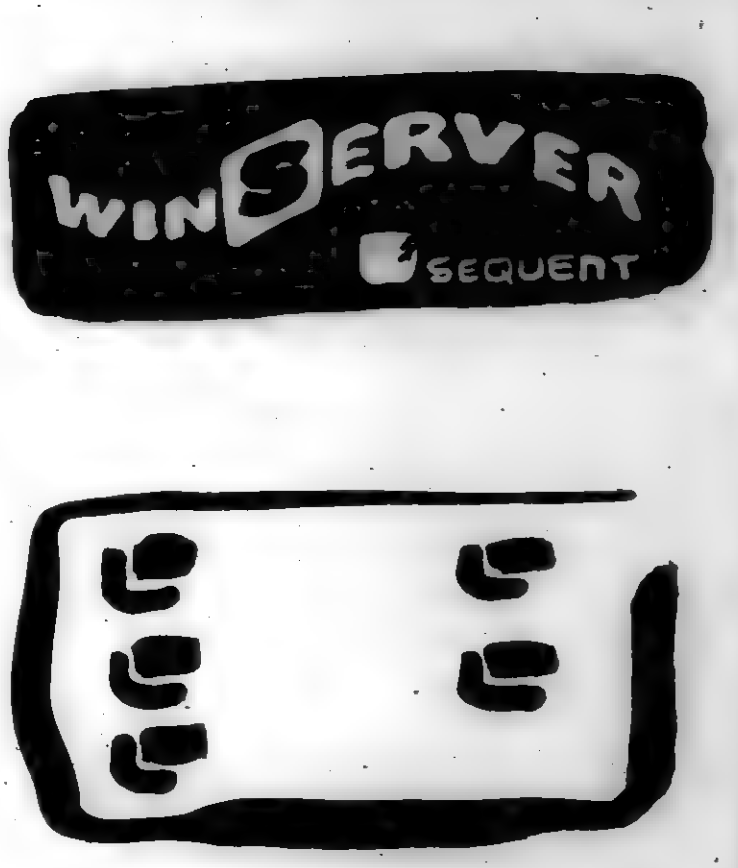
The OmniBook's 9-in. Video Graphics Array display is perhaps its only unfavorable feature. Although its 16 gray shades produce sharp and readable screen resolution, the non-backlit, reflective LCD screen does mandate regular adjustment of the screen.

The best advice is to use the notebook under a good background light. The alternative — a backlit LCD display with greater power consumption — would sharply reduce the unit's battery life.

Other power-savers enhance battery life. The unit's four PCMCIA Type II slots support a storage configuration of either a single 40M-byte hard disk or a 10M-byte flash card unit. Either option uses two of the four PCMCIA slots, leaving two slots for a modem or other device. The unit we tested did not have a modem or any of the OmniBook fax or communication software, which includes WinFax Lite, Microsoft Mail Remote and Dynacomm.

Though we have not covered all of its features here, the HP OmniBook is the forerunner of a new breed of portable subnotebook computers that will become pervasive in the next year or two. Well-engineered, thoughtfully designed and an able performer, it is one of the top choices for the traveling computer user.

CLIENT/ SERVER



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Aircraft test data takes wing

McDonnell Douglas engineers record in-flight data on patchwork of systems

By James Daly
LONG BEACH, CALIF.

Any airline passenger who has ever pressed his nose to the window and looked earthward is sure of at least one thing: It's a long way down.

Aeronautics engineers performing experiments on new aircraft at Douglas Aircraft Co. also know that when test flights do not come back with the data they were sent into the wild blue yonder to gather, it is a long and expensive way back up.

That was one of the problems troubling the engineers at the Douglas Flight Test Center, a division of McDonnell Douglas Corp.

"We'd fly around to do our tests, then land and process the data down here," said engineer Richard Paul. "If we found that we didn't hit our data point quite right, we'd have to fly the next day and do the tests all over again," he added.

Paul and his co-workers are halfway through the 18-month test period for the MD90, a 153-passenger jet scheduled to be certified by the Federal Aviation Administration by the middle of next year. Flying a fuel-gobbling jet like the powerful MD90 — it demands 25,000 pounds of takeoff thrust — is an expensive process costing approximately $50,000 an hour, according to Paul.

ON SITE

Douglas Aircraft
Long Beach, Calif.

Challenge: To provide flight test engineers with a way to check for accuracy and completeness of experiments while in the air.

Technology: DEC VAXs, Apple PowerBooks, Pacer Software's PacerTerm connectivity package, homegrown software and hardware.

Benefits: Complex 18-month test of new airliner stayed on schedule and within budget.

Paul and his co-workers have added a real-time in-flight monitoring system to the racks and racks of test equipment already in the MD90 to make sure they come down with the information they were sent up to retrieve.

The Test Data Monitoring System (TDMS) is a homemade patchwork quilt of electronic components. At its heart is a Motorola, Inc. 68030-based system running a Unix derivative called Uniflex. An Apple Computer, Inc. PowerBook provides the interface for in-flight monitoring by flight engineers.

Monitor and record

Paul noted that gigabytes of data are recorded during the flight testing of a new aircraft. Engineers in flight monitor and record on 1-in.-wide magnetic tape everything from flap movement to air speed to fuel consumption. To convert the data from analog format to digital and then analyze it, the flight test center has remained mainframe-oriented, using primarily Digital Equipment Corp. VAXs and MicroVAXes.

The TDMS provides sky pilots with a mobile way to use a computer interface without having to disconnect from a battery of mainframes. In designing the system, Paul opted for the Apple Macintosh and then set out to find a terminal emulation program that would speed his work.

In conducting his search, Paul noted that he had rigorous product specification requirements. VT320 emulation was essential because it was the common denominator among all his host applications. Xmodem and Zmodem file transfer protocols were needed to access outside computer resources. The many repetitive tasks the flight center's engineers needed to perform made a serious scripting capability mandatory. And having an Ethernet connection and a serial connection at the same time was also mandatory.

Paul and his engineers ultimately settled on the PacerTerm communications package from Pacer Software, Inc. It includes a time-saving bonus called MiniWindows that allows in-flight engineers to stay logged on to two accounts simultaneously.

MD90 at a glance

Specifications for the McDonnell Douglas MD90

Number of Passengers:	153
Takeoff thrust:	25,000 pounds
Length:	152.6 ft.
Cargo space:	1,300 cubic ft.
Flight range:	2,610 miles
Average flight speed:	500 mph
Power:	Two International Aero Engine V2500 jet engines
Due date:	Mid- to late 1994

CW Chart: David S. Marshall

Down to earth

During the five- to six-hour test flights, in-flight engineers carefully monitor the TDMS to make sure that they are indeed gathering the information they were sent up to collect. The recorded magnetic tapes are still extensively scrutinized after test flights, but now the engineers know they have "hit their mark" before they return to earth, Paul said.

The TDMS has streamlined an already complicated testing process by improving both the accuracy of the data collected and the efficiency of the collection process. The result is that travelers may soon be stowing their luggage and settling into a brand new MD90.

"It keeps us on schedule," Paul said. "And that keeps all the engineers around here very happy."

Select's success exceeds Microsoft's expectations

By Stephen P. Klett Jr.
BEDMOND, WASH.

Customers are reportedly jumping aboard the Microsoft Corp. Select bandwagon at a steady rate, indicating that the prospect of large discounts is easing users' fears of a two-year commitment to Microsoft software.

Select, a volume-discount licensing program aimed at large corporate customers [CW, Feb. 1], had a roster of approximately 30 signed up when it debuted in February. It now boasts more than 200 customers worldwide, according to Craig Fiebig, Select program manager at Microsoft.

"The run rate of new licenses has far exceeded our early expectations," Fiebig said. "Initially, we thought we'd have 100 to 120 agreements in the first year." Microsoft is signing one to two agreements per business day and now expects to have 150 more inked by year's end.

Select customers forecast how many units of a product they expect to buy during a two-year period. That figure is used to set pricing on a per-license or per-machine basis. Customers are given a discount classification based on the number of units they expect to purchase. For example, customers who expect to buy 10,000 or more units are given the highest rating and are entitled to discounts of up to 70%.

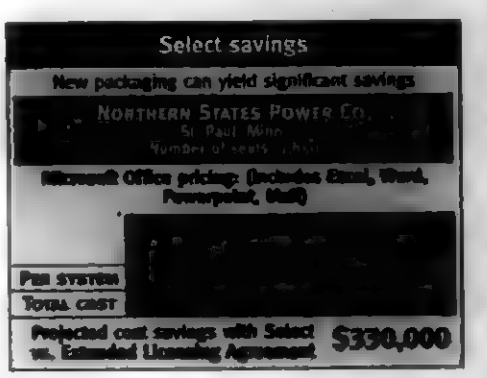
Sole contact appealing

While Microsoft may be surprised by Select's rapid acceptance, industry analysts and users contacted said they are not.

"All indications are that the Select program has been a success, but there's no mystery as to why," said Matt Cain, an analyst at Meta Group, Inc. in Stamford, Conn.

Select's main attraction is that it eliminates the need for customers with multiple sites to negotiate deals with multiple vendors. Each firm deals with one "large-account reseller" (LAR), which gives each site, no matter how small, the collective bargaining power of the entire company, resulting in better discounts.

With Select, Xerox Corp. in Rochester, N.Y., which has forecast the need for 5,000 copies of Microsoft's Office suite during the next two years, is saving 30% to 40% over Microsoft's previous Extended Licensing Agreement (XLA) program, according to Dave Mindel, Xerox's manager of library services.



However, Mindel said perhaps the main reason Xerox went with Select was that it allowed the company "to avoid the word 'commitment.' No cash is required up front, and the worst that can happen if we don't meet our projections is that we are dropped into a lower discount bracket or dropped from the program, which is no big deal."

While customers said Select resulted in above-average discounts and greatly simplified license management, those with global operations were not totally pleased with the effort.

International expansion

W. R. Grace & Co. in Boca Raton, Fla., plans to purchase approximately 23,000 PCs, spread throughout 50 countries, during the next five years. Jesse Koontz, a corporate manager at W. R. Grace, said the company is currently negotiating the purchase of roughly 3,000 copies of Microsoft's Office under Select at a savings of more than 50% compared with XLA.

"However, in countries where LARs aren't identified yet, it is very difficult to buy under Select," Koontz said. "Microsoft is making efforts in this area, but we continue to grumble at them on a regular basis."

Microsoft currently has approved 100 LARs worldwide and is working to add to the list as quickly as possible, Fiebig said. He added that Microsoft is making changes for international customers in regard to pricing and distribution concerns, but he declined to give specifics.

According to Mindel, Xerox is working with Microsoft on a way to order licenses for its foreign sites through Xerox's U.S.-based LAR.

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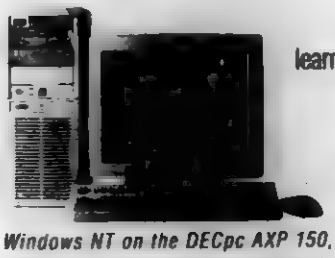

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Handheld computing

Surveys predict slow start for handhelds, PDAs

By Michael Fitzgerald

A new survey predicts that today's minuscule market for handheld computers will reach $3.8 billion in sales by 1996. The principal applications for the personal digital assistants (PDA) reportedly will be communications-oriented and aimed at personal productivity.

Link Resources Corp./International Data Corp. (IDC) conducted a series of focus groups and interviewed 600 end users for the survey. The survey predicts that businesses will be the first users of the new types of handheld devices, such as the AT&T EO Personal Communicator or Apple Computer, Inc.'s Newton, with a consumer market developing no earlier than late 1994.

IDC analyst Bruce Stephen feels handheld devices "will not be an overnight sensation."

Michael French, an analyst at Link, predicted four major uses for these devices:

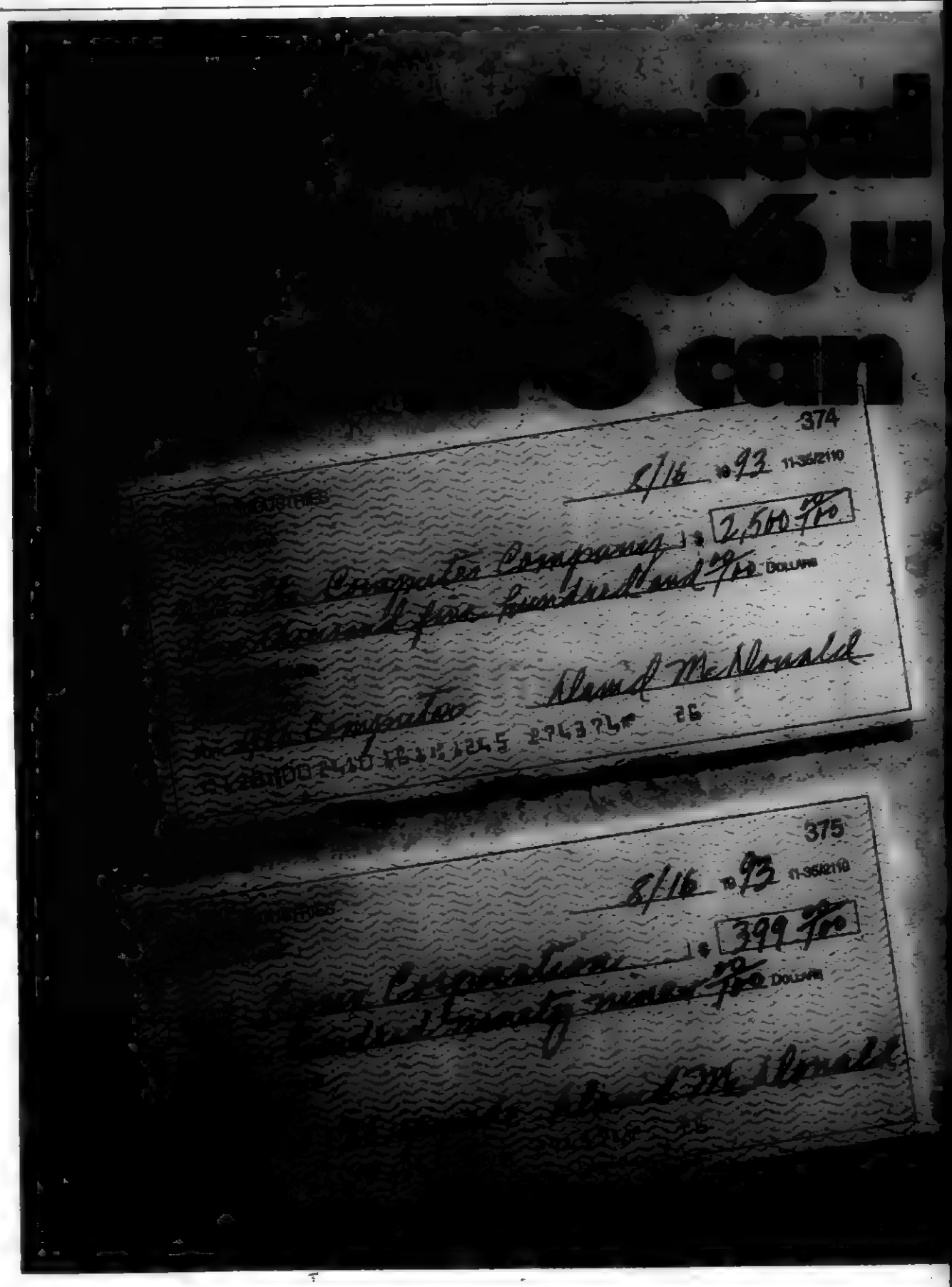
- Sending and receiving phone calls.
- Keeping in touch.
- Schedule coordination.
- Minor document editing and annotation.

"Desk-based workers are largely creators of information, while mobile workers are net users of information," French said. "They don't write reports while standing in front of a customer. They need to check facts."

While Link/IDC thinks the market for handheld devices will grow more than 50% a year, "these will not be an overnight sensation," cautioned Bruce Stephen, an analyst at IDC. "We're in the embryonic stage of market development right now, and currently there are competing platforms coming to market, in the form of subnotebooks."

A recent study of the market for PDAs by BIS Strategic Decisions in Norwell, Mass., suggests a similar growth pattern for the handheld market, predicting that only 65,000 of these products will be sold in 1993.

Both studies pointed to a lack of actual hardware and software products as being a problem for PDAs in the early going.



Macintosh-like software for Windows unveiled

Claiming to have blurred the line between the Apple Computer, Inc. Macintosh and Microsoft Corp.'s Windows operating system, Granite Software, Inc. in Austin, Texas, has released a software package that gives Windows screens a Macintosh-like look and feel.

McDesk for Windows Version 4.0 allows users to create buttons for any application or macro and arrange them around the screen. The interface features the familiar Macintosh trash can and, like the Macintosh, allows file names to exceed the DOS eight-character limit. It also provides some drag-and-drop features, such as the ability to print a file by dragging it to a printer icon.

McDesk also features a library of more than 200 application icons, auto backup and restore, single-click disk drive access and automatic reopening of last-used files upon re-entry.

The product is a polished-up and renamed version of File Organizer, which sold about 10,000 copies in its first three releases.

McDesk for Windows has a retail price of $149.

—*Paul Gillin*

Avantos Performance Systems, Inc. has started shipping Release 2.0 of ManagePro for Windows, software for managers.

Advanced synchronization, cross-platform support, mobile user support and planning and organizational tools for the single user are included in this version. ManagePro 2.0 also features multiperson delegation, electronic-mail support and Dynamic Data Exchange support/Document Attachment.

An assistance window, coaching diagnostics and a new tool bar are also provided. ManagePro 2.0 for Windows costs $395.

▶ *Avantos Performance Systems*
Suite C
5900 Hollis St.
Emeryville, Calif. 94608
(510) 654-4600

Computer Associates International, Inc. is shipping updated modules in Version 6.1 of its ACCPAC Plus accounting package.

CA updated the Accounts Payable and Accounts Receivable modules. According to the company, Version 6.1 offers users a fully integrated multicurrency solution.

The product can revalue open transactions, enter transactions in any number of currencies and make inquiries and reports in source or home currency. Version 6.1 modules require an IBM PC or compatible, a hard drive, DOS 3.1 or higher, 640K bytes of random-access memory and Windowing System Manager Version 6.1A or higher.

The ACCPAC Plus accounting modules cost $795 each.

▶ *Computer Associates International*
1 Computer Associates Plaza
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Like DOS, OS/2

Microsoft Corp. has introduced Publisher 2.0, a desktop publishing application for Windows.

Microsoft said it added more than 25 features to this version. With the Publisher software, users can create newsletters, brochures, business forms and other types of professional-quality publications.

The product includes interactive templates called PageWizard design assistants that ask users design questions and can help develop a publication in minutes, the company said.

New graphics and design features such as a Clip Art gallery and irregular text wrap are also provided.

Microsoft's Publisher is available for an introductory price of $139 until Sept. 30. After that, the product will cost $199.

▶ *Microsoft*
1 Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

Product shorts

CE Software Holdings, Inc. has announced QuicKeys 3.0, a new version of its QuicKeys desktop automation software. With QuicKeys, users can create shortcuts designed to automate frequently used actions in applications and in the Macintosh operating system. Cost: $169. CE Software Holdings, West Des Moines, Iowa, (515) 224-1995.... **Dow Jones Business Information Service** has introduced Market Monitor, an electronic source of financial and market information. Daily and historical news, quotes, analyses and forecasts are provided via a PC and a modem. Cost: $29.95 per month. Dow Jones Business Information Service, South Brunswick, N.J., (609) 520-4649.... **Spinnaker Software** has introduced the PFS:PowerAlbum for Windows, a product designed to provide users with a simple way to preview, organize and access clip art, images, scans and drawings. The product includes 1,000 color clip art images and provides image browsing and keyword indexing to speed image searches. Cost: $59.95. Spinnaker Software, Cambridge, Mass., (617) 494-1200.... **Strategic Mapping, Inc.** has announced MapMaker for Windows Version 1.1, a version of its Atlas MapMaker software program for IBM-compatible PCs running Windows. Improved graphics, new geographic point file support and refined interchanges with other programs have been incorporated with this release. Cost: $395. Strategic Mapping, Santa Clara, Calif., (408) 970-9600.

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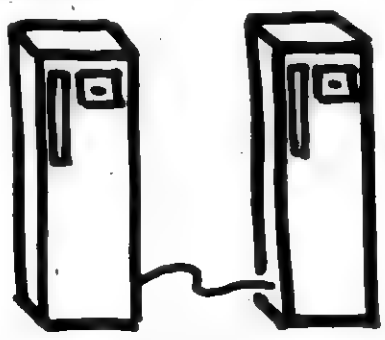

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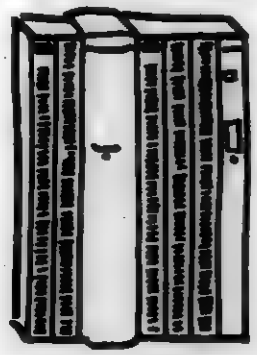

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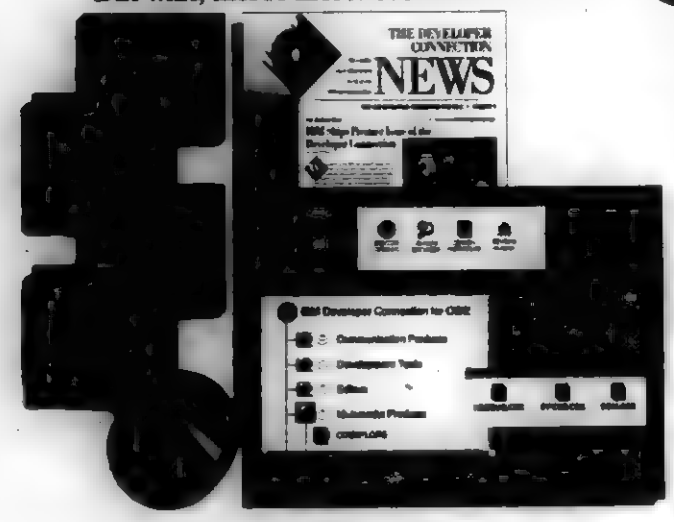

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Optical drives

Lower prices drive sales surge

By Stephen P. Klett Jr.

Declining hardware and media costs have sparked a dramatic increase in optical drive shipments, with CD-ROM drives the top seller, according to a recent study by Freeman Associates, Inc. in Santa Barbara, Calif.

Last year, shipments of CD-ROM, write-once and rewritable optical drives into the data storage market were up 119% compared with 1991 levels, and revenue was up 49%, the study said.

While more expensive than traditional storage products, optical drives offer users faster access, larger storage capacities and longer shelf life than both tape and magnetic media.

According to Freeman Associates, the optical disc drive industry shipped 2.6 million drives to data storage markets in 1992. More than 4.5 million units are expected to ship this year, a 76% growth rate. Demand is expected to be in excess of 11 million units by 1998.

CD-ROM drives will be the leader in shipment volume through 1998, with rewritable drives expected to move ahead of CD-ROM drives in revenue in 1997.

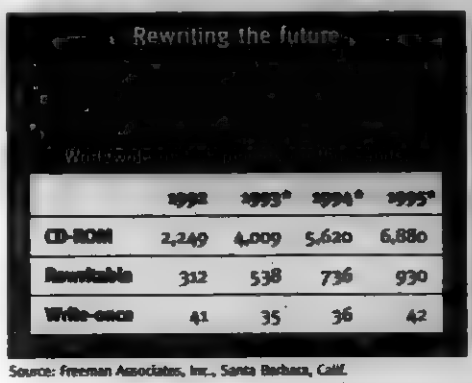
Price barrier removed

Price has been the main barrier standing in the way of CD-ROM technology. However, according to Robert Abraham, vice president of Freeman Associates, that barrier has been virtually eliminated.

"For $300 or $400 you can get a CD-ROM drive that is a real gem; for $600 to $700 you can get a top-of-the-line unit," Abraham said. "While [they are] still more expensive than traditional tape and magnetic drives, users are beginning to think that the performance benefits may be worth the expense."

In addition to price, Abraham said excitement over multimedia, a steady flow of new CD-ROM titles and the declining costs of optical media have contributed to demand for CD-ROM.

Able to store multiple forms of data, optical technology is particularly well-suited for storage and retrieval of imaged documents, which is clumsy and expensive to do via tape or magnetic disk.



	1992	1993*	1994*	1995*
CD-ROM	2,249	4,009	5,620	6,880
Rewritable	312	538	736	930
Write-once	41	35	36	42

Source: Freeman Associates, Inc., Santa Barbara, Calif.

For example, City Bank in Linwood, Wis., installed a 940M-byte, write-once optical drive from Panasonic Co. three years ago to replace a microfiche-based storage system. The drive connects to a host PC running an archiving software package called LaserArc from Premier Technologies in Portland, Ore.

Each day, the bank downloads a customer data file, which it archives to optical storage, from an NCR Corp. mainframe located at its service bureau in Milwaukee.

The result, according to Vice President Dan Coppin, is that the roughly 50 users on the bank's Novell, Inc. NetWare-based local-area network now have simultaneous, next-day access to the most up-to-date customer data possible.

Previously, "our service bureau made us a copy of the customer database on microfiche, which we didn't get for three to four days," Coppin said. "Now we have access to all customer information the next day, and we have the ability to produce the most accurate customer records possible, on demand."

Quick ROI

Coppin said the imaging system saves City Bank roughly $3,000 per month in processing costs associated with microfiche. "The system paid for itself in the first year," Coppin said.

While sales of write-once drives are projected to remain relatively flat, Abraham said this is due to users migrating to rewritable optical drives as their prices fall closer to write-once levels.

The worldwide market for all types of optical disk drives will approach $2.5 billion at OEM price levels in 1998, a 15% compound average growth rate from the $1 billion value of the 1992 market, according to the Freeman report. Projected revenue for 1998 is divided among the three major optical products as follows: $1.2 billion for rewritable drives (49% of total revenue); CD-ROM drives at $1 billion (42%); and write-once drives at $222 million (9%).

Jean S. Bozman

Planning for NT *and* Unix

By now, you've read all about the marketing wars pitting Microsoft's Windows NT against Unix. It sounds like the billing for the fight of the century.

For IS managers who want one standard operating system, it may be just that. But for most sites, the shipment of Windows NT means it's finally time to roll up your sleeves and start planning to support Windows

Bozman, *page 56*

Utility seeks to standardize 20,000 PC users

By Michael Vizard
SAN FRANCISCO

The Pacific Gas & Electric Co. (PG&E) has created an information systems architecture that was designed to bring the company's office automation strategy in sync with its overall application development efforts.

According to Art Beckman, manager of client support systems at PG&E, the company's Information 2000 Development Model is intended to provide a road map for a distributed client/server model that will span the enterprise.

In contrast, Beckman noted that back-end operations and individual units within PG&E have tended to pursue their own strategies. But as the industry makes a concerted push to adopt client/server models, PG&E decided the time had come to adopt a single infrastructure.

"We had about three months of discussions with managers about what the goals should be, and then it took us about nine months to a year to build a strategy," Beckman said during the recent Groupware '93 symposium in San Jose, Calif.

Beckman said one of the primary benefits of creating an IS architecture is that it will help the company streamline a lot of the support costs incurred when each business unit creates its own standards.

"It's a major change in support. We want to drive out duplication so instead of having 100 help desks, we have plans to consolidate into one help desk," Beckman said.

The equipment

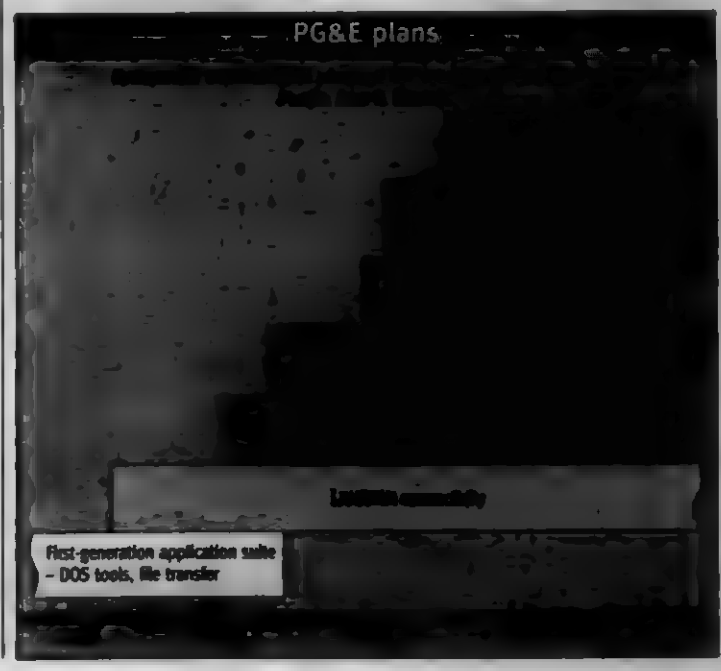
A key component of that strategy will be the enforcement of standards, which at PG&E will consist of 20,000 Intel Corp. 1486-class PCs running Windows 3.1 and 450 servers running either Unix or OS/2. Microsoft Corp.'s Windows NT, meanwhile, is under evaluation.

On top of this base, PG&E has deployed the Vines network operating system from Banyan Systems, Inc., a variety of applications from Microsoft and more than 10 gateways that link departments to the central message handling services in Vines. PG&E also has SQL Server and Oracle databases running on its servers and DB2 running on an IBM mainframe.

In addition, PG&E has about 3,000 of its 20,000 PC users up on Notes from Lotus Development Corp.

"One of the reasons Notes has

PG&E, *page 72*



Client/server

Barnett banks on OS/2 LAN servers

By Mitch Betts
JACKSONVILLE, FLA.

The nightly backup routines that are taken for granted in the mainframe world are not so routine in the client/server world. When Barnett Banks, Inc. implemented its client/server system for international trade services, the bank's software contractor had to write its own nighttime support routines.

Now, without human intervention, the system runs its nightly batch jobs, backs up the database and shuts down the servers. By 8:30 p.m., it essentially goes to sleep.

At 4:00 the next morning, the main file server reboots, setting off a chain reaction that wakes up and refreshes other parts of the system so that users can logon and begin transaction processing at 7 a.m.

Taking care of these housekeeping chores automatically was just one of the challenges involved in the implementation of an OS/2-based system that features multiple servers, multiple local-area networks and links to Barnett's mainframe files.

The international trade system, developed by American Management Systems, Inc. (AMS), a software and services firm in Arlington, Va., went into service on May 3. It was the culmination of a two-year effort by AMS to transform TradeLine, its mainframe software product with 1.5 million lines of code, into a client/server product called MicroTradeLine.

The software automates much of the work involved in producing the "letters of credit" that smooth the way for high-risk international transactions. A second module, for processing international collections, is slated to be installed by November.

A central "engine" LAN in Jacksonville, Fla., running multiple database and transaction servers supports a remote-user LAN in Miami, with other user LANs to come.

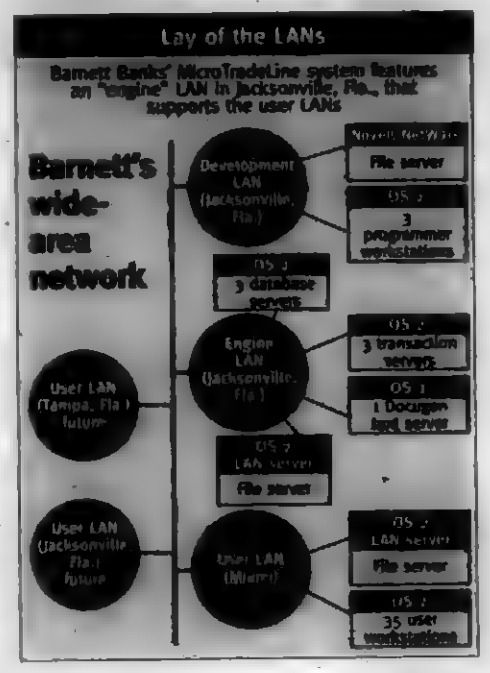
Tangible payoff

Charles Piazza, vice president in charge of Barnett's international operations, said the new system cost the bank $800,000. He brushed aside questions about quantifiable benefits, saying the payoff is measured in the following business terms:

- Instead of paying chargeback fees for mainframe processing on a never-ending basis, Piazza said the client/server system has a one-time cost.
- Piazza said he likes the client/server system's scalability. As Barnett's international business picks up, and as the bank holding company expands regionally, Piazza said he can just add more servers and PCs rather than pay for more mainframe processing.
- The system takes much of the "grunt work" out of creating letters of credit, Piazza said. Using a graphical user interface, staff members type the key parameters for a transaction into certain fields, and the software's built-in logic produces the boilerplate legal language with the details filled in.
- Piazza said he envisions the OS/2 system as the "platform of the future," capable of supporting future plans for a document imaging system.

Barnett took considerable risks by becoming the beta-test site for MicroTradeline. But Piazza said he has had a long and comfortable relationship with AMS. After all, he was the beta-test user for AMS' mainframe-based TradeLine system nearly a decade ago.

Even so, Piazza said his contract with AMS had an escape clause — which was never used — that "left the door open" to using the mainframe version if the client/server version never materialized.



Platinum expands downsizing arsenal

By Kim S. Nash
IRVINE, CALIF.

Platinum Software Corp. extended client/server financial offerings with three modules last week in a product line that, like that of rival Dun & Bradstreet Software, is standardized on Sybase, Inc.'s relational database.

Introduced a year ago, Platinum's Sequel to Platinum family is aimed squarely at mainframe downsizers, especially those users weighing alternatives to D&B Software, said Kevin Riegelsberger, executive vice president and co-founder of Platinum.

For example, in October, Clark Oil plans to ditch several mainframe-based financial systems from D&B Software for Sequel to Platinum applications. All but two of Platinum's 120 Sequel to Platinum users plan to migrate or have already migrated off the mainframe, Riegelsberger said. (The two standouts are customers who have grown PC-based financial systems to a client/server environment, he said.)

The 9-year-old company extended Sequel to Platinum with the following modules:

- Sequel Publisher, a report writer that can access databases, including those from Oracle Corp. and IBM.
- Cash Management, which was designed to integrate with accounts receivable and payable modules to reconcile cash and balance disbursements and receipts.
- Inventory, which helps users automate product counts and price change processes.

Prices range from $50,000 to $125,000, depending on the platform and number of users. Riegelsberger said $50,000 would buy enough for 10 to 20 users on low-end Unix workstations such as SPARC2s from Sun Microsystems, Inc.

The new components, available now, join five other Sequel to Platinum modules, including general ledger and accounts payable and receivable. Four other products are in beta testing. The line runs on OS/2, Microsoft Corp.'s Windows NT and Unix servers with OS/2 and Windows clients.

Sequel to Platinum runs native on Sybase's SQL Server database and relies on links and gateways from Sybase to access other relational databases, such as those from Oracle, Informix Software, Inc. and The ASK Group, Inc.'s Ingres Division.

Boot-laid plans

Financial packages on the way from Platinum include the following:

- Order entry: Fourth-quarter 1993.
- Multicurrency general ledger: Fourth-quarter 1993.
- Fixed assets: First-quarter 1994.
- Purchase order: First-quarter 1994.
- Payroll: Under development; no release date scheduled.

For the past three years, Platinum has funneled all research and development funds — about $25 million — into Sequel to Platinum, according to Kevin Dowling, senior vice president of marketing.

Wyse fills in server line gaps

By Stephen P. Klett Jr.
SAN JOSE, CALIF.

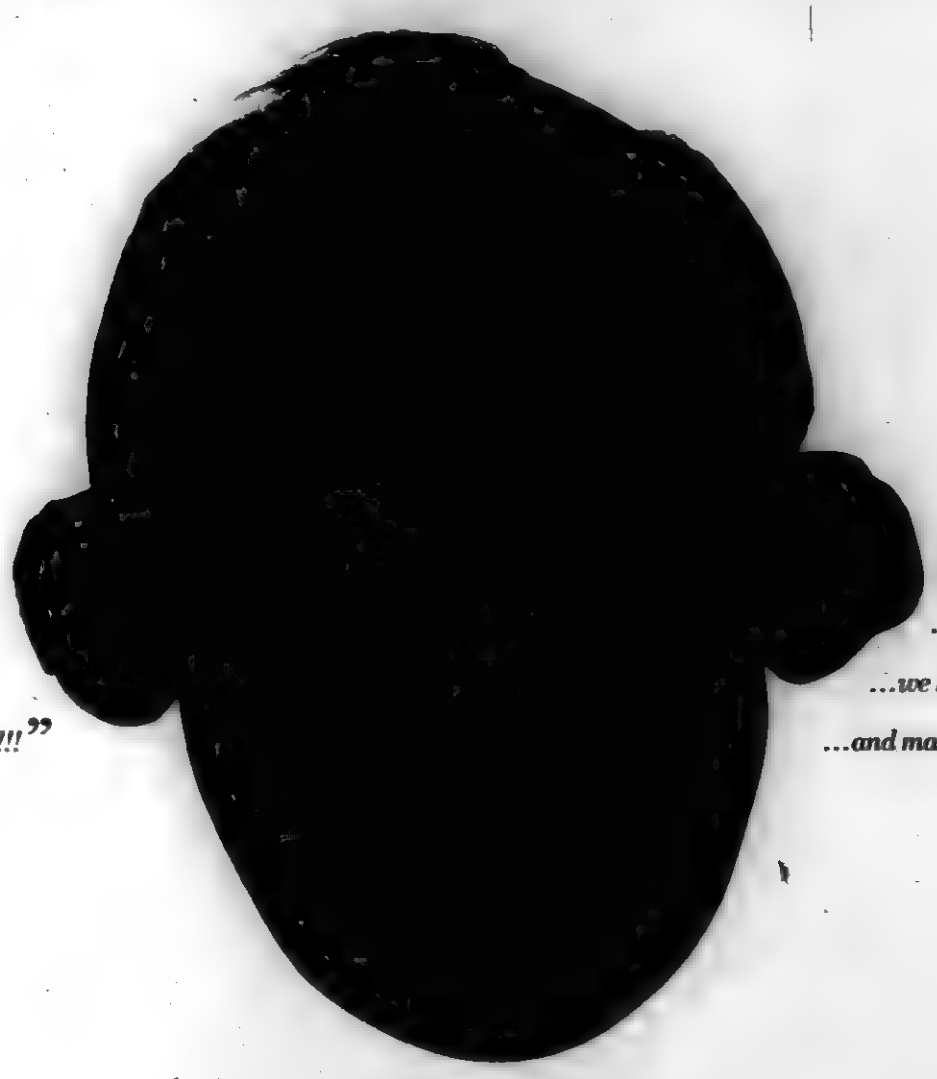
Wyse Technology, Inc. recently started shipping its third-generation symmetric multiprocessing architecture to its OEM and value-added reseller channels. The firm also filled in some gaps in its server line, announcing a midrange uniprocessor server and preinstallation of The Santa Cruz Operation's (SCO) Open Server Unix operating system on all of its systems.

Wyse's multiprocessing architecture is available in the form of chip sets, boards and full systems. Chip sets are available in three configurations starting at $800. A board set consisting of a system board, CPU board and error detection and correction memory board starts at $7,300. Wyse's Series 7000I Model 760MP scales up to five CPUs and starts at roughly $14,000. The Series 7000I Model 740MP scales up to three CPUs and costs approximately $10,100.

The Series 6000I Model 650 uniprocessor server is targeted at small and medium-size workgroups supporting up to 32 users. The system is based on the Extended Industry Standard Architecture bus and ships with an Intel Corp. 66-MHz I486DX2 microprocessor. Base pricing starts at approximately $2,980.

Wyse will bundle SCO's Open Server 3.0 and SCO MPX Release 3.0 — the software extension to SCO Open Server that supports symmetric multiprocessing — on its Series 6000 and 7000 servers. It will also distribute and provide technical support for all other SCO products, including networking and development software.

Diagnosis: *Acute Demanditis*



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Notes rival runs over TCP/IP networks

By Michael Vizard
HOUSTON

While Lotus Development Corp.'s Notes currently dominates the groupware platform, the ForeFront Group, Inc. has set sail on a course to compete with Lotus using a cross-platform groupware architecture developed at the Baylor College of Medicine.

Designed to run over Transmission Control Protocol/Internet Protocol, the object-oriented Virtual Notebook System (VNS) is a distributed client/server groupware platform that runs on Unix, Windows, OS/2 and Macintosh systems.

"We originally looked at Notes but decided to go with VNS because at the time we made the evaluation, Notes only ran on OS/2 servers, and we were looking for an open, Unix-based system that supported a client/server architecture," said Arun Jain, manager of engineering computers at British Petroleum of America (BP) in Cleveland.

Jain said BP is building some prototype applications on top of VNS that may be put into production in the coming year. In the meantime, Lotus is expected to deliver its first Unix implementations of Notes, but Jain said he still favors VNS over Notes.

Specifically, Jain noted that VNS supports real-time conferencing and provides an electronic scrapbook metaphor that is less structured than the templates associated with Notes applications.

"The real-time capability is really important when you're dealing with sites distributed around the world where you only have maybe a two-hour window to communicate," Jain said.

In addition to these features, ForeFront executives noted that VNS, unlike Notes, does not require sites to adopt a separate file format to support groupware. Instead, VNS applications can be stored in a standard Unix file format or as flat files attached to a SQL database. In addition, the next release will support the storing of VNS documents as binary large objects directly in the kernel of a SQL database.

VNS users can also integrate third-party applications into VNS via an application programming interface or through a set of customizable hypertext links provided by ForeFront.

Notes is priced at $495 per server or client license, but Notes servers are limited in size to 1G byte. A VNS server has an unlimited storage capacity.

In the future, ForeFront plans to deliver VNS on top of Novell, Inc.'s IPX protocol and Digital Equipment Corp.'s DECnet. It will also support Windows NT from Microsoft Corp. as a server.

Pricing for VNS servers is $8,000 for an unlimited-use license. Windows and Macintosh clients are priced at $595.

NetServer breaks performance mark

Auspex Systems, Inc. announced that its NS 6000 NetServer broke the 2,000 operations/sec. throughput barrier running Standard Performance Evaluation Corp.'s (SPEC) System File Server benchmark software suite.

The NS 6000 achieved a throughput rate of 2,037 SPECnfs operations/sec. with an average Network File System (NFS) response time of 46.5 msec. while managing eight Ethernet-based networks, Auspex said.

According to the firm, the performance level was achieved through its Functional Multiprocessing (FMP) architecture, which eliminates I/O bottlenecks by separating the network, file and disk management functions typically performed by the server's Unix processor. FMP allocates those operations to specialized processors so the Unix processor can perform system and network administration and database processing functions.

The SPEC System File Server software provides a standardized method for comparing NFS file server performance across different vendor platforms.

—*Stephen P. Klett Jr.*

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Bozman

CONTINUED FROM PAGE 51

NT *and* Unix at different locations throughout your enterprise.

According to an International Data Corp. (IDC) report released in June, IS managers fully expect Unix to win out over Windows NT in the area of high-end data servers for the next year or two.

Their reasons: Unix is a mature, multitasking operating system with well-known strengths and weaknesses. It fits into a broad open systems infrastructure that was 20 years in the making.

By contrast, Windows NT is in its first release and, for now, lacks some utilities and interoperability features.

But users and business units, empowered by trends toward downsizing, are free to buy Windows NT when and where they will. That represents the challenge to IS because while Windows NT can live apart from Unix in an alternate universe of marketing and advertising, it cannot live in an alternate enterprise. It will live throughout your network.

Microsoft CEO Bill Gates begged the question of interoperability in his PC Expo speech in June when he said NT was a form of Unix [CW, July 5].

The IDC report said that of 150 sites surveyed, 32% planned to use Windows NT only for desktop applications and 15% for LAN applications. Just 11% saw NT as a challenger to Unix as an enterprise-wide operating system. However, 45% of the same survey group said NT's lower cost of ownership was compelling in planning for future purchases, and 40% expect widespread availability of shrink-wrapped NT applications.

There are many ways for IS sites to accommodate Windows NT. For example, one can convert a local database server from Unix to Windows NT, or one can place NT servers on TCP/IP networks.

A third method would be to place Windows NT servers on Novell NetWare networks, but you may need special software to do so, according to Microsoft.

A fourth method, suggested by third-party vendors, would be to use X terminals to display both applications from NT and Unix servers on the same screen. That way, data and text could be transferred between X Windows using a cut-and-paste technique.

The path toward interoperability will not always be smooth, Microsoft admits. "Any time you put two or three complex systems together, there will be bumps to get over," said Collins Hemingway, a Microsoft spokesman. "We've been testing these [NT servers] with Unix systems to make sure they can communicate."

Microsoft already supports the TCP/IP networking standard out of the box, and it has limited support for the Posix and Sockets interfaces. But it does not have counterparts for "a whole boatload of utilities [found] on many Unix systems," Hemingway said, and it is looking to third parties to provide equivalents for NT.

In an era when there will be open data highways linking corporate offices scattered around the globe, NT will need to add plenty of hooks into open systems standards. That may be one reason Microsoft is a member of the Object Management Group in Framingham, Mass. Objects can be used as electronic couriers to dissimilar systems.

As a matter of practicality, it may take two or three years for Windows NT to catch up to Unix in many re-engineering projects. Downsizing projects that required multitasking database servers and were specified before 1993 had no alternative to Unix, users say.

However, some IS managers believe they might have planned differently if Windows NT had shipped earlier. Future evaluations will, they say, include both Windows NT and Unix.

Bozman is *Computerworld*'s senior West Coast editor.

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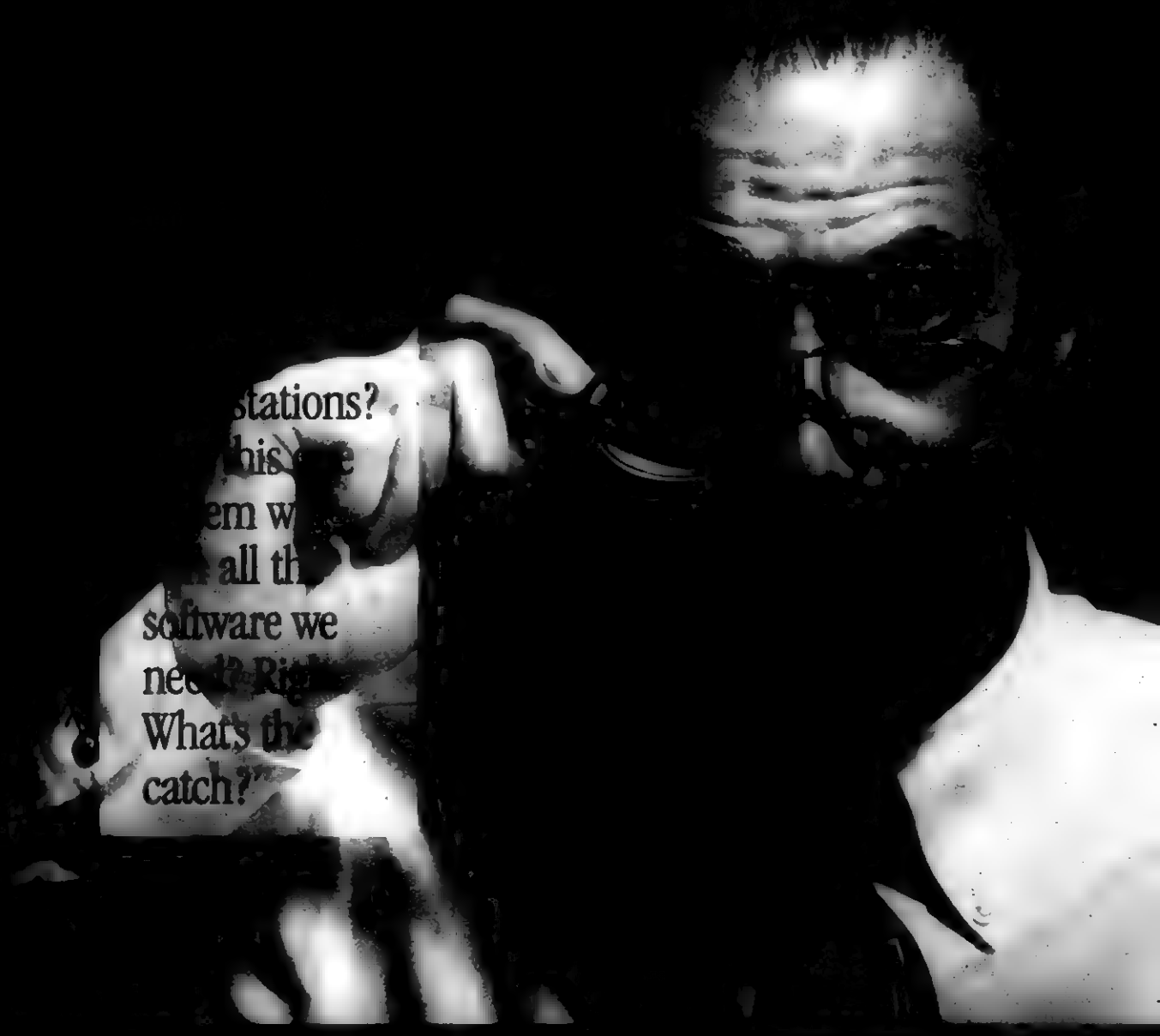

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Introduction

Just as the average American is sometimes painfully conscious of his or her weight, so too, it seems, is the average American corporation. While individuals slavishly work out in order to shed pounds, corporations are exercising various "resizing" approaches in an attempt to develop svelter profiles.

The corporate approach is largely fixed on downsizing and rightsizing, both of which are commonly associated with client-server computing architectures. Increasingly fueling those architectures, however, are the new generation of 32-bit operating systems such as IBM's OS/2 2.x, Microsoft's Windows NT and SunSoft's Solaris.

These 32-bit systems are ideal for downsizing mainframe and minicomputer applications onto networked desktop systems. They are also ideal for the client-server computing environments that are becoming so prevalent on today's information technology landscape. Client-server computing merges trends such as downsizing with the movement toward open systems and interoperability — first as part of Unix, now as a force on its own. It also incorporates the ever-increasing numbers of networks based on powerful, affordable microprocessor-based systems.

OS/2 2.x is an evolutionary step above the previous, non-32-bit OS/2 versions. It is a full 32-bit system that runs Windows applications and includes many features of other operating systems.

Windows NT, like OS/2 2.x, is a complete 32-bit operating system that incorporates the Windows interface. It is shipping first as a client, and then as a server operating system platform.

Solaris is more than just an operating system because it is packaged with ONC Networking and middleware tools such as OpenWindows and ToolTalk. While optimized for rightsizing application support, it also includes many new system management and base technology features such as symmetric multiprocessing, multithreading and installation tools. Solaris is scalable to support heterogeneous networks of up to tens of thousands of users.

Although SunSoft and Solaris have a lot of tough competition in the 32-bit operating system world, Solaris is a technically sound product that has a solid shot at carving out a significant portion of the market.

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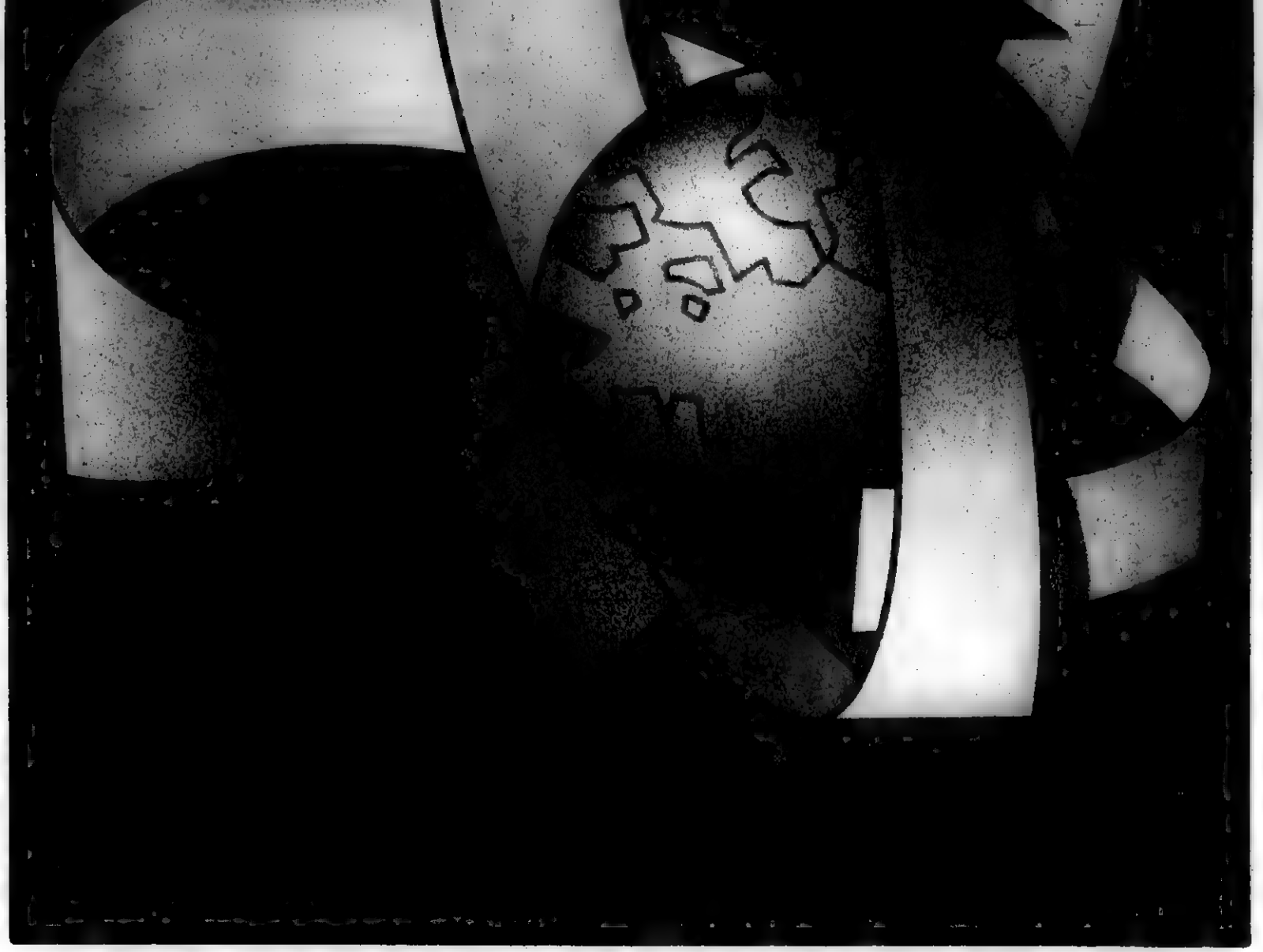

Information technology is an integral component of the corporate infrastructure. Computing does more than streamline a few isolated processes such as accounting or order entry transactions. The information network of an enterprise reflects, and in some instances helps determine, the corporate culture.

Because today's corporations compete more effectively and operate more efficiently with the critical assistance of information system technologies, computing now directly affects the ways in which a business functions and adapts. At the same time, business requirements place demands on information technology.

The belt tightening that has gripped U.S. corporations in recent years has directly impacted the data center and Information Systems (IS). Costly mainframe-dominated information infrastructures are being scrutinized. The convergence of low-priced, high-performance desktop hardware, 32-bit operating systems, open computing, and increased interoperability has offered corporations an appealing alternative: shift the focus of enterprise computing away from cen-

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tralized processing to distributed architectures.

This technology has led to the creation of trends such as downsizing, rightsizing and client-server computing. Companies that downsize are migrating from expensive central processing platforms, usually mainframes, to alternative platforms of interconnected desktop processors and servers offering highly competitive price/performance.

Rightsizing is a term used to cover both downsizing and upsizing.

Users who downsize are not doing so simply to lessen their dependence on mainframe products and plans. Other factors also come into play. The primary one is cutting costs, but improving end user support and service is also important.

Unix has provided a viable platform for rightsizing. Among the biggest winners in this environment are the systems vendors, selling hardware and operating systems, and the relational database vendorssuch as Informix, Oracle and Sybase.

Together, Unix platforms and the relational database servers pioneered client-server computing. Both camps are being rewarded with increased revenues and a sense of legitimacy within user organizations.

Sun and Hewlett-Packard add features to improve performance and database access within their systems software. This in turn improves corporate information access.

This mutually-beneficial, coordinated Unix-database effort is rapidly developing the technologies necessary to link legacy databases with client-server environments.

32-BIT COMPUTING AS A DOWNSIZING PLATFORM

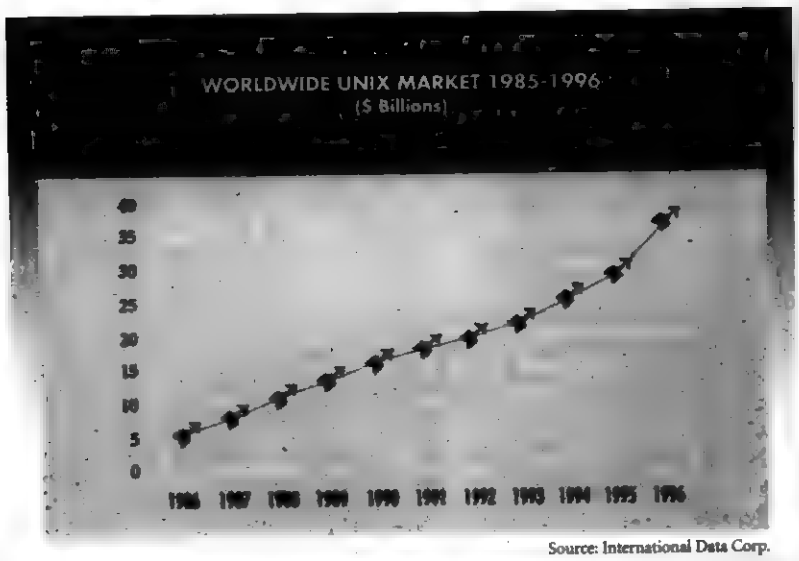
From the perspective of downsizing/rightsizing, 32-bit computing is the platform vehicle for client-server computing.

Conversely, 16-bit microprocessors are limited in their application support. For example, objects are limited to 64K bytes without additional programming. In this environment, programmers are forced to be aware of their memory architecture when designing applications, even if coding is in a high level language.

The 32-bit architecture enhances the process of downsizing mainframe and minicomputer applications onto single or networked desktop systems. As an integral part of that architecture, 32-bit operating systems and system software provide additional technology that supports memory management and better networking. The richness of the environment also enhances the ability to develop other technologies such as multimedia.

Source: International Data Corp.

Unix database vendors are taking advantage of the need to link client-server architectures with database servers.



Source: International Data Corp.

As a primary platform for client-server computing, Unix is well-positioned to prosper for the next three years.

A COMPARISON OF VARIOUS OPERATING SYSTEMS

Sixteen-bit operating systems like DOS provide limited access to memory amounts above 64K bytes. The primary way to get around this is via segmentation.

Thirty-two bit operating systems have been around for years in the minicomputer and mainframe worlds. For instance, proprietary operating systems and many Unix versions have long taken advantage of 32-bit hardware capabilities. In the PC world, DOS was written to run on the Intel 8088 processor. As Intel expanded the family to the 8086, 286 and eventually the 32-bit 386 and 486, DOS stayed essentially the same.

Even though the hardware systems utilizing these new 32-bit chips were widely available, the software was not available from Microsoft.

The first operating systems that successfully incorporated the 386 and 486 chips were variations of Unix. Santa Cruz Operation and Interactive Systems (now part of Sun Microsystem's SunSoft subsidiary) were pioneers in this area. Additional versions from SunSoft (Solaris 2), NeXT (NeXTStep), and Univel (UnixWare) have recently been introduced.

WINDOWS

Microsoft built Windows as an extension of the widely installed DOS operating system, greatly extending the life of DOS in the process. Windows is almost an operating system in itself — it provides not only a graphical user interface (GUI) but also memory management and rudimentary multitasking capabilities.

If DOS is a 16-bit operating system, then Windows is a hybrid 20-bit operating system built on a 16-bit core. While Windows is not perfect, it has provided a credible response to the Macintosh interface, which exposed the limitations of DOS.

OS/2 2.x

IBM's OS/2 2.x is an evolution of previous versions of OS/2 that were not 32-bit. Today's OS/2 2.x is a full 32-bit system that includes many of the features of other operating systems in addition to the ability to run Windows applications. OS/2 2.x, which is technically a fine operating

SOLARIS APPLICATIONS

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Interactive Software Engineering	(805) 685-1006
Interleaf	(617) 290-0710
InterSystems Corporation	(617) 621-0600
KnowledgeWare	(404) 231-8575
Lagunt Corporation	(508) 870-1900
Liant Software Corporation	(508) 872-8700
Lindo Systems	(312) 871-2524
mental images	49308821088
Mihalisin Associates	(215) 646-3814
MiniGraph	(215) 359-1300
National Information Systems	(408) 985-7100
NOETICS	(415) 927-3841
Numerical Algorithms Group	(708) 971-2337
Open Text Corporation	(519) 571-7111
Oracle Corporation	(415) 506-7000
OSL (Occam Solutions)	44584 877491
Paragon Imaging	(508) 251-7500
Pectronics Corporation	(408) 446-5544
POET Software	(408) 748-3404
Portable Graphics	(512) 908-4700
Prior Data Sciences (PSI)	(714) 362-2190
Progress Software Corporation	(617) 280-4000
PSTAT	(609) 466-9200
Recital Corporation	(508) 750-1066
RGB SPECTRUM	(510) 814-7000
SARA	(714) 373-5509

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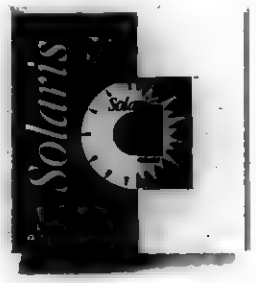

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TOCK

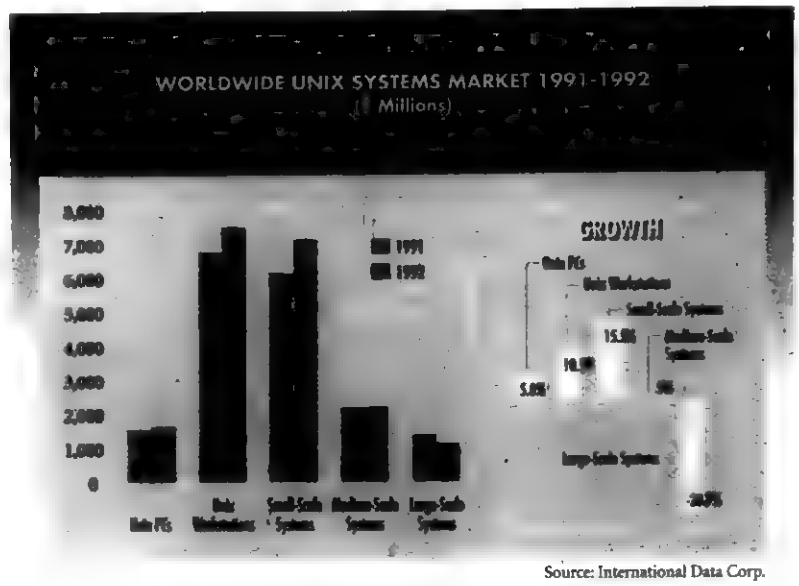
SOLARIS APPLICATIONS

Desktop Tools (cont.)

SAS Institute	(919) 677-8000
Six Sigma CASE	(206) 643-6911
SL Corporation	(415) 927-1724
SoftQuad	(416) 239-4801
Software Artisans	(904) 372-8815
Software Moguls	(408) 748-8575
SPRING	33148705656
SPSS	(312) 329-3500
SunSolutions	(415) 960-1300
Sybase	(510) 596-3500
S. I. Systems	(403) 264-4343
Texas Instruments	(800) 336-5236
Time Arts	(707) 576-7722
Uniface Corporation	(510) 748-6145
Unify Corporation	(916) 928-6400
Virtual Prototypes	(514) 483-4712
Vividata	(510) 841-6400
V. I. Corporation	(413) 586-4144
WordPerfect Corporation	(800) 321-3280
WorldDesign	(206) 782-8630
XED Systems	(818) 407-4000
X-Solutions	440483502003

Business-Specific

Adra Systems	(508) 937-3700
Appleby Technologies	(201) 433-5580
Atlantic Microsystems	(703) 478-2764
AUTODESK	(415) 332-2344
Bentley Corporation	(408) 354-7511
Cadkey	(203) 298-8888
Cimage Corporation	(313) 761-6550
CIMLINC	(708) 250-0090
Decision Software	(212) 385-1662
Dendrite Clinical Systems	(503) 292-3022
Hiblitt, Karlsson & Sorensen	(401) 727-4200
HUBLink	(614) 841-9877
INFINITY International Financial Technology	(415) 960-6100
Intergraph Corporation	(205) 730-2000
InterLinear Technology	(415) 748-6850
Kendl Data Products	(301) 937-8847
Marquette Electronics	(414) 355-5000
Metaphase Technology	(612) 482-4313
Microimages	(402) 477-9554
Mobile systems International	44719718199
Oasis Technology	(416) 886-2177



Source: International Data Corp.

Large-scale systems are clearly losers in the booming Unix systems market.

system, has had moderate commercial success to date.

WINDOWS NT

Like OS/2 2.x, Microsoft's NT is a complete 32-bit operating system that incorporates the Windows interface. NT will first be available as a client and then as a server operating system platform. Although NT has generated considerable interest, it is still an unproven product.

UNIX AND RIGHTSIZING: A NATURAL FIT

Unix fits into the interoperability mix as a link downward to DOS, Windows and OS/2. It also provides an upward link to the proprietary worlds of MVS and VMS. Achieving a high degree of interoperability is critical to fulfilling the promise of client-server computing because it gives users access to applications regardless of operating system environments.

Interoperability taken to its logical conclusion really means hardware and software independence, true application portability and transparent access to information.

The fastest growing segments of the Unix hardware market are those embracing systems that are most often employed as rightsizing platforms: PCs, workstations, small-scale systems and workgroup servers.

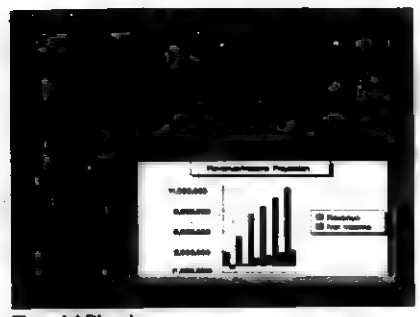
SUN'S UNIQUE POSITION IN THE UNIX MARKET

Sun Microsystems and Unix have been very good for each other. Sun benefited when Unix provided the operating environment for Sun's pioneering RISC platform. And Unix benefited from the success and evangelism of Sun.

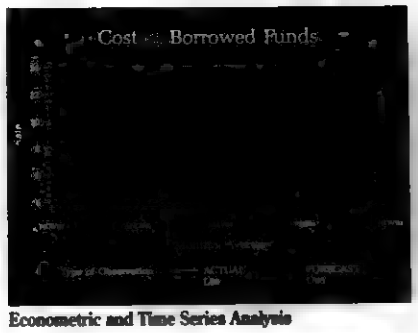
During planning for Unix System V Release 4 (SVR4), AT&T and Sun started to solidify their relationship. Wary of the potential fruits from that relationship, Sun rivals IBM, Digital and HP formed the Open Software Foundation (OSF).

Sun, AT&T and others responded by creating Unix International (UI). The Unix and Graphical User Interface wars followed. Although the Unix market prospered during these confrontations, it could have done even better.

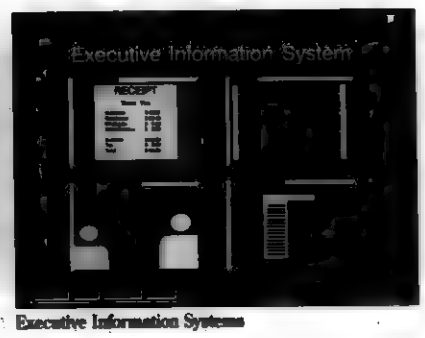
Sun was extremely successful in exploiting a movement away from minicomputers to workstations in



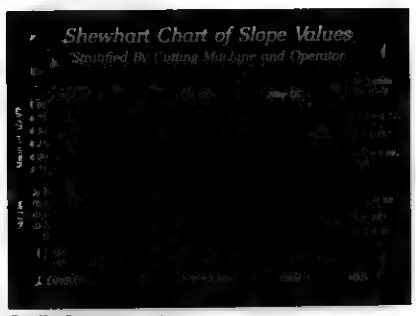
Financial Planning



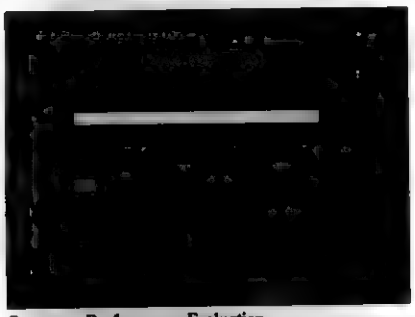
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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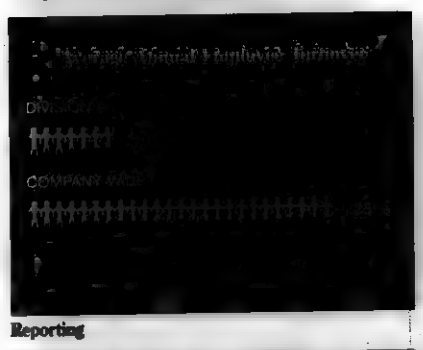
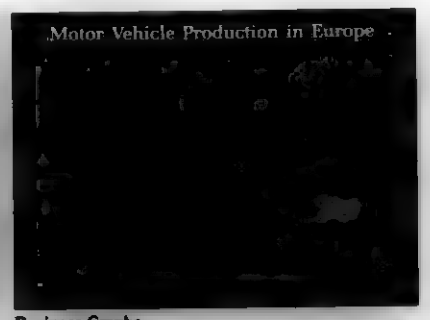
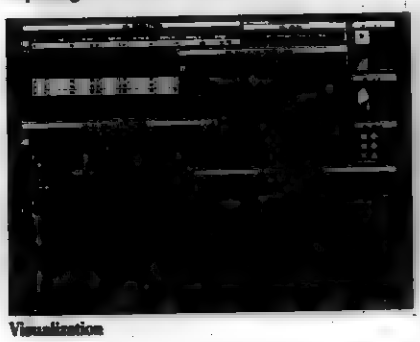


Reporting

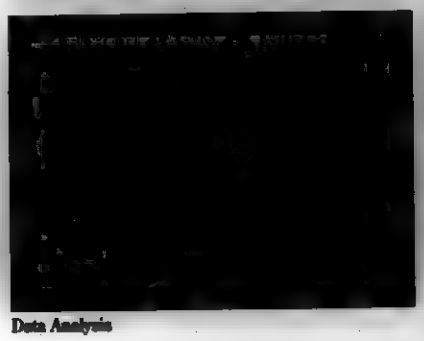
Market Research



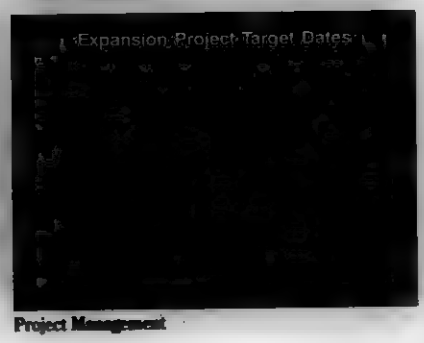
Business Graphs



Visualization



Data Analysis



Project Management

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SOLARIS APPLICATIONS

Business-Specific (cont.)

SAIC Sensory Data Analysis Division	(407) 676-3102
Sigma Design	(617) 270-1000
Spotlight Graphics	(908) 530-8484
Systems Plus	(415) 969-7047

Networking

Accton Technology	(510) 226-9800
ADAX	(510) 548-7047
American Computer & Electronics Corporation	(301) 258-9850
Bristol Group	(415) 925-9250
Bridge Systems	(617) 661-6262
Century Software	(801) 268-3088
Cockerill Technology Corporation	(914) 965-6300
DigiBoard	(612) 943-9020
Eclair	(415) 341-9065
ICON Corporation	(206) 728-6465
Information Presentation Technologies (ipt)	(805) 541-3000
IRIS Distributed Systems	(607) 272-6327
Legato Systems	(415) 329-7880
Matrix	(603) 888-7000
Micro Computer Systems	(214) 659-1514
Microplex Systems	(604) 875-1461
Morning Star Technologies	(614) 451-1883
National Instruments	(512) 794-0100
OSIware	(604) 436-2922
Perform	(609) 895-0404
Spry	(206) 286-1412
Sterling Software	(415) 964-9900
Synoptics	(206) 838-2626

Technical Tools & Devices

Adaptec	(408) 945-8600
Advanced Archival Products	(303) 792-9700
American Megatrends	(404) 263-8181
American Power Conversion Corporation	(401) 789-5735
Applied Engineering Research	(714) 348-7979
Applied Logic Technologies	(212) 262-0148
a/Soft Development	(603) 666-6699
Berkeley Software Services	44252310933
CALAY SYSTEMS	(714) 863-1700
CalComp — Digitizer Division	(602) 948-6540
CaseWare	(714) 453-2200
Centerline Software	(617) 498-3000

the technical market. The company also capitalized on Unix and the concept of open systems in general.

It further created the perception that Unix was the best vehicle to implement open systems and developed and licensed the SPARC architecture, which allowed competitors to clone its machines.

SunSoft: SUN'S SYSTEM SOFTWARE COMPANY

The other major result of the AT&T/Sun alliance was Sun's decision to migrate from its early Berkeley Software Distribution-based SunOS to SVR4. In 1991, Sun broke up into several "planets" with the idea that each would focus on a particular opportunity. One such planet was Sun Microsystems Computer Corporation (SMCC), whose charter called for it to build and sell computer systems, including both workstations and servers.

As another spun-off planet, SunSoft was created with the intention of developing Sun's operating system software into a profitable business. One of the first things done by SunSoft was to announce Solaris as a SunSoft brand-name for its version of Unix.

In its efforts to sell system software, SunSoft targets hardware manufacturers. Naturally, SunSoft's largest customer is SMCC, but it also sells to the other hardware manufacturers that use the SPARC architecture.

SunSoft's market is not limited to SPARC. Solaris on Intel x86 is now shipping, and the company subsequently announced support for the PowerPC architecture as well. This is consistent with the view that there will be three winning chip architectures — SPARC, PowerPC, and Intel x86 — and three winning operating systems — Solaris, Windows NT and OS/2.

SOLARIS: MORE THAN AN OPERATING SYSTEM

Solaris is more than an operating system because it is packaged with many other features that IDC calls "middleware." Examples include OpenWindows and ToolTalk. SunOS 4.x and its associated software were renamed Solaris 1, while SunOS 5.x and its associated software were called Solaris 2.

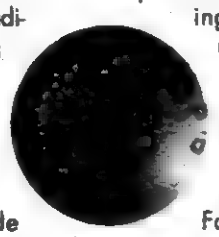
Solaris 2 represents a major technological step for SunSoft. While optimized for rightsizing application support, it also includes many new system management and base technology features such as symmetric multiprocessing, multithreading and security. It will be the basis for future object-oriented technology. Solaris 2 provides support for up to tens of thousands of users, an important requirement in the commercial server market. Solaris is compatible with

Source: International Data Corp.

Sun attributes its growth in the worldwide Unix market to its open technology.

Foxboro Company Links Executives, Manufacturing

For several years, manufacturers have been struggling to link two disparate worlds: the shop floor and the executive office. Both areas have been heavily automated for many years, yet in the traditional batch processing approach, information from the shop floor only reached the central processor periodically.



Six years ago, Foxboro Company, a worldwide provider of process control instruments, systems and services for manufacturers, embarked on a mission to resolve this predicament.

The ambitious task facing Foxboro, according to John Puckett, manager of worldwide engineering and network services, was the integration of its complete worldwide operations into a real-time, fault tolerant process control system. Foxboro, a division of Siebe PLC, is a worldwide operation with plants in the U.S., Europe and Canada, and offices throughout the world.

The project was conceived as a five-year plan and had a dual purpose. First, Foxboro was committed to integrating process control information into IS systems. This would connect the shop floor to the executive office, and, according to Puckett, "enable real-time, intelligent decisions." Second, Puckett and his colleagues from telecommunications, systems and applications replaced the firm's outdated IS system.

Two obstacles stood in the way of the company's goals. "Luckily, there was some cooperation in a handful of strategic locations, enabling the implementation to go forward.

The other obstacle was the network design. Eventually, Foxboro determined that to develop an open architecture, it had to find new suppliers. As part of the evaluation process, it took an independent approach doing its own benchmarking and beta testing. The role played by Sun was crucial, and Sun's networking products, hardware and software largely determined the direction of the project. For Foxboro, Sun offered the most coherent mix of hardware, applications and networking technology. The company decided on a networking architecture based on TCP/IP and Ethernet. It also implemented Solaris, the version of Unix offered by Sun's subsidiary, SunSoft.

Sun's ONC network architecture tied it together. As the network evolved, NFS and PC/NFS continued to allow Foxboro the ability to more easily bind systems together. But in Puckett's view, Solaris was the key to Foxboro's transformation.

Ultimately, Foxboro developed a solution based on Unix and ONC Networking that created a seamless architecture called the Intelligent Automation System. This architecture now serves the entire corporation, connecting design, production, sales, shipping and field service.

Six years after the project began, Foxboro has all but eliminated its mainframes and proprietary minicomputers, and replaced them with client/server systems that include Sun, HP, and Digital Equipment servers and workstations. The Digital systems were first moved from VMS to Ultrix. Once the applications were moved to Ultrix, it became a short step to other Unix platforms.

SOLARIS APPLICATIONS

Technical Tools & Devices (cont.)

Corollary	(714) 250-4040
Corporate Microsystems	(603) 448-5193
CoSYSTEMS	(408) 748-2190
Digital Multimedia	440819771105
DPT-Distributed Processing Technology	(407) 830-5522
DyneSoft	4687268560
Edinburgh Portable Compilers	44312256262
Enhanced Software Technologies	(602) 820-0042
Extended Systems	(208) 322-7575
G E T Engineering	(619) 443-8295
Glenpal Software	(215) 584-4261
Greenleaf Software	(214) 248-2561
GW Hannaway and Associates	(303) 440-9631
Harris EDA	(716) 924-9303
HiCOMP Storage Technologies	494063809-0
Highland Software	(415) 493-8567
Hunter Systems	(415) 424-9200
Information Management Co.	(908) 417-9770
Innovative System Applications	(206) 867-1515
Integral Solutions	44256882028
Intelligent Software Solutions	(904) 738-6820
INTERSOLV	(301) 230-3200
KOM	(613) 831-8350
Linton Corporation	(212) 753-2544
Logic Works	(609) 243-0088
Los Altos Technologies	(415) 949-4567
Media Vision	(510) 770-8600
Mentor Graphics Corporation	(503) 685-7000
Mesa Ridge Technologies	(619) 457-0570
Neuron Data	(415) 321-4488
NobleNet	(508) 655-2438
Objectivity	(415) 688-8000
Open Computing Security Group	(206) 882-8721
Q Star Technologies	(301) 762-9800
Quad Design Technology	(805) 988-8250
Rockwell International	(805) 968-4262
Software Maintenance & Development Systems	(508) 369-7398
SQL*Builder Software Company	(414) 782-7700
Sunburst Computers	(619) 693-1680
SunPro	(415) 960-1300
Sunrise Software International	(401) 847-7868
Systems Engineering Research Corporation	(415) 962-8092
Technology Applications	(314) 394-6436
Technology Concepts	44633872611

SOLARIS APPLICATIONS

Technical Tools & Devices (cont.)

Template Software	(703) 318-1000
Thursby Software Systems	(817) 478-5070
Tidalwave Technologies	(415) 441-0985
Tom Sawyer Software Corporation	(510) 848-0853
Transitional Technology Inc. (TTI)	(714) 693-7707
TWINCOM International	31162023936
UltraStar Corporation	(510) 623-8955
Viewlogic Systems	(508) 480-0881
VITAL	(713) 781-7406

Software Engineering

Abraxas Software	(503) 244-5253
AETECH	(619) 431-7714
Aggregate Computing	(612) 546-5579
Aleyo	(805) 683-5777
Archelon	(519) 746-7925
BASIS	(510) 547-5900
Bradford Business Systems	(714) 859-4428
Bristol Technology	(203) 438-6969
Codex Technologies	(401) 351-5950
CASEtools Systems Corporation	(408) 559-4240
Clem & Associates	(504) 928-5765
Computer Innovations	(908) 542-5920
DDC-I	(602) 275-7172
InoTech	(703) 641-0955
Interactive Development Environments	(415) 543-0900
Market Focus Technologies	(619) 546-6689
Mercury Interactive Corporation	(408) 987-0100
MetaWare	(408) 429-6382
Microprocessor Developments	44713282277
Oasys	(617) 862-2002
Object Design	(617) 270-9797
Objective Interface Systems	(703) 264-1900
Quorum Software Systems	(415) 323-3111
Scandura Intelligent Systems	(215) 664-1207
Softools Corporation	(619) 457-2700
Stepstone Corporation	(203) 426-1875
Summitpointe Technologies	(415) 390-8920
Teleran Corporation	(415) 965-8050
Top Systems	(416) 781-3968
UniPress Software	(908) 287-2100
Viking Software Services	(918) 491-6144
Virtual Technologies	(703) 430-9247
Visible Systems	(617) 890-2273
Waterloo Maple Software	(519) 747-2373
Wild Hare Computer Systems	(303) 530-2221
Workstation Group	(708) 696-4800

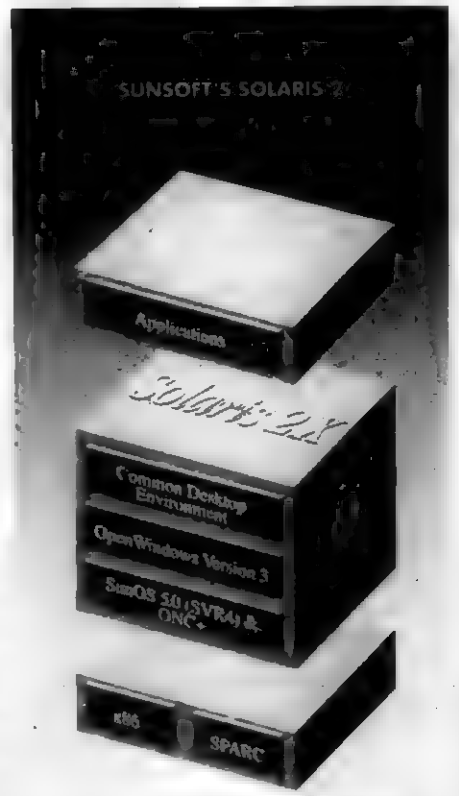
the Windows, Macintosh and NetWare environments.

While an operating system kernel performs many mundane functions, it also is the basis upon which all other software (both system and application) resides, and therefore represents a potentially weak link. The greatest hardware system in the world is only as good as its operating system.

APPLICATION DEVELOPMENT ENABLERS

Solaris provides many features that facilitate the development of rightsizing applications. It is a modular operating system with loadable drivers for dynamic configurations and clean software changes and additions. It is based on a modular programming model that discourages monolithic applications that are difficult to maintain and modify.

The modular programming model is based on network-transparent, protocol-neutral APIs. Solaris is also scalable, and applications running under it are binary-compatible on a wide range of hardware platforms, running from low-end workstations to 750+ transactions-per-second servers.



Source: SunSoft, Inc.

Solaris incorporates a wide range of Unix and enabling technologies.

SunSoft's PLACE IN THE RIGHTSIZING MIX

Downsizing, the shift in emphasis from mainframe host environments to microprocessor-based systems, is rapidly taking hold. The continued development of client-server architectures and rightsizing requires commitments from vendors as well as IS and other enterprise entities.

Rightsizing projects will stretch client-server-related work beyond today's internetwork connectivity services and require additional skill sets which are currently in short supply. This will be a challenge for both vendors and users.

The integration and interoperability of new technologies with older technologies is vital to the success of rightsizing.

SunSoft has developed a technically sound product, but translating technical success to commercial success is a daunting process. Customers are looking to outside experts to assist them in their rightsizing projects. Simply providing users with tools is not enough.

Given SunSoft's open architecture and support of interoperability, the company is positioned to become a market force in commercial rightsizing. The Solaris operating environment has increasingly been engineered to support distributed computing, but there are many more challenges to overcome. Solaris is poised to overcome those challenges. ■

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Utility

CONTINUED FROM PAGE 51

taken off on every desktop is because we already had an electronic-mail and bulletin board service installed that we still use. We tend to use it as a distributed database for tracking applications. And the officers like to use it for discussions," Beckman said.

Beckman noted that PG&E is looking at ways to consolidate the number of servers the company has to support and that PG&E's overall groupware strategy is being held back by a lack of E-mail standards.

"With groupware, each application creates a new set of standards and services. This is just a killer to the overall groupware environment because it presents an unusable environment that no one can administer," Beckman said.

At the same time, however, Beckman said groupware applications are too important to ignore at this point.

"It used to be that PG&E linemen, who are responsible for $100,000 worth of jobs, were managing those jobs based on six-week-old data from a mainframe. These people need to manage their jobs in real time," Beckman said.

By 1997, Beckman said he envisions a time when a gas service employee will be able to respond to bill inquiries by accessing a central server over a mobile terminal that will download data describing a customer's usage pattern. With this data, the employee will be able to schedule an energy audit and provide information on various payment plans.

By 2002, Beckman said he expects that the employee will be able to detect abnormal usage patterns and move to correct them before the customer's bill rises substantially.

To accomplish these goals, Beckman said IS people need to get department managers to agree to pick one product as a standard so they can create a usable groupware environment.

"Otherwise, people build applications that conflict with one another," Beckman said.

Ultimately, Beckman said he hopes that widespread support for the Distributed Computing Environment from the Open Software Foundation will resolve many of these conflicts.

Briefs

IBM manufacturing tools

IBM has tapped AGS Information Services, Inc. to market and support its CIMAPPS software, which was designed to streamline manufacturing business processes under IBM's AIX and OS/2.

Meanwhile, IBM plans to resell Unix-based client/server manufacturing programs from Tucson, Ariz.-based Avalon Software, Inc. RISC System/6000 users will be able to buy Avalon CIIM, a 12-piece line of integrated manufacturing and financial applications, from IBM, the companies said. Along with Oracle Corp., Avalon is one of few vendors to offer client/server manufacturing products.

Client/server labs

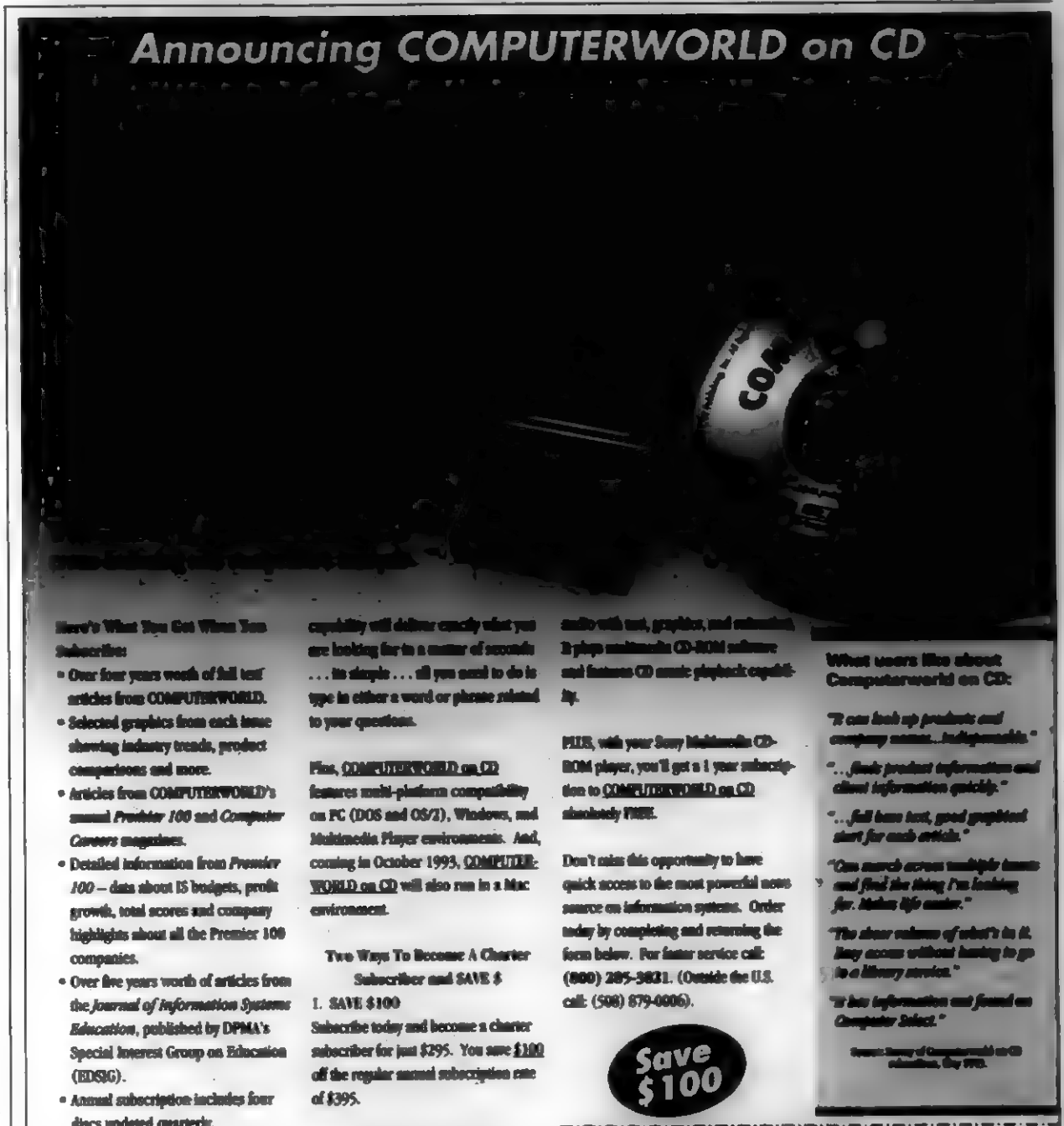
IBM has opened the first two of its integration laboratories to test client/server products and services. The labs are in Research Triangle Park, N.C., and Austin, Texas.

Resume package

SAP AG plans to integrate a resume processing package from Resumix, Inc. in San Mateo, Calif., into its client/server human resources product line, according to a Resumix spokeswoman. Resumix uses artificial intelligence to match job applicants' resumes with skills listed in job postings.

SQL-to-TCP/IP networks

The SQL Access Group released its first specification for connecting SQL software to Transmission Control Protocol/Internet Protocol networks. The Remote Database Access document provides for software vendors a definition for communications between clients and remote database servers.



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Silicon Graphics, Inc. has introduced InPerson, desktop conferencing software designed for interactive collaborative work on the company's workstations, including the new Indy desktop system.

InPerson allows users to share high-quality audio, video, images, text and three-dimensional models in real time over standard network connections.

The software employs a media user interface called Indigo Magic, and it is fully equipped with multiway conferencing and messaging indicators. The product works over standard Unix networking protocols.

InPerson software will be available for the Indy and Indigo desktop systems in December 1993 and for other Silicon Graphics workstations by the end of 1994, the company said.

A single-user license will cost $495.

▶ *Silicon Graphics*
2011 N. Shoreline Blvd.
Mountain View, Calif. 94039
(415) 960-1980

Vycor Corp. has announced Release 1.1 of DP Umbrella for Windows SQL, a help desk product that manages an integrated database for clients, personnel, systems, components, connections, activities and tasks.

According to the company, the product is intuitive and efficient because it uses pull-down menus, scroll bars, buttons, prioritizing and alarm features and automatic transaction updates.

Other new features include unlimited user-defined field labels, re-sort pop-up lists to specifications, a Lotus Development Corp. CC:Mail interface for receiving calls and sending tasks and messages, on-line Help and a tutorial.

A five-user network version of DP Umbrella for Windows SQL costs $6,995. A site license costs $21,995.

▶ *Vycor*
M/S 304
5411 Berwyn Road
College Park, Md. 20740
(301) 220-4450

US LAN Systems Corp. has chosen Microsoft Corp.'s Access as the platform for Version 3.0 of USL Financials and SQL Fund Master, its client/server accounting software.

An enhanced graphical user interface for all data entry screens is included in this version, and all hard copy and screen reports will be done in Microsoft Access, the company said.

Eight accounting modules are currently shipping based on Microsoft's SQL Server/Sybase.

The modules include Accounts Payable, Accounts Receivable, General Ledger, Job Cost, Inventory, Purchase Order, Check Reconciliation and Payroll. Access screens will replace the current Windows interface.

All eight modules of USL Client/Server Financials 3.0 are scheduled to be available at the end of the fourth quarter, according to the company.

Prices range from $3,500 to $76,000.

▶ *US LAN Systems*
8227 Old Courthouse Road
Vienna, Va. 22182
(703) 790-2754

Artecon has introduced FileTrek, a client/server network-based distributed Hierarchical Storage Management (HSM) System for Sun Microsystems, Inc.'s Scalable Processor Architecture and Hewlett-Packard Co.'s HP 9000 platforms.

According to the company, FileTrek provides a complete suite of HSM capabilities such as automatic restoration, archiving, system backup and user-transparent file migration for the heterogeneous computer environment.

Based on user-defined criteria, targeted files can be moved automatically and transparently to less expensive storage.

The product adheres to industry-accepted standards, including ISO 13346 nonsequential recording format, IEEE Mass Storage Reference Model and the Open Software Foundation's Distributed Computing Environment and OSF/Motif.

Pricing begins at $7,100 and includes a server license for up to 16 cartridges and client license for unlimited workstations (same platform) in the network.

▶ *Artecon*
2460 Impala Drive
Carlsbad, Calif. 92008
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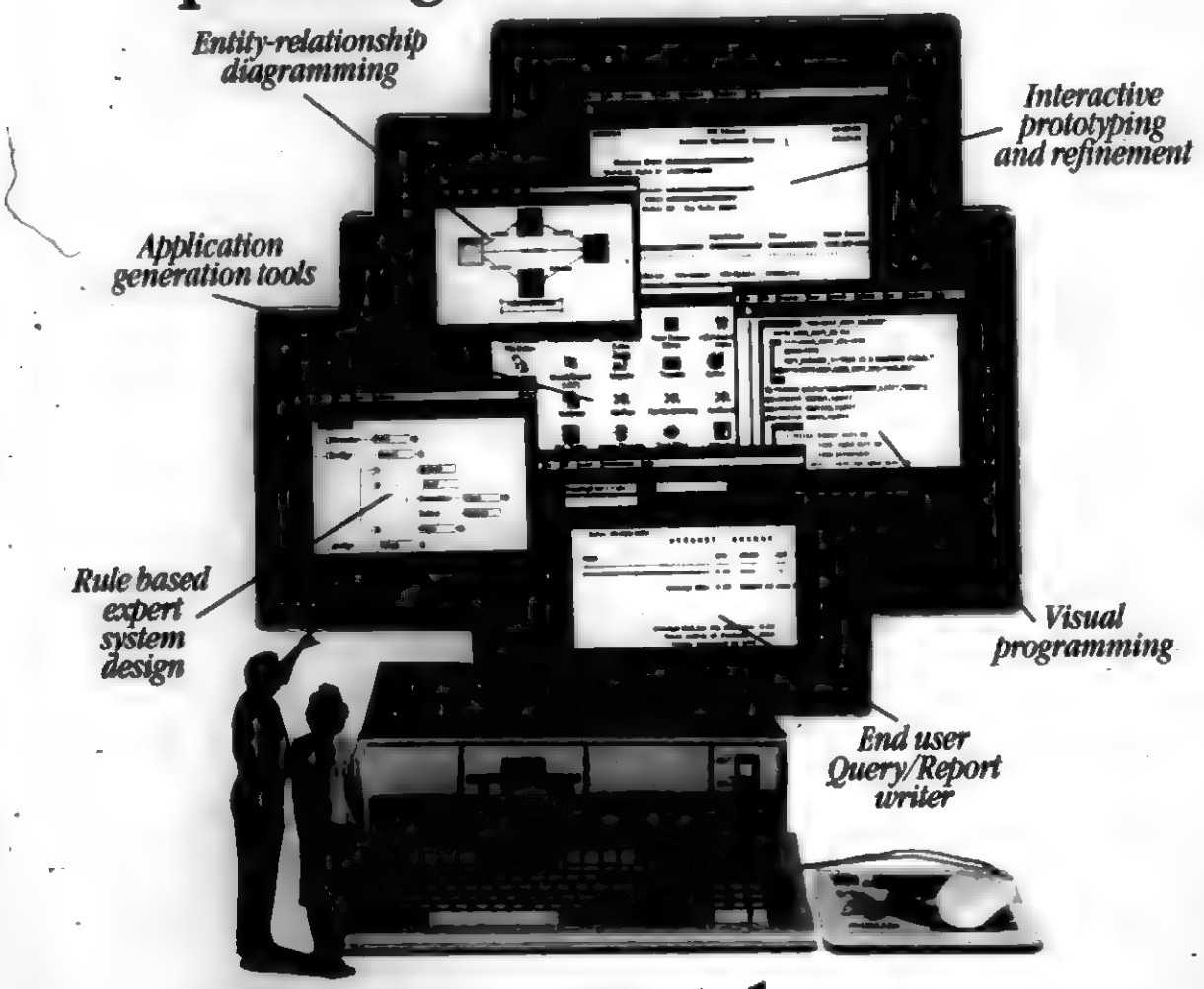

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Novell services win kudos

By Elisabeth Horwitt
PROVO, UTAH

Novell, Inc. seems to be winning some praise, at the expense of Microsoft Corp., for its strategy to provide all the key pieces that corporations need for their networked enterprise computing plans. Users and analysts cited two key areas where Novell seems to have successfully differentiated itself from its rival.

One point of differentiation is Novell's willingness to share the glory with its partners. "Microsoft is trying to do it all: desktop, network and applications," said Robin McCubbin, a network planning analyst at National Grocers, Inc. "Novell is letting third parties handle some of it."

Another reason for Novell's success is its strength in the area of server technology. Novell is positioning NetWare to deliver key services without users having to fit clients with extra hardware and software. And the vendor is also using NetWare 4.0 as the keystone of an integrated set of enterprise services, such as authentication, directory, network and systems management, Novell spokesmen said at a recent briefing.

Both these strategies are coming into play as Novell rolls out a series of NetWare Application Services that were designed to position its network operating system to deliver services traditionally outside its bailiwick. These include video, telephony and imaging applications.

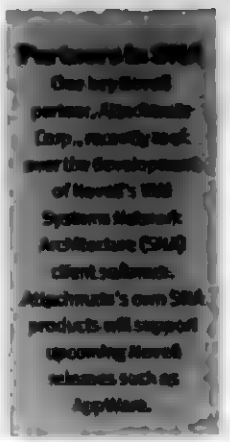
Smart buy

For example, Novell's recent acquisition, Fluent, Inc. in Natick, Mass., has come up with a product that is said to enable a NetWare server to deliver full-motion audio/visual material over a local-area network to any Windows client. Novell is also working with AT&T to develop a NetWare Loadable Module that will enable NetWare servers to participate with private branch exchange systems for applications such as customer service and intelligent dialing.

"Novell's vision is precisely on target" in that it makes such resources available to clients without the need to install a special video board or software on each one, said David Strom, president of David Strom, Inc., a Port Washington, N.Y., consultancy. In contrast, "Microsoft is a very client-centric company that thinks everyone will upgrade their clients to handle fancy things like multimedia and video."

Novell's Application Services will be one layer of a model that the firm has developed for implementing NetWare as a distributed system whose services are accessible and manageable across the enterprise, a Novell spokesman said.

At the center of the model is the NetWare operating system and services such as database and authentication. Application Services runs on top of those elements.



And wrapped around the application layer will be the NetWare Directory Service, which will allow client applications to transparently access any service on any server in the enterprise, Novell spokesmen said (see chart). In the works are management services that will ensure such services run reliably and can be updated from central locations. These services will eventually run across NetWare and UnixWare, the Unix environment provided by Novell subsidiary Unix Systems Group, company spokesmen said.

Government ties to Internet expand citizens' access to data

By Gary H. Anthes
WASHINGTON, D.C.

One Wednesday afternoon last March, the White House called the Extension Service of the U.S. Department of Agriculture and posed this question: "What could a national youth service program, as administered by the Extension Service, accomplish for America?" Reply by Friday morning, please.

Not everything in government moves slowly. By Thursday morning, ideas were coming in from agriculture extension agents around the country, and by the White House deadline, 1,000 electronic responses had been received, thanks to a recent move to put agents on the Internet.

Long used by researchers at the U.S. departments of Defense and Energy, NASA, the National Science Foundation and a few other bastions of science and engineering, the Internet is now welcoming the likes of agriculture extension agents, economists, lawyers and other nontechnical government officials up to and including President Bill Clinton.

The surge in Internet use by nontechnical government users parallels a similar trend in the corporate world, where financial and administrative personnel are using the network for electronic mail and database access.

And, as the Internet increasingly becomes a tool of bureaucrats, so is it also becoming a means for the public to download government data, find answers to questions and communicate with public officials. Increased use of the Internet by the government — and by the citizens it serves — is a major component of Clinton's technology vision for the country.

Internet connections have recently been made at the following agencies:

- The Department of Commerce said last month it would make its major databases of financial information from the Department of Labor, the Federal Reserve System, the Department of the Treasury and the Bureau of the Census available via the Internet.

"We've had this data available on a simple dial-up basis for about eight years," said Jack Kremeans, director of the Office of Business Analysis at Commerce. "We are just trying to keep up with the times."

- Also last month, the U.S. General Services Administration began offering Internet access to its "Catalog of Federal Domestic Assistance," which contains information about 1,308 federal programs including grants, loans, loan guarantees, scholarships, insurance and so forth.
- In June, President Clinton and Vice President Al Gore got electronic mailboxes on the Internet.
- In April, the Library of Congress put its 26 million-record card catalog on-line via the Internet.

"Investment in a national information infrastructure is one of the initiatives that is being pursued to build America's economic strength through technology," wrote Reed Phillips, the Commerce Department's director for Information Resources Management (IRM), in a recent memo to senior IRM managers at the agency. "In the short run, this includes expanded access to Internet and in the long run, development of the National Research and Education Network."

Among the replies to Reed's memo, which asked managers "to consider expanded use of the Internet," was one from the U.S. Patent and Trademark Office telling of its plans for giving the public Internet access to huge databases of patent information.

Not all agencies have enthusiastically embraced the mother of all networks, however. Corporations, public interest groups and members of Congress have pressured the U.S. Securities and Exchange Commission to make the data in its electronic filing system available to the public over the Internet. So far the SEC has resisted, saying that it already provides access in other ways and that setting up and maintaining the Internet connection would be too expensive.

Bell Labs drives NCR ATM effort

By Thomas Hoffman

NCR Corp. last week threw its hat into the ring of aspiring Asynchronous Transfer Mode (ATM) vendors. The company's ATM products will focus on optimizing local- and wide-area network bandwidth for data, video and voice transmissions at speeds reaching 3.2G byte/sec.

By announcing its strategic ATM directions, the Dayton, Ohio, computer firm joins IBM and a cast of smaller networking-specific players in the race to cash in on the crowded but relatively small ATM market. NCR will rely in great part on AT&T Bell Laboratories' communications expertise.

Analysts said they were impressed with NCR's plans to deliver its Universcell family of workgroup, departmental and backbone ATM premises switches based on a common scalable ATM chip from AT&T called Phoenix.

"If you've got multiple architectures to approach, it's more expensive to maintain compatibility than if you have a single platform. That's a pretty rational approach," said John Rymer, editor of "Distributed Computing Monitor," a monthly report published by the Patricia Seybold Office Computing Group in Boston.

Unlike other ATM players that plan to deliver their backbone switches first and workgroup switches later, NCR will ship its workgroup switches sometime in mid-1994 and its departmental and backbone ATM switches later in the year. It will target the workgroup switches at branch environments, particularly NCR's cadre of banking and retail customers, according to David Lindmulder, a product manager at NCR's network hardware business unit in Lincroft, N.J.

Lindmulder said pricing for all of NCR's ATM products would be announced closer to rollout.

The workgroup switches, designed to support roughly 20 branch PC users with WAN connections to headquarters, will provide up to 3.08M bits of output bandwidth, the equivalent of two T1 lines. The departmental switches were designed to support larger Ethernet or Token Ring workstation environments, providing up to 1.6G bits of throughput.

Mixed feelings

Analysts offered mixed views on NCR's choice of promoting its workgroup ATM switches first. "They will pay a price for making that choice," Rymer said. "Most of the growth in ATMs is going to be in the backbone network first, and NCR will be later to market with backbone products."

Still, Rymer praised NCR for placing the workgroup needs of its banking and retail customers ahead of the burgeoning backbone market.

Bankers Trust Co. in New York plans to address its enterprise backbone needs ahead of its workgroup requirements, according to Anish Mathai, vice president of technology/strategic planning for the firm.

"We're looking at the enterprise first, primarily because our biggest communications issues are internal and because our workgroups are dispersed around the world," Mathai said.

Still early

But Bankers Trust, like most prospective users, is in the early stages of evaluating the ATM market. And because he expects a solid offering from AT&T/NCR, Mathai said the firm will likely consider NCR's backbone switch before making a decision.

Before the workgroup, departmental and enterprise switches are rolled out, NCR will ship its SmartHub XE ATM switch next summer. SmartHUB XE is an entry-level, pluggable ATM switching module that permits users to evolve to ATM technology gradually. The SmartHub XE, equipped with an Ethernet-to-ATM bridge, was designed to support up to three LAN segments.

Each four-port ATM switching module will be able to provide up to 800M bit/sec. of aggregate throughput and Simple Network Management Protocol management.

One-stop box

LightStream Corp., a joint venture between Bolt Beranek and Newman, Inc. and Ungermann-Bass, Inc., has unveiled what analysts said is the first integrated local- and wide-area network backbone ATM switch to reside in a single box.

The LightStream 2010 ATM switch combines Bolt Beranek and Newman's wide-area bandwidth management capabilities and UB's LAN-based multiprotocol bridge/routing technologies. The first release of the product, due late next month, will focus on WAN backbone support.

The second release, which is scheduled for mid-1994, will support collapsed backbones.

The third release, targeted for late 1994, will integrate voice and video capabilities, according to Anand Parikh, general manager of the broadband networks business unit at UB.

The ATM switch, which offers throughput of up to 2G byte/sec., will include interfaces for frame relay and X.25 access. Pricing for the first release will start at $25,000. The products will be marketed by LightStream, Bolt Beranek and Newman and UB.

Analysts said they were impressed with the product's multiple functionalities. "The biggest thing that struck me is that they're going in with a system that doesn't require users to slap an ATM interface at all points," said Curtis Price, a senior market analyst for data communications at International Data Corp. in Framingham, Mass.

— Thomas Hoffman

New devices to propel technology into social fabric, report says

By Gary H. Anthes

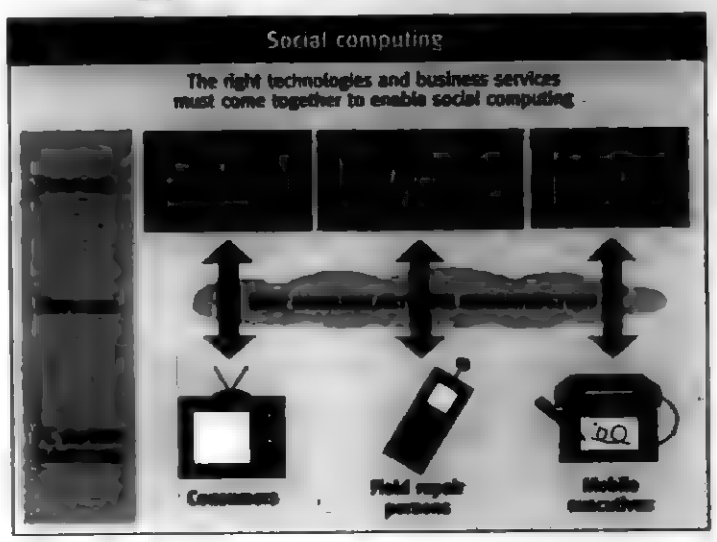
A new computing architecture, called "social computing," will emerge as new technologies such as handheld computers, intelligent telephones and interactive television begin to collide with unmet needs in American society.

The architecture will move the center of computing gravity outside the walls of business and into society at large, said Cambridge, Mass.-based Forrester Research, Inc. in a recent report. Traditional ways of buying and selling will give way as customers order products and services through electronic media while communicating electronically with other consumers and businesses.

That will bring companies into direct, continuous contact with consumers of their products. Suppliers that fail to embrace this new architecture will be abandoned by "techno-tuned" customers who are increasingly impatient with the frustrations of modern life, Forrester said. "It will be the increasing ability of ordinary people to communicate electronically with large corporations that really reshuffles the competitive deck," the report stated.

In the past six months, computer makers, software vendors, cable television operators and telephone companies have engaged in a "frenzied mating dance," Forrester said. The dance appears chaotic, but these streams of innovation will soon converge:

- Within five years a new generation of TVs, telephones and handheld electronic devices, derivatives of PC hardware, will support two-way data communications.
- Wireless and traditional networks will fuse to offer "anywhere, anytime" communications.
- Commercial information services and bulletin boards will explode in number and move into mainstream use.



Source: Forrester Research, Inc., Cambridge, Mass.

"As digital technology introduces itself in a variety of low-cost, portable information devices, that gives another way for vendors to improve or simplify service or lower costs," said Carl Lehmann, director of consumer media and electronics at BIS Strategic Decisions in Norwell, Mass. "The market is driven by, 'Make my job easier, make me smarter faster and make me have more fun in the limited time that I have.'"

But Lehmann predicted that a mass market — defined by the U.S. government as regular use in 30% or more of U.S. homes — for the components of "social computing" is at least a decade away.

Forrester said a move down the road to client/server can help companies prepare for social computing by giving them practice dealing with common issues such as the "democratization" of data. Client/server also offers exposure to technologies such as groupware, server databases, electronic mail and mobile networking, all of which are likely to become important components of social computing, Forrester said.

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NETWORK

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Small player offers net management

By Elisabeth Horwitt
SAN LUIS OBISPO, CALIF.

A small vendor claims to have come up with a set of network and network server management applications that provide a level of integration and functionality that compares favorably with offerings from the big guys.

XTree Co. announced NetControl, a set of application modules that are said to manage a full range of network devices and systems via the Simple Network Management Protocol (SNMP). Different modules provide the following:

- Real-time monitoring of local-area network devices, using the SNMP Remote Network Monitoring standard.
- Auto discovery, which seeks out network systems and automatically displays them on a map.
- Management of network servers, including Novell, Inc.'s NetWare 2.x and 3.x, Banyan Systems, Inc.'s Vines and Microsoft Corp.'s LAN Manager.

The applications for managing NetWare, which Xtree has been offering since 1988, are said to provide more in-depth analysis than Novell does for its own servers. For example, the Xtree tools are said to perform 100 tests on 3.x servers and to monitor Transmission Control Protocol/Internet Protocol devices in a more integrated way than Novell does through its Lantern diagnostic tool. An application to manage NetWare 4.0 is planned for 1994.

Also included is a database for historical reporting based on Novell's Btrieve and a trouble-ticketing application.

A graphical user interface, running on a Windows console, provides users with a consistent environment for calling up applications and displaying information and alerts, an Xtree spokesman said.

The company is seeking support from third-party network vendors. 3Com Corp. has agreed to make its equipment manageable by NetControl.

XTree is also holding discussions with systems integrators to provide the implementation and ongoing support that corporate users demand for an enterprise network management system, the Xtree spokesman said.

NetControl will support the Internet Engineering Task Force's Host management information base for managing servers and the Desktop Management Task Force's standard for collecting information about client systems' software and hardware components.

NetControl Console Module, Server Modules and Device Modules will begin shipping in November.

The console is priced at $995 per station and the server modules at $895 per managed server. The device modules are priced at $495 per managed device.

Switching hub links FDDI to Ethernet

Network Peripherals recently announced a Fiber Distributed Data Interface (FDDI)-to-Ethernet switching hub.

The hub is meant to connect to 100M bit/sec. FDDI server networks with 10M bit/sec. Ethernets. Unlike traditional Ethernet switching hubs, it allows traffic from servers on the FDDI ring to deliver data to the Ethernets at 100M bit/sec.

Currently, some companies use routers between high-speed server networks and Ethernet local-area networks. The switching hub, however, is a less expensive connector because it switches traffic using hardware only at the media access layer and is protocol-independent. This also means it is not programmable like a router, and the hub is not meant to replace a router on wide-area networks, said Gordon Stitt, vice president at Network Peripherals.

The hub can scale up to 48 Ethernet segments and includes Simple Network Management Protocol management. Future network support will include Asynchronous Transfer Mode. It is priced at $7,500 for 12 dedicated Ethernet segments and $576 per FDDI port. It will be available in October.

—Lynda Radosevich

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NOVELL. The Past, Present, and Future of Network Computing.

Fax server delivers data around globe

By Jean S. Bozman
PALO ALTO, CALIF.

Dialog Information Services, Inc. has a new way to deliver data from the 450 databases stored on its IBM VM/CMS mainframes —a Unix-based fax server. The new delivery system, expected online by 1994, will not replace traditional dial-up and electronic-mail access to Dialog. Instead, it will lead to further re-engineering of Dialog's 20-year-old mainframe applications, information systems executives here said.

A local-area network of Sun Microsystems, Inc. SPARCstation 10 workstations will host a series of Unix-based applications written in C language, said Wayne Martin, director of operations at Dialog's data center. The workstations know how to navigate through Dialog's homegrown database structure — and through some 2 terabytes of stored mainframe data. An alpha test of the new Unix system is set to start this month, Martin said.

The addition of Unix systems is being made to improve client/server access to the Knight-Ridder, Inc. subsidiary's central data center. It is also moving to support more open systems standards, such as Transmission Control Protocol/Internet Protocol and the CCITT's X.400 E-mail standard. Dialog's base of more than 150,000 users worldwide employs a hodgepodge of IBM 3270 terminals and PCs to access central databases through low-level teletypewriter and Teletype emulation. Dialog also distributes some of its databases on CD-ROM.

Data engines

Dialog runs some 450 databases on three IBM-compatible mainframes: two Hitachi Data Systems Corp. EX 1005 and an HDS 8210. It is building a new fax delivery system on several Sun SPARCstation 10 workstations.

"It's somewhat easier to deliver fax from an open environment than from a mainframe environment," said Gordon Schick, vice president of systems and operations. "Clearly, there are going to be plans to change to an open environment." Development of more Unix applications is already under way, but any substitution of back-end Unix parallel servers for the firm's IBM-compatible mainframes would be several years away, he said.

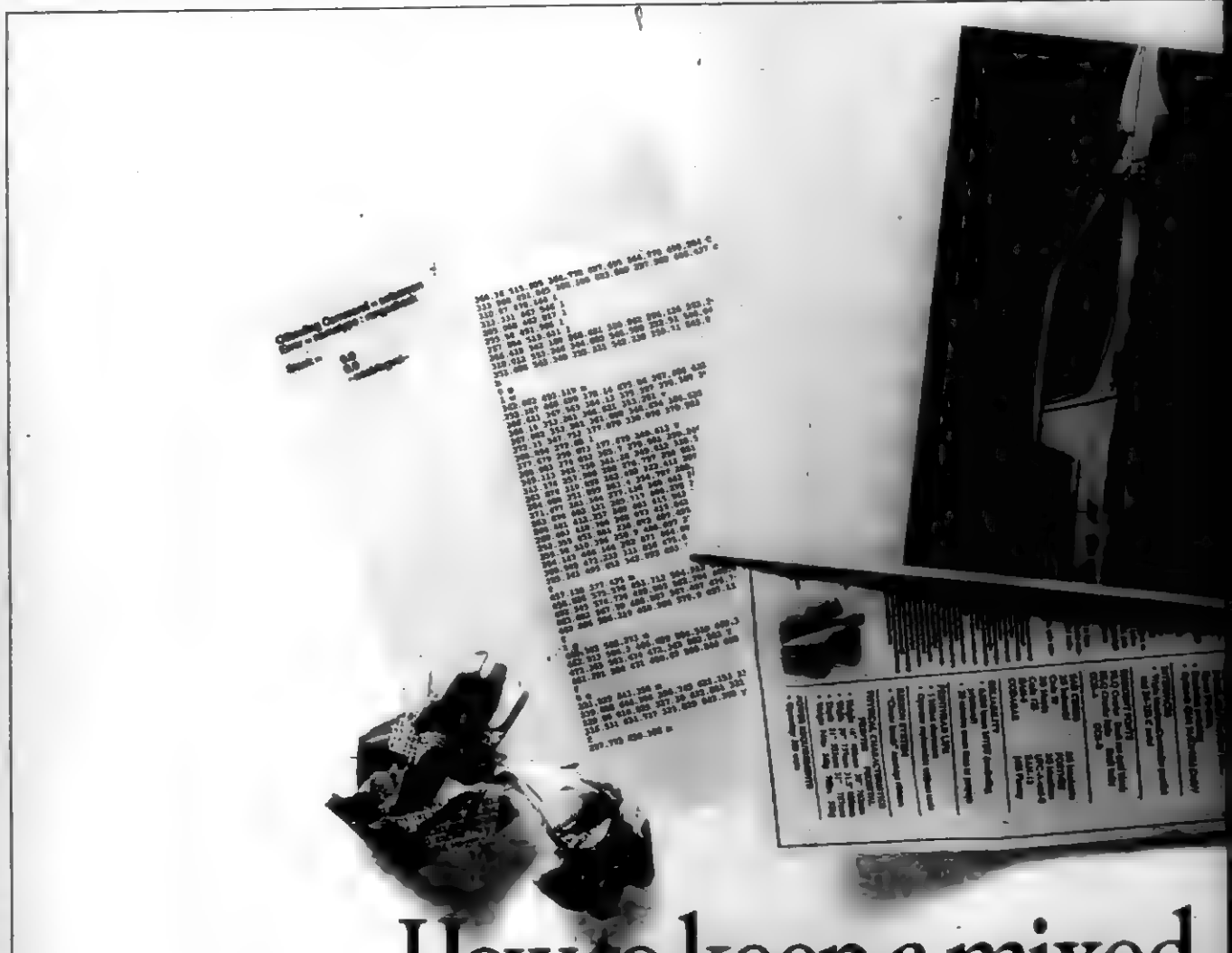
By directing new application development projects to the Unix platforms, Dialog planners hope to create new services more quickly and save money, too. "It's more cost-efficient to develop on new platforms," Martin said. A small group of 10 programmers wrote the new fax server system in a matter of months, for example. However, Dialog also faces the task of migrating to Solaris 2.X from the older SunOS operating system, he said.

The Sun workstations, located just outside the data center, will act as data lenses and navigators for the new fax service. "The [Dialog] customer still connects through the mainframe," Schick explained. "But the server will be the one [device] responsible for routing the data and tracking it."

So far, Dialog's mainframes still beat workstations for sheer throughput, Martin said. For the immediate future, the mainframe will continue to act as both a front end to all databases and as a database server. "What these mainframes do, they do very, very well," he said. "They push large amounts of data in a short period of time." They also have features that ensure reliability and availability, which are only now being added to Unix.

But by bringing in new technology Dialog may avoid an architectural dead end. Since its founding in the early 1970s, Dialog has built its query engines on IBM mainframes, complete with their high operating costs. Using reduced instruction set computing-based systems and C is less costly and offers a way to migrate to new hardware platforms, such as massively parallel servers, Schick said.

Dialog announced plans to form partnerships with several outside firms to bring about a move to updated systems by the late 1990s.



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Briefs

Fast Ethernet

Grand Junction Networks, Inc. in Union City, Calif., unveiled a new family of Ethernet products for workgroups. The FastLink product family is composed of FastSwitch 10/100, which provides 100M bit/sec. Ethernet to servers and 10M bit/sec. Ethernet to clients; FastNIC 100 EISA, the first 100M bit/sec. Ethernet adapter; and FastSwitch 10, a low-cost 10M bit/sec. Ethernet hub with 24 ports. The FastSwitch 10/100 will be available in the fourth quarter for $7,250. The FastNIC card will be ready in the fourth quarter for $399 and will include Novell, Inc. NetWare drivers. The FastSwitch 10 will be available in September for $6,250.

Join together

3Com Corp. and Novell announced a partnership to deliver tighter integration between 3Com's routers and Novell's NetWare operating system. In related news, 3Com announced support for Novell's IPX WAN, a multivendor router protocol, and Novell's NetWare Link State Protocol.

Marketing partner

NCR Corp. announced an agreement with Anixter Brothers, Inc., a reseller of intelligent hubs, to market NCR's StarLAN and WaveLAN products.

NCR also added Novell NetWare enhancements to its StarGroup family of networking software for its NCR System 3000 platform.

PC parts

Legent Corp. in Herndon, Va., and Atlanta-based Digital Communications Associates, Inc. announced an agreement under which Digital Communications will resell the PC components in Legent's XCom file-transfer product for Windows and OS/2.

LAN agreement

Windata, Inc. and Gandalf Technologies, Inc. have announced they will work together to incorporate Windata's FreePort Wireless Ethernet LAN System and Gandalf's LANline 5220 Remote Ethernet Bridge.

Two views

Synernetics, Inc. has added support for Hewlett-Packard Co.'s OpenView to its Viewplex product for managing Synernetics hubs. Viewplex also runs on Sun Microsystems, Inc.'s SunNet Manager.

Good idea

Ideassociates, Inc. in Billerica, Mass., has signed up Ingram Micro in Santa Ana, Calif., to distribute the Idea family of internetworking products, including the Ideacomm Brouter, Ideacom WANserver and Ideahub.

Double switch

Hub supplier Optical Data Systems, Inc. in Dallas and Artel Communications Corp. in Hudson, Mass., have agreed to integrate the Artel StarBridge Turbo Ethernet Switch into Optical Data's Infinity Intelligent Switching hub. The StarBridge technology will be used in the 4-, 7- and 12-slot Infinity hubs.

Video proliferation

UK-based BT and VideoLogic in Cambridge, Mass., have announced a cooperative agreement under which they will develop PC-based video communication products. VideoLogic will market BT's PC videophone, and the companies will work together to market combinations of their products for targeted customer applications. VideoLogic's products include the DVA-4000 digital video adapter; Mediator, a computer graphics-to-video conversion system; a digital video and audio compression system; high-performance graphics processors; and a movie capture card for Microsoft Corp.'s Video for Windows.

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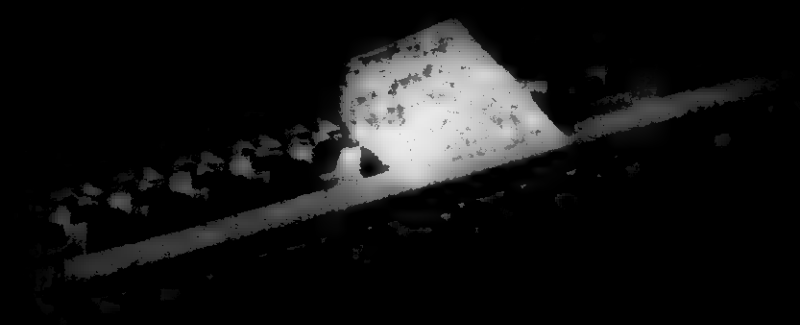

IBM

Crescendo Communications, Inc. has introduced an Sbus dual-attach adapter, based on Crescendo's Copper Distributed Data Interface (CDDI) architecture.

The CDDI Sbus dual-attach adapter provides dual-redundant network connections for fault tolerance, a Simple Network Management Protocol (SNMP) agent for remote monitoring and control and an on-board processor to reduce host overhead.

According to the company, a dual-attach Fiber Distributed Data Interface (FDDI) Sbus adapter for fiber-optic cable that presents the same feature set was also introduced.

An on-board processor that performs station management functions is used by both adapters, and the FDDI adapters are the only 100M bit/sec. Sbus solutions that include an SNMP agent for remote network management.

The CDDI Sbus dual-attach adapter costs $1,995, and the FDDI Sbus dual-attach adapter costs $2,995.

▶ *Crescendo Communications*
710 Lakeway Drive
Sunnyvale, Calif. 94086
(408) 732-4400

Spider Software, a division of Spider Systems Ltd., has announced Spider-Frame-Relay, a portable, Streams-based product that gives computer and communications equipment suppliers the ability to add frame-relay functionality to their products.

According to the firm, manufacturers and systems integrators that want to provide frame-relay access for devices, including bridges, routers, hubs, communications boards and communications servers, can do so by using the frame-relay technology under source-code license from Spider Software.

Support is provided for Permanent Virtual Circuits and Switched Virtual Circuits, and the software protocol stack is compatible with ANSI and CCITT recommendations for the Frame Relaying Bearer Service.

The product comes with an application programming interface and has a local management interface for access and control of layered information.

The product will be available during the first-quarter 1994.

A source-code license will cost $30,000.

▶ *Spider Software*
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Product shorts

Beall Technologies, Inc. has started delivering its Beall Link 5000 Escon products. According to the company, the family of products provides IBM Escon channel extension to 20 km and offers conversion capabilities for Escon fiber exchange channels to bus and tag control units as a stand-alone function or in conjunction with a channel switch. Cost: ranges from $10,000 to $200,000. Beall Technologies, Secaucus, N.J., (201) 864-9433.... **Moses Computers** has introduced MosesSpool, a printer sharing system designed to let users upgrade to a local-area network. All the necessary hardware, software and cabling to connect two PCs for printer sharing purposes is included. MosesSpool will begin shipping in September. Cost: $179 per two-node starter kit. Moses, Los Gatos, Calif., (408) 358-1550.... **Digital Communications Associates, Inc.** has announced Version 3.1 of the IRMA Workstation for Macintosh. The product is Macintosh-to-mainframe software that includes TN3270, an implementation of the standard Telnet protocol for accessing IBM mainframes over Transmission Control Protocol/Internet Protocol networks. Cost: $425. Digital Communications Associates, Alpharetta, Ga., (404) 442-4000.... **CR Systems Corp.** has released Multi Protocol SNA Xpander, a converter that allows for the migration of Systems Network Architecture (SNA) lines and mixed Ethernet LAN and/or Token Ring environments to a Logical Link Control (LLC)-based internetwork. The Multi Protocol SNA Xpander makes it possible to support SNA host access through LLC from any mix of Synchronous Data Link Control lines and PCs with 3270 emulators. Cost: ranges from $17,860 to $28,750 for up to two LANs serving 32 communication lines. CR Systems, Atlanta, Ga., (404) 767-8230.

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IBM Business Partner

Parallel processing

Union Pacific rail says, 'I know I can'

By Thomas Hoffman
OMAHA

Transportation companies have been among the pioneers when it comes to adopting massively parallel processing systems to power their decision-support systems, analysts said, and Union Pacific Railroad is no exception.

Since the first quarter of 1992, the rail division of Union Pacific Corp. has been re-engineering decision support by moving data from its IBM MVS mainframe legacy systems to an NCR Corp./Teradata Corp. DBC/1012 massively parallel database engine, according to Joyce Wrenn, vice president and chief information officer at the railroad. The project was launched so users could more easily manipulate and analyze information on train schedules, customer locations, fuel costs and capital deployment using distributed Unix-based PCs instead of IBM 3270 terminals.

More recently, Union Pacific decided to invest in an NCR

Union Pacific, *page 93*

Union Pacific Railroad *hopes to give users new decision-making powers*

Warehouses cling to mainframe

Client/server systems slow to crack data warehouse market

By Johanna Ambrosio

■ While some users are loath to rely entirely on a client/server architecture for their data warehouses, others are moving ahead without the benefit of a mainframe.

Playtex Apparel in Dover, Del., for example, is phasing out its leased IBM host and has put its warehouse on a Unix computer. But not everyone has that luxury —at least not yet.

"I haven't seen anything industrial-strength enough to take hundreds of users' pounding and still remain standing," said Mark Theissen, a customer segment leader in data management at Hughes Electronics in Fullerton, Calif. The company's 50G-byte warehouse, which contains financial information, resides on a mainframe with Unix servers that provide end-user access.

At Florida Power & Light Co. in Miami, "It's primarily a manpower issue," said Jonathan Geiger, data management supervisor. "We aren't even using the mainframe warehouse to its fullest capacity."

Most warehouse implementations already make some use of client/server architecture; indeed, in many companies, the warehouse is the first real test of their client/server components. But in virtually all of these early warehouse adopters there is also a mainframe, where most of the data resides and to which servers and PCs are attached.

Warehouses that are completely off the mainframe are still relatively rare. Since it announced its specialized database management system for warehouse applications in September 1992, Red Brick Systems has sold 20 copies, said Chris Erickson, president of the Los Gatos, Calif., company.

Typically, he said, the warehouse applications built with his company's product are used at companies that are downsizing or that have chosen to separate the warehouse into pieces by product line or by business unit. "We see very little interest in having the financial database in one location, marketing in another, inventory in another and so on," Erickson said.

Downsizing success

Playtex Apparel is a classic example. The company is downsizing all its applications off a leased mainframe. The data warehouse contains product, distribution and shipment information used by the sales and marketing forces. Although only five users are up and running thus far, about 20 more are slated to use the system by the end of October.

The warehouse, running Red Brick's database on a Hewlett-Packard Co. HP 9000 computer, has not yet been fully stress-tested, said Sandra Tucker, Playtex Apparel's MIS supervisor. "We haven't gotten deep enough into the user community to see if performance will degrade" when everyone's using it at the same time, she said. Then, too, only about half the data has been loaded at this point, with two years of history expected to be on-line eventually.

Still, even at this point Tucker said she considers the warehouse a success. Custom reports that used to take two weeks to order, run and test from the information systems department now run in minutes on the system. Sales and marketing can figure out what products are selling and where, and what promotions seem to be most effective.

Then, too, the idea of client/server warehouses seems to be picking up steam, albeit slowly. Bill Inmon, a consultant associated with software vendor Prism Solutions, Inc. in Sunnyvale, Calif., said he has been noticing more and more non-mainframe warehouse implementations.

It may be a long time, however, before current mainframe warehouse users are ready to switch over. "Corporate infrastructures are a lot further behind than many people think," Theissen said.

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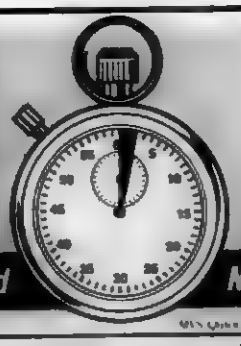

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Briefs

Cornell to buy IBM system

The Cornell Theory Center at Cornell University announced plans to purchase one of IBM's SP-1 Scalable Power parallel supercomputer systems for $13 million, primarily through funding from the U.S. Department of Defense's Defense Advanced Research Projects Agency and the National Science Foundation.

The 512-processor system, based on IBM's RISC System/6000 chip design, will be installed in the second and third quarters of 1994. The supercomputer will be used to tackle high-performance scientific applications such as fluid dynamics and seismic analysis, though small to medium-size commercial businesses would be able to buy time on the machine for $10 per processor hour, according to Malvin Kalos, director of the Cornell Theory Center.

EMC seals Bell Sygma deal

EMC Corp. in Hopkinton, Mass., announced the sale of $4 million in Symmetrix 5500 Integrated Cache Disk Array mainframe storage systems to Bell Sygma, a Bell Canada subsidiary with operations in Toronto and Montreal. Continuing its parent's pattern of robust growth, EMC's Canadian operation has brought in more than $20 million in revenue this year, more than doubling last year's figures.

Cray wins computer contract

The National Oceanic and Atmospheric Administration (NOAA) awarded a five-year, $46 million contract to lease a 16-processor C-90 supercomputer from Cray Research, Inc. The computer, which the NOAA said will operate at 15 billion operations per second, will be used by the National Weather Service to generate its daily midrange forecast.

Softworks, Amdahl team up

Softworks, a vendor of systems management software, has agreed to jointly develop training materials with Amdahl Corp.'s education and training division. The courses will focus on maintenance of and disaster recovery techniques for ICF and VSAM catalogs.

Multimedia training

In other training news, Datathon, Inc. in Northridge, Calif., announced Version 3.1 of TrainEase, its multimedia tool for developing presentations on the Application System/400 and mainframes. TrainEase runs on PCs, but it captures keystrokes and data from the larger machines; it also supports full video.

Bell wins Lockheed contract

Lockheed Information Technology Corp. has awarded a five-year multimillion-dollar contract to Bell Atlantic Business Systems Services for service of its Denver data center and some other sites. Bell Atlantic will support three IBM 3090 600J mainframes, as well as Digital Equipment Corp. minicomputers and Storage Technology Corp. tape silos.

NCR trade-in

NCR Corp. has introduced a program for customers of its older midrange systems to receive trade-in credit toward its NCR System 3000 machines.

Separately, NCR has dismissed its lawsuit against First Financial Management Corp. (FFMC) regarding a signature capture device developed by FFMC subsidiary MicroBuilt Corp. As a result of the settlement, the companies entered into a joint marketing and delivery agreement for the systems.

SHORT TAKES Unisys Corp. announced that its FBA Navigator retail banking system will support Microsoft Corp.'s Windows NT operating system.... The ASK Group, Inc. moved Eric Carlson from president of the manufacturing applications unit to the new position of head of corporate strategies and new ventures. Amal Johnson, an 18-year IBM veteran, is slated to take over Carlson's former post.... IBM has announced the general availability of CICS/6000, the version of CICS that runs under IBM's AIX operating system.... According to the SQL Access Group, its Remote Database Access specification for the OSI model is now final and available from the Manchester, N.H.-based organization for $62.... SAS Institute, Inc. has signed an agreement for IBM to market its SAS System product line to VSE customers.

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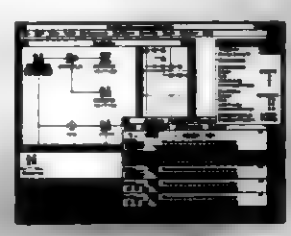

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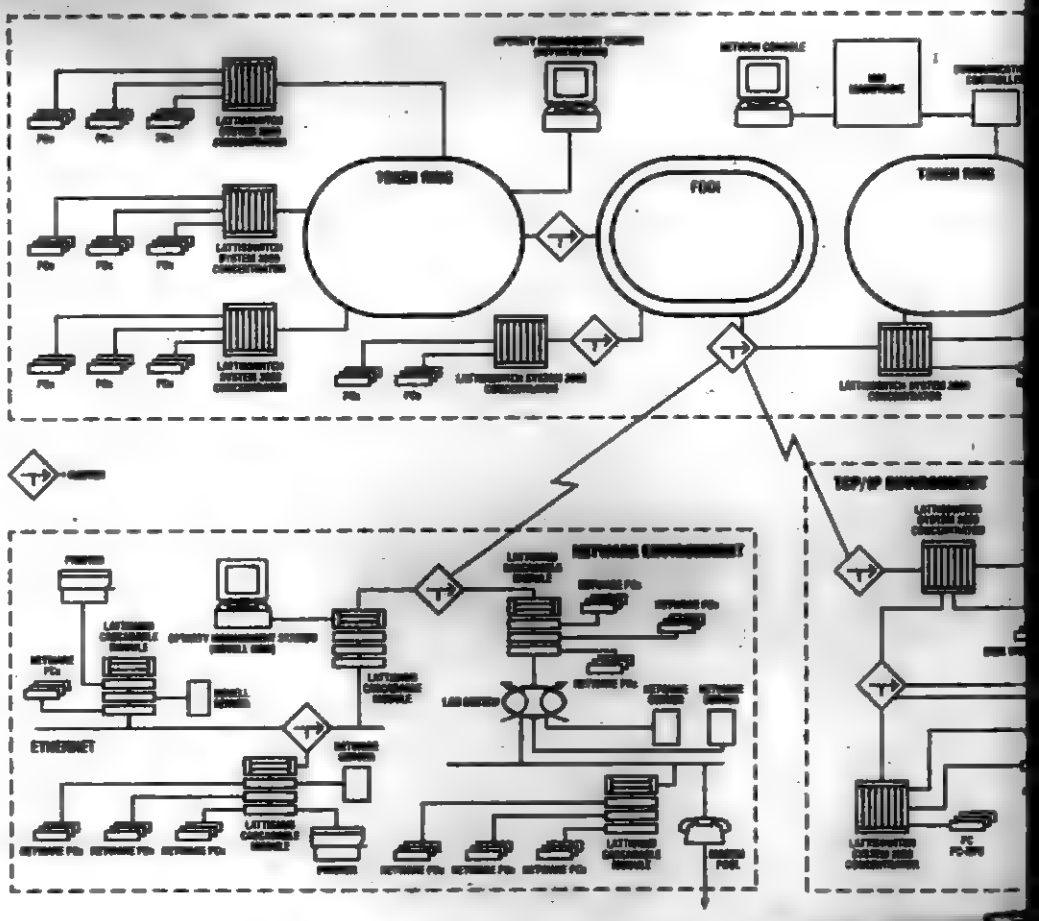

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Union Pacific

CONTINUED FROM PAGE 91

3600 massively parallel system that will hold the Teradata database. The $6 million system, which includes several multiprocessing servers, was purchased by Union Pacific Technologies, a St. Louis-based services firm that supports the operations of Union Pacific Corp. companies such as the railroad and Skyway Freight Systems, Inc. The railroad will be the first of the corporate entities to utilize the NCR 3600 system.

Union Pacific is remodeling data now housed in IBM DB2 databases for access through the Teradata system. Wrenn said the firm's end users running client/server applications will be better equipped to access and query data for decision support.

"We expect that most of our departments will get a big benefit from being able to query data that's already out there but difficult to retrieve from the mainframe," Wrenn said.

The move reflects a growing trend among transportation companies to tap massively parallel systems for decision-support analysis, according to David Frankel, director of technology at Smaby Group, Inc., a Minneapolis-based market research firm that specializes in high-performance computing. "Transportation companies are optimizing their decision-support systems with large databases in growing numbers," said Frankel, who noted Delta Air Lines' use of a Teradata DBC/1012 database for freight tracking and decision support.

To extract and remodel data from the legacy systems for parallel processing on the Unix-based machine, Union Pacific is using Texas Instruments, Inc.'s Information Engineering Facility computer-aided software design suite, said Mark Davis, director of data management at the railroad. He said once the data has been developed and tested on the Teradata machine, it will be loaded onto the NCR 3600 for production. The NCR 3600 is slated to be in full operation by early next month. Until then, the Teradata machine will handle existing production applications.

ON SITE

Union Pacific Railroad
Omaha

Challenge: To let users query previously inaccessible data.

Technology: Distributed Unix-based PCs tied into NCR parallel processors.

Currently, 40G bytes of data resides on the Teradata system. The railroad plans to add 100G bytes of data to the NCR 3600 each year, Davis said. In the past, that data would have been stored on the mainframes.

As a result, Davis said he believes the railroad's use of Information Builders, Inc.'s Focus for TSO, a fourth-generation language Union Pacific has used to access mainframe data, will decline as users gain access to data from their PCs.

In addition, the railroad is developing new applications to run on new systems. They include client/server systems running on an NCR 3550 midrange server that will be used to power the company's new revenue management and railroad yard systems. The revenue management system, in development since last fall, and the railroad yard system, in development since April, are slated to go into operation next year, Davis said.

He said the railroad will likely begin to port some of its legacy data to the client/server architecture in mid-1994. The legacy systems will remain on the mainframes for a while, but as the railroad develops client/server applications, the legacy systems will fall by the wayside.

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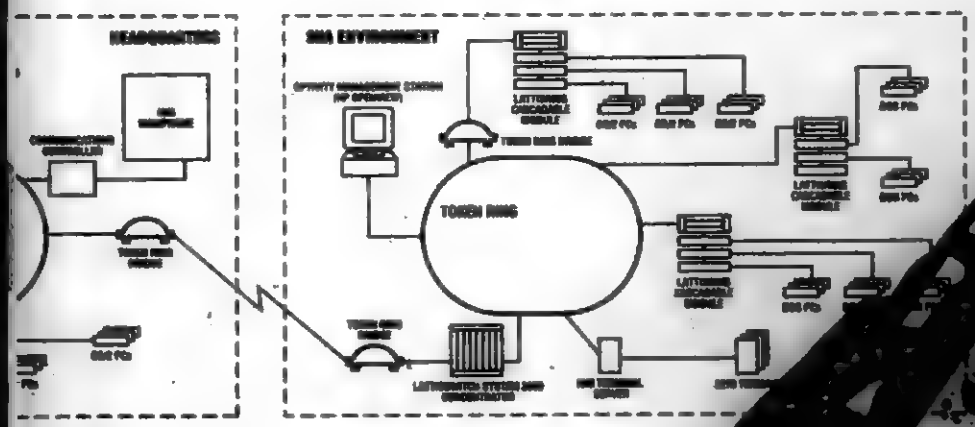

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intel.

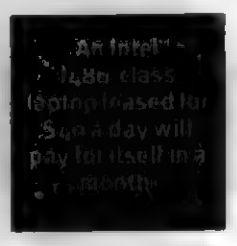
Lessors change tactics with the times

Industry's top firms say close relationships with suppliers key in sluggish market

By Ellis Booker
CHICAGO

Leasing companies are scrambling to keep up with a changing industry by handling more low-end equipment and providing asset management services, among other moves.

"Many of us have gotten into the overnight workstation business," said Thomas C. Wajnert, chairman and chief executive officer of AT&T Capital Corp. in Morristown, N.J., which claims a portfolio of just 34 large mainframes, half of which are leased to AT&T. A $6 billion asset entity, AT&T Capital went public last month.



Four top executives from leasing firms talked about these and other trends at a recent Chicago forum sponsored by the Equipment Leasing Association of America in Arlington, Va. Also in attendance were executives from GE Capital Commercial Equipment Financing in Stamford, Conn., Comdisco, Inc. in Rosemont, Ill., and Bell Atlantic TriCon Leasing Corp. in Paramus, N.J.

Computing "costs are going down by 30% to 35% a year," said Kenneth Pontikes, Comdisco president and chairman. "Customers don't want to bring in a system that will last three to five years." Leasing companies, he said, can become "just-in-time suppliers of computer capacity."

While leasing companies continue to have enormous investments — 32% of the $375 billion U.S. companies spent on equipment last year was leased — returns have been virtually flat, hurt by the sluggish overall economy. At the same time, computer-related goods have become the dominant sector of the market, capturing approximately 23% of the leasing industry's dollar volume in 1992, an increase of 2% over 1991, according to the Equipment Leasing Association's 1992 survey.

Boost in customer support

All the executives agreed that the pace of technological change and the cost profile of distributing computing has forced leasing firms to offer customers more than the mere "financial transactions" that characterized the industry for decades. To survive, if not prosper, all are now offering sophisticated plans and services, including asset management and the short-term provision of computers for peak needs.

"These short-term leases can be extraordinarily profitable," said Timothy Summers, a vice president in the research division at Hamilton Investments, a Chicago-based investment firm. He noted that an Intel Corp. 1486-class laptop leased for $40 per day will pay for itself in a month. He said the future growth in the industry will be with companies that focus on the low end and enter into tight relationships with their suppliers.

This is certainly the case at Leasing Solutions, Inc. (LSI) in San Jose, Calif., which to date has eight such vendor ties. The most recent is with Apple Computer, Inc., which in June made LSI the exclusive source for lease financing for Apple corporate accounts in the U.S.

While LSI is arguably not a low-end provider — its average lease is in the $250,000 to $300,000 range, and its portfolio of 100,000 assets has a value of $360 million — the company "did make a strategic choice when we were founded in 1986 not to be involved with mainframes," said manager of investor relations Timothy P. Leehy.

Mainframe margins

Then again, "There's nothing new about high-technology assets plunging in value," said Pontikes, who founded Comdisco in 1969. Allowing that "nobody is being real aggressive" about residual value assumptions and realizing big margins for mainframes, Pontikes and other leasing executives at the Chicago briefing suggested that the imminent death of the mainframe has been overplayed.

Still, data center products, the category Comdisco was founded on, have shrunk to about one-third of the company's business, Pontikes said. Comdisco has $2.2 billion in revenue and $5.2 billion in total assets.

Summers pointed to Comdisco, which along with IBM Credit Corp., IBM's leasing arm, is the industry's leader in the high-technology arena, as one firm that has seen the writing on the wall and is trying to de-emphasize high-ticket, mainframe-based hardware in its portfolio [CW, Jan. 18]. "It seems to be working for them, but it's a slow process," he said.

Industry Shifts

In 1992, the category "computers" replaced "aircraft" as the [illegible] of the $200 billion domestic leasing business. Computers financed 23% of dollar volume, up 2% from 1991. Manufacturer-lessor represented 9.9% of new leasing business in 1992, up about 1% from 1991. Lessors for peripherals, small systems and software also increased [illegible] during 1992. Lessors of equipment manufactured (so-called "captives") and independent leasing companies each purchased approximately 25.7% and 25.9% of their business in 1992, respectively. They were followed by brokers/investment bankers (20%) and banks (20.7%).

Source: "1992 Survey of Industry Activity," published in June by the Equipment Leasing Association of America.

Kim S. Nash

Group therapy

Let's do some word association. I say "downsizing" and you say what?

Layoffs and budget cuts? IS overhauls and nausea?

I thought so — you're normal. But being normal doesn't necessarily help you endure the pain of downsizing, client/server, rightsizing, et al. Hackles go up when people hear the D-word. And not just among the lumps at every firm who wouldn't change their work habits if their desks were on fire.

Dig beneath the downsizing "successes" and you'll find IS managers who admit that the very idea of change touched off a wave of doubt or even subterfuge at their firms. Downsizing means big fat change — technological, business and human change. And it hurts.

People wonder, and rightly so, whether their jobs are slated for the sharp saw. Should I jump ship before I'm pushed? How can I duck the wrenching change they're foisting on me?

You in IS inherit these cultural issues because you're the people dealing with the downsizing project every day, from the top brass on down. You end up having to build end-user and business-side support, yet you've never before had to deal with these kinds of cultural issues on such a large scale.

Let's face it: IS managers can be ill-equipped to play psychologist and motivator to an entire company. The upshot is that getting users to buy in on downsizing projects isn't easy.

But you're not helpless.

First off, I have yet to find a consultant or IS manager who says you don't need a thumbs-up from the CEO. If the CEO isn't behind the plan, there's probably not much you can do with it. It's that simple.

But, say the CEO is on board. Consultants advise that you should then set up touchy-feely teams of people from lots of different departments. This task force will tell IS what they want out of a new system and envangelize the plan to colleagues. In theory.

Fly in the ointment

One IS manager recently told the story of a downsizing plan that was methodically undermined by a scared saleswoman in an end-user department. The poor IS guy was doing everything the fancy consultants say: Coax on board vocal, visible end users. Empower these people by asking for their input. Make them user advocates to IS and management.

But he overlooked the night sweats. This woman didn't want to lose her spot as the company's top sales rep, and she saw client/server — which gave fellow salespeople more power than they had before — as a threat. So she nodded her head eagerly during team meetings and agreed to herald the downsizing plan to colleagues.

However, when the meetings ended, she zipped her lip and returned to business as usual, leaving fellow workers clueless about coming changes.

"When we came over to work with them, they had no idea what was going on," the IS manager said.

He warned others to be wary of similarly wicked users, managers and even other IS staff members. "They may be nodding their heads 'yes,' but they could be thinking 'not in my lifetime,'" he said.

Of course, this tale doesn't address why IS and upper-level managers weren't themselves communicating ideas to the ranks. But that's another column.

The point is that even the appearance of buy-in doesn't mean you have it. Downsizing, moving to client/server, re-engineering — these technological concepts boil down to very political, very human issues. That's new turf for many IS departments. Although you can't be expected to plow that ground alone, you can do your part to clear paths.

First, know where end users are coming from so you can help them move to the downsized computing nirvana you and the CEO are hyping. Get outside IS, as one consultant put it.

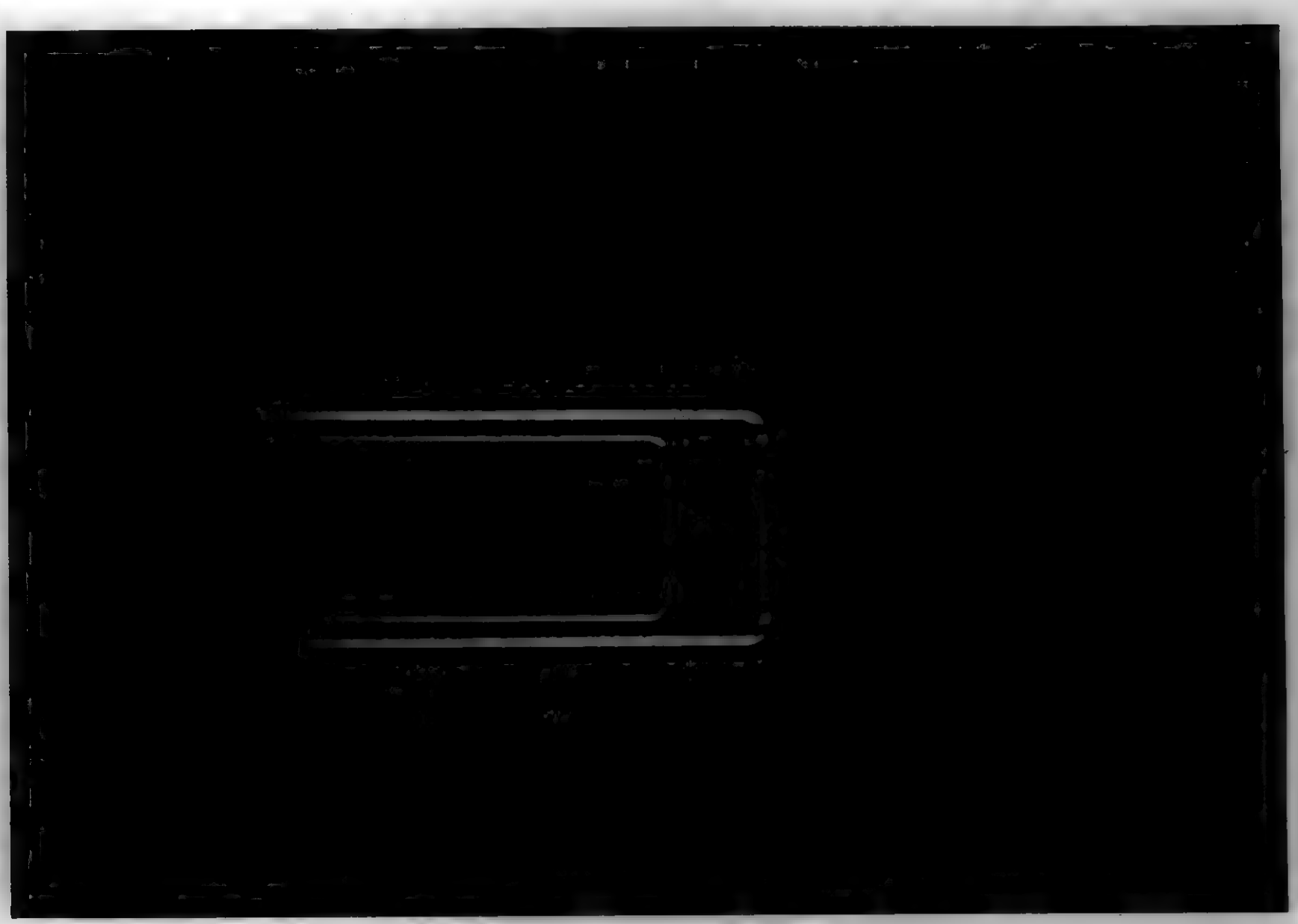
For example, a big finger-lickin' good fast-food chain has started sending IS personnel to work in other departments, including purchasing and finance. These people are *not* building applications or setting up PCs. They're actually doing the jobs of purchasers and accountants. Corporate cross-training, if you will.

If that's not possible at your firm, veterans say, at least launch your own public relations campaign. Build a simple prototype of the new system and cart it around the office. Talk to users. Talk to managers. Ask for their input. And — get this — actually incorporate their ideas.

As a consultant friend told me, "The political environment is difficult in downsizing. . . . It can't hurt to show people what you want to do." Remember Ross Perot's charts and pointer? Never mind that he didn't win the election. He did change the political landscape, which is what you need to do. It's also the toughest part of any downsizing project.

Nash is *Computerworld*'s West Coast correspondent.

Perfect timing.



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Exec looks back on IBM career

By Johanna Ambrosio

Earl Wheeler, the soon-to-be-retired head of IBM's Programming Systems division, has few regrets about his performance as the head of Big Blue's software products group. Still, he does allow that some of the large-scale architectures his group cooked up were not exactly on target.

About frameworks such as AD/Cycle and OfficeVision — intended to integrate many different products for application development and office systems, respectively — Wheeler said, "With 20/20 hindsight, the concept was right, but the execution wasn't.

Earl Wheeler: *Division's revenue grew to $3 billion*

"With AD/Cycle, we had the repository on the wrong platform, and we're fixing that," Wheeler said.

IBM has not yet announced when the revamped repository, slated originally for the mainframe and now to run on a local-area network, will be available. Wheeler said it will be "sometime next year before all the pieces are integrated the way we want them."

OfficeVision "will run very well before this year is over," Wheeler said.

He maintained that Information Warehouse — for customers to build decision-support databases and the last of the IBM grand initiatives to be unveiled — is "working very well."

Wheeler made his comments during a telephone interview after IBM announced his decision to retire effective Aug. 31 [CW, Aug. 16]. He said he and his wife will head to Hilton Head, S.C., to play golf, tennis and, in general, "give my family more time. My kids even gave me some Rollerblades."

Under his management, Programming Systems' revenue grew from $500 million five years ago, when Wheeler started heading up the division, to a projected $3 billion this year. He said the group is profitable but would not provide details.

Wheeler said he is most proud of the "team in place as I leave," and the role he played as the "mentor for all the software development going on at IBM." During the past few years, the division also started developing versions of its software for non-IBM hardware platforms — CICS, for example. That direction will continue, he said.

"There are always things you'd do differently, but as I look back I feel pretty good about the road we've traveled," Wheeler added.

[redacted]

Hardware

System Industries, Inc. has announced its HSI-Series of storage controllers for Digital Equipment Corp.'s VAXcluster systems users.

According to the company, the HSI-44 and the HSI-45 are high-performance Small Computer Systems Interface (SCSI)-based Hierarchical Storage Controller alternatives that are compatible and fully licensed with DEC's Computer Interconnect-based VAXclusters. The HSI-45 also interconnects to DEC's DSSI-based clusters.

The products were designed for users who need open SCSI architecture, high I/O performance and additional connectivity.

Features for the HSI-44 include six SCSI buses that can support seven single-ended SCSI devices in single-host mode and six devices in dual-host mode, the company reported. The HSI-45 supports five single-ended SCSI buses. Two failover/redundant power supplies in a 19-in. standard rack-mount package are included.

Prices begin at $25,500.

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Software

Software Engineering of America has announced Release 4.1 of Keys/MVS for TSO/ISPF and CICS/MVS and Keys/VSE for CICS/VSE, which is for automated help desk management.

According to the company, Keys is a complete on-line system designed for the viewing, organization and archiving of all information concerning data center alterations, conflicts and modifications.

New administrative functions include problem and change management, absolute and date range criteria and the ability to calculate financial information for hardware and software leasing.

New problem history, problem-tracking and batch-reporting capabilities have been added. Audit trailing for all Keys subsystems is provided.

Prices range from $12,500 to $39,200.

▶ *Software Engineering of America*
1230 Hempstead Tnpk.
Franklin Square, N.Y. 11010
(516) 328-7000

Velocity Software, Inc., has released VM/XA and VM/ESA Monitor Analysis Program (XAMAP).

According to the company, XAMAP is a software tool that produces performance reports from VM monitor data to assist in capacity planning and system tuning.

Shared File System analysis, a Service Level Agreement facility, rapid install and improved performance are new features, the company said.

Interfaces for Legent Corp.'s MICS, Merril Consultants' MXG and IBM's SLR are available.

XAMAP can be leased for an annual fee of $3,150 or a onetime fee of $7,500.

▶ *Velocity Software*
60 Alban St.
Boston, Mass. 02124
(617) 625-3500

NBS Systems, Inc., has announced TOSS/Mainframe Release 3.0, an electronic-mail system for IBM operating environments.

The product, part of NBS Systems Total Office Support System, provides system-related enhancements for efficiency and systems management. It also includes new end-user and administrator facilities.

End-user enhancements include a form-routing facility, multiple time zone support and alternate date display format, a multiple name-picking facility and a revised full-name format, according to the company.

Administrative enhancements include a distributed administrative facility, batch loading of public distribution lists and meeting issue lists and the ability to restore purged users.

The product is written in CICS command language. CICS 3.1 and higher are supported.

TOSS/Mainframe Release 3.0 costs $23,500.

▶ *NBS Systems*
15 Mullen Road
Enfield, Conn. 06082
(203) 741-2244

FileTek, Inc. has expanded its support of IBM's Report Management & Distribution System (RMDS).

According to the company, its Storage Machines can work with RMDS applications written for CICS and IMS and for the already supported VTAM and TSO.

Companies that use the IBM system can now receive the benefit of optical storage without the penalty of program modification, the company reported.

FileTek is also offering interfaces to Goal Systems International, Inc.'s SAR Express; Mobius Management Systems, Inc.'s Infopac report management and distribution systems; a file viewer called Alternative to Microfiche/Microfilm Online; and Optical VSAM, a program for transparent access to VSAM files on Storage Machines for MVS applications.

The company offers client/server application development tool kits for Unix workstations on Ethernet local-area networks with Transmission Control Protocol/Internet Protocol and Token Ring LU6.2 connectivity for both OS/2 and DOS-based PCs.

The RMDS interface is priced from approximately $25,000, depending on users' host processor class.

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Developers get ready for the Newton Toolkit

Analysts don't expect full availability until fall; applications must be built from scratch

By James Daly

So you think Apple Computer, Inc.'s Newton MessagePad is pretty neat. And you're thinking that maybe you'd like to pick one up and start building an application.

Sit tight.

Although Apple has fired the starting gun on the Newton product line, software developers interested in crafting applications for the handheld Messagepad organizer are going to be at the starting line for at least the next few weeks.

The Newton Intelligence operating system demands that developers start from scratch using the Newton Toolkit.

Although Apple officials said the tool kit is scheduled for imminent release, analysts such as Jeffrey Henning at BIS Strategic Decisions in Norwell, Mass., said they do not expect it to be widely available until this fall.

The delay represents the classic conundrum for those attempting to establish a new operating system platform: Users will buy only if a wide range of applications is available, but software vendors will develop applications only if there is a large installed base of users.

Apple officials said about 100 developers are using beta-test copies of the tool kit. More than a dozen applications built using the software were shown at the Newton launch earlier this month.

In addition, officials at Apple's Personal Interactive Electronics (PIE) Division said they have received inquiries from 1,500 developers regarding the tool kit.

That is an impressive number for a device with an installed base of only a few thousand machines, Henning said. "It took Hewlett-Packard two years and 325,000 palmtops to interest that many developers," he added.

Follow the script

The tool kit has its own object-oriented programming language, called NewtonScripts, which enables developers to program functionality as a series of reusable objects that speed the development cycle.

"There's a lot of wind in Newton's sails right now," said Philip Ivanier, developer relations manager at PIE. Ivanier said Apple has licensed Newton Intelligence to major corpora-

Apple Newton, *page 104*

What's Right?

The Newton Toolkit development environment, which is expected to be available at the end of this month, includes the following features:

- Graphical layout tools.
- NewtonScript programming tools.
- Context creation and formatting tools.
- Reusable-function components.
- An interactive development cycle.
- Cross-development features that leverage desktop resources.

Easel offers DBMS, CASE tools

By Melinda-Carol Ballou

Easel Corp. earlier this month introduced Enterprise Workbench, a package that offers point-and-click access to SQL relational database management systems, the ability to integrate upper-level computer-aided software engineering (CASE) tools and a 32-bit architecture.

In addition, Easel is targeting users seeking to integrate legacy mainframe applications with PC client/server networks via a new tool: Renovator Plus.

Enterprise Workbench includes DB/Assist, which allows users to visually create, test and edit SQL application logic for access to IBM Systems Application Architecture databases in its first release. Support for other RDBMSs such as those from Sybase, Inc. and Oracle Corp. will follow next year, officials said.

Better late than never

Although Easel is playing catch-up to the other development tool vendors that offer such database access already, Easel users were enthusiastic about the new capabilities.

"The DB/Assist tool is very useful. You don't have to be an expert SQL user since it visually guides you through the syntax for SQL," said Mark Wilkinson, a PC analyst at Kemper National Insurance Corp. in Longrove, Ill., a beta-test site for the product. "The integration with [Workbench] is a lot cleaner than what we're currently using."

Also shipping with this release is Easel's Continuity for Enterprise Workbench, a visual tool for integrating External Source Format output from CASE vendors such as Bachman Information Systems, Inc., KnowledgeWare, Inc. and Texas Instruments, Inc.

This support for upper-level CASE tools will also prove attractive to many users, according to Elizabeth Barnett, an analyst at New Science Associates, Inc., a consultancy in Westport, Conn.

"Users are increasingly aware that there needs to be ties between traditional upper-level CASE tools and client/server application generators," she said. "You have all these nifty client/server tools with no upper-CASE support, and Easel will now allow users to feed data in and out of enterprise environments."

Easel's Renovator Plus allows users to extend legacy applications and build client/server applications by integrating Workbench with Commbuilder, an Easel tool that automates the development of communications logic for 3270 and 5250 protocols. The combined tool set lets developers create graphical user interfaces for existing hardware while addressing the communications protocols.

This release of Workbench is based on 32-bit OS/2 Version 2.1, which takes advantage of OS/2's flat memory model, officials said. This also paves the way for support of Microsoft Corp.'s Windows NT sometime next year, they added.

Enhancements to Easel/Win and Easel/32 include interfaces to Microsoft's Open Database Connectivity and a new language feature for Easel/32. Dubbed a "table object," the new feature allows users to display large quantities of tabular data in a row-and-column format.

Pricing for the Enterprise Workbench Corporate Edition is set at $10,900 for OS/2 and $8,900 for Windows.

Oracle users say, 'Don't forget Unix'

By Kim S. Nash
REDWOOD SHORES, CALIF.

■ Oracle Corp.'s plan to move aggressively into the Windows development tools market is right on the money, as long as its Unix-based products do not suffer as a result, users said.

Although the overlap of Windows users with Oracle database users is relatively small, the number is growing, according to Mike Fisher, who represents the Delaware Valley Oracle User Group. Fisher did not have precise figures but said he has seen user demand for Windows utilities for all phases of development jump notably during the past year to 18 months.

"It'll probably grow much more, too, if we know they can get this stuff from Oracle itself," added Fisher, who is also a database administrator at FLS Industries, Inc. in Bethlehem, Pa.

Oracle plans to release a full set of Windows application development tools under its Cooperative Development Environment (CDE) banner before shipping a complete set for Unix [CW, Aug. 16]. However, all tools — both Unix and Windows — are expected out by the end of 1993 or early 1994, according to Dennis Moore, director of CDE product marketing.

CDE is an umbrella term Oracle invented in March for 14 existing and new application development tools, including Oracle computer-aided software engineering (CASE) and report writers.

Defensive move

Oracle's Windows push is an attempt to counteract the Sybase, Inc./Microsoft Corp. one-two punch in the form of closely tied database and development products under Windows, said David McGoveran, president of Alternative Technologies in Boulder Creek, Calif.

McGoveran also noted that Oracle is seeing some of the tools market swallowed up by hot client/server development vendors such as Powersoft Corp. and Gupta Corp. CDE for Windows is "no surprise," he said. "Everyone wants to be a Powersoft these days."

Meanwhile, Oracle's Windows push pleased users interviewed recently. Buffalo State College in Buffalo, N.Y., has used Oracle databases and utilities for about four years, said Rob Smith, senior programmer/analyst at the college. Buffalo State currently runs Oracle CASE tools on a Digital Equipment Corp. VAX.

"We'd do more [Windows] development in the Oracle environment if we had the products to do it with," Smith said.

EDA/SQL helps Ciba decentralize data

By Thomas Hoffman
BASEL, SWITZERLAND

Ciba-Geigy International AG, the Swiss chemicals giant based here, decentralized its information systems operations in 1990. Since then, the firm has been able to provide its users with greater access to corporate data, particularly through the use of SQL-based software tools.

For example, Ciba-Geigy programmers are using Information Builders, Inc.'s EDA/SQL fourth-generation language (4GL) software to download financial data from the company's IBM DB2 and other midrange and mainframe databases to Lotus Development Corp.'s 1-2-3 and Information Builders' Focus PC software packages, according to Nicholas Palmer, head of languages and tools in central information services at Ciba-Geigy.

Financial controllers within the company then use the decentralized financial applications to determine whether cash movements are meeting the firm's objectives.

Palmer said the 4GL software has enabled Ciba-Geigy to access data from its IBM DB2, DL/1 and other database systems without having to redevelop the databases for its distributed systems, including OS/2.

"Decentralization of the financial reporting would have been enormously expensive with the new programming on a centralized basis," Palmer said.

Nicholas Palmer: *Ciba expects to save five man-years of development time on one application alone*

Although Palmer said the company has not yet determined the dollar savings from the initiative, he said it expects to save more than five man-years of application development time by harvesting the mainframe systems with SQL tools. "That's for one application. We expect over the years to make further savings with a number of other applications," Palmer said.

Since Ciba-Geigy began using the EDA/SQL package in full production in the third quarter of 1992, 50 users have tapped into the distributed financial applications. Ciba-Geigy plans to finish testing EDA/SQL for compliance with Microsoft Corp.'s Open Database Connectivity by October. After that, Palmer said he anticipates an additional 100 users will begin using the systems within 18 months.

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Gembase 5.0 aids move to client/server

By Melinda-Carol Ballou
REDWOOD CITY, CALIF.

Ross Systems, Inc. is now shipping Gembase 5.1, a new version of its fourth-generation application development tool that targets both legacy and client/server environments, company officials said.

Version 5.1 allows data requests to be routed to multiple servers to improve application performance, increasing transaction speed for host-based and client/server applications, according to the company.

It also allows developers to create applications where the processing is performed on either the client or server, depending on which would provide the best processing load.

Gembase applications can be designed to run on PCs, terminals or both and can provide a smooth migration path for those desiring to make the transition from host-based to client/server environments, officials said.

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Briefs

Object-oriented punch

Rational and Osaka Gas Information System Research Institute have formed a marketing and training partnership to target the object-oriented software development arena in Japan.

Blyth tools to support Oracle

Foster City, Calif.-based Blyth Software, Inc. said it plans to add access to Oracle Corp.'s Oracle 7 database in the next release of Blyth's application development tools. Omnis 7 Version 2.0 is scheduled to ship later this summer and is expected to support Oracle access from Windows-based PCs. Oracle-to-Macintosh support is in the works, Blyth said.

KnowledgeWare makes plans

KnowledgeWare, Inc. announced a new distribution strategy for its client/server development tools that targets third-party channels. Dubbed the Client/Server Alliance Program (CAP), the program targets system integrators and consultants, 35 of whom have already been accepted as members. CAP includes a reseller program as well as products, services, support and training.

Separately, KnowledgeWare officials said there are no plans to cut back on Application Development Workbench (ADW), its mainframe development tool, despite employee cuts in areas relating to ADW development and a ramp-up in client/server development.

Support for Alpha apps

Powersoft Corp. and Digital Equipment Corp. announced that PowerBuilder and the Powersoft Enterprise Series will support DEC's Alpha-based products running Windows NT and Rdb, DEC's relational database management system. Separately, Uniface Corp. announced an agreement under which DEC will develop and resell applications using Uniface's client/server tools.

Building kit for imaging

Media Cybernetics, Inc. in Silver Spring, Md., has announced a tool kit for building imaging applications for Microsoft Corp.'s Windows NT, Windows, DOS, Macintosh, OS/2 and Unix environments. Available immediately, Halo Advanced Imaging Library is targeted at users who build scientific programs, such as medical pathology and geographic information systems.

Sybase combines languages

Sybase, Inc. plans to work with Intermetrics, Inc. to build a precompiler that incorporates Samedl, a high-level language that combines SQL with Ada. Samedl stands for SQL Ada Module Description Language. The Sybase Samedl precompiler will be aimed at government users and will be compatible with Sybase's SQL Server relational database, the companies said.

The company said product is due out by the end of the year; pricing was not available.

LOOK WHAT HAPPENED WHEN DIGITALK BROKE INTO THE BANK.

Congratulations to Bank of America on their new 11-state wide area network. A system they call "the most sophisticated distributed network in the world."

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Newton Toolkit

CONTINUED FROM PAGE 101

tions such as Motorola, Inc., Sharp Corp., Siemens AG, Cirrus Logic, Inc. and Kyushu Matsushita Electric.

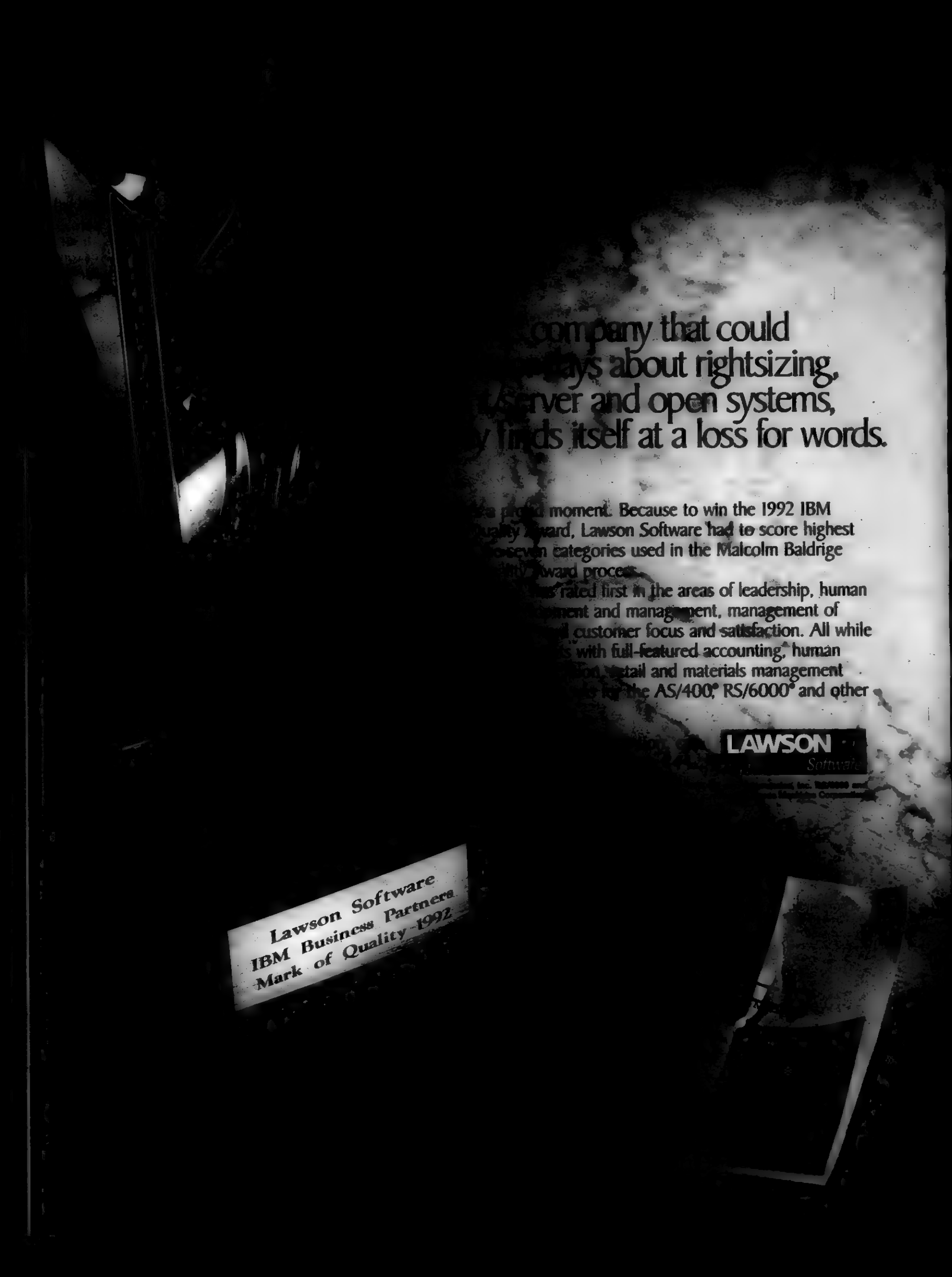
By using NewtonScript and high-level communications application programming interfaces (API), Ivanier said, developers can also write applications that take advantage of Newton's underlying communications capabilities.

Eye on the future

The NewtonScript communications API, for instance, provides developers with a consistent interface to various transports. By writing to the high-level APIs, applications can run on whatever communications media are available now and in the future.

For example, an application that transfers information over a modem would be able to transfer information via a wireless connection by selecting a different medium.

The integration of the communications architecture with the object-oriented database and handwriting recognition and intelligence software allows every application with the devices to be communications-aware, according to Ivanier.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[redacted]

The Indus Group, Inc. has made its Passport Software Solutions application products available across IBM's CICS family of products.

According to the company, Passport industrial applications designed for process and manufacturing plants have been ported to both OS/2 CICS and CICS/6000.

A set of Business Migration Tools that work in conjunction with the product translate code and provide utilities.

Passport's applications include document management, work management, inventory control, engineering change control, purchasing, equipment tag-out, fugitive emissions management and personnel qualifications data.

Passport modules range in price from $50,000 to $350,000.

▶ *The Indus Group*
60 Spear St.
San Francisco, Calif. 94105
(415) 904-5000

Blue Sky Software has announced that it will start shipping RoboHelp Version 2.0, the company's Windows-based Help authoring tool, next month.

The product includes more than 100 new features, allowing it to design, create and test comprehensive, on-line, context-sensitive Windows Help systems, the company said.

RoboHelp 2.0 also offers the ability to use a single text source for both the Help system and printed documentation. It has a fully integrated environment that enables users to access all the new features of the Windows 3.1 Help Engine, according to the company.

A feature called Error Wizard takes users to the exact place of a potential error before compiling and provides an explanation.

RoboHelp 2.0 costs $495.

▶ *Blue Sky Software*
Suite 3
7486 La Jolla Blvd.
La Jolla, Calif. 92037
(619) 459-6365

Data Access Corp. has announced the release of a graphical implementation of its object-oriented fourth-generation language for the Windows environment.

According to the company, DataFlex for Windows was designed for the creation of true event-driven Windows applications because it is object-oriented.

Windows utilities included in DataFlex for Windows accelerate the creation of graphical user interface applications, the company said. New controls, presentation classes and communications support is provided.

The product also has a feature that enables applications to be built that can resize themselves to the user hardware environment.

Development licenses cost $795.

▶ *Data Access*
5753 Miami Lakes Drive E.
Miami Lakes, Fla. 33014
(305) 238-0012

Product shorts

ACI US, Inc. has started shipping ObjectMaster Universal Version 2.0, an upgrade to its source-code editor and development tool. Enhancements facilitate the development of applications created in the MPW, Think C, Think C++ and Think Pascal environments, the company said. Cost: $395. ACI US, Cupertino, Calif. (408) 252-4444.... **Horizons Technology, Inc.** has announced the availability of its Fuzzy Search Engine Developer's Kit. According to the company, the product allows users to embed a cost-effective information search-and-retrieval tool as a native feature in Windows or DOS applications. Cost: $3,995, plus variable runtime fees. Horizons Technology, San Diego, Calif. (619) 292-8331.

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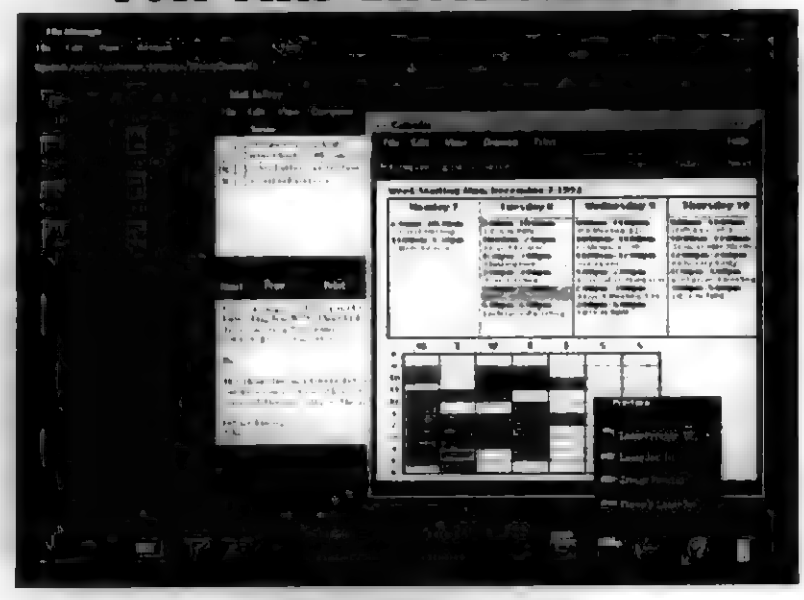

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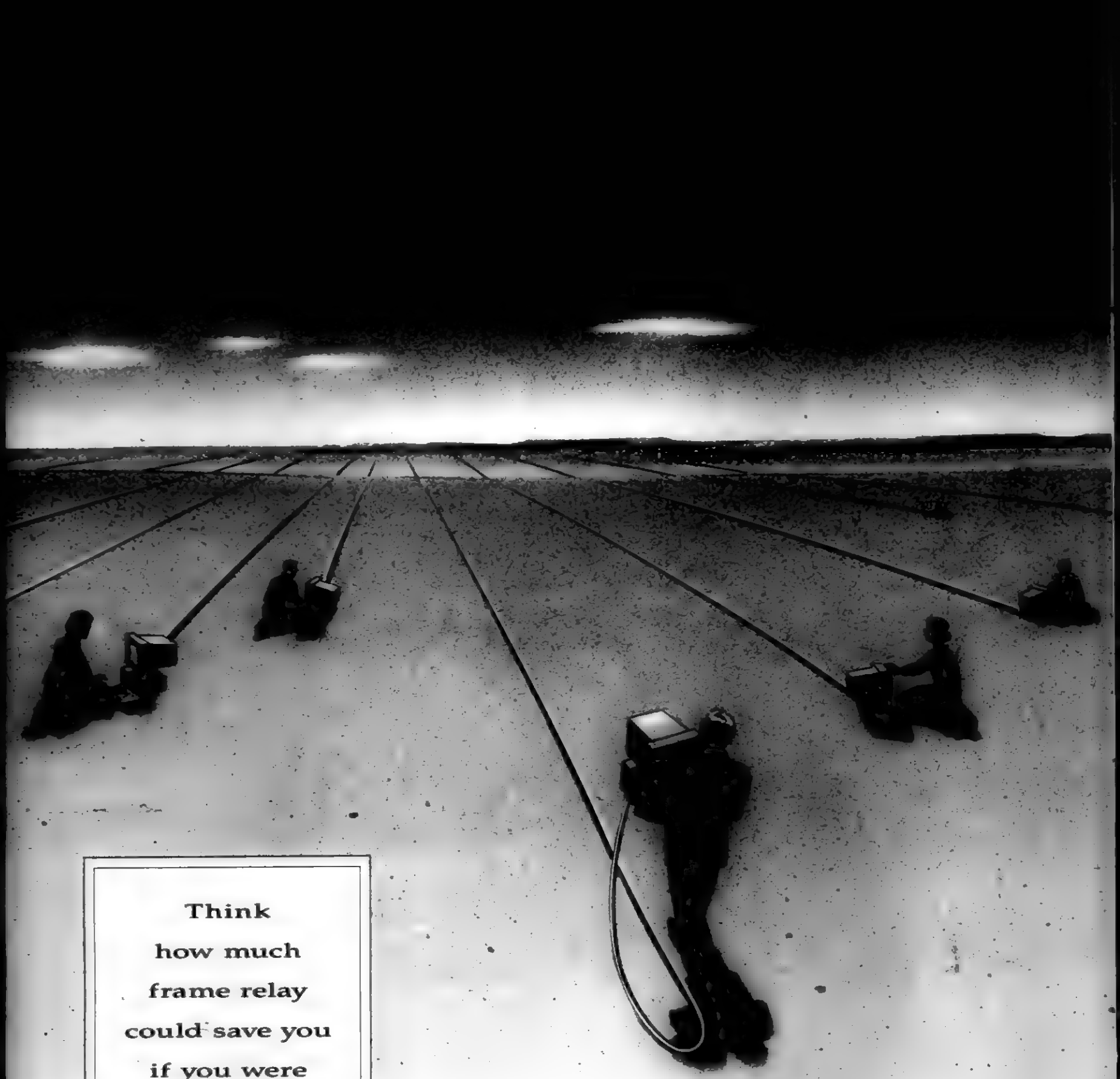

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GE WHIZ

KATHERINE LAMBERT

GE's Hellene Runtagh: *"One of the biggest mistakes a CIO can make is to tell a client, 'Call me in once you've got a game plan.'"*

As General Electric Corp.'s first CIO, Hellene Runtagh will play a pivotal role in creating a lean, "borderless" corporation that hopes to dominate all 15 of its markets.

BY NELL MARGOLIS

Whatever Jack Welch wants, he usually gets. And these days what General Electric Co.'s chairman wants is to propel each of his conglomerate's 15 business divisions to the top of their respective sectors. And he wants to do it by wedding the resources of the $60 billion, 230,000-employee corporate giant to what he calls the "speed and soul" of an entrepreneurial start-up.

That's why Fairfield, Conn.-based GE, the nation's fifth-largest conglomerate, is in its fourth year of a relentless top-down transformation. The challenge is formidable: Dissolve the gridlock of traditional corporate categories into a climate of "integrated diversity." The aim, Welch says, is to create an efficient, effective flow so that the best business practices can be transplanted to each individually empowered corner of the company.

That's also why Welch created GE's first-ever corporate chief information officer post last fall and chose Hellene Runtagh to fill it. The move, observers say, gives Welch a better-than-average chance of keeping GE ahead in aircraft engines, major appliances, materials, aerospace, broadcasting and other important core markets.

"Information and information management are critical to the success of the [integrated diversity] concept," says DuWayne Peterson, an information systems management consultant and former Merrill Lynch & Co. CIO. "Welch recognized that early on."

Peterson says, however, that driving the right information effectively through a new model corporation requires a rethought role for the CIO.

Indeed, the new GE model has no internal boundaries. Resources of every kind are continually mustered, focused, disbanded and reassembled to serve widely diverse customers. Only a CIO steeped in the business yet removed from day-to-day operations can hope to help effect so sweeping a change.

Runtagh seems to have the

GE whiz, *page 110*

GE whiz

CONTINUED FROM PAGE 109

stripes. She joined GE in 1970 as a human resources trainee right out of Pennsylvania State University. Later she did tours in the manufacturing and marketing arenas.

When tapped for the corporate CIO job, Runtagh was serving as president and chief executive officer of GE Information Services (GEIS), GE's 2,600-person information technology subsidiary, a position she still holds along with her new corporate post.

Creating community

But no CIO alone can plumb the disparate aspects of the business deeply enough to do the job, Runtagh says. So GE turns to its CIO Council — a group chaired by Runtagh and composed of the CIOs of each of GE's business units. The council meets quarterly and communicates daily, producing a steady flow of questions, suggestions and observations.

Runtagh, based in Rockville, Md., says the group's sharing is a powerful tool for meeting Welch's vision of "integrated diversity."

"For instance, if one business implements a LAN, aren't the people who worked on that project the best experts for another business to consult when it's thinking of doing the same thing?" she asks. "Without something like the council, the second business well might reinvent the wheel without anyone even realizing so wasteful an action had occurred."

The information management arena, Runtagh continues, must be seen as a change agent, where people want challenge. "No more boasting about 'zero attrition,' where the good news is that we haven't lost anyone in three years and the bad news is that we haven't lost anyone in three years," she says.

Lofty words — but easier to believe from the head of an IS organization that is not only sending its staffers out into the businesses on a regular basis but also attracting business professionals into IS (see stories below and page 112). Runtagh envisions an exciting hub "with people constantly coming and going from different bases. What a fantastic place from which to see the big picture, to get further stretched and challenged."

Swift technological change, increasing competition, more sophisticated customers and virtually overnight globalism guarantee that IS will continue to play a pivotal — and customer-sensitive — role.

"One of the biggest mistakes a CIO can make is to tell a client, 'Call me in once you've got a game plan,'" Runtagh says. "That's a disaster waiting to happen."

If information management isn't involved as soon as a business need emerges, she says, the game plan that evolves is unlikely to be optimal. "Information management, correctly conceived, carries within it the functional body needs of the company," she says. "You can't divide an organ away."

She seems sold on the importance of the IS function: "I'm going to make a prediction: I think IS management is going to emerge as the future boot camp for CEOs."

If that vision pans out, Runtagh's mix of technical credibility and catalytic inspiration is likely to be a major reason why, according to many of her colleagues.

"Hellene has made it clear that customer satisfaction is her No. 1 priority," says Geri Stoner, vice president of customer quality at GE. "She frequently participates in our daily quality reviews. She issues bulletins. There's constant follow-up and follow-through."

GE's Motors Division IS chief Jack Sprano adds: "What Hellene's brought to the party is the call to say, 'We're gonna do this, and we're gonna make it work.'"

And the fact that the CIO's attitudes as well as her actions are clearly endorsed by the chairman, Peterson says, enhances her effect.

Even this early in the game, the approach of top-down buy-in is generating bottom-up payback, Runtagh notes. Recently, "a very 'thing-oriented' [internal] client came up to me with a brochure that knocked my socks off," she recalls. "It listed all the technology-enabled services his business would provide for customers." For a manager who had formerly thought of IS as extraneous to his mission at best, she says, the shift was stunning. "Here he was, consciously using IS as a differentiator."

Observers agree that the earmarks of the change-agent CIO — enthusiasm, pragmatism, the ability to motivate people rather than issue orders, the rooted self-confidence that lets one empower others without feeling threatened — are embodied in Hellene Runtagh.

And that's just what Jack Welch wants. ■

Geri Stoner: Departing for business battles

When critical business goals are targeted at GE these days, "IS is brought in up front and kept involved at every turn," says Geri Stoner, vice president of customer quality.

Stoner is an eight-year GEIS veteran who left the IS post "to broaden my perspectives" three years ago; she is now of her second business executive's post. Last year she analyzed her division's customer tracking tool and "found that it was a very effective tool but not a very good one."

That was because the software told plenty about who called and when but not much about why. "If you looked to see the reason for the call, 85% came up as 'general,'" she says. "It's very hard to fix 'general.'"

So the quality department embarked on a wholesale system revision, set in the context of a departmental re-engineering that is still under way.

At the project's outset, she recalls, "IS people sat down with the call analysts and watched how they did what they did." Only after they understood the process, the goals and the gulf between the two did the IS staff members begin to suggest technological approaches, Stoner says.

"IS was very rigorous in demanding that we know up front what we wanted accomplished," she says. "Once we did and could communicate it to them, they offered alternatives, explaining the relative advantages and disadvantages: which ones were less complex but would bring in wins sooner vs. longer-term but perhaps deeper benefits."

For the business folks, Stoner says, the interplay was an empowering experience: "IS helped them see that they were a critical part of the information that is so important to the company," she says.

As for the IS folks, Stoner says, "They enjoyed the heck out of being with the business — getting to know the real questions and knowing that they could provide answers, not *requirements*. It got to the point where they were having weekly lunches, just to exchange more information."

— *Neil Margolis*

THE CIO

Hellene Runtagh, GE's first corporate CIO

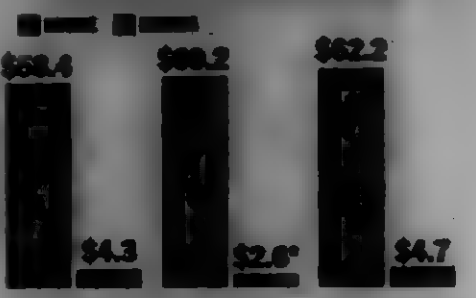
Credit: Katherine Lambert

After graduating from Pennsylvania State University, Runtagh joined GE in 1970 as a human resources trainee. Later she did tours in manufacturing and marketing before being named president and CEO of GE Information Services, the corporation's 2,600-member IS subsidiary. She is based in Rockville, Md.

THE COMPANY

General Electric Co., Fairfield, Conn.

GE is the fourth-largest employer in the U.S.

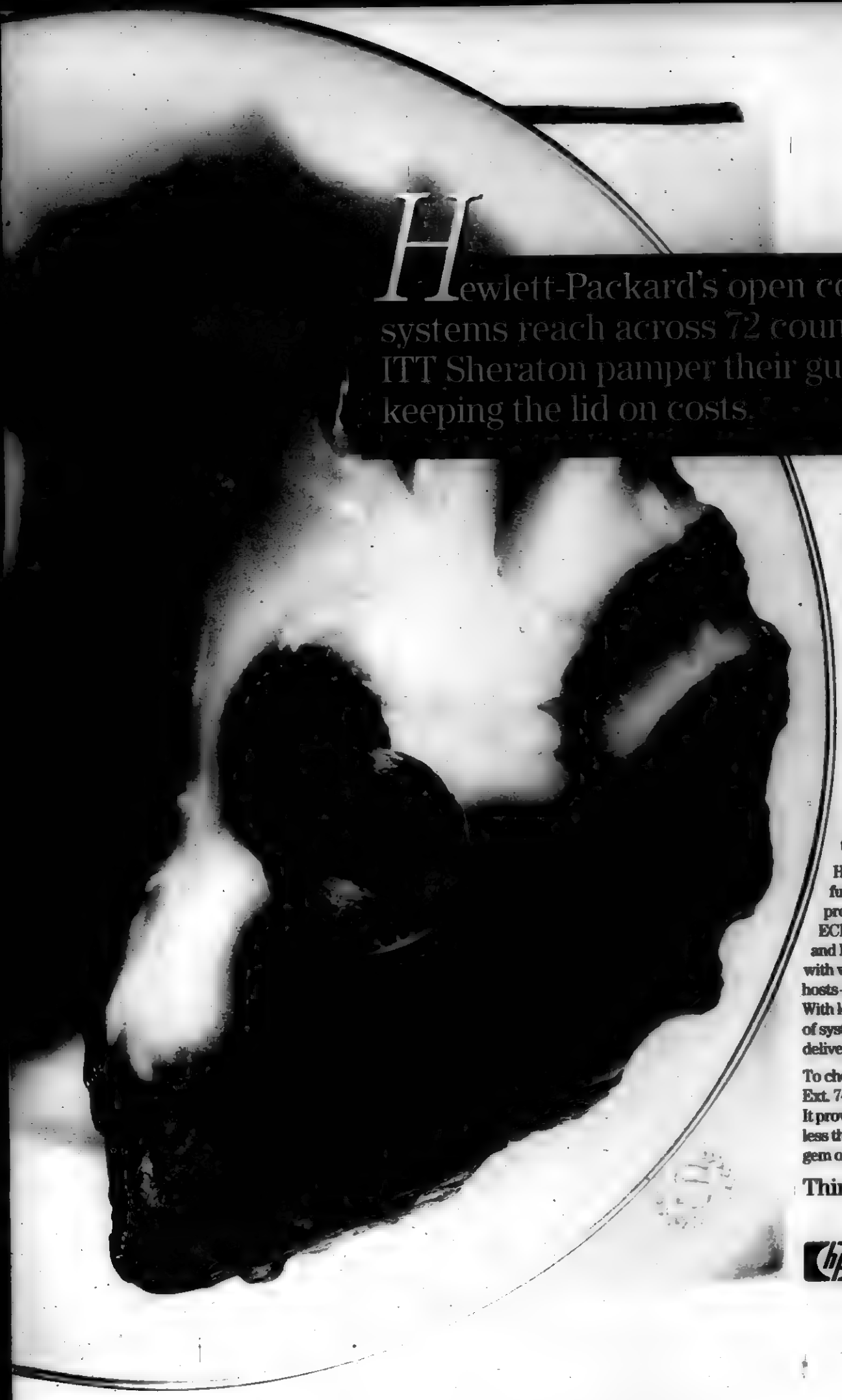


*Includes accounting charge for discontinued operations
Source: General Electric Co.

Key businesses: Aerospace, aircraft engines, appliances, capital services, industrial and power systems, lighting, medical systems, broadcasting, plastics, electrical distribution and control, information services, motors and transportation systems.

THE PLAN

- Dissolve traditional corporate boundaries to create "integrated diversity." The goal is to share best practices. Resources are continually assembled and disbanded to serve widely diverse customers.
- A 16-member CIO council meets quarterly and communicates daily to share ideas and expertise.



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— Lawrence W. Hall, Director, Hotel Systems
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At GE Motors Division, E-mail has led the way

Two years ago, cost pressures drove GE's Fort Wayne, Ind.-based Motors Division from a centralized Honeywell Bull, Inc. mainframe platform to a client/server system based on IBM-compatible PCs, says IS manager Jack Sprano. Using router technology, the company corralled 25 networks into a single Token Ring network that spans the $1.2 billion division's 22 factories.

"Now any PC can speak to any PC," Sprano says.

Sounds like a happy ending — but for the Motors Division and the IS group that helped it onto the new system, it was also an unexpected beginning. An electronic-mail system put in basically as an afterthought, Sprano says, is re-engineering the business.

E-mail for the masses

At an estimated 65 cents a message, he says, the Motors Division's earlier mainframe-resident E-mail system was too pricey a treat to be widely used, he notes. But the advent of the client/server network has made a dramatic difference.

"We're doing so much on PCs now that the incremental cost of E-mail adds up to peanuts," Sprano says. As for administration, he adds, the division, which gets central IS support from Bethesda, Md.-based information technology subsidiary GEIS, is "getting by with just about what we had before. As long as you've already invested in the Token Ring, E-mail starts to make a lot of practical sense."

And dollar sense, too: Sprano estimates that the GEIS-designed local-area network-based E-mail system will save the Motors Division $500,000 a year.

However, he says, "The real hit is, there are so many more people using it." Today, "when you've got a thought, you can hold it, you can play phone tag — or you can put it down right away. The guy in the field writes a note on competitive reality, 30 of us back here read it, add our own comments and send it further on."

In-house expert

Little wonder, then, that Sprano is doing double duty as head of GE's E-mail "center of excellence": a volunteer ad hoc committee tightly focused on exploring and disseminating a technology or methodology that is likely to be put to beneficial use elsewhere in the company.

"We're looking at technology that would allow us to send drawings via E-mail by sending them out as text and receiving them in graph form," Sprano says.

Right now, he says, the choice lies between current electronic drawing transfer alternatives that are not yet cost-productive and GEIS' present offering, which lets a user receive a message via E-mail and send it out via fax at an affordable cost but with a loss of resolution and time.

At the moment, the latter is holding the line. However, Sprano says, "sending drawings back and forth in an open technology is key to us. We're not letting up on that."

Other GE businesses are still using mainframe-based E-mail, Sprano says — but not for long. Six, he says, are "implementing LAN-based E-mail. [The] Lighting [Division] has been in; they're trying to steal everything they can." Last month, a delegation from the cost accounting unit requested — and received — a full-day E-mail site visit hosted by Sprano and his band of volunteers.

"I don't know what will happen if I get a run on my guys," acknowledges Sprano, whose staff members are all moonlighting and whose war chest is nonexistent. "Every business wants someone to come out and help them set up an E-mail system like ours."

— Nell Margolis

Donna Valtri: Former customer joins IS

[illegible] that's quite tough like a spec, but she thinks like a customer. That's probably because until a year ago, she was a customer.

What makes an eight-year GE marketing staff member with an academic background in economics shift to the IS side?

Valtri, who has spent the past year serving as leader of GE's Consumer Services Information Technology Division, has two quick answers: "Dick Stoneciffer" and "Lately, it's hard to find an IS 'side' at GE."

Last year, according to Valtri, Stoneciffer — the CIO of GE's appliances business — set out "to populate the IS organization with more business people."

By that time, Valtri says, the boundary-blurring campaign kicked off by Chairman Jack Welch and since carried quantum leaps forward by corporate CIO Bolanz Dastugh was in high enough gear that "I actually didn't think of this as moving to IS. I saw it as moving to Appliances — learning a wholly new, very manufacturing-oriented business."

Today, the former marketeer is spearheading an aggressive agenda of IS-enabled initiatives for the Appliances unit. That includes a review of some 30 major applications to make sure they're matched with the best possible tools and retraining mainframe-based personnel to handle a gradual move from older Honeywell Bull and IBM mainframe platforms to the division's newer Unix environment.

The numbers can be daunting, Valtri says. "Everything is huge — there are 700 million records in one of these systems," she says. "When I think about moving them, I cringe."

On the other hand, however, she is far from daunted by the challenge that has been staggering to some IS staffs as total quality management, teamwork and re-engineering have taken the fore during the past several years: trying to view the business and its IS elements from the user's vantage point. Valtri doesn't have to try — all she has to do is remember.

The Appliances IS "organization is not aware of the wealth of third-party tools that are available because everything here has been basically home-grown," she notes. "The whole notion of libraries, tools, standards is kind of foreign."

Valtri, whose marketing experience trained her eye on outside shelves, is trying to bring tools, training and standards to bear on her new domain.

"Longer term, I want to introduce object-oriented [programming] into Appliances," she says. It is precisely the needs of the nontechnological user that are driving Valtri into the realm of advanced technology.

"Object-oriented is a real opportunity for folks from multidisciplines to speak the same language," she says. "Talking about programming in a functional mode puts the businessperson at a tremendous disadvantage. Object-oriented allows him to describe what he needs in terms everyone understands."

— Nell Margolis

Executive Track

Jasmine Alexander has been promoted to vice president of MIS at the ABC Radio Networks. Alexander joined Capital Cities/ABC as a programmer/analyst in 1985. Eighteen months later she was promoted to manager of MIS at the corporate controller's department. In 1990 she was named senior director of MIS.

In her new post, Alexander will be responsible for development and maintenance of all business systems for the 3,400 stations that make up the nation's largest radio network.

At McCormick & Co., Charles W. Brown has been named director of MIS strategic planning for corporate information management systems.

Brown has worked at McCormick, a Sparks, Md.-based international producer of spices, seasonings, flavorings and specialty foods, since 1977. Previously, he held positions at Westinghouse Corp., PHH and Read's, Inc. Most recently, Brown was director of application and technology development at the firm.

In his new role, Brown will be responsible for facilitating corporate MIS strategic planning and assisting management in developing IS plans.

Terry L. Crum has been appointed director of information services at **Boult, Cummings, Conners & Berry**, a Nashville law firm. Crum, a 25-year industry veteran, will be responsible for the 80-member firm's computer and communications technology. Most recently he held a similar post at **Hunton & Williams**, a Richmond, Va., law firm.

Sharon Dawes, formerly executive director at the **New York State Forum for Information Resource Management**, has been appointed director of the newly formed **Center for Technology in Government** at the University of Albany.

H. Michael Gleason, a managing partner at **Coopers & Lybrand's** Management Consulting Group, has been named corporate vice president in charge of worldwide operations at **Electronic Data Systems Corp.** Gleason has also held senior positions at Revlon Group, Inc., Xerox Corp. and Eastman Kodak Co.

Dort A. Cameron 3rd has been appointed chairman of newly formed **Enten Information Services, Inc.**, a Rye Brook, N.Y., provider of services and technology for large firms. The 1,900-employee firm was formed following the acquisition of JWP, Inc.'s Information Services Division.

Pat Motola has been named vice president and general manager at **Pencom Software**. The Austin, Texas, company specializes in open systems software services, including business process re-engineering and technology integration.

Dick Munn, founder of **The Ledgeway Group**, has formed a company to assist business-to-business firms market their services. The new firm, **Munn and Co.**, is based in Lexington, Mass.

Have you or a colleague in IS recently been promoted? *Computerworld* would like to share your news with the rest of the IS community. Please contact Joe Maglitta at (800) 343-6474 to pass along the news.

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Intelligence files

Monitoring employees

Information systems designs play a key role in the conception and creation of electronic performance-monitoring systems. Such systems already monitor some 10 million workers, and while the goal is to raise worker productivity, many systems fail. Such projects raise many social and ethical issues. Chances for success are best when workers are invited into the development process, systems are flexible, high performers are rewarded, and only meaningful activities are measured.

Source: "Developing an employee-centered electronic monitoring system," Kristen Bell De Tienne and Nelson T. Abbott, *Journal of Systems Management*, August 1993, (216) 243-6900.

Network printing plans

The insurance industry remains an aggressive user of high-speed electronic printing. A new survey by Xplor International, the document systems professional association, found that more than half of 57 firms polled had implemented a distributed printing technology. Two-thirds said they had a corporate printing strategy. Only about one quarter had integrated network and mainframe publishing, however.

Source: Xplor International survey, (310) 373-3633.

Insurance downsizing

Meanwhile insurers are racing ahead with downsizing plans. Nearly 90% of 120 insurers polled recently by the Life Office Management Association (LOMA) report having local-area networks. That compares with 80% two years ago and approximately 60% in 1989.

Security efforts have also risen dramatically. Approximately 67% have an official company plan for dealing with viruses, compared with just 15% in 1989.

Source: Life Office Management Association survey, (404) 951-1770.

Book Reviews

Re-engineering Your Business

By Daniel Morris and Joel Brandon; McGraw-Hill; hardcover; 247 pages.

Re-engineering, somewhat surprisingly, has become a hot topic in the popular press. Consider the heady ascent of Mike Hammer and James Champy's recent book, *Reengineering the Corporation*, on the *New York Times* best-seller list.

The latest entry is *Re-engineering Your Business*, described by its authors as a "brass tacks" book to help companies make process redesign a reality. The work discusses the latest modeling and simulation techniques, ways to design organizational structures and how to implement change without disrupting daily operations. The authors are re-engineering consultants.

Electronic Marvels at State Farm Mutual

By Myron G. Wilkie. Distributed by Alamo II Bookstore, Normal, Ill.; hardcover; 368 pages; $22.95.

Ever wonder what the IS history of your organization would look like if someone had kept meticulous records of its progress during say, the last 40 years? You'd have a pretty complete one if Myron Wilkie had been your IS boss. Wilkie, who spent 34 years at State Farm Mutual Automobile Insurance Co., has produced an exhaustive and careful account of how a pioneer IS department grew from four people in 1955 to 4,800 today. Wilkie, who retired in 1980 as assistant vice president of IS, walks readers through six computing eras into modern times.

Although the detail presented here will probably be most interesting to those in the insurance industry and other pioneering peers, Wilkie has struck on something: the value of IS history. With so many companies detonating so much these days, firms that remember where they came from stand a much better chance of successfully navigating their future course.

Calendar

SEPT. 5-SEPT. 11

Compuexpo '93. Las Vegas, Sept. 9-11 — Contact: UNSC Investment Group, Newark, Calif. (510) 657-3418.

Corporate Computer Professional Exposition. Rosemont, Ill., Sept. 9 — Contact: The Corporate Association for Microcomputer Professionals, Northbrook, Ill. (708) 291-1360.

SEPT. 12-SEPT. 18

EDMS '93 User Forum. Anaheim, Calif., Sept. 13-16 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 871-6808.

Penn Tech '93. Philadelphia, Sept. 13-14 — Contact: Pennsylvania Technology Council, Pittsburgh, Pa. (412) 687-2700.

Engineering Document Management Systems. Anaheim, Calif., Sept. 14-16 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 871-6808.

Expo '93 East. Atlantic City, Sept. 14-15 — Contact: C. S. Report, Inc., Uwchland, Pa. (215) 458-6415.

Omnicom Week Conference. San Diego, Sept. 14-17 — Contact: Sherri Ross, Omnicom PPI, Phillips Business Information, Inc., Potomac, Md. (301) 424-3338.

SEPT. 19-SEPT. 25

1993 SIM Conference. Washington, D.C., Sept. 19-22 — Contact: Gregg Lapin, Society for Information Management, Chicago, Ill. (312) 644-6610.

1993 Interex Hewlett-Packard Computer Users Conference/Expo. San Francisco, Sept. 19-23 — Contact: Interex, Sunnyvale, Calif. (408) 747-0227.

Business Excellence For Top Management. Kansas City, Mo., Sept. 21-23 — Contact: Joanne Gordon, Sandra Conn Associates, Inc., Chicago, Ill. (312) 327-0062.

Mobile World. San Jose, Calif., Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Second IEEE Network Management and Control Workshop. Tarrytown, N.Y., Sept. 21-23 — Contact: Hart Rasmussen, Workshop/Tutorial Registration, CATT, Hawthorne, N.Y. (914) 347-6942.

Expo '93. New York, Sept. 21-23 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

Document World '93. Hartford, Conn., Sept. 22-23 — Contact: Key Productions, Inc., Hartford, Conn. (203) 247-8383.

SEPT. 26-OCT. 2

Association of Banyan Users International Hosts Conference and Expo. Ottawa, Sept. 26-29 — Contact: Association of Banyan Users International, Chicago, Ill. (312) 644-6610.

OOPSLA '93: Conference on object-oriented programming systems languages and applications. Washington, D.C., Sept. 26-Oct. 1 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

IS as a Service Organization. Columbus, Ohio, Sept. 27-28 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

Imaging Expo. New York, Sept. 28-30 — Contact: Comtek International, Wilton, Conn. (203) 834-1122.

OCT. 3-OCT. 9

The Ninth International Congress on Advances in Nonimpact Printing Technologies/Japan Hardcopy '93. Yokohama, Japan, Oct. 4-8 — Contact: The Society for Imaging Science and Technology, Springfield, Va. (703) 642-9090.

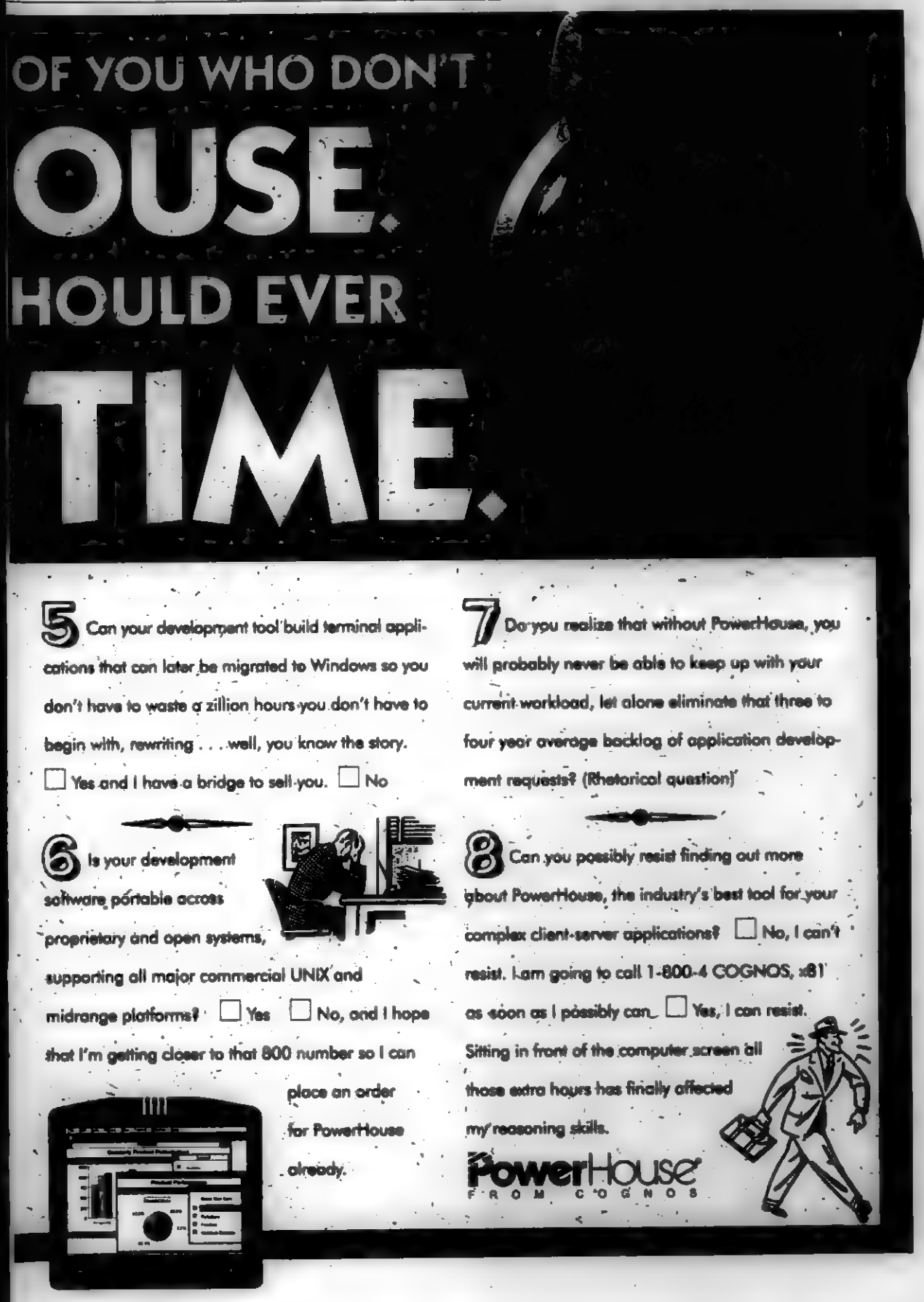
NetWorld '93. Dallas, Oct. 5-7 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

OCT. 10-OCT. 16

Design/West. Anaheim, Calif., Oct. 10-12 — Contact: Karl Steidl, Reed Exhibition Cos., Stamford, Conn. (203) 964-0000.

Hypertext '93. Seattle, Oct. 14-18 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

National User Applications Seminar. Atlanta, Oct. 14-15 — Contact: Bellcore TEC, Lisle, Ill. (708) 960-6000.



Linkage lineup

LAN SWITCH

INVERSE MULTIPLEXER

COLLAPSED BACKBONE

HUB

BRIDGING ROUTER

SDLC CONVERTER

Just when you'd figured out the difference between a router and a bridge, along comes a whole new generation of interconnect devices called switches. Here's a guide to help you stay on course as you inspect your internetworking options.

BY FRED J. McCLIMANS

For an example of just how diverse the networking field has become, check out the diagram (pages 118-119) of the National Any Company, U.S.A., which highlights many of the new products and capabilities on the market today.

BUYERS' SATISFACTION SCORECARD

Attachmate's SNA gateway tops user satisfaction ratings.

FIRING LINE

Cisco Systems' 7000 router combines reasonable performance with better-than-expected protocol support, reliability and tech support.

If you think that more than one object can't possibly occupy the same space at the same time, put aside modern physics and examine the internetworking market. Never before have so many vendors tried to hop on the same musical chair.

Why? Perhaps they are inspired by Wellfleet Communications, Inc., a router manufacturer rated the fastest growing company in the U.S. by *Fortune* magazine for the last two years.

Or perhaps they want to join Cisco Systems, Inc., SynOptics Communications, Inc. and Cabletron Systems, Inc., all of which, with Wellfleet, will likely close in on a combined $2 billion in sales this year — all in a market that barely existed five years ago.

With companies beginning to value leading-edge networking as a strategic asset, this market shows no signs of letting up.

One of the reasons internetworking has taken off is the maturation of current local-area network technology, including network interface cards (NIC) and shared-segment LAN hubs. As prices drop beneath the $100 per port cost on both NICs and hubs, more users can now economically justify network expansion.

Routing technology has also benefited from the growing maturity of both hardware and software. Once difficult and onerous, routing can now be easy to use and manage.

Making this market even more interesting is the fast-growing requirement for LANs to support legacy systems, such as good old Systems Network Architecture (SNA). Here we see a number of companies taking advantage of IBM's own efforts to sell into this market, probably best demonstrated by the movement of many routing companies into the SNA/Synchronous Data Link Control (SDLC)/Logical Link Control (LLC) conversion market (i.e., SNA tunneling or encapsulation).

Complicating things is the choice between traditional LAN technology and a new generation of switching LAN technology, including products that provide "port" switching, "segment" switching and even "virtual" LAN switching (see story page 121). New "cell-relay" as well as Asynchronous Transfer Mode (ATM) technologies have already begun reshaping both hubs and routers.

When trying to cope with all the products and network architectures on the market today, managers must realize there is no single answer. Most users employ a range of technologies.

Collapsed backbone networks are often interconnected with distributed Fiber Distributed Data Interface technology. SNA and LAN integration are often provided by both SDLC tunneling and SDLC/LLC Token Ring attachment in the same network. LAN segment switches work as congestion breakers front-ending the router-based backbone.

The key here is to abandon preconceived notions about single-technology solutions and find the best product set to match your immediate and long-term needs. ■

McClimans is program director of the local-area communications service at Gartner Group, Inc. in Stamford, Conn.

GLOSSARY

What's what

Internetworking devices

Leading vendors include Cisco, Wellfleet, Digital Equipment Corp. and 3Com Corp.

BRIDGE: Connects two or more LANs to form a single larger LAN. Can also filter traffic to each LAN segment, minimizing unnecessary broadcasts.

ROUTER: Connects two or more LANs but allows each LAN segment to maintain its independence. Creates logical addressing domains to control LAN packet routing. Most routers support the concurrent use of multiple protocols.

Traditional workhorses

Traditional players still rule here, including IBM, DEC, Newbridge Networks Corp. and Timeplex, Inc.

FRONT-END PROCESSOR: Controls traffic or communications between a mainframe and user/LAN devices.

GATEWAY: Allows devices on different networks, using different protocols, to communicate (i.e., Apple Computer, Inc. AppleTalk to TCP/IP).

PROTOCOL ASSEMBLER/DISASSEMBLER (PAD): Allows a user to access a protocol-specific WAN, such as a frame-relay or ATM service.

TERMINAL SERVER: Provides LAN access to terminals or workstations incapable of direct network access.

New technologies

COLLAPSED BACKBONE ARCHITECTURE: An increasingly popular network design that uses a high-performance router or switch at the center of the network. Hardware reliability is key.

SDLC/LLC CONVERTER: Allows IBM SNA SDLC data streams to be encapsulated into an LLC LAN-based packet for transmission across a LAN segment.

INTEGRATED NETWORK DEVICE: Integrates a LAN hub or terminal server with a remote bridge or router. A niche product today, these devices will grow considerably as vendors offer cost savings and simpler management. Ideal for remote users with little technical expertise.

ROUTE SERVER: Helps create, maintain and disseminate information on paths through a switched network. Currently in an early development stage.

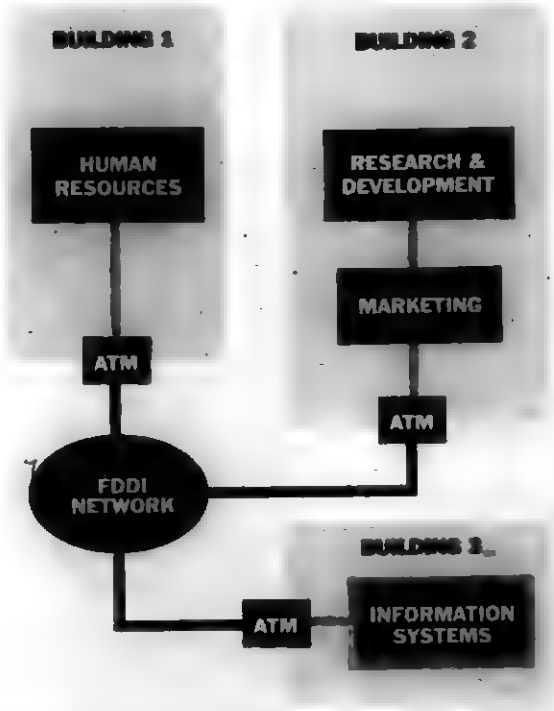
VIRTUAL LAN SWITCH: Provides each connected user with his own dedicated LAN (called LAN-per-port). Also provides the ability to create logical workgroups to improve LAN flexibility. ■

—Fred McClimans

Any Company, U.S.A.

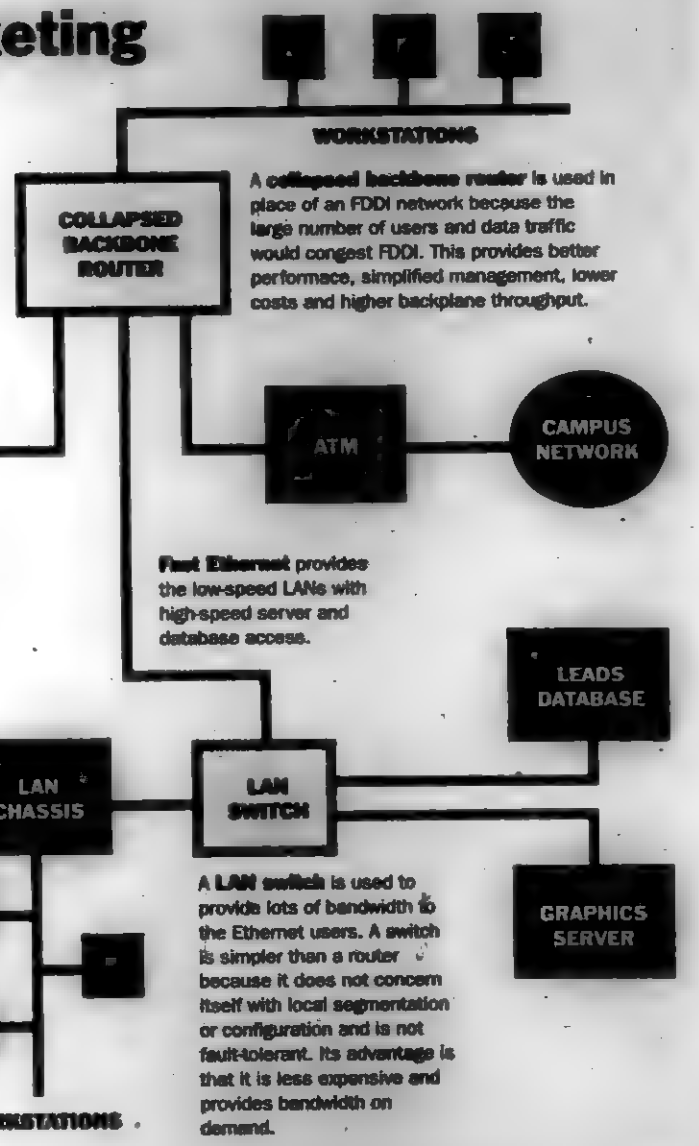
Actually, these diagrams of a large, state-of-the-art multidivision manufacturing enterprise don't represent just any company. But the capabilities required are very real for many companies, large and small, that are in the process of either migrating away from older legacy systems or trying to bring together formerly disparate networking elements in a single "division-oriented" corporation.

Created by Fred J. McClimans



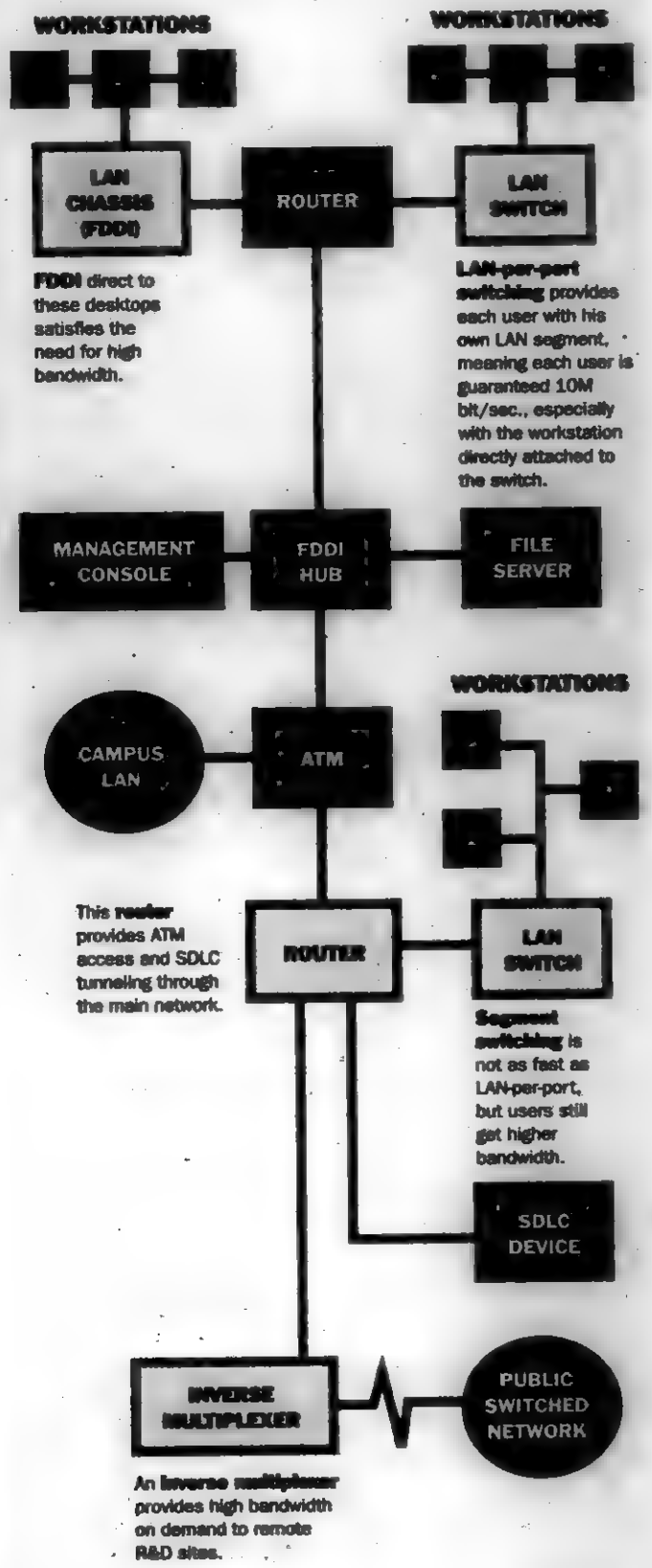
Sales and marketing

Two functions are important here:
1. Marketing materials creation, such as print brochures, data sheets and product literature. This requires document production capabilities, usually Macintosh-based.
2. Lead-tracking, such as client status, response to ad campaigns, etc. This requires access to a large database.



Research & development

This department's heavy work in CAD/CAM, graphics modeling, code generation, programming and product design means each user needs high performance and the ability to transfer large files to other developers. As a result, much attention is paid to giving each user high bandwidth directly to his desktop and using switches to increase bandwidth when necessary.



FDDI direct to these desktops satisfies the need for high bandwidth.

LAN-per-port switching provides each user with his own LAN segment, meaning each user is guaranteed 10M bit/sec., especially with the workstation directly attached to the switch.

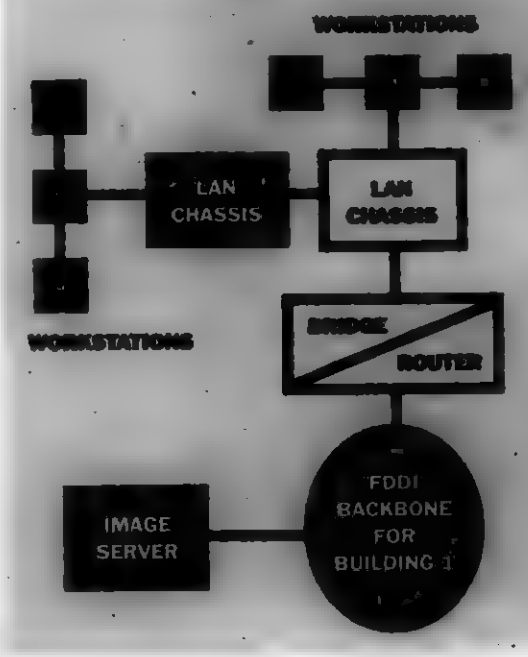
This **router** provides ATM access and SDLC tunneling through the main network.

Segment switching is not as fast as LAN-per-port, but users still get higher bandwidth.

An **inverse multiplexer** provides high bandwidth on demand to remote R&D sites.

Human resources

Here, users need access to many documents, including memos, employee databases, accounting records, etc. Much of these are placed on an imaging server, so there's a need for heavy file storage and fast access to the imaged material. Data sharing among workgroups is also important.

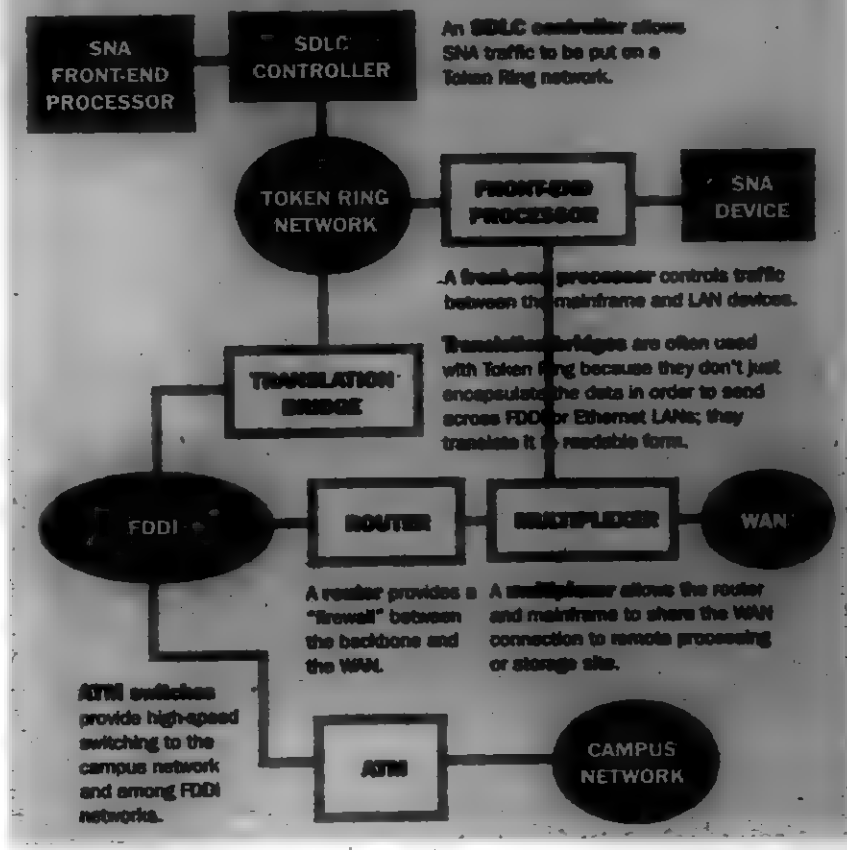


The **chassis hub** contains multiple stackable hubs. It's used here in place of a stackable hub because it can support routing, switching and management modules for large configurations of more than 20 users, up to 200.

A **bridging router** is used so that the workgroups function as a single LAN (as in a bridged network) and can therefore share data easily but are protected from the building's FDDI backbone by the router. The router "firewall" provides a clear segmentation between the human resources LAN and the backbone network so that no unwanted traffic comes through.

Data center

In the data center, there are data repositories holding video and imaging data as well as IBM and DEC VAX processors. FDDI networks provide an extremely reliable high-speed network between the processors and database systems as well as high data access from remote users in other buildings.



An **SDLC controller** allows SNA traffic to be put on a Token Ring network.

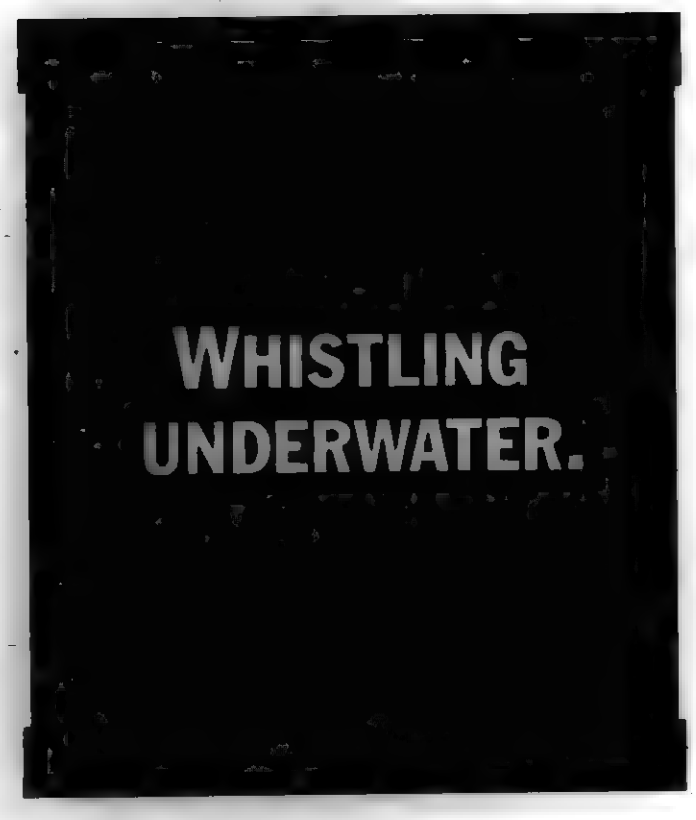
A **front-end processor** controls traffic between the mainframe and LAN devices.

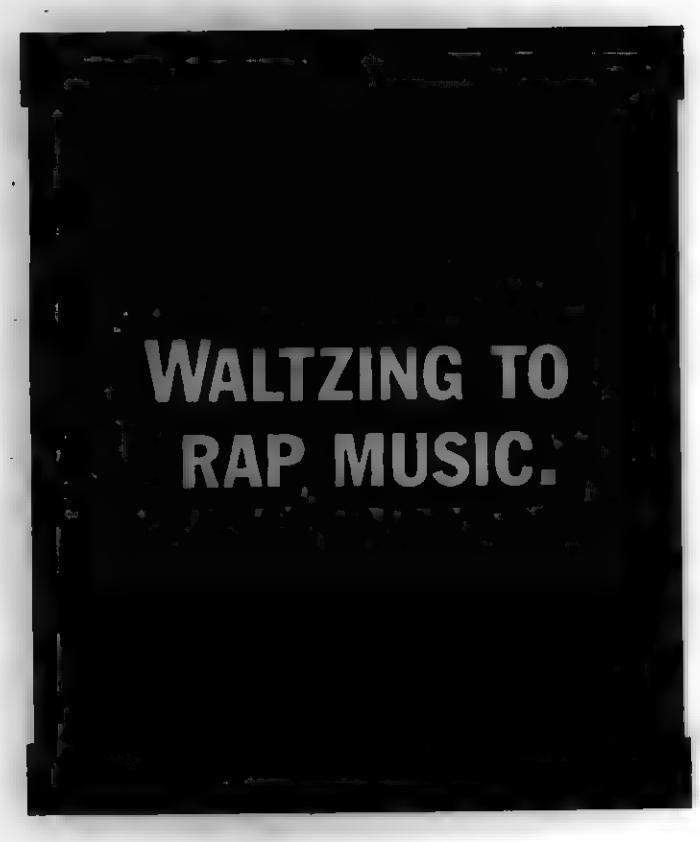
Translation bridges are often used with Token Ring because they don't just encapsulate the data in order to send across FDDI or Ethernet LANs; they translate it to readable form.

A **router** provides a "firewall" between the backbone and the WAN.

A **multiplexer** allows the router and mainframe to share the WAN connection to remote processing or storage site.

ATM switches provide high-speed switching to the campus network and among FDDI networks.





WHAT'S NEW IN ROUTERS

A summary of tricks

Few technologies are evolving faster than the multiprotocol router. Once a simple LAN interconnect tool, routers have grown into products capable of supporting not only LANs but also many traditional legacy systems.

PRIORITIZATION enables users to prioritize the different types of traffic. Because higher-priority data is always forwarded first, this feature can be critical to managers trying to support time-sensitive applications. Now a common feature in many multiprotocol routers, prioritization is usually supported at little or no extra cost. Prioritization can be based on source/destination addresses or protocol type. However, because most routines apply prioritization only on the first "access" port into the network — and intermediate routers typically do not continue the priority service — prioritization is a limited service.

CLASS-OF-SERVICE goes beyond prioritization to provide an end-to-end "quality" transmission to a protocol or device. Very important to IBM SNA traffic, class-of-service provides better or faster routes throughout the network for important traffic. True class-of-service is not available in most router products.

DIAL-ON-DEMAND routing combines the traditional router with an asynchronous dial-out modem that initiates a connection to a remote site whenever a remote message is generated by the local network. This can offer significant cost savings for users who do not have enough traffic to justify a dedicated leased line. This is still a relatively new technology supported by only a handful of vendors, such as Telebit Corp. and NEC Technologies, Inc.

INVERSE MULTIPLEXERS typically dial bandwidth in 56K bit/sec. increments over a fractional T1 service, unlike most dial-on-demand products, which use asynchronous dial lines. Inverse multiplexers can be used to dial up (or increase) bandwidth between two sites to handle heavy bursts of traffic.

Inverse multiplexers from vendors such as Newbridge Networks Corp., Ascend Communications, Inc. and Teleos Communications, Inc. can be coupled with routers to provide supplemental bandwidth for large file transfers or as backup connections. This function is likely to be integrated directly into routers within the next 18 months. This technology is very important for users trying to build redundant network connections.

COMPRESSION is used to shrink the size, or amount, of information being sent across a wide-area link. Compression operates only on an individual circuit by replacing repetitive patterns with a compression code. This can result in significant increases in bandwidth, often 2-to-1 or 3-to-1, meaning that lower-speed circuits at low costs can replace high-speed, high-cost circuits. Most router vendors support some type of compression at little or no extra cost.

BANDWIDTH SHARING allows multiple WAN connections between two sites to share transmission responsibilities. This is often referred to as load-balancing and can be used to provide live backup connections or high levels of bandwidth (i.e., three T1 circuits to provide a total of 4.5M bit/sec.). Most router vendors provide this function as part of the base router system.

SNA TUNNELING (or encapsulation) allows SNA traffic to be encapsulated in a LAN packet and routed through an internet using the LAN packet-routing functions. SNA packets are usually encapsulated in an Internet Protocol (IP) packet with the IP addressing based on fixed "virtual circuits" between the SNA access and egress points. Once within the router network, the traffic is routed according to standard IP routing tables.

This technology is key for managers trying to consolidate LANs and SNA networks. Many vendors offer proprietary solutions, usually at little or no extra cost but often lacking in functionality and flexibility.

COLLAPSED BACKBONE ROUTING is a method for improving the bandwidth and manageability of a backbone network. In place of the traditional architecture, a single high-performance router is installed. Each individual LAN is given a dedicated LAN port on the collapsed backbone router; the backplane of the router serves the same role as the traditional backbone network.

The use of a router as the collapsed backbone node will likely give way to switching systems during the next two to three years. Managers using a collapsed backbone architecture need to evaluate features such as product reliability and backup, as this type of product is generally a single source of failure in many networks.

—Fred J. McClimans

MAKE WAY FOR SWITCHES

The next generation

Traditional local-area network technology operates in a shared-segment manner. That is to say, Ethernet, Token Ring and Fiber Distributed Data Interface LANs force attached users to share the entire available bandwidth with all other users on the LAN. LAN switching systems, on the other hand, are reshaping this "shared access" approach. There are a number of different types:

PORT SWITCH: This device allows an administrator to remotely redirect traffic among incoming ports on a LAN hub and the shared-segment backplanes within the hub. The administrator can reconfigure which users are connected to which shared segments on the backplane of a LAN hub. Bytex Corp., Chipcom Corp. and LANnet Data Communications are strong here.

SEGMENT SWITCH: A segment switch is a fast, economical way to break up a large LAN into several smaller components. Like a learning bridge, it forwards LAN packets among LAN segments — but only if the packet is truly destined for that LAN segment. Users typically deploy these devices to reduce the number of users on a single shared segment, thereby improving LAN access. Companies such as Artel Communications Corp., Alantec, Inc. and Synernetics, Inc. are strong here.

FRAME SWITCH: A device that functions like a segment switch for wide-area traffic, such as X.25 or frame relay.

CELL SWITCH: A device that switches cells (such as ATM) instead of LAN frames or packets. Cell switching is used by vendors such as LANnet, Fore Systems, Stratacom, Inc. and Newbridge Networks Corp., although many others will be shipping products within the next year that provide this type of support. Cell switching will likely be used at the core of many segement and frame switches in the next two to three years.

— Fred J. McClimans

QUIZ

How much do you know about internetworking?

By Scott Bradner

1. You can use routers from different vendors in the same network.
true false

2. With APPN, it is easy to integrate SNA into a multiprotocol enterprise network.
true false

3. The Point-to-Point Protocol (PPP) allows you to connect routers from different vendors over all WAN links.
true false

4. SNMP guarantees that a network manager can control all internetworking devices using a standard database.
true false

5. You can only use 30% of an Ethernet's 10M bit/sec. data rate.
true false

6. 100M bit/sec. FDDI is always better than 10M bit/sec. Ethernet.
true false

7. You should not use TCP/IP in new data networks because we are running out of network addresses.
true false

8. You can reduce overhead traffic by using a router instead of a bridge to connect two LANs over a wide-area link.
true false

9. You should use bridges instead of routers because they are so much faster.
true false

10. A popular network design puts all your eggs in one basket.
true false

Answers on page 122

TYPING WITH BOXING GLOVES.

MOVING MISSION-CRITICAL APPLICATIONS TO CLIENT/SERVER.

ANSWERS TO THE QUIZ, page 121

How did you do?

1. TRUE. In most cases you can mix routers from different vendors if they interconnect over an Ethernet, FDDI or Token Ring LAN. The standards for the encapsulation of data and the format for routing information on LANs are well-established and implemented for most protocols.

2. FALSE. IBM has licensed its Advanced Peer-to-Peer Networking (APPN) software to a number of router vendors, but the resulting products have not yet proved themselves in the real world. A number of vendors have announced plans for APPN products, and there should be a variety to choose from soon.

3. FALSE. The use of the Point-to-Point Protocol (PPP) with Transmission Control Protocol/Internet Protocol (TCP/IP) has been standardized, and products have been shown to interoperate for simple data transfer. Some problems have been found when using advanced routing protocols such as Open Shortest Path First, but things work for the most part.

The story is quite different for other protocols. A version of PPP that includes multiprotocol support is working its way through the standards process, but final adoption and implementation are still some time away.

4. FALSE. There are standards for databases — called Management Information Bases (MIB) — to be used by Simple Network Management Protocol (SNMP) for different types of devices, but some vendors don't implement them fully or skip them altogether and roll their own. Just because a vendor claims its network-based device uses SNMP does not mean it uses the standard MIB for the device. Products that use incomplete or nonstandard MIBs force the network manager to customize the management station.

5. FALSE. This is an old fable told around the campfires of Token Ring salesmen. Ethernet does have a problem if you have too many nodes on the same LAN. Even with this limitation, though, it is easy to make use of more than half an Ethernet's theoretical bandwidth, and the peak is closer to 65% than to 30%, even with 100 nodes per LAN.

6. FALSE. If you have 20 nodes sharing an FDDI ring, each of them can use, on average, 5M bit/sec. If you have the same 20 nodes connected to ports on an Ethernet switching hub, each one will be able to use almost twice as much. You will not have as high a peak transfer rate, but the average will be better, and this solution can be less expensive than an FDDI ring.

7. FALSE. There has been a scare about this in the last year or two, but current projections show that this network number exhaustion will not occur until about the year 2000. By that time, the Internet community will have agreed on and deployed an alternative to TCP/IP.

8. TRUE. The use of routers in place of bridges will eliminate almost all broadcast traffic from the wide-area network link. Although some routing protocol traffic will be required between the routers, this will almost always be far less than the broadcast traffic displaced.

9. FALSE. In the Ethernet environment, both bridges and routers can meet the theoretical limits of the network technology. There is not much difference after you reach that point.

10. TRUE. A number of network designers now believe that bringing all of the LANs in an enterprise back to a common location and interconnecting them with a single high-speed router provides for easy management and very high speed. This is the ultimate in collapsed backbones: The router backplane serves as the campus backbone.

As a number of vendors are now advertising backplane speeds of .5G to 1G bit/sec., the capacity of this design far exceeds technologies such as FDDI rings. The design does result in a bit of a single point of failure, though. ■

Scott Bradner is director of the Harvard University Network Device Testing Laboratory.

RemoteWare and the SEMINAR [redacted] missed

THE VERY MOMENT AN EXPERT WAS EXPLAINING THE COST- AND SANITY-SAVING BENEFITS OF REMOTEWARE-CREATED AUTOMATED WORKFLOW SYSTEMS TO A ROOMFUL OF HIS FELLOW CLIENT/SERVER AFICIONADOS [redacted] was sitting

in a tiny center seat, in coach, staring blankly at a fly nimbly exploring the OXYGEN PANEL above him. It had come down to a scheduling conflict. One more FREE product seminar, half-day, inevitably bad deli sandwiches... potato chips that had gotten too close to the kosher dills and gone soggy. Or this junket to clean up yet another set of branch communication difficulties in Opelika, St. Louis, and San Antone. So the picture of this fly on the ceiling RUBBING ITS FRONT LEGS TOGETHER with an ominous delight didn't have the significance for him it might have had he seen that MEANWHILE, BACK AT THE SEMINAR THE REMOTEWARE FOLKS WERE SPINNING COLORFUL TALES OF SUCCESSFULLY-IMPLEMENTED FIELD COMMUNICATIONS SYSTEMS, HOLDING CHARLIE'S TECHNO-PEERS FROM COMPETING COMPANIES CAPTIVE WITH THE PROMISE OF THOUSANDS OF FULLY-AUTOMATED, EASY-TO-MANAGE AND UNATTENDED DIAL-UP COMM SESSIONS, AND RIVETING ACCOUNTS OF REAL COMPANIES WITH HUNDREDS OF MOBILE CORPORATE LAPTOPS AND REMOTE BRANCH OFFICES USING CENTRALLY-CREATED AND MANAGED ELECTRONIC FORMS, DOCUMENTS, AND REPORTS, ALL LINKED TO CENTRAL SYSTEMS AND DATABASES, AND ALL NEATLY SUPPORTED BY INTEGRAL ELECTRONIC SOFTWARE DISTRIBUTION CAPABILITIES!

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But what did he know? He was headed to lunch with the fellas in San Antone. For bad deli sandwiches. And SOGGY CHIPS.

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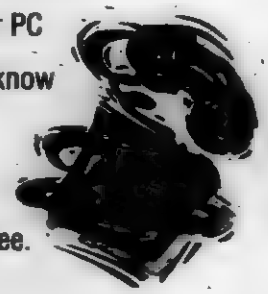

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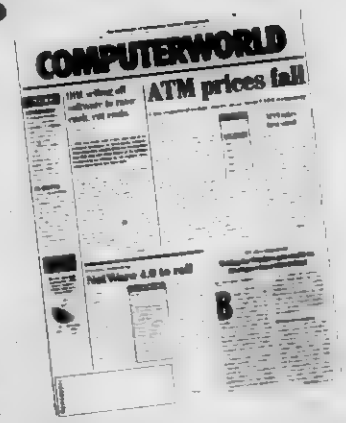

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COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

Attachmate's Extra grabs top spot in LAN/SNA gateway satisfaction

By Kevin Burden

Extra from Attachmate Corp., the smallest of the four vendors competing for the top spot in the local-area network/Systems Network Architecture (SNA) gateway market, squeaked by its competition to win our Buyers' Satisfaction Scorecard.

This is the second time Extra took the top spot. The last time we rated SNA gateways (Jan. 28, 1991), the product also slipped by the other vendors, beating Digital Communications Associates, Inc.'s IrmaLAN by just one point.

Extra has increased its shipments in the last several years, from 2,100 in 1990 to 2,700 in 1992, according to Framingham, Mass.-based International Data Corp.

Eicon Technology Corp.'s SNA Gateway finished a close second in overall user satisfaction with a score of 72, while also enjoying a second-place ranking in U.S. market share right behind Novell, Inc.

Desktop-to-mainframe gateways

PERCENT OF 1992 U.S. INSTALLED BASE (TOP 4 VENDORS)

TOTAL INSTALLATION (TOP 4 VENDORS): 56,050
TOTAL INSTALLATIONS (ALL VENDORS): 108,791

Positioning itself as a solutions provider for wide-area networks, Eicon's success is impressive because unlike Novell, it continues to achieve double-digit growth without the strong network operating system sales to pave the way.

IrmaLAN achieved an overall score of 70, two points behind Eicon. The company had a comeback year in 1992: It shipped 3,300 gateways, up from 2,090 in 1991, which was a 12% decline from 1990.

Digital Communications Associates also added to its gateway arsenal by purchasing Computer Logics this year.

Novell's NetWare for Systems Application Architecture (SAA) gateway came in five points behind Extra, with a score of 69.

Because gateway sales are so closely integrated with the sale of network operating systems, Novell has maintained a clear advantage in this market in terms of market share. Last year, the company shipped close to 9 million nodes of NetWare 3.X and 2.X — more than 10 times that of any other network operating system vendor.

Novell sold its previous gateway to Microdyne Corp. at the beginning of 1992, which allowed it to focus more on NetWare for SAA. Novell has also been able to take advantage of IBM's sales channels, which have accounted for more than half the sales of NetWare for SAA. ■

METHODOLOGY

User names were obtained from nonvendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 98.

Users rated their satisfaction with their installed products in 16 different categories and were not asked to compare or rate one product directly against another in the Scorecard. All categories were factored into the final scores.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for all remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers were rounded off where necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following for their assistance in preparing this Buyers' Scorecard: *Computerworld* Database Division; Nancy Meachim, International Data Corp.

Attachmate's Extra 3270 Gateway Option

SCORE 74

RESPONSE BASE: 50 USERS

RATINGS BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

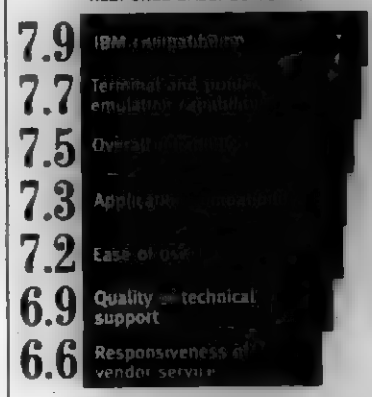
Would you buy the program again?

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Eicon's SNA Gateway

SCORE 72

RESPONSE BASE: 28 USERS



RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

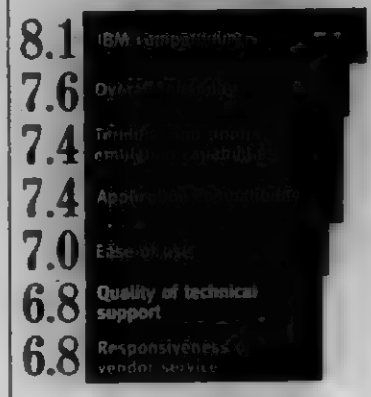
Would you buy the program again?

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Digital Communications Associates' IrmaLAN

SCORE 70

RESPONSE BASE: 50 USERS



RATINGS BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

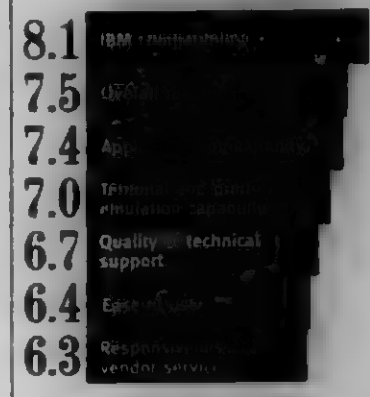
Would you buy the program again?

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Novell's NetWare for SAA

SCORE 69

RESPONSE BASE: 50 USERS



RATINGS BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

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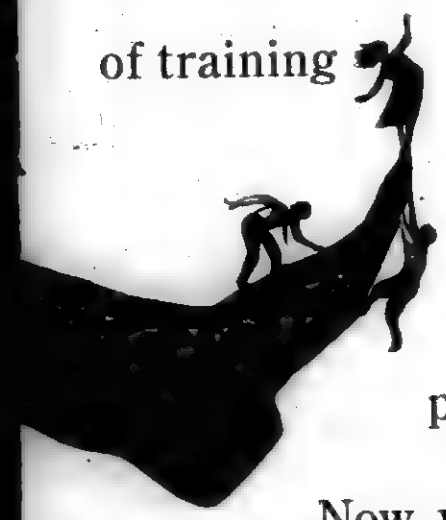

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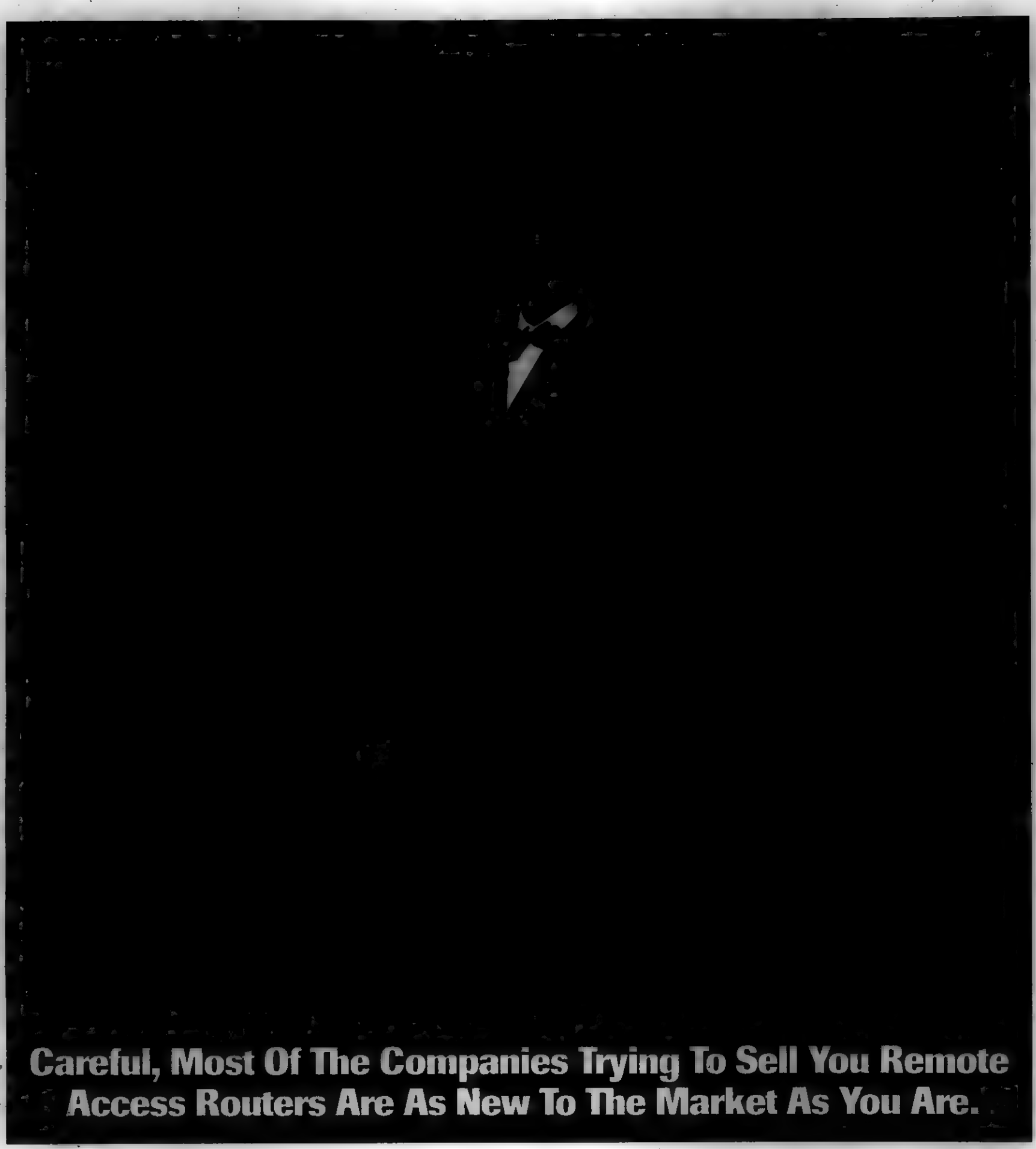

Careful, Most Of The Companies Trying To Sell You Remote Access Routers Are As New To The Market As You Are.

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CISCO SYSTEMS

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Cisco Systems' 7000:
Users give router high marks for installation, protocol support

Cisco Systems' Cisco 7000

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

- **Cisco Systems, Inc.'s Cisco 7000 internetworking router was praised by evaluators for its ease of use, multiprotocol support and fault-tolerant features.**
- **The evaluators also said the performance and pricing were in line with expectations.**

If the late 1980s were the years of the local-area network, the 1990s will surely be the decade of the internetwork. Why? Companies that are long past the stage of connecting PCs and workstations now want seamless networks that span the continent and the globe.

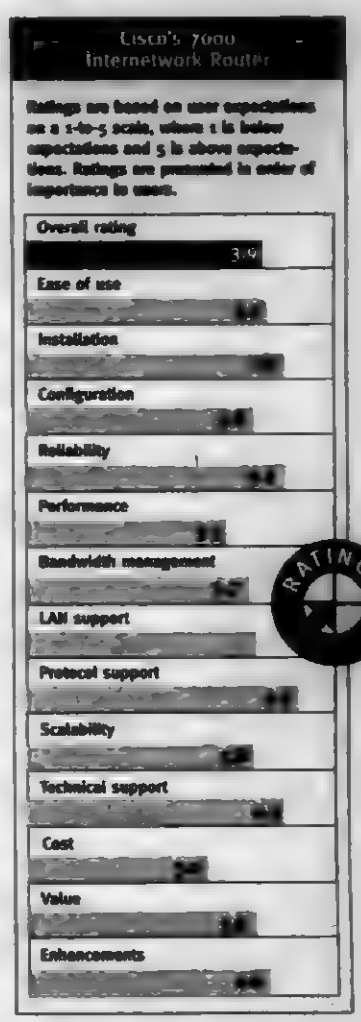
One company that has aided in that effort is Cisco Systems, Inc. in Menlo Park, Calif. A dominant supplier of internetworking routers, it announced its high-end Cisco 7000 in January.

At its unveiling, the Cisco 7000 caused a stir among analysts and users. Competitors Wellfleet Communications, Inc. and Coral Network Corp. had been releasing fault-tolerant routers with better throughput and larger capacities.

The Cisco 7000 came out with competitive features. Specifically, it boosted performance about 50% above previous Cisco routers, according to Cisco benchmarks. Fault tolerance is delivered through redundant power supplies and a "hot swap" feature that allows users to replace failed components while the router is on-line and operational. Capacity was boosted with five card slots that can support a variety of connections including 30 Ethernets, five Fiber Distributed Data Interface rings, 20 Token Rings, 40 wide-area network serial ports or a combination of those alternatives.

Evaluators for this Firing Line include technical staff members at a major health care provider, a public utility company, a computer services firm and a large regional bank. All have been working with the Cisco 7000 for a period of one to six months. All evaluators had also considered the IBM 6611 router in competitive evaluations with the Cisco 7000. Collectively, the evaluators oversaw 17 Cisco 7000 routers at an average cost of about $70,000 for each unit, including service, support and spare parts.

The format for this evaluation was prepared with help from Howard Rubin Associates and Technology Investment Strategies Corp.



Ease of use

The evaluators said the Cisco 7000 presented few problems in terms of day-to-day use, including adding or removing hardware components. They said the design of the chassis made it easy to swap components in and out of the router.

Health care: "It's very easy to view the status of network components and very easy to work with."

Computer services: "I was happy with the upward compatibility [of other Cisco routers] to the 7000. We didn't have to learn anything new."

Ease of installation

Average installation time was about one hour per unit, all the evaluators said. The utility evaluator expressed misgivings about installing the unit in a standard network rack but was assured by Cisco representatives that his concerns would be addressed.

Health care: "This was the first time we've installed a high-end router. The instructions were clear. It took about one hour to physically install."

Bank: "It was easy to handle, the instructions were complete, and [installation] took about one hour per box."

Configuration

The evaluators said the Cisco 7000 was about as easy to configure as earlier Cisco routers. They mentioned the command-line syntax required to program the router and said they thought configuration would be eased with a menu-driven or graphical interface.

Computer services: "We replaced five routers with one Cisco router and were able to do so on the first shot. It was very easy."

Bank: "Compared to Wellfleet [routers], it was more difficult [to configure]. It's not menu-driven, so you have to look in the manuals, and you're not sure what options you have."

Reliability

The evaluators noted few reliability problems beyond the norm. Most failures were attributed to individual networks rather than the Cisco 7000. The banking evaluator had tested reliability by hot-swapping cards but had not experienced any operational failures.

Utility: "[Reliability] improvements are the redundant power supplies and the hot-swappability of modules."

Computer services: "Fault tolerance of the 7000 seems to be better than some [competitive] systems. You have more cards and redundancy."

Performance

Performance, according to the evaluators, was in line with their

Cisco 7000, *page 130*

Installation descriptions for users who evaluated the Cisco 7000

	Health care	Public utility	Computer services	Banking
Cisco 7000s installed	2	4	1	10
Installed since	FEBRUARY 1993	JULY 1993	JULY 1993	JUNE 1993
LANs supported	ETHERNET, TOKEN RING	ETHERNET, TOKEN RING	ETHERNET, TOKEN RING	TOKEN RING, SERIAL
Protocols used	IPX, APPLETALK, TCP/IP	BANYAN VINES, TCP/IP, SNA	TCP/IP	IPX, NETBIOS, TCP/IP
WANs supported	FRAME RELAY	FRAME RELAY (PLANNED)	T1, FDDI (PLANNED)	FRAME RELAY, SERIAL 56K, T1

Evaluators neutral on cost, performance; say software could use upgrade

CONTINUED FROM PAGE 129

expectations. However, none had pushed the unit to its threshold, with the banking and health care evaluators saying they had not exceeded 20% and 50% of capacity, respectively.

Utility: "We're not pushing the parameters of the box right now, but we expect it to perform well."

Computer services: "We expected it to replace five routers, and it performed very well."

Bank: "We're not even at 20% of [the router's] capacity."

Bandwidth management

None of the evaluators made extensive use of the Cisco 7000's bandwidth management features, although they agreed documented specifications seemed to fulfill their expectations.

Health care: "We noticed that the base scripting and management capabilities can be awkward at times, although they are comprehensive."

Bank: "The 7000 gives you a lot of options to control traffic. On Novell [NetWare], we're able to block some services."

LAN support

The health care evaluator wanted better network analysis in the Cisco 7000, including the ability to copy network packets to a separate analysis buffer. The computer services evaluator said many functions of LAN analyzers could be integrated into internetworking routers such as the Cisco 7000.

Utility: "They support everything we need to do and beyond."

Computer services: "It is comparable with other products, but I'd expect more features to monitor a LAN."

Protocol support

Protocol support may be one of the most vexing issues in the networking industry. Router vendors must support a wide range of de facto standard protocols, as well as variations in protocol implementation.

The evaluators gave the Cisco 7000 router high marks for protocol support, saying that protocol problems had promptly been addressed and fixed by Cisco engineers.

Health care: "There has been a problem with some protocols, but Cisco came up with a fix in five or six days."

Utility: "They support every protocol we have ever wanted to support, although there have been intermittent problems with each of them."

Computer services: "It's not error-free, but this is the heart of the router, and Cisco has really put a lot of effort into debugging some of these protocol issues."

Scalability

The evaluators said Cisco's stated product plans were their primary gauge of scalability. They concurred that the key issue was compatibility with the current product line and that they had no preference for a particular architecture.

Health care: "Our needs will be increasing quickly over the next eight to 12 months, so their migration path for the CBus and the switch processor is important."

Utility: "They talk about scalability in their future products, but only time will tell."

Computer services: "We're nervous about the compatibility of the existing system."

Facts about the Cisco 7000

- Dual redundant power supplies.
- Hot swap of components while router is in use.
- Configured price approximately $70,000.

Cisco Systems, Inc.
1525 O'Brien Drive
Menlo Park, Calif. 94026
(415) 326-1941

Technical support

With a range of support contracts, the evaluators agreed that Cisco's technical and engineering support was superlative. Two of the evaluators said they use third-party technical support services because of concerns about on-site support in far-flung or remote offices.

Utility: "Their tech support is excellent. The people are knowledgeable, and it's definitely one of their high strengths."

Computer services: "The thing they do best is tech support."

Costs

Evaluators said the costs of Cisco 7000 routers, service and parts were in line with their expectations. The evaluators spent approximately $70,000 on average per installed unit.

Utility: "If you stuff the chassis with [network] cards, the cost per port comes down and becomes very economical. It also depends on your network design, which can bring down costs."

Computer services: "In our environment, we replaced five boxes with one [Cisco 7000], so it was cost-effective."

Value

The evaluators rated overall value slightly better than the cost per unit.

Health care: "We've gotten what we paid for."

Bank: "It provides the internetworking we need for our applications and our sites."

Enhancements

The evaluators concurred that the hot-swap cards and redundant power supplies were the best enhancements to the Cisco 7000. Future enhancements include better bandwidth management, gateways to IBM host systems and Asynchronous Transfer Mode (ATM) interfaces.

Utility: "There are still some features we'd like to see, like better hot-swappability. But the design is excellent. The next thing we're waiting for is ATM."

Computer services: "It's not a different box [than the AGS+], other than size and redundancy. We wanted something [to replace the AGS+ line] that was bigger, compatible and wouldn't go down."

Bank: "Fault tolerance was the most important." ■

Reported and written by Computerworld *senior editor Garry Ray.*

Cisco responds

Cisco officials provided these responses to issues raised in this evaluation.

▶**Scalability:** Cisco intends to maintain compatibility and upward scalability in future iterations of our high-end line of routers through software compatibility, architectural design that anticipates and supports interfaces to accommodate new technologies and adherence to industry standards. The Cisco 7000 was designed to serve as the foundation for tomorrow's high-performance technologies, including silicon packet-switching and ATM technology.

By the end of next year, the Cisco 7000, while remaining fully software-compatible with existing Cisco platforms, will double its performance on all media through the use of silicon-switching technology and will support such advanced interfaces as ISDN Primary Rate, IBM channel and channelized T1. The architecture also allows for future performance upgrades.

▶**Architecture:** In order to protect the investments of our installed base of customers, Cisco will continue to offer the product architectures and solutions that meet customer demand for scalable performance with traumatic "fork-lift" upgrades.

The Cisco 7000 has a very powerful architecture that handles all LAN/WAN connections easily. For example, a heavily loaded Ethernet plugged into a Cisco 7000 today consumes about 1% of the router processing power of the box. Additionally, unlike some parallel backplane architectures, the Cisco 7000 is not constrained by its interfaces. The proof is that Cisco is well along in the development of a 155M bit/sec. (bidirectional) ATM interface.

▶**Future enhancements:** To address the high-speed, distributed backbone network architectures of the near future, the Cisco 7000 will be enhanced with silicon switching; a multiple channel interface processor; an IBM channel-attach interface and ISDN Primary Rate interface; an ATM interface; and support for routing clusters that can act as high-speed silicon cell switches.

Let BENCHMARKS Help You Select the Right Windows NT System for Your Business ★

With its potential to span the operating system environment from personal to departmental to mainframe to data center, Microsoft's Windows NT enables you to take advantage of the best microprocessor technology available, such as Digital's AXP processors — dubbed by *PC Week* as the "dream machines of the Windows NT world."

In deciding on a Windows NT system, you must first understand how this system will fit into your business — as a PC, as a workstation, or as a server. With an increasing number of vendors to choose from, the actual selection of a particular Windows NT system may prove difficult. Benchmarks will help.

A Word of Advice When Choosing Windows NT Benchmarks

Benchmarks measure everything from CPU to memory to I/O subsystems, and more. As a general rule, you should always pick benchmarks that most closely resemble your particular application environment. That way you'll avoid the surprise — not to mention the cost — of a system that isn't up to your specific business requirements.

When comparing benchmarks from different vendors, be sure to acquire information that gives you the closest comparison. For example, it's not a good idea to compare TPC-A numbers from one vendor with SPEC numbers from another. The particular benchmarks you're comparing and contrasting should be the same across the board — no matter how many vendors you're looking at. In addition, make sure to use the same version of each benchmark.

For Windows NT specifically, be sure to use benchmarks that are ported native to Windows NT. Native benchmarks are written to Windows NT's Win32 API (Application Programmer's Interface) and provide truer performance numbers than non-native benchmarks.

Here's a benchmark listing to assist you in selecting the best Windows NT system for your business.

PC Benchmarks for Windows NT

Hellstone
(*Windows Magazine*)
Hellstone offers a good system level comparison of native Windows NT platforms. It measures integer performance (Dhrystones per second), floating-point performance (KiloWhetstones per second), disk performance (kbytes per second), and video performance (megapixels per second).

Ziff-Davis
The Ziff-Davis benchmark is made up of three different tests. The processor test, measured in cycles per second, executes a mixture of operations. It does not exercise floating-point math capabilities, but it is designed to exceed the limits of the onboard processor cache, so as to test the secondary cache subsystem and cache-to-memory interface.

The graphics test, measured in megapixels per second, executes typical Windows functions such as drawing lines, drawing polygons, and rendering fonts on the screen.

The disk test, measured in kilobytes per second, measures the aggregate speed of the processor, hard disk, and intervening cache/controller subsystems in transferring data to and from mass storage.

Decide how your Windows NT system will be used. Will it run PC spreadsheet applications? Workstation CAD applications? Or will it run as a server? As the operating system of the future, Windows NT can do the work of all three. Then, choose the benchmarks that allow you to best evaluate your business processing environment.

Workstation Benchmarks for Windows NT

Mandelbrot
This benchmark uses Mandelbrot set generation and display to determine the double-precision, floating-point speed rating of a system. The Mandelbrot set can be used as a computer performance benchmark by measuring the rate at which double-precision floating-point computations are performed in generating the set. Such measurement leads to an application-specific measure of a system's speed. (Metric: MandelFloats)

CLINPACK
A linear equation solver written in C, CLINPACK programs consist of floating-point additions and multiplications of matrices. 100 × 100 CLINPACK solves a 100 × 100 matrix of simultaneous linear equations. Source code changes are not allowed so that the results may be used to evaluate the compiler's ability to optimize for the target system. (Metric: execution rate measured in MFLOPS)

X11perf
X11perf tests various aspects of X server performance including simple 2D graphics, window management functions, and X-specific operations. This benchmark employs an accurate client/server synchronization technique to measure completion times of graphics operations. X11perf tests primitive drawing speeds of graphics and window environment manipulation. (Metrics: 2D kilovectors/second drawing rate, 2D megapixels/second fill rate)

PLB
PLB (Picture-Level Benchmark) allows comparisons to be made of graphics display performance for different hardware platforms. It contains six applications: a typical 2D electrical CAD application, a 3D wire frame model of a computer chassis, a 3D solid model of an automobile engine's cylinder head, a 3D model of a human head created using data generated by a laser scanner, an example of a low-end 3D simulation, and an architecture walkthrough of an artist's studio consisting of 300 frames. Each benchmark generates two GPCmarks, the PLBlit (literal) and the PLBopt (optimized).

SPEC CINT92 and CFP92 (Standard Performance Evaluation Corporation)
CINT92, the integer suite, contains six real-world benchmarks written in C. The suite represents application areas including circuit theory, LISP interpreter, logic design, data compression, spreadsheet, and software development. SPECint92 — the geometric mean of the suite's four SPECratios — is a good base indicator of CPU performance in a commercial environment.

CFP92 consists of 14 real-world applications; 2 are written in C and the remaining 12 in FORTRAN. This suite of benchmarks represents application areas such as circuit design, quantum chemistry, optics, robotics, quantum physics, weather prediction, and others. SPECfp92 — the geometric mean of the suite's 14 SPECratios — may be used to compare floating-point-intensive environments.

Dhrystone
This benchmark measures integer processor and C, Ada, or Turbo Pascal compiler efficiency. Dhrystone is representative of systems

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imagine the best solutions for your business needs. digital

programming environments and contains many procedure calls. (Metric: Dhrystone Millions of Instructions per Second [DMIPS])

Server Benchmarks for Windows NT

TPC-A

This benchmark measures CPU, memory, I/O subsystems, terminal handling, and database performance. TPC-A is an online transaction processing benchmark and is database dependent. Some vendors use client/server or front-end/back-end configurations. (Metrica: tpsA-Local and $/tpsA-Local)

TPC-C

TPC-C exercises a breadth of system components associated with online transaction processing (OLTP) environments. The workload is a mixture of read-only and update-intensive transactions that simulate the complex activities present in many OLTP application environments. Five transactions are used to model the business activity, and each transaction is subject to a response-time constraint. (Metrica: tpm-C, i.e., number of orders processed per minute, and price-per-tpm-C)

To get an online copy of Digital's AXP PC performance brief, use the Internet application, FTP, to connect to gatekeeper.dec.com.

NETbench (Ziff-Davis Labs)

NETbench consists of three benchmarks that focus on CPU throughput with the metric in transactions per second, Network Interface Card (NIC) throughput in bits per second, and I/O throughput in bits per second.

In Store for the Future: Tomorrow's Windows NT Benchmarks

Look for the following benchmarks to be ported to Windows NT in the near future.

BAPco

BAPco — a consortium of PC manufacturers and PC software vendors — created an applications-based benchmark to demonstrate realistic application performance. Its first benchmark, SysMark92, was introduced in 1992 and contains eleven real applications, eight DOS-based, and three Windows-based applications in six categories. With the SysMark92 suite, you're provided with actual applications-based benchmarks in the areas of word processing, spreadsheet, database, desktop graphics, desktop publishing, and software development.

Khornerstone

Developed by Workstation Laboratories, the Khornerstone benchmark contains 21 separate tests that rate the overall performance of a system. The tests include both public domain, e.g., Whetstone, Dhrystone, Sieve, etc., and proprietary routines. Khornerstone measures single-user loads on a system and provides one number to represent that load condition. (Metric: Total Khornerstones)

Ghraphstone

The Ghraphstone tests — 125 tests in all — draw a variety of different graphics shapes and sizes and measure the operations per second that graphics hardware can support. The tests are written in C and have been ported to a number of different graphics libraries such as X11, Microsoft GL, SiliconGraphics, CGI, CORE, and GKS. Currently, these tests run on MS-DOS and UNIX. (Metrica: operations per second for each drawing function; a summary performance number for each of 13 different figure types; a summary Ghraphstone rating indicating overall graphics performance)

For information on Windows NT performance benchmarks or benchmarks on Digital's AXP-, Intel-, MIPS-, or VAX-powered processors, write to the following Internet address:

cxgperf@mabcs.enet.dec.com

Begin 21st Century Application Development Today — With PowerHouse and Alpha AXP

If you're looking for the fast route to the future of application development, the search is over. Cognos, Inc. is now shipping its PowerHouse 4GL application on Digital's Alpha AXP platform. It's the first 4GL with native-mode availability to ship on Alpha AXP and OpenVMS systems. In short, the most widely used 4GL in the Digital marketplace is now better than ever — running on the world's fastest microprocessor.

"Our Alpha AXP strategy is part of the Cognos commitment to provide powerful solutions to Digital users and our VARs who have written applications in PowerHouse," says Ron Zambonini, President and COO of Cognos, Inc. "This commitment has made us one of Digital's largest COHESION solution providers. We're also fully committed to support Digital's strategic direction with Alpha AXP, DEC OSF/1, and Windows NT platforms."

Whether you choose to move to the Alpha AXP platform today or tomorrow, change all your systems or just a few, the flexibility and compatibility of PowerHouse can help you succeed.

"We went the extra mile, ensuring that PowerHouse applications are completely binary compatible between VAX systems and Alpha AXP systems," Zambonini explains. "Customers can build applications on the VAX system today and run them on an Alpha AXP system later. Or, they can use the power and speed of Alpha AXP systems to develop applications of the future right now."

Cognos/Digital Solutions Get Rave Reviews from Customers

PowerHouse applications have already been ported to the Alpha AXP platform — with positive results for Cognos' value-added resellers and customers alike.

"Digital and Cognos made it possible for us to take advantage of the latest in technology without changing a single line of code," says Brian Deppeise, Vice President of Technology, StarGarden Corporation. "For us, the move to OpenVMS on Alpha AXP was very simple."

Lou Anne Strickland, VAS Software President, explains that "with PowerHouse on Alpha AXP, we can now offer our customers VAS financial packages running on a very powerful alternative within the Digital family."

For the Marketrieve Company, the porting of its MarketrievePlus marketing and sales automation system was completed with ease. "The process couldn't have been more straightforward thanks to Cognos and Digital," says company President Edward Lucia. "This opens up a new market for our PowerHouse-based software and lets Marketrieve get in on the ground floor."

For information on PowerHouse, the StarGarden Human Resources Information System, VAS Software financial packages, or the MarketrievePlus marketing and sales automation system, call 800-4COGNOS (800-426-4667), ext. 81. ■

Imagine the freedom to choose from a range of technology options.

When It Comes To **DATABASE TECHNOLOGY,** Digital Delivers **CHOICE SOLUTIONS**

By Gareth Tasko, Manager
Database Partners Program

The world of computing is becoming increasingly open. And businesses aren't looking back. In fact, they're looking ahead — and demanding more.

You don't want to be locked into any technology component that you can't change, including your platform and your operating system. It's no surprise that your database is also a significant and key component of the solution you're looking for.

In selecting a database, you have made your requirements known.

- Many businesses operate one or more database technologies across their IT infrastructure. Therefore, you need to be sure that the database products you purchase will interoperate and integrate with your existing IT environment.
- You want to be able to change database technology when and if the need arises.
- Most important, you want to ensure that the technology you acquire takes full advantage of your particular computing environment.

In short, you're asking for freedom, flexibility, and maximum performance.

To that end, Digital has joined forces with industry-leading database vendors such as Informix, Ingres, Oracle, Progress, and Sybase to architect the very best solutions for your business needs.

Customers have been asking Digital for help to create solutions that include database products from Informix, Ingres, Oracle, Progress, and Sybase. We've responded with enhanced partnerships to help you solve your business problems.

Digital's Database Partners Program Enhances Database Technologies for Your IT Environment

Imagine high-performance, distributed database technology that's well integrated with the information technology you purchase today. Then imagine using this technology to access information from anywhere in your company — quickly and reliably.

Digital's Database Partners Program is making this scenario a reality. And our customers have played a significant role. You let us know which database technologies were critical for your business, and we, in turn, developed the technology and business partnerships with key vendors to optimize your choices.

The program follows a basic premise. It tightly couples Digital's and our partners' capabilities — resulting in an optimized technology set. And, it's successful because we've established one place where our partners link directly to our development organizations, receive assistance in handling business needs, and participate in programs to promote these new enhanced product sets.

So, how do you benefit? By bringing all these together in one location, Digital, along with our partners, can produce optimum sets of solutions for your business — a vast portfolio of solutions that gives you the freedom to pick and choose according to your specific business needs.

Digital's Database Partners Are Looking to the Power of Alpha AXP Technology

Gone is the classic definition of a database as a repository for data on only one computer system. If you want to distribute different databases safely across many systems — within your office building or across the ocean — this choice is now available.

With all the downsizing, rightsizing, and reengineering of applications going on in the business world, it's a trend that has caught on. It's called open client/server computing. Open because the technology components are interchangeable and interoperable; client/server because computing is being distributed across a whole range of platforms. And popular because of its flexibility and cost-efficiency.

Today, database technologies are designed to run in many environments. What's more, Digital's database partners are taking advantage of Alpha AXP power by offering products on a range of Alpha AXP systems — from PCs running Windows NT to mainframes running OpenVMS or OSF/1.

In fact, using standard benchmarks — both in the uniprocessor and multiprocessor categories — Digital has broken all records by teaming the Alpha AXP platform with database enabling technologies.

Digital's 64-bit RISC architecture provides for huge memory addressing — enabling databases that typically had to reside on a disk to reside now in main memory. Since the slowest part of any transaction is disk I/O, this has enormous implications for the speed at which these databases function.

Currently, we're working with our key database partners to optimize the Alpha AXP architecture for database technologies. This effort will give our customers even more freedom to:

- Distribute across multiple platforms
- Distribute across fewer platforms that are multiprocessor-based for higher performance and improved availability
- Cluster applications and technologies together for improved availability

Ultimately, within your client/server environment, you can implement servers that are optimized for specific business requirements.

For information on integrated solutions from Digital and our third-party database partners, call:

Johanna Cheung at Informix Software, Inc. 617-273-0600

Jeanne Elrod at Ingres Corporation 510-748-2542

Oracle Corporation information HOTLINE 415-345-3267

Jeri Batina at Progress Software Corp. 617-280-4930

Dwight Chen at Sybase, Inc. 510-596-3500 ■

DIGITAL'S PARTNERS HAVE THEIR SAY

Informix has set ambitious goals for technical advancement, and we expect Alpha AXP technology to contribute significantly to those goals.

Allen Wil, Vice President
Product Development, Informix Software, Inc.

Ingres' support for the Alpha AXP architecture builds on our long-standing relationship with Digital. We feel this architecture will be a key component of open systems client/server architectures in the future.

Mort Millender, Vice President
Product Marketing, Ingres Corporation

Oracle Corporation believes that Digital's new Alpha AXP architecture has the potential to become an industry-leading open systems platform. The potential combination of ORACLE on an Alpha AXP system further strengthens our position as the leading provider of corporate OLTP solutions.

Larry Ellison, Senior Vice President
Product Line Division, Oracle Corporation

PROGRESS, combined with the scalable architecture and strong price/performance of Digital's Alpha AXP systems, gives application developers the power and flexibility to rapidly build and deploy client/server-based mission-critical applications. Users of Digital's Alpha AXP systems will have access to thousands of commercially available applications based on PROGRESS — giving users transparent application deployment and interoperability across a wide range of platforms.

John Ward, Vice President
Marketing and Development, Progress Software Corp.

With the Alpha AXP architecture, Digital is becoming a leader in delivering high-performance, commercial 64-bit systems. The combined SYBASE and Alpha AXP solution will become a premier performance architecture for enterprise-wide client/server solutions.

David Peterschmidt, Vice President
Worldwide Operations, Sybase, Inc.

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Digital Gives PRIME Customers Something to SMILE About

The economy has taken its toll on computer suppliers. However, there is a "light at the end of the tunnel" for those suppliers that have the ability to respond quickly to customer business needs. Digital is one such organization — finding new opportunities to help companies respond to today's business challenges.

But, where does that leave you? Or, more important, where does that leave your current computing investment?

A glance at today's headlines shows some computer companies consolidating and redefining their products and services to better meet your needs. Digital has been listening carefully to your concerns and is prepared to help.

How? By offering you a long-term, stable computing environment, a 25-year architecture with Alpha AXP, database and graphics capabilities, and a clearly defined path to get there. Together with recognized software vendors, Digital will provide the hardware products and software conversion tools you need to migrate to VAX VMS, Alpha AXP running OSF/1 or OpenVMS, ULTRIX on DECsystems, or SCO UNIX on Intel.

In short, we can provide you with a complete set of migration solution services.

Good News for Prime Customers

To remain competitive in today's market, businesses must anticipate their computing needs. Companies currently dependent on Prime technology are facing several challenges, including when and how to:

- Upgrade current technology without losing the entire investment in their Prime-based solution
- Move their business applications to a computing architecture that meets their open systems requirements
- Plan the migration to a new platform within a timeframe that makes good business sense and is easy to implement
- Implement a client/server strategy
- Contain or minimize operation costs

In spite of these challenges, there is good news. Through its investment protection program called Digital Solutions for Prime, Digital offers Prime customers a clear growth path to 21st century computing.

Simple, Practical Solutions

Whether your business goal is migration, coexistence, technology upgrading, or containment of operation costs, Digital has the consulting experience and tools you need today. In fact, our Solutions Integration Unit — along with our Independent Software Vendors — was on hand at the National Prime Users Group Conference recently to demonstrate Digital Solutions for Prime on the Alpha AXP platform.

DIGITAL OFFERS YOU A WAY TO PROTECT YOUR INVESTMENT IN PRIME COMPUTERS. THROUGH OUR COMPREHENSIVE SET OF MIGRATION SERVICES, YOU CAN MAKE A TECHNOLOGY TRANSITION THAT'S RIGHT FOR YOUR COMPANY.

Companies previously dependent on Prime have transitioned easily to Digital platforms because of all we have to offer, including:

- Prime migration/conversion consulting experience and extensive tool set
- A choice of operating system environments such as PICK, OSF/1, OpenVMS, ULTRIX, and SCO UNIX
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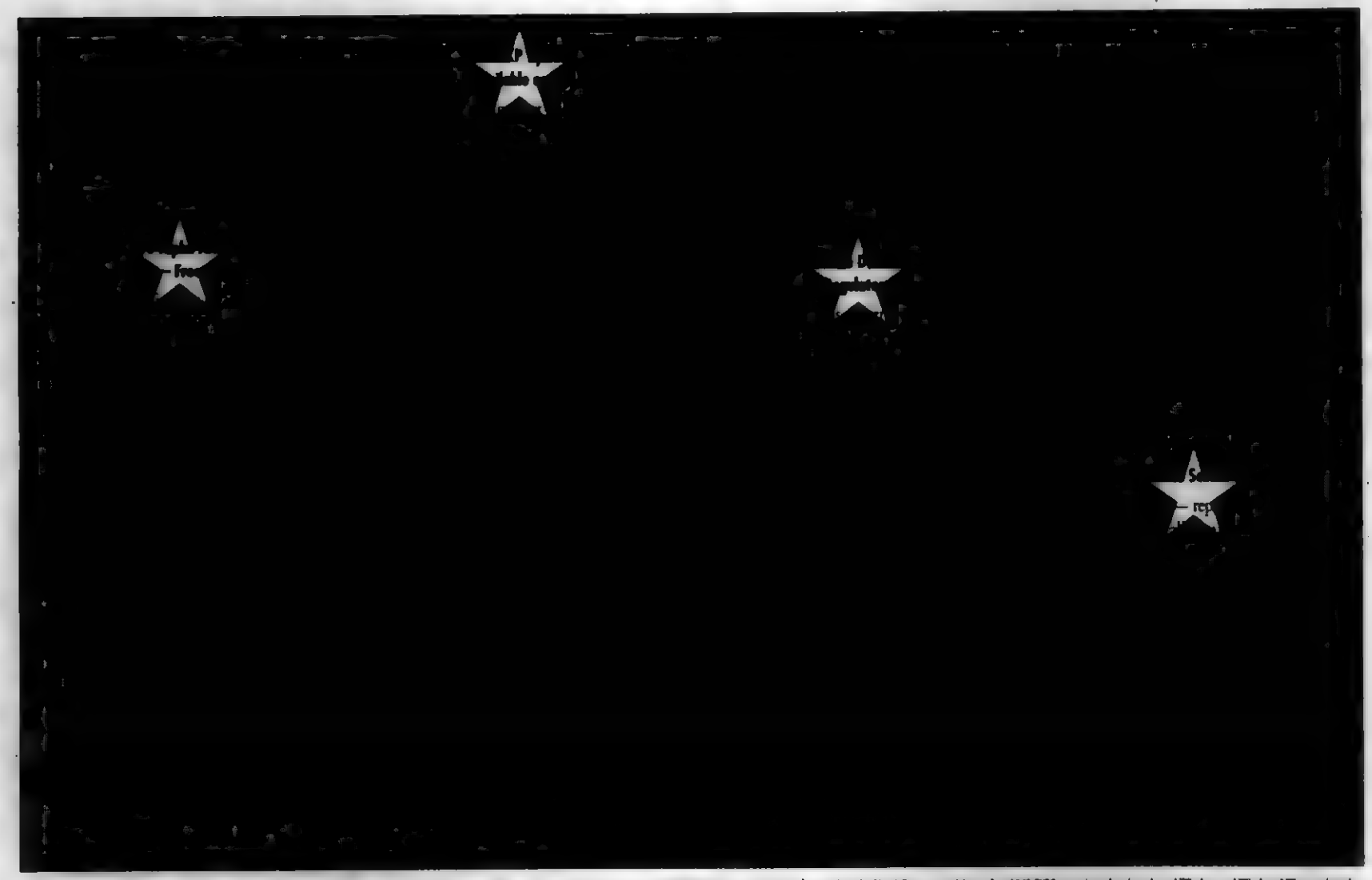

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PUTTING IMAGINATION TO WORK

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Working on the Brain Gang

Most advanced technology chiefs say the think-tank mentality is dead. The heat is on to make advanced tech work relevant to the business.

By Ellis Booker

Blue-sky technologists at end-user companies are an increasingly rare breed. These days, free thinkers unconcerned with the bottom line or the relationship between technology and explicit business goals have become a luxury few can afford.

On the other hand, as companies of all sizes race toward distributed environments — open architectures in which, typically, no one vendor dominates — corporate technologists have to work overtime watching the horizon for new software or new and untried companies.

Organizationally, while many information systems shops continue to designate a small group to perform this function, others have tried to distribute responsibility for "advanced technology" throughout the ranks. As one executive who promotes this sort of structure puts it: "We don't want to create two classes — one working on the new, the other with its finger in the dike of the old."

As complex as finding and selecting new technology can be, it often pales in comparison to the task of deploying it. One valuable approach is to make end-user departments part of the process of technology assessment. This has the same benefit as involving users in application development: It spreads responsibility and helps avoid a mismatch between what the users need and what IS ultimately delivers.

The following interviews with those involved in advanced technology touch on many points. But the most valuable advice may be the tips on how to avoid dead ends, headaches and heartaches.

MEET THE BRAIN GANG

On the next few pages, the following group of advanced technology execs share their views on planning for implementation and integration of new technologies.

MARK BARMANN
CIO
Charles Schwab & Co.
SAN FRANCISCO

JOHN DYNKOWSKI
MANAGER,
Emerging Technology
Midwest Securities
Trust Co.
CHICAGO

DAVID ECKERT
MEMBER,
Advanced Technology and
Architecture Group
Westinghouse
Savanna River
AIKEN, S.C.

BRUCE FOLGER
DIRECTOR,
Advanced Technology and
Resource Management
Variable Annuity
Life Insurance Co.
HOUSTON

GEORGE KENNEY
EXECUTIVE DIRECTOR
Swiss Bank Corp.
CHICAGO

KENNETH TIVEN
VICE PRESIDENT,
Television Systems
Turner Broadcasting, Inc./
CNN
ATLANTA

Tips on how to plan, deploy

Plan it

SWISS BANK

When it comes to advanced technology, "the CIO has to figure out which strategy the company is pursuing and then pick technologies," says George Kenney, executive director in charge of globalization of technology within the 260-person IS operation at Swiss Bank's U.S. headquarters in Chicago. Swiss Bank's business strategy is defined by product innovation, with object-oriented programming used to get it there.

"If product innovation is your goal, you want to be able to turn on a dime. One key technology for this is software reusability," says Kenney, who has standardized around Objective C.

▶ CNN's Kenneth Tiven *wants technology that delivers a 'warp leap'*

VARIABLE ANNUITY

Bruce Folger, director of advanced technology and resource management at Variable Annuity Life Insurance in Houston, says his research projects don't get undertaken unless some business-related project has been articulated first. In fact, the company does not allocate funds to research as a percentage of the IS budget. "Spending could be 3% this year, 10% next," Folger explains. "In a sense we're tying research to the business plan."

WESTINGHOUSE SAVANNA RIVER

David Eckert, member of the 10-person advanced technology and architecture group at Westinghouse Savanna, says his group must balance its initiatives between an investigation of far-out technologies (those that could have an impact five-plus years away) and ones promising short-term benefits.

TURNER BROADCASTING'S CNN

Kenneth Tiven, vice president of television systems, points out that when CNN considers new technologies, it desires "a warp leap, not a little leap." In other words, he says, tried-and-true systems will not be overhauled unless the benefits are large.

MIDWEST SECURITIES TRUST

At Midwest Securities, a broker clearinghouse in Chicago, an exclusively business-driven approach to new technologies is the rule. "The reason for no.['blue sky' organization] is cost justification," says John Dynkowski, manager of emerging technology in the 40-person IS shop.

Test it

CHARLES SCHWAB

At Charles Schwab, one promising approach to appraising advanced technology requirements and involving end-user departments early on has been the creation of 14 conceptual applications, known as Paths.

The idea is to figure out what the company needs functionally and match a technology to that. For example, mutual funds order processing is an easily identifiable application related to a business initiative.

Late last year, business unit executive vice presidents were named owners of the Paths and were vested with responsibility for deciding both the deployment of resources and the sequence of Path projects.

"We're breaking up our system, which is intensely mainframe-based, into thousands of little computers," Chief Information Officer Mark Barmann says. For this to work, workstations, not PCs, were the platform for the desktop.

MY JOB WOULD BE EASIER IF . . .

PRODUCTS WERE MATURE.

"I'd like longer track records and more mature products. I wish they were 50 years old, not two. Also, there's confusion in pricing strategy — there's no convention in the open systems market."

— MARK BARMANN

PRESENTATIONS WERE SUCCINCT.

"It would be easier if all vendors would start all presentations in the middle. I was recently scheduled to go to a very large American technology firm. They insisted on pinning down exactly when I would arrive. Now, since they are very fond of long, boring presentations, I showed up a day early and asked for the people I needed. They, of course, were horrified. I said as gently as I could that I didn't want to sit through three hours of a presentation."

— KENNETH TIVEN

VENDORS WERE ON THE BALL.

"Vendors should spend more time showing the business benefits than the technology benefits."

— DAVID ECKERT

▶ Midwest Securities' John Dynkowski *says to involve users*

Sell it

TURNER BROADCASTING

"You need to assume most people will have less confidence in the desirability of new technology," Tiven says. So-called early adopters will support the change, and another 20% at the bottom will never like the disruption and may even pine for the system that was in place two generations ago. "It's the 60% in the middle that you go after. The war is won if you [sell] 31% percent of these people in the middle," he says.

MIDWEST SECURITIES TRUST

One way to sell a new technology is to build prototypes using loaner hardware and software from a vendor, says Dynkowski, manager of emerging technology. "You need to make users a key part of the development process," he says, adding that only these users can tell "how big, how fast and how scalable" the new system has to be.

Deploy it

CHARLES SCHWAB

Deploying technology becomes easier if the IS group as a whole is knowledgeable about the new technology. When it begins installing the first pieces of an ambitious distributed computing architecture this fall, Charles Schwab's 465-person IS group plans on having advanced technology know-how throughout its ranks, according to Barmann.

Barmann says he wants to put advanced technology personnel side by side with the applications development, telecommunications and operations groups he has today. "We don't want to create two classes — one working on the new, the other with its finger in the dike of the old."

WESTINGHOUSE SAVANNA RIVER

"It's extremely important to consider training and the help desk as part of the whole [technology deployment] process," Eckert says.

Users should not need vast amounts of training to do their jobs, Eckert argues. New technologies ought to be "appliances," the workings of which are largely transparent to them, he says.

TURNER BROADCASTING'S CNN

Tiven assumes new technology deployment is always disruptive, so promised benefits must outweigh this.

STAYING AHEAD

READ voraciously, including science publications, and extrapolate ideas from other companies.

ATTEND conferences selectively.

NETWORK with peers and universities.

PARTNER with vendors. Get close enough to influence product offerings.

and integrate advanced tech

WINNER: BEST GROUP NICKNAME

Westinghouse Savanna River

In reflection of the next-o technologies it experiments with, the advanced technology and architecture group calls itself "Toys R Us."

Merge it

VARIABLE ANNUITY

Looking for easier ways to integrate a number of off-the-shelf products is a short-term project for Folger.

Specifically, he wants a way to wrap Notes, an application generator, an imaging system from FileNet Corp. and several other tools into a customer-file application.

"We're trying to implement this before the end of this year," says Folger, who is part of a 200-person IS team.

Longer term, Folger wants a way to mix operating systems on a network, which will let him focus on finding the best applications for different jobs, regardless of what underlying operating platform they may use in the work process.

▶ **Swiss Bank's George Kenney** *bets on standards*

Unify it

SWISS BANK

Like several other advanced technology planners, Kenney is betting on standards as a way of freeing his department from spending time inventing mundane things.

"It's even conceivable we'll be buying standard applications and packaging them together," he says.

"You don't want to spend precious [information technology] resources. . . . You want to outsource as much as you can," he adds.

The caveat to this advice is that suppliers of new technologies must be picked in a very careful manner. Kenney recommends reducing the number of technology suppliers to eliminate any hassles.

"You only have so many management cycles and so much management bandwidth," he says.

CHARLES SCHWAB

Charles Schwab's distributed computing initiative includes support for open standards such as the Open Software Foundation's Distributed Computing Environment and Distributed Management Environment.

Barmann says the world of advanced technology and standards has meant a change for Schwab. The company — once upon a time a dependable IBM account — has had to work with vendor companies that are small and young.

"There are a lot of new [technology] entrants . . . and we're dealing with much smaller companies with much more limited resources," he says.

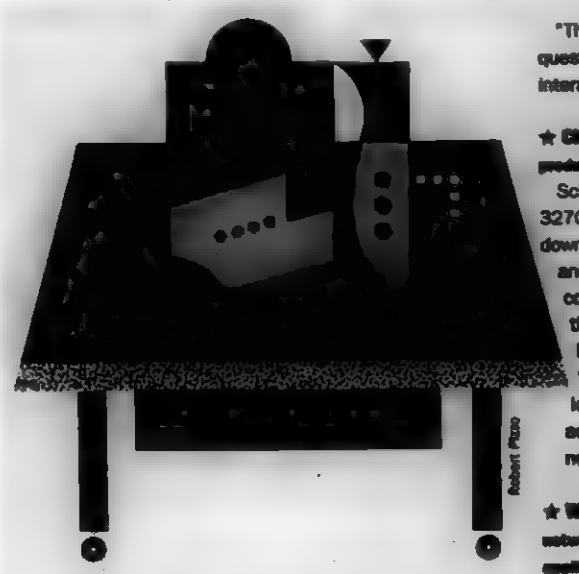
▶ **Charles Schwab's Mark Barmann** *has had to rely on untried vendors*

In these cases, he explains, Schwab becomes "part venture capitalist, part bank and part customer."

VARIABLE ANNUITY

Taking a contrary view on standards, Variable's relatively young technology group — it was formed 10 years ago — made a deliberate decision to install best-of-breed applications rather than hold to a set of technical standards. While this approach creates more support issues for the IS organization, it gives Variable a great deal of flexibility, Folger says. ■

All interviews compiled by Ellis Booker, senior editor, advanced technology.



Robert Pizzo

THE HOT ONES

Here are the advanced technologies our chiefs are pursuing:

★ **SWISS BANK: Enhanced functionality for automated teller machines, interactive cable television and wireless data systems.**

"I don't know if all three of these horses will come in, but I think one or two will," IS chief George Kenney says.

★ **CNN: Nonlinear storage media.**

"Everything we do now is on linear media," explains Kenneth Tiven, vice president of television systems. Tiven says he is looking forward to being able to store and manipulate images, audio and text on a single system.

Just as important, such a "unitary" storage architecture — with capacities in the terabyte and beyond range — will have an enormous impact on the cable news company's internal operations, promising speed and reduced costs and complexity.

Unfortunately, what's available today isn't up to the task of, say, broadcast-quality video, which has 50M bits of information per frame and 30 frames per second.

"The two issues for us are storage and then the question of content — what consumers will want to interact with and pay for," Tiven says.

★ **CHARLES SCHWAB: Distributed computing; CASE tools that produce and scale code from mainframes, servers and clients.**

Schwab's IS division will replace the company's IBM 3270-type environment with a three-tiered architecture, downplaying its Hitachi Data Systems Corp. mainframes and putting in hundreds of reduced instruction set computing-based Unix servers and potentially thousands of Unix workstations, according to CIO Mark Barmann.

"The distributed computing architecture allows a whole lot of things to happen across that network," he says, adding that he expects this infrastructure will spawn new ideas about technology and applications.

★ **WESTINGHOUSE SAVANNA RIVER: Client/server and networking technologies for multimedia and videoconferencing applications.**

The plan at Westinghouse Savanna River is to have client/server and networking technologies seamlessly link the 25,000 workers and 15,000 PCs with the mainframes, minicomputers and supercomputers on the site's 30-mile-wide campus in Aiken, S.C.

Already the company has installed some Fiber Distributed Data Interface backbone networks between buildings; the technology group is currently evaluating ways of upgrading its 10Base-T Ethernet LANs. This network migration anticipates multimedia and multiperson desktop videoconferencing applications.

The group is also focusing on how to handle licensing, software distribution and systems management for a client/server architecture.

★ **MIDWEST SECURITIES TRUST: Client/server.**

The company is developing client/server applications under Ethernet, Unix and an Informix Software, Inc. relational database management system.

"We're trying to define a single system appearance to run across Windows or Motif for any variation of Unix," says John Dynkowski, manager of emerging technology.

Dynkowski is especially bullish on the next generation of Informix's RDBMS, with its added disk mirroring and simultaneous writing to tape for backup.

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Teach yourself RPG III

By Alice Bredin

RICH PAGNI HAD NEVER seen an IBM Application System/400 when he decided to learn RPG III. But one month and many hours later, he landed a job as a technical consultant in the AS/400 market.

Pagni had spent 19 years programming in RPG II on an IBM System/36. When he lost his job, he saw little chance of getting a similar position. His plan was to convince a company to let him train on its AS/400 without asking for a job. He propositioned approximately 20 firms, and New Resources Corp., a Schaumburg, Ill., AS/400 information management services firm, took him up on his offer.

ACHIEVER'S PROFILE

For the next nine days Pagni listened to audio tape tutorials on the commands and logic of the AS/400 and RPG III and worked on the equipment at New Resources. He studied about 11 hours every day.

Pagni's first step was getting used to RPG III's top-down programming, which requires that code be written in sequence. He says his automatic response was to write code and go back and forth between the different lines to change it, like he did for RPG II.

One of the more difficult concepts to learn was that of relational databases, as opposed to the flat organization of the System/36. He also had to learn how to organize data when programming. "With the System/36, you have a file, and that's it," he says. "With the AS/400, a file of information can be organized in 15 different ways in addition to the original way it was constructed."

To use the relational database, Pagni learned Data Description Specifications. He taught himself to use a reference file, which contains keywords for recalling fields with defined parameters. He also familiarized himself with AS/400 functions such as "query," which selects records based on specific criteria.

Giant leap

The biggest technical hurdle was learning about subfile programming—creating a file that allows a user to scroll forward and backward. When he programmed for the System/36, he changed one record at a time. Now when he changes an application, he makes more decisions about what options to offer users. "I can program it so they see the next 15 files or the next 50 files. It's just more decisions and more logical problems to solve," he says.

The AS/400's elaborate Help function, which prompts you when necessary, was useful. "If you want to know if there is a start command, you can scroll through the verb list until you find it," he says.

Looking back, Pagni says the undertaking was difficult, but it has been worthwhile. He makes about 10% more than he did in his last job. "And I'm still learning," he says.

Bredin is a free-lance writer in New York.

LESSONS LEARNED:

We asked a few information systems experts to comment on Rich Pagni's transition from IBM's System/36 to the AS/400 and to add their own suggestions for others facing a similar requirement.

Teresa Elms, president of Elms Information Services Group, a San Diego market research and strategic planning firm that specializes in IBM midrange systems: "This is a great approach. Another suggestion is to use IBM's interactive training diskettes that run on the PC. It's preferable to work on the AS/400 and then with other people to really learn the system, but self-training at least gives you the vocabulary and some system knowledge."

Donald Bolle, director of MIS at Koh-I-Noor in Bloomsbury, N.J.: "He was wise to recognize that it's necessary to bring a productive skill set to an employer. In many cases, companies cannot offer on-the-job training. However, there is a limit to which one can be self-taught. An instructor can expand the scope of the subject matter and prioritize areas of particular importance. He might have been better off with a vendor course."

Steve Hicks, data center director at Clark Information Technologies in South Bend, Ind.: "From the standpoint of an employer, what he did is attractive because it shows dedication and courage. The AS/400 is not CAD/CAM, but it requires a lot of memorizing. The only other way would be to take an AS/400 class. Not everyone can memorize or make themselves burn the midnight oil the way he must have."

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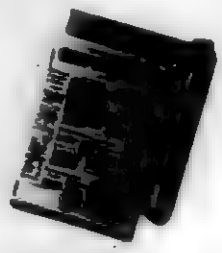

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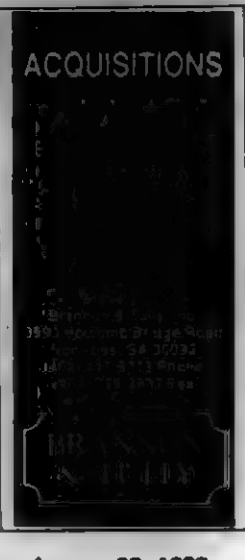

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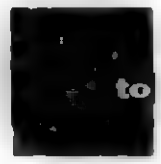
The network news



By Joseph Lazzaro

If you're a network administrator migrating to a new network operating system, there's little to worry about. Once you understand the basic concepts of one, experts say, it's relatively easy to learn the others.

"The terminology used among different networks is different, but the functionality is more similar than the major players care to admit," says Jeff Sloman, vice president of Systems Integration, Inc. in Indianapolis.

Networks perform the same basic function: sharing files, printers and other resources among users and groups of users, irrespective of the brand name on the box. If you're planning to learn the ins and outs of one that you're not used to, you'll want to know the basics and maybe check out a few classes.

Novell, Inc.'s NetWare

NetWare supports file systems ranging from MS-DOS, OS/2 and Macintosh to the NFS network file systems found on many Unix machines. It generally uses a text-based interface but also supports Windows. Versions of NetWare can support small peer-to-peer networks using NetWare Lite, while you can create larger networks using NetWare 3.X and 4.X.

Microsoft Corp.'s LAN Manager

LAN Manager supports OS/2, Macintosh and Unix, which enables it to deal with a wide range of platforms. Microsoft's Windows NT Advanced Server, however, is expected to replace LAN Manager in Microsoft's product line in the near future. A solid knowledge of the Windows environment is mandatory for NT Advanced Server because of its graphical user interface. The system is on par with NetWare and is well-suited for medium-size networks.

IBM's LAN Server

LAN Server is an OS/2-based network operating system that supports DOS, Windows and OS/2 clients. It also performs peer-to-peer as well as client/server networking. In addition to standard network functions, LAN Server lets an OS/2 workstation share local resources with the rest of the network, allowing a local hard drive to be used by others on the network. Under this arrangement, a workstation could share a printer, disk drive or other local resources with others on the network.

Banyan Systems, Inc.'s Vines

Knowledge of Unix is useful. However, if you are dealing with a preinstalled Vines setup, you can put off learning it for a while. After installation, Vines creates a shell that resembles MS-DOS; therefore, a concrete knowledge of DOS is also mandatory. If you know NetWare, you should have little trouble with Vines, unless you want to dive deep under the hood to its Unix core.

Artisoft, Inc.'s LANtastic

LANtastic is MS-DOS-based and well-suited for smaller networks. The network can be configured as either peer-to-peer or in a client/server mode. LANtastic supports MS-DOS, Windows, Macintosh, Unix and NetWare.

Lazzaro is director of the Adaptive Technology Program at the Massachusetts Commission for the Blind in Boston.

Training opportunities

Novell

Novell offers a multilevel training program covering network installation and system administration. This program consists of the following levels:

•Certified Network Administrator: Responsible for system administration from a software point of view, with minimal training and responsibility for hardware.

•Certified NetWare Engineer: Focuses on both system hardware and software. Covers operating system installation, network expansion, wiring topology, troubleshooting and general administration.

•Enterprise Certified Network Engineer: Focuses on cross-platform networking across wide-area networks.

For more information call (800) 638-9273.

Banyan Systems

There are two basic ways to obtain Banyan training — from Banyan or from a Banyan certified education center. For an apprentice administrator, suggested courses include the following:

•Vines Administration: Focuses on how to set up, maintain and manage a typical network.

•Problem-Solving for Vines Networks: Explains the fundamentals of Vines architecture, operations and basic problem-solving methodology.

Microsoft

Microsoft offers a series of courses focusing on LAN Manager, Windows NT Advanced Server and Windows for Workgroups.

Titles include Supporting Microsoft Windows NT, Network Administration for LAN Manager, Management of Advanced Services for Microsoft Windows NT and Supporting Microsoft Windows with Networks. Microsoft also offers video versions of certain classes.

For more information call (800) 227-4679.

IBM

IBM offers a series of courses through its Skill Dynamics centers for OS/2 LAN Server training. These courses can be conducted at IBM sites or onsite. Courses include OS/2 LAN Server Workshop and Integrating NetWare and OS/2 LAN Server.

For more information call (800) 426-8322.

Artisoft

LANtastic's courses are aimed at resellers that are responsible for training and supporting their end users. Courses offered include the following:

•LANtastic for TCP/IP: Details how to interface a LANtastic network to Unix boxes.

•Planning and Installing the LANtastic Network Operating System: Covers the crucial planning stages of a network.

For more information call (800) 233-5564.

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SYSTEM ANALYST/PROGRAMMER (REF #27383) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. 1 specific duty incl the design, development, integration & migration of an on-line Transaction sys. Responsibilities incl business analysis, data modeling using E-R & Data Flow Diagrams, Process Modeling, Data Normalization & tech support & overall integration & migration of the sys, maintenance & enhancements for existing on-line Product Tracking Sys, & designing database administration. Tech support provided will be for AS, CSP, DB2 & DB2PM on an IBM 3090 mainframe running MVS/ESA operating sys & IBM PS/2. S/ware & languages used: AS, CSP, SQL, PL/1, TSO/ISPF, REXX, CLIST, Assembly & RACF. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, sys design, business anal, data modeling, integration & migration, & using IBM 3090, MVS/ESA, AS, CSP, SQL, REXX, E-R Diagram, PL/1, TSO/ISPF, RACF & Assembly. Pay is $34,000/yr. 40 hr./wk.

PROGRAMMER ANALYST (REF #37382) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl analysis, design & development of various integrated tax sys, incl meeting users to understand their req for tax reporting. The major area of design & development will be for apps using CICS, FOCUS on IBM 3090 using IBM 3090, IBM PS/2s, MVS/ESA, TSO, VSAM, COBOL, CLISTS, EASYTRIEVE & MICROFOCUS COBOL on PCs. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, design & development of app sys, & using IBM 3090, IBM PC/2s, FOCUS, VSAM & CLISTS. Pay is $33,156/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF #40980) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl, designing, enhancing & customizing retail sys modules, database modifications, sys testing, administrating production database, & post implementation s/ware support. Duties require using Unisys U8000, UNIX based comp, Informix 4GL, C & UNIX shell programming. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg, Consultant or Sys Executive. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, design & development of commercial app & using UNIX based comp, Informix 4GL & C. Pay is $34,000/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF #41083) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to their needs incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl analysis, design & development of app s/ware for engg industries. Duties incl design & development of comp aided engg s/ware, integration & testing of the s/ware with custom h/ware, & installation & tech support using VAX station 4000, VAX/VMS, UNIX, X Windows, VUIT & C. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, development of CAE & engg apps, s/ware testing & installation, & using VAX Station, VAX/VMS, UNIX, X Windows & C. Pay is $43,800/yr. 40 hr/wk.

SYSTEM ANALYST (REF #41190) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl analysis, design & development of an integrated welfare sys. The responsibilities include sys design (defining Requirement Specific document, Change design document, program specs), tech design, coding & testing of the sys. The tech support provided will be for design of apps using IBM 3090, MVS/XA, IMS DB/DC, TELON, VS-COBOL2 MF COBOL/2 WORKBENCH, IMSVS88, TSO/ISPF, DOS, EXPEDITER, BTS & FILEAID. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, tech design, coding & testing of app sys. & using IBM 3090, MVS, IMS DB/DC, TELON, MF COBOL/2 WORKBENCH & TSO/ISPF. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF #41793) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to their needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl an integrated corporate database, its daily update cycles & app. Duties incl data analysis, database design, providing programming specifications for developing reporting apps using 4GL reporting language AS to interact with DB2 & using IBM 3090, MVS/ESA, AS (V2.2), CSP, APS, DB2, (V2.3), SQL, CMF, SPUR, DB2 Utilities, CICS, IMS DB/DC, REXX, DBMAUI, VS COBOL II, & Dynamic SQL. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, designing an integrated corporate database & reporting sys, & using IBM 3090 under MVS environment, VS COBOL II, IMS DB/DC, APS, DB2 & DBMAUI. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF #41893) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to their needs incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl 1 specific patient monitoring sys. Duties incl studying vendor protocol compatibility, defining specs, designing, implementing, testing & documenting s/ware for interfacing medical equipment to the sys including device drivers, real-time operating sys, data transfer protocols, local real-time data storage & working closely with the design team, marketing, clinicians & field support to understand specific user needs. Duties are performed using HP9000 series workstation, 8051 microcontroller based embedded sys, HP 64000 emulator, HP 4957 protocol analyzer, RS-232, UNIX, C & 8051 Assembly. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg, Consultant or Engg. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, design & development of real-time app sys, s/ware interfacing, & testing, & using HP64000, UNIX, C, & 8051 Assembly. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF #42983) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, including analyzing, designing, developing & implementing computer s/ware for clients' EDP sys, incl analysis, design & development of an integrated welfare sys. Responsibilities incl process-data flow design, data modeling identification, tech support & overall design of app entry part of the sys, & meetings with users to gather reqs. Tech support provided will be design of apps using IMS DB/DC on IBM mainframe using IBM 3090, MVS/ESA, IMS DB/DC, TELON, ADW Case Tool used for sys anal & design, TSO ISPF, REXX & CLISTS. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, design of app sys on IBM mainframe environment, & using IBM 3090, MVS, IMS/DC, TELON, CASE TOOL, TSO, ISPF, REXX & CISTS. Pay is $34,000/yr. 40 hr/wk.

ANALYST PROGRAMMER (REF #44983) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing computer s/ware for clients' EDP sys, incl analysis, design & development of State's automated social welfare sys. The responsibilities incl analyses & design preparing functional & tech specifications, development, testing & maintenance of Application s/ware, interact with user for enhancement & changes in the sys & using IBM PCs, COBOL2, TELON, BANYAN Sys, Vines LAN, Microfocus Workbench, MSWORD for sys development, IBM 3090 using IMS DB/DC, MVS/ESA, TSO, ISPF/PDF, CLISTS, DIALOG MANAGER, JCL5, EXPEDITER & COBTEST for sys enhancement & maintenance. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, app sys design, & using IBM h/ware, MVS, IMS/DB & COBOL or COBOL2. The related experience or training must also include JCL. Pay is $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF #45093) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl designing, developing & implementing Database Server on VAX (coupled to the RDB databases) & DB-SERVER on SEQUENT sys (coupled to Oracle databases), as well as Generic Data server with domain knowledge & NetWork transparency so that heterogeneous databases can be uniformly accessed. Both sys are designed in CLIENT-SERVER mode of functioning. Duties also incl designing a GUI user interface using Motif & using VAX sys, SUN workstations, HP-750, DEC 5000, SEQUENT sys, VMS (ver 5.2), SUN OS (Solaris), SCO UNIX, VAX-C, ANSI-C, RDB relational database, SQL, VAS GKS, CSCAPE, MOTIF, ORACLE, TCP/IP & DEC-NET. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, design, development & implementation of app & using each of the following: VAX sys, C on a VMS operating sys, UNIX, RDB, Oracle & GKS. Pay is $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF #61193) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl lead analyst for analysis, design & development of an integrated welfare sys. Responsibilities incl process flow & data flow design, data modeling identification tech support & overall design of client scheduling part of the sys, meetings with users to gather reqs & coding & testing of the programs. Tech support provided will be for design of apps using DB2 & IMS DC on IBM 3090, using IBM 3090, MVS/ESA, DB2, IMS DB/DC, PC in OS/2 environments, ADW CASE tools, Telon, AD/MVS, XDB, Microfocus Cobol h/ware, s/ware & languages. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, developing comp sys incl scheduling sys, sys or program testing, & using IBM 3090, IMS DB/DC, DB2, Microfocus Cobol or Cobol. Pay is $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF #61283) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl analysis, design & development of a student information sys with accounting support. Duties incl client interaction, functional analysis, tech analysis, impact analysis, tech specification, coding, unit testing, integration testing & production support of the large IDMS based integrated sys using IBM 3090-300J (MVS/ESA, MVS/XA, TSO-ISPF), IDMS-DB/DC (IDD, ADSO, ADSA, OLM, OLQ, DDL, DDR, DML, CULPRIT, DB-UTILITIES), COBOL-II, JCL, IDMS-XADC & FASTACCESS. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg, Consultant, Project Leader, Team Leader or Project Manager. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, design & development of large integrated database sys, functional analysis, customer interaction, & using IBM 3090, MVS/XA, TSO/ISPF, IDMS-DB/DC, DML, DDL, ADSO, OLM & OLQ. Pay is $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF #50883) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl analysis, design & development of the security maintenance & caseload management part of an integrated welfare sys. The responsibilities incl process flow & data flow design using CASE Tools, data modelling & meeting with the users to gather reqs. The tech support provided will be for the design of apps on the IBM 3090 sys using MVS/XA, DB2, IMS/DC, TSO, TELON, ADW, COBOL, REXX, CLISTS & WordPerfect used for sys documentation. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, app sys design & using IBM 3090, MVS/XA, DB2, CLIST, REXX & TSO. Related experience or training must also include TELON & CASE Tools. Pay is $34,000/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF #64763) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties include: enhancing & customizing the Remittance & Proof & Transit apps, incl redesign of modules, database modifications & sys testing. Duties require using UNISYS BTOS workstations & DP500 document processor, BTOS Operating Sys & utilities, PASCAL language. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, development of banking apps, s/ware testing & customization, & using BTOS & PASCAL. Pay is $34,000/yr. 40 hr/wk.

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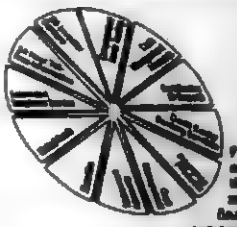

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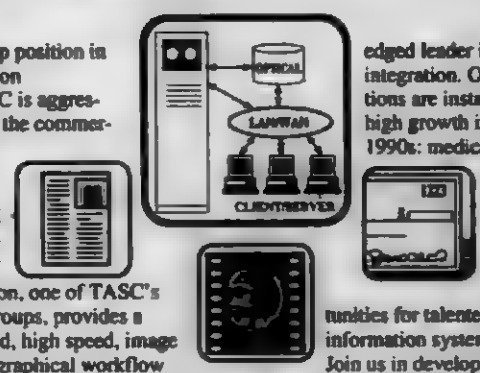

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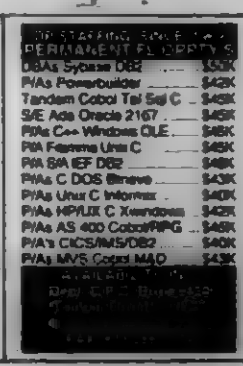

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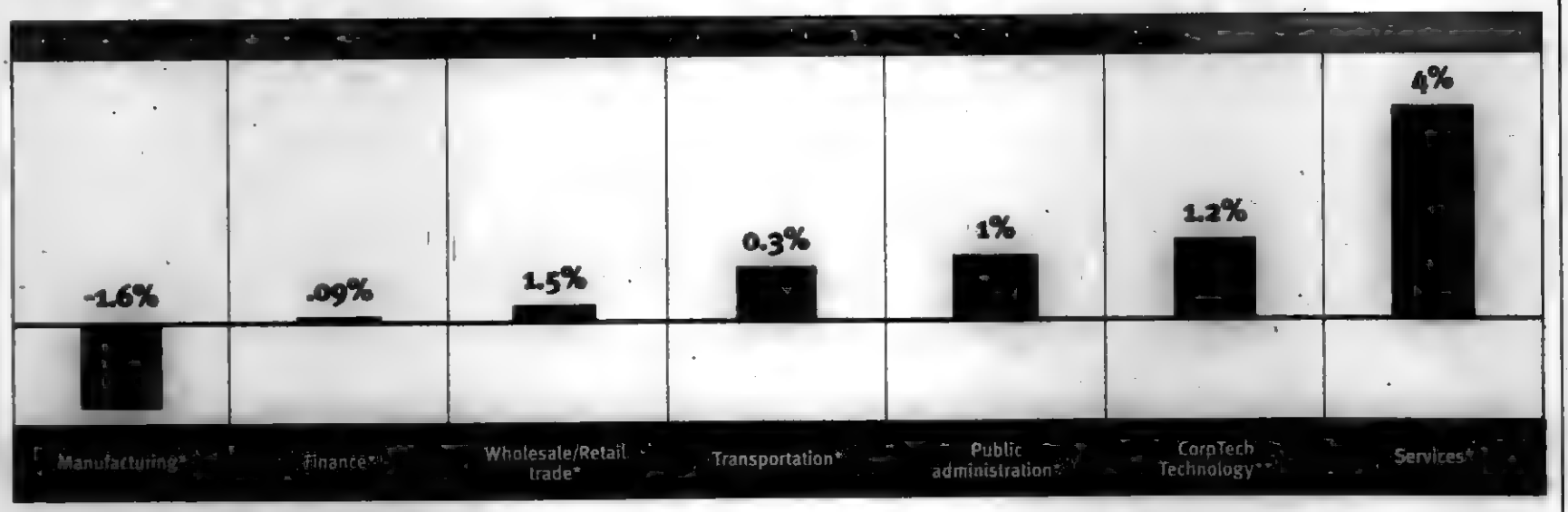

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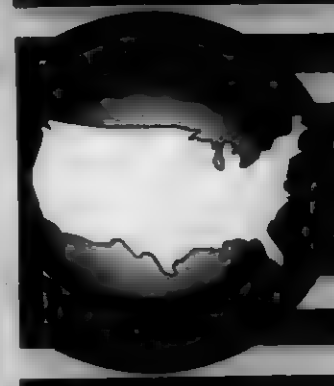

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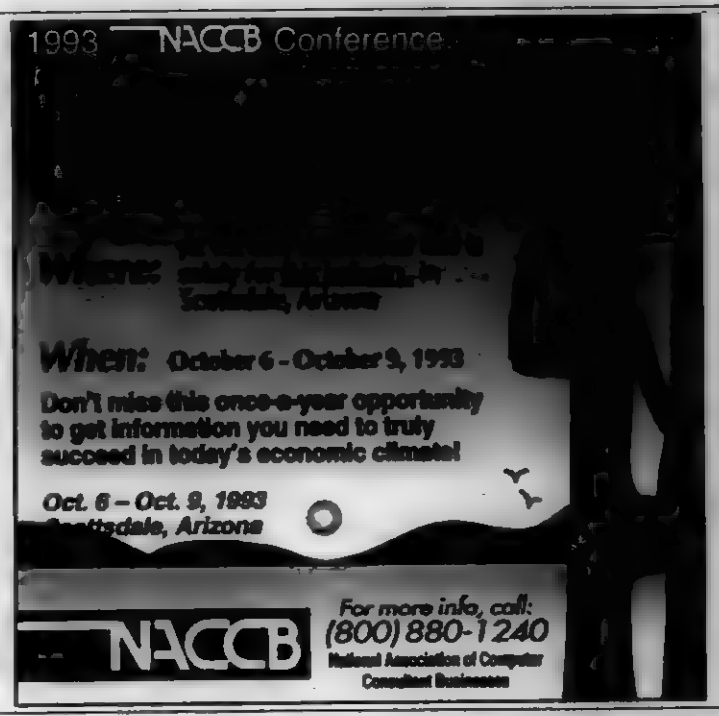

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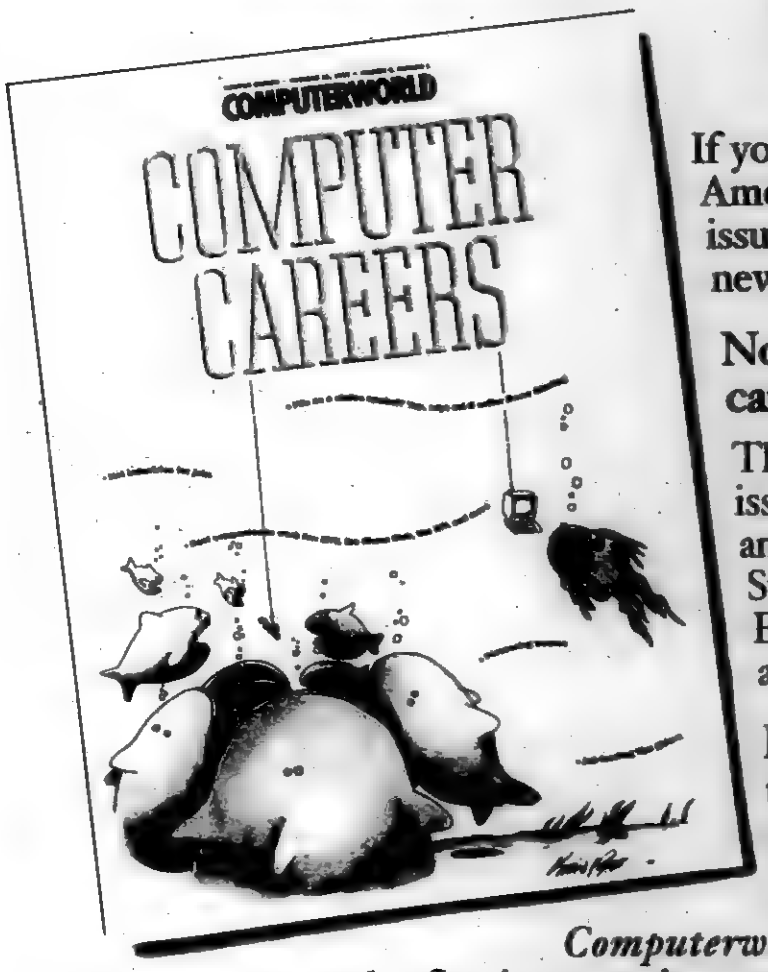

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Planned Editorial Features:

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- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!

Lessons in the leasing game

SOFTWARE LEASING: WHICH METHOD IS RIGHT FOR YOU?

By Timothy E. Duncan

playing it SAFE

Leasing or financing software is like going for a sail: You have to know where you're going and how you'll get there before you leave the dock. Unfortunately, most companies never learn to navigate the software leasing seas.

"The word 'leasing' is really a misnomer when applied to software," says Doug Wetzel, founder of International Software Finance, a financing firm in Westport, Conn. "We generally speak of software financing to make clear that we are not dealing with a situation where title is being transferred to a lessor, as in hardware leasing."

Software financiers, unlike hardware lessors, do not take title to the property they finance because software vendors refuse to pass title. Instead, vendors grant a license to use the software for a specific purpose and time period. They also restrict a user from transferring the rights of the software to other parties, including lessors.

As a result, software financiers make their money on the user's payments, not on the value of the software at the end of the financing terms.

Who's at risk?

"Hardware lessors take asset residual risk. Software financiers generally do not," Wetzel says. "Because the license agreement limits the right to use the software to the original user, the software is of no use to anyone else at the end of the lease term."

Even though its nature is different from hardware leasing, software financing is a valuable tool for a number of reasons.

•Users can often avoid dipping into their capital budgets to pay up-front software licensing fees. Lease payments, depending on the structure of the transaction, may be treated as an operating expense over the life of the lease term rather than a capital outlay.

•Companies can sometimes do a better job of matching expenses with benefits. According to Wetzel, software implementation takes an average of 28 months to reach full productivity, and most users dislike absorbing all licensing costs in the first year of a project. Software financing can spread out the cash and accounting expenses associated with acquiring software over the life of a project.

•Capital can be conserved initially by financing some of the additional costs associated with software acquisitions such as the installation, training and maintenance. These additional costs can be paid over the life of the financing term instead of on Day 1.

Duncan is an attorney and president of Duncan Resources Group, a Boston advisory firm that assists companies with purchasing, leasing and financing high-tech equipment.

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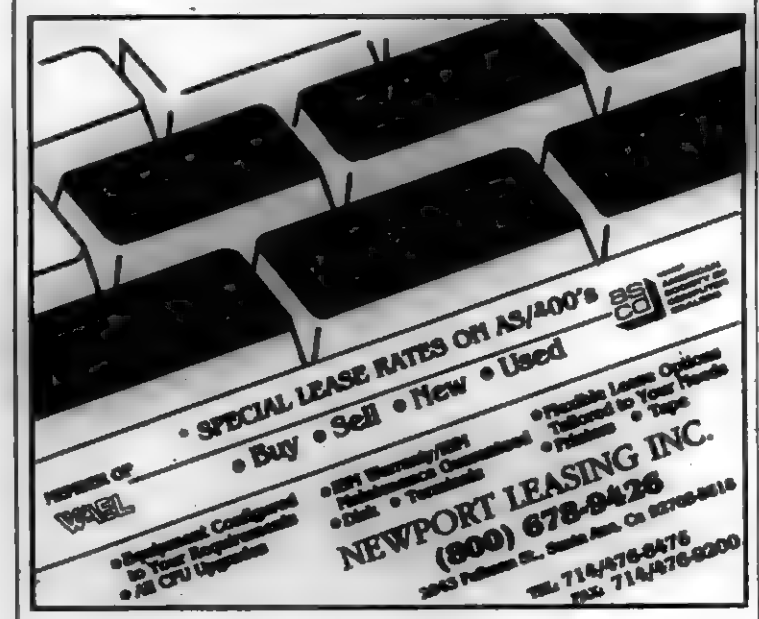

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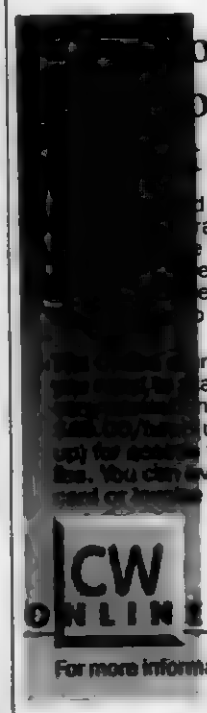

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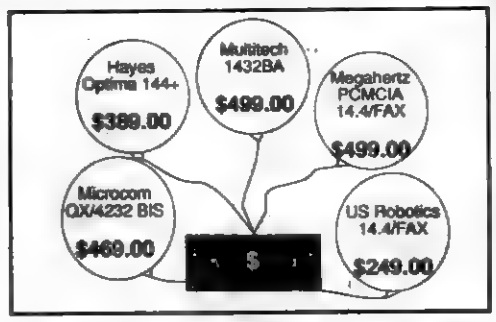

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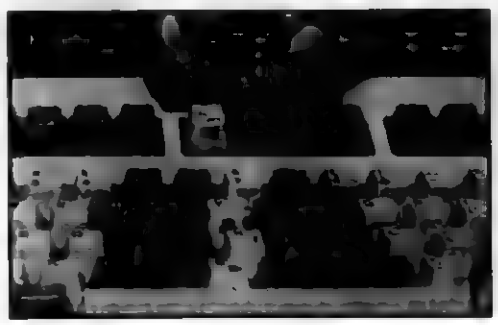

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Percent

McAfee Associates	39.1
CompSoft	31.3
Mentor Corp.	28.8
Rasterops	23.1
Intersolv Inc.	20.8
Chips and Technologies	20.0
Softdesk Software	19.0
Trimec Corp.	18.1

Adobe Systems Inc.	-22.0
Group 1 Software	-19.2
Wonderware	-19.0
MathSoft	-15.4
Cray Computer	-14.8
KnowledgeWare Inc.	-12.9
IPL Systems Inc.	-11.8
Advanced Logic Research	-11.5

Dollar

Boundless Networking Corp.	6.88
BSC Communications	5.38
Centerline Software Inc.	5.25
Silicon Graphics	5.13
Texas Instruments(H)	4.50
Intel Corp.(H)	3.75
Analysts Int'l.	3.63
Micron Technology(H)	3.25

Adobe Systems Inc.	-6.88
AT&T	-6.88
Auto Data Processing	-2.63
Novell Corp.	-2.50
Group 1 Software	-2.50
Autodesk Inc.	-2.38
TheCord Systems	-2.25
Powersoft	-2.88

CASE of arrested development

Computer-aided software engineering (CASE) stocks have been looking downtrodden of late.

Euphoric initial public offerings by client/server graphical user interface (GUI) application builders Powersoft Corp. (PWRS) and Gupta Corp. (GPTA) earlier in the year gave the appearance that older application development technologies might be swept aside completely. And CASE vendors contributed to their own grim prognosis: KnowledgeWare, Inc.'s (KNOW) restructuring led to a big loss in fiscal 1993, despite mild revenue growth, while Intersolv, Inc. (ISLI) surprised Wall Street by stumbling badly in its February quarter report, dropping its share price into the basement.

KnowledgeWare issues have hovered just over 10 recently, off a 52-week high of 16. Intersolv, after sinking under 5 in the past month, rebounded somewhat last week. When Intersolv reported quarterly results last week, the company notched a modest first-quarter profit of 5 cents a share, or $0.6 million, on declining revenue year-over-year. Intersolv's 52-week high was 18.

CASE providers have scrambled to reposition their front-end analysis tools to work with PowerBuilder and its ilk. Analysts disagree on whether the CASE stocks' current low valuations represent a buying opportunity or a stopover on a downward journey.

Curt Monash, president of Monash Information Services in New York, mentioned Intersolv as "the most undervalued stock in the industry," pointing to the 40%-plus growth rate of its PCVS configuration management product sales and the release of a new generation of Excelerator technology (see story page 20).

However, investors and other analysts have remained skeptical. "It's a wait-and-see situation," said Peter Schleider, an analyst at Wessels, Arnold & Henderson in Minneapolis. "If they really make 10 to 12 cents a share next quarter, maybe the stock lives."

Schleider said KnowledgeWare also has more to prove. "People are probably going to do some data modeling when they use a GUI 4GL [such as PowerBuilder], but there is never going to be that total buy-in with the structured analysis" that KnowledgeWare's flagship CASE products provide, he said.

Actually, Powersoft and Gupta have lost some momentum on the stock market. Schleider said he expects the whole application development market to slow for a time while users try to sort through the confusion of multiple development methods and products.

—Derek Slater

Exch	52-Week High	52-Week Low		Aug. 20 3 PM	Wk Net Change	Wk Pct Change
Networking and Network Systems						UP 0.66
OTC	60.00	10.25	3 COM Corp.	23.13	0.75	3.4
NYS	82.88	63.38	American Info Techs Corp.	80.63	-0.88	-1.1
NYS	65.00	40.63	AT&T	58.13	-4.00	-6.4
OTC	4.06	0.75	Artel Communication Corp	3.44	-0.06	-1.8
OTC	24.50	10.25	Banyan Systems Inc.	18.00	-0.75	-4.0
NYS	60.13	44.50	Bell Atlantic Corp.	56.38	-1.75	-3.0
NYS	58.88	46.75	Bellsouth Corp.	54.63	-1.38	-2.5
NYS	14.75	3.63	Bolt, Beranek & Newman(H)	12.50	1.25	11.1
OTC	18.50	9.50	Brooktrout Technology	10.50	-1.25	-10.6
NYS	119.00	53.38	Cabletron Systems	113.75	-2.00	-1.7
OTC	30.25	5.88	Centigram Communications(H)	29.25	1.75	6.4
OTC	54.25	19.00	Chipcom Corp.	51.25	0.38	0.7
OTC	59.25	22.13	Cisco Systems Inc.	53.50	-0.25	-0.5
OTC	16.38	5.50	Compression Labs Inc.	13.38	-0.25	-1.8
OTC	36.00	13.00	CrossComm	25.75	-1.00	-3.7
OTC	4.63	1.38	Data Switch Corp.	2.94	-0.06	-2.1
NYS	19.88	12.38	Digital Comm. Assoc.	13.88	0.00	0.0
OTC	12.75	3.75	Digital Systems Int'l Inc.	4.00	-0.25	-5.9
OTC	60.63	5.88	DSC Communications	60.13	5.38	9.8
OTC	9.50	4.75	Fibronix Int'l Inc.	5.25	0.00	0.0
OTC	24.00	8.75	Filenet Corp.	12.75	0.25	2.0
OTC	4.38	1.50	Gandalf Technologies Inc.	2.75	0.13	4.8
OTC	2.06	0.75	Gateway Communications(L)	0.91	0.03	3.5
NYS	15.75	2.88	General Datacomm Inds.	11.63	0.38	3.3
ASE	3.75	2.00	Go Video	2.44	0.00	0.0
NYS	37.75	32.38	GTE Corp.	35.13	-1.00	-2.8
NYS	93.50	62.75	ITT Corp.(H)	92.50	0.38	0.4
OTC	29.88	16.06	MCI Communications Corp.	27.88	-0.88	-3.0
OTC	6.50	1.50	Microcom Inc.	1.75	0.00	0.0
OTC	24.25	3.50	Netrix Corp.	4.00	0.13	3.2
OTC	19.00	7.00	Network Computing Devices	8.00	0.75	10.3
NYS	15.00	5.38	Network Equipment Tech.	9.25	0.00	0.0
OTC	20.13	8.00	Network General	12.88	1.50	13.2
OTC	15.75	6.88	Network Systems Corp.	8.00	0.25	3.2
OTC	66.25	7.63	Newbridge Networks Corp.	66.25	8.88	15.5
NYS	46.00	21.38	Northern Telecom Ltd.	25.38	1.75	7.4
OTC	35.25	17.63	Novell Inc.	21.00	-0.50	-2.3
NYS	92.50	79.00	Nynex Corp.	88.00	-2.50	-2.8
OTC	30.00	14.50	Octel Communications Corp.	20.00	-1.50	-7.0
OTC	6.13	3.38	Penril Data Comm Networks	3.88	0.13	3.3
OTC	30.50	10.25	Picturetel Corp.	17.50	-0.63	-3.4
OTC	15.25	3.63	Protocon Inc.	6.44	0.44	10.9
NYS	35.00	16.84	Scientific Atlanta Inc.	32.25	-1.50	-4.4
NYS	42.25	31.75	Southwestern Bell Corp.(H)	41.75	-0.13	-0.3
NYS	36.63	22.25	Sprint Corp.	36.13	0.88	2.5
OTC	27.00	11.38	Standard Microsystems Corp.	19.13	-0.38	-1.9
OTC	18.50	8.25	Stratacom Inc.	13.25	0.75	6.0
OTC	42.75	10.75	Synoptics Communications	28.25	-1.00	-3.4
OTC	7.00	3.75	Telebit Corp.	4.75	0.25	5.6
OTC	11.88	2.25	Telematics Int'l Inc.	11.38	1.13	10.5
OTC	29.50	14.00	US Robotics(H)	29.50	1.50	5.4
NYS	47.75	35.25	US West Inc.	44.88	-1.00	-2.2
OTC	56.00	17.50	Wellfleet Communications	51.75	1.00	2.0
OTC	19.00	7.25	Xircom(H)	17.75	-0.25	-1.4
PC and Workstations						UP 0.60
OTC	5.56	2.50	Advanced Logic Research	2.88	-0.38	-11.5
OTC	65.25	25.25	Apple Computer Inc.	27.50	-0.25	-0.9
OTC	24.25	11.25	AST Research Inc.	15.00	0.50	3.4
NYS	9.38	2.50	Commodore Int'l.	3.50	-0.25	-6.7
NYS	61.75	28.38	Compaq Computer Corp.	52.63	0.00	0.0
OTC	49.88	13.50	Dell Computer Corp.	19.75	0.13	0.6
NYS	89.25	50.25	Hewlett Packard Co.	73.38	-1.88	-2.5
NYS	39.75	17.63	Silicon Graphics	38.25	5.13	15.5
OTC	41.00	24.00	Sun Microsystems Inc.	26.88	0.38	1.4
NYS	32.38	22.25	Tandy Corp.	29.63	0.63	2.2
OTC	7.00	2.75	Zeos International Ltd.	3.25	0.25	8.3
Large Systems						UP 0.63
ASE	15.13	4.63	Amdahl Corp.	5.25	0.00	0.0
NYS	8.75	3.63	Convex Computer(L)	3.88	0.13	3.3
OTC	6.13	2.25	Cray Computer	2.88	-0.50	-14.8
NYS	30.88	19.00	Cray Research Inc.	20.75	0.13	0.6
NYS	13.88	7.63	Data General Corp.	9.00	0.75	9.1
NYS	49.25	30.38	Digital Equipment Corp.	38.13	1.88	5.2
NYS	44.00	28.38	Harris Corp.(H)	42.63	-0.50	-1.2
NYS	88.75	40.63	IBM(L)	43.00	1.50	3.6
OTC	22.00	5.50	Kendall Square Research	20.00	0.25	1.3
NYS	134.50	83.00	Matsushita Electronics(H)	131.50	-0.50	-0.4
OTC	23.75	8.25	NetFrame	14.75	-0.25	-1.7
OTC	17.25	9.25	Parallan Computer	17.13	2.13	14.2
OTC	21.00	6.00	Pyramid Technology	20.25	1.25	6.6
OTC	24.00	11.25	Sequent Computer Sys.	13.88	-0.75	-5.1
OTC	8.75	1.38	Sequoia Systems Inc.	1.94	0.03	1.7
NYS	48.38	20.25	Stratus Computer Inc.	25.13	1.25	5.2
NYS	16.88	8.88	Tandem Computers Inc.(L)	8.88	-0.75	-7.8
OTC	23.50	10.63	TheCord Systems	19.25	-2.25	-10.5
NYS	13.88	7.75	Unisys Corp.	11.13	0.75	2.3
Software						UP 2.97
OTC	37.00	12.63	Adobe Systems Inc.	21.25	6.00	-22.0
OTC	20.75	10.25	Aldus Corp.	17.38	0.88	5.3
OTC	11.25	5.50	American Software Inc.	7.38	-0.13	-1.7
OTC	28.13	9.50	Ask Computer Systems	10.88	0.25	2.4
OTC	56.75	38.63	Autodesk Inc.	41.00	-2.38	-5.5
OTC	9.25	2.50	Bachman Info. Systems	3.63	0.00	0.0
OTC	43.00	30.00	BGS Systems Inc.	30.00	-1.50	-4.8
OTC	84.13	38.75	BMC Software Inc.	58.75	1.25	2.2
OTC	28.25	18.00	Boole & Babbage	24.38	0.38	1.6
OTC	49.00	15.25	Borland Int'l. Inc.(L)	18.75	2.75	17.2
OTC	5.00	2.75	CE Software	3.00	0.13	4.3
ASE	37.38	9.00	Cheyenne Software Inc.	37.38	5.25	16.3
OTC	19.50	8.25	ChipSoft	13.13	3.13	31.3
OTC	8.88	5.63	Cognos Inc.	8.38	-0.38	-4.3
NYS	31.38	13.00	Computer Associates	30.13	0.63	2.1
NYS	12.13	2.75	Computervision Corp.	3.00	-0.13	-4.0
OTC	34.25	19.25	Computware Corp.	27.88	0.13	0.5
OTC	14.75	5.75	Consware Inc.	8.25	-0.75	-8.3
OTC	23.25	10.75	Corel Corp.(H)	23.25	2.88	14.1
OTC	15.25	5.00	Easel Corp.	7.00	0.00	0.0
OTC	25.25	12.00	4th Dimension	19.88	0.63	3.2
OTC	19.50	5.25	Frame Technology	7.63	-0.50	-6.2
OTC	17.50	8.38	Group I Software	10.50	-2.50	-19.2
OTC	35.25	14.50	Gupta	18.25	0.25	1.4
OTC	10.25	4.13	Hogan Systems Inc.	9.25	-0.50	-5.1
OTC	25.75	11.25	IMRS	21.25	0.00	0.0
OTC	38.00	21.00	Information Resources	35.88	0.13	0.3
OTC	27.25	9.06	Informix Corp.	21.00	1.00	5.0
OTC	14.75	8.50	Intergraph Corp.	10.00	0.75	8.1

Exch	52-Week High	52-Week Low		Aug. 20 3 PM	Wk Net Change	Wk Pct Change
OTC	13.63	6.00	Interleaf Inc.	6.88	0.00	0.0
OTC	18.00	4.75	Intersolv Inc.	7.25	1.25	20.8
OTC	16.00	7.75	Knowledgeware Inc.	10.13	-1.50	-12.9
OTC	54.75	13.50	Legent Corp.	21.00	0.63	3.1
OTC	60.13	14.75	Lotus Development	55.38	-0.63	-1.7
OTC	23.00	5.50	MathSoft	5.50	-1.00	-15.4
OTC	23.25	4.50	McAfee Associates	8.00	2.25	39.1
OTC	11.63	2.00	Meca Software	5.75	0.00	0.0
OTC	12.00	5.25	Mentor Graphics	8.88	-0.13	-1.4
OTC	46.00	26.25	Micro Focus(L)	29.88	2.88	10.6
OTC	13.25	4.38	Micrografx Inc.	6.38	-0.13	-1.9
OTC	98.00	68.50	Microsoft Corp.	75.50	0.79	1.0
OTC	54.13	15.75	Oracle Corp.(H)	53.25	1.88	3.6
OTC	38.75	18.38	Parametric Technology(H)	30.63	1.63	4.4
OTC	40.50	22.50	Peoplesoft	36.25	2.50	7.4
OTC	7.13	3.50	Phoenix Technologies	4.38	0.00	0.0
OTC	40.00	22.00	Powersoft	29.25	-2.00	-6.4
OTC	41.50	17.00	Platinum Software	40.00	2.50	6.7
OTC	25.00	10.75	Platinum Technology	13.75	-0.13	-0.9
OTC	61.50	32.25	Progress Software Corp.	52.50	0.00	0.0
OTC	7.38	2.56	Quarterdeck Office Sys.	3.00	0.06	2.1
OTC	32.00	15.00	Rainbow Technologies Inc.	28.50	1.50	5.6
OTC	10.75	4.00	Rasterops	10.38	1.88	22.1
OTC	15.25	3.63	Ross Systems	9.50	0.63	7.0
OTC	27.75	9.63	Sapiens Intl. Corp. N.V.	23.50	-0.25	-1.1
OTC	14.50	5.50	Software Publishing Corp.	7.00	1.00	16.7
OTC	14.13	2.63	Software Toolworks Inc.(H)	12.88	-0.75	-5.5
OTC	2.75	0.75	Spinnaker Software	1.56	0.25	19.0
OTC	13.00	3.25	State of the Art	12.25	1.00	8.9
NYS	24.63	15.00	Sterling Software Inc.	23.13	-0.13	-0.5
OTC	21.63	8.00	Structural Dynamics Research	19.88	-0.25	-1.2
OTC	77.50	26.75	Sybase Inc.	73.25	2.38	3.4
OTC	18.63	5.88	Symantec Corp.	15.13	-1.19	-6.9
NYS	12.50	5.25	Systems Center Inc.	10.25	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	22.25	-0.75	-3.3
OTC	6.38	2.75	Toltec Corp.	4.00	0.63	18.5
OTC	23.75	10.00	Viewlogic Systems(H)	21.75	-0.13	-0.6
OTC	23.50	5.50	Walker Interactive Systems	5.75	0.00	0.0
OTC	3.19	1.06	Wordstar(L)	1.06	-0.25	-19.0
Semiconductors						UP 1.00
NYS	32.88	8.38	Advanced Micro Devices	30.88	1.00	3.3
NYS	25.13	9.38	Analog Devices Inc.(H)	24.50	0.25	1.0
OTC	35.00	7.63	Atmel Corp.	32.50	0.88	2.8
OTC	5.50	2.75	Chips and Technologies	4.50	0.75	20.0
OTC	39.75	13.00	Cirrus Logic	26.00	-1.25	-4.6
NYS	16.75	7.88	Cypress Semiconductor Corp.(H)	15.88	0.50	3.3
NYS	19.00	9.38	Dallas Semiconductor(H)	18.50	0.63	3.5
NYS	65.75	27.13	Intel Corp.(H)	63.50	3.75	6.3
NYS	19.25	6.88	LSI Logic Corp.	17.88	0.63	3.6
OTC	24.25	13.66	Lattice Semiconductor(H)	23.25	1.38	6.3
NYS	55.00	14.38	Micron Technology(H)	52.75	3.25	6.6
NYS	98.75	61.38	Motorola Inc.(H)	96.00	0.13	0.1
NYS	19.50	9.88	National Semiconductor(H)	18.50	0.13	0.7
OTC	15.75	6.50	Sierra Semiconductor	7.38	-0.63	-7.8
OTC	51.75	23.00	SynOpsys	50.00	2.00	4.2
NYS	88.38	36.75	Texas Instruments(H)	80.38	4.50	5.9
OTC	15.13	6.50	VLSI Technology(H)	13.63	-0.63	-4.4
OTC	13.25	2.63	Weitek(H)	12.63	0.00	0.0
ASE	9.63	3.63	Western Digital Corp.	5.88	0.63	11.9
OTC	45.00	14.50	Xilinx(H)	45.00	3.00	7.1
OTC	33.00	15.66	Zilog Inc.	31.00	0.75	2.5
Peripherals and Subsystems						UP 0.62
OTC	48.00	15.00	American Power Conversion(H)	45.00	-0.25	-0.6
OTC	20.16	15.50	Banctec Inc.	18.75	0.13	0.7
OTC	18.00	4.00	Cambex Corp.	4.00	0.00	0.0
ASE	18.38	3.88	Cognitronics Corp.(H)	5.88	0.00	0.0
NYS	25.50	9.00	Conner Peripherals	12.63	1.50	13.5
OTC	38.50	11.00	Creative Technologies Inc.	21.38	0.38	1.8
OTC	30.75	11.00	Data Race Inc.	13.25	-0.75	-5.4
ASE	13.25	4.75	Databrain Corp.	8.63	-0.13	-1.4
NYS	32.38	5.06	EMC Corp.(H)	32.38	2.38	7.9
OTC	10.50	5.38	Emulex Corp.	7.38	0.63	9.3
OTC	19.00	13.25	Evans & Sutherland	17.00	0.50	3.0
OTC	25.00	7.50	Exabyte	10.13	1.00	11.0
OTC	28.75	7.09	Intelligent Info. Systems	27.00	0.25	0.9
OTC	8.88	3.50	Iomega Corp.(L)	3.63	0.00	0.0
OTC	15.25	5.75	IPL Systems Inc.	7.50	-1.00	-11.8
OTC	24.00	14.00	Komag Inc.	22.50	2.00	9.8
OTC	19.63	4.38	Maxtor Corp.	6.38	1.50	30.8
OTC	10.75	5.75	Micropolis Corp.	7.25	0.13	1.8
NYS	117.00	97.00	3M Corp	107.50	-0.75	-0.7
OTC	7.75	4.00	Pinnacle Inc.	7.00	0.13	1.8
NYS	17.25	6.88	QMS Inc.	9.25	0.00	0.0
OTC	17.88	9.50	Quantum Corp.	12.88	1.25	10.8
OTC	7.50	3.13	Radius Inc.	4.25	0.38	9.7
NYS	16.50	8.88	Recognition Equipment	14.50	1.63	12.6
OTC	13.88	3.75	Rexon Inc.	5.00	0.75	17.6
OTC	22.38	12.00	Seagate Technology	20.90	1.38	7.2
NYS	45.00	18.00	Storage Technology	27.00	2.13	8.5
NYS	27.88	17.63	Tektronix Inc.	24.63	-1.50	-5.7
NYS	88.88	70.25	Xerox Corp.	74.63	0.63	0.8
Services						UP 1.56
OTC	23.75	14.88	American Mgmt. Systems	17.75	0.00	0.0
NYS	4.75	2.38	Analogic Inc.	3.13	0.25	8.7
OTC	35.75	16.25	Analysts Int'l.	34.63	3.63	11.7
NYS	56.13	43.00	Auto Data Processing	48.25	-2.69	-5.2
NYS	17.25	12.50	Ceridian Corp.	15.38	0.38	2.5
NYS	17.38	13.13	Comdisco Inc.	14.38	-0.25	-1.7
OTC	9.25	4.50	Computer Horizons	9.25	0.25	2.8
NYS	90.25	63.50	Computer Sciences(H)	90.25	2.13	2.4
NYS	9.25	6.00	Computer Task Group	6.38	0.25	4.1
NYS	40.50	19.00	CompUSA Inc.	27.38	3.00	12.3
OTC	14.25	6.00	Corporate Software	11.00	0.00	0.0
OTC	12.75	6.63	Egghead Discount Software	9.00	1.00	12.5
NYS	35.88	26.00	General Motors E (EDS)	30.13	-0.13	-0.4
OTC	25.50	10.50	Inacom Corp.	19.00	-1.75	-8.4
OTC	17.13	8.13	Intelligent Electronics(H)	17.13	0.50	3.0
OTC	13.13	6.88	Merisel	12.38	0.00	0.0
OTC	24.50	5.75	Micrografx Inc.	22.00	0.00	0.0
OTC	44.00	25.00	Paychex(H)	43.75	0.50	1.2
NYS	87.25	21.63	Policy Management Sys. (L)	24.13	1.13	4.9
NYS	43.63	20.38	Reynolds and Reynolds(H)	43.13	0.25	0.6
OTC	17.25	11.00	SEI Corp.	17.00	0.50	3.0
OTC	24.38	17.50	Shared Medical Systems	20.75	-0.13	-0.6
OTC	12.63	5.75	SHL Systemhouse	10.25	-0.50	-4.7
OTC	30.75	20.00	Software Spectrum Inc.	24.75	-0.25	-1.0
OTC	39.25	23.75	Sunguard Data Systems	37.00	-2.00	-5.1
NYS	6.38	1.13	Ultimate Corp.	3.00	-0.25	-7.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

HP's revenue up 23%

For its fiscal third quarter, ended July 31, **Hewlett-Packard Co.** reported net earnings of $271 million, a 44% increase; revenue of $5 billion, a 23% increase; and orders of $4.7 billion, a 19% jump when compared with the same period in 1992. However, Lewis E. Platt, HP's president, did express concern over a sharp rise in inventory.

Trio merge into one

Softkey Software Products, Inc., Wordstar International, Inc. and **Spinnaker Software Corp.** last week agreed to a three-way merger that will result in a single $140 million consumer software firm. The combined entity will have access to approximately 15,000 distribution outlets, a registered user base of more than 4 million and OEM arrangements with most of the leading hardware makers. In a prepared statement, the trio said they have agreed "to implement substantial reductions in employees and facilities." The new company will make its headquarters at Spinnaker's Cambridge, Mass., facility.

SPSS goes public

Common stock of Chicago-based **SPSS, Inc.** began trading last week on NASDAQ under "SPSS." The 2 million shares available under the initial public offering were priced at $8 per share. SPSS markets a family of statistical applications.

CA buys Exospace

Computer Associates International, Inc. has acquired Exospace, software said to allow CA-Clipper applications to run in protected mode. CA immediately cut the application's price 67%. Exospace was developed by **ObjecTech, Inc.** and **SofDesign International, Inc.** Financial terms of the sale were not disclosed.

Dell trying to get back on track

Dual strategy focuses on adding distribution channels, streamlining processes

By Michael Fitzgerald
AUSTIN, TEXAS

Having taken its lumps following several crucial missteps, Dell Computer Corp. last week softened the blow of a $75.7 million second-quarter loss with details about its future plans.

Threatened by the entry into the direct marketing channel of newly aggressive IBM PC Co. and Compaq Computer Corp. and slammed for its inability to track parts and inventory and its strategic blunders in the notebook industry, Dell executives said the company is ready to correct the mistakes that appear to have cost it dearly.

In recent interviews here, Dell executives cited two main courses of action the firm is taking to regain a strong bottom line:

- Diversify its direct-centric distribution.
- Effectively execute its new corporate infrastructure to avoid the problems it had handling its growth, particularly poor inventory management systems.

Joel Kocher, Dell's president of sales, conceded, "We have to execute and the fourth quarter is key."

Results speak

Dell's various problems were resoundingly underscored by the $75.7 million loss on revenue of $700 million for its second fiscal quarter. While Dell had cautioned investors in advance, its second-quarter loss was slightly worse than expected, and revenue was also slightly lower than it had expected [CW, July 19]. Revenue was up 53% over the year-earlier quarter and 4% over the first quarter of 1993.

The major factor in the loss was a $71 million restructuring charge Dell took to deal with such problems as a lack of inventory controls, which caused it to build too many systems, and its junked notebook project.

Sean Burke, an original member of the team that produced ProLinea at Compaq and now director of product marketing and planning at Dell, said it took Compaq until after its third-quarter loss in 1991 to see what its problems were. Dell, on the other hand, realized it had some problems and started to work on them before its recent loss.

Despite the loss, the stock market reacted positively by boosting Dell's stock slightly.

Dell, once lauded as a distribution pioneer, in more recent months has been roundly criticized for sticking too closely to a once unique direct-mail model that has since been copied by bigger competitors. Some 80% of its sales still come through the direct channel, putting Dennis Jolly, Dell USA's group vice president of indirect sales, on the spot. He said Dell's goal is to get as much as half of its sales from the indirect channel in the future, though for 1993, Dell will settle for a more modest 30%.

To do this, Dell needs a "portfolio of channels," Jolly said. Specifically, Dell is looking to expand relationships with systems integrators and value-added resellers, bolster its OEM channel and add retailers and distributors.

Tried and true

Neither Jolly nor Kocher would say that Dell must have a presence in the traditional reseller channel, which remains the largest distribution channel, but sources said Dell's efforts to add this channel have so far been rebuffed. Both executives insisted that Dell would not rush into any deals just to expand distribution but would focus on making sure its agreements were mutually advantageous partnerships.

Mutually advantageous may be difficult to define. For instance, William Tauscher, chairman of ComputerLand Corp., said his company spurned Dell because "we want to commit to someone who wants to be our partner. Dell doesn't really want to do that. They want to run the business and then try to find some cracks and crevices they can use us for, but whenever possible they want to go to the direct channel."

At least one analyst said he doubts Dell will be able to spread its distribution model. "I don't see them being successful in trying to get new channels, in part because they just don't have the margins to offer traditional resellers," said Randal Giusto, an analyst at Work-Group Technologies, Inc. in Hampton, N.H.

Despite the competition from IBM and Compaq, Kocher said, "They are not going to succeed at direct. [However,] we're not going to out-IBM IBM or out-Compaq Compaq."

Highly hybrid

Separately, the company is also focused on digesting its growth and engineering a new corporate identity as a "manustributor," a company that operates effectively as a hybrid distributor and manufacturer.

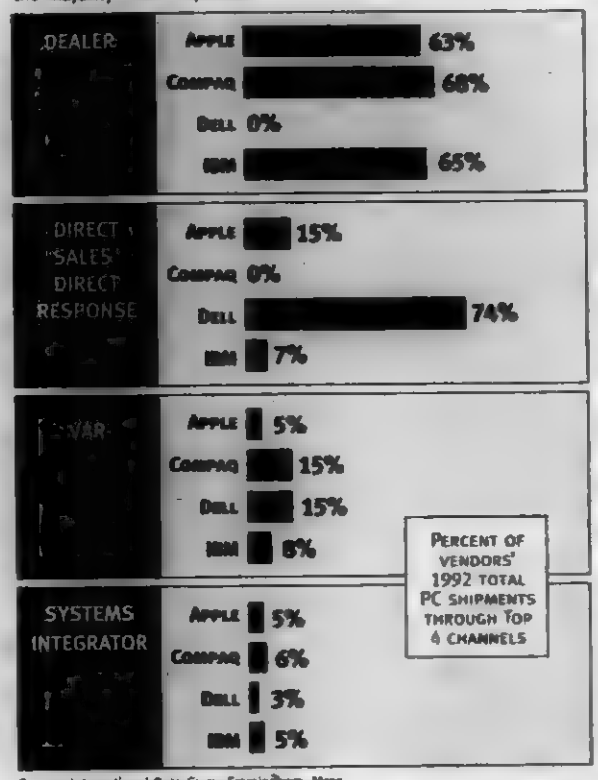
"We needed to get big fast, and we grew 285% in two years. Now, we have an adult head on an adolescent body, and we need to build up the body," Kocher said.

Kocher said he believes a variety of new hires, working on managing supplier relationships, manufacturing processes and creating new order and inventory control systems, will give Dell the ability to cope with its growth.

Still, "hires are not systems. Systems require design and pilot testing and training and integration and enhancement," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. However, he said he is confident Dell will continue to be among the "creme de la creme" in the PC hardware business.

Not like the others

Unlike other major PC vendors, which ship the bulk of their PCs themselves, Dell relies on the direct sales and response channel for the majority of its shipments



Source: International Data Corp., Framingham, Mass.

Changin' Execs

Joel Kocher, Dell's president of sales, pointed to a number of key posts created at Dell since last November, designed to correct structural weaknesses holding the company back. These include:

- [illegible], senior vice president of worldwide operations, hired mid-November 1992.
- [illegible], vice president of operations strategy and research, hired mid-January 1993.
- [illegible], chief information officer, hired mid-March 1993.
- [illegible], vice president of worldwide procurement, hired mid-June 1993.

One of my favorite experiences, which continues to happen, is watching employees grow and explore their talents — finding them from within the organization and placing them in a challenging position then watching that person grow to be successful. That gives me a tremendous thrill – a real buzz.

Michael King
CEO/President
Software AG of North America, Inc.

Here's a book one of your peers feels is worth reading.

Developing the Leader Within You
John C. Maxwell

This books defines leadership as influence. In these days and times when the management structure is flattening out and there are fewer "positions" and "titles" to go around, this book has helped me gain a new perspective of what a true leader is and how you can develop leadership skills regardless of your title.

Janet Judson
Systems Specialist
Weyerhaeuser Co.

WHAT ISSUES OR EVENTS ARE YOU TALKING ABOUT WITH YOUR PEERS? WE'D LIKE TO KNOW. CONTACT STEFANIE MCCANN, MCI MAIL 591-8021, FAX (508) 875-8931, PHONE (800) 343-6474.

The 5th Wave *by* Rich Tennant

Inside Lines

Necessity breeds coop-etition

Digital Equipment Corp. and IBM will suspend competition this week long enough to disclose a deal under which DEC will drop its DECmcc network management architecture and license IBM's NetView/6000 Unix network manager for use with the Alpha AXP systems line. DECmcc did not make the cut for the Open Software Foundation's Distributed Management Environment, and its sales have been lower than DEC had hoped. Sources said DEC went to IBM rather than Hewlett-Packard, developer of the OpenView technology that underlies NetView/6000, because it sees IBM's implementation as having more of an enterprisewide focus.

I want my N—TV!

Apparently feeling that it needs a more powerful medium to get the word out about its unfolding enterprise strategies, Novell is preparing to launch the network industry's first satellite television network, according to company sources. Novell will put on regular satellite broadcasts to provide a "hot issues forum" aimed at educators and value-added resellers. The announcement was slated for Interop this week but will probably be delayed for a few weeks, a Novell source said.

Almost invisible

If you've seen IBM PC Co.'s new ThinkPad 500 subnotebook, you're in a select group. IBM hasn't managed to ship any of the 3.9-pound notebooks yet because of what insiders acknowledge are bad parts. IBM Direct staff members say they don't have a delivery date even now but hint that the system could ship in a couple of weeks.

Everyone's doing it

Ingres plans to unveil on Sept. 13 a database replication product similar to Sybase's Replication Server. The replicator will be sold as a separate product from the Ingres database, according to a source close to the ASK Group subsidiary. The replicator will be priced on a per-user basis, although existing Ingres customers can choose to pay a flat fee if they wish, the source said.

Equal rights

Unify Corp. in Sacramento, Calif., will make its big splash in the client/server application market at Unix Expo next month, where the vendor will introduce a cross-platform development tool set for creating large, complex client/server applications. Beta-test versions of Unify Vision, which can be used to build and deploy applications on Unix and PC platforms, will go into production in November at 30 customer sites. Initially, the product will support Sun SPARCstations, HP 9000s, IBM RS/6000s and Intel-based PCs.

Vaporous fumes

Never let the facts stand in the way of an award. At the SCO Forum 1993 sponsored by The Santa Cruz Operation, Notes from Lotus won the 1993 Product of the Year award in the category of business application software. Of course, winning this award seems to have little to do with the fact that Notes isn't scheduled to be available on the SCO operating system, or any other Unix platform, until the fourth quarter at the earliest.

Clear the DECs! It's Digital from now on. Marketers from the Maynard, Mass.-based mini maker are on an intensive campaign to expunge the "DEC" acronym from the industry's vernacular. They've asked publications to refer to the company as "Digital" from now on. We're happy to comply, but we wonder what Digital is going to do with its DECchip 21064, DECpc, DEC 3000 AXP, DECstations, DECsystems, DECnet Phase IV, DECnet/OSI, DEChub 900, DECnis 500/600 routers, DECconcentrators, DECbridges, DECservers, DECEDI, DECimage, DEC C, DEC Pascal, DEC Fortran, DEC Ada, DEC Cobol, DEC C++, DECforms, DEC Rdb, DEC DBMS, DEC PHIGS, DEC GKS, DECest, DEC DB Integrator, DEC DSA Workcenter, DEC Bally and DECwindows Motif. We'll probably find out at the next DECworld. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 75537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

WHEN REMOTE ACCESS PRODUCTS WERE TESTED IN THE ARIZONA DESERT, GUESS WHO HAD THE HOTTEST SOLUTION?

The test was part of a comprehensive analysis of remote network access solutions done by ZD Labs. They packed up nine dial-in server products and sent a technician out to do some real field testing—in the town of Sedona, Arizona, pop. 7940.

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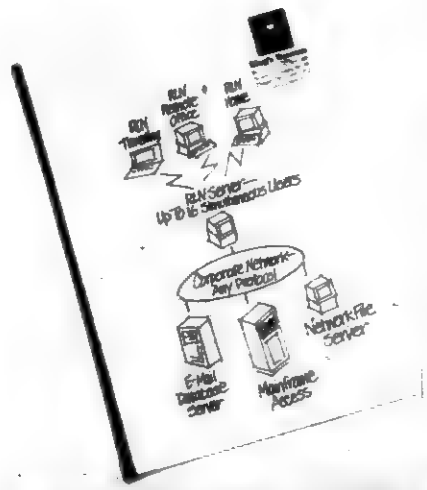

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The report went on to say, "Our winner, DCA's RLN, stood out for its capability to handle multiple communications protocols," commenting that "it won hands-down on flexibility, allowing our remote users to connect to both IPX and IP servers in the same call."

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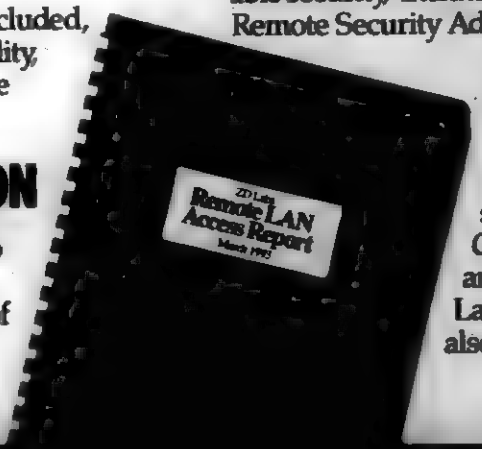

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The Newspaper of Information Systems Management
August 30, 1993, Vol. 27, No. 35, 108 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Borland slashes prices in bid to regain momentum

By Michael Vizard
SCOTTS VALLEY, CALIF.

■ Borland International, Inc. last week went on the offensive, offering the latest version of its Quattro Pro spreadsheet for Windows and DOS for $50. Borland is looking to build momentum following a court ruling that it infringed on copyrighted Lotus Development Corp. technology.

But whether Borland has the resources necessary to withstand another price war has industry analysts wondering if its price-cutting strategy might not ultimately backfire. Borland may have to shell out millions in damages to Lotus if it loses the suit.

Undaunted, Borland pushes on. "We're shooting for a 35% unit share of the Windows spreadsheet market. That means we plan to ship 500,000 copies by Jan. 15," said Philippe Kahn, Borland's chief executive officer (see chart page 10). The company claims to have a 15% share of that market today and to have shipped close to 2 million Quattro Pro licenses for Windows and DOS.

Borland's Philippe Kahn: *Hawking his wares at Safeway?*

Borland's attaining a 35% share will be critical to absorbing the costs it is likely to incur from the Lotus suit and to creating the sales volume necessary to make one of its core businesses profitable.

Toward that end, Borland has come up with an attention-grabbing promotion for Quattro Pro 5.0 that consists of a $49.95 list price and a $39.95 competitive upgrade offer. Both run through Jan. 15.

This latest initiative is a bold attempt to gain market share at a time when many customers of Lotus' 1-2-3 spreadsheet for DOS are thinking of upgrading to 1-2-3

Borland, *page 10*

Management

Tilling technology

You're here, users are out there. So how does a scattered and decentralized organization keep from duplicating costly efforts? IS executives such as Sara Lee's Vince Swoyer have evolved a wide range of tactics, from recentralization to near complete autonomy for business units. *See story page 75.*

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IBM revs up PowerPC

Big Blue toils to improve X86 emulation in RISC chip

By Ed Scannell and Stephen P. Klett Jr.

IBM has quietly set up a clean room in an attempt to significantly enhance the X86 emulation abilities of its PowerPC chip, sources familiar with the project said last week.

The hope is that by improving the chip's ability to run Intel Corp.-compatible software, IBM will get its PowerPC-based servers and desktop systems off to a fast start.

While IBM's Advanced Workstation Systems Group is expected to announce the first PowerPC-based systems late next month, those systems will not have versions of the chip with the improved emulation capabilities.

It is not clear whether the PowerPC-based desktop systems expected from IBM's Power Personal Systems Division either late this year or early next year will have the improved chips.

X86 emulation, *page 20*

Roughly 1.5 million PowerPC chips are expected to ship through next year, according to Dataquest projections.

Modular AIX tailored to varying application needs

By Jean S. Bozman
AUSTIN, TEXAS

IBM will field a scalable version of its AIX version of Unix for the PowerPC series of processors later this year, matching code functions to specific PowerPC hardware platforms.

Existing RISC System/6000 machines will also be able to use the new AIX code, IBM said.

Called Scalable AIX, the building-block approach will cover a wide range of computers from laptops to high-end clustered machines, IBM said. Some AIX versions will add to the 4 million lines of code in AIX Classic — the current version — while others will subtract some system utilities and special features from it.

For example, AIX Lite will have "substantially" less code than the AIX Classic, according to

AIX, *page 16*

Alliance may aid fast copper nets

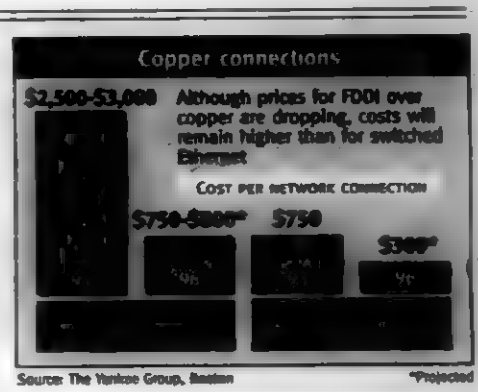
By Joanie M. Wexler and Lynda Radosevich
SAN FRANCISCO

Many user companies are excited by the prospective economies of running high-speed local-area networks over copper cabling. But early users are finding that incomplete standards, compatibility problems and missing pieces of the components puzzle are stalling efforts to build a physical network infrastructure to support networks pushing the technology envelope.

To alleviate this problem, analysts said they expect to see more vendor alliances, like the one announced at last week's Interop '93 August show between Compaq Computer Corp., cabling supplier ITT Datacom and high-speed LAN vendor SysKonnect, Inc.

The companies, each of which represents dif-

Alliance, *page 12*



Early users laud AppBuilder

By Elisabeth Horwitt
SAN FRANCISCO

If the experiences of early users are any indication, Novell, Inc.'s Visual AppBuilder is fulfilling its promise as an easy-to-use application development tool for developers who need to program in a hurry or write in an unfamiliar desktop environment.

However, users reported that AppBuilder is no panacea; it still requires intimate programming knowledge, particularly when the applications get larger and more complex. Moreover, a few key pieces are still missing, making it less of a client-independent application environment, at least initially.

Originally developed by Novell acquisition Serius, Inc., Visual AppBuilder was unveiled last spring as part of Novell's AppWare family of client application development tools. The product consists of modules of prewritten code

AppBuilder, *page 14*

INTEROP '93

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• Novell, SynOptics link up. Page 14

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■ **The U.S. Justice Department's Antitrust Division** schedules a meeting with an **IBM** outsourcing competitor to discuss long-standing charges that IBM's outsourcing business violates antitrust rules. *Page 6*

■ And, within hours of the **FTC**'s decision to end its 30-month probe, the **Antitrust Division** announces its own investigation of **Microsoft**. *Page 6*

■ **Borland** woos IS with a WorkGroup Edition of Quattro Pro for Windows. *Page 10*

■ **Novell** and **SynOptics** forge enterprise networking ties. *Page 14*

ADVANCED TECHNOLOGY

■ Computerized aids help an **Intel** engineer work and interact with peers and family, despite his battle with amyotrophic lateral sclerosis. *Page 28*

DESKTOP COMPUTING

■ New to market: notebooks from **Toshiba** and enhancements to **AST**'s Bravo line. *Page 41*

WORKGROUP COMPUTING

■ **Excalibur Technology** uses neural networking to retrieve data despite entry errors and sloppy queries. *Page 47*

ENTERPRISE NETWORKING

■ Microsoft's Mail and Lotus' CC:Mail are top choices for companies standardizing on a PC-based mail system, but even they fall short when networks are large. *Page 57*

STELLA JOHNSON

John H. Christoffel at Grossman's, Inc. *is placing decision-making tools in the hands of sales floor personnel.* **Page 39**

LARGE SYSTEMS

■ With its engineering budget limited, **Digital** is focusing Rdb database development on high-end production systems functions. *Page 65*

■ **The Jockey Club** switches from VM and OS/2 to Unix servers running Sybase. *Page 65*

APPLICATION DEVELOPMENT

■ Database vendors don't like the name, but analysts say their application development tool sets are CASE tools with a somewhat better grasp of client/server development. *Page 73*

MANAGEMENT

■ Overseeing technology deployment in a decentralized environment demands good coordination and a lot of diplomacy. *Page 75*

IN DEPTH

■ Skill requirements are changing too quickly for conventional training to keep up. Embedded performance support may be the most practical and economical answer. *Page 81*

CAREERS

■ Want to be a Windows developer? Most employers look for a year of Windows programming experience and fluency in the C language. *Page 86*

MARKETPLACE

■ When you're buying talent, don't lean too heavily on vendor technical certifications. They may tell you less than you think. *Page 93*

COMPUTER INDUSTRY

■ **HP** proves that you can be profitable and still have troubles. *Page 101*

COMMENTARY

■ Politics made a long-running sideshow out of the **Justice Department**'s investigation of IBM, says editor in chief Bill Laberis. Let's not do it again with Microsoft. *Page 32*

■ Want to succeed as a CIO? Put those long-term planning documents in a bottom drawer, Akram Yoseri advises. *Page 33*

■ Groupware is touted as a boon to productivity, Michael Schrage writes, but it's mostly used to compensate for downsizing. *Page 33*

■ The Internet isn't the national information highway of our dreams, Charles Babcock says, but it's a good starting point, as many businesses are starting to discover. *Page 35*

■ What **Novell** needs is a little competition in the network arena to teach it the importance of listening and responding to customers, according to David Coursey. *Page 80*

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Executive Briefing

Any delay between promise and reality is frustrating, but the intervals between unveilings of promising technology schemes and vendor follow-through do seem to be getting shorter. In many instances, vendors aren't just taking unilateral action; they're actually collaborating to make technologies more workable. For example, while early implementors of copper wiring for high-speed LANs are expressing frustration over compatibility problems and missing pieces, three vendors — Compaq, ITT Datacom and SysKonnect — have joined in an alliance they say will guarantee a 100% performance improvement. *Page 1*

In the E-mail arena, where gripes about administrative, management and diagnostic weaknesses are heard about even the most favored products *(page 57)*, **vendors are also putting their heads together to solve some of the most pressing problems for large corporate customers. The X.400 Applications Program Interface Association, an E-mail industry group consisting of Lotus, Microsoft and other E-mail vendors and users, promises to address incompatibilities in user directories and calendar applications that make large-scale integration of mail systems such a headache.** *Page 12*

Equipment makers and carriers with an interest in Asynchronous Transfer Mode (ATM) are moving with blazing speed (and a high degree of cooperation) to bring products, services and price points to a level where customers will feel comfortable making a commitment. Sprint activated a coast-to-coast ATM link earlier than expected, and a number of industry players are working together to blend ATM LANs and wide-area networks. *Page 8*

Vanity of the "not-invented-here" variety no longer has any place at Digital Equipment Corp., according to CEO Robert Palmer. This week the company proves it by dropping work on the DECmcc network management platform and announcing it will license IBM's NetView/6000 as the network management platform for Alpha AXP systems. *Page 7.* **A limited engineering budget is also forcing the company to focus development of its Rdb relational database more sharply, instead of trying to stretch to appeal to departmental and workgroup buyers, the company will concentrate its efforts on functionality for high-end production systems.** *Page 65*

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chaos

errors

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CA plans to enter object fray

September beta version planned for CA-Visual Objects

By Thomas Hoffman
ORLANDO, FLA.

Seeking a foothold in the Windows application development arena, Computer Associates International, Inc. last week said it will ship a beta-test version of its CA-Visual Objects package next month.

CA-Visual Objects, unveiled before the 1,000 application developers who attended CA's Technicon '93 conference here last week, is an object-oriented Windows application development suite. It is based on a set of next-generation application development technologies known as Aspen, which were obtained when CA acquired Nantucket Corp. last year [CW, June 15, 1992].

Since then, CA has added visual development tools, class libraries and SQL access to the product set. CA-Visual Objects also supports Microsoft Corp.'s Open Database Connectivity requirements and traditional Xbase databases, including CA-Clipper for DOS.

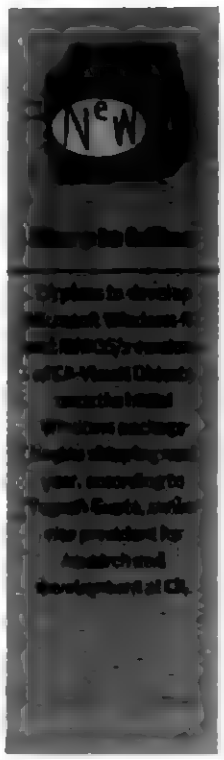
CA-Visual Objects is expected to compete primarily with Microsoft's Visual Basic for Windows and Powersoft Corp.'s PowerBuilder for Windows application development tool sets.

Windows appeal

The package should appeal to CA's 300,000 Clipper licensees and other mainframe software customers seeking to move older DOS and Cobol applications onto Windows platforms, according to Tina Foraker-Blackwell, a senior analyst at New Science Associates, Inc. in Westport, Conn.

However, she noted that CA will have a tough time wresting Visual Basic and PowerBuilder users away from Microsoft and Powersoft because Visual Objects is late to market compared with those well-established products.

CA-Visual Objects differs sharply from Visual Basic and PowerBuilder in several respects, according to John Faig, a senior research analyst at Meta Group, Inc. in Westport, Conn.



PowerBuilder is a fourth-generation language environment for use by large teams of programmers, while CA-Visual Objects, like Visual Basic, will be better-suited for smaller application development programming environments, such as those deployed by value-added resellers and small workgroups, Faig said.

In addition, CA-Visual Objects is a true object-oriented environment, unlike its competitors, Faig said. In addition, CA-Visual Objects includes both native code and P-code compilers for variable programming capabilities, a feature that has appealed to early Alpha-test users of the product. P-code, or pseudo-code, is non-machine-generated code.

"It's easier to code than Visual Basic," said Kevin J. Farley, director of software development at Rent Roll, Inc., a Dallas-based property management software developer that also uses the Microsoft package.

"It's like having the power of C++ without having to go through the complexities of using it," added Tad Frysinger, manager of information services at Colorado Commodities Management Corp. in Boulder, Colo.

Details sketchy

CA executives offered scant details about pricing and general availability for the product. However, analysts said the software should hit the market by mid-1994, priced competitively with Visual Basic and PowerBuilder. Those two products cost $495 and $1,495 for entry-level packages, respectively.

Marc Sokol, CA's director of product strategy, said the 1,200 planned beta-test shipments of CA-Visual Objects reflect CA's emphasis on the product as a cornerstone of its application development strategy.

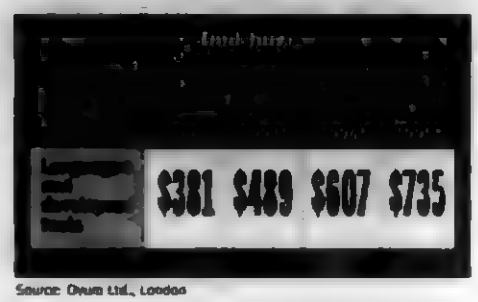
"Visual Objects is to application development for CA what Unicenter is for systems management," said Sokol, referring to the vendor's two-year-long development of Unix and PC-based ports of its systems management package.

Client/server

OLE 2.0 hinges on Visual C++

By Michael Vizard and Melinda-Carol Ballou
BOSTON

Information systems managers looking to get a jump on client/server application development using Microsoft Corp.'s Object Linking and Embedding (OLE) 2.0 interface will have to rely on a 16-bit version of Microsoft's Visual C++ tool, which will offer full support for OLE later this year.



Source: Orum Ltd., London

At present, OLE tools consist of standard character-based C languages, a time-consuming proposition; and a 16-bit implementation of Visual Basic, which supports only the creation of OLE containers for clients.

Developers looking to add OLE server support for their applications, which gives them the ability to launch and control another application, can look to the upcoming release of 16-bit Visual C++, said W. Quinn Curtis, Microsoft product manager for workgroup applications.

Last week, Microsoft launched the 32-bit version of C++ at the Software Development Conference but noted that OLE server support will not be added to the 32-bit version of Visual C++ until sometime next year. Microsoft offered no time frame for when server support will be added to Visual Basic.

C++ is the one

As a result, IS managers should begin thinking about bolstering their C++ development staffs because Visual C++ will be the tool that supports the building of OLE servers, added Denis Gilbert, Microsoft's general manager for the Visual C++ business unit.

Traditionally, Visual Basic has been used to create local Windows applications, which are then generally linked to databases using C or C++ calls. Moving this model out to client/server computing implies that developers will probably only require OLE container services for the Visual Basic applications, Gilbert said.

As part of that effort, Gilbert said Microsoft will focus on providing enhancements between applications written in Visual C++ and Microsoft applications.

However, the company said it has no plans to develop a version of Microsoft Office that would include Visual C++ similar to the Microsoft Office/Visual Basic edition currently offered.

Price is right

Microsoft Visual C++ 32-bit edition is priced at $599. For NT Software Developers Kit users or those upgrading from the Visual C++ Professional Edition, the product is priced at $99.

David Halpin, systems engineer at Computer Systems Co., a Breckville, Ohio-based image systems house for the health care industry, said "16-bit applications just don't hack it" for the work he is doing.

While he is also investigating tools from Symantec Corp. and Borland International, Inc., the full OLE 2.0 support to be offered by Microsoft is likely to be a deciding factor for his company.

Meanwhile, Allan Wolff, programming special interest group coordinator for the Chicago Computer Society, said he has seen a noticeable increase in demand for C++ programmers, but he cautioned IS managers to question whether they would be better off doing complicated C++ programming in-house or outsourcing such projects to professional developers.

And even Visual Basic users are checking out the Visual C++ tools.

"We think [Visual Basic] 3.0 is fantastic, [but] we're also really playing with Visual C++ and using it for [Distributed Computing Environment] development," said C. David Marcillo, technical manager at Harvard University's office of financial systems. "We're definitely interested. And since it's all new development, we figure that we might as well go to 32-bit right away [when using the Visual C++ tools]."

Rivals respond

While Microsoft made its C++ pronouncements, rivals fired salvos of their own last week, including the following:

- Symantec said it began shipping its 32-bit C++ tools last week as expected [CW, Aug. 16]. Symantec C++ Professional is priced at $499. The upgrade price is $149.
- Borland, meanwhile, announced a "strategic direction" based on the company's Object Windows Library 2.0, which will begin shipping later this fall with Borland's C++ for Win32.

This is a multiplatform strategy for the company's tools to extend its compiler support for Windows and DOS to OS/2, Macintosh and Unix platforms. This support will be provided by third-party compiler companies. Pricing will be announced when the product ships.

—Melinda-Carol Ballou

Corrections

- Because of a reporting error, Spectrum Information Technologies, Inc. was misidentified in an article in the Aug. 23 issue.
- Because of a reporting error, Congress Financial Corp. of New York was misidentified in an item in the Aug. 16 issue.

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News Shorts

Novell slumps, prepares for new CEO

As expected, Novell, Inc. said its operating profits for the third fiscal quarter were down 6% from a year ago to $62 million [CW, Aug. 2]. Novell posted a loss for the quarter of $255.4 million, or 80 cents a share, compared with earnings of $66 million, or 21 cents a share, a year earlier. Revenue rose 12% in the period to $273 million from the year-ago period. Also, the Provo, Utah, firm paved the way for the succession of Chief Executive Officer Raymond J. Noorda, by appointing two senior executives to join him in an office of the president. Mary M. Burnside, executive vice president of operations, and James R. Tolonen, senior vice president and chief financial officer, will join Noorda.

GM subsidiary outsources to SMS

What is good for **General Motors Corp.** is not necessarily good for **Electronic Data Systems Corp.** A GM subsidiary, **Packard Hughes Interconnect**, has outsourced data center operations in a three-year contract to **Software Maintenance Specialists** (SMS) in Santa Ana, Calif. Packard Hughes makes electronic components and is transitioning from its traditional government market to the commercial sector. SMS said it will provide data center services for manufacturing operations, including customer order processing, inventory control and assembly line monitoring. It could not be learned whether GM subsidiary EDS bid on the contract.

Turner Broadcasting hires CIO

Turner Broadcasting System, Inc. in Atlanta has hired its first chief information officer: Elahe Hessamfar, who hails from the telecommunications industry. Her most recent post was vice president of information systems at Pacific Bell Directory. Hessamfar is the first IS executive to serve as a member of Turner's executive committee.

OSF announces DME pricing

Acknowledging delays in getting products shipped, the Open Software Foundation (OSF) last week announced a pricing schedule for its Distributed Management Environment (DME) distributed services package at Interop '93 August. The prices, which range from $25,000 to $250,000, are for systems vendors considering how to implement DME in their own products, the OSF said. DME's Distributed Services functions, scheduled to ship later this year, include print management, software distribution, license management and PC services.

Sybase repository to debut today

Sybase, Inc. intends to announce an application development repository today as part of an expected tools unification plan [CW, Aug. 16]. Two new object-oriented tools are also on the agenda, expanding on Sybase's recently acquired GainMomentum product, according to sources briefed by Sybase. EnterpriseMomentum was designed to build large-scale client/server software, while BuildMomentum is aimed at smaller departmental applications.

SHORT TAKES **IBM** announced a $1,095 software developer's kit for OSF's Distributed Computing Environment that supports the OS/2 operating system and Windows operating environment.... Last week, **Thinking Machines Corp.** in Cambridge, Mass., announced the resignation of President Harvey L. Weiss, who joined the company in June 1991.... Legent Corp. has agreed to acquire **Netwerx, Inc.**, a client/server problem management and trouble ticketing software vendor.

News shorts, page 16

ISSC catches eye of Justice Dept.

Assistant attorney general to hold antitrust meeting Sept. 14

By Mark Halper
WASHINGTON, D.C.

A long-standing charge that IBM's outsourcing business breaches antitrust rules has caught the interest of the U.S. Department of Justice's new antitrust chief.

Assistant Attorney General for Antitrust Anne Bingaman will meet on Sept. 14 with executives from outsourcer Affiliated Computer Systems, Inc. to discuss allegations against IBM's Integrated Systems Solutions Corp. (ISSC), according to Affiliated general counsel William Deckelman.

The meeting will mark the highest level of attention given to the matter by the Justice Department since Affiliated and other outsourcers claimed more than two years ago that ISSC violates a decades-old agreement between IBM and the department that restricts IBM's participation in the outsourcing business.

The Justice Department's action on the ISSC case could range from dismissing it to bringing criminal or civil charges. Some industry observers predicted the agency will not move against ISSC but will rewrite the 1956 agreement, known as the Consent Decree, to more accurately reflect a changed computer and business world. Still others questioned the timing of any move against what is one of the few bright spots in an otherwise bleak IBM financial picture.

At a glance
Anne Bingaman, who was named to head antitrust on June 17, is expected to take a more active role pursuing antitrust matters than did her predecessors in the Reagan and Bush administrations.

Unfair advantage?

The 1956 agreement addressed concerns that IBM could use its clout as a predominant hardware supplier to gain an unfair edge in what was then known as the service bureau business.

It required IBM to establish a separate subsidiary for service bureau work and expressly barred IBM from offering the subsidiary special pricing.

An ISSC spokesman last week reiterated ISSC's ongoing claim that it is in "complete compliance" with the decree.

A Justice Department spokeswoman said only that the department "is continuously monitoring the Consent Decree." She confirmed that Bingaman will participate in a meeting on the 14th but said, "I can't comment on the topic."

Executives from Sungard Data Systems, Inc., another concerned outsourcer, may also attend the Sept. 14 meeting, Deckelman said. Sungard did not return calls by press time.

The planned Sept. 14 meeting follows an Aug. 2 letter to Bingaman from U.S. Rep. John Bryant (D-Texas) that urged the Justice Department to resolve the matter. Bryant, a member of the House Judiciary Committee, criticized the department for "a larger, disturbing trend of inaction ... regarding certain antitrust matters." He further charged that the Justice Department's failure to make a decision has left smaller outsourcing companies in limbo trying to plan their business around an uncertain outcome to the investigation. He noted that Justice's foot-dragging "is seemingly denying these companies their due process."

In his letter, Bryant said several members of the committee had recently become aware of the Affiliated complaint.

Bryant could not be reached last week.

Competitor claims

Affiliated has asserted since 1991 that ISSC's use of IBM's sales force and its name, as well as its receipt of special IBM discounts, violates the Consent Degree.

And even if ISSC were a legitimate subsidiary, IBM is still benefiting from jobs it won before setting up the subsidiary, Affiliated said.

The investigation had stagnated at the staff attorney level until the Justice Department elevated it to the attention of Deputy Assistant Attorney General Mark Gidley a year ago [CW, Nov. 9, 1992].

But Gidley, a Republican, left with the change in administration, and the case soon bogged down again as President Clinton wrestled for months to win approval of a new attorney general.

FTC hands Microsoft probe to Justice

The Department of Justice's Antitrust Division will pick up where the Federal Trade Commission (FTC) left off in its antitrust investigation of Microsoft Corp.

The division acknowledged last week that it will launch a formal investigation under its new chief, Anne Bingaman, that will use all of the evidence submitted to the FTC.

Justice officials said they will make a concerted attempt to avoid duplication of the work already done by the FTC. The Justice Department requested and received clearance from the FTC, said Gina Talamona, a spokeswoman for the Office of Public Affairs for the Justice Department. She declined to say specifically what prompted her agency to begin its investigation.

The Department of Justice announced this week that it will continue the Microsoft antitrust investigation where the FTC left off.

"We have been granted clearance by the FTC and we are investigating the matter. We'll use all materials submitted by the FTC to avoid duplicating in an attempt to conclude this matter as soon as possible," Talamona said.

Talamona also refused to say in which area the agency will be investigating Microsoft, which has been accused of unfairly leveraging its various product technologies and marketing practices.

The decision by the Justice Department came within hours of the FTC's announcement that it was closing its 30-month investigation of Microsoft without taking any action.

In a tersely worded statement, the FTC said it has decided that "no further action is warranted." However, it cautioned that this action should not be "construed as a determination that a violation may not have occurred" and that it is reserving the right to take further action "as the public interest may require."

Microsoft officials could not be reached as of press time. —*Ed Scannell*

DEC swaps DECmcc for NetView

By Craig Stedman
SAN FRANCISCO

Digital Equipment Corp. last week confirmed that it will stop work on its DECmcc network manager and license IBM's NetView/6000 software as the network management platform for Alpha AXP systems.

The decision to drop DECmcc is part of a continuing process of weeding out engineering projects that are not paying off. Digital cut engineering spending by 13% in fiscal 1993 and has been casting a stern eye at what Robert Palmer, its president and chief executive officer, calls "vanity projects."

Rose Ann Giordano, Digital's vice president of production systems software, acknowledged that the reductions and Palmer's demand that internal projects have built-in market potential helped prompt the move to NetView/6000.

She added that the licensing deal with IBM [CW, Aug. 23] is aimed at giving Digital access to a larger base of network management applications than it was able to muster for DECmcc, which supports the company's VAX computers and its hardware based on Mips Computer Systems, Inc. microprocessors.

Only 60 applications are available with DECmcc, according to Digital. That compares with 170 packages for Hewlett-Packard Co.'s OpenView product, which beat DECmcc for inclusion in the Open Software Foundation's (OSF) Distributed Management Environment (DME) and is the base technology for NetView/6000.

"There's dollars in volume," Giordano said. "It just makes a much, much better economic case" to write applications for NetView/6000 and other OpenView derivatives than for DECmcc, she added.

Not a long-term move

Chris Christiansen, an analyst at International Data Corp., said it would have taken "a massive investment" for Digital to add DME compliance to DECmcc and to catch up to IBM and HP in functionality. "It's clear Palmer doesn't want to make that kind of strategic investment," Christiansen noted. "He's more interested in the next quarter than the next millenium at this point."

Reaction among Digital users was mixed. "I'm a bit surprised Digital went in this direction because that was one of the technologies they were pushing pretty heavily," said Ed Homko, systems manager at Dr Pepper Co./The Seven-Up Co. in Dallas. His company has been looking at using DECmcc, "but obviously that's up for question" now, he added.

However, Frank Brake, director of international operations for technology business development at Newport News Shipbuilding and Drydock Co. in Newport News, Va., said he had been urging IBM and Digital to work together even though he is a DECmcc user with VAX systems in place.

A single network management platform for Digital and IBM hardware "is exactly where we want to go," Brake said. The shipbuilder can do that today "to a certain extent" using AT&T's Accumaster Integrator software, "but it's a shotgun marriage as opposed to the romantic relationship we'd like to see."

George Kerns, assistant vice president for cellular information management operations at GTE Telecommunications Products and Services in Atlanta, said he also had recommended that Digital leverage more outside software technology. "This is good news from the perspective of DEC kind of breaking the old mind-set that they had to invent everything themselves," he noted.

Digital will market NetView/6000 under the name Polycenter NetView and will continue to develop its Polycenter applications for use with the IBM platform, Giordano said. A NetView/6000 release for the DEC OSF/1 operating system is due in the first quarter of 1994 and will be followed by versions for Microsoft Corp.'s Windows NT and OpenVMS.

The porting work is being done jointly at IBM's Networking Systems facility in Raleigh, N.C., and the firms said future NetView/6000 and Polycenter NetView products will be developed from a single code base and released at the same time.

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Vendors, carrier make ATM moves

By Joanie M. Wexler
SAN FRANCISCO

To ensure that the momentum behind Asynchronous Transfer Mode (ATM) does not falter, carriers and local-area network switch providers alike put the pedal to the metal with the emerging high-speed technology at last week's Interop '93 August trade show here.

Progress took the form of an earlier-than-expected nationwide service rollout from Sprint Corp., the addition of liberating wide-area links to ATM LAN switches and alliances between equipment makers and carriers for blending ATM LANs and wide-area networks into one superfast network infrastructure.

Along with Sprint, the wide-ranging moves involved industry players such as Fore Systems, Inc., Digital Link, Inc., Network Equipment Technologies, Inc. (NET), 3Com Corp. and WilTel. The unprecedented headway with a new network technology, which also included further LAN-side price cutting and new adapter cards, is instilling confidence in some ATM-bound users that the technology is more than vaporware.

For example, Hughes Aircraft Co. has already signed on to Sprint's ATM service and is testing a 1,000-user pilot from California to Virginia to determine traffic patterns and price/performance ratios.

Bob Emmett, manager of network architectures, said Hughes has "no particular killer application" and is instead relying on ATM to serve the array of its internetworked application needs.

"People aren't putting in ATM because it saves them money. They're doing it because it allows them to change what they do in their businesses," said Mark Juliano, vice president of marketing at Fore Systems in Pittsburgh.

Meanwhile, Stanford University is trying to extend its local ATM network nationwide. Stanford is a user of NET's heretofore local ATM switch, which last week gained T3 and Synchronous Optical Network wide-area interfaces.

Stanford is educating students at corporations who are trying to remotely earn master's degrees in electrical engineering, said Dale Harris, director of the Palo Alto, Calif., institution's center for telecommunications.

Bye, bye T3?

In WANs, ATM price points are being set to blow T3 service offerings away. A coast-to-coast Sprint ATM link from Washington, D.C., to Los Angeles at T3 (45M bit/sec.) speeds would cost $40,000 to $50,000 per month, not including local access charges at each end. Sprint estimated this to be 20% to 30% cheaper than its standard T3 offering.

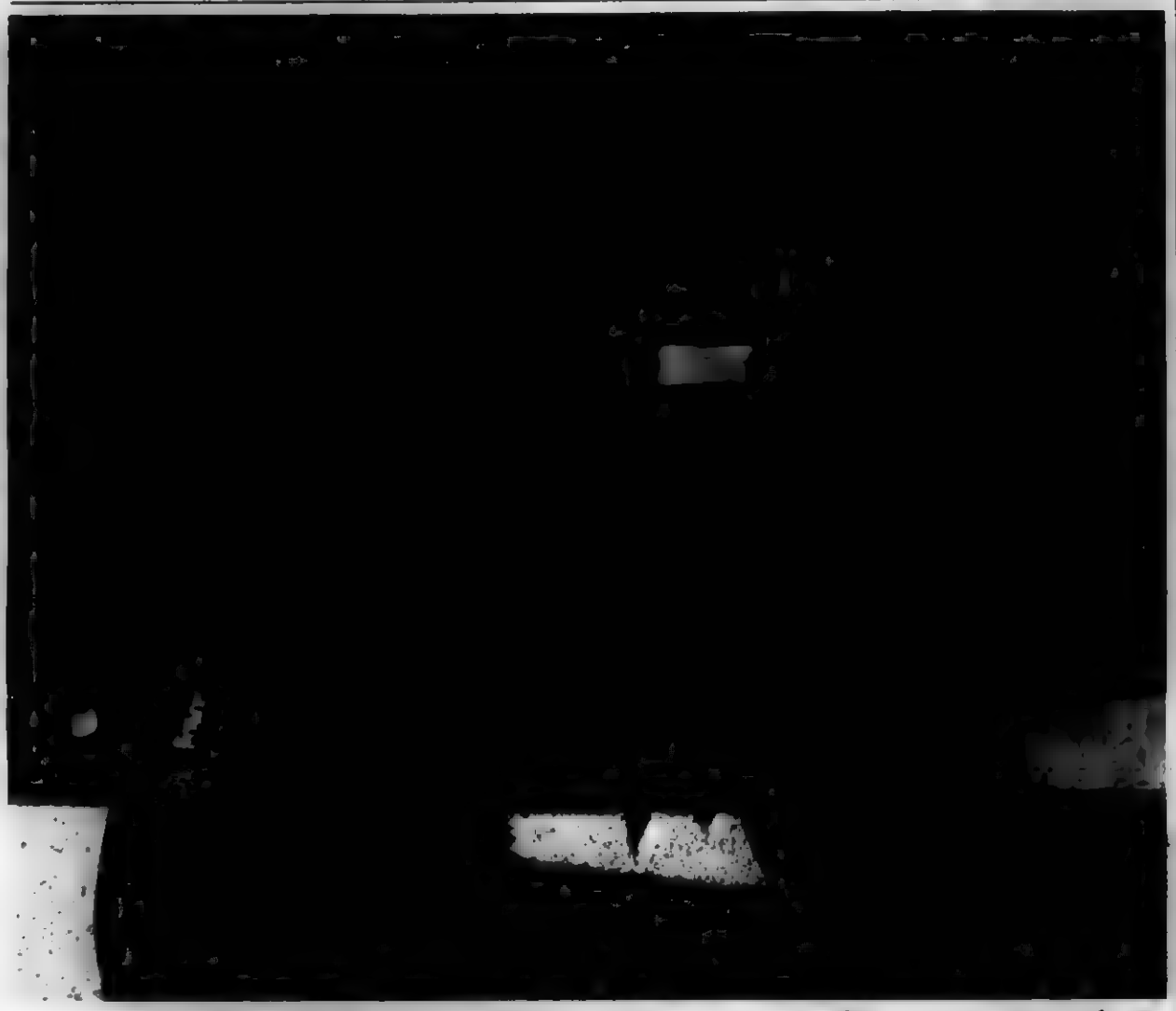
Stanford is hooked to a Sprint metropolitan-area ATM trial network today and sees public ATM service as the way to reach the scattered groups of users who could not be served on a private line network because of cost and complexity.

The Sprint ATM service — six months ahead of schedule and available now — lets users choose the type of billing structure, service and speed needed on a per-location basis.

Sprint offers per-site variable-bit rate ATM, better-suited for data-heavy applications, or constant-bit rate service, which is more attuned to delay-sensitive voice and videoconferencing traffic.

Sprint, meanwhile, has partnered with Fore Systems and Digital Link to sell end-to-end ATM networks. Fore Systems has also struck a deal with 3Com aimed at blending the routed LAN world with the ATM switched world and integrating 3Com's other network components into the ATM fray.

Fore Systems also dropped the price of its Sun Microsystems, Inc. Sbus workstation adapter from $1,995 to $1,295. The price tag rivals those for 100M bit/sec. Fiber Distributed Data Interface (FDDI) LAN adapters over copper wiring, and the cost for fiber-based FDDI cards remains several thousand dollars.



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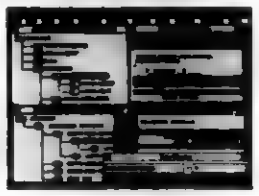

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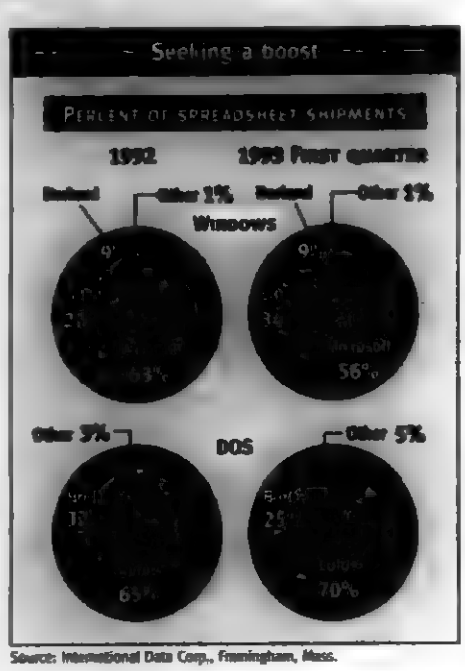
Borland slashes prices

CONTINUED FROM PAGE 1

for Windows 4.0, which was launched two months ago. Thus far, many of Borland's Windows market sales have come from customers switching from 1-2-3 on DOS to Quattro Pro for Windows.

For Borland to be successful, it will have to radically increase sales volume by expanding its distribution channels in pursuit of new spreadsheet customers. The current version of Quattro Pro sells for $99, which means Borland will have to sell two copies of Quattro Pro 5.0 to make up the difference.

"Don't be surprised to see us selling Quattro Pro at places like Safeway," Kahn said.



Source: International Data Corp., Framingham, Mass.

New accounts

In addition to expanding its sales channels, Borland will also have to rally customers disenchanted with Microsoft and Lotus to its cause.

For example, Garber Travel Services, Inc. in Boston switched from 1-2-3 on DOS to Quattro Pro for Windows about three months ago, said Rock Blanco, vice president of information systems. He said he is disappointed with Lotus' service and the performance of 1-2-3 on networks. At the same time, Blanco said he is disinclined to purchase Microsoft applications because he believes Microsoft's strategy deliberately pushes customers into buying Microsoft products.

The Borland initiative essentially extends the volume discounts that have been enjoyed by large customers down to the masses, analysts said.

"Borland has essentially pulled the veil off volume discounts. People shouldn't be deceived into thinking that Borland is the only company selling software at these prices," said Drew Brosseau, a principal at Cowen & Co. in Boston.

"It's all about elasticity of demand. Borland is betting that it can get customers to switch while also expanding the market. From there, they will try to live off the upgrades," he added.

Hard act to follow

Yet another challenge facing Borland, however, is that it is difficult to raise street prices after an extended promotional offering. And if Borland fails to expand its customer base through this latest pricing initiative, the company's stock may fall enough to make it an easy target for a takeover, Brosseau said.

"There's a lot of skepticism about Borland on Wall Street. People were excited about it a few years ago and then lost faith. This is a gamble to kick-start its spreadsheet business and regain that lost faith," Brosseau said.

As part of that gamble, Borland will also have to calculate damages assessed under a recent judgment made against it in the copyright infringement case with Lotus [CW, Aug. 23]. Lotus is expected to seek $100 million in damages, but industry analysts predicted damages would probably not exceed $30 million (see story below).

For its part, Borland said it is confident it will win its appeal before the damages hearing in October. As such, the company has no plans to set aside any reserves to cover potential damages, a company spokesman said.

In the meantime, Borland will spend the next nine months focusing on increasing sales volume, which it hopes will generate enough income to cover all of its future expenses.

Down but not out

Borland customers appear to be keeping the faith. "The Lotus suit may hurt them, but it won't drive them out of business. I'm comfortable that Borland has the staying power to stay in the market," said Frank Austin, president of an independent consulting firm in Houston.

Kahn said last week that the unfavorable court ruling could not have come at better time because Borland was already in the process of launching a new version of Quattro Pro. He said Borland has a relatively small number of Quattro Pro units in the channel; copies already installed are unaffected by the suit.

"We won't have to take any charges because the software that is in the channel has already been accounted for as part of the new product launch," Kahn said.

"We're not changing anything in terms of visibility on the next quarter, and earnings will be in line with previous quarters," Kahn added.

Lotus seeks $100M; may have to settle for less

It is unlikely Lotus will be able to extract the $100 million in damages it is widely expected to seek from Borland as a result of its copyright infringement suit, analysts said, citing previous decisions in this type of case.

Instead, analysts have speculated, damages could run as high as $30 million.

The court will have to first calculate what percentage of Borland's Quattro Pro spreadsheet sales during the last several years infringed on technology owned by Lotus. Then, it will have to estimate how much profit Lotus lost as a result of those sales.

In addition, the court will have to determine what percentage of Borland's sales were won by beating Lotus head-to-head; how many customers purchased Quattro Pro to take advantage of the specific features mentioned in the suit; and whether damages are going to be based on how much profit Borland made or how much profit Lotus lost.

"If you assume Borland has cumulative revenues of $300 million for Quattro Pro, the damages will probably be below $30 million, maybe even $10 million," said Drew Brosseau, a principal at Cowen & Co. in Boston.

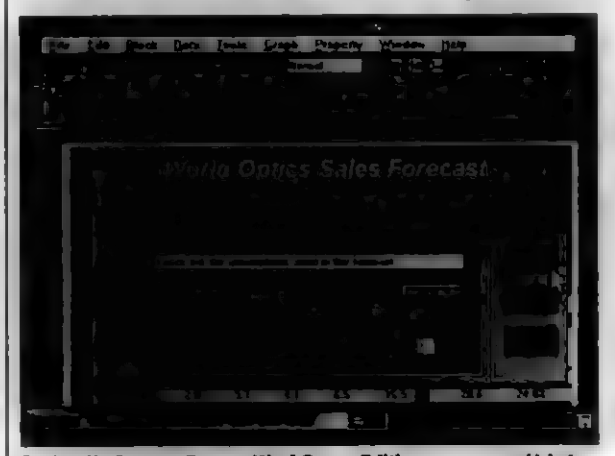
—Michael Vizard

Quattro Pro 5.0 for workgroups launched

By Michael Vizard
SCOTTSVALLEY, CALIF.

In addition to launching a $50 stand-alone edition of its Quattro Pro spreadsheet this week, Borland International, Inc. will unveil a WorkGroup Edition designed to provide a groupware approach that does not require information systems managers to adopt a separate set of middleware services.

Priced at $99.95 through Jan. 15 ($495.95 afterward) and based on the forthcoming Quattro Pro 5.0 for Windows spreadsheet, the WorkGroup Edition incorporates Borland's long-awaited Object Exchange (Obex) technology directly into the application, which then allows users to share



Borland's Quattro Pro 5.0 WorkGroup Edition *can consolidate 150 worksheets from various offices into one*

spreadsheet data across electronic-mail and network transport services.

As a thin layer of object technology built directly into an application, Obex was designed to let users encapsulate a piece of data and then send a message to other users alerting them that this data is available. Once alerted, users then log in and have that data automatically incorporated into Quattro Pro.

"The WorkGroup Edition allows us to create a group strategy without having to make a huge financial commitment," said Ezra Davidson, manager of IS at the Brown Organization, a privately held Los Angeles firm that owns several radio stations.

In contrast, Davidson said other groupware offerings require users to deploy and maintain a separate software package, such as Notes, to provide a set of middleware services.

Bringing remote offices closer

Garber Travel Services, Inc. in Boston intends to deploy the WorkGroup Edition to help link all of its remote offices. "I can use the Notebook feature in the WorkGroup Edition to roll up 150 worksheets from different offices into one worksheet," said Rock Blanco, Garber vice president of IS.

In addition, Blanco noted that support for SQL will allow him to deploy Quattro Pro as a front end to SQL databases. Other features include the ability to deploy custom configurations from a single server.

Borland's workgroup strategy calls for supporting Obex as a tool for integrating applications. For example, Obex will be included in a forthcoming version of Borland's Paradox for Windows database.

However, whether Borland has enough clout to garner industry support for Obex, which currently does not provide the range of services available in groupware environments such as Notes, remains to be seen.

For example, WordPerfect Corp. Vice President of Technology Dave Moon said his company is currently evaluating Obex but has made no specific commitments.

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Users want unified mail directories

Products demonstrated at Interop ease synchronization headache

By Lynda Radosevich
SAN FRANCISCO

Hearing the frustrated cry from large electronic-mail sites, vendors are stepping up efforts to address managers' biggest headache: synchronizing incompatible directories from many different systems. The idea is to allow end users to access E-mail addresses from users on different systems directly from their native systems.

DunsNet's Allan Conner: *Setting up global directory not easy*

The problem behind directory synchronization stems from the different addressing conventions E-mail vendors use. When information systems managers create a master names and address directory, they must translate the addresses to the different formats or create homegrown software to do so.

"One of our primary goals in setting up enterprisewide E-mail is setting up a global directory, and that won't be easy because it requires cooperation and coordination by the different entities at Dun & Bradstreet, each with independent mail systems," said Allan Conner, president of DunsNet, a Dun & Bradstreet Corp. company that provides network services to the corporation's divisions.

Initially, the messaging industry thought it would solve the directory problem by having all vendors comply with the X.500 standard. However, "X.500 hasn't come on board fast enough, and the systems have grown up differently," said Thomas Tansy, a partner at Tansy Associates, a technology consultancy in Santa Cruz, Calif.

Therefore, efforts from independent directory synchronization vendors with no stake in particular E-mail or network operating systems are important to the effort to solve directory problems, he said.

At the Interop '93 August conference last week, several announcements and demonstrations were offered to help ease the difficult synchronization task, including the following:

- The X.400 API Association agreed to work on delivering directory interoperability guidelines (see story below left).
- SoftSwitch, Inc., an E-mail integration company in Wayne, Pa., launched a consulting group that will help firms manage the directory integration process.
- Hitachi Computer Products, Inc. announced Mosaic Works, software that will synchronize directories from the major E-mail systems. It will ship in October. Mosaic Works uses a "rules engine" to convert address formats to a standard format. The addresses are stored in a master database, then propagated to local-area networks. An agent at the LAN converts the addresses back to the native format and updates the local E-mail directories. It operates on the Simple Mail Transfer Protocol messaging protocol using a directory synchronization method published by Retix.

The Hitachi software runs on the Sun Microsystems, Inc. Scalable Processor Architecture Unix platform or an X.400 platform from Hitachi and integrates directories across most Unix, Macintosh and PC-based LANs. The directory server software costs $2,495 and supports 1,500 addresses. Individual agents cost $995.

To help companies with planning and longer-term strategy, SoftSwitch created a consulting service called Directory Xpress. The service helps users prepare addressing conventions and migrate to X.500 standards-based directory protocols, a level of help not included in the traditional installation services, said Ron Kopeck, vice president of marketing at SoftSwitch.

Vendors align on mail API

By Lynda Radosevich
SAN FRANCISCO

Every cloud has its silver lining, and one outcome of the so-called "API wars" between Lotus Development Corp. and Microsoft Corp. camps is said to be increasing signs of cooperation.

Evidence of this emerged last week when an electronic-mail industry association composed of Lotus, Microsoft and other E-mail vendors and users decided to move forward to make E-mail applications interoperate.

The X.400 Applications Program Interface Association (XAPIA) voted at Interop '93 August to develop calendaring application programming interfaces (API). The APIs would allow calendar programs from different vendors to exchange information using E-mail and let applications work with multiple calendaring systems.

Additionally, the XAPIA decided to deliver within one year tools that will help vendors make their E-mail directories compatible. Here, speed rather than thoroughness is the essence, an XAPIA spokesperson said.

To encourage end-user and small business participation in developing these APIs, the XAPIA introduced a new category of associate membership that costs $2,000 per year rather than the usual $5,000. Associate members can participate in technical committees but cannot vote.

"I'm generally a pessimist when it comes to these arrangements, but things have changed since the VIM/MAPI wars," said Pete Donaghy, manager of enterprise information systems at Hughes Aircraft Co. "Users learned that we have to be involved. . . . Vendors learned that API wars didn't do anyone any good and confused the industry."

Alliance

CONTINUED FROM PAGE 1

ferent elements of a LAN infrastructure, said they plan to build stable physical-layer-level network platforms out of Compaq servers and workstations. SysKonnect copper Fiber Distributed Data Interface (FDDI) adapters and concentrators and ITT Datacom cabling. The clincher is that the alliance will guarantee 100% interoperability.

Alliances such as these are needed because the technologies are immature, making for "a fairly messy job," said Kenneth M. Hays, network technical coordinator at Florida State University in Tallahassee.

"The bottom line is you have to be far enough along in your education or go to someone you can pay to make this stuff work," he said. "Just because you can plug [a network adapter] into an EISA bus doesn't mean it will necessarily work under DOS, Windows or NT."

The issue parallels the state of the industry two years ago when 10M bit/sec. Ethernet over unshielded copper (10Base-T) emerged. At the time, Houston-based Texas Commerce Bank had to turn to an alliance of Compaq, Novell, Inc. and ViewStar, Inc. to guarantee the interoperability of its 10Base-T platform for running a new imaging application.

To get these technologies up and running, many users must initially turn to the vendors to figure out the impact of "all these different pieces of equipment banging into each other and figuring out whose fault it is when the thing crashes," said Allen Cournyer, senior vice president of retail technology and operations at Texas Commerce.

"I'm originally from the glass house; we were pioneers [with 10Base-T] and we would not have succeeded without this coalition-like strategy," Cournyer said.

Watching for details

Part of the justification behind offering what the three vendors call a near-bulletproof platform for new communications technologies is that the standards for getting very high-speed networking rates to run over error-prone unshielded copper leaves no room for error.

In fact, "there isn't even an official standard in place yet for 16M bit/sec. Token Ring," Kevin Johnson, ITT Datacom's director of North American operations, pointed out. That is because getting those speeds — which are far slower than the 100M bit/sec. speeds of FDDI and fast Ethernet — to run over unshielded copper is no simple feat, he said.

The idea behind the alliance is to preclude users from worrying about device driver compatibility with a given server or figuring out how to set up the right network parameters as they create applications requiring the speeds and features of FDDI, fast Ethernet and Asynchronous Transfer Mode.

An Interop attendee who asked not to be identified said he prefers a vendor alliance for such platform tweaking to services from value-added resellers. "I'd prefer these engineers who know their technology to sales guys who just say, 'I'll get back to you.'"

On the other hand, Matt Jacoby, a senior network analyst at Norwest Mortgage, Inc. in Minneapolis, said having to choose allied vendors' products is too constraining. "We've been going through a project to replace our Compaq servers with Tricord superservers," he said. "And wiring would be a big concern because we generally get it from a number of different sources."

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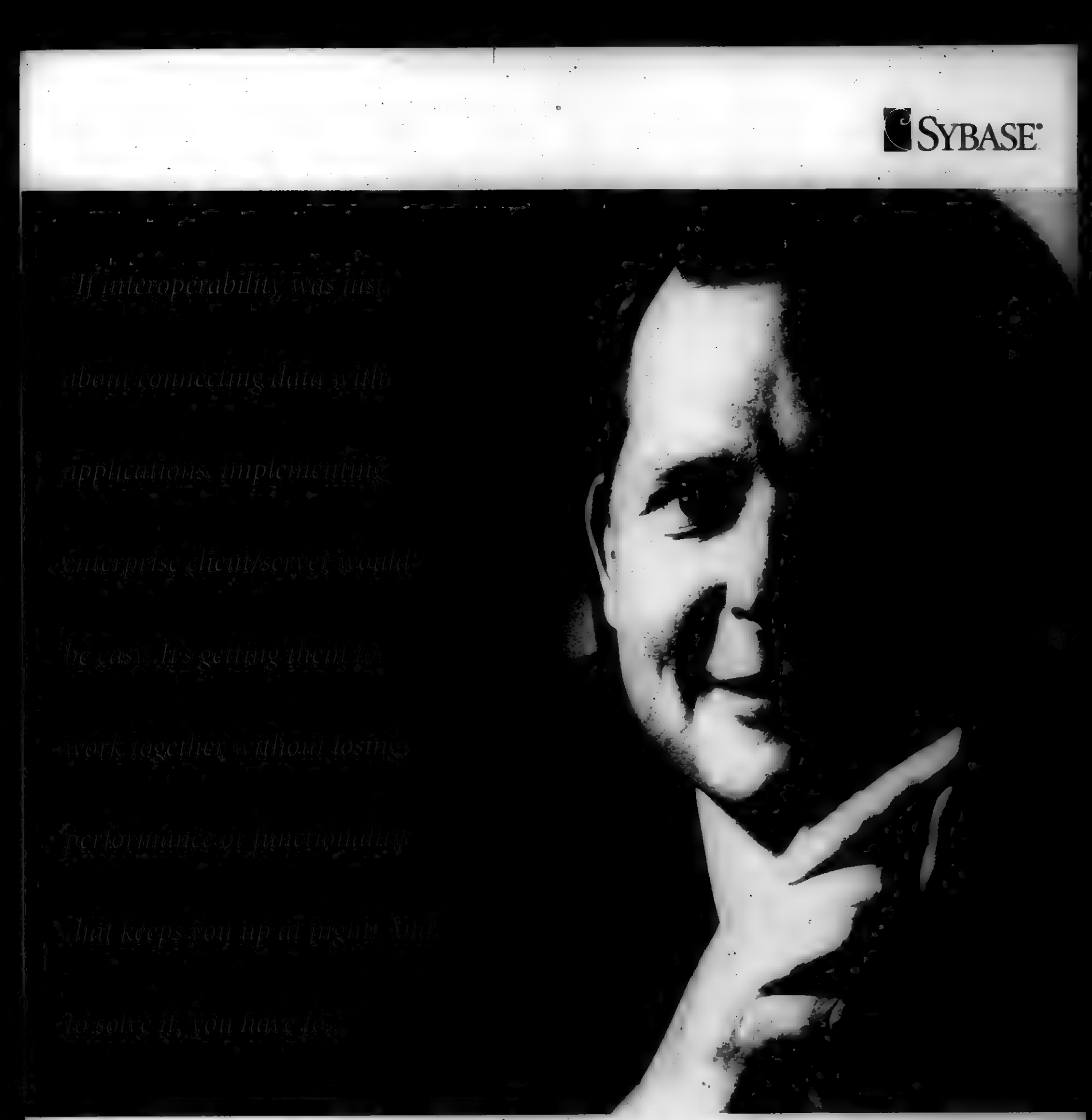

Mark Page knows the situation well. Vice President of Connectivity Products at Sybase, he's helped a long list of customers develop integrated solutions to one of the most significant problems in client/server computing. He shares that experience in a taped conversation *"Making Connections In Client/Server Computing."* For your copy, call 1-800-SYBASE-1.

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Novell, SynOptics team up

Firms to bring ATM services to routed NetWare internetworks

By Joanie M. Wexler
SAN FRANCISCO

Two local-area network bigwigs teamed up last week with plans to eventually blend the "smart" services on today's router-based LAN internetworks with the fast switching technologies slated to carry the next generation of distributed applications. Users may cheer, but some observers question why the two companies are attempting such a project outside a parallel standards effort.

Novell, Inc. is working with SynOptics Communications, Inc. to tightly integrate Novell's IPX networking protocol and other NetWare operating system services such as routing with the latter's Asynchronous Transfer Mode (ATM) switch.

Such an effort would bring the benefits of ATM transport to the broad population of NetWare users on an internetwork, Novell officials said. These include allowing individual network nodes to "virtually" belong to LANs, meaning network administrators can reassign them to different LANs via software control as traffic patterns and work projects warrant.

Unlike routed networks, ATM operates at the physical network layers and is independent of higher-layer protocols, such as IPX, which today find their way to their destinations when a router reads an address within the IPX packet. However, leaving routing in place on top of ATM would allow NetWare servers embedded in SynOptics hubs and switches to determine the best path to take through an internetwork, explained Doug Laird, product line manager for Novell's Internetworking Products Division.

"This would help us cut down on the management required for new switching hubs," said Mel Lively, network manager at Presbyterian Healthcare Systems in Dallas, a pure Novell and SynOptics shop. "Today, NetWare and SynOptics environments are managed separately."

Protocol puzzle

But the isolated effort to interface ATM to IPX has bewildered some observers, who wonder why the companies would undertake the task apart from the work in progress at the ATM Forum for interfacing all upper-layer protocols — including IPX — to ATM.

The ATM Forum expects to have specifications completed for three protocols, including IPX, this year. The various ATM switch vendors all have proprietary ways of interfacing to ATM.

Novell implied that its work would merely tighten the interoperability ties between SynOptics switches and NetWare. George Powers, a Novell director of product development, said the companies would publish an IPX-to-ATM interface "based on ATM Forum specifications."

Meanwhile, Novell and SynOptics have scheduled some technology stepping-stones to take them to their ultimate ATM/IPX goal. Novell servers will be integrated first into SynOptics hubs, allowing all Novell NetWare Loadable Modules to run off the SynOptics hardware platform. Novell has the same relationship with hub vendor Networth, Inc., an Ungermann-Bass, Inc.-owned company.

That first effort took shape last week in the form of the $5,000 to $8,000 LattisEngine 486, basically a NetWare PC server that can be plugged into a SynOptics smart wiring hub and slated to ship in the fourth quarter.

The next rendition of NetWare, due in late 1994, will take advantage of SynOptics switching technology, Novell said. In June, SynOptics introduced ATM-like (but slower) hub modules for today's packet-based LANs.

In the works

With partner SynOptics' ATM assistance, Novell intends to prime IPX and NetWare for ATM with the following moves:

- Its MultiProtocol Router will support ATM interfaces and connect separate "virtual" LANs.
- It will enhance its NetWare Link State Protocol routing algorithm to establish ATM circuits over the shortest path possible.
- It will extend its IPX application programming interface so that IPX is smart enough to know when ATM is underneath and to take advantage of ATM services, such as reserved bandwidth and predictable latency.

Early users laud AppBuilder

CONTINUED FROM PAGE 1

for specific functions, such as accessing a database or sending data over a network.

The user creates an application by calling these modules up as icons and using the mouse to arrange and connect them into a series of routines that make up a program.

Voice of user

Mobil Environmental and Health Services Laboratory has been using the original Serius product for about a year as a quick way to develop applications through which Macintoshes can access databases on Digital Equipment Corp. VAXs.

"At the time [of purchase], TGS Systems' Prograph was the only other choice, and it didn't do the database part," said Lisa Vaz, manager of application development at the laboratory. She was at the Interop '93 August show here last week.

AppBuilder is "well put together," and its graphical development environment is unique, Vaz said. "None of us had experience in Macintosh development, and we had no time to mess around" with learning the new environment, she added.

The laboratory used AppBuilder primarily to put together a system that talks to Rdb on the VAX, tracks purchases and prints out purchase orders. "It involved a lot of communication back and forth" between the Macintosh and the VAX, Vaz said. It took her about a year to complete the project.

While AppBuilder definitely made their lives easier, the laboratory's developers found that programming with the product was not as simple as it seemed from demonstrations, "where you just connect a lot of little boxes," Vaz said. "A simple application is easy; with a complex application, you run into the same problems you get with other [developers'] products."

While the boxes "encapsulate you from low-level details," such as how to set up host links, the programmer "still needs to worry about error-handling and flow-control issues and do debugging to ensure that all of the pieces interoperate in a large-scale environment, [so] you don't have things like infinite loops," Vaz explained.

"If you're a regular programmer, you should be able to understand the loops and subroutines," said Mitch Miller, director of technology at Collegeview, a Cincinnati software company. "What's special is the objects; you don't have to do special code for things like a database or screen manipulation."

Miller said he was able to create a "pretty good database in a couple of hours, realizing a minimum 50% savings in programming time."

Collegeview began using the Serius precursor to AppBuilder last fall to develop a multimedia application that allows high school students to search for colleges that match their requirements and then get audio-visual presentations of the institutions they are interested in.

Overall, users said they are pleased with what Novell is doing with AppBuilder. Vaz said she had noticed that new function modules have been introduced faster since the acquisition.

For example, a report-generation box is coming along soon; Serius had promised it for almost a year, she said.

A key advantage that Serius provided with AppBuilder and that Novell is extending is portability across a variety of client systems. AppBuilder supports Windows and Macintosh platforms now; once it is compiled on Foundation Manager, it will support Unix and OS/2 next year.

Novell is in the process of porting Visual AppBuilder to Foundation Manager, another AppWare offering that compiles code so that it automatically runs across a variety of desktop environments. This saves the user from having to learn how to program each time a move is made to a new system, said Kevin Mooney, a manager of business development at Novell.

However, it will take Novell some time to port all of the key objects across all of the platforms, Miller warned. "On the Windows side, they have a strong database object" that Novell is just now porting to the Macintosh, he said. "And we want to make sure they don't forget to enhance the Windows side with the Mac multimedia object."

Novell is also working on extending AppBuilder into networked client/server systems, Mooney said. This will mean that applications built with the offering will be able to automatically access NetWare services using protocols such as AppleTalk and Transmission Control Protocol/Internet Protocol.

Miller said he was looking forward to being able to build "true distributed services," such as using the NetWare server to deliver multimedia information out to client workstations.

Novell pressure?

However, Vaz expressed some nervousness that Novell will try to pressure AppBuilder users to adopt NetWare.

"I want more strong promises from Novell that my [non-NetWare] environment will stay acceptable. I accept that some new features will arrive on NetWare only; I just don't want to lose what I've got," she said.

One key missing piece that Miller is eagerly awaiting is AppBuilder Application Loadable Modules (ALM) based on popular software packages such as Lotus Development Corp.'s 1-2-3 and Microsoft Corp.'s Excel. ALMs are the software building blocks within AppBuilder.

Novell is talking with major application vendors and will announce alliances to bring their products into AppWare at the Networld '93 show in October, Novell senior manager Ed Firmage said. Novell is also adding ALMs in areas such as telephony, document industry, device control and report generation.

One last advantage Novell will bring to the AppBuilder table is price, which will be set when the Novell product ships in October. The original Serius price was about $1,500; the new one will be "way down" from that, according to Firmage.

Modular AIX tailored to needs

CONTINUED FROM PAGE 1

Cal Killen, director of AIX development at IBM's Advanced Workstation & Systems Division here. He did not give specifics.

Compared with AIX Classic, AIX Lite will have fewer system utilities and will not have multiuser support, he said.

Pieces of the revamped AIX will be introduced over time, along with new PowerPC processors, Killen noted. "It's not one big unveiling," he said. "The hardware drives it, so within a year and half it will all be unveiled."

The staged rollout of PowerPC systems will begin later this year and extend through 1994.

Scalable AIX will make it possible to tailor versions of the "classic" AIX 3.X code to specific business applications (see chart). For example, AIX Lite will be used for laptop or desktop computers, while Classic AIX will target midrange machines, and Cluster AIX will run on high-end systems.

Desktop AIX users will also find installation and memory requirements greatly reduced. Still, "You wouldn't be able to run AIX Classic in less than 16M bytes [of random-access memory]," Killen said. "We're going to drive that down so that our desktop boxes can run in less than that, maybe even 8M bytes."

Smart move

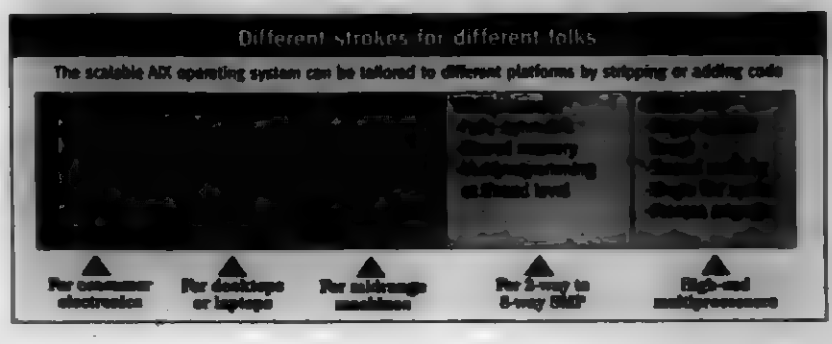
Industry analysts said the AIX move is pragmatic, given the wide range of computers that will run on the PowerPC architecture, which is being developed by IBM and Apple Computer, Inc. "I think IBM is trying to respond to the reality that its product is no longer monolithic," said Gartner Group, Inc. Unix analyst Paul McGuckin. AIX "is not just for [use with] a technical workstation anymore."

Users said they are pleased with the plan because the current AIX 3.X can take four or more hours to install. IBM addressed installation and updating problems in the release of AIX 3.2.4 last month [CW, July 19]. However, many users said they simply do not need all the extras, such as administrative support and support for Kanji characters used in the Japanese language, in AIX 3.0.

"When we get the machine, and it's preloaded, it has just about everything on it," said Bob Maggard, a technical analyst at Continental Health Care, Inc., a health care software firm in Overland Park, Kan., with two RS/6000s. Continental Health also maintains many of the 50 RS/6000s at its customer sites, he said. "Anything that could make some of the code optional would be good."

The AIX Lite version will suit desktop applications, users said. "I think it does make some sense, especially in the PC market, where you're trying to give the user something that's manageable and that installs and runs as easily as Windows," said Tony Scott, vice president of software development at VideoCart, Inc. in Chicago. His firm uses 12 IBM RS/6000s to track 20,000 supermarket-cart displays in 200 stores.

Pricing concerns may also play a role in IBM's Scalable AIX plans, some users said. "It would allow them to have products priced at different points in the market," said Richard Lester, vice president of information services at Associated Grocers, Inc., a $1.2 billion supermarket cooperative with eight RS/6000s.



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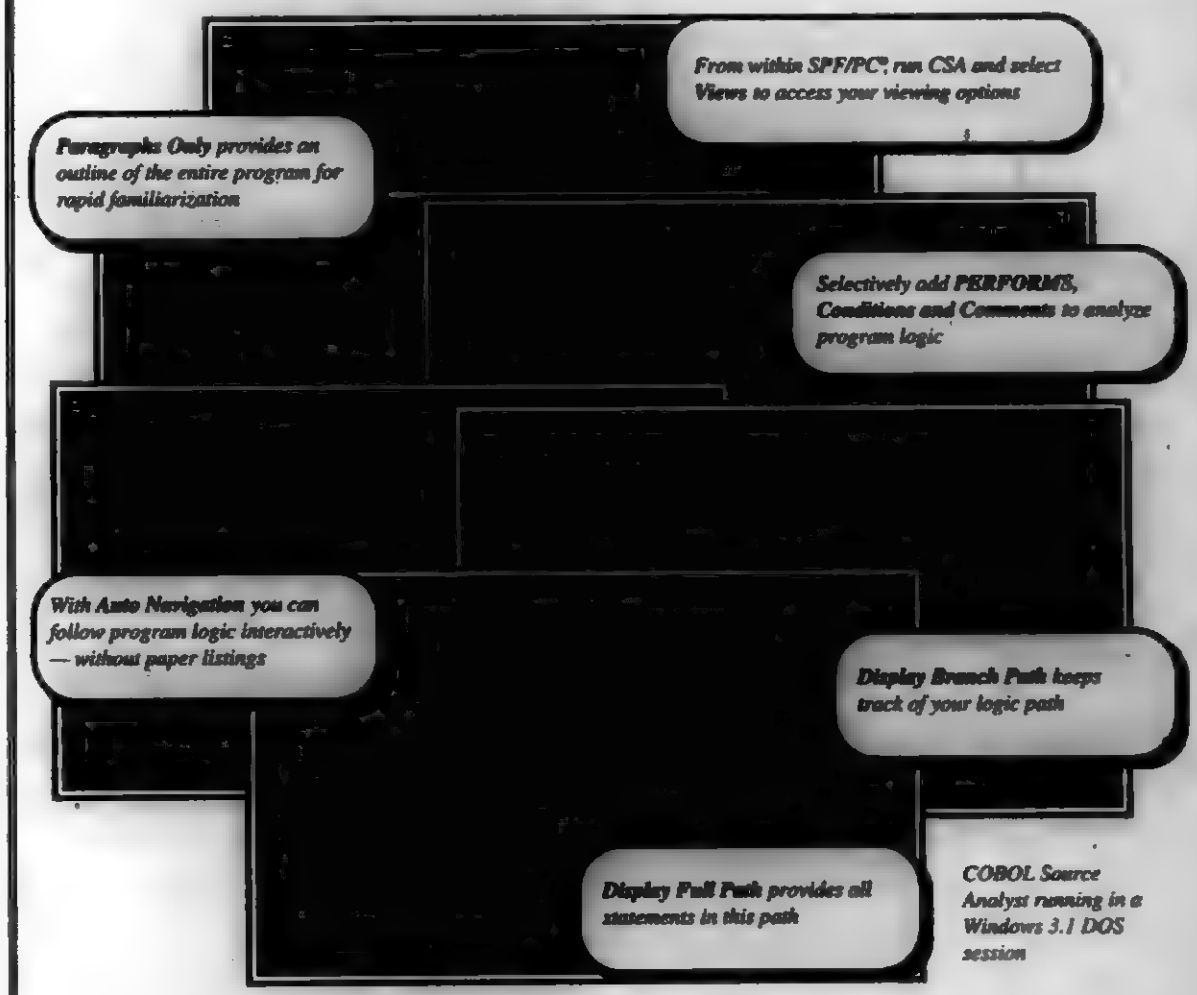

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News Shorts

Computer makers battle export controls

U.S. computer makers got half a loaf last week from the U.S. Department of Commerce, which said it will free computers rated below 67 million theoretical operations per second (MTOPS) from most export controls. That is up from the old limit of 12.5 MTOPS. However, 67 MTOPS is approximately the power of an Intel Corp. Pentium processor or a Sun Microsystems, Inc. Scalable Processor Architecture chip. Disappointed industry groups had asked for a much higher threshold, saying that outdated regulations intended to keep computer power out of the hands of unfriendly forces cost billions of dollars in lost sales while contributing nothing to national security [CW, Aug. 23].

IBM consolidates Big Iron development

IBM is finishing up the consolidation of its mainframe hardware development facilities in upstate New York, a spokesman confirmed last week. By the end of next month, it will move 450 engineers, programmers and other developers from Kingston to Poughkeepsie; some 200 people have already moved. As of July 30, there were some 2,800 people left in the Kingston facilities, compared with last year's total of 4,200.

Intel buys into videoconferencing

Intel Corp. and VTEL Corp. said last week that they will develop a compatible family of videoconferencing products. The terms of a cross-license agreement call for VTEL to bring Intel's PC video technology into its desktop, conference room and multipoint videoconferencing line. As part of the arrangement, Intel will purchase 10% of VTEL's outstanding stock for approximately $7 million and retain the right to use VTEL technology in future Intel products.

IBM/Sun agree on interface

Sun's SunSelect business unit and IBM said last week they have agreed to trade technology to implement Sun's Windows Application Binary Interface (WABI) for Windows programs. The two firms reached a cross-licensing agreement, under which IBM will use WABI on its RISC System/6000 workstations and Sun will gain unspecified IBM technology to enhance WABI's functionality and performance. No pricing or availability information about the IBM WABI software was given.

Amdahl restructures operations

Amdahl Corp. said last week it was reorganizing the $2.5 billion firm into five business units that are responsible for profits — and the development and manufacture of various product lines. At the same time, the mainframe maker announced a shuffling of executives to head up the business units. Chief Executive Officer Joseph Zemke said the moves were to make Amdahl executives more accountable for profits.

SHORT TAKES Borden, Inc. last week outsourced its Columbus, Ohio, data center to The Genix Group in a five-year contract worth $12 million.... IBM said last week that Heinz Fridrich, vice president of manufacturing, will retire on Sept. 30. He will be succeeded by Jean-Pierre Briant, formerly at IBM's Technology Products Division.... Concurrent Computer Corp. Chairman and CEO Denis R. Brown has retired "for personal reasons," the firm said last week. John Stihl, Concurrent president, will assume Brown's duties.... Intel last week announced it has signed a pact with Pacific Bell to explore the integration of audio, data and video applications on PCs.... X/Open Co. will orchestrate next week an agreement between some 50 Unix hardware and software vendors to cooperate on an application development interface.

DEC PC push to take low-cost turn

Additions aimed at indirect channels

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. plans this week, for the first time in a year, to update its desktop PC line. The company will roll out nine lower-priced Intel Corp. I486-based models designed to move Digital into the indirect channels it needs to expand its market share.

Digital is cutting the base price for a 486SX-based DECpc LP system with a noninterlaced Super VGA monitor from $1,649 to $1,448 to get back on the same pricing curve as other PC firms. Users and analysts said it fell down on pricing during the last 12 months.

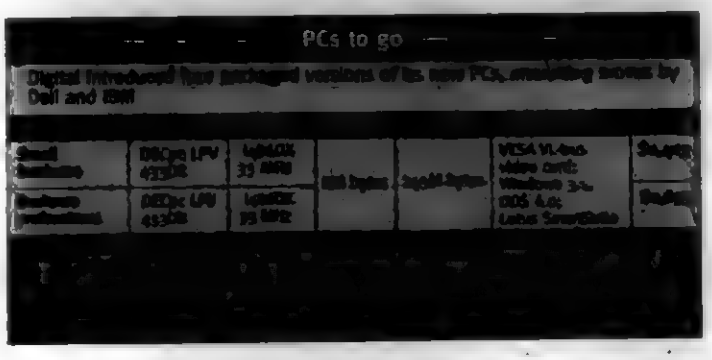
"We'd like to use DEC PCs, but they just haven't been price-competitive, and they've been stale for a while," said a Digital customer at a major bank, who asked not to be identified.

Children's Hospital of Eastern Ontario in Ottawa considered both the DECpc LP line and Hewlett-Packard Co.'s PCs for a pending 45-system order but selected HP for an initial trial purchase because of lower pricing, said Andre Hallam, a senior analyst at the hospital.

However, the situation could be revisited once the new DECpc LPV and LPX machines are available. "If they come out with a better price, they might still be in the running," he added.

The three-slot LPV models are direct LP replacements with faster local bus graphics, Digital said; five are being offered, from a 25-MHz 1486SX-based unit to one using the 66-MHz I486DX2. The four LPX machines are new six-slot models with more graphics options and support for upgrades to Pentium OverDrive processors; they start with the 33-MHz 486SX and go up to the 66-MHz DX2.

Starting prices range from $1,049 to $1,799 on the LPV without a monitor and from $1,299 to



$1,949 on the LPX. Both include 4M bytes of memory, a 170M-byte disk drive, S3, Inc.'s 805 local bus video card, Windows 3.1, DOS 6.0 and a three-year warranty. Monitor prices start at $299 for a 14-in. interlaced Super VGA unit.

The new line "gets them back in the hunt," said Neal Hill, an analyst at Forrester Research, Inc. in Cambridge, Mass. He and others added, though, that Digital needs to expand its limited presence in indirect channels to meet an internal goal of becoming one of the Top 5 PC vendors by mid-1995.

The company doubled its PC shipments in 1992 to about 200,000 and said it expects to double them again this year. However, International Data Corp. analyst Richard Zwetchkenbaum said most of the increase is coming from Digital's catalog, "and there's only so far they can grow in direct response."

Digital, which got 70% of its PC sales from catalog orders in the fiscal year ended July 3, expects an equal split between the catalog and indirect channels this year, said Jesse Parker, director of product management for its PC business unit. By fiscal 1995, he added, 70% of the business should come from channels.

Zwetchkenbaum said, however, that breaking into indirect channels will be "a challenge" because Digital will have to compete more outside its own installed base.

Digital has moved up to "just outside the Top 10" in PC shipments, but mostly by taking business from second-tier companies, added Scott Miller, a Computer Intelligence/InfoCorp analyst.

Stocking deals signed with three major PC resellers and distributors last month are positive. But Digital has yet to develop marketing programs for those channels, said Randal Giusto, an analyst at WorkGroup Technologies, Inc.

Programs for the LPV and LPX lines should be in place within the next two months, Parker said.

Back orders snare Ambra line

Billed as "fast on its feet" when it debuted this month, Ambra Computer Corp. appears to have tripped over the same backlog quagmire affecting the likes of its parent company, IBM, and Compaq Computer Corp.

The mail-order subsidiary said it underestimated demand for its notebook and high-end Blue Lightning-based systems and, as a result, is experiencing a three-week backlog.

"Blue Lightning systems sold out quickly, but we expect to be back on track in two weeks," said Craig Conrad, director of marketing at Ambra.

"When the [Ambra] systems finally came out, they went through an initial sales spike on their announcement date that far exceeded their forecasts," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H.

While Ambra would not comment on its forecast figures, WorkGroup Technologies estimated Ambra's forecast for initial sales during its first three months to be about 50,000 systems, while actual orders have been roughly twice that.

Conrad said orders for the NC425SL Notebook were also put on backorder last week. But he added they would ship in volume starting today. Pending final approval from the Federal Communications Commission, Conrad said he expects the single- and dual-Pentium processor systems to ship early and late next month, respectively.

While Conrad said Ambra was not having difficulty meeting orders for the low-end systems, at least one user said he had trouble getting hold of the 25-MHz, $1,399 S425SX model.

Stephen Adea, information systems director at garment manufacturer States Nitewear, Inc. in New Bedford, Mass., said he ordered two 425SXs the second week of this month and was initially told it would take two weeks to get them.

When he called recently to check on the order, he was told it may not ship until late next month.

Miffed, he placed several calls to Ambra and IBM corporate to complain. Last Thursday, the systems, which were supposed to arrive via United Parcel Service, arrived via Fedex.

—*Stephen F. Kiett Jr.*

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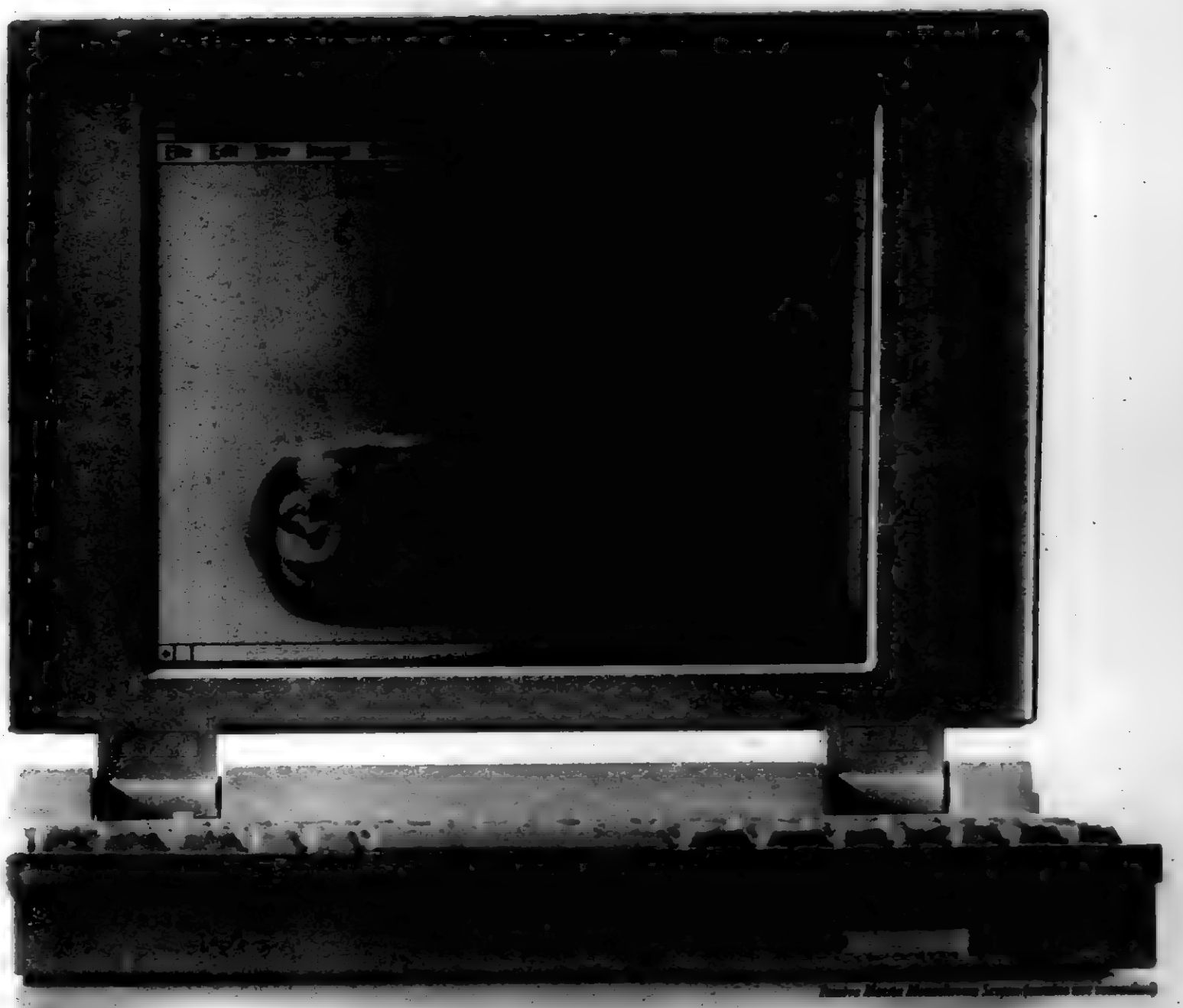

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X86 emulation

CONTINUED FROM PAGE 1

industry sources said.

"The servers due in September will have good emulation abilities, but it's the products that come in 1994 where you'll see much superior emulation," said one source familiar with the project.

IBM spokesmen declined to comment on the company's plans for enhancing its PowerPC series of chips. Intel Corp. declined comment on IBM's efforts.

Despite published reports last week, sources said IBM has little interest in jumping into the Intel cloning business against competitors such as Advanced Micro Devices, Inc. and Cyrix Corp. Nor does it have a plan to use its clean room to do any reverse-engineering based on Intel technologies.

"While IBM would have a significant impact on the Intel cloning market, it is important to keep in mind that by the time it came out with a viable product it would be the No. 4 or 5 vendor behind AMD, Cyrix, TI, etc.," said Michael Slater, editor of the "Microprocessor Report" newsletter in Sebastopol, Calif.

"IBM has no interest in duplicating Intel's chips with no value added and selling them at a lower price. That would be nuts," said another source close to IBM.

IBM engineers are examining the X86 instruction set to better understand its functions. In so doing, IBM hopes to rid the PowerPC of the performance problems commonly associated with emulating multiple environments.

"There are lots of things IBM can do at the chip level in terms of microcode assists to really enhance the performance and quality of emulation," the source said. "They in no way are trying to duplicate the Intel chip on top of PowerPC."

While IBM is undertaking this effort, any emulation improvements made will be available to Apple Computer, Inc.

It is not clear whether superior emulation and performance of Intel-compatible applications will significantly spur sales of PowerPC-based systems.

> "But if [PowerPC] wants to play seriously as a client platform, it must have the ability to move forward without throwing away stuff users are now using. They tend to get cranky about that."
>
> *—Bob Holmes, Southern California Gas*

That may be mostly determined by any pricing actions taken by Intel on its 1486 and Pentium chips and by the hardware OEMs selling systems based on those chips during the next few months.

Prices remain constant

An IBM spokesman last week said users could expect to see the divisions price their PowerPC systems fairly close to the systems they currently sell.

"Initially, [PowerPC-based] servers look more attractive as a server than as a client platform," said Bob Holmes, manager of systems evaluation at Southern California Gas Co. in Los Angeles. "But if [PowerPC] wants to play seriously as a client platform, it must have the ability to move forward without throwing away stuff users are now using. They tend to get rather cranky about that."

IBM's clean room efforts with the PowerPC in no way preclude the joint development agreement IBM signed with Intel two years ago, a source close to the project said. That deal gives IBM the right to create derivative works based on Intel's 80386, 1486 and successor technologies. So far, IBM has produced Personal System/2 and ThinkPad systems centered around its 486SLC chips.

But it remains to be seen whether IBM's efforts with the PowerPC increase the tension already present between IBM and Intel as a result of IBM's casting its lot with Apple and Motorola, Inc. for PowerPC.

RemoteWare and the SEMINAR he almost missed

AT THE VERY MOMENT AN EXPERT WAS EXPLAINING THE COST- AND SANITY-SAVING BENEFITS OF REMOTEWARE-CREATED AUTOMATED WORKFLOW SYSTEMS TO A ROOMFUL OF HIS FELLOW CLIENT/SERVER AFICIONADOS [illegible] was sitting

in a tiny center seat, in coach, staring blankly at a fly nimbly exploring the OXYGEN PANEL above him. It had come down to a scheduling conflict. One more FREE product seminar, half-day, inevitably had deli sandwiches... potato chips that had gotten too close to the kosher dills and gone soggy.

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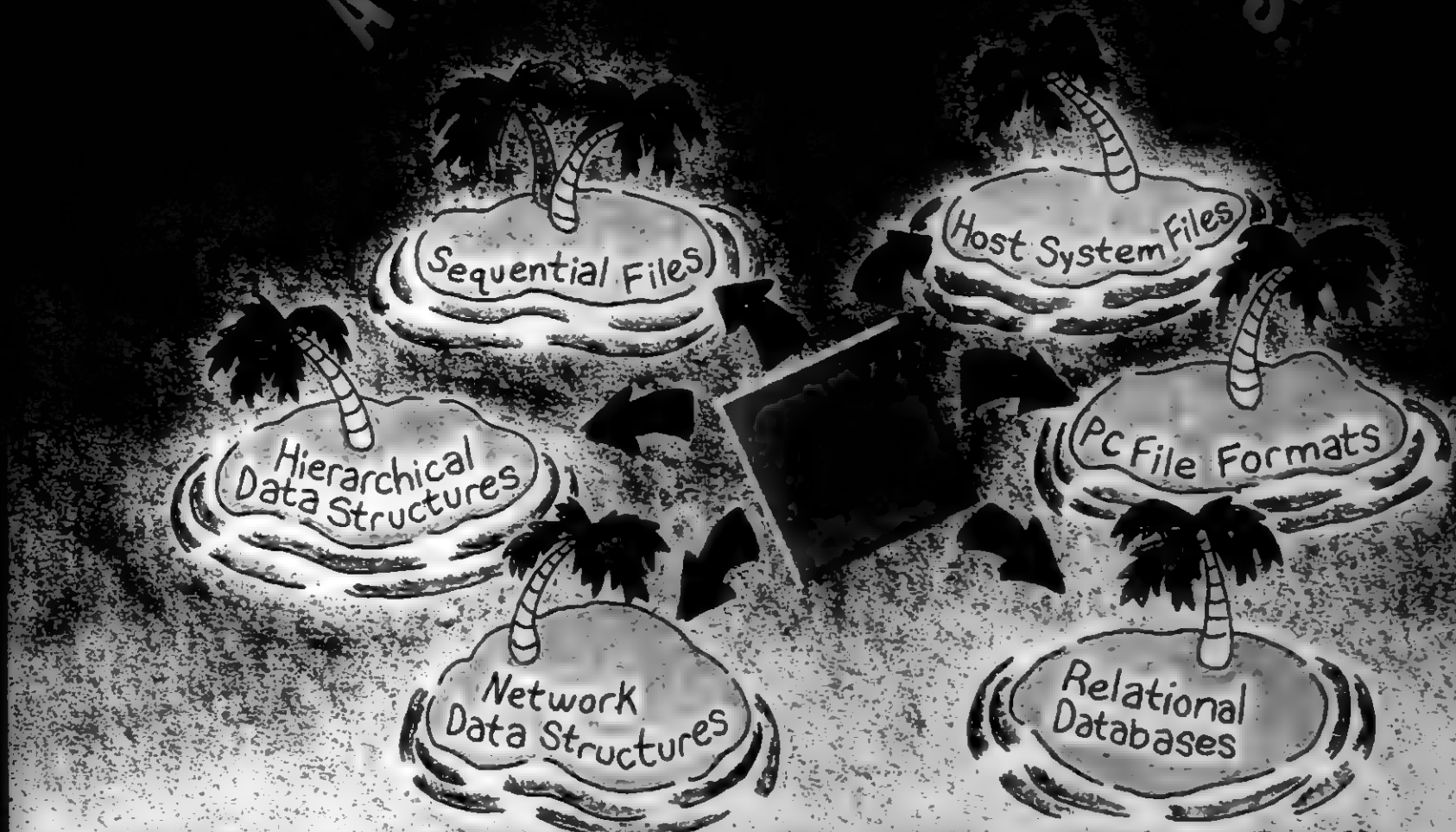

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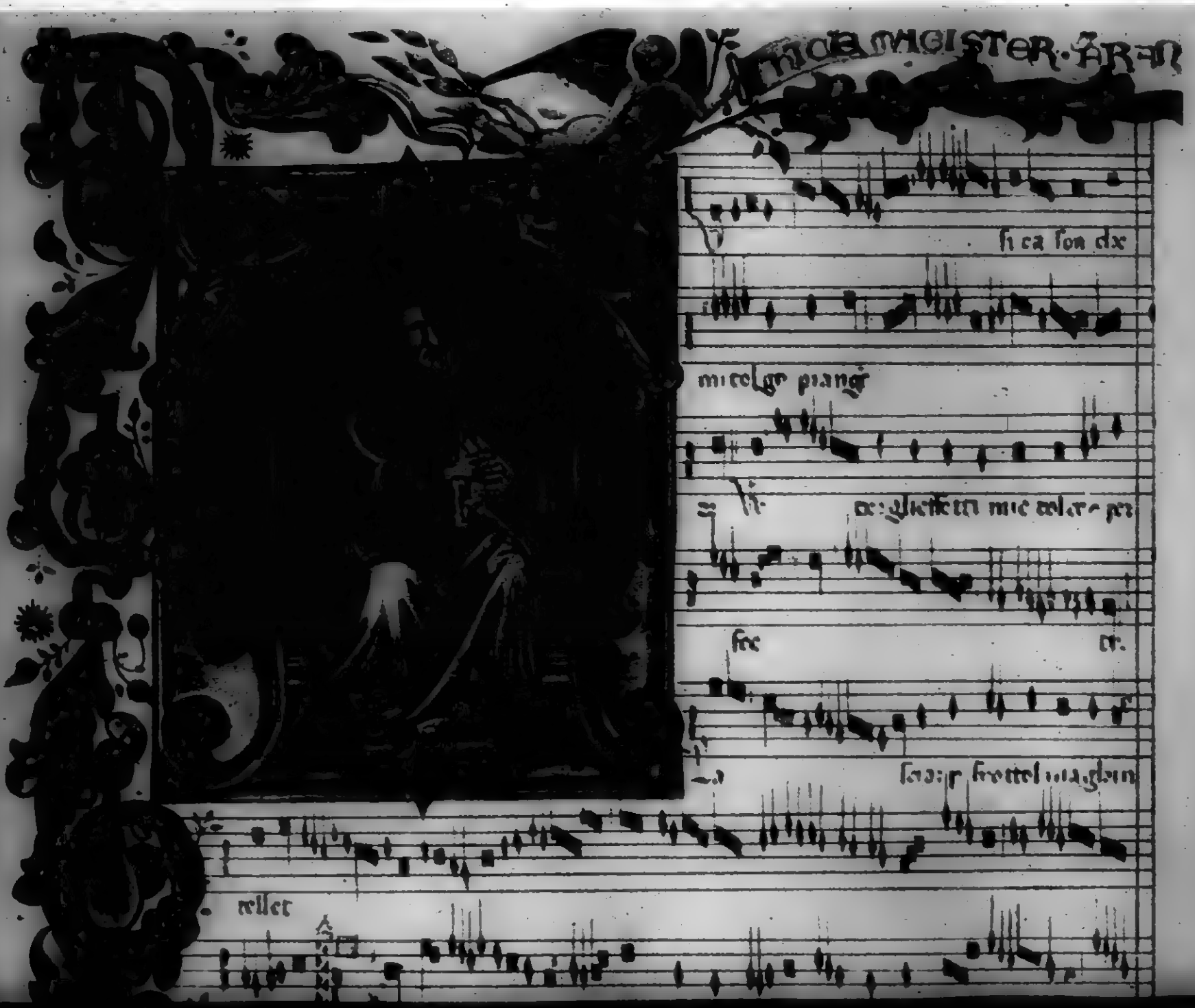

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WordPerfect 6.0 ready to roll

By Michael Vizard
WASHINGTON, D.C.

WordPerfect Corp. will announce this week a Windows version of its namesake word processing package that promises to greatly simplify support issues for information systems directors. It is slated to ship in the fourth quarter.

The long anticipated WordPerfect Version 6.0 comes with a set of highly customizable interfaces said to let IS directors deploy WordPerfect with specific sets of features for specific user groups.

Previously, WordPerfect users would adopt certain features at their own pace, resulting in complex support issues for IS directors. In addition, some IS shops were forced to adopt separate low- and high-end word processors, which were frequently incompatible, to provide solutions for novice and power users.

"With 6.0 you can hide a lot of the advanced features and deploy WordPerfect with three or four settings. Without the ability to customize applications for certain types of users, it was a real support issue," said Tom Carson, director of MIS at Zale Corp., a supplier of diamonds based in Irving, Texas.

Systems administrators can also restrict access to data at the application level. "We used to do this using PC support tools at the Windows level," said Norm Weiner, chief information officer at Philadelphia law firm Duane, Morris & Hecksher.

WordPerfect 6.0 is also the company's first word processor to take full advantage of the Windows interface. "Version 5.2 of WordPerfect certainly left a lot of areas for improvement. I think they put that out because they had to get a product out for Windows. A lot more went into the design of 6.0," said Harris Televitz, director of technology at Skadden, Arps, Slate, Meagher & Flom, the largest law firm in New York.

Televitz said his firm has stayed loyal to WordPerfect, despite robust offerings from Microsoft Corp. and Lotus Development Corp., because WordPerfect is a standard in the legal community.

However, analysts noted that while WordPerfect customers are likely to remain loyal, the firm will face significant challenges as other customers move to adopt integrated PC applications.

"The trend is definitely away from stand-alone word processors to documents that are made up of multiple applications. And that works against WordPerfect," said Krystyna Filistowicz, an analyst at Dataquest, Inc.

Pricing for Version 6.0 is $495, with upgrades from DOS, Windows or OS/2 platforms priced at $129. Competitive upgrades, from any word processor with a retail price of $395 or higher, are priced at $149.

Word wars

In a move calculated to divert attention from WordPerfect, Microsoft last week outlined an AutoFormat feature that will be included in Microsoft Word 6.0, due this fall.

AutoFormat uses IntelliSense agents that Microsoft is including in the forthcoming release of its applications. Agents are routines that automate specific tasks.

Using the agent technology, Microsoft plans to bundle more than 400 rules in Word that examine text and format it into document style by analyzing its elements.

Word 6.0, therefore, will be able to automatically format text into a memo, newsletter, agenda or resume format, for example.

AutoFormat can run in an automatic mode or in an interactive mode that allows users to approve an action before it is taken, said Chris Peters, Microsoft general manager for Word.

Other features that will be included in Word 6.0 are support for Wizards that helps automate specific tasks, tabbed dialogs to make it easier to find specific documents and Object Linking and Embedding 2.0. —*Michael Vizard*

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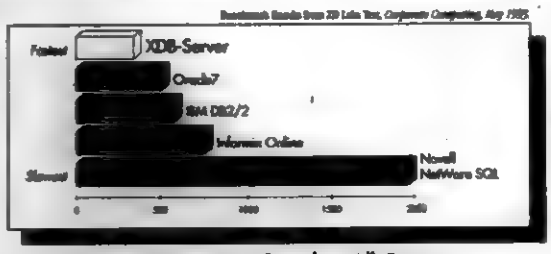

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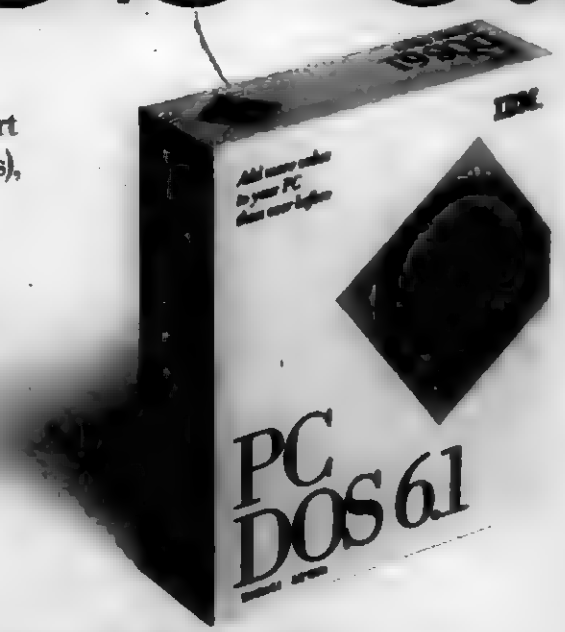

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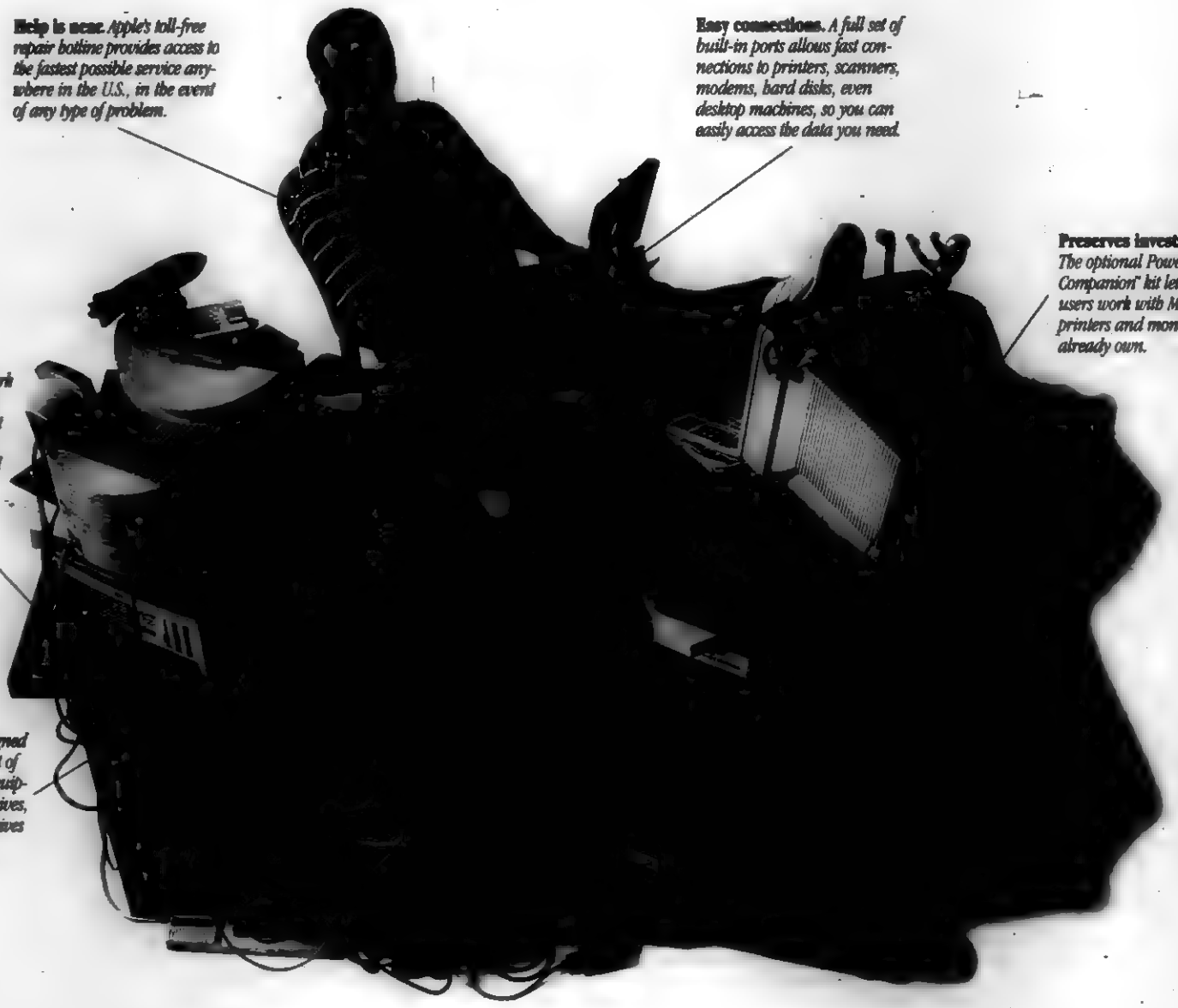

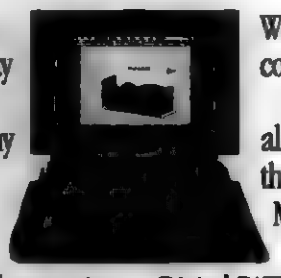

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Knocking down barriers

Eye-tracking system helps paralyzed engineer Mike Ward contribute and cope

By Thomas Hoffman

Mike Ward, an accomplished engineer at Intel Corp. in Hillsboro, Ore., is on deadline. As editor of "Failure Analysis Summit," a quarterly internal newsletter at Intel, he edits articles written by fellow Intel engineers about their failure analyses of components used in various high-tech projects.

Ward compiles the newsletter on a Compaq Computer Corp. SLT 386 PC. But you will not find him using a conventional keyboard. You see, he cannot use his hands anymore. In fact, he has lost control of all his muscles, except for his eyes. Ward has amyotrophic lateral sclerosis, or ALS.

Diagnosed seven years ago and confined to a wheelchair for the past five years, he can no longer speak or move. Ward breathes through an artificial ventilator, requires around-the-clock nursing and is artificially fed.

Commonly known as Lou Gehrig's disease, ALS is a motor neuron disease in which the nerves that control muscular activity degenerate in the brain and spinal cord. Eventually, the muscles used for breathing and swallowing are affected, usually leading to death in two to four years. But some people have lived more than 20 years after being diagnosed.

Since January, Ward, 47, has been able to continue working and communicating with his family and peers by using an eye-tracking computer system.

"I can't do anything by myself. This allows me as much control as I want," Ward said.

The Eyegaze Computer System, developed by LC Technologies, Inc. in Fairfax, Va., enables Ward and other incapacitated persons to "stare" at control keys displayed on a computer screen to perform functions including speech synthesis, typing, using a telephone and controlling environmental surroundings (turning on lights, TVs, etc.).

The desktop system is based on the Pupil Center/Corneal Reflection Method. The concept stems from weapons-tracking control research conducted by the U.S. Air Force to track a pilot's eye movements when sighting targets.

Intel's Mike Ward *can perform a variety of functions by staring at control keys displayed on the computer screen*

Rosalie MacLaren

Catching a glance

Ward's Eyegaze system, powered by a Northgate Computer Systems, Inc. 386 PC, uses a video camera positioned below the control monitor to observe the movements of one of Ward's eyes. A low-power infrared LED mounted in the center of the lens illuminates the eye and provides a bright image of the pupil and a bright spot reflecting off the cornea.

Sophisticated image processing software determines where on the screen Ward is looking. The system predicts the gaze point with an accuracy of better than ¼ of an inch, letting its user activate keys as small as ⅝ of an inch square.

To "press" a key visually, a user must look at it for about a quarter of a second; the key flashes to indicate it has been "pressed." The computer then performs the action associated with the key.

"Mike essentially uses Eyegaze as the keyboard into his PC," said co-worker Bob Welton, a senior engineering technician at Intel who has worked with Ward for the past nine years. Ward's Compaq PC runs MS-DOS 6.0 and related programs; the Eyegaze system includes a software keyboard emulator called Words + Software Keyboard Emulator from Words +, Inc. in Palmdale, Calif.

The Eyegaze system that Ward uses cost Intel about $25,000.

Ward is also able to "talk" — as he did for this interview — through the Eyegaze system via a portable Toshiba Corp. 1200 HB featuring a text-to-speech system called MultiVoice TM 1.0 from the Institute on Applied Technology, a division of The Children's Hospital in Boston. From the laptop, which is mounted on his wheelchair, comes a deep voice — known as "Huge Harry." The quality and intonation can be adjusted.

Ward's Compaq PC is coupled to a Digital Equipment Corp. VAX 4500 minicomputer so he can communicate with other employees via Intel's electronic-mail system.

Ward estimated that his output is 10 times greater with the Eyegaze system than with his home and wheelchair-based systems. Those rely on a muscle-activated switch that Ward controls by twitching one of his thighs, which in turn moves one of his hands to select a character on a scanning alphanumeric matrix.

Welton said the single-switch system is slower than Eyegaze and makes it difficult for Ward to "speak" in complete sentences.

"With the Eyegaze system, he's gone back to using full punctuation and complete sentences," Welton said. "It's a very good improvement for him. He's never been down about his disease, but this has greatly brightened his countenance. He smiles more."

Money an issue

One caveat of the Eyegaze system is that it is not yet portable. The biggest roadblock, said LC Technologies President Joseph Lahoud, is money. He estimated a portable Eyegaze system could reach the market in a few years if LC Technologies continues to secure government funding. "We think it can be done if the resources become available," Lahoud said.

A portable system would allow Ward to keep pace in his involvement with the Forest Grove Rotary Club and take part in more outdoor activities with his family.

Until then, the current Eyegaze system is helping Ward face his adversities. "Work keeps me from the despair that comes from being totally paralyzed," he said. "The technology that's available today makes this possible."

Mobility on the horizon

It should not be long before virtual reality technologies and speech input/keyboard-replacement systems are available to disabled Americans, experts say.

"As computers get smarter and faster and advances are made in artificial intelligence, more capabilities will exist for speech recognition systems," said Douglas Wakefield, a computer specialist at the Clearinghouse on Computer Accommodation (COCA), a division of the U.S. General Services Administration. Wakefield and Susan A. Brummel, COCA's director, also say portable systems will eventually become more common for the disabled as applications for this special marketplace are developed for the Personal Computer Memory Card International Association standard.

Wakefield, who is blind, said personal digital assistants equipped with global navigation software and microchips that store city maps will help the blind go from one location to another.

Early leaders testing laptop speech-input systems include Kurzweil Applied Intelligence, Inc. in Waltham, Mass., and Dragon Systems, Inc. in Newton, Mass., Wakefield said. — *Thomas Hoffman*

"We were told it was impossible to develop a client/server application without extensive retraining. Then we talked to Micro Focus."

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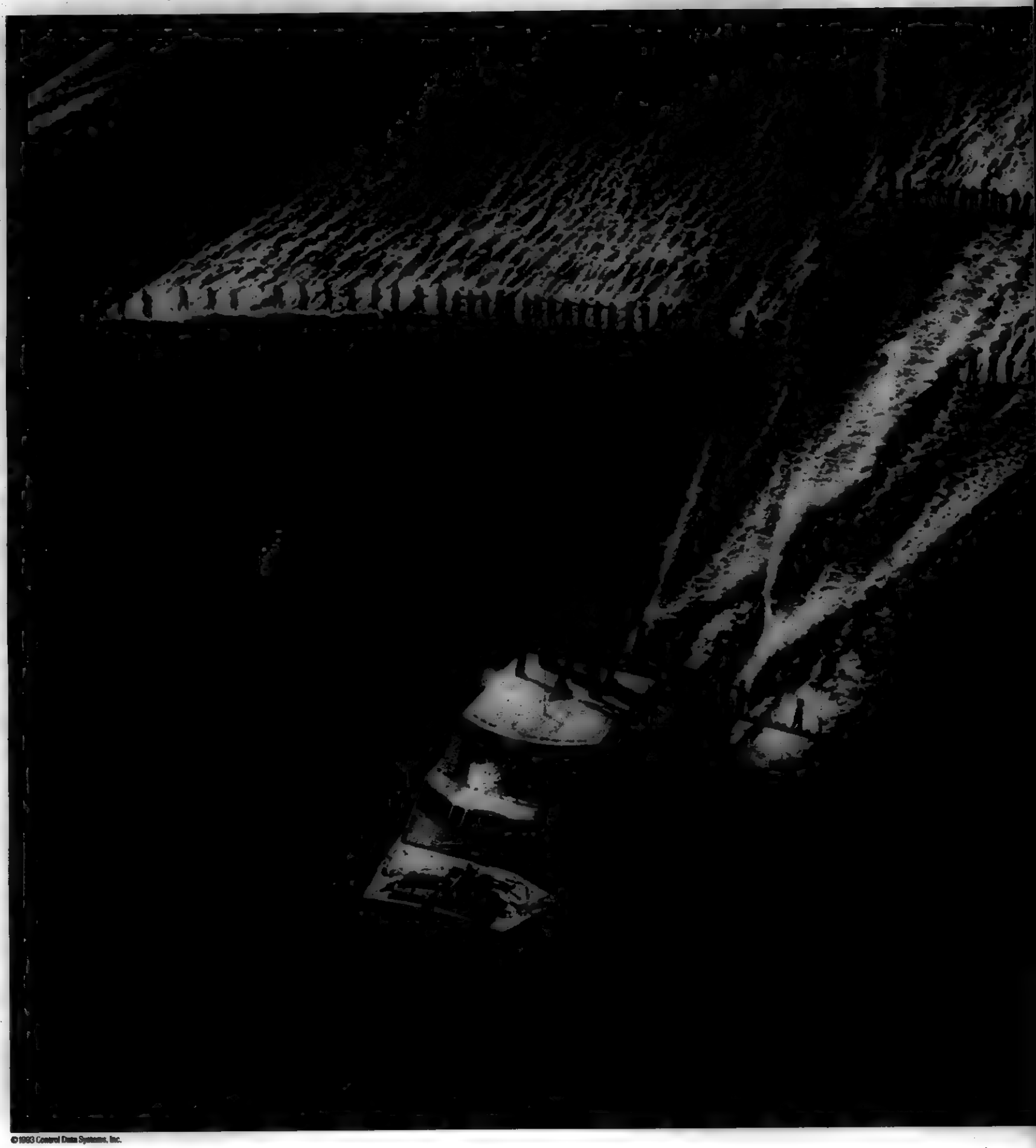

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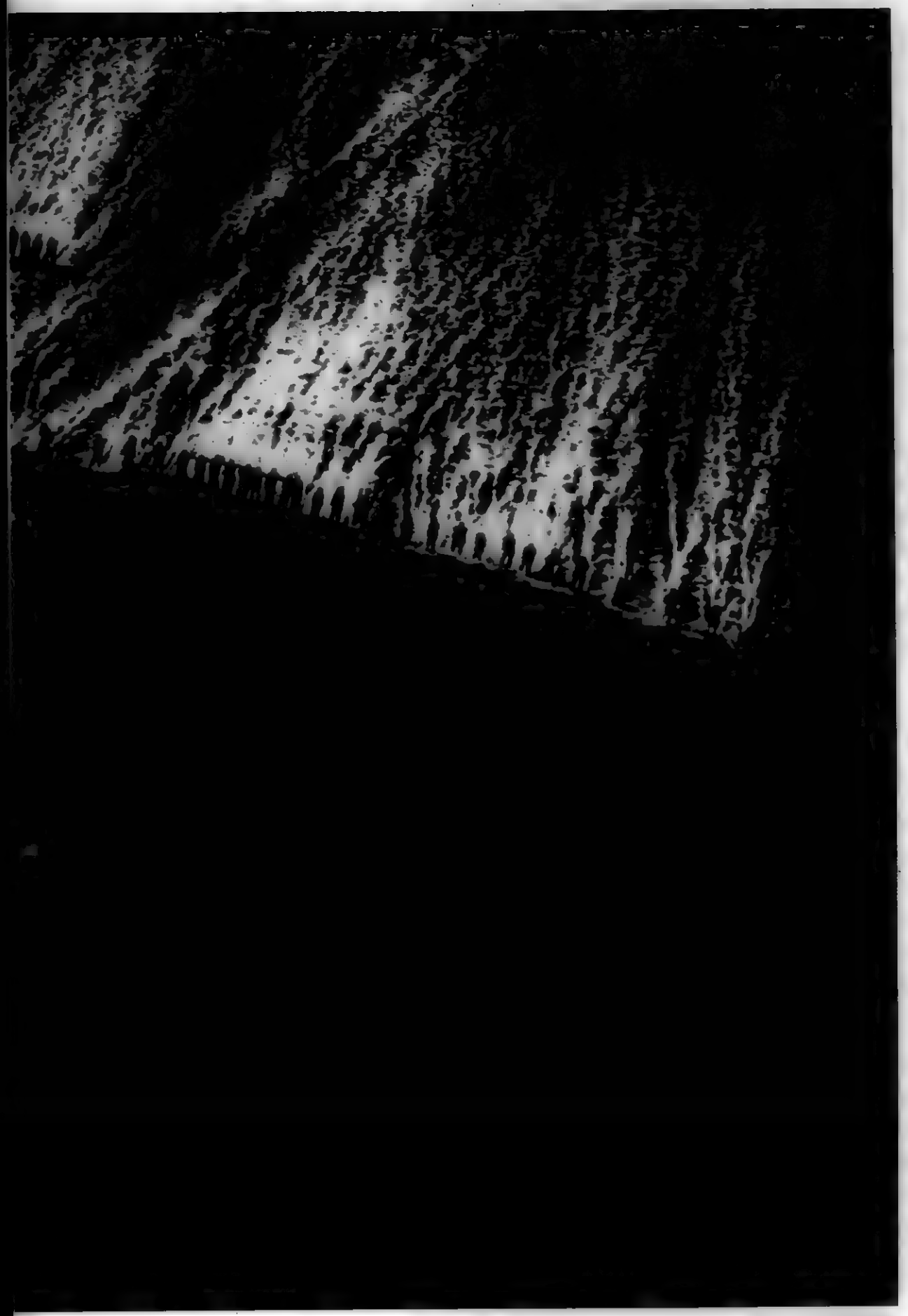

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Ramsey's ghost

Let's turn back the clock a generation to a time real late in the Lyndon Johnson administration. Real late, like about 11 p.m. the night before the inauguration of Richard Nixon.

Johnson's legal majordomo, Attorney General Ramsey Clark, slips in just under the wire with some documents that would launch a thousand legal careers. The Democrats, still smarting from the self-immolation at their convention in Chicago the previous summer, decide that IBM looks too much like a Republican monolith. So Clark and friends initiate a Justice Department investigation into a company that back then was broadly considered the world's most admired corporation.

The investigation wound its way through many hearings and ended 12 years and four presidents later with a finding of "Oops, we were wrong. Sorry we took so much of everyone's time."

If you talk to any of the ex-IBMers who were at the company during the investigation, they will tell you in unanimity that as good as IBM was in the 1970s, it wasn't all it could have been had IBM not continually been staring down the gaping maw of Big Bertha in Washington. To what degree those events added to the bunker mentality that was to pervade and almost ruin the company is a matter of debate.

But the bottom-line conclusion that historians cannot forcibly argue against is the blatant political underpinnings of the Justice Department's actions in the first place — actions that were arbitrary and capricious at best, damned sleazy at worst.

Fast forward to the present. The most influential and dominant computer company, Microsoft, has lived in the shadow of an investigation by the Federal Trade Commission (FTC) for more than a year. Hopelessly deadlocked, the five-member FTC, down to four voting members, splits on the decision of whether to take action against Microsoft.

Enter the Justice Department and its antitrust czarina Anne Bingaman, wife of U.S. Senator Jeff Bingaman (D-N.M.). They've been known to hobnob in circles where the current thinking is that anything big is bad. Except government, of course.

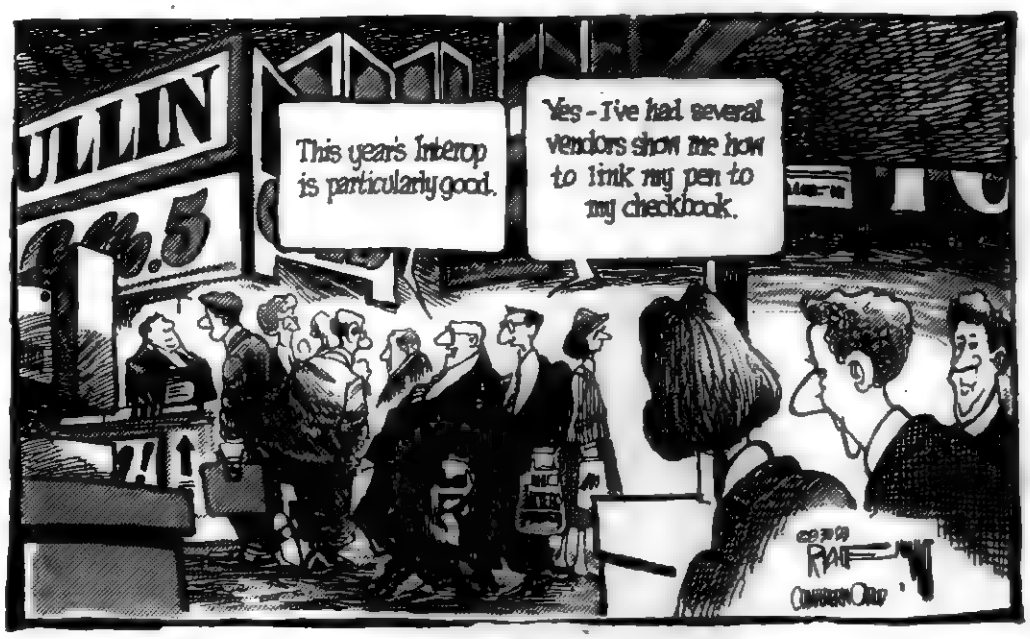
To its credit, the Justice Department decides to do what the feckless FTC would not, and that is to press ahead with the investigation. This is not to say that Microsoft has done anything illegal. I don't think anyone knows that for certain. But with the FTC deadlocked, this matter should be pursued to some conclusion. Microsoft and its customers deserve it, as do the companies that initiated the complaints.

But how on earth do we keep the politics out of this matter? And how can the investigation be stopped from evolving into the seemingly eternal three-ring circus to which the IBM affair degenerated?

There's too much at stake here to let this happen. Yet one can't help getting that sinking feeling that it's deja vu all over again.

Bill Laberis

Bill Laberis, *Editor in chief*



Oracle defends benchmarks

Oracle takes issue with Charles Babcock's "Oracle's moot court" [CW, Aug. 2] in which he derides Oracle for challenging The Standish Group's attack on industry-standard Transaction Processing Council (TPC) benchmarks.

Babcock misses the mark when he suggests Standish's charge of "fraud" on the part of Oracle is a "lesser issue" here. It is the key issue. Standish's attack went far beyond an informed, balanced debate on benchmarks. Given — as Babcock says — that the Oracle 7 benchmarks complied with the TPC specifications, charges of "fraud," "unethical conduct" and "cheating" on benchmarks were irresponsible. Standish should be held accountable for such statements.

Both Standish and Babcock publish as "fact" statements regarding Oracle 7 that are not true. Yet neither contacted us to verify the statements. Contrary to statements made, for example, Oracle 7 significantly outperforms Oracle Version 6. We are stunned Babcock could possibly assert otherwise.

Oracle does agree that the TPC review process was designed to promote informed review of published benchmarks. Oracle supports that process and submitted to it. Our benchmarks were accepted after opportunity for challenge by the 46-member council comprised of software/hardware vendors and customers.

Oracle also agrees with Babcock that Oracle's customers are the only jury whose verdict matters. And given the widespread acceptance and market leadership of Oracle 7, one can only conclude that the verdict is in.

Ken Jacobs
Vice president, product planning
Oracle Corp.

Literary laugh

It's quite refreshing that Mike Walsh of Comdisco Systems cited "Russian author" Vladimir Nabokov as a personal hero in the Aug. 9 WYSIWYG. However, I suspect that the author of *Lolita* (who departed this earth as a U.S. citizen) would roar in his grave if he knew that his subject matter was described as "life's challenges."

The great theme of Nabokov's work was the transfiguring power of art and the imagination. His books have almost nothing to teach us about capital life.

Joe Williams
Carmel, Ind.

Wrong turn

David Baum's article "The rough road to objects" [CW, Aug. 2] unfortunately perpetuates common misconceptions about object-oriented programming (OOP). He suggests that programmers should acquire products such as Visual Basic or ObjectVision to learn about OOP.

These products are not object-oriented. They are visual, or GUI, products, but they fail to meet any of the standard criteria for OOP languages. They do not support encapsulation, inheritance or polymorphism. Programmers would be better served by a true OOP language, such as SmallTalk.

Colin Davies
Simi Valley, Calif.

Flood facts

In the article "Flood has minor impact on data centers" [CW, Aug. 2], the photo caption identifies Craig Pitt as the owner of Pitt Des Moines, Inc. Pitt Des Moines is, in fact, a public company traded on the American stock exchange. Its symbol is PDM.

Also, our Des Moines plant flooded July 11, eventually to the 14-foot mark. All operations were temporarily disrupted, including use of our Application System/400 and multiple PCs that were on the ground-level floor. But within days, all office operations were functional, including the replacement of computer equipment. Plant operations are being continued at our nearby facilities.

Michael Krogstad
Pittsburgh

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Say good-bye to strategic planning

Akram Yosri

If you are a CIO who has been spending most of your time locked in a conference room with your staff going over multiple drafts of a long-term strategic planning document, stop it.

Rapid changes in information technologies, particularly software, coupled with economic constraints and fierce market competition are making this kind of insular, long-range planning obsolete. Current conditions are just too volatile for anyone to predict technology needs beyond the short term.

At one point, it made a great deal of sense to try to forecast requirements and budgets well into the future. That time is over. Today, what IS executives will be judged on is not strategic planning but their ability to adapt quickly to the unforeseeable, which depends on contingency planning.

Contingency planning is the only kind of steering apparatus that makes sense in turbulent times. If you can't foresee what's coming, at least you can create mechanisms for dealing with sudden changes in a controlled fashion. As Charles Marshall, CIO at Sunkist Growers, puts it, "While we have a five-year plan, emphasis lately has been given to the contingency component of our one-year plan. This component is set for information needs and technology platforms we expect but are not sure about."

Adapting to this kind of planning requires a major shift in attitude for many CIOs, who have been trained to believe that "not staying the course" is synonymous with failure. Furthermore, it requires a management structure and style flexible enough to withstand business pressures and economic instabilities. The long-distance-runner credo doesn't work anymore. What the times call for are leaders who know how to sprint.

Venture capitalists might be the most relevant model to work from because their main objective is to maximize return on investment, mostly through high-yielding, short-term investments and that, to an increasing degree, is how success is defined for CIOs.

How can a CIO act like a venture capitalist?

- By directing resources and expenditures to information-intensive business areas that add value to the bottom line.
- By carefully and dispassionately assessing the cost/benefit equations for all technology investments.
- By hiring or locating someone with both technology and financial experience, a sort of information technology-CFO, who can track the benefits of information technology expenditures by business area.
- By making preparedness and rapid deployment priorities.

As radical as this may sound, thinking small and tactical with an emphasis on contingency planning is really the only rational response to the kinds of changes taking place in business and industry. What firms are evolving toward is a structure where smaller business units set their own objectives, form their own information policies and control their own destinies. Trying to navigate in that environment with clumsy and inflexible planning instruments just won't work.

Yosri is a lecturer at New York University's Information Technology Institute and a consultant.

Trying groupware on for (down)size

COUNTER-INFORMATION *by* Michael Schrage

Perhaps you've heard the joke about the method actor with the bit part who didn't like what the director was asking him to do. After receiving his instructions, the actor arrogantly looks up and asks, "But what's my motivation?"

"Motivation?" the director sneers, "Your motivation is— Do it or you're fired."

This punchline kept echoing through my mind as I talked with participants at the recent GroupWare '93 conference in San Jose, Calif. This was no Groupware Woodstock, where people grooved on the concept that computer-mediated cooperation is "where it's at, man." No way. In fact, the motivation most attendees offered for exploring groupware wasn't any Tom Peters/Peter Druckeresque value such as "sharing information," "collaboration" or creating (All together now!) "The Learning Organization." The big motivator was downsizing.

No, not downsizing, as in moving applications off the mainframe to client/server. Downsizing, as in delays, cuts, firings, restructurings, sackings, reductions in force, outplacements, terminations, job losses, etc.

Think for a moment, and it becomes blindingly obvious just why groupware is becoming more popular: After downsizings, organizations have fewer people trying to do more work. The brittle infrastructure that remains just doesn't cut it anymore, and managers are grasping for whatever tools they can to handle the added burdens.

It only makes sense to grab for groupware. The hope is that groupware will act as a sort of organizational glue to stick people together and fill in the gaps that all those downsizings leave behind.

Now there's an irony in this. For years, the groupware advocates (Jim Manzi, Ray Noorda, Steve Jobs, are you listening?) have waxed charismatic on the general wonderfulness of the networked organization and how the spirit of interpersonal computing will lift corporate productivity to previously unattainable heights. Groupware was championed as a medium that would put productive people in touch with one another in new value-added ways.

This may well happen. But what's becoming clear is that the companies most interested in groupware view it as a technology that will help shrink their organizations, not position them for growth.

In other words, the motivation underlying most groupware investment today appears to be 180 degrees different from the motivation espoused by its most ardent advocates.

In a perverse way, it's reminiscent of the mid-1980s when all those clever PC pundits (including me — mea culpa) were predicting the rise of the "paperless" office, just in time to see desktop publishing become the singular driving force of the industry. We weren't just wrong — we were completely, 180 degrees wrong.

Is that what's happening with groupware? Is it possible that, instead of being a source of empowerment and collaboration, groupware will become the new medium for corporate autocracy and white-collar Taylorism? Sure, this is a company-by-company, culture-by-culture issue, but we're foolish if we ignore today's motivations for groupware investment.

The simple reality is that the driving force behind groupware today is not the values of sharing, learning and collaboration that we all deem so desirable. The motivation is, "We better try this or we're screwed."

Let's stop all the groupware empowerment pabulum and start talking about the new pragmatism. Are we investing in groupware to infuse the organization with collaborative energy? Or are we investing primarily to stanch the bleeding?

Schrage is a fellow at the MIT Sloan School Center for Coordination Science. He is also the author of *Shared Minds: The New Technologies of Collaboration*, (Random House, 1990). His internet address is schrage@media-lab.media.mit.edu.

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Charles Babcock

Internet and beyond

Doug Johnson, a senior staff scientist at Atmospheric and Environmental Research, Inc. in Cambridge, Mass., is an Internet pioneer, a business user who has adapted the public sector design of this network of networks to private sector use.

He is also an example of why the Internet is generating thousands of new business users per month. From March through June, the number of commercial networks tied to the Internet increased to more than 300%, from 485 to 1,590.

Johnson regularly logs on to make use of massive databases on natural resources from the U.S. Geological Survey, air pollution from the Department of Energy and atmospheric conditions from the National Oceanic and Atmospheric Administration in Woods Hole, Mass.

Although those are mainly scientific databases, visionaries such as Brewster Kahle, formerly of Thinking Machines Corp. in Cambridge, Mass., and now the founder of WAIS, Inc. in Menlo Park, Calif., expect more and more commercial databases will soon come on-line to offer value-added extracts of U.S. Census, farm crop, stock market or geological data — for a fee.

Johnson also sends E-mail to scientific colleagues at research labs or collaborating businesses. Although the number of commercial enterprises connected this way is still limited to those with ties to the national research labs and universities, the E-mail Johnson exchanges on the Internet is particularly productive. He has adapted an Internet search technique to do keyword searches on hundreds of old E-mail messages so they remain useful beyond their immediate, fly-by existence.

Johnson is not a typical business user with an IBM PC on his desk (he connects via a Unix workstation), but what he is doing is not an impossibility for those who are. Today, both Macintosh and PC users can obtain freeware client software that allows them to connect through a modem by dialing out to a local commercial service. Simplified search and retrieval mechanisms have also recently been added, which help to demystify this data highway.

For example, the wide-area information server, or WAIS, is a client/server application invented by Kahle that includes a search mechanism using keywords typed in by the user. All documents and files on a particular server have been indexed, and the search returns titles of those scoring the highest number of hits for the keywords. The user then selects those that reflect what he was pursuing. The WAIS system then launches another search based on this "relevance feedback," zeroing in on the subject matter sought. This mechanism allows a novice business user to pursue searches that locate the most pertinent documents.

Gopher, created at the University of Minnesota, is another two-piece interface that helps an Internet user find a particular database. The Gopher client software connects the user to a Gopher server, which offers a directory of databases under various headings. As the user makes selections, Gopher makes the connection, or "goes for" the designated documents and downloads them.

Johnson's firm had to be persuaded to pay $1,000 a month for a leased line to the Internet, but "the thing that sold it was the Internet's ability to get mail to NASA and other agencies, even to colleagues in China," he says. Now, he says, the nontechnical brass of the firm notices if the E-mail does not go out over the Internet.

If we ever get a national information highway — which will have to be larger and more closely managed than the Internet — it will owe its existence and probably many of its features to the pioneering users on the Internet.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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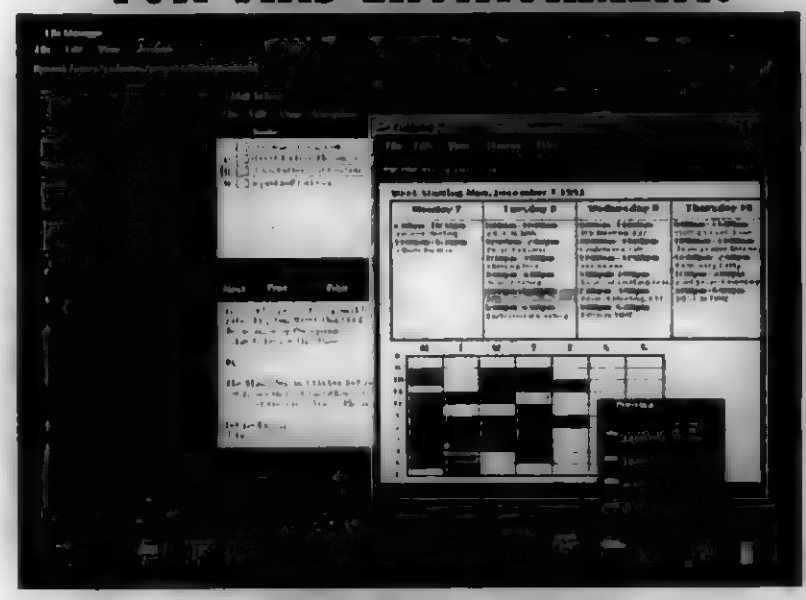

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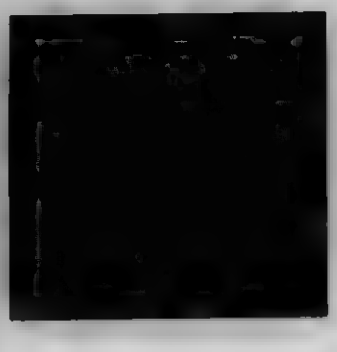

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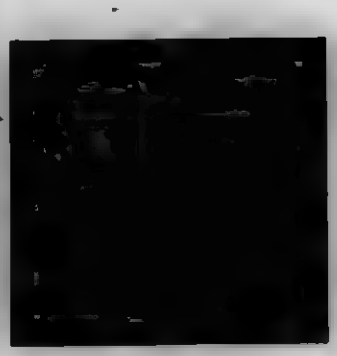

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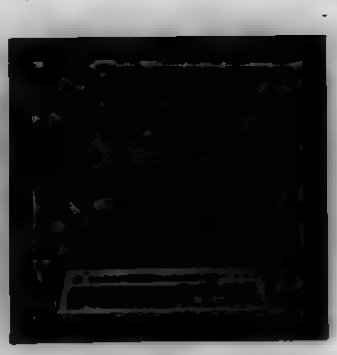

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Power tools boost sales at checkout line

Retail home improvement chain replaces dumb terminals with full-function PCs running OS/2

By James M. Connolly

The clink-kerchunk of the old mechanical cash register has typically given way to the click-click of electronic point-of-sale (POS) systems. However, few retailers have dropped full-function PCs onto their checkout counters.

At Grossman's, Inc., a chain of home improvement centers based in Braintree, Mass., the dumb POS terminal is yielding to a PC running IBM's OS/2. The idea surprised industry observers, although Grossman's said it feels it is positioning itself for the future.

"A lot of us have thought for a few years that we could take the same tools offered to the office worker and make them applicable to the cashier. The cashier is a decision-maker, and we want to help them make their decisions, their sales," said John H. Christoffel, director of MIS operations at Grossman's. "Why shouldn't you make the selling and buying decisions as pleasant as possible?"

STELLA JOHNSON

Grossman's John H. Christoffel *used backbone of existing system*

Grossman's is rolling out more than 700 NCR Corp. System 3221 terminals in its 138 stores. Those PCs are linked by a 16M bit/sec. Token Ring local-area network to NCR 3550 servers. With 25 stores now converted, Grossman's plans to step up the rollout in the fall, aiming for a late 1994 completion date.

More flexibility

Placing more intelligence in POS terminals gives cashiers the ability to draft price quotes for contractors, and it smooths the transition between different types of transactions. It also helps managers in their planning by simplifying reporting and by lending credibility to weekly numbers that once were typical of the retail industry — outdated, inaccurate or irrelevant.

"As you start to implement things that make people feel the data is better, that makes people more willing to pursue an automated replenishment route. We can move from a more myth-based stereotype of retailing that has been common in retailing for hundreds of years," said Michael Bergman, vice president of information systems.

The POS system, which was installed in the first store in October 1992, is a key element of an overall store systems plan that features a 2-year-old automated inventory replenishment system. Shipments of lumber and other building materials are accompanied by an electronic data interchange shipping order and are checked in by employees using handheld, radio-frequency Telxon Corp. scanner terminals that are also used for shelf inventory and customer checkout.

The combination of the wireless devices and the PC-based POS systems could help Grossman's rethink the checkout process, Christoffel said, noting that one possibility for busy times is to have roaming clerks scan in purchases for customers waiting in line and produce invoices for cashiers.

Custom design

In addition, the longer-term impact could include more custom marketing. For example, Grossman's could use artificial intelligence to identify the preferred materials used by a particular contractor — the company's sales strategy focuses on the contractor and the more advanced do-it-yourselfer — and anticipate when the contractor will need those materials. Or it could give the cashier greater flexibility to give discounts without waiting for a man-

Grossman's, *page 41*

On Site

Grossman's, Inc.
Braintree, Mass.

Challenge: To place decision-making tools in the hands of sales clerks and enhance automated replenishment system.

Technology: NCR POS systems running IBM OS/2, Token Ring LANs and wireless Telxon data terminals.

Results: Training time reduced for sales clerks; sales data is more reliable; staffs spend less time on inventory management and more on sales; and company is positioned to empower clerks to carry out tasks such as custom price quotes.

Suites use spurs look at licensing utilities

By Michael Vizard
HAWTHORNE, N.Y.

As software suites deployed on Windows systems continue to proliferate, information systems managers are finding it increasingly difficult to comply with the terms of software licensing contracts.

To solve this problem, some IS managers have turned to Express Meter 2.0, a license management program by HDC Computer Corp. in Redmond, Wash., that runs across a variety of networks, including Novell, Inc.'s NetWare, IBM's LAN Manager, Banyan Systems, Inc.'s Vines, Digital Equipment Corp.'s Pathworks and Artisoft, Inc.'s LANtastic.

Express Meter, which sits as a driver in a Windows client, monitors and tracks the launching of each application on that system.

Big money

In 1992, the Software Publishers Association cited 747 companies for license violations, resulting in $3.9 million in fines.

Because of this capability, Ciba-Geigy Corp. has adopted Express Meter at its Hawthorne, N.Y., facility as a tool that helps reduce the number of software licenses it needs to acquire.

At Ciba, end users launch applications from a network server, which was designed to support a number of concurrent users.

"Today, most shops are faced with either buying copies for every user or putting 100 copies up on a LAN. I couldn't see justifying copies of software on every desktop," said Paul Elliott, a programmer/analyst at Ciba.

Relying on the honor system

But without a license metering facility, Ciba, like most companies that have adopted a server license model, was complying with software license restrictions using an honor system.

"Ciba's a major company, so complying with licensing restrictions is a big deal. We're going to make sure that every client comes preconfigured with a set of virus utilities from Norton and the license management software," Elliott said.

He added that while his users have noticed a slight performance penalty after installing Express Meter on Intel Corp. 1486-based systems, the performance hit is not really a significant issue.

"Express Meter is really a dynamite product. I think it's the only product that can actually monitor suites," Elliott said.

According to Elliott, most companies are in violation of their suite contract because they think that their license will allow them to have separate users launching different parts of a suite. But technically, a suite license does not allow one user to launch a presentation graphics package while another user is launching a word processor.

Elliott added that Express Meter is a fairly flexible offering that can be used to monitor both local and server-based applications. In addition, Express Meter can be configured to just monitor software use, put users in a queue waiting to access software or simply lock them out of a software package altogether.

Ciba is currently completing a 25-user pilot with Express Meter and plans to deploy the license utility on as many as 900 desktops connected to VAX servers using Digital's Pathworks network operating system.

It's all time high, wiping out more than [illegible] billion in shareholder value.

'Steep Learning Curve'

Those pressures leave little time for a new boss to master IBM's business. Fully 51% of IBM customers surveyed by Computerworld magazine say IBM needs to hire a CEO with a technology background. With Mr. Gerstner lacking such a pedigree, "he's going to be on a very, very steep learning curve," says David Hanna, a former IBM executive who is now president of Hanna Group, a computer-consulting [illegible]

THE WALL STREET JOURNAL.
March 25th, 1993

Computers & Automation

"Information systems managers are grasping onto this as a Holy Grail," said Paul Gillin, executive editor of Computerworld, which is just one of many industry trade publications that spotlight reengineering on a regular basis. "It is an important leap for corporations."

The hype should reach crescendo in May, when a new book by management consultants Michael Hammer and James Champy will be [illegible] "Reengineering the [illegible] Revolution."

Investor's Business Daily
March 25th, 1993

[illegible] systems.

SEE, THERE'S A MOUSE in the corner office. The percentage of executives who regularly use computers nearly doubled in four years, to 81% from 42% in 1988, says a study by Computerworld magazine and Andersen Consulting. Fewer than half think they are getting their money's worth from corporate computer systems.

[illegible] systems were largely privately owned, real-time computer networks. Because [illegible]

THE WALL STREET JOURNAL
April 20th, 1993

[illegible]eir question: Where are the productivity savings?

The New York Times
April 25th, 1993

CORPORATE executives appear to be more knowledgeable about computer technolgy than ever before, but they have also become more demanding and less forgiving, a new survey has found. While they believe information technologies are the key to competitive advantage, they also say that they have not been getting their money's worth.

The survey, conducted by the computer industry newspaper, Computerworld and Andersen Consulting, also found that 81 percent of top executives are personally using computers in their daily jobs, nearly double the percentage reported when the survey was first taken four years ago.

More than 200 chief executives, chief operating officers, and chief financial officers, representing a broad range of businesses, participated in the study, the results of which were published in Computerworld last week. Annual company sales ranged from $250 million to $20 billion.

The New York Times
March 25th, 1993

[illegible] CUSTOMERS HAVE THEIR SAY TOO

■ IBM directors should forget about hiring another salesguy to replace John Akers as CEO. And whoever he is, Akers's successor should fire a whole lot more people. So says a Computerworld survey of executives at 100 companies that spend at least half their computer budgets on IBM products. The participants, who work at the likes of Kmart and Parker Hannifin, a maker of pneumatic and hydraulic components, also said IBM's reorganization into smaller business units should go further.

Computerworld, in addition, interviewed various computer industry luminaries, including Steve Jobs. The Next CEO marveled that none of IBM's machines from mainframes to PC's uses the same software. Says Jobs: "IBM's troubles stem from the fact that they approach everything from a hardware strategy, and the Nineties is a software decade."

Not everybody agreed that breaking up is the way for IBM to go. Said Larry Ellison, CEO and co-founder of Oracle, a software company: "This is the [illegible] you nit- [illegible]ber. Richard is a retired I.B.M. vice president.

A survey of some 100 of I.B.M.'s largest customers by Computerworld magazine found that 51 percent preferred someone with a technical background to be the computer giant's new chief executive, while 36 percent said technical expertise was not essential and 13 percent had no opinion.

But some industry [illegible] say technology [illegible] in [illegible] "be a b[illegible]

[illegible]93 FORTUNE 11

FORTUNE
April 5th, 1993

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Grossman's

CONTINUED FROM PAGE 39

ager's approval.

"We don't really know what this business is going to evolve into, so what we did was take the backbone and use it as an open approach," Christoffel said.

One logical extension of the system would be to place the POS software on a laptop computer and give it to a salesperson for on-site calls. Another might be to give it to the contractors who could then place their own orders.

That type of option is made possible by the flexible fourth-generation language in which the POS system was written — Application Manager from Intelligent Environments in Tewksbury, Mass.

> "Why shouldn't you make the selling and buying decisions as pleasant as possible?"
>
> *— John H. Christoffel, Grossman's*

Grossman's is what remained when parent Evans Products went through final bankruptcy proceedings in the mid-1980s. The company at that time had what Christoffel now describes as a rather antiquated, proprietary POS system. Grossman's budgeted $15 million for a three-year project. Working in an atmosphere of austerity — Grossman's IS staff now totals 70, down from a high of 120 — the company had expected to recoup its investment through increased margins and "our freeing the store staffs for selling," Christoffel said. However, falling hardware prices have resulted in some unexpected savings.

At the cashier's station — the site of high employee turnover throughout the retail sector — use of PCs is expected to ease training by being more intuitive than traditional IBM 3270-type terminals.

For example, Christoffel demonstrated how a cashier wanting to process a refund on the PC sees the screen change color to red, whereas the older application was prone to mistakes or fraud because the same screen form was used for both sales and refunds.

OS/2's Database Manager also gives the cashier more opportunities to perform alphabetical searches for product information. The server holds price information and relays sales information to Grossman's Hitachi Data Systems Corp. mainframe. Credit authorizations pass through a satellite network and return in four seconds, compared with the up to 45 seconds it took for dial-up authorization.

Personal computing

AST adds to family of entry-level PC equipment

By Michael Fitzgerald
IRVINE, CALIF.

AST Research, Inc. last week broadened its Bravo PC family with the addition of a minitower server and a notebook computer.

The Bravo line has been AST's entry-level brand for some time, and analysts said they thought AST was wise to extend it. With the new products, AST offers users standard desktops, slimlines, Energy Star-compliant desktops, a tower server configuration and notebooks.

"They really did a nice job of fleshing out the product line," said Ted Julian, an analyst at International Data Corp. in Framingham, Mass. "They've solidified the line and perhaps have helped define it better in users' minds."

Aggressive pricing

Pricing on the new Bravos, all of which are 486-based and include local-bus graphics, including the two notebook computers, looked aggressive. AST will start its base PC at $825 with no hard drive, and the server will start at $1,300.

The notebooks come with a monochrome, passive-matrix color or active-matrix color screen, and prices range from an aggressive $1,699 to $3,549 for the active-matrix, thin-film transistor product.

The Bravo MT server marks AST's first low-end server product. With its Bravo LP, it also added a family of PCs compliant with the Environmental Protection Agency's new Energy Star program.

Competitive edge

The expansion of the Bravo line to include notebooks and servers may help AST compete more effectively with the likes of the IBM PC Co. and Compaq Computer Corp. Most companies have not offered so many different types of PCs within a single product family, analysts said.

AST officials said they chose to offer an unusually broad variety of form factors because "we were trying to listen to what our customers wanted, rather than look at what IBM or Compaq or Dell were doing," said Daniel Sheppard, AST's director of marketing.

According to Sheppard, AST hopes the variety of form factors, in addition to other features, such as flash-upgradable Basic Input/Output System, will help it stand out in the midrange corporate PC market and earn it new customers.

AST [illegible]

[illegible] MT minitower
Processors: 33-MHz Intel Corp. i486DX, 33/66-MHz 486DX2; Pentium-upgradable; six bays, six slots; optional 170M- or 340M-byte hard drives.
Base price: $2,300.

Bravo LC PCs
Processors: 25-MHz i486SX, 33/66-MHz i486DX2; five bays, four slots; optional 120M- or 210M-byte hard drives.
Base price: $825.

Bravo LP PCs
"Green" PC
Processors: 25-MHz i486SX, 33-MHz i486DX, 33/66-MHz i486DX2; three bays, two slots; optional Token Ring, business audio and Ether-audio.
Base price: $925.

Bravo NB notebook
Processor: 25-MHz i486SX; integrated trackball; monochrome or passive-matrix color display; one Personal Computer Memory Card International Association Type II slot; 80M- or 170M-byte hard drive.
Base price: $2,699.

Toshiba expands its Satellite notebook line

By Stephen P. Klett Jr.
IRVINE, CALIF.

■ The Computer Systems Division of Toshiba America Information Systems, Inc. will unveil today a new family of Satellite notebooks based on Intel Corp.'s 40-MHz, 3.3v, SL Enhanced i486DX2 microprocessor.

The Satellite T1950 series includes three models: the T1950 with a 9½-in. dual-scan color LCD; the T1950CT with an 8.4-in. color active-matrix LCD; and the T1950 with a 9½-in. monochrome LCD. All models come with 4M bytes of random-access memory, which is expandable to 20M bytes, and offer customers a choice of 120- or 200M-byte hard drives. In addition, a 320M-byte hard drive is available for the T1950CT model.

Estimated street prices start at $2,199 for the T1950/120 and $2,499 for the T1950/200. The T1950CS/120 starts at $2,799, and the T1950CS/200 starts at $3,049. All above products are shipping now. Pricing for the T1950CT, slated to ship in 60 days, was not available at press time.

The T1950 weighs 6½ pounds, while the T1950CT and CS weigh 7.4 pounds and 7 pounds, respectively.

Powered by a nickel metal hydride battery pack, the T1950 series has a battery life of more than three hours for the T1950 and two-plus hours for the T1950CT and CS. According to Toshiba, the T1950 recharges in 2.3 hours, and the T1950CT and CS models recharge in 1.4 hours.

Leading the pack

Estimates from International Data Corp. place Toshiba as the No. 1 U.S. portable vendor, with a 16.2% market share last year. Toshiba also ranks first among IBM-compatible notebook vendors, with a 20.7% volume share.

Power saver

To conserve battery life, the series uses Toshiba's MaxTime power management system, which includes automatic display and hard disk shutdown after a period of inactivity set by the user.

MaxTime also includes an automatic CPU "sleep" mode, a low-battery warning light, an AutoResume electronic bookmark and an AutoSave feature that enables AutoResume if the battery runs out of power.

The notebooks feature a 16.5mm Personal Computer Memory Card International Association (PCMCIA)-2 expansion slot that allows connection of PCMCIA data/fax modems with RJ-11 jacks, hard drives, networking cards and other industry-standard options available from Toshiba and third-party manufacturers.

All models feature power-on password protection and a Kensington lock slot for data security and theft protection. The series comes preinstalled with Windows 3.1 and Ultrafont and includes Microsoft Corp.'s BallPoint 2.0 trackball.

Software reduces litigation costs

By Michael Vizard
SAN RAMON, CALIF.

In a move that is expected to be warmly received in the legal offices of most corporations, Stenograph Legal Services, Inc. has begun delivering a Windows version of its Discovery litigation support software.

The software allows lawyers to easily scan transcripts using Boolean operators and wild card searches using keywords and phrases.

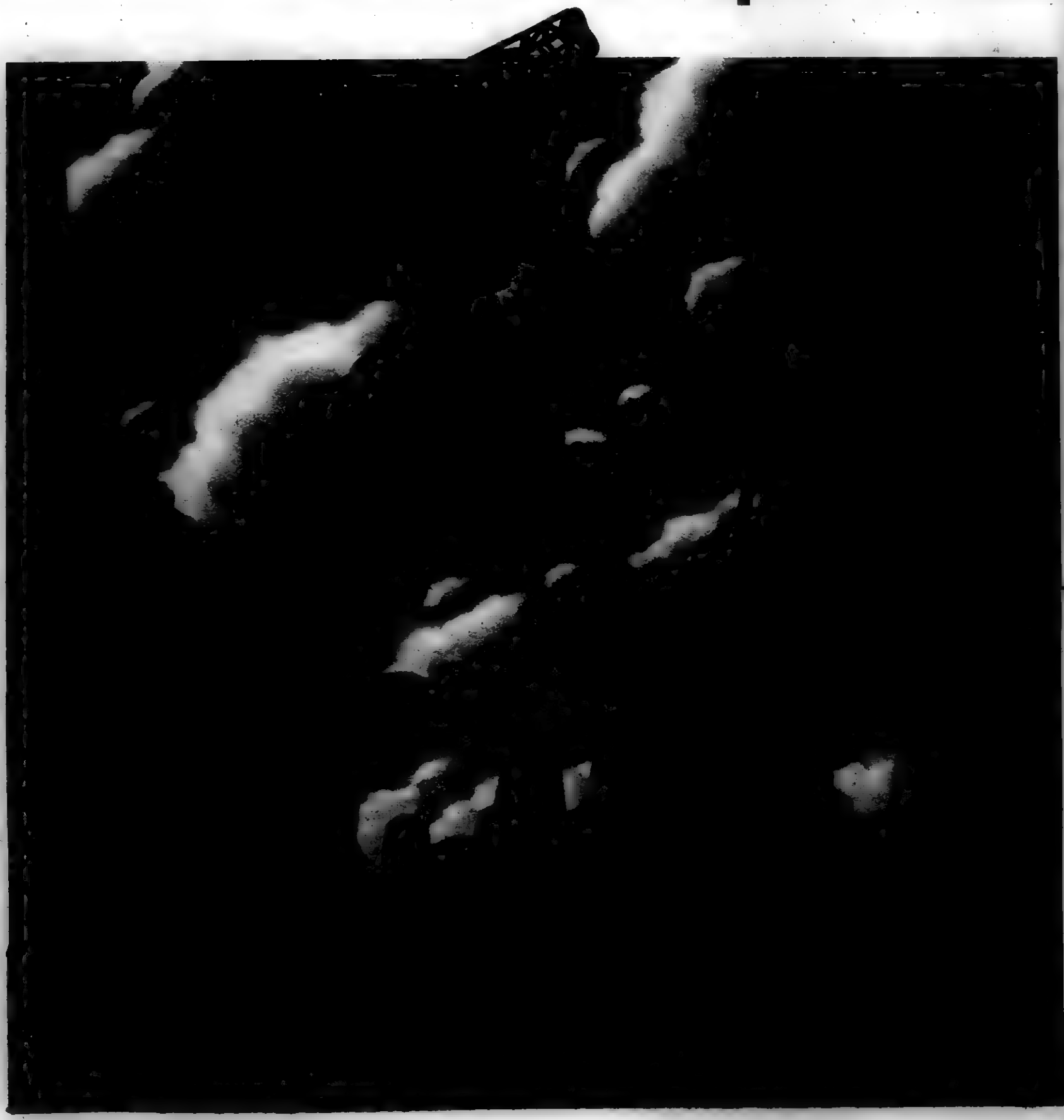
"I love it. It saves a lot of billing charges because lawyers and paralegals don't have to leaf through piles of transcripts," said John Aseveto, a paralegal at Thelen, Marrin, Johnson, Bridges, a law firm in Los Angeles.

Aseveto said that as corporations move responsibilities for court cases to in-house lawyers and paralegals, use of Discovery at corporations will increase. "About 99% of the court reporters out there will provide transcripts in a Discovery format. And those that don't will convert ASCII formats into Discovery," Aseveto said.

He said given the cost of litigation, the investment in Discovery is "a ridiculously good deal."

Discovery is priced at $199 but is available at an introductory price of $99.

Is there a simpl
an enterprise-



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[redacted]

Software

Horizons Technology, Inc. has introduced Sure MAPS 2.0, a Windows and DOS version of its CD-ROM-based desktop mapping software.

The product offers raster mapping capabilities that can present the shape of tunnels, bridges, large buildings, waterways and landmarks such as parks and airports.

The software can draw lines, circles, rectangles and polygons to calculate distance or annotate specific map areas, the company reported.

A library of 22 optional "Map Sets" is offered that houses detailed maps of more than 60 major metropolitan areas in the U.S.

Sure MAPS 2.0 costs $199. The Map Sets cost $99.

▶ *Horizons Technology*
3990 Ruffin Road
San Diego, Calif. 92123
(619) 292-8331

Microsoft Corp. has introduced Microsoft Open Database Connectivity (ODBC) Desktop Database Drivers Version 1.0, a set of drivers that provides Windows operating environment-based applications with access to desktop databases and file formats through ODBC.

According to the company, customers can use the drivers in conjunction with ODBC-enabled applications or create new applications.

Data is transferred to applications from desktop databases and file formats such as Borland International, Inc.'s dBase III and dBase IV, Paradox 3.0 and 3.5, Microsoft's Access database management system Versions 1.0 and 1.1, FoxPro DBMS Versions 2.0 and 2.5 and formatted text files.

The drivers cost $49.

▶ *Microsoft*
1 Microsoft Way
Redmond, Wash. 98052
(206) 882-8080

MicroBiz Corp. has announced that The Business Controller Plus Version 3.3, point-of-sale software, will begin shipping early next month.

According to the company, The Business Controller Plus is a multipurpose business management software package that is compatible with any PC with a hard disk drive.

The product can be used for purchasing and receiving, vendor tracking, sales reporting, inventory and customer tracking and invoice or receipt printing.

New features include enhanced barcode printing functions and a recurring billing option that enables users to automatically update their accounts receivable and generate customer bills.

Requirements include a 386 or higher PC or IBM compatible, an 80M-byte hard drive, 2M bytes of random-access memory and DOS 3.3 or higher.

A single-user version of the product costs $1,595, and a multiuser system (as many as four users) costs $2,495.

▶ *MicroBiz*
500 Airport Executive Park
Spring Valley, N.Y. 10977
(914) 425-9500

Ocean Isle Software, Inc. has introduced ReachOut Total Remote, software that mixes remote control and remote access functionalities into one program.

According to the company, the product can prepare a document on a laptop, dial into the office network and fax the document using the office fax software.

ReachOut Total Remote automatically eliminates the need to copy from the laptop to the office network. The product comes equipped with a full-featured file manager and also has the capability to bridge dissimilar networks.

ReachOut Total Remote costs $249.

▶ *Ocean Isle Software*
2nd Floor
1201 19th Place
Vero Beach, Fla. 32960
(407) 770-4777

Hardware

CypherTech, Inc. has announced its CypherScan line of Business Card Scanning Systems.

The line consists of CypherScan 1000, a complete ready-to-use system that has a compact scanning unit and Windows software; CypherScan HF-flatbed, a Windows software version for use with Hewlett-Packard Co.'s ScanJets and compatibles; and CypherScan HF Handheld, a Windows software version for use with Logitech, Inc.'s scanners and compatibles, the company reported.

Users can put business cards into their computers, usually without having to type in the information. First name, last name and address information is automatically determined and entered into corresponding database fields.

Prices range from $145 to $395.

▶ *CypherTech*
250 Caribbean Drive
Sunnyvale, Calif. 94089
(408) 734-8765

Texas Instruments, Inc. has introduced the TravelMate 4000E WinSX/25 Color, a notebook that weighs 6 pounds (including battery) and is powered by a 25-MHz 486SX processor. The product features an advanced passive color display. Cost: $2,499. Texas Instruments, Austin, Texas (512) 345-1145. ... **Dragon Systems, Inc.** has announced DragonDictate-30K Version 2.0, a speech recognition system. Without using a keyboard, users can create letters and business memos or complex reports and documents by dictating data and text into their computers. Cost: $4,995. Dragon Systems, Newton, Mass. (617) 965-5200. ... **DeltaPoint, Inc.** has announced Graphics Tools for Windows, a suite of utilities for browsing, cataloging, converting, organizing and capturing multimedia and graphics. Users can find and view thousands of media files on demand. A suite of additional utilities is provided to handle graphics file conversion, image editing and image processing. Cost: $169.95. DeltaPoint, Monterey, Calif. (408) 648-4000.

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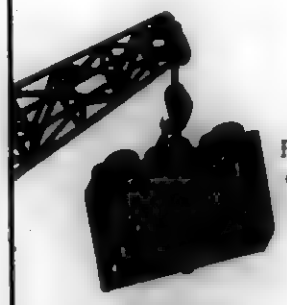

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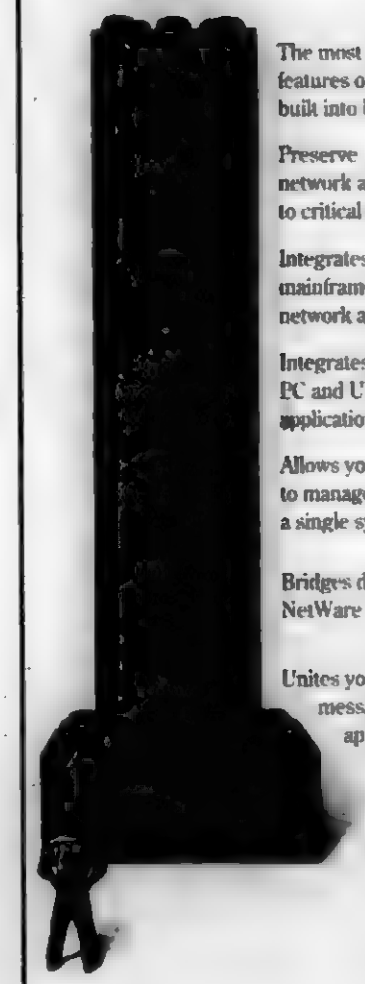

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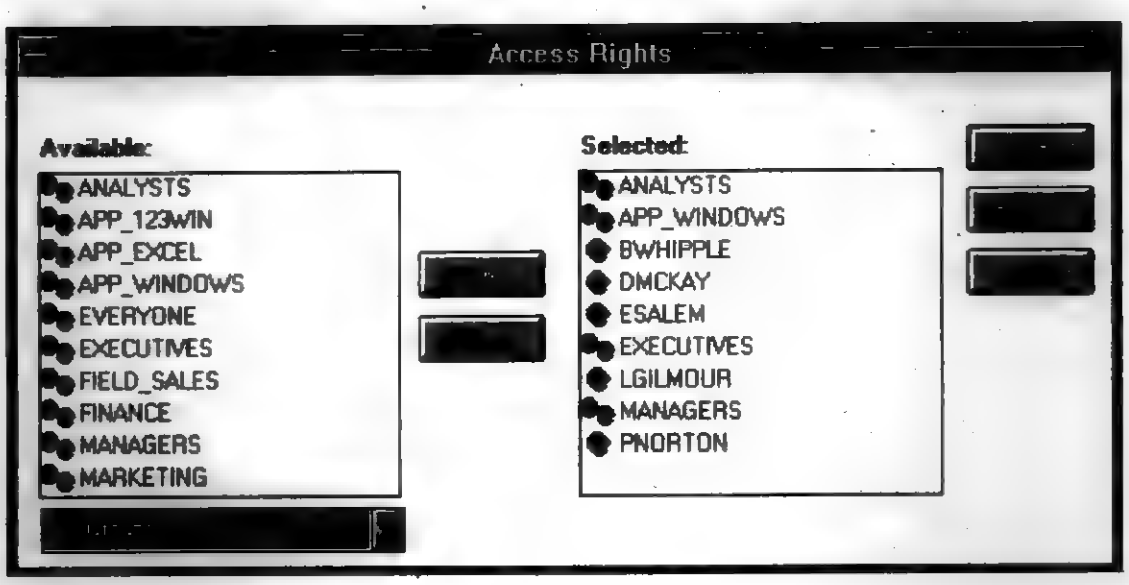

Peter Norton, the leader in Windows utility software.

It seems Windows was designed to make everyone's life easier. Everyone, that is, save for today's network manager.

Saving that manager is exactly what Peter Norton has in mind. With Norton Desktop's Network Menuing Admin Pack 2.2 (NMAP for short), you now have the power to take complete control over access to network* applications.

Peter recognized that there may be hundreds of Windows users with varying skills, needs and preferences. And then there is you, expected to maintain corporate desktop standards, control the free flow of information and handle the stream of panicky requests from your users.

With NMAP as a seamless add-on to Norton Desktop for Windows 2.2, you get centralized security and menu control over all the applications on your network. You can also easily customize your users' interface, without taking away the individual flexibility they demand.

NMAP's unique Administrator's Mode makes restricting access to applications fast and simple because it's based on existing network privileges. Best of all, you can exercise all this control without ever leaving your desk.

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How the feds find data

Retrieval system more intuitive than traditional search tools

By Gary H. Anthes

Some people at the U.S. Department of Defense are feeling a bit defensive these days as their budgets shrink but not their work loads. So when analysts supporting the Joint Chiefs of Staff were given the job of developing a system to store and retrieve gigabytes of data — but not enough funds to scrub the data clean — they turned to Excalibur Technology Corp. for a solution.

In data retrieval, a miss is as good as a mile, but San Diego-based Excalibur has a search technique that users say greatly reduces the odds that sloppy queries or dirty data will lead to the heartbreak of an empty screen.

In a demonstration, John Weiler, Excalibur federal director, typed in, "not ask not what i can do for your but ask what." in seconds came the "match" from a database of 14,000 documents: "Ask not what your country can do for you; ask what you can do for your country," from President John F. Kennedy's 1960 inaugural address.

"If I say, 'Be to, not be to,' you'll still think Shakespeare," Weiler explained. "Most computers won't, but we will."

Excalibur's PixTex Electronic Filing Software (EFS) uses neural network technology to support "fuzzy searching." Unlike most retrieval systems that rely on keyword matching, PixTex/EFS employs pattern recognition at the binary level. With a conventional word-search approach, a single wrong bit would cause a character to change and the search to fail. But to PixTex/EFS, the binary pattern overall might still be 99% correct and hence judged a good match.

The software that remembers

In addition to using this extra level of granularity, the neural network technique — pioneered in a classified project for two national laboratories 12 years ago — adapts and grows smarter with use. As the database and its associated binary indexes grow, the software is able to recognize variations of patterns it has seen and indexed before.

The technology is particularly appropriate with databases built by optical character recognition (OCR) scanning, Weiler said.

PixTex/EFS can accurately search raw OCR-processed text with no need to correct or rekey the data, which can run $1 to $5 per page, Weiler said.

Excalibur's system *here uses a black-and-white image of a wheel as a clue to retrieve the original color image from a database of images*

The Joint Chiefs of Staff are loading some 3 million microfilm images and 750,000 paper pages by OCR into databases on IBM RISC System/6000s running PixTex/EFS. "With such a backlog to get scanned in, we couldn't conceive of having someone edit every page in order to produce a 100% quality database," U.S. Air Force Maj. Keylor Eng said.

Eng said the system can find references to Col. Muammar el-Qaddafi in all of its spelling variations, even if the input query is misspelled.

In addition to ASCII text, PixTex/EFS can handle images — ones the Federal Bureau of Investigation may use for fingerprint recognition — and signals, such as seismic patterns in oil exploration. Users include the following:

•The Library of Congress uses it in its

Excalibur, *page 50*

Groupware

Object software facilitates electronic discussions

By Michael Vizard
HOUSTON

As part of an effort to create a collaborative computing environment without having to deploy additional platforms, The M. W. Kellogg Co. has adopted a conferencing package from Office Express, Inc. in Atlanta.

Called GrapeVine, the Office Express software is based on an object file system that allows users to participate in specific discussions using filters to create specific profiles of interest.

As a result, each comment added to the database is stored as an object. The relationship between objects is tracked using an index, which in GrapeVine parlance is referred to as a thesaurus. On these systems, discussions are stored as binary large objects in either a flat file system or a SQL database that provides pointers to the individual comments that are stored as objects.

"Each time a new item is added to the database, the thesaurus will check to see who has an interest in that item and send them a message that there's been an update that will interest them," explained Richard Emery, Office Express business development manager.

For example, Kellogg uses GrapeVine to distribute technical documents to the appropriate user based on a set of interests that have been programmed into each user's profile.

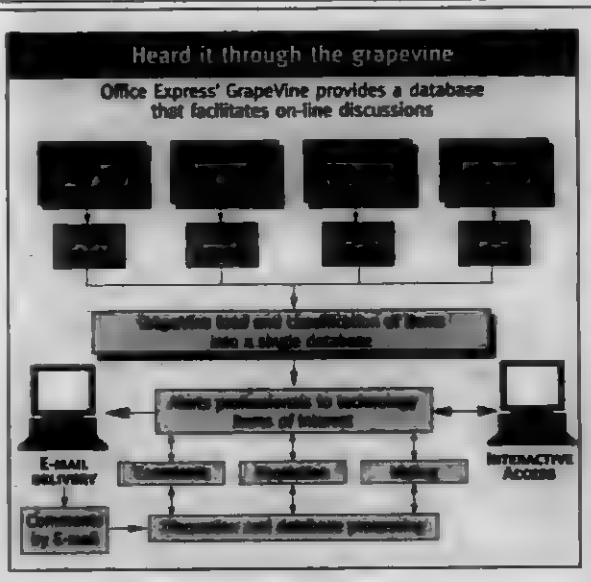
According to David Lee, manager of application development for information systems, the engineering and construction firm opted for GrapeVine over other solutions. That is because as an engineering company, it has a large commitment to OpenVMS systems from Digital Equipment Corp. that are not supported by products such as Notes from Lotus Development Corp.

And while Digital offers a conferencing package called VAX Notes, Lee said Kellogg opted for GrapeVine because it has better support for PCs and the ability to load external data, run on top of multiple electronic-mail packages and easily follow threads of discussions.

PC potential

While most of Kellogg's use of GrapeVine has been based on a 500-user license for OpenVMS, Lee said he is currently evaluating a project that will call for using GrapeVine on PCs.

In addition to supporting Windows, Macintosh and Unix clients, GrapeVine runs on OS/2, IBM's AIX, Sun Microsystems, Inc.'s SunOS and OpenVMS servers. Support for Microsoft Corp.'s Windows NT is due in the third quarter.



Networks supported include Novell, Inc.'s NetWare, Microsoft's LAN Manager, Transmission Control Protocol/Internet Protocol and Apple Computer, Inc.'s AppleTalk.

E-mail switch

However, Lee noted that his greatest challenge remains getting people to switch their on-line discussions from E-mail systems such as Digital's All-In-1 offering to a conferencing package.

"The people who rely heavily on E-mail tend to still use it, even though it's easier to pull replies together and follow threads of discussions in conferencing software," Lee said.

According to Office Express, GrapeVine differs from Notes in that it does not seek to provide a programming environment on top of a distributed architecture made up of many gigabyte Notes databases. Instead, GrapeVine is a single database that uses filters to automatically route documents to users over E-mail.

"We don't have a development front end, so in some cases we have customers using GrapeVine alongside Notes by forwarding documents to a GrapeVine mailbox," Emery said.

Pricing for GrapeVine ranges from $400 to $800 per seat, which includes a server license.

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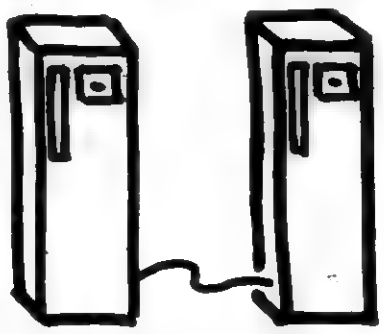

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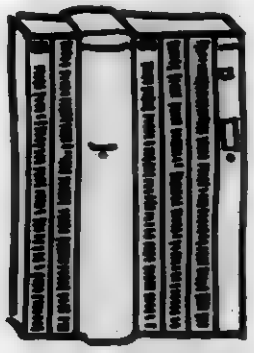

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Briefs

SCO supports Ingres, Informix

The Santa Cruz Operation (SCO) recently signed joint marketing agreements with Informix Software, Inc. and The ASK Group, Inc.'s Ingres Products Division. The deals call for SCO to sell and support Ingres and Informix database and application development tools.

Sybase certifies DB2 access

Sybase, Inc. has started a program to guarantee users access to data stored in IBM's DB2 warehouse through specific "certified" third-party software makers. Sybase has tested seven tools to make sure they work with the Sybase OmniSQL Gateway product, which interprets tool commands for use with DB2 applications. Those vendors are Business Objects, Inc., Clear Access Corp., KnowledgeWare, Inc., Open Books, Inc., Powersoft Corp., Q+E Software and Trinzic Corp.

PC data access

Trinzic recently unveiled InfoHub, a link designed to let PC users access data stored in mainframe-based or nonrelational database management systems. The product comes in two pieces: a driver compatible with Microsoft Corp.'s Open Database Connectivity standard and server software that resides on a mainframe. Prices for InfoHub, which is due out next month, range from $50,000 and $75,000, according to Trinzic officials.

SCO targets superservers with its alliances

By Jean S. Bozman
SANTA CRUZ, CALIF.

In a bid to information systems sites planning to "upsize" their local-area network applications, The Santa Cruz Operation (SCO) is positioning its Unix-on-Intel desktop operating system for multiprocessor superservers.

Industry analysts said the move, announced at the recent SCO Forum developers conference, is an attempt to reverse the previous emphasis on SCO's Open Desktop user environment.

Large SCO servers will require the multiprocessor MPX version of SCO Unix and a high-end Intel Corp.-based machine, such as those from Wyse Technology, Inc., Compaq Computer Corp. or Tricord Systems, Inc., SCO executives said.

Low-end servers typically support four to six users, said Paul McGuckin, a program director and Unix analyst at consultancy Gartner Group, Inc. But some of the larger servers might support more than 100 users, McGuckin said.

More than 60% of SCO systems are installed in small and medium-size businesses, said Sam Spadafora, senior vice president of worldwide field operations at SCO. But SCO will increasingly target downsized applications in large enterprises, he said at the SCO Forum.

Too soon to know

THE PRIME COMPETITOR FOR SCO'S OPEN SERVER WILL REMAIN NOVELL, INC.'S UNIXWARE DESKTOP UNIX SERVER, SAID PAUL MCGUCKIN, A PROGRAM DIRECTOR AND UNIX ANALYST AT GARTNER GROUP'S INTRANET COMPUTING STRATEGIES SERVICE. IT IS TOO SOON TO JUDGE THE IMPACT OF NEW UNIX COMPETITORS ON THE INTEL ARCHITECTURE, INCLUDING SUNSOFT, INC.'S SOLARIS AND NEXT, INC.'S NEXTSTEP 3.0, HE SAID.

Platform partnerships

Also at the forum, SCO announced partnerships with Lotus Development Corp., Computer Associates International, Inc., Wyse and Informix Software, Inc. to bolster its claims of providing a robust server platform. These firms agreed to help SCO provide technical support to large corporate IS organizations.

U.S. Army Maj. Gen. Gary A. Stemley told forum attendees that he plans to install 13,000 SCO servers on 9,000 LANs to manage applications for 60,000 users at Army Reserve units nationwide. The Reserve Component Automation System (RCAS) contract, based on SCO servers and Informix databases, is managed by Boeing Computer Services, Inc. Roughly 200 servers for 2,000 users are now installed, many of them in California; the rest should be installed by late 1994, Stemley said.

One advantage of RCAS is that the hardware platform can be upgraded to faster and more powerful platforms as needed. "We know that two to three years from now, we won't be delivering 486s into the field," Stemley said. "It'll be a better piece of equipment."

SCO has already made important inroads at large commercial sites such as the NASDAQ stock market, said Rikki Kirzner, a principal analyst at Dataquest, Inc. in San Jose, Calif.

Its biggest challenge is breaking out of its image as a small-site supplier, she said. Other big SCO sites, each with many hundreds of SCO units, include McDonald's Corp., Goodyear Tire & Rubber Co. and Taco Bell Corp. Some of these sites attach just a few client PCs to each SCO server; others use SCO workstations as stand-alone units.

Despite its goals for high-end servers, SCO is likely to continue building its $164 million-plus business on its success as a provider of small servers for packaged applications, McGuckin said. "Their strength will be multiuser support for small mom-and-pop shops, as well as for large sites with replicated applications," he said.

NCR doubles RAID-5 speed

Phase 2 line writes faster

By Stephen P. Klett Jr.
WICHITA, KAN.

NCR Corp.'s Microelectronic Products Division plans to announce today availability of its second-generation disk-array subsystem for Unix-based networks.

According to the company, the NCR 6298 Phase 2 product line improves read/write performance in RAID-5 mode by nearly 100% over the original Phase 1 product, which debuted last September.

The NCR 6298 redundant arrays of inexpensive disks (RAID) family ranges in capacity from 2G to 21G bytes and supports NCR's Unix System V Release 4, IBM's AIX and Microsoft Corp.'s Windows NT.

The Phase 2 line sports a new disk-array controller based on a 40-MHz CPU from Motorola, Inc. aimed at improving performance lags associated with RAID-5. The controller can manage four ranks of up to five drives and support RAID Levels 0, 1, 3 and 5 simultaneously.

When compared with Phase 1's 25-MHz controller, Phase 2 offers up to 98% faster write performance in RAID-5 mode, according to NCR benchmarks. The controller also supports hot swapping, or the ability to replace a failed drive without powering down.

Analysts said Phase 2 was a strong step for NCR toward alleviating some of users' performance concerns associated with RAID-5; however, they said price was still the major issue for most shops. "Today, nearly everyone offers RAID products," said James Brennan, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "The only way vendors can truly differentiate themselves is through pricing, which NCR is doing with this announcement."

RAID levels

RAID-0: Data striping without parity.
RAID-1: Data duplication on mirrored drive.
RAID-3: Parallel transfer of data with dedicated parity.
RAID-5: Parity data spread across all disks in rank.

Using AIM III, a standard benchmark in the Unix industry, NCR tests showed that users running I/O-intensive applications in RAID-5 mode could reduce their runtime by more than 40%.

The Phase 2 line is targeted at high-end users with write-intensive applications, while Phase 1 is aimed at entry-level users with storage needs below 15G bytes.

The Phase 2 line is slated to ship next month at prices starting at $26,891 for 5.25G bytes of storage — a cost of roughly $5.12 per megabyte. The high-end 21G-byte system costs $55,976, about $2.67 per megabyte. The line will also be available for OEM customers at the corporate level.

NCR also announced price cuts of more than 50% on the NCR 6298 Phase 1 family. For example, a 2G-byte Phase 1 system starts at $14,000. Previously, the base configuration cost $33,884.

Phase 1 owners can upgrade to the Phase 2 line by swapping in the new controller board for $9,950.

NCR officials said the company will release a 2G-byte drive in October that will double the line's capacity. An NCR official said a 40G-byte Phase 2 system would cost roughly $100,000.

Excalibur

CONTINUED FROM PAGE 47

American Memory project for searching through books and articles without knowing precise names, spellings or file locations.

•Task Force Russia, sponsored by the Decision Systems Management Agency, uses the document imaging technology to process records from the former Soviet Union, searching Russian and English documents related to U.S. prisoners of war.

•Employees at Ultramar, Inc. use the fuzzy logic capabilities of PixTex/EFS to access safety information about hazardous materials, even when they do not know the materials' specific names.

•The law firm Pillsbury, Madison & Sutro uses it to assemble cases from legal documents in huge databases.

New York-based Pfizer, Inc. chose PixTex/EFS to store and retrieve drug "recipe" images used to answer questions from Pfizer manufacturing plants and distribution centers. Previously handled by a manual process involving microfilm, Pfizer now scans in 500,000 images for fast, automated retrieval.

Peter Reimann, a Pfizer data management group coordinator, said the forgiving nature of "fuzzy searching" is important because of scanning errors in the database and spelling errors by users. "Even Dan Quayle could use this system," he said.

PixTex/EFS runs on Unix and Digital Equipment Corp. VMS servers and workstations and supports PC, Macintosh and X Window System clients. Its price ranges from about $2,500 to $12,000 per user.

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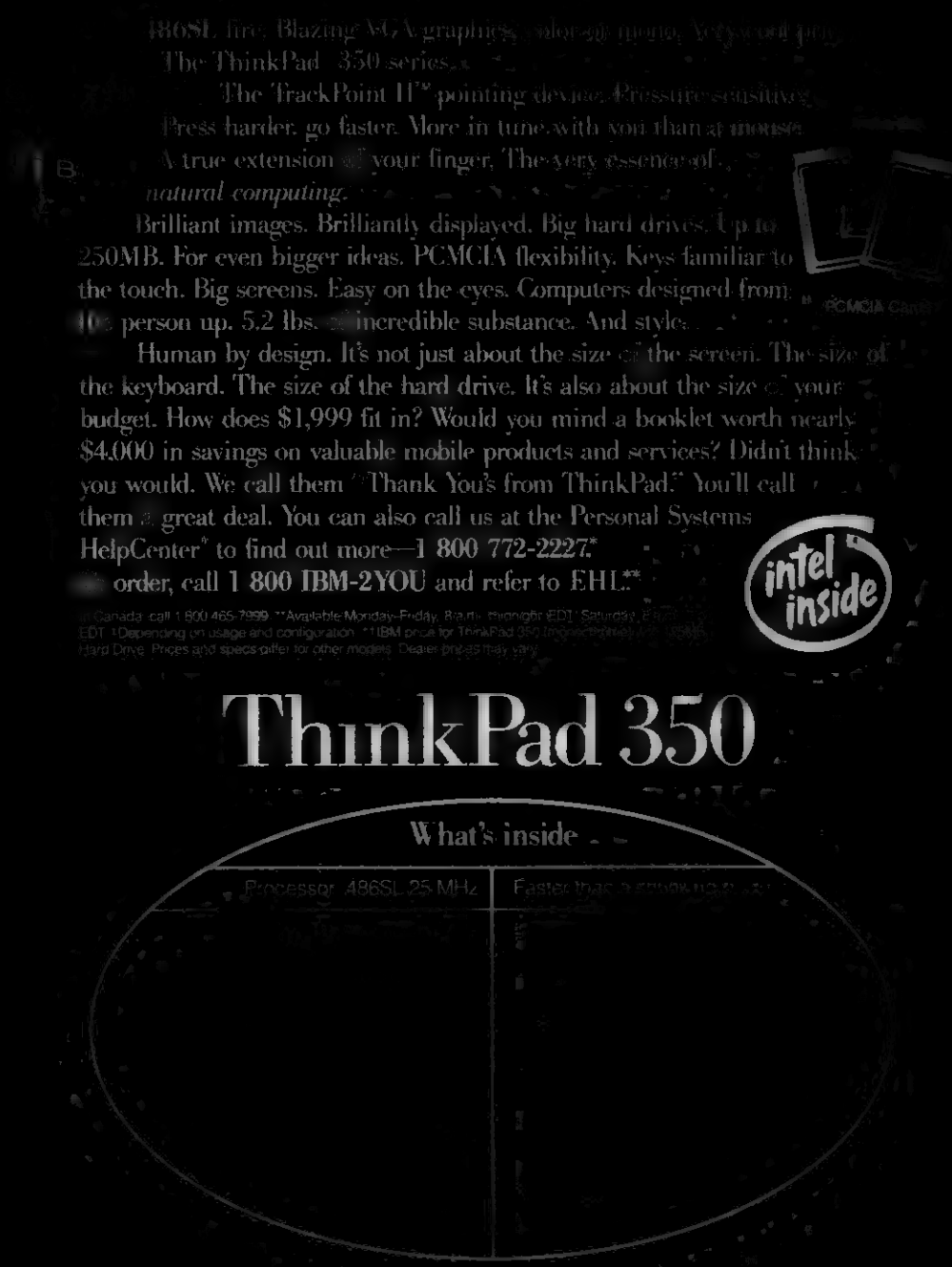

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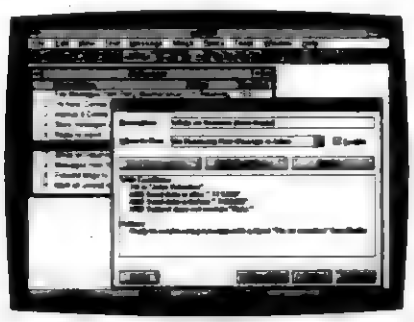

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Corel Corp. has introduced CorelDraw 3 for Unix.

The product combines CorelDraw, a vector-based illustration program, with image editing and painting, business charting and presentation modules.

CorelDraw features include on-screen text editing, editable preview, unlimited layers, enhanced special effects and improved precision, the company reported.

Cross-platform compatibility enables users to share files between Windows and Unix environments.

CorelDraw 3 for Unix costs $595.

▶ *Corel*
The Corel Bldg.
1600 Carling Ave.
Ottawa, Ontario CDK1Z8R7
(613) 728-8200

Performance Software, Inc. has announced the availability of its V-Series of software quality tools on Digital Equipment Corp.'s Alpha AXP platform.

According to the company, the V-Series tools include V-Test, a fourth-generation language automated testing environment; V-Timer, a response time analysis tool for users of interactive applications that monitors and reports actual response, service and transmission times; and Video, a terminal monitoring and recording system.

V-Test prices start at $5,000, V-Timer at less than $5,800 and Video at $2,500.

▶ *Performance Software*
26 Parker St.
Newburyport, Mass. 01950
(508) 462-0737

Emerald Systems Corp. has announced XpressServe, a high-performance network file server-based backup software product.

The product is a NetWare Loadable Module, and, according to the company, it has a NetWare-like C-Worthy interface on the workstation, a server console interface and a DOS command line interface to permit job submittal and status from any workstation in the server or the network.

XpressServe starts at less than $800.

▶ *Emerald Systems*
12230 World Trade Drive
San Diego, Calif. 92128
(619) 673-2161

Network Peripherals, Inc. has introduced the Ethernet In, FDDI Out (EIFO) client/server switching hub, an Ethernet Fiber Distributed Data Interface (FDDI) switch created to improve client/server performance with high-speed networking.

The product switches local-area network traffic between Ethernet and 100M bit/sec. FDDI. According to the company, servers can deliver 10 times more data than is possible with an Ethernet switch, when connected to 100M bit/sec. FDDI via the EIFO.

Pricing starts at $7,495 for an EIFO equipped with a single-attached unshielded twisted-pair FDDI uplink. The dual-attached fiber connection version costs $8,995.

▶ *Network Peripherals*
1371 McCarthy Blvd.
Milpitas, Calif. 95035
(408) 321-7300

IBM Technology Products has announced the 14.4/14.4 Data/Fax modem and the 2.4/9.6 Data/Fax modem, two PC fax/modem cards based on the Personal Computer Memory Card Interface Association standard.

The modems support AT and Fax Group 3, Class 1 and 2 commands that enable third-party fax and data applications software, the company said.

Prices start at $299.

▶ *IBM Technology Products*
Route 100
Somers, N.Y. 10589
(914) 766-1900

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CC:Mail, Microsoft Mail top E-mail list

By Lynda Radosevich

As PC-based electronic-mail market leaders, Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Microsoft Mail have a lot in common: Large-size customers said neither is ideal for enterprisewide service.

"CC:Mail is a great PC product, but it's not robust, it doesn't have great administrative, management or diagnostic tools, and I'm not very happy with the support," said Lorna Pauls, manager of office systems at Alcan Aluminum, Inc., a 40,000-employee aluminum products firm headquartered in Montreal.

"Administering a [Microsoft] Mail database is like trying to assemble a puzzle inside of a black box: You just can't see how things fit together and work," said Greg Scott, computing services manager at the College of Business at Oregon State University in Corvallis, Ore.

Despite the complaints, the two packages are the top choices for information systems managers who are choosing a standard PC-based E-mail platform. For those managers, it is the differentiation between the two that counts when choosing a corporate standard for local-area network E-mail.

Basic elements

The basic pieces of PC-based E-mail include the following:

- Client software — what the end user sees on his desk.
- A post office or a database that holds messages in "mailboxes" or queues messages to be sent to other post offices. This typically resides on a stand-alone DOS-based PC attached to the LAN.
- Directories within post office database that contain the addresses of users on the system.
- Administration tools for adding users.

Other key components include the following:

- A router, which often runs at the machine that has the post office, for transporting messages and directory information between post offices and to remote users.
- Gateways or "backbone" software that translates messages to other E-mail systems.

For example, CC:Mail has the larger installed base, which means it has more products available from third-party vendors. That includes gateways, which translate the messages from one E-mail system to another, and administration tools. Also, it is the choice for users who need to run E-mail across Windows, DOS, Unix, Macintosh and OS/2 platforms.

"When I made my choice four years ago, CC:Mail was the de facto standard. Now we're in the process of setting up a worldwide backbone, and we just want to hook up what's already there," Pauls said. The platform support and gateways help do that, she added.

Microsoft Mail is often the choice for companies migrating from IBM's Profs/OfficeVision products because the Profs/Mail gateway is the most robust, Microsoft Mail users said. One issue for many users migrating from Professional Office System (Profs) is the ability to do group calendaring, and Microsoft is offering a new Profs/Mail calendaring gateway.

Additionally, Microsoft Mail is the default choice for some because they have chosen to standardize on the Windows platform and the Windows product suite.

For instance, Allied Signal Corp. standardized recently on Microsoft Mail in part because it was one piece of the overall Microsoft solution, said Charlie Stoner, computing services analyst at the firm's aerospace division in Tempe, Ariz.

Connection choices

Other distinguishing features include connectivity options. Both packages support X.25 and dial-up leased-line options for connecting mail routers over wide areas. CC:Mail can also use the following network protocols for connecting CC:Mail routers: Transmission Control Protocol/Internet Protocol (TCP/IP), Novell, Inc.'s NetWare IPX/SPX, Banyan Systems, Inc.'s SPP and IBM's Advanced Program-to-Program Communications.

Support for these networks is important for companies that want to leverage their existing investment in communications networks, especially IBM's Systems Network Architecture and TCP/IP, said David Ferris, editor of the "Ferris E-mail Analyzer," an E-mail newsletter in San Francisco.

Users of each have their own likes and dislikes, but they sound a common call for better administration and directory functions.

For instance, at GD Searle in Skokie, Ill., Keith Addison, manager of network integration, said he would like to see CC:Mail move its administration services to non-DOS platforms. Once a week, the pharmaceutical firm reorganizes the CC:Mail address database to clean up the fragmentation that occurs when records get added and deleted. The 40,000-entry database takes two hours to reorganize, and if the network has a glitch, the DOS-based servers have no error-checking capability, Addison said.

Post office problem

Better CC:Mail directory tools are another item that Addison said he wants to see on Lotus' action list. For instance, he would like to see Lotus improve the method for transferring users from post office to post office. That is because it makes sense to switch an end user's information to the nearest CC:Mail "post office" (address server) when that user switches location.

On top

In a January 1993 survey of 50 large companies with multiple E-mail packages, 32% said CC:Mail is their fastest growing E-mail system and 20% picked Microsoft Mail. The survey was completed by Forrester Research, Inc. in Cambridge Mass.

The idea is to avoid having messages making too many "hops" between servers to get to and from the end user. However, user information must now be extracted to an intermediate file and imported to the new post office. As a result, the password is lost, and the process is "labor-intensive," Addison said.

At Chevron Corp., the main challenge in running Microsoft Mail is keeping the gateways up, said Jim Lisiak, a systems engineer at Chevron Information Technology Co. in San Ramon, Calif. That is because the Microsoft Mail gateways typically run on DOS-based machines.

"Anytime you run an automated program 24 hours a day on a typical DOS platform, there are lots of points of failure," he said.

Microsoft Mail offers gateways on OS/2 machines running Version 1.3, but that version is unstable. Chevron uses DOS-based remote control software to help manage the gateways from a central site, and that software is not available for OS/2 Version 1.3, Lisiak said.

Lotus and Microsoft said they plan to address some of the shortcomings. Lotus plans this fall to release an updated version of its automatic directory exchange software that will allow offsite administration of the post offices, said Andy Watts, director of CC:Mail product management.

Lotus will also move its router — the piece that directs messages between CC:Mail post offices — to Unix platforms by early next year and to NT "if it is stabilized" then, Watts said. The router will also support the 1988 version of the X.400 messaging protocol, which is an important standard for exchanging messages among organizations.

Microsoft's plans include a messaging server based on its Windows NT operat-

E-mail, *page 68*

YOUR COSTS

	50	1,000	6,000
Installation costs			
E-mail software products	$5,000	$70,000	$600,00
Message stores	$8,000	$160,000	$1,600,000
Message router PCs	$2,000	$4,000	$124,000
Dial-in PC gateways	$2,000	$4,000	$28,000
Fax gateways	$3,000	$39,000	$285,000
Public E-mail gateways	$600	$600	$1,800
Profs/OfficeVision gateways		$4,000	$4,000
SMTP gateways			$2,000
TOTAL INSTALLATION COSTS	$20,600	$281,600	$2,644,800
Annual operating costs	$8,500	$170,000	$1,020,000
Local PC network support		$20,000	$120,000
Central technical support	$1,250	$25,000	$300,000
Communications	$175	$3,500	$21,000
Public E-mail service	$2,678	$36,608	$343,824
Product maintenance			
TOTAL OPERATING COSTS	$12,603	$255,108	$1,804,824
TOTAL INCREMENTAL COSTS			
Three-year costs	$58,409	$1,046,924	$8,059,272
Cost/mailbox/year	$389	$349	$448

Source: Ferris Networks, Inc., San Francisco, Calif.

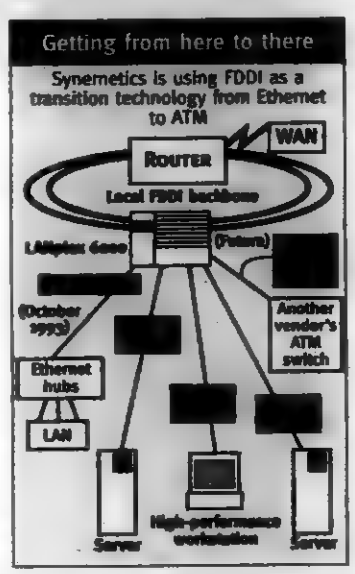
Synernetics targets switched FDDI market

By Joanie M. Wexler
NORTH BILLERICA, MASS.

Users wading through the pool of choices for escorting their existing networking equipment into an era of very high-speed communications gained another option early this month from the original local-area network switching vendor.

Synernetics, Inc. said it will ship in October a big brother to its existing LANplex 5000 Ethernet switch aimed at migrating users to Asynchronous Transfer Mode (ATM) networks using switched Fiber Distributed Data Interface (FDDI), a 100M bit/sec. LAN, as a stepping-stone.

Switched FDDI would give users the ability to dedicate 100M bit/sec. of LAN bandwidth to a high-performance workstation, server or LAN. This parallels the way many companies have chosen to breathe more life into their 10M bit/sec. Ethernet networks using the Synernetics LANplex 5000 and switches from Kalpana, Inc., Alantec, Lannet, Inc., Artel, Inc. and other vendors.



Switched support

Synernetics' forthcoming LANplex 6000 builds on its predecessor both by accommodating switched FDDI, planned for availability in mid-1994, and by making room for an eventual ATM interface to separate, stand-alone ATM switches. It includes a 3.2G-byte backplane to accommodate switched FDDI, ATM and integrated Internet Protocol routing.

However, an ongoing debate questions whether FDDI is a reasonable interim technology to ATM, given that the two technologies are unrelated and require different expertise. In addition, more familiar 100M bit/sec. Ethernet technology is on the horizon.

"We think FDDI is a good migration path to ATM," said Dan Leonard, director of information systems technology at Cadence Design Systems, Inc.

Leonard, who expressed interest in the concept of switched FDDI, said his company runs hundreds of Sun Microsystems, Inc. SPARCstations "and a single workstation can consume 15% of an FDDI. When you build a workgroup of these, an FDDI can quickly become fully consumed," he said.

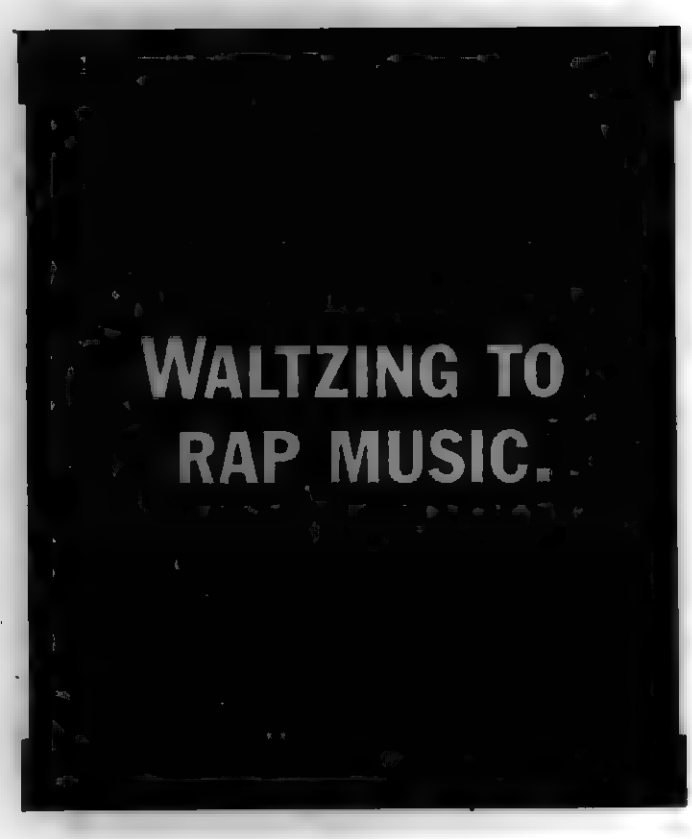
Paul Callahan, a senior analyst at Forrester Research, Inc. in Cambridge, Mass., though, predicted that "for the next three years, at least, the hub business will feed off of switched Ethernet."

Callahan deemed the switched FDDI market very small, mainly because "there are millions" of relatively lower-speed PCs that would not be able to fill an FDDI pipe compared with "just hundreds of thousands" of more FDDI-appropriate higher-performance workstations.

The vendor itself bit the bullet and acknowledged that today, few customers strain even a shared FDDI network. However, the LANplex 6000 is meant "as a network infrastructure product that can accommodate new technologies coming down the road," explained David Tolwinski, vice president of marketing.

In addition, "what FDDI has going for it is that it's the only game in town today for backbones," Callahan said.

To date, the only existing competitor to the LANplex 6000 is the Digital Equipment Corp. GigaSwitch. Synernetics has not yet priced its LANplex 6000 FDDI switching module.



E-mail choices

CONTINUED FROM PAGE 57

ing system. The server is based on the 1988 X.400 messaging and X.500 directory protocols.

What may have an even greater influence on user decisions in the future are the strategic E-mail plans of both companies. Lotus' strategy is to provide mail servers that are independent of the network operating system and to retain a cross-platform strategy, Watts said.

Other aspects of Lotus' plans include tight integration with Notes groupware software, although analysts indicated that CC:Mail's links to Notes are not much stronger than other Microsoft Mail links. Furthermore, E-mail vendor Beyond, Inc. offers a mail client that can access information from Notes databases better than CC:Mail or Microsoft Mail.

Microsoft has outlined an architecture in which the messaging services are closely linked to the network operating system: namely, future versions of Windows. The advantage is tight integration with the operating systems, which will use application programming interfaces to "hook" into directory services, back-end databases and other vendors' messaging transportation services. However, the architecture is what some users call "Windows-centric."

Interop '93 unveilings

Products demonstrate vendors' commitment to SNMP systems, interoperability across systems

By Elisabeth Horwitt
SAN FRANCISCO

"Putting all the pieces together" was the unofficial theme of last week's Interop '93 August show here. Particularly promising to network and systems administrators was further evidence of vendors' willingness to work with one another in order to ensure management and interoperability across the typical corporate hodgepodge of multivendor client/server and network systems.

In the past two weeks, several network equipment vendors announced offerings that enable their hubs and switches to be managed by Simple Network Management Protocol (SNMP) systems. This expands on SNMP's potential to enable users to manage a variety of vendors' networking products via a single popular SNMP-based platform, such as **Hewlett-Packard Co.**'s OpenView.

Introductions included the following:

▶ **Lannet, Inc.** in Huntington Beach, Calif., introduced Multiman, a product that reportedly enables its intelligent hubs to be managed by both Unix-based SNMP systems such as OpenView and **Sun Microsystems, Inc.** SunConnect's SunNet Manager, as well as Windows-based SNMP systems such as OpenView for Windows. The vendor is also completing a suite of Remote Network Monitoring-compatible LAN diagnostic tools that will sit on Lannet hubs and report LAN traffic and error data to an SNMP system.

▶ **Hughes LAN Systems** announced the availability of Hughes 20/20 Enterprise Hub Manager, a PC-based system for managing Hughes hubs via SNMP. The product's features include a graphical user interface and Auto-Learn, which is said to automatically discover hubs out there. It operates within the OpenView for Windows environment and is priced at $2,995.

▶ **Concord Communications** announced the integration of its Trakker LAN diagnostic system with HP's OpenView.

▶ **Motorola Codex** announced the 9000-UX Open Management system, another HP OpenView-based product that is said to support SNMP in a Unix and X Window System/Motif environment. The 9000-UX will provide management for Motorola Codex Periphery Routing platforms. Available by year's end, it is priced from $20,000 to $60,000.

▶ **Network Security Systems, Inc.** in San Diego announced LANSafe II for Novell, Inc.'s NetWare Management System (NMS). The SNMP-based system's snap-in power management application reportedly enables NMS users to interactively manage and control Network Security's uninterruptible power supplies. The product is said to monitor and log power conditions. It also does automated systemwide power testing, remote shutdown and reboot and unattended NetWare orderly shutdowns. It costs $199.

▶ **Standard Microsystems Corp.** announced EliteView/OV, a Unix-based network management application that enables OpenView systems to manage Standard Microsystems' Elite Switching Hub ES/1. The company also announced that its EliteView network management applications will be able to exchange data with popular spreadsheets such as Microsoft Corp.'s Excel, using Microsoft's Dynamic Data Exchange.

▶ **Tally Systems Corp.** in Hanover, N.H., announced that it will soon offer a snap-in module for Novell's NMS as a standard feature of its NetCensus product. NetCensus is said to provide detailed inventory data on hardware and software components, including brand names and serial numbers.

▶ **Peregrine Systems, Inc.** in Carlsbad, Calif., last week enhanced its network management offering, Peregrine Network Management System, with a variety of features. These include an interactive topological map; automatic inventory population/problem ticketing for Transmission Control Protocol/Internet Protocol and IBM Systems Network Architecture (SNA) networks; and a neural network-based expert system for retrieving text.

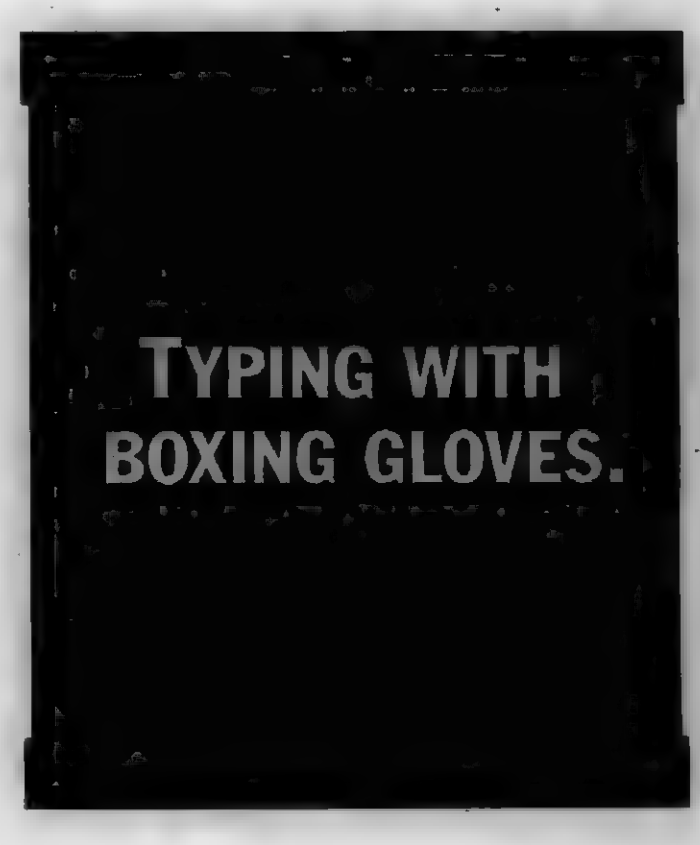
Broadband news

On the broadband wide-area network front, **Sprint Corp.** announced availability of its Asynchronous Transfer Mode service.

Hypercom, Inc. announced that its Integrated Enterprise Network family of network access nodes will now support SNA traffic over a variety of carriers' frame-relay services. The carriers include AT&T, US West, Inc. and Sprint. Hypercom's frame-relay implementation will include congestion control, multicast and global addressing features.

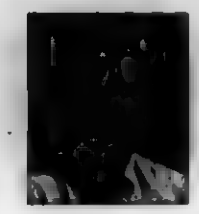
Standard Microsystems announced support of Novell's IPX protocol on its switching hub and what is said to be the first High Speed Serial Interface (HSSI) module for a switching hub, enabling customers to create 45M bit/sec. T3 links across metropolitan and campus-area networks. The single-port Elite Switching Hub ES/1 module will link LANs over a public network at speeds ranging from 56K to 45M bit/sec., using HSSI for high-speed connections and RS-449 for speeds of up to 10M bit/sec., the company said.

The RS-449 port has an inverse multiplexer capability for combining up to six T1 traffic streams into one very high-speed link. The HSSI module is priced at $6,950.



David Coursey

In need of Novell



Novell is to networking what Microsoft is to the PC desktop, but with one important exception: While Bill Gates has Lotus, Borland and (yipes!) a newly vigorous WordPerfect to watch out for, Novell has little serious opposition. That's a problem because customers need better solutions and a better networking partner than Novell is able to provide.

The name Novell doesn't conjure up oceans of respect in corporate boardrooms where NetWare is viewed more as a necessary evil — and a hard-to-use one at that — than a major strategic platform. And that is if Novell gets any attention at all. More often, Novell is treated like the network equivalent of a public utility — absolutely essential but not worth spending much time thinking about unless you are the one who has to make it work day to day.

The glacial acceptance of NetWare 4.0 — even Novell acknowledges it is selling slowly — shows that NetWare is easy to sell only when the focus is on the most basic services such as printer and file sharing. NetWare sales bog down in a seemingly endless sales cycle when Novell reaches for the data center. Few corporate IS executives are really comfortable with Novell extending its reach, no matter how inevitable it may seem.

Obvious choice

As for people who'd like to switch, the question is: To what? Banyan lost the war quite some time ago, Microsoft isn't yet a credible networking vendor, Apple isn't a real option for most people, and Artisoft is but a blip on Provo's threat-detection radar.

So who is going to step forward and help us create a truly user-centered, task-based, desktop-centric computing environment? Who is going to create an applications environment that really leverages the network?

Novell is the obvious answer, but only if you believe Novell can really improve its level of play fairly quickly. The biggest concern right now is at the top. Ray Noorda seems more and more distant from the business at hand, which both insiders and outsiders attribute to his advancing age. Yet, while recognizing the need to step aside someday, Noorda doesn't seem in a big hurry to do it.

Novell needs to convince the world that NetWare really has a future as the open platform for corporate enterprise networks.

He recently told reporters that succession has been in the planning stage for three years, but he couldn't point to any specifics, save that he would consider an outsider as his replacement at the helm of Big Red.

Worse, after proclaiming he is healthy and that his pacemaker is working fine, Noorda recently told analysts that the company is quite ready if an emergency should occur. That sounds like a man with no plans to go anywhere in a hurry.

The Novell board cannot be expected to step in and speed Noorda along very much, leaving us with a case of management gridlock. The best option would be for Novell to hire an outsider with experience running a billion-dollar company who could come in as chairman and CEO, with Noorda becoming chairman emeritus or something. If this doesn't happen soon, Wall Street, which has already hit Novell's shares pretty hard, needs to force the question.

First things first

For the new leader, the first task would be streamlining the management structure and reorganizing to clarify roles and responsibilities. At the same time, Novell needs to develop a real vision for how its customers will be computing five or 10 years from now and start building in that direction.

Customers need to know how their NetWare infrastructure should evolve and which technologies they should invest in. Then Novell has to deliver on its pronouncements.

This will be new for Novell, which has traditionally addressed the market by facing its customers with its back to the future. That was great if you needed some new network plumbing, but it has kept Novell largely out of the next-great-advance business, which Microsoft seems to own.

While not a serious threat to Novell today, Microsoft is nothing if not tenacious, and Novell can expect to see its dominance whittled away if it doesn't take immediate steps to win the hearts and minds of not only network administrators but also their bosses, all the way up the corporate ladder.

Novell needs to convince the world that NetWare really has a future as the open platform for corporate enterprise networks. To do this, Novell needs to develop a clear strategy, communicate it effectively (Microsoft does both well) and deliver it in a timely manner.

With its AppWare client/server strategy, ownership of Unix and its installed base, Novell has an excellent base to work from. But it also needs the leadership in both the executive suite and in customers' minds to make this happen, and that, today, is where Novell comes up most critically short.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4480.

Systems Strategies, Inc. has introduced Systems Strategies Express Peer-to-Peer for Unix, a real-time software solution for linking Unix systems to IBM Application System/400s.

According to the company, Express Peer-to-Peer is a bundled communications package that can access an AS/400 from a Unix system using 5250 terminal emulation; execute remote job submissions; perform bidirectional file transfer; and print documents on both Unix and IBM printers.

Support is provided for combined Transmission Control Protocol/Internet Protocol and IBM's Systems Network Architecture Advanced Peer-to-Peer Networking.

Express Peer-to-Peer for Unix costs $20,000 for point-to-point connections and $35,000 for the networked version.

▶ *Systems Strategies*
1 Penn Plaza
New York, N.Y. 10119
(212) 279-8400

Chipcom Corp. has announced the Ondemand Network Control System (NCS) software package, including support for Digital Equipment Corp.'s Polycenter and Hewlett-Packard Co.'s HP OpenView network management platforms.

According to the company, the product is a graphical application package for managing various Chipcom network devices.

Through a central workstation, Ondemand NCS Version 2.0 offers point-and-click control of all Online System Concentrators, bridges, routers, ports and modules.

Ondemand NCS can identify an end station, port characteristics, a concentrator and an Internet Protocol address with a Port Database feature. A Port Grouping feature allows users to add, remove, enable and disable ports within a module, the company said.

Ondemand NCS Version 2.0 costs $4,495.

▶ *Chipcom*
Southboro Office Park
118 Turnpike Road
Southboro, Mass. 01772
(508) 460-8900

3Com Corp. has announced the LinkBuilder Multi-Services Hub (MSH) and NetBuilder II bridge/router, a bundled solution.

The bundle consists of the LinkBuilder MSH platform that can support Ethernet, Token Ring and high-speed services such as Asynchronous Transfer Mode and the NetBuilder backbone for Ethernet, Token Ring and Fiber Distributed Data Interface, the company reported.

The four-slot NetBuilder II costs $19,190, and the eight-slot NetBuilder II costs $21,690.

▶ *3Com*
5400 Bayfront Plaza
Santa Clara, Calif. 95052
(408) 764-5000

Shiva Corp. has announced LanRover/E 2.0, an upgrade to LanRover/E, its enterprisewide, multiport remote networking server.

Support for Transmission Control Protocol/Internet Protocol has been added to LanRover/E for NetWare and LanRover/E for AppleTalk Remote Access.

According to the company, additional enhanced management capabilities and shared dial-out, cost-effective modem pooling are included.

The product was designed for enterprisewide networks whose users require access to databases, file servers, electronic mail and other resources on Ethernet local-area networks, the company reported.

Client software, management software and a dedicated remote networking server are included.

Prices range from $2,499 to $3,499.

▶ *Shiva*
Northwest Park
63 Third Ave.
Burlington, Mass. 01803
(617) 270-8300

Network Dimensions, Inc. has announced GrafBase, a software package for visual display and documentation of communications networks.

The product is a graphical database designed for configuration management and network information. GrafBase's features provide users with flexibility and control in accessing, maintaining, updating and presenting network information from PCs, according to the company.

GrafBase can consolidate and manage network data; produce network presentations and reports; and configure and track network configurations.

The ability to import and export network information through a text file is also provided.

The product runs under Windows on an IBM PC-compatible machine.

GrafBase costs $750 with options for geographical map data.

▶ *Network Dimensions*
Suite 312
5339 Prospect Road
San Jose, Calif. 95129
(408) 446-959

Product shorts

Moda Systems, Inc. has announced Via, plug-and-play wireless connectivity software (middleware) for mobile computer users. By employing local- or wide-area radio links, users can access existing software applications residing on the host system by using off-the-shelf portable devices, the company said. The product can be used for applications such as database inquiry or order processing. Cost: Prices range from $1,295 to $1,595. Moda Systems, Cambridge, Mass. (617) 494-0402.

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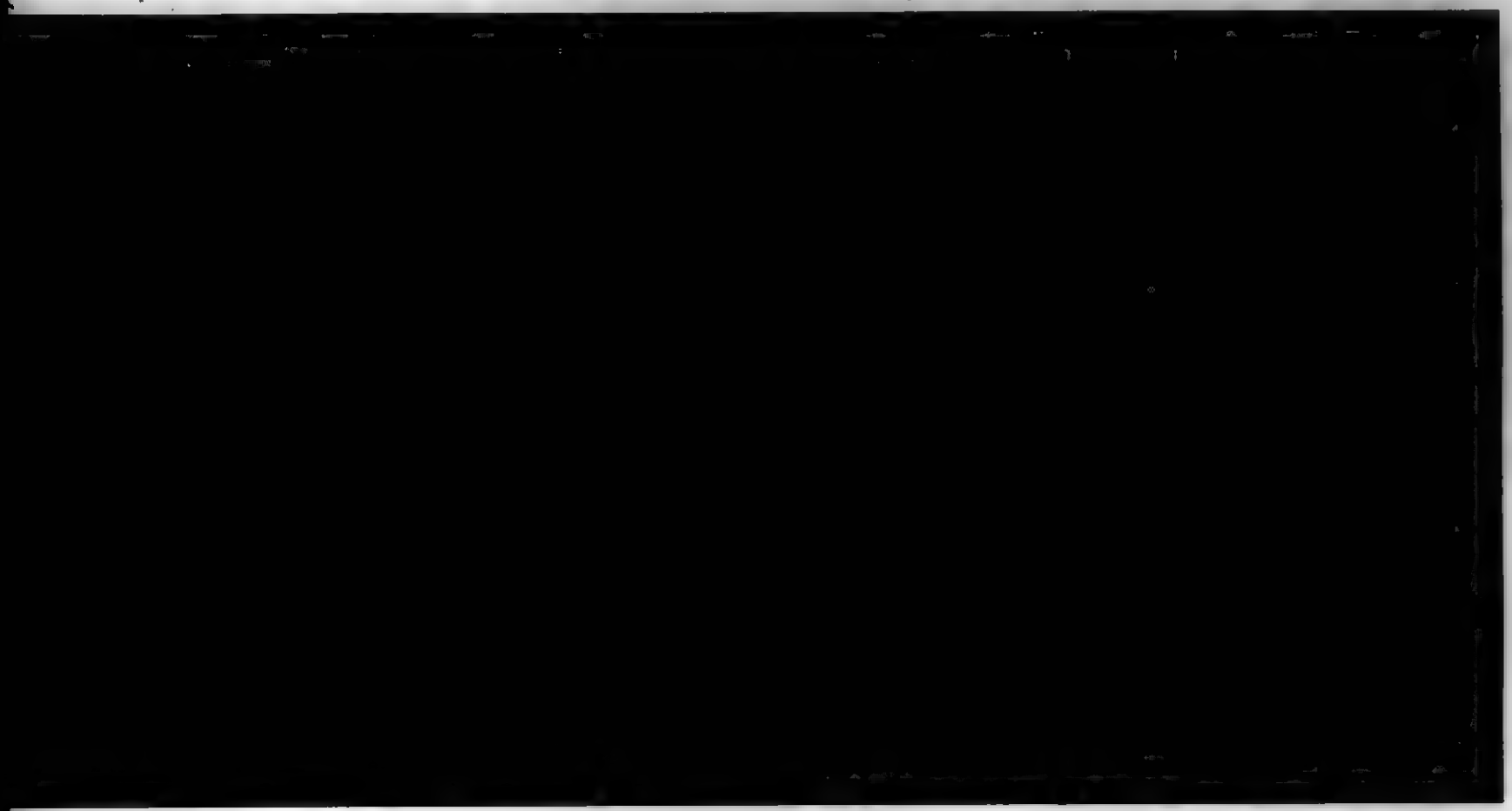

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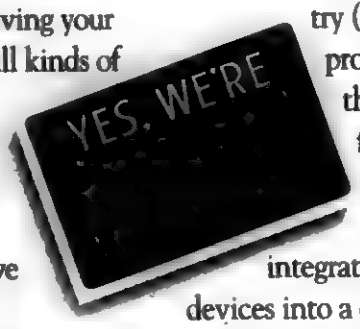

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DEC focuses Rdb on high end

By Craig Stedman
BOSTON

With its engineering budget now more limited after sharp cutbacks during the past year, Digital Equipment Corp. is concentrating development of its Rdb relational database on high-end production systems functionality rather than the department or workgroup levels.

Digital executives said at a recent Rdb conference here that the other main database investment going forward will be integrating multiple databases into a single logical view, in keeping with the company's new emphasis on software frameworks over individual applications.

"We continue to make a significant investment in database products, but we're reengineering what our focus is for those investments with the move toward distributed computing," said Chuck Rozwat, group engineering manager for database systems at Digital.

> One analyst said Robert Palmer's primary goal is to make Alpha successful.

Also playing a role, analysts noted, is the ongoing reduction of the company's spending on engineering. Digital cut its research and development budget by 13% in the fiscal year that ended in early July; fourth-quarter spending was down a whopping 24% in that area.

Chris Christiansen, an analyst at market research firm International Data Corp. in Framingham, Mass., said Digital's senior management has made it "quite clear that any additional R&D efforts would have to be cost-justified quite quickly" in order to be funded.

Robert Palmer, Digital's president and chief executive officer, appears to be concerned mainly with driving Alpha AXP system sales, using outside software if necessary, Christiansen added. "His [Palmer's] primary goal is to make Alpha successful, not to make Rdb successful," he said.

Rozwat said Rdb development will now be targeted at "production attributes" such as availability, reliability and security, plus support for larger databases and better performance. Meanwhile, Digital hopes to augment Rdb with DB Integrator, a package due in December that is supposed to tie together Rdb and outside databases.

Rdb users who attended the conference reacted positively when they heard of Digital's development plans for the database. These call for two new releases tied to the OpenVMS operating system this year and then initial versions for DEC OSF/1 and Microsoft Corp.'s Windows NT next year.

"Concentrating on increasing the performance of production [with Rdb] definitely would help," said Mitchell Pielech, database administrator at Colonial Management Associates, Inc.'s information services division in Boston. Pielech said he is "comfortable" with Digital's plans.

"I think they're really moving ahead and getting a lot of things out," added Hilary Wright, senior systems analyst at *The Boston Globe*.

No need to switch

The *Globe* looked at switching to either Oracle Corp. or Sybase, Inc. products for its production systems database but stuck with Rdb after deciding its performance matched the others, Wright said.

AFSA Data Corp., a Long Beach, Calif., processor of student loans, has had no major problems with a "very complex" 61G-byte Rdb database it brought on-line in May. "I was pretty pessimistic, but so far it's been chugging along," said William Doernbach, AFSA's database administrator.

Analysts said they believe, however, that Digital needs to move Rdb to competing hardware platforms to get enough revenue to keep up with the engineering investments of other database vendors [CW, Aug. 23]. The company thus far has not committed to doing any outside ports.

New image on way

Digital has failed to sell itself "the open client/server company" as it switches its software development focus from applications to integration frameworks. But the company admits it has a ways to go before getting users to accept that description.

"I don't know if we're starting behind [in client/server], but we have a lot to do in sort of redefining our image, and that's across the board," said Rose Ann Giordano, Digital's vice president of production systems software, in an interview at the Rdb conference in Boston.

Client/server computing is one of the two main pillars of Digital's strategic blueprint, along with Alpha AXP, and the software frameworks are supposed to provide an architecture and tools for blending third-party and custom applications in a multivendor environment [CW, Aug. 9].

Giordano did not comment in detail on the company's plans for bringing the framework concept to fruition. "A lot of the individual pieces exist, but we're putting them together and making it more of a horizontal solution," she said, without providing a shipment schedule.

Rdb should be "the heart" of a so-called information framework that also will encompass the Application Control and Management System transaction processing monitor and Reliable Transaction Router routing software.

Horse club races for payoff from database overhaul

By Joanie M. Wexler
LEXINGTON, KY.

When The Jockey Club's computer operations manager, Robert A. Burch, curled up with a mystery novel recently, he discovered that his own organization's static database had found its way into the plot as an obstacle to the good guys' nabbing the murderer.

Burch sheepishly concluded that his 40-person information systems group had launched its database overhaul project none too soon.

The worldwide data supplier for the thoroughbred horse breeding and racing industry is immersed in an IS and business process revamp that merges the data buried in its core mainframe-based nonprofit pedigree and registry business with that in its newer, money-making data service subsidiaries.

The seven-figure effort hinges on Hewlett-Packard Co. HP 9000 Unix servers and Sybase, Inc. relational databases, and it is the second-largest expenditure in The Jockey Club's near-100-year history. The first was the purchase of its headquarters.

The Jockey Club's Nicholas D'Altilio (left) and Robert Burch *needed a new database to store information on more than 2 million thoroughbreds*

The impetus for the overhaul was that Jockey Club database subscribers were running into the same cross-search frustrations as the mystery novel protagonist: Rigid data structures and separately designed systems for the various business subsidiaries were putting up brick walls to those who might want to search for information using keywords other than a horse's name.

"So far, the businesses are integrated; the systems are not," said Nicholas D'Altilio, director of MIS. This is incongruous, he said, because "as we evolve profit-making subsidiaries, all the data is related."

The goal of the new project, which includes retiring The Jockey Club's IBM 3081K mainframe by the second half of 1995, is to separate the data from the application so that it is accessible across businesses. The organization is creating a single logical database spanning businesses and directed by one data model, D'Altilio said.

The Jockey Club's original nonprofit service is to provide horse pedigree and breeding information from its hierarchical mainframe database, which today stores 2 million thoroughbred pedigrees. The company collects data on births, blood types, horses' markings and other telltale information for identifying an individual animal. The goal is to give breeders, owners, buyers and racing aficionados dial-up or dedicated access to accurate research.

Also, one of The Jockey Club's for-prof-

Horse club, *page 68*

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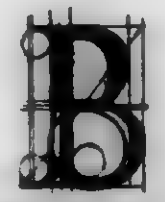

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Potential labor strike stalls conversion

Downsizing project on hold at Philadelphia Newspapers

By Mark Halper
PHILADELPHIA

There may be no better reminder than a labor dispute that human factors can disrupt a technology project, as Philadelphia Newspapers, Inc. is discovering.

The owner of *The Philadelphia Inquirer* and *Philadelphia Daily News* has effectively put its mainframe-to-minicomputer downsizing project on hold as management, including Director of Business Systems Al Vaccaro, focuses on a possible Sept. 1 walkout by any or all of 10 unions.

"It's very difficult to make progress with the system right now," said Vaccaro, who earlier this year began moving the publishing company's business and advertising operations from an IBM 3090 to a Hewlett-Packard Co. HP 3000 minicomputer.

At a time when Vaccaro and his 16-person nonunion development staff should be concentrating on writing code for HP/MPE programs and connections, they are instead preoccupied with what to do in the event of a strike. As of presstime, unions and the company were far apart in negotiations, and a walkout was likely. Calls to several of the unions were not returned.

Management is working with the information systems developers in strike preparation, delving into such charged issues as whether to cross picket lines when such action would pose ethical and even safety questions.

"Some people may not cross the picket line," Vaccaro said. If that is the case, IS progress may not be completely impeded, as Vaccaro noted: "I could have them work from home."

What is more, the IS development staff is also preparing to take over certain unionized operations during the course of strike. For instance, some may be asked to run the company's data center should the 12 unionized data center operators walk out.

The developers are also now devising a program that would credit subscribers who do not receive issues if delivery shuts down or becomes less effective.

Wage dispute

Further complicating matters, one of the issues on the negotiating table — higher pay for support workers who are trained on the client/server system — ties directly to the company's technology shift and must be resolved before the papers implement the new technology.

Vaccaro said the chances are quickly vanishing of the company's implementing its maiden program cutover by the original October time frame. That conversion, from a Dun & Bradstreet Software accounts payable program to a Collier Jackson Corp. accounts payable package, may well slip into next year, Vaccaro said.

Hidden costs

Philadelphia Newspapers has discovered plenty of hidden costs in its move to client/server. Among them: Developing local-area networks tied into the HP 3000 has been trickier than anticipated, and the company has hired an outsourcer to take over that project.

Ways to save

Philadelphia Newspapers chose Collier Jackson's circulation program in part because parent Knight-Ridder, Inc. was encouraging its papers to adopt it and HP platforms. Philadelphia Newspapers could then save money it would otherwise have spent developing its own.

That means other planned program moves, which are scheduled to run through 1995, would also kick in at later dates. Those include migrating to a Collier Jackson general ledger program, a Neasi-Weber International Admarc advertising program and Cyborg Systems, Inc.'s human resources program.

While the labor dispute is stalling the client/server effort, problems with the technology itself have also caused delays.

"It's never quite as easy as it all sounds on paper," he noted. A Collier Jackson load program intended to automatically transfer accounts payable data from the old system to the new has misfired, for instance, contributing about a month's delay, Vaccaro said.

Although the timing of the move to a client/server operation may now be in question, the company's motivation for undertaking such a massive technology shift is not, at least in Vaccaro's eyes.

Philadelphia Newspapers first began contemplating a technology shift around 1990, when it discovered that it was pushing the capacity of its 3090. Among the factors that steered Vaccaro away from the mainframe was what he considered exorbitant upgrade and maintenance costs by mainframe software vendors such as Computer Associates International, Inc. and D&B Software.

In a comparison of mainframe to client/server software costs, Vaccaro noted that D&B Software charges $45,000 per year in maintenance for an accounts payable/general ledger combination. Collier Jackson will charge about $15,000 per year for its comparable package.

No immediate savings

While Vaccaro said he expects to save costs in the long run, he does not expect those savings to kick in immediately.

His seven-year cost projection shows expenditures on the HP environment at about $13.4 million, compared with what would have been $14 million on IBM, not including payroll expenses. After the first seven years, he said he anticipates a savings of about $1 million per year.

But Vaccaro said cost is not his only concern. The system should provide information to end users in a more timely manner, he said. The mainframe tends to bog down at the end of the month, when it is overloaded with accounting tasks, and at around 2 p.m. every day, when a circulation program kicks into full swing. By distributing computing, the central system will not slow down as much, he said.

Horse club

CONTINUED FROM PAGE 65

it subsidiaries resells data such as racing statistics to publications, owners and breeders.

However, the lack of links and relationships between the data gathered by the subsidiaries has impeded the company from quickly offering new services, such as the ability to correlate breeding information with a horse's eventual racing performance. For example, The Jockey Club spends seven to 15 hours a day doing batch processing to prepare the mainframe's canned dial-up reports for the next day, Burch said.

Successful subsidiary

By contrast, one of the company's newer businesses, Equibase Co., which today uses an OS/2 relational database on an IBM Personal System/2 to collect racing results, "would know immediately which horse just won a race. The mainframe wouldn't know until the next day," Burch said.

Equibase's PS/2 system will be retired in favor of HP workstations for consistency among platforms, D'Altilio said. Equibase, a Jockey Club co-partnership with the Thoroughbred Racing Association, has accumulated information on 200,000 races in its 2½-year existence.

The Jockey Club's various system islands also impacted basic financial areas. For example, if a subscriber sent a check for service payment that did not have the horse's name on it, the company had no way to apply it to an account. "We simply had to return the check to the sender," said Denny Durcholz, a senior business analyst.

Durcholz was recently hired to examine the systems of all Jockey Club businesses and help re-engineer them. He and another analyst are about two months into interviewing high-level business managers for developing a new enterprise business model, which D'Altilio has scheduled for completion in October.

Then, software and new network development will take place in 1994.

Besides better access, Burch is eyeing a 25% reduction in operating costs.

D'Altilio's staff considered Unisys Corp. mainframe, Digital Equipment Corp. minicomputer, OS/2 and Unix operating environments before settling on its HP/Sybase combination. The vendor picks, D'Altilio said, had less to do with technology and more to do with vendor strengths in training and consulting in an industry shy on client/server expertise.

"Sybase and [competitor] Oracle technology really leapfrog each other," he said. "But we just couldn't get Oracle's attention; they were too busy. On the other hand, we've contracted for a nearly full-time Sybase consultant and part-time HP consultant that act like part of the staff."

Also, client/server technology "allows us to distribute the [processing] work load," D'Altilio said. "If we are treating data as a common resource, we don't want access compromised by competing requests."

D'Altilio said he views The Jockey Club as the prototypical company of the year 2000. "Data is our business. It's not like we only use data to help us run our business. We have no other products but data," he said. That being a given, "we have to be able to get at it!"

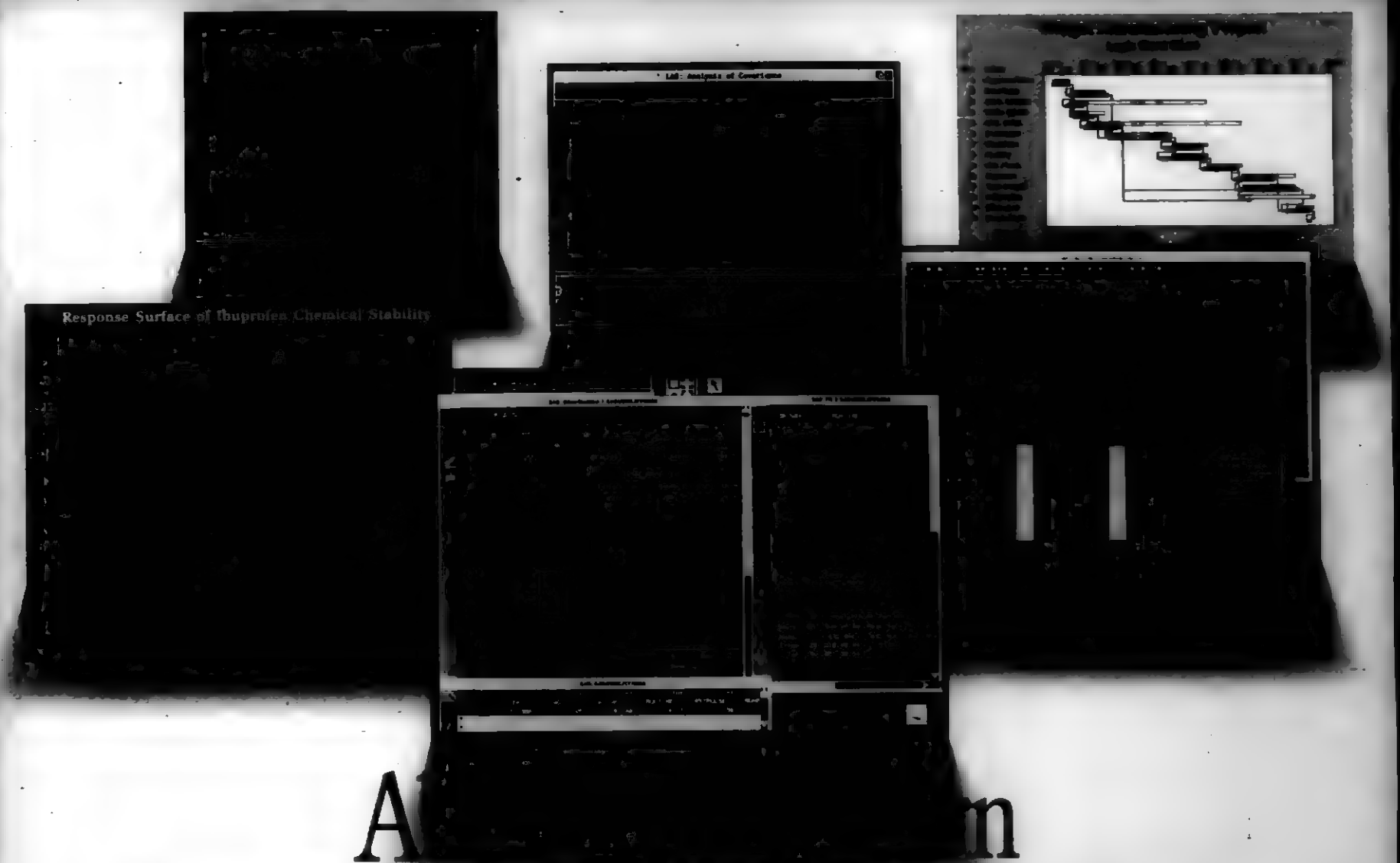
Betting on new standard

Networkwise, The Jockey Club is in the rudimentary stages of local-area networking and internetworking. It has an eye toward using the HP-driven, emerging 100Base-VG standard for "fast" (100M bit/sec.) Ethernet LANs, largely for the piles of bandwidth needed to accommodate imaging.

"We've got to get out of the data entry business and start scanning," said Robert A. Burch, the company's computer operations manager.

"Information is not just data; it could be video, voice and image," he said, providing pictures or videos of horses to subscribers, for example. This would require heftier networking technologies than 3270 mainframe access.

Burch is bullish on 100Base-VG because of economies he might leverage as an HP customer. However, he said he is disappointed that two technologies will survive from competing camps within formal standards bodies. "So we'll really have to wait and see which technology gets the attention of vendor products."



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IDC Insight
INTERNATIONAL DATA CORPORATION

New Cost-to-Use Analysis Key to E

Sponsored by IBM Appli

IDC has developed a better method of evaluating costs of computing. Price/performance numbers based on hardware benchmarks are often extremely poor predictors of the actual computing costs users will face. This is especially true in situations where customers are distributing very-complex workloads across an enterprise.

Hardware price-performance benchmarks such as TPC-A provide solid, base-level comparisons in specialized environments. They don't reflect the complexity of most users' business needs and processing workloads. Therefore, they have limited value in making realistic buying decisions.

To help IS management better predict the true cost of computing, International Data Corporation (IDC) developed a "cost-to-use" model. This model is intended to more-accurately measure and compare the full costs of using four types of leading midrange systems in networked, enterprise-wide applications. The systems in the study were: IBM AS/400, DEC VAX VMS, HP UX, and NetWare LANs.

The IBM AS/400, sometimes mistaken as a premium-priced product, emerges as the lowest cost-to-use system in complex, networked, enterprise-wide processing environments

Contradicts Price-Performance Notions

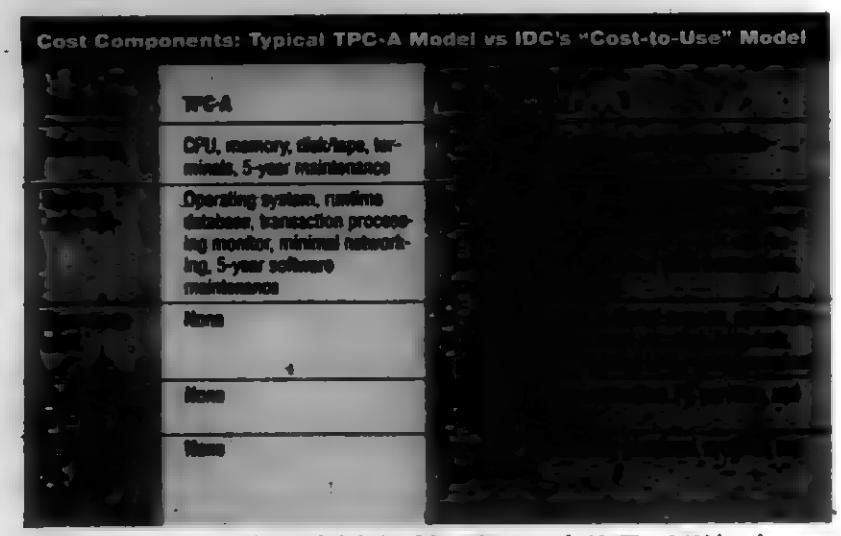
IDC studied more than 150 commercial computer installations in the United States. We interviewed more than 30 customers who have installed networked-enterprise systems to assess the full range of computing costs in complex, enterprise-wide environments. The model IDC developed from this research includes hardware, system software, application software, development-staff and operations-staff costs, and all overhead costs associated with remote-systems management performed by a central site over a five-year period.

IDC believes the results of this study provide IS professionals with the best information available on the costs of processing in the most-complex type of computing environment, the networked enterprise. While we doubt that the results of the study will come as a major surprise to those who have fully considered the issues, our data contradicts notions based simply on hardware price/performance figures.

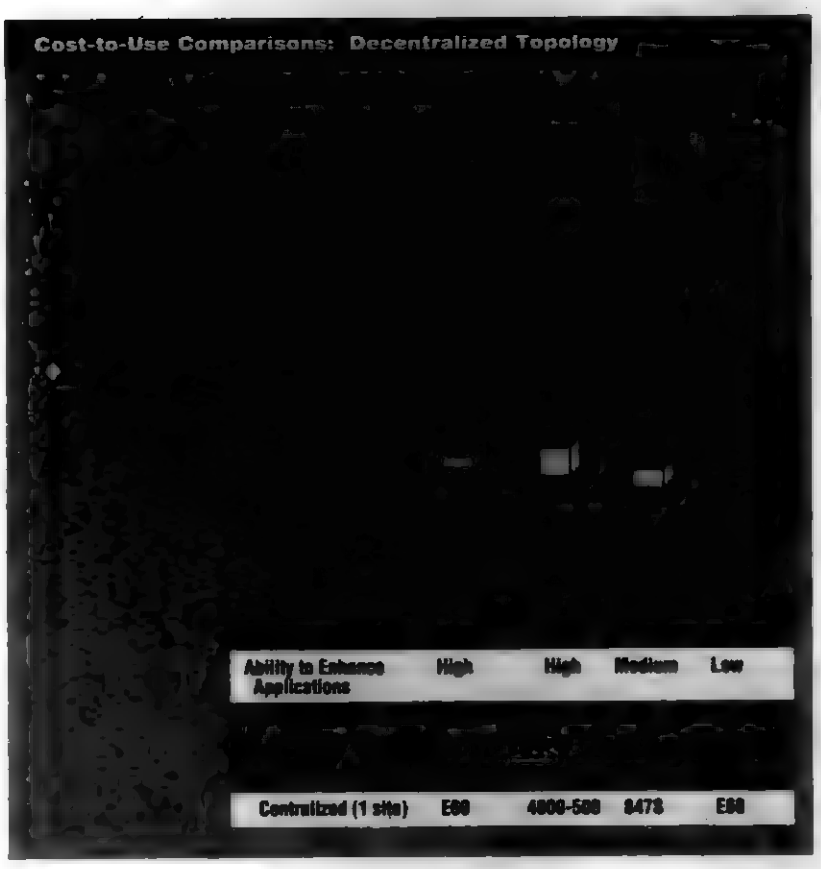
Options

Four major options appear to be available to PC LAN users.

1. Do nothing, and continue to live with existing distributed or decentralized topologies and functionality as they currently exist.
2. Wait for LAN vendors to deliver the needed functionality.
3. Add to operations staff, even though this will increase costs out of proportion to the increase in benefits.
4. Implement currently available technologies that provide the advanced functionality not yet available on LANs. While this may result in higher up-front costs, the IDC Cost-to-Use model indicates that this is the most-effective choice.



** Minicomputer-based topology included 60% PCs, 40% terminals. NetWare LAN-based topology included 100% PCs. Source: International Data Corporation, 1993.*



Staffing costs dominate

For example, consider the following:

- Integrated systems-management software services (a series of coordinated tools for administering local and remote systems) are a major differentiator for users because staffing expenditures dominate overall cost in the networked enterprise.

  In a distributed topology, operations-systems staffs for IBM AS/400 and DEC VAX systems cost $36 per workstation per month, roughly a tenth of the cost of a LAN-based system. In a decentralized topology, as opposed to distributed, the reverse is true — LANs had the lowest costs for operations staff at $244 per workstation per month. However, IDC believes these staffing costs are likely to rise during the next two years as the LAN-based applications mature and require reworking.
- Users — even IT professionals — generally lack experience with networked enterprise topologies. The logistics of distributing new software, software updates, physical and electronic support services, and hardware in a networked enterprise are viewed as a major barrier to success. As a result, few users are taking full advantage of the possible benefits of complex, distributed processing.
- The application set on LANs tends to be less-sophisticated than those on minicomputers. Development resources available for minicom-

valuating Networked Enterprises

cation Business Systems

puters often are considerably more sophisticated that those available for LANs. In response to rapid changes in business environments, we believe that many LAN-based applications in networked enterprises will require significant reworking in the 1993-1995 time frame as the environments move from support roles (i.e. file, print, and electronic mail servers) to full-fledged production applications (OLTP, database, accounting, and data analysis) computers.

- The IBM AS/400, sometimes mistaken as a premium-priced product, emerges as the lowest cost-to-use system in complex, networked, enterprise-wide processing environments.

The IT industry is currently investing heavily in distributed computing — and rightly so. Distributing processing power while retaining overall cohesiveness is an outstanding strategy for achieving the most-pressing objectives facing IT professionals today: organizational effectiveness, better return on IT investments, increased productivity, and more-rapid exploitation of new technologies.

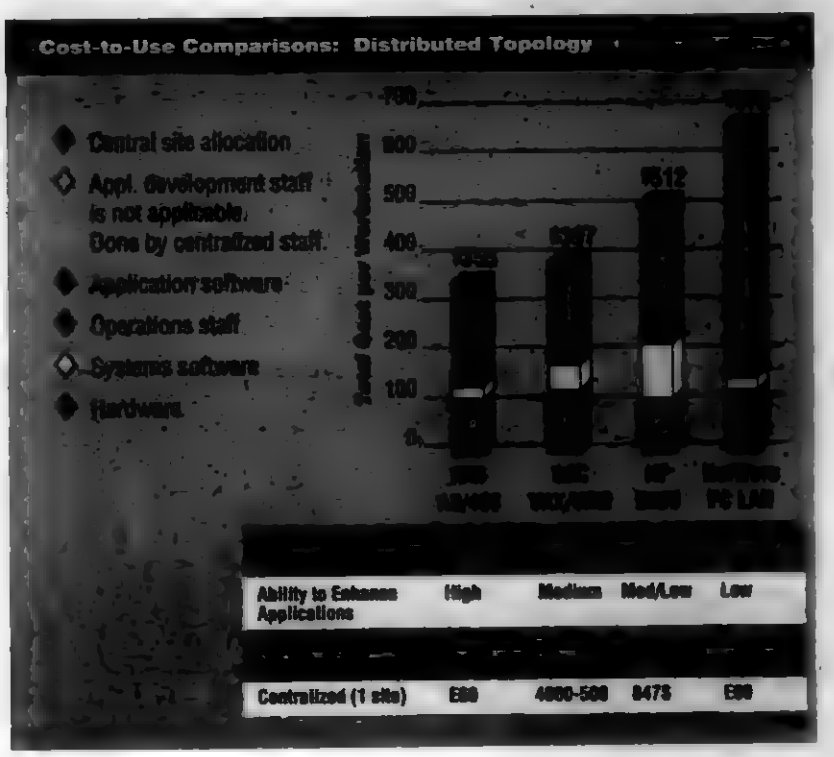
However, distributed processing is associated with significant complexity and uncertainty. Making the right decision requires higher quality, more-relevant information.

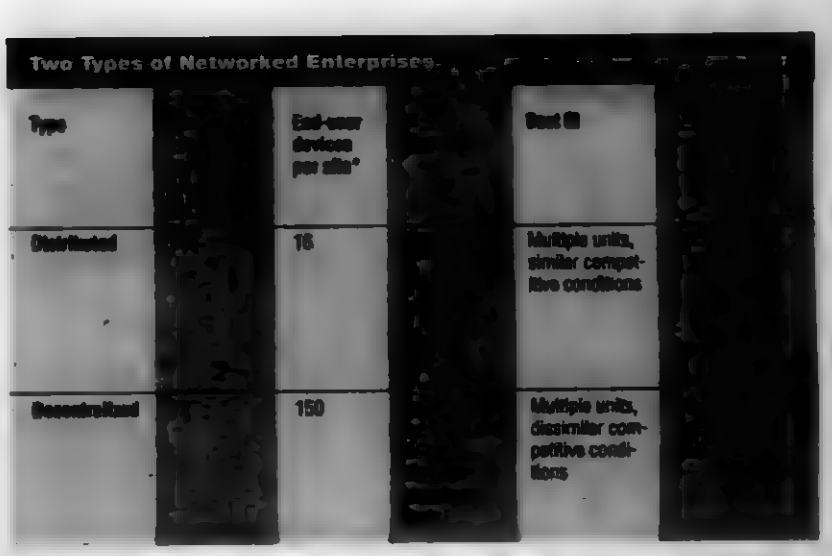
Conclusions

The information technology market is a very-complex place to shop. An expanding variety of hardware, software, and communications technologies, most associated with individual functional capabilities — that offer unique benefits — is being marketed by IT vendors to prospective and current customers. IT professionals demand better sources, quality and types of information to help them make the right decisions when planning purchases in this market.

Popular benchmark metrics such as TPC-A are specialized indicators of application performance (e.g. OLTP). As systems topologies get more complex, the appropriateness of this benchmark decreases dramatically. But TPC-C and the forthcoming TPC-D and TPC-E benchmarks will provide significant advances.

Users are exploring more-complex topologies as they attempt to support more-complex business strategies.





** Site size and end-user populations based on survey data. These qualities are used as the basis for all distributed and ecentralized analysis Source: International Data Corporation, 1993.*

The distributed enterprise and the decentralized enterprise, although more complex relative to traditional host-based, fully centralized configurations, are especially attractive to many companies. Comprehending options in these more complex setting, however, requires special costing tools.

IDC applied its Cost-to-Use model to help users better understand tradeoffs between alternatives. From our research, the following conclusions emerged:

- Overall costs-to-use in networked enterprise are very dependent on staffing levels. Superior systems-software services allows users to minimize staffing levels at remote sites without also minimizing IT support and responsiveness.
- IBM's AS/400 and Digital's VAX VMS systems, largely because of their advanced system-software capabilities, are more attractive alternatives to LANs in sophisticated, networked OLTP enterprises. Moreover, our research indicates that IBM's AS/400's cost to use is superior even to Digital's VAX VMS offerings.
- The Hewlett Packard 9000 offers excellent pricing at the hardware level. It is being positioned to attack costs of complex topologies and staffing issues. Its vulnerabilities are in applications software and system software in distributed topologies. In decentralized topologies, HP displays a lack of sophistication in system- and network-management tools relative to IBM and DEC.
- As customers gain more experience with complex, networked enterprise topologies, they will (1) become more familiar with the logistics and politics of choosing, implementing and managing complex topologies, and (2) they will deploy these complex topologies more often.

Although we feel that the functionality of UNIX and LAN alternatives will increase over time, customers looking to take advantage of the benefits of networked enterprise topologies should strongly consider more integrated alternatives.

- Many users with LAN-based, decentralized enterprise topologies will be forced to chose between continued reliance on aging, less-sophisticated applications — and the potential competitive disadvantages implied by that choice — or greater staffing costs to rework and maintain their code base. We feel that they will have to choose more staff, despite the added costs, if they retain these topologies.

For a copy of the complete report, "Cost-to-Use of Midrange and PC LAN Systems in the Networked Enterprise," call 1-800-765-0119.

[redacted]

Micro Decisionware, Inc. (MDI) has announced its Database Gateway for DB2, AIX Version.

According to the company, the product was designed for the growing number of users with architectures based on Unix servers and Transmission Control Protocol/Internet Protocol networks who have to accommodate high traffic loads and require the high performance affiliated with 32-bit processing.

Users can choose from more than 150 front-end tools. The product offers a "Transfer" function that is a copy management solution. MDI also supports OS/2 and Microsoft Corp. Windows NT and Unix server platforms.

Pricing begins at $2,500 and varies according to the number of connections.

▶ *Micro Decisionware*
3035 Center Green Drive
Boulder, Colo. 80301
(303) 443-2706

HarrisData has announced Version 6.2 of HarrisData/HRMS for the IBM Application System/400.

A Payroll Component enhancement includes a group update function that updates all employee deduction percents/amounts via a range selection. The Personnel Component enhancement features a Turnover Report to assist users in budget preparation.

Enhancements in Submittal Entry include expanded audit controls, and the product offers added Flexible Spending Account Administration capabilities.

Prices range from $6,900 to $45,000.

▶ *HarrisData*
611 N. Barker Road
Waukesha, Wis. 53186
(414) 784-9099

American Software has announced Flow Manufacturing Technology, an application designed to integrate finished goods planning with just-in-time execution.

Features for the product include flexible forecasting, flow line design, integrated demand management, rate-based planning, product costing, manufacturing accounting and simplified production reporting. The product also provides end-item planning, blanket purchase orders, cellular workstations and total quality management.

Prices range from $20,000 to $400,000.

▶ *American Software*
470 E. Paces Ferry Road
Atlanta, Ga. 30305
(404) 261-4381

The Storage Management Division of **Sterling Software, Inc.** has introduced SAMS:Allocate Version 5.0, a product designed to extend the capabilities of SAMS:Allocate to the allocation control of IBM's DFSMS data, offering a central point of control for the allocation of all MVS data.

In a single location, data allocation rules and standards can be coded using standard Automatic Class Selection-like routines, the company reported. The need to learn a new command structure and enter code in a second location is eliminated. Requirements to preallocate multivolume data sets is also eliminated because SAMS:Allocate automatically chooses an appropriate volume from the pool at the time the expansion to multiple volumes becomes necessary.

The product is said to optimize tape use and improve direct-access storage device use. Users can create rules and standards to use the storage hierarchy effectively, and SAMS:Allocate automatically allocates data and executes these standards.

Pricing begins at $13,500.

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   23. Dir./Mgr. Sys. Development, Sys. Architecture
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   41. Engineering, Scientific, R&D, Tech. Mgt.
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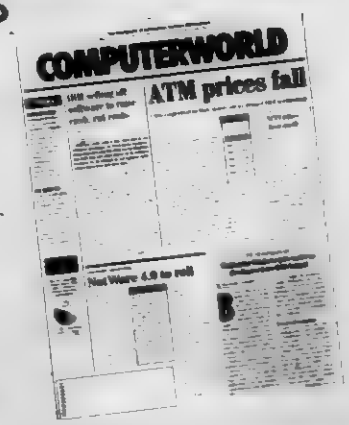

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Tool sets

Database tools bear CASE's burden

By Kim S. Nash

■ Although database vendors recoil from the phrase "computer-aided software engineering," their development tool sets smell a lot like CASE for the desktop. The notion raises red flags about whether this next wave of CASE products will sink, like its ancestors, from the weight of oversized promises.

Sybase, Inc. is expected to unveil today a plan to integrate various tools the firm has recently bought or built. Oracle Corp., meanwhile, fights to meet its delivery schedule for development aids under its Cooperative Development Environment banner.

"CASE" is a four-letter word for many users who bought workbenches a few years back from Texas Instruments, Inc., KnowledgeWare, Inc. and others," said David Sharon, president of CASE Associates, Inc., a consulting firm in Oregon City, Ore.

"We're still dealing with false hopes stirred years ago," Sharon said, referring to CASE tool kits of the mid-1980s that promised top-to-bottom management of software development but ultimately disappointed users. The tools focused on front-end tasks such as application analysis and design, leaving users in the lurch at the code generation stage, he said.

Neo-CASE tools from database vendors have recognized that failing and sought to address it. In broad strokes, old CASE was good at front-end processes such as application modeling, while new CASE concentrates on quickly generating software.

Tools that are tied tightly to relational databases have filled some of the more glaring holes left by traditional CASE makers. Plus, they are better-suited than old-line CASE for doing client/server development, according to analysts. Gupta Corp., for example, provides point-and-click facilities for application prototyping.

Also key for database tools, analysts said, is that they have grown from the PC and Unix workstation world. Such neo-CASE products are better able to cope with client/server development, said Gene Forte, executive editor of *CASE Outlook*, a technical magazine in Lake Oswego, Ore.

"They have a better understanding of how to handle network control and administration," Forte said. Mainframe-oriented workbenches look at application development in a mainframe world, he explained, where security, administration and systems management are done in a central location.

For all the improvements new CASE tool sets make, neo-CASE has holes of its own. For example, a typical user does not simply shut down an existing application when his company decides to build a replacement. There is an overlap while the legacy software is in use and a more modern system is being built. Therefore, users need an automated, efficient way to synchronize the two applications. "It's a transient, temporary job, but an important one," Sharon said. Tool sets from Sybase and Oracle, for example, do little to address this migration problem, analysts agreed.

Another question comes under the heading of application testing. New CASE products largely lack facilities for automatically testing newly constructed client/server applications on multiple operating systems hardware platforms. Testing has always been a weak spot for all genres of application development aids, Forte said.

Sybase release

Sybase, which was never known for strong development tools, will bound into the market today. Sybase plans to unite its disparate development tools under a single banner, lashing together a fourth-generation language, modeling and object-oriented products (CW, Aug. 16).

Development dictionary

Front-end work: Analyzing user requirements for a new application and designing the system from that data.

Back-end work: Generating an application from design specifications and testing the system.

Dense market

Overall, the application development market is becoming increasingly crowded. Sybase's tools-unification plan, for example, is an attempt to reclaim ground lost to third-party tool providers, analysts said. Meanwhile, old-line CASE makers seek to combat challenges from database companies and others by partnering with upstarts such as Powersoft Corp. Bachman Information Systems, Inc. and LBMS, Inc., for example, have agreed to provide links between their mainframe-based CASE tools and PowerBuilder, Powersoft's Windows-based development environment.

"The market can only make room for this kind of activity for so long," said Tim Harmon, an analyst at Meta Group, Inc., a consulting firm in Stamford, Conn.

He declined to name names but estimated that several development products companies will fall by the wayside within eight to 12 months. "I expect a wrenching shakeout," Harmon said.

Synon offers Windows support to AS/400 developers

By Melinda-Carol Ballou
LARKSPUR, CALIF.

Synon Corp. recently announced a suite of products targeting Application System/400 development for Windows, as well as new releases of a range of Synon tools.

Synon offers a development environment for the IBM AS/400 that lets users design, develop and maintain applications for cross-platform execution on IBM's RISC System/6000 mainframe platforms, PCs or Hewlett-Packard Co.'s 9000 series.

With the new Windows 3.1 generator for Synon's client/server product, developers will be able to use the AS/400 as a server running OS/400 and PC clients running either Windows or OS/2. From the same data model, users will be able to build native AS/400 applications supporting either Windows or OS/2.

"The fact of the matter is that we thought we'd support OS/2 because of its multitasking [capabilities], but the predominance of Windows brought us to say to ourselves that we just had to offer what the customers are asking for," said Jim Smith, marketing director at Synon. Synon will offer a version of the tools for Microsoft Corp. Windows NT server development early next year.

A new release of the Synon base product, Synon/2E, will allow users to perform change management at the model level. Developers will no longer have to go into the "guts" of the application at the source or object level to make changes, Smith said, but will be able to make changes to the model instead. In addition, the new release offers multilevel impact analysis linked to model object tracking and Archive/Revert features.

"Model level changes are critical, particularly in large development environments, because you may need to make multiple changes to a single model at the same time," said Roger Buss, managing director of information services at RLI Insurance Co. in Peoria, Ill. "And Windows support is important because it's not clear what the future of OS/2 is."

The Synon/IM change control tool will now provide check-in and checkout of model objects with conflict detection and resolution, promotion and archive/rollback at the model level.

A new product, Synon/PE, or Performance Expert, is a knowledge-based system designed to optimize the performance of Synon applications in AS/400 environments.

Synon RPM, a rapid application development tool for Synon/2E, includes a set of sample project deliverables with step-by-step examples and testing forms.

Synon/2E 5.0 and the client/server tool for Windows will ship during the first quarter of 1994; Synon/PE will ship during the fourth quarter, and the other products are available now. Pricing for Synon/2E 5.0 starts at $48,000, Synon/PE starts at $2,500, the client/server product starts at $2,400 and IM starts at $4,125. Synon RPM is priced at $15,000, which includes computing services.

IBM connection

In 1992, IBM acquired minority equity interest in Synon. Synon has continued membership in AD/Cycle, and Synon products are distributed as IBM logo products.

Visual Basic strategy draws praise, concern

By Melinda-Carol Ballou

Microsoft Corp.'s effort to universalize Visual Basic by using Visual Basic Applications Edition as a common macro language within popular Microsoft applications appears to be working, judging by comments from potential users.

But some expressed disappointment over Microsoft's failure to open up Visual Basic to non-Microsoft applications.

Microsoft plans to integrate Visual Basic with Microsoft Excel Version 5.0 and Microsoft Project Version 4.0 and to ship them in the fall, with eventual support for other Office applications (CW, June 28). The common macro language and support for Object Linking and Embedding (OLE) 2.0 enables users to more easily integrate applications and automate various tasks, officials said.

When Microsoft announced Visual Basic Applications Edition earlier this summer, it was too late for developers at Lockheed Missiles and Space Co.; they had already spent people power writing code to integrate Visual Basic with Excel.

Yet project managers at Lockheed and other sites praised the new Visual Basic capabilities and said they look forward to its release.

"We hooked Visual Basic up with Excel but had to write the interface ourselves," said Bob Remington, project leader for the Rapid Prototyping Lab at Lockheed.

"The upcoming integration with Excel and with [Microsoft's] Access database engine will make life much easier, as will connections with the other Microsoft applications."

"The nice thing about Visual Basic for Applications is that it allows you to move a lot of your application code into Excel and use Excel as an application development tool," said David Osborne, a vice president at Bankers Trust Co. "They also have a link from OLE 2.0 to encapsulate Excel within [Visual Basic] which really opens it up. And [Microsoft Word] is next," he added.

Mixed reviews

While some sites offered only praise for Visual Basic, others bemoaned the lack of an embeddable scripting language and Microsoft's proprietary grasp on the product.

"The difficulty with [Visual Basic] is that it's hard to add your own functions and integrate them tightly into an application," said Kip Mercure, software development manager at Dow Chemical Co. in Midland, Mich. "We need a scripting language that allows us to embed macro code."

Mercure's group at Dow, therefore, opted for an embeddable scripting language from SoftBridge Corp., a Cambridge, Mass.-based tools company, whose product is syntactically compatible with Visual Basic.

Popkin announces PowerBuilder link

CASE tool offers improved data modeling, GUI

By Melinda-Carol Ballou
NEW YORK

Popkin Software & Systems, Inc. recently demonstrated Version 3.0 of System Architect (SA), Popkin's PC-based computer-aided software engineering tool (CASE), and an interface between SA and Powersoft Corp.'s PowerBuilder.

Features key to the new release include enhanced data modeling and object-oriented features; a graphical user interface with floating tool box; and support for IDEF0 and IDEF1X, key standards for process and data modeling used by the federal government.

The release also offers new data modeling features such as support of views, relationship lines between entities and automatic foreign key generation. Users can define new dictionary definition types as well.

The object-oriented capabilities include the ability to use the SA Schema Generator to generate relational database management system schema from class attributes and to define methods and services locally based on object or class.

Coming up to date

The new graphical user interface support brings SA in line with Windows 3.1; previously, SA ran in conjunction with a Windows look that was 5 years old, according to company officials.

The SA/PowerBuilder link allows developers to import and export design information between SA and PowerBuilder, including data elements, entities/tables and extended attributes, Popkin officials said.

SA pricing starts at $1,395, and Version 3.0 will ship in October, when it will be formally announced at CASE World in Boston. The SA/PowerBuilder Link is priced at $1,995 and is slated to ship during the fourth quarter.

ObjecTime Ltd. has started shipping ObjecTime 4.1, its object-oriented computer-aided software engineering tool for distributed, event-driven systems.

According to the company, the validation of design models and executable requirements has been improved by the visualization of message flow during model execution.

The product now supports Hewlett-Packard Co.'s HP 9000/700, IBM's RISC System/6000 and SunSoft, Inc.'s Solaris 2.2., as well as the previously supported HP 9000/400 and Sun Microsystems, Inc.'s Scalable Processor Architecture.

Through a floating license manager, ObjecTime user licenses can now be shared. ObjecTime supports an advanced methodology called Real-Time Object-Oriented Modeling that is used for the analysis and design of distributed, event-driven systems.

ObjecTime 4.1 also features other enhancements including improved support for modeling complex structural relationships, message breakpoints, more detailed protocol specification and a color user interface.

A node-locked license costs $20,000, and a floating license costs $25,000.

▶ *ObjecTime*
Suite 200
340 March Road
Kanata, Ontario, Canada K2K 2E4
(613) 591-3535

Borland International, Inc. and JYACC, Inc. have announced the availability of JAM/Database Interface for Windows and DOS Link for InterBase.

The JAM interface to InterBase provides complete access to all InterBase SQL functions without writing third-generation language code, the firms said.

Users can define character and field-level edits and validations, specify the layout and visual attributes of screens and create and link together screen, window and menu objects by using JAM's authoring tools.

Development licenses cost $990 for DOS and $1,780 for Windows.

▶ *JYACC*
116 John St.
New York, N.Y. 10038
(212) 267-7722

Concentric Data Systems, Inc. has announced R&R Report Writer SQL Edition, a client/server data access and reporting tool for the Windows environment.

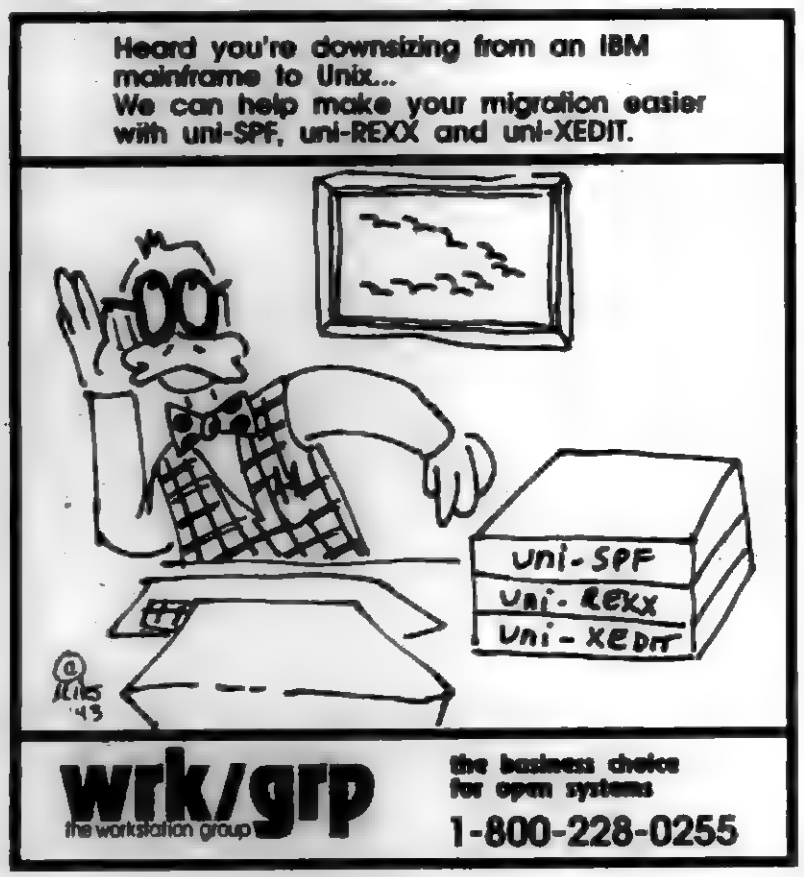
According to the company, the product provides users of Oracle Corp.'s Oracle, Sybase, Inc.'s SQL Server, Microsoft Corp.'s SQL Server, Novell, Inc.'s NetWare SQL, Btrieve and Xbase with the benefits of R&R's query, analysis and summary capabilities in conjunction with publication-quality output.

R&R Report Writer SQL Edition is both an end-user and a developer tool that can generate SQL statements invisibly and automatically. Improved layout and presentation features such as color printing, background shading and line and box drawing are included.

A single-user package costs $395.

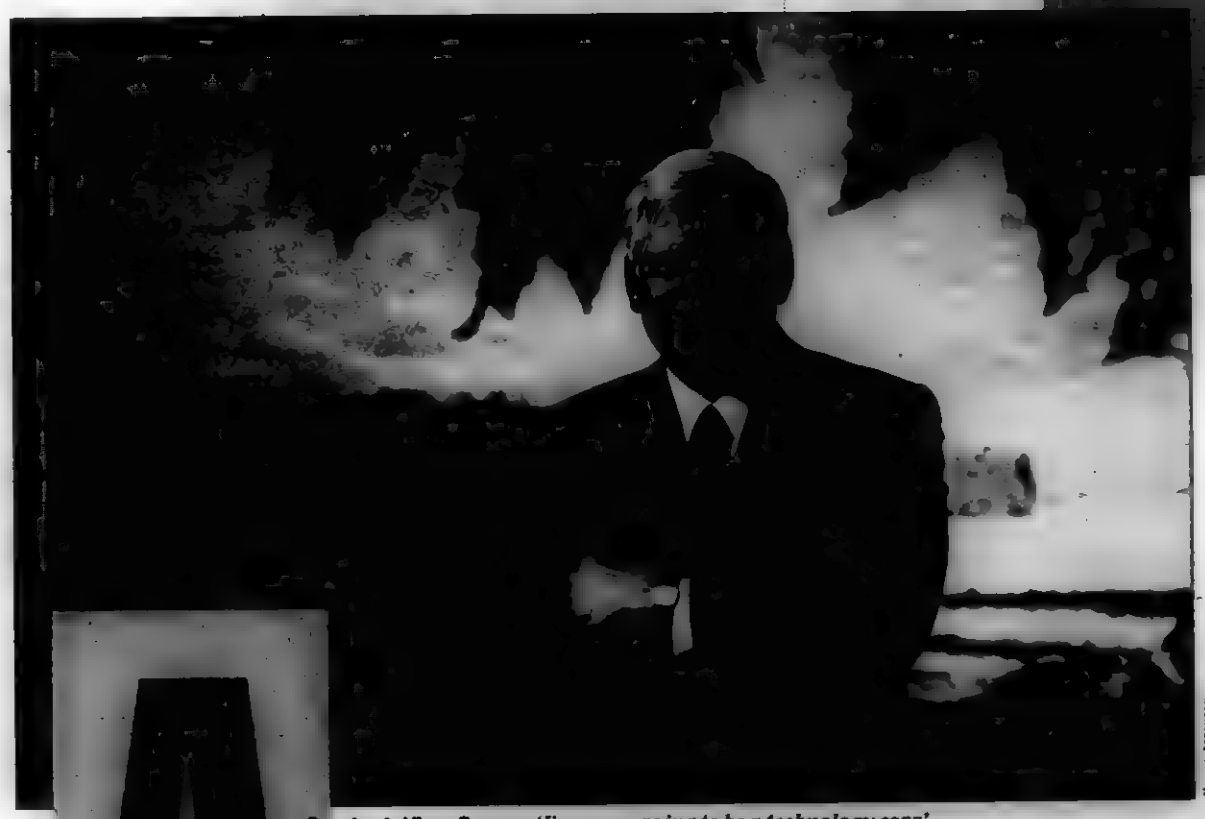
▶ *Concentric Data Systems*
110 Turnpike Road
Westboro, Mass. 01581
(508) 366-1122

Bristol Technology, Inc. has announced Wind/U 1.3, a Windows to Unix portability tool kit with support for Microsoft Corp.'s Visual C++ applications via the Microsoft Foundation Class Library Version 2.0. The product allows Windows and Visual C++ applications to run as native Unix/Motif applications, the company said. Cost: $9,950. Bristol Technology, Ridgefield, Conn. (203) 438-6969.



Scatter-shot systems

There are lots of ways to buy and manage technology in a decentralized environment. Some of them work.



MICHAEL ABRAMSON

Sara Lee's Vince Swoyer: *'I'm never going to be a technology czar'*

BY WILLIE SCHATZ

Alarm bells went off in Louis Chiesa's head when he learned that Tyco Corp.'s Asian subsidiary wanted to put $800,000 of the company's money into two new Prime Computer, Inc. machines.

"I thought it was terrible overkill," says Chiesa, vice president of MIS and administration at the Exeter, N.H.-based, $3.1 billion maker of water-flow devices and fire protection equipment. "They definitely needed new equipment, and they wanted to continue using Prime machines. I think they thought they could get away with one."

And why not? Chiesa's global information systems empire may encompass 200 employees with a $15 million budget, but he knows very little about Tyco Asia Pacific Ltd. or any other Tyco subsidiary's daily information technology activities. Each company is allowed to do its own technology thing. The only time Chiesa sticks his face in their businesses is for a capital expenditure greater than $25,000.

So who's the IS boss? A corporate maven such as Chiesa? Or the IS executive at the individual company? Perhaps more importantly, how does an organization keep from tripping over itself technologically and duplicating costly efforts? That endless struggle is what John Varanelli, a senior analyst at New Science Associates, Inc. in Westport, Conn., calls the $64 million question.

"Centralized IS has historically been in such ill repute

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Scatter-shot systems

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that it's hard in many organizations to receive a fair hearing for implementing any standard in a decentralized environment," Varanelli contends. "But it's technologically intelligent for an organization to have a standard yet open environment."

So how do you create that nirvana in a global company with several dozen divisions, hundreds of corporate IS personnel and thousands of worker bees?

Not long ago, the answer was easy: When the corporate IS office spoke, most employees listened. Then came the revolt against mainframes. In many companies today — where shadow IS organizations spend as much as 60 cents for every technology dollar — the motto seems to be: "Whatever floats your boat" [CW, Aug. 2].

That philosophy apparently prevailed at Tyco Asia Pacific. But because $800,000 is higher than Chiesa's jump-in threshold, he hopped a plane to Sydney, Australia. When he asked the Aussies why they needed more than twice as many new millions of instructions per second from a struggling company, few answers were forthcoming, he recalls. Even if they'd had answers, Chiesa adds, it wouldn't have mattered.

Ultimately, Chiesa gave the subsidiary a spare Prime machine from Canada and told it to hang on until IBM's RISC System/6000 hit the street.

"They were really pissed off," Chiesa recalls. "We had one hell of a fax war for a while. But three years later, they're thanking me."

Indeed, such conflict occurs constantly, as multinational companies struggle with how to assess and deploy technology cost-effectively in increasingly decentralized environments. Each company has its unique ways and means. The golden rule of thumb? If it works, do it.

"The question of how you integrate IS in a decentralized environment varies from one company to the next depending on the philosophy of the organization," says Dudley McRae, director of corporate IS at Phoenix-based Phelps Dodge Corp. Although he concurs with Varanelli that the issue hits companies where they live, McRae says it's only a $64 question.

"You can't hamstring yourself by following a specific hardware or software," he says. "But at the same time, you have to have standards."

Phelps Dodge: Independence

Phelps Dodge achieves that blissful state by centralizing its back-office IS information about the company's financial, payroll, insurance and human resources programs and, through a corporate steering committee, the company's IS policy. Almost every other IS function is left to the discretion of the IS tribes at the Phelps Dodge Industries and Phelps Dodge Mining Co., the company's major business entities.

Each group has its own IS staff, whose members report to the local management. McRae's only involvement in the local operations occurs when one of the groups wants to make a major hardware or software acquisition. The president of the division sends the request to McRae, who reviews it to determine whether it fits within the corporate IS plan. If McRae says no, the deal doesn't go through until he finishes investigating the ramifications.

McRae says Phelps Dodge wants its distributed IS staff to be as close to the local business functions as possible and to respond to the business manager's needs and requirements to get the job done. But he's not about to dictate that from Phoenix.

"We're not going to tell particular companies within our divisions that they have to follow a particular technology," McRae says. "If you acquire different divisions over the years, as we have, then you have to be prepared to live in a multivendor world. Our job is to set an example for the different divisions and show them viable systems that can be beneficial."

Easier said than done, of course. If a company executive spots a more efficient way to accomplish a strategic business objective, McRae's minions will lead the client/server charge and the ensuing migration of applications to the workstation. If a different approach is successful for one of the company's businesses, more power to it.

Luckily, McRae craves heterogeneous environments. Two of the company's five divisions are using OS/2; the remaining three are committed to Windows and Unix. But that's nothing compared with the nine different electronic-mail systems scattered across 11 manufacturing sites. So if someone wants to send an intracompany message in real time, he had better use the phone.

"Our problem is the same as for most corporations our size," McRae says. "We want as much integration as possible but not more than we need to be effective. Since our industrial companies are really autonomous in their business objectives, integration is much more important for the executives."

Melville Corp.: Regrouping

McRae clearly is not flying solo on that journey. At Melville Corp., a $10 billion Fortune 100 company with 7,120 retail stores and 100,000 employees, Vice President and Chief Information Officer John Mitchell has been playing catch-up ball following Melville's belated recognition of the information Revolution.

The company, which lives and breathes IBM, is attempting to solve its information problems by taking to the sky. It is using 1,500 personal earth stations to keep its far-flung subsidiaries in touch with one another. It plans to add another 1,500 in the next 18 months to finally connect all the company's stores with their respective division offices and distribution centers. The division offices will be connected to one another and to the Rye, N.Y., corporate headquarters.

"Until five years ago, we were absolutely autonomous," Mitchell says. "But we're moving away from that to leveraging our knowledge and facilities and taking advantage of the technology to dramatically improve our delivery of information services."

Mitchell cites Melville's check authorization system as a prime example. If one large division uses the system, it's a small incremental cost for another division to use it through the satellite network. The IS-in-the-sky thus precludes the usually enormous costs of developing and arranging a separate system.

Although Melville, which has 10 operating divisions, is far larger than Phelps Dodge, Mitchell has to cope with a much less heterogeneous environment than McRae. The five largest divisions, which are delineated by revenue, are based on IBM Enterprise System/9000s. The two midsize divisions make their living off Application System/400s. The three small divisions rely on RS/6000s. The decision to go all IBM was made by Mitchell and the divisional IS executives.

But that decision, as do the yearly strategic information plans autonomously devised by each division, must synergize with the company's overall business direction and strategic plan, which is ex-

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How they sow technology

Most large, successful organizations today are using a mix of centralized and decentralized IS functions

Tyco Corp.

A centralized IS operation for the $3.1 billion Exeter, N.H., maker of water-flow devices approves technology purchases over $25,000.

Phelps Dodge Corp.

Back-office IS functions, including payroll, insurance and human resources, are centralized at the Phoenix headquarters. Most other functions are left to divisional IS staffs, which report to local management. Division presidents forward IS proposals for corporate review.

Melville Corp.

The $10 billion retailer, with 7,120 stores and 100,000 employees, is moving to centralize key functions after an unsuccessful period of granting divisional autonomy. Key shared applications such as check administration are handled through a new companywide satellite system.

Sara Lee Corp.

Each of the 100 units handles technology independently. A 25-person corporate IS staff acts as "umpires and referees."

Hard planning: The year ahead

Most large organizations plan to keep a delicate balance between central and distributed platforms in 1993 and beyond

"Which one of the following statements best describes your site's strategy for managing centralized and distributed hardware resources during the next 12 months?"

1	We expect to more or less maintain the current mix of central and distributed resources.	47%
2	We are focusing most major new application developments on smaller, distributed systems, but we are not really changing existing applications.	17%
3	We are moving major applications off our central computers onto smaller, distributed systems.	20%
4	We are consolidating our distributed processing capacity onto larger, centralized systems.	5%
5	We are moving applications based on low-end LANs to more robust, host-based platforms.	7%
6	Don't know.	4%

Base: 374 respondents

Source: International Data Corp., Framingham, Mass.

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Regroup if you must

By Johanna Ambrosio

The unique demands of distributed systems support have led some information systems shops to reorganize how they structure themselves.

Nike, Inc. in Beaverton, Ore., for instance, regrouped about two years ago. Dan Croft, manager of computing services, used to manage the data center, help desk and applications development. Now he handles operations, client services, data network operations and workstation services.

"My mission in life is to manage the multiuser, client-owned platforms running Nike business applications," Croft said. "We think we have the organizational structure in place that can handle all the technology we need."

Something for everyone

Atlantic Richfield Co. in Plano, Texas, no longer has a local-area network administrator in each department, as was the case in years past. Now there is a centralized network services group of about 35 people who provide "some core functions for everyone," said Mark Armentrout, manager of network services.

These include automatic backup and security, as well as some technical support for the 100-plus servers used in the company's upstream oil business. The group also serves as the focal point for working with vendors.

In addition, Armentrout's group supports the voice and wide-area data network for services such as electronic mail and helps set standards for naming and file transfer.

First-level technical support is provided by technicians on site at Atlantic Richfield offices nationwide. ■

Scatter-shot systems

CONTINUED FROM PAGE 76

tablished annually by a 12-person council consisting of corporate and divisional business and IS executives.

"Integration is neither a priority nor a desire," Mitchell says. "We want enough standardization and consistency in our applications portfolio and our hardware and software platforms that we can leverage our knowledge across the divisions without having experts in everything in every division.

"It's working, but part of our problem is that a loose confederation like ours elongates that [leveraging] process. A dictatorship moves more rapidly, but we don't work that way, and we never will. It's foreign to our culture."

> "A dictatorship moves more rapidly, but we don't work that way."
>
> *John Mitchell*
> *Melville Corp.*

But many large corporate IS departments are finding that they can go home again. According to Dean Meyer, president of NDMA, a Stamford, Conn., consulting company, decentralization generally leads to architectural fragmentation. That's one of "many reasons" why Meyer says the IS pendulum is swinging back toward centralization.

However, Meyer warns, the need to locally tailor mission-critical IS solutions remains essential for global corporate competitiveness.

Chiesa deals with that issue daily. Tyco is decentralized enough so that when Grinnell Corp., a leading fire protection device manufacturer, instituted a scanner system to replace its manual reporting method, the IS director never heard a discouraging word from Chiesa.

But that freedom is countered by the straitjacket Chiesa can place on his company's often-recalcitrant IS directors.

"I look at technology just as I look at a new machine for the business," Chiesa says. "What's the return on investment? How will it add to earnings per share? Will it increase profitability?"

That philosophy also rules at Sara Lee Corp. If you think the Chicago-based conglomerate only bakes cakes, forget it. Within the Sara Lee umbrella are 100 companies, each traversing its own IS path. It's Vince Swoyer's job to ensure that each division is equipped with the appropriate technology, despite having no control over any of the divisional operations.

Keeping in touch

Swoyer's first priority is staying in contact with the IS directors at the operations level because "they're the people really doing things." Swoyer's 25-employee corporate IS office tracks what's happening in the field so it can relay the information to whichever division is interested in the data. As with umpires and referees, Swoyer says his best work won't be noticed.

"I'm never going to be technology czar," Swoyer says. "I don't have the wherewithal to understand what technology each division needs to best do its job. When they tell me it's needed, I'll assist the divisions in selecting software and hardware.

"Integrating and interconnecting systems is not a priority. Only the divisional financial information and unit volume performance come to the corporate IS office. We don't see any operating data such as manufacturing flow or order backlog. We always try to keep an open mind about the use of technology. We don't put it in just to see the technology work. We use it to make the business more profitable."

Sometimes the business makes money despite the technology. At Baker Hughes, Inc., for example, employees communicate the old-fashioned way.

"The divisions get their information to us, but not in a high-tech way," says Leroy Harmeyer, director of corporate MIS at the Houston oil field services and process company. "We use fax, letters and some E-mail to get the stuff in and out of here."

So if the vice president of human resources, for example, wants to distribute a directive to all 20 of the Fortune 200 company's divisions, he's going to fax it?

"That's the fastest way for him to do it," Harmeyer says. "Is it the best way? I don't think so. But that's how it's being done, and we're getting by. I don't think it's hurt business that I haven't jumped out there and said, 'This is the way it's going to go.' I know we're talking dinosaurs, but what's the solution?"

Forget that. What's the problem? Harmeyer says he has not heard any "screaming need" for a change in how the company communicates. A few whimpers, perhaps, and possibly some well-disguised dissension. But if any of those traits exist, Harmeyer doesn't hear about it. And with the company's business booming, he probably won't.

"I admit that our technology is not ready to allow me to communicate with anyone in the company at any time," he says ruefully.

"But does that really matter? If you've got 20 employees and each one knows what needs to be done, does it matter if the guy doing the hedges talks to the guy mowing the lawn? No, not if they get the job done," Harmeyer says. ■

Schatz is president of The Schatz Group, a Washington, D.C.-based consultancy.

Executive Track

Polly McClure has been named vice president for information technology and communication at the **University of Virginia**. Formerly associate vice president and chief information officer, McClure has broad planning responsibility for expanding the university's electronic infrastructure. University officials said the appointment reflects the growing importance of technology at the Charlottesville, Va., school.

Meanwhile, **Edward Lieblein** has been appointed dean at the Center for Computer and Information Sciences at **Nova University** in Fort Lauderdale, Fla. A former director of computer and software systems at the Office of Secretary of Defense in Washington, D.C., he has been a member of the center's faculty for the last three years.

In health care, **Gwy Beada** was named manager of strategic information services at **Central DuPage Hospital** in Winfield, Ill. He was formerly a health analyst at Central DuPage Health System. **Ira J. Rothman** was named vice president of information technology at **Foundation Health Corp.** in Rancho Cordova, Calif. E. **Bradford Ridley** was named assistant director of information resources at **Massachusetts General Hospital** in Boston.

In consulting, **Tom Lewis** was appointed senior consultant at the **Strifler Group**, a Dallas-based information systems consultancy that specializes in shifting clients to open systems. Lewis will lead a team specializing in IS technology for manufacturers.

Calendar

SEPT. 12 - SEPT. 18

Penn Tech '93. Philadelphia, Sept. 13-14 — Contact: Pennsylvania Technology Council, Pittsburgh, Pa. (412) 687-2700.

EDMS '93 User Forum. Anaheim, Calif., Sept. 13-16 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 871-6808.

Engineering Document Management Systems. Anaheim, Calif., Sept. 14-16 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 871-6808.

Omnicom Week Conference. San Diego, Sept. 14-17 — Contact: Sherri Ross, Omnicom PPI, Phillips Business Information, Inc., Potomac, Md. (301) 424-3338.

SEPT. 19 - SEPT. 25

1993 SIM Conference. Washington, D.C., Sept. 19-22 — Contact: Gregg Lapin, Society for Information Management, Chicago, Ill. (312) 644-6610.

1993 Interex Hewlett-Packard Computer Users Conference/Expo. San Francisco, Sept. 19-23 — Contact: Interex, Sunnyvale, Calif. (408) 747-0227.

Business Excellence For Top Management. Kansas City, Mo., Sept. 21-23 — Contact: Joanne Gordon, Sandra Conn Associates, Inc., Chicago, Ill. (312) 327-0062.

Mobile World. San Jose, Calif., Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Second IEEE Network Management and Control Workshop. Tarrytown, N.Y., Sept. 21-23 — Contact: Hart Rasmussen, Workshop/Tutorial Registration, CATT, Hawthorne, N.Y. (914) 347-6942.

Expo '93. New York, Sept. 21-23 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

Document World '93. Hartford, Conn., Sept. 22-23 — Contact: Key Productions, Inc., Hartford, Conn. (203) 247-8383.

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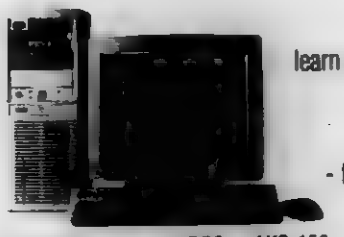

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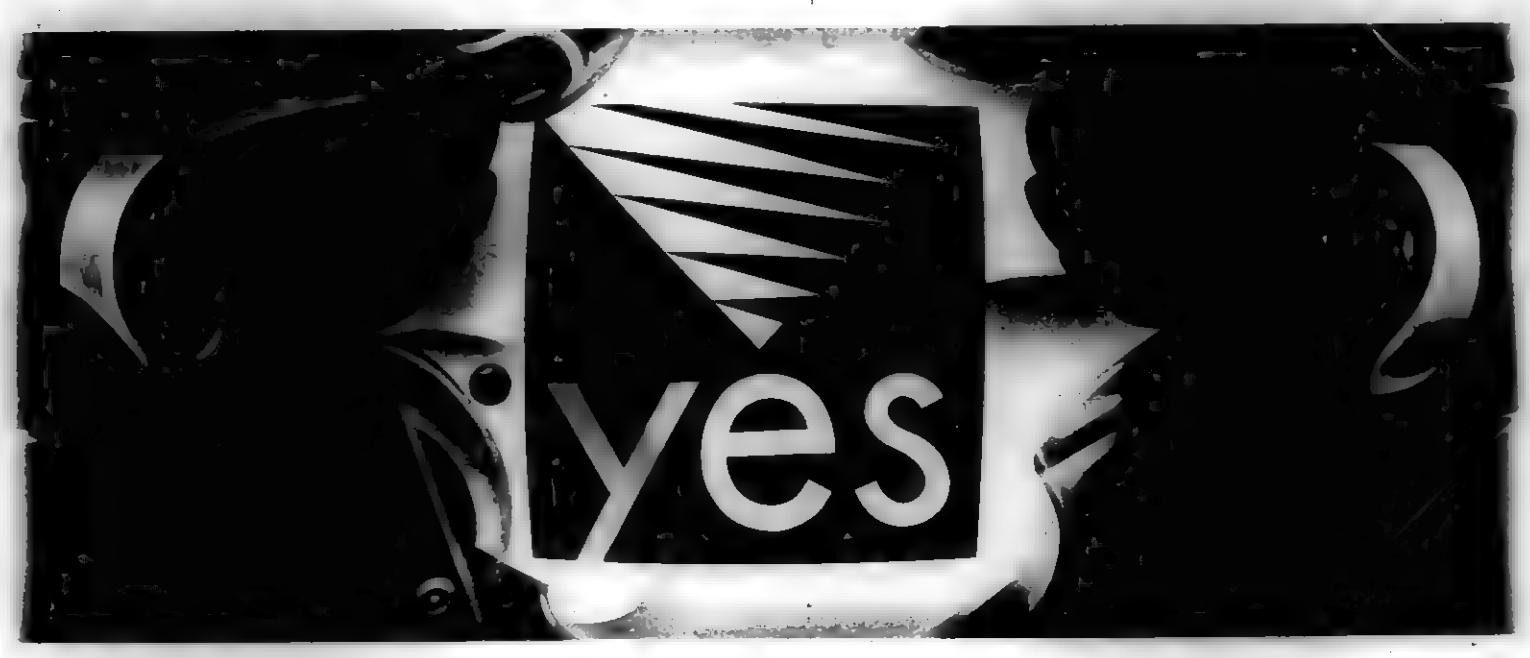

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Training and support is being embedded in systems so users can learn on demand, on the job. By using these integrated performance support systems, companies such as BASF have reduced training costs, cut help desk staff and made users more self-sufficient.

LEARN while you WORK

By Lance E. Dublin

Information systems managers, listen up: I want you to throw out your old notions of training, documentation and support. They're just not going to cut it anymore.

Face it. The world is changing too fast to make memorization the primary way people learn and improve their job performance. This rote learning may not only be futile — it is estimated that most staffers may lose up to 90% of what they learn in a traditional training session — but also pricey. Traditional, instructor-led training costs average $150 to $350 per person per day.

And that's only the direct costs. When you add in the cost of lost productivity as staffers wait to be trained or take time out to attend training sessions, it's not hard to see why most companies shell out between 1% and 5% of their total annual budgets on employee training!

Luckily, you don't have to rely solely on memorization and instructor-led training any longer. Most of the information and tools workers need to do their jobs can be made available on demand, just in time and at their fingertips.

The burgeoning area of integrated performance support systems (IPSS) is helping to make learning on the job easier. IPSSs are a combination of computer systems (in which learning, advice, guidance and support are embedded into an application itself or are accessible from the application at any time), media systems, people and paper to help workers keep pace with change. They also help companies save money over traditional training methods. (For a cost worksheet, see page 82.)

What you want it to be

Today, there is no turnkey system that falls into the category of "performance support system." Rather, it is up to you to create these system from off-the-shelf and internally developed components, depending on what your users need.

A comprehensive IPSS might include a mix of the following components:

•*Technology:* Computer-based training and interactive tutorials for learning; context-sensitive and inquiry-based Help and on-line reference systems for information; expert, rules-based or knowledge-based systems; and on-line bulletin boards. Oftentimes a company will set up a bulletin board and train users to post their questions there *before* calling the help desk. Then, if another user doesn't answer within 24 hours, the help desk will post an answer. Using a product such as Notes, these answers can then be incorporated into a knowledge base for all users.

•*Media:* Videotapes and audiotapes, interactive videodisc and

Learning, *page 82*

Learning

CONTINUED FROM PAGE 81

interactive videotape for information and learning.

• *Print:* Paper-based help is unavoidable and actually suitable for some users. Sometimes, it is a nice break for users to look at something other than the screen.

• *People:* Instructor-led training, hot-line phone support, consulting, application development and management briefings. Users still find it soothing to talk about new systems with others.

Change for the better

At some firms, the savings and benefits of IPSSs are dramatic.

A large insurance association in San Francisco that has been in business for 100 years had been burdened by old ways of doing things, especially in the customer service area. It decided to revamp its business processes and include a new system to help expedite customer inquiries. That meant a hefty training schedule for thousands of employees.

The company calculated that retraining staffers in new job functions and the new system using traditional instructor-led training would take four years and cost tens of millions of dollars. Retraining with an IPSS would reduce costs 66% and help cut training time to 18 months.

The association's IPSS includes an on-line Help and reference system, print-based manuals and job aids. In order to handle on-the-job learning, it also gives users access to computer-based training applications as well as audio and video self-study supplemented by workshops.

The system helped reduce the time employees were away from productive work. With a traditional one-size-fits-all class approach, each employee would be off the job for 65 days; with the IPSS one-size-fits-one approach, training will require 30 days or less, the company estimates.

For Parsippany, N.J.-based BASF, Inc., the biggest benefit of IPSS came in the form of reduced help desk support.

When the company rolled out a new ecology database to 75 sites in the U.S. and Canada, it rolled out an IPSS strategy as well. That consisted of sending out a PC-based demonstration and tutorial disk, which contained sample screens and work-flow information, three months prior to the application's release. The on-line Help system was written for users by users.

When users need help for a problem, for instance, they press the Help key. They get directed to the appropriate training, learning or Help tool (be it electronic or paper-based). The user also has the option of posting problems on the company's bulletin board for help from other users. The Help desk is a last resort.

As a result of this media mix of support and training, BASF employs only one help desk person to handle its 500-plus users.

Cuts down wasted time

IPSSs minimize the need for unneeded memorization, disruptive support calls and untimely training. They should be designed from a user's perspective: They should be based on what a user needs, when he needs to know it and how he can best get the information.

Just-in-time performance support means that companies don't have to rely only on experts to handle problems or train every staffer to expert level. A knowledge worker armed with a little on-line boost can do wonders.

General Electric Co., for instance, has an expert system-based performance support system that helps railroad maintenance people fix and learn about diesel electric locomotives without an expert looking over their shoulders, according to Angus Reynolds, a technical trainer in Central Islip, N.Y.

The system provides the user with a menu of possible problem areas, and after he picks one, the system generates detailed questions — about, say, fuel pressure, the fuel filter and so on — so it can pinpoint what's wrong. Depending on the user's responses, the system forms an if-then scenario, such as, "If the engine is set to idle, fuel pressure is below normal and the fuel filter is OK, then the fuel system is faulty."

Added features include the ability to print out diagrams that show component locations and a color videodisc player that illustrates detailed step-by-step repair procedures. Today, the system handles 80% of GE's diesel electric locomotive troubleshooting problems.

Keep in mind that while each company can pick and choose what goes into its systems (costs typically run between $100,000 and $1 million), there is a singular philosophy that underscores their creation: The system *must* provide information, advice and learning when it's needed, where it's needed and in the medium most effective for the user. ■

Dublin is chairman and chief executive officer of The Dublin Group, Inc., a human performance consulting firm in San Francisco. He is also on the board of the International Computer Training Association.

[redacted]

- **[redacted]** February 1994
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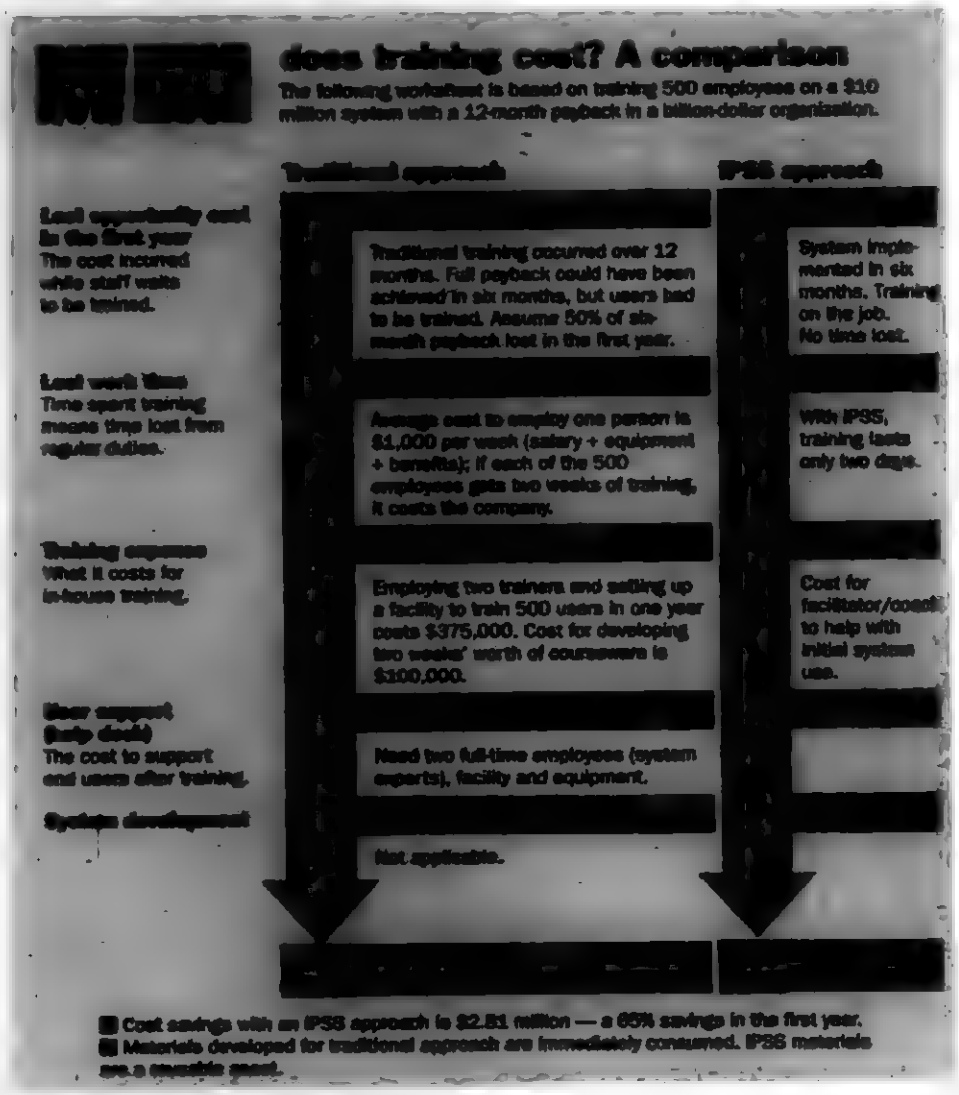
- **Electronic Performance Support Systems** By Gloria Gery (1991, Weingarten Publications, Boston)



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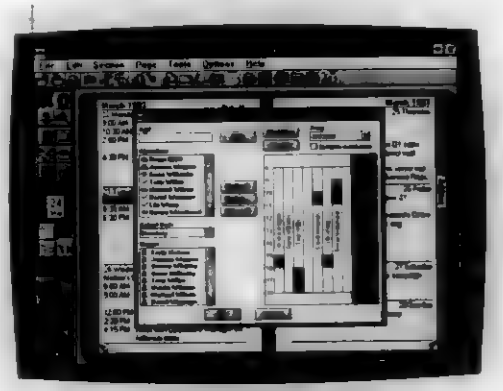

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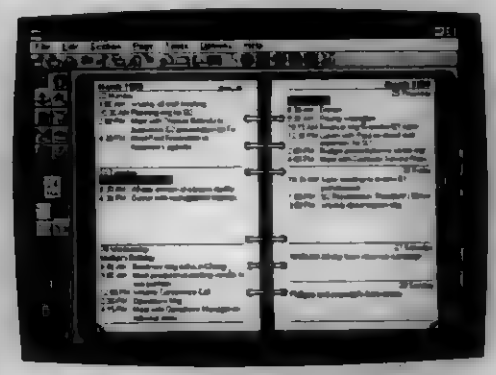

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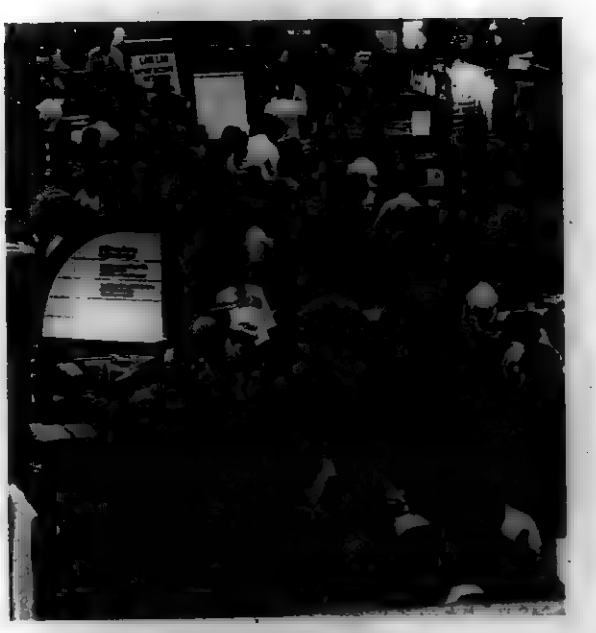

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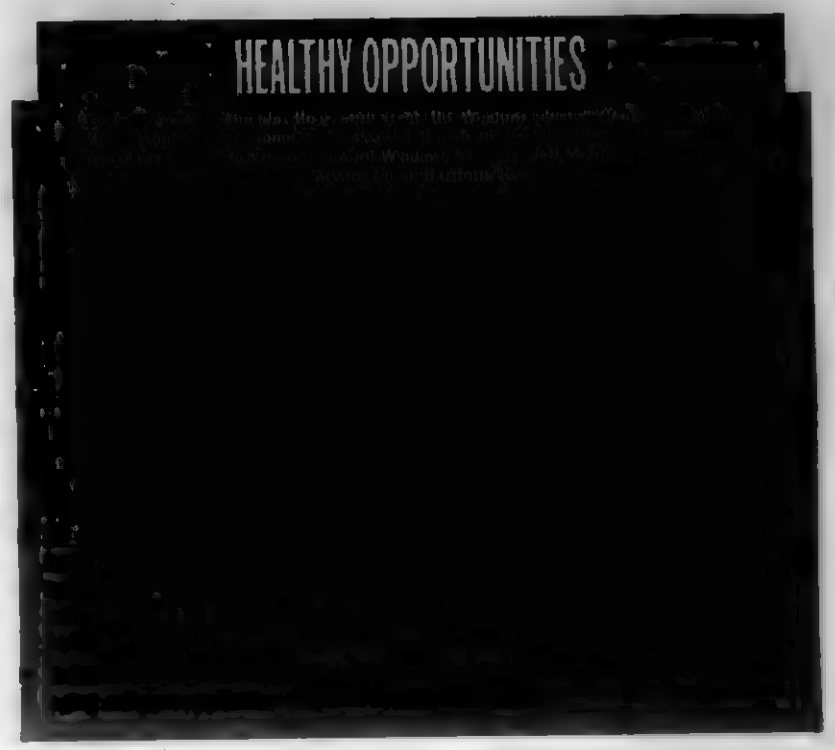
ENERGIZE with Windows

Boost a sagging career through Windows development. Experts say job prospects look good.

By David Baum



DEVELOPERS HAVE to work in the environments their employers have chosen, and many are choosing Windows.

"Most new PC installations these days are Windows installations. We're talking about 30 million PCs purchased last year alone," says John Rymer, an analyst at the Patricia Seybold Office Computing Group in Boston.

If your shop is moving to Windows and you want to move with it, be prepared to face two primary technical challenges, says Joel Diamond, co-founder of the Windows Users Group Network in Media, Pa. You must learn the C programming language and the Windows operating environment, including messaging, interface issues and memory management.

"If you want to learn about Windows programming from the pure root, that means C and C++ programming," Diamond says.

A good Windows programmer thinks of function first and then emphasizes the interface, he adds, making knowledge of C almost essential. But people wanting a quicker entry into Windows can turn to a host of visual programming tool sets, such as Microsoft Corp.'s Visual Basic, Gupta Corp.'s SQL Windows or Borland International, Inc.'s ObjectVision. These tools hide much of the complex, system-level C programming inherent in creating an application. Prepackaged building blocks help you build applications quickly.

Jeff McGroary, principal at The Aristos Co., a Windows consulting firm in Hartford, Conn., voices skepticism about this approach. "There's no such thing as a free lunch," he says. "If an application is that easy to develop, there has to be some overhead incurred. Ultimately, programmers must have the core skills in C to create a workstation full of solid, well-performing applications."

Required learning

Whether or not to learn C is a moot point because most employers require it. "What I typically hear from employers is this: a need for people with a C and possibly C++ background, a year of experience programming under Windows and an understanding of the Windows GUI," says Dan Shafer, editor of the "Inventive User Letter" and president of Graphic User Interfaces, Inc., a consulting firm in Redwood City, Calif. But knowing an event-driven environment, Windows or otherwise, is the key, Shafer adds. "Experience with Motif, Macintosh or OS/2 Presentation Manager will probably make you a reasonable candidate for most Windows positions," he says.

While you're at it, Diamond suggests that you become an expert in the use of a specific software package such as Borland's Paradox for Windows or Microsoft's Word for Windows. Many departmental workgroup applications are created by customizing these off-the-shelf packages by writing macros in Basic, C and a variety of other languages, he says.

"In the Windows world, this is how many applications that support day-to-day business transactions in a horizontal part of a company are created. It wouldn't be a bad idea to adopt a specialty, get to know one of these products inside and out and master its programming APIs," Diamond says.

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.

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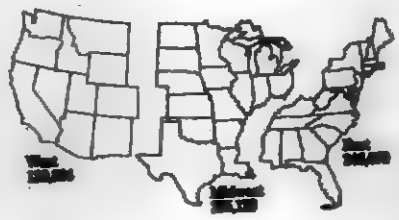

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Caught in a LAN*slide*

Programmers are being asked to take on more LAN responsibility. Those who have done so say it's difficult but manageable.

By Julie Hart

If you're a mainframe programmer, take heed. Many of your peers are being pushed into the local-area network world. And you could be next.

For the past two years, Navajo Agricultural Products Industry in Farmington, N.M., has been moving to the LAN environment. "When I came on board, we were just starting to downsize," says programmer/analyst Rick Hoskie. "At the time, about three programmers left the company. I guess they just couldn't cope with the changes."

Jobs in

Programmers say learning about how LANs work is all part of the downsizing process. They share more ownership of LAN management than they did when working in the mainframe world, where a strict division of duties between systems administrator and applications programmer exists.

Of the new skills required, network troubleshooting is an essential one for some. "With a LAN, equipment just doesn't plug and play," Hoskie says. "There's a lot more involved than that. I had to learn a lot about Ethernet protocols, including data collisions and packet transfers."

This also means mastering network operating systems, including standards for file transfer and remote file management, printer handling and system recovery. The key is to keep the LAN up and running. Without adequate LAN knowledge, programmers asked to take on this additional responsibility will be stuck.

Paul Davis, lead programmer at Loral Control Systems in Archbald, Pa., needed to learn more about hardware, including the use of Open Data Interface and IPX drivers. "I wrote a program that I couldn't get to execute," Davis says. "If I were working on the mainframe, I would have called the systems programmer for help. But on the PC, I have to do the debugging myself, since it's likely that I caused the problem."

Knowing whether the LAN is optimized, or which drivers to use, makes a difference. "I was able to get the program to execute on my own," he says.

What's next?

Some of those who have already made the switch to the LAN arena, or are in the process, say learning to work with an object-oriented programming language is the next priority.

The Davies Can Co. in Solon, Ohio, for instance, programmed in Cobol and RPG before beginning its transition to LANs early last year. Now, programmers work with Powersoft Corp.'s PowerBuilder. Rather than move to the LAN environment cold turkey, programmers are still "babysitting the mainframe," says Glen Case, senior programmer. This gave programmers a chance to make mistakes. "We're almost ready to test our first payroll system," he adds.

"Using objects is hard to learn," Case says. "And not because it's technically difficult. It's more of an adjustment in thinking. In Cobol and RPG, we worked in a very structured environment; now, the structure is gone. But once you grasp the concept of reusable code, you realize its power over RPG."

By using the object-oriented approach, programmers spend more time thinking about how an application will be used rather than about how it will be created. "I can build better applications, since Visual Basic worries about the details," Davis says.

"The first time I used Visual Basic I thought I'd go nuts," he adds. "It's a whole new mind-set. Instead of writing code, I had to learn how to just ask for what I want."

Hart is a free-lance writer in San Jose, Calif.

Training jump start

If your company is pushing you toward LANs, prepare yourself for a few hurdles

Glen Case, senior programmer at The Davies Can Co., strongly recommends formal training for everything — from operating systems to development.

"We wasted about two months thumbing through manuals," Case says. To cut the learning curve, Davies' programmers eventually attended Microsoft Corp.'s University and a Powersoft Corp. PowerBuilder class. "When an instructor touched on a concept that appeared in the manual, we at least had an idea of what he was talking about."

"We're only allowed one training session per year."

Rick Hoskie, programmer/analyst, Navajo Agricultural Products Industry

Federated Rural Electric Co. in Jackson, Minn., also plans to move to the LAN environment in another six months or so. When the change occurs, programmer Steve Lawson says, application development will continue on the company mainframe. "I have to make sure that everyone has access to the mainframe from their PC, and I don't expect this will be easy."

If your company won't or can't send you to training, don't despair. "Born again" programmers say the true key to unlocking learning potential lies in your attitude.

"The cost of education is the biggest hurdle. It can be about $10,000 to $15,000 or more per programmer."

Glen Case, senior programmer, The Davies Can Co.

"I learned everything the hard way — reading manuals," says Robert Conklin, data processing manager, programmer and systems administrator at Milwaukee Mack Sales, Inc. in Milwaukee. "But that's the way it is. I'm just glad we stayed in the DOS environment and I didn't have to learn Unix."

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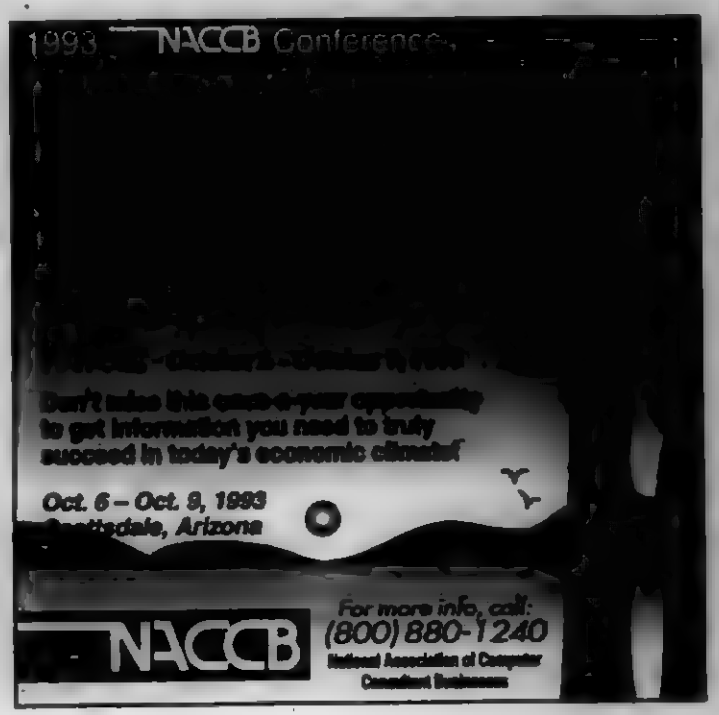

MASSEY UNIVERSITY

SENIOR LECTURER/LECTURER
Department of Information Systems

The Department of Information Systems is seeking interested and experienced information systems practitioners to complement its group of enthusiastic and supportive colleagues. Applicants must be in possession of a good Honours degree together with several years of experience.

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The successful candidate will be expected to contribute a modern view of systems development to teaching the undergraduate programme, and to teach graduate courses in an area of interest. In addition, they will undertake their own personal research activities and participate in outreach programmes locally and nationally.

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Enquiries of an academic nature should be addressed to the Acting Head of Department, Associate Professor Chris Freyberg (e-mail: C.Freyberg@massey.ac.nz).

Reference number CWUSA 77/93 must be quoted.

Closing date: Open.

An information package including Conditions of Appointment is obtainable by telephoning extension 7318.

Applications, including a full curriculum vitae and the names, addresses and fax numbers of three referees should be sent to Mrs V B Bretherton, Personnel Section before the closing date specified.

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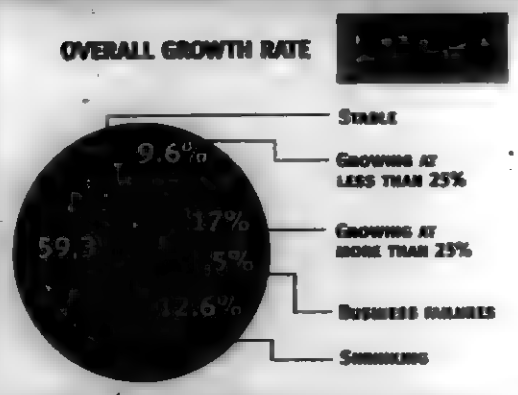

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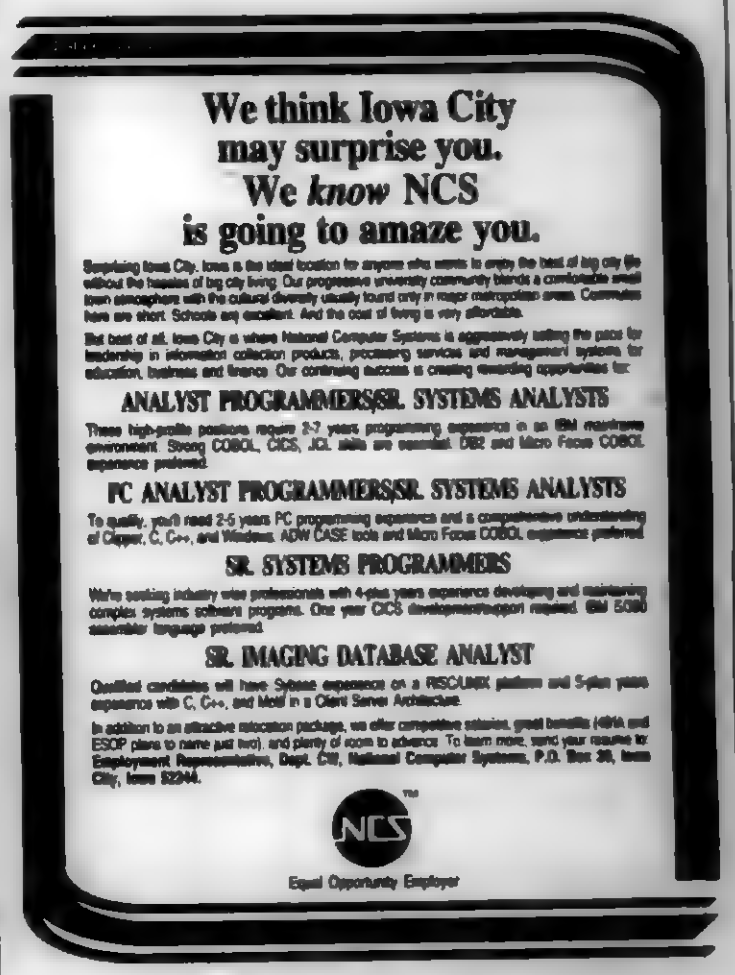

Senior Programmer Analyst - Plan/develop/test/evaluate/document comp. progs., design files & NATURAL/ADABAS/NATURAL SECURITY applic. sys., meet w/ clients & their tech. staffs to isolate/define sys. & business probs. & -fashion solutions; prep. sys. doc. for comp. components; assist in tech. eval. of estimation process, test progs./create req'd corrections, lead sys. implement. at customer sites in coord. w/their staffs, dev. tech. expertise of custs. & their staffs; lead/direct programmer/analysts & assist them in dev. of applic. sys.; utilizing sys. expertise to minimize costs, isolating/defining customer needs & fashioning cost/effect. solutions. Teaching customers & their staffs NATURAL & other products. Bach. or equiv. in comp. sci. related field. & 2 yrs. exp. in job offered or in sys. analysis, req'd. Exp. must incl. NATURAL/ADABAS/NATURAL SECURITY. Travel in US req'd. 70% of time. Must be willing to temporarily relocate for longer term jobs. $48,950. Apply at TEC, Dallas, TX, or send resume to TEC, TEC Bldg., Austin, TX 78778, JO#6844385. Ad paid by Equal Opportunity Employer.

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PROGRAMMER ANALYST (REF. #50793) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl analysis, design & development of an integrated welfare sys & hospital management sys. Responsibilities incl data modeling, process flow & data flow design, user liaison & tech support. Tech support provided will be design, coding & testing of applications using IBM 3090, IBM 4381, IBM PC compatibles, MVS/XA, MVS/ESA, TSO, IMS DB/DC, CICS, DB2, TELON, MICROFOCUS WORKBENCH, CLARION, COBOL/2, MF-COBOL, NEWVIEW, REXX, CLISTS, MSWORD & EZYTRIEVE. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, analyses & design of app sys, sys coding & testing, & using IBM 4381, IMS DB/DC, CICS, DB2, MICROFOCUS WORKBENCH & CLARION. $34,000/yr, 40 hr/wk.

SOFTWARE ENGINEER (REF. #50893) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties: Customizing & supporting A-Series IPS (Item Processing Sys) pkg, incl writing Req Definition spec., modification of various modules of A-IPS & BPS (Bulk Filing System), sys testing & DVT (Design Verification & Testing) of customized product. Customizing & support PTA (Proof & Transit Application) & RPA (Remittance Processing Application) on DP500 document processors. Responsibilities also incl tech support of DCH (Data Comm. Handler) libraries, providing interface btwn a UNISYS high speed document processor (DP1800, DP1000) & UNISYS mainframe sys (A-series & V-series); customization of RPA & PTA apps in a networked client-server environment using UNISYS B30 line of workstations, & using DP1800, 1000, 900, B30, UNISYS A-series op env, WFL, COMS, VCS, ALGOL, PASCAL, COBOL74, CP2000 network processor, DCDUP, 4ADUP Data-comm protocols & BTOS. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, development of app sys; customization & support of Item Processing Sys; & using UNISYS A-series, COBOL 74, COMS & ALGOL. $36,000/yr, 40 hr/wk.

SYSTEMS ANALYST (REF. #64893) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl an analytical data management integrated network sys. Responsibilities incl process flow & data flow design, data modeling identification, tech support & overall design of application entry part of the sys, & meeting users to gather reqs. Tech support provided will be for design of applications using VMS on VAX using VMS, CMS, MMS, ORACLE V6.0 & V7.0 on VAX micro clusters. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, application development & using VAX/VMS, Micro VAX, & Clustered VAX. $34,000/yr, 40 hr/wk.

SYSTEM ENGINEER (REF. #65293) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl analysis & design of application s/ware sys, incl database modeling & data communication. Managing/modules of large application development projects. Duties req using IBM ES 9000 series sys running VM operating sys, IBM PCs, SQL/DS or DB2, VSE/VSAM, COBOL, FOCUS, AS, CICS, REXX, ASSEMBLER, ISPF, TSO, QMF, KEYPLAY, EXCELERATOR, DBASE, LOTUS WINDOWS, WORD & C. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, Sys Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, sys analyses & design, & using IBM ES9000 Series, PCs, VM Operating Sys, DB2 or SQL/DS, VSE/VSAM, COBOL, FOCUS, CICS, REXX, ASSEMBLER, EXCELERATOR, LOTUS, DBASE & KEYPLAY. $34,000/yr, 40 hr/wk.

SYSTEMS ANALYST (REF. #65083) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: perform s/ware analysis, design & development required for maintenance & enhancements of app s/ware of document processors of networked payment processing sys. Responsibilities incl programming, debugging & solving problems with least impact on released app & easier upward migration of s/ware levels; tech support & training team members as needed using B38 comp with BTOS II operating sys using Pascal language with forms & BTOS debugger utilities. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, design, maintenance & enhancement of applications; using B39, BTOS II & Pascal with forms. $34,000/yr, 40 hr/wk.

SR ANALYST/PROGRAMMER (REF. #65393) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl an integrated welfare sys. Responsibilities incl interfacing with user for reqs. planning, design, programming, testing, documentation & tech support. Tech support will be provided for the design & development of applications using IBM 3090, IBM PCs, MVS/ESA, TSO, ISPF/PDF, IMS DB/DC, TELON, File-AID, XPEDITER, COBTEST, JCL, Banyan Systems VINES LAN, MICROFOCUS COBOL/2 WORKBENCH, VS COBOL II, SPF & MS-WORD for PCs used for sys design. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, application sys design, sys testing & documentation, user interface, & using IBM 3090, MVS/ESA, TSO, ISPF/PDF, VS COBOL II & IMS. $34,000/yr, 40 hr/wk.

SYSTEMS ANALYST (REF. #64993) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl analysis, design & development of an integrated welfare sys. Responsibilities incl gathering reqs from customers, analyze & design the process flow & data flow, overall design of Application Entry Module & tech support. Tech support provided will be for the application design using IBM 3090, MVS/ESA, IMS DB/DC, TELON, VS COBOL II, MICROFOCUS WORKBENCH, TSO/ISPF, REXX, CLIST. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, application sys design using IBM 3090, MVS/ESA, IMS DB/DC, TELON, MICROFOCUS WORKBENCH, TSO/ISPF & CLIST. $34,000/yr, 40 hr/wk.

SYSTEMS ANALYST (REF. #65193) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl design, development, implementation & support (production/clients) for an application s/ware sys. Responsibilities incl process flow, data flow design, data modeling, identification, data base modifications, sys testing & meeting with users to gather reqs, administering the production Data Base & maintaining data communication network. Technical support will be for design of Applications using UNISYS A & V Series with CP2000 Comp, COMS, DMS II, COBOL, LINC (4GL), XGEN (4GL). ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, application design, program or sys testing, & using UNISYS A Comp, DMS II, COBOL & XGEN. $34,000/yr, 40 hr/wk.

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Programmer/Analyst to analyse business procedures and problems to refine data and conduct it to customized programmable form, studies existing programs to evaluate effectiveness, develops new programs to improve production specifics in detail logical and for mathematical operation to be performed by comprehensive computer programming; debug programs and train end users. Programming design for DEC, VMS, and INGRES system. Requirements: B.S. in Math or Computer Science plus two years experience necessary. Experience must include DEC and VMS plus INGRES or some other relational database product. M.S. in Computer Science may substitute for one year of experience. Salary: $31,600 per year/40 hour work week. Qualified applicants to submit resume to: Illinois Department of Employment Security, 401 South State Street, 3 South, Chicago, Illinois 60605. Attention: Mikune Counts. Refer to Job Order #V-IL 106911C. Send two copies of resume. Must have proof of legal authority to work permanently in the U.S. An employer paid ad.

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SOURCE: Skill Survey of Computerworld's Audience, August 1992.

Call for a copy of our Skill Survey.

Computerworld erred. A similar advertisement ran in the December 21, 1992 issue of Computerworld. That advertisement incorrectly stated that the Skill Survey had been verified by the Audit Bureau of Circulations.

It is a fact that ABC audits our circulation figures but this study, conducted by IDG Research Services, was not verified by ABC.

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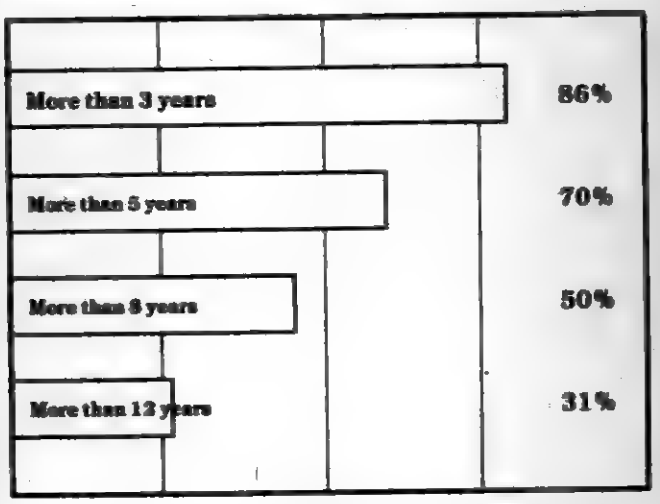

Source: Skill Survey of Computerworld's Audience, August 1992.

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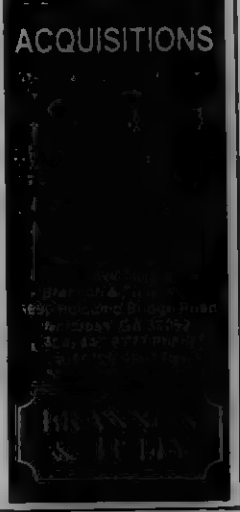

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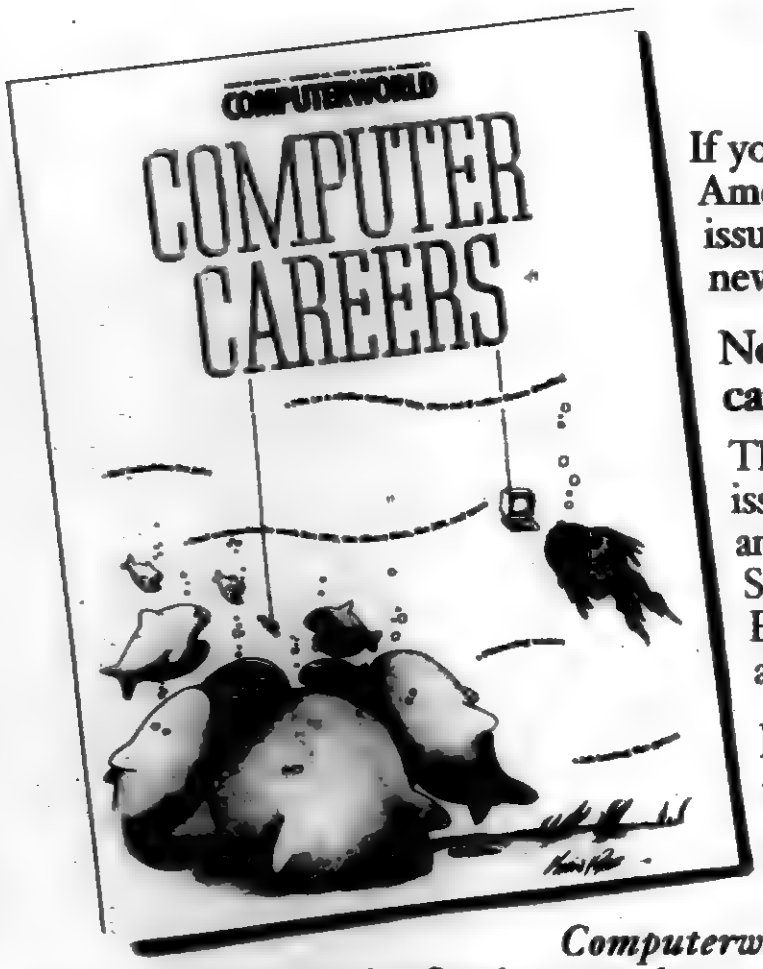

Issue Date: October 31, 1993
Close: September 17, 1993

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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!

Don't forego experience

Technical certifications are all the rage but often lack the ability to qualify real-world experience

USER'S VIEW

Cocks is a networking specialist with more than 13 years of experience. He recently completed his CNE certification.

By Edward Cocks

When shopping for network professionals to add to your staff, you may be using technical certifications as a prerequisite for hiring. But, even though these certifications are in demand right now, hiring companies should be wary. Certifications often require no on-the-job training to pass, and you could wind up with employees who have less real-world experience than you had bargained for.

In the last year, I've had many conversations regarding this trend, and one feeling is common: Depending on experience, many certified people sorely need a reality check when it comes to running production networks. In my opinion and those of my colleagues, realistic network environments cannot be taught in static classrooms.

These programs are good for training vendors, but advanced courses are too vendor-specific and lack the means to evaluate production experience in a multiproduct environment. Even Microsoft Corp. and Novell, Inc. insist their programs are designed to establish a baseline of knowledge, allowing individuals to progress into a specialized area.

"Just as an MBA doesn't make the individual an expert in business, the Certified NetWare Engineer indicates that they have the basic knowledge and awareness of the products to the point where they can pass an in-depth test," says K. C. Sue, director of education and marketing at Novell.

Celeste Boyer, development manager at Microsoft's Information Certification and Education Division, agrees, stressing that the Microsoft Certified Professional certification should be one criterion in evaluating a job applicant.

Big buy-in

Nonetheless, some companies are buying into certifications in a big way. They have made certification a prerequisite to employment.

Earlier this year, for instance, a senior Citicorp systems manager told me his company employs more than 200 CNEs. This is considerably more than the number most Novell vendors and large systems integrators employ, and it qualifies Citicorp to be a platinum-level systems integrator.

I thought I had missed something until a director of information systems for a large city/county government expressed the frustration he felt while searching for a qualified network designer/architect. He advertised for CNEs with three years of local- and wide-area networking experience, but out of 20 applicants, only four had marginal levels of experience. He he had cut himself off from experienced people who did not apply because of the required certification.

Get generic standards

It's understandable that resellers and manufacturers need to hire these people to sell and support their products. It's also possible to understand how large companies such as Citicorp can commit to hiring and maintaining that level of expertise. But what about the mid-size company whose shops have the most diverse product mixes and where interoperability is a way of life?

Groups such as the Institute for the Certification of Professionals, the Local Area Network Dealers Association and the Microcomputer Managers Association are working to establish generic non-vendor-specific certification levels, but they are not available yet. In the meantime, training companies are the ones benefiting from the hoopla: They are being deluged with students seeking courses that will prepare them for certification tests.

Until we accept generic certifications for PC specialists, network administrators, engineers and analysts and then look for product specialization, many managers and personnel administrators would be better off increasing experience requirements rather than expecting the vendors to solve their screening problems.

HEAD COUNT

Novell, Inc.'s technical certifications are on the rise

Certified NetWare Engineers (CNE)	[redacted]
CNEs who have gone on to become Enterprise Certified NetWare Engineers	1[redacted]
Certified NetWare Administrators	[redacted]

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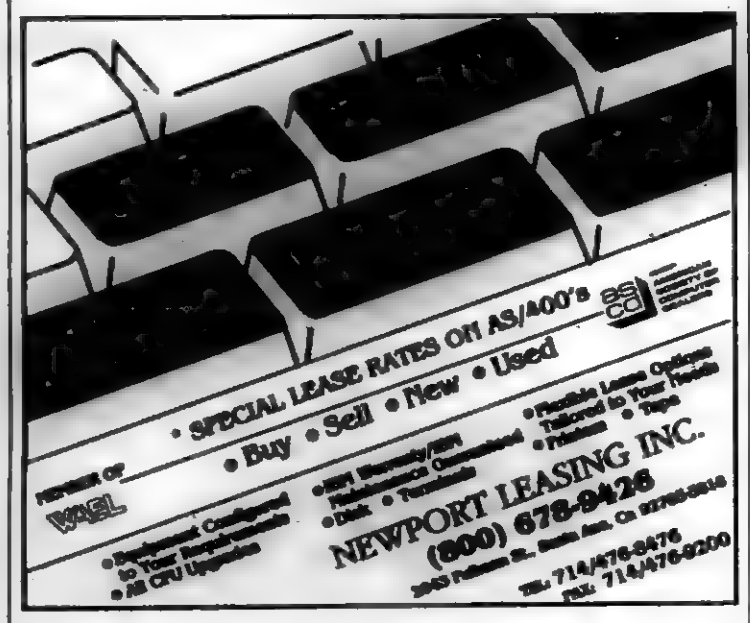

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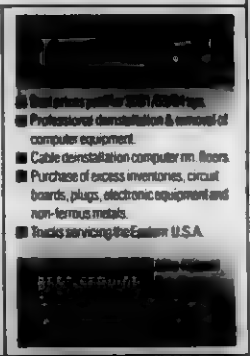

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Gainers

Percent

Sequoia Systems Inc.	78.0
Alysis Corp.	46.9
McAfee Associates	25.0
Chips and Technologies(H)	22.2
Cray Computer	21.7
Canal Corp. (H)	19.4
Gateway Communications	17.3
Parallan Computer(H)	16.0

Dollar

Novametrix Medical Systems (H)	7.25
Bell Atlantic Corp.	4.75
Informix Inc.	4.63
Canal Corp. (H)	4.50
AT&T	4.13
3 COM Corp.	3.75
Scientific Atlanta Inc.	3.75
Intelligent Info. Systems	3.25

Losers

Percent

System Software Assoc.	-20.2
Sybase Inc.	-18.8
Standard Microsystems Software	-18.1
Easel Corp.	-14.9
IPL Systems Inc.	-13.3
Lotus Development	-13.1
HMS	-11.8
Cadmus Peripherals	-10.9

Dollar

Sybase Inc.	-13.75
Cabletron Systems	-6.75
Lotus Development	-4.63
System Software Assoc.	-4.50
Progress Software Corp.	-4.25
Microsoft Corp.	-3.75
Platinum Software	-2.75
Telxon(H)	-2.50

Workstation high jinks

Intergraph Corp. (INGR), an engineering workstation vendor that has struggled in that market recently, sparked some curiosity last week by announcing a Shareholder Rights Plan. The plan, commonly known as a "poison pill," was designed to discourage hostile takeover bids.

The plan will not prevent a friendly buyout or merger. It should encourage potential buyers to "negotiate appropriately" with Intergraph instead of taking it by force, according to the company's statement. Intergraph also said the move was "not adopted in response to any specific attempt to acquire control of the company."

Neeraj Vohra, an analyst at Standard & Poor's Corp., agreed that the Shareholder Rights Plan serves as a very effective security system. "If there was something going on, that should put a damper on it," he said.

However, Vohra questioned Intergraph's assertion that no specific deal was brewing. "Typically, they only do this if there's a threat," he said. "It takes a lot of effort to put this together. If you're a company that hasn't made money in several quarters, you better be spending time on something constructive," Vohra said.

Vohra noted that Intergraph's more constructive recent moves include announced ports of its computer-aided design and engineering software to **Silicon Graphics, Inc.**'s (SGI) workstations and to **Microsoft Corp.**'s (MSFT) Windows NT operating system.

Meanwhile, workstation rivals Silicon Graphics and **Sun Microsystems, Inc.** (SUNW) are also commanding a lot of Wall Street attention these days but for different reasons than Intergraph.

Despite doubts raised among customers [CW, Aug. 23] and some evident investor reticence (Sun issues were near its 52-week low last week), analysts said they like Sun's prospects. New SPARCcenter products improve the company's standing in the server market. Also, although Sun shipped several new products late during the past few quarters, it has maintained its market share. "Clearly they must have been doing something right, or else their customers wouldn't have stayed around," said Laura Conigliaro, a computer analyst at Prudential Securities, Inc.

Silicon Graphics has raised its profile with heavy exposure in the blockbuster movie *Jurassic Park* and with moves into the consumer sector. Last week the company announced it will license chip technology to Nintendo for use in a three-dimensional game system due out in 1995. Several analysts recommended purchase of Silicon Graphics shares.

— Derek Slater

Exch	52-Week Range			Aug. 27 Wk 3 Pm	Net Wk Change	Wk Pct Change
Networking and Communications Software						
OTC	40.00	11.00	3 COM Corp.	26.88	3.75	16.2
NYS	83.63	63.38	American Info Techs Corp.	83.63	1.00	3.7
NYS	65.00	40.63	AT&T	62.25	4.13	7.1
OTC	4.06	0.75	Aztel Communication Corp.	3.56	0.13	3.6
OTC	24.50	11.50	Banyan Systems Inc.	18.00	0.00	0.0
NYS	61.13	44.50	Bell Atlantic Corp.	61.13	4.75	8.4
NYS	58.88	46.75	Bellsouth Corp.	57.13	2.50	4.6
NYS	14.75	3.63	Bolt, Beranek & Newman	11.38	-1.13	-9.0
OTC	18.50	9.50	Brooktrout Technology	12.25	1.75	16.7
NYS	139.00	56.50	Cabletron Systems	108.00	-5.75	-5.1
OTC	30.25	5.88	Centigram Communications	28.25	-1.00	-3.4
OTC	55.50	20.25	Chipcom Corp.(H)	51.75	0.50	1.0
OTC	59.25	22.63	Cisco Systems Inc.	51.50	-2.00	-3.7
OTC	16.38	5.50	Compression Labs Inc	14.25	0.88	6.5
OTC	36.00	14.75	CrossComm	25.50	-0.25	-1.0
OTC	4.63	1.44	Data Switch Corp.	2.75	-0.19	-6.4
NYS	19.88	12.38	Digital Comm. Assoc.	14.00	0.13	0.9
OTC	12.75	3.75	Digital Systems Int'l Inc.	4.00	0.00	0.0
OTC	63.00	6.38	DSC Communications(H)	62.88	2.75	4.6
OTC	9.50	4.75	Fibronix Int'l Inc.	5.13	-0.13	-2.4
OTC	24.00	8.75	Filenet Corp.	13.75	1.00	7.8
OTC	4.38	1.50	Gandalf Technologies Inc.	2.63	-0.13	-4.5
OTC	2.06	0.75	Gateway Communications	1.06	0.16	17.3
NYS	15.75	3.00	General Datacomm Inds.	12.25	0.63	5.4
ASE	3.75	2.00	Go Video	2.38	-0.06	-2.6
NYS	37.75	32.38	GTE Corp.	36.50	1.38	3.9
NYS	94.38	62.75	ITT Corp.(H)	93.63	1.13	1.2
NYS	29.88	16.25	MCI Communications Corp.	26.50	-1.38	-4.9
OTC	6.50	1.50	Microcom Inc.	1.81	0.06	3.6
OTC	24.25	3.50	Netrix Corp.	5.88	1.88	46.9
OTC	19.00	7.00	Network Computing Devices	7.75	-0.25	-3.1
NYS	15.00	5.38	Network Equipment Tech.	9.63	0.38	4.1
OTC	20.13	8.00	Network General	12.63	-0.25	-1.9
OTC	15.75	6.88	Network Systems Corp.	8.38	0.38	4.7
OTC	73.50	7.88	Newbridge Networks Corp.(H)	73.50	7.25	10.9
NYS	46.00	21.38	Northern Telecom Ltd.	26.13	0.75	3.0
OTC	35.25	17.63	Novell Inc.	19.25	-1.75	-8.3
NYS	92.50	79.00	Nynex Corp.	89.00	1.00	1.1
OTC	30.00	16.50	Octel Communications Corp.	20.00	0.00	0.0
OTC	6.13	3.38	Penril Data Comm Networks	4.00	0.13	3.2
OTC	30.50	10.75	Picturetel Corp.	16.50	-1.00	-5.7
OTC	15.25	3.63	Proteon Inc.	5.13	0.69	15.5
NYS	36.00	17.00	Scientific Atlanta Inc.	36.00	3.75	11.6
NYS	44.00	31.75	Southwestern Bell Corp.(H)	44.00	2.25	5.4
NYS	36.88	22.25	Sprint Corp.	36.88	0.75	2.1
OTC	27.00	12.50	Standard Microsystems Corp.	19.13	0.00	0.0
OTC	18.50	8.25	Stratacom Inc.	13.00	-0.25	-1.9
OTC	42.75	11.50	Synoptics Communications	28.63	0.38	1.3
OTC	6.63	2.88	Telebit Corp.(L)	4.75	0.00	0.0
OTC	13.25	2.38	Telematics Int'l Inc.(H)	12.88	1.00	8.4
OTC	29.75	14.00	US Robotics(H)	29.00	-0.90	-1.7
NYS	47.75	35.25	U S West Inc.	46.00	1.13	2.5
OTC	56.00	18.75	Wellfleet Communications	49.63	-2.13	-4.1
OTC	19.00	7.25	Xylogics	17.75	0.00	0.0
Workstations						
OTC	5.56	2.50	Advanced Logic Research	3.13	0.25	8.7
OTC	65.25	25.25	Apple Computer Inc.	26.38	-1.13	-4.1
OTC	24.25	12.00	AST Research Inc.	14.75	-0.25	-1.7
NYS	9.25	2.50	Commodore Int'l	3.38	-0.13	-3.6
NYS	61.75	31.00	Compaq Computer Corp.	52.75	0.13	0.2
OTC	49.88	13.50	Dell Computer Corp.	18.00	-1.75	-8.9
NYS	89.25	50.25	Hewlett Packard Co.	73.88	0.50	0.7
NYS	41.00	17.63	Silicon Graphics(H)	39.38	1.13	2.9
OTC	41.00	24.00	Sun Microsystems Inc.	25.13	-1.75	-6.5
NYS	32.38	23.38	Tandy Corp.	29.50	-0.13	-0.4
OTC	7.00	2.75	Zeos International Ltd.	3.13	-0.13	-3.8
Large Systems						
ASE	15.13	4.63	Amdahl Corp.	4.81	-0.44	-8.3
NYS	8.75	3.63	Convex Computer	4.50	0.63	16.1
OTC	6.13	2.25	Cray Computer	3.50	0.63	21.7
NYS	30.88	19.00	Cray Research Inc.	22.88	2.13	10.2
NYS	13.88	7.63	Data General Corp.	9.00	0.00	0.0
NYS	49.25	30.38	Digital Equipment Corp.	40.63	2.50	6.6
NYS	44.00	28.38	Harris Corp.	41.00	-1.63	-3.8
NYS	88.75	40.63	IBM	43.75	0.75	1.7
OTC	22.00	5.50	Kendall Square Research	20.25	0.25	1.3
NYS	134.88	83.00	Matsushita Electronics(H)	133.38	1.88	1.4
OTC	23.75	8.25	Netframe	14.13	-0.63	-4.2
OTC	20.00	9.25	Parallan Computer(H)	20.00	2.88	16.8
OTC	22.63	6.00	Pyramid Technology(H)	22.63	2.38	11.7
OTC	24.00	11.25	Sequent Computer Sys.	15.25	1.38	9.9
OTC	8.75	1.38	Sequoia Systems Inc.	3.31	1.38	70.9
NYS	48.38	20.25	Stratus Computer Inc.	25.38	0.25	1.0
NYS	16.88	8.50	Tandem Computers Inc.(L)	8.75	-0.13	-1.4
OTC	23.50	10.63	TriCord Systems	19.13	-0.13	-0.6
NYS	13.88	7.75	Unisys Corp.	11.00	-0.13	-1.1
Software						
OTC	37.00	12.63	Adobe Systems Inc.	20.75	-0.50	-2.4
OTC	20.75	10.25	Aldus Corp.	17.50	0.13	0.7
OTC	11.25	5.50	American Software Inc.	7.00	-0.38	-5.1
OTC	28.13	9.50	Asa Computer Systems	11.38	0.50	4.6
OTC	56.75	38.75	Autodesk Inc.	45.63	4.63	11.3
OTC	9.25	2.50	Bachman Info. Systems	4.00	0.38	10.3
OTC	43.00	29.00	BGS Systems Inc.(L)	29.00	-1.00	-3.3
OTC	84.13	38.75	BMC Software Inc.	58.13	-0.63	-1.1
OTC	28.25	18.00	Boole & Babbage	23.63	-0.75	-3.1
OTC	49.00	15.25	Borland Int'l Inc.	17.75	-1.00	-5.3
OTC	5.00	2.75	CE Software	3.13	0.13	4.2
ASE	39.63	9.46	Cheyenne Software Inc.(H)	37.75	0.38	1.0
OTC	19.50	8.25	ChipSoft	15.00	1.88	14.3
OTC	8.88	5.63	Cognos Inc.	8.13	-0.25	-3.0
NYS	51.38	13.50	Computer Associates	30.00	-0.13	-0.4
NYS	11.25	2.75	Computervision Corp.	3.38	0.38	12.5
OTC	34.25	19.25	Computrade Corp.	28.00	0.13	0.4
OTC	14.75	5.75	Comshare Inc.	7.50	-0.75	-9.1
OTC	27.75	10.75	Cosoi Corp.(H)	27.25	4.50	19.4
OTC	15.25	5.00	Easel Corp.	6.00	-1.00	-14.3
OTC	25.25	12.00	4th Dimension	19.00	-0.88	-4.4
OTC	19.50	5.25	Frame Technology	7.75	0.13	1.6
OTC	17.50	8.38	Group I Software	10.00	-0.50	-4.8
OTC	35.25	14.50	Gupta	17.25	-1.00	-5.5
OTC	10.25	4.13	Hogan Systems Inc.	8.88	-0.38	-4.1
OTC	25.75	11.25	IMRS	18.75	-2.50	-11.8
OTC	38.25	21.00	Information Resources(H)	37.25	1.38	3.8
OTC	27.25	9.25	Informix Corp.	20.25	-0.75	-3.6
OTC	16.75	8.50	Intergraph Corp.	11.00	1.00	10.0
OTC	13.63	6.00	Interleaf Inc.	7.00	0.13	1.8
OTC	18.00	4.75	Intersolv Inc.	8.25	1.00	13.8
OTC	16.00	7.75	Knowledgeware Inc.	10.75	0.63	6.2
OTC	54.75	15.50	Legent Corp.	19.75	-1.25	-6.0
OTC	40.13	14.75	Lotus Development	30.75	-4.63	-13.1
OTC	23.00	5.13	MathSoft(L)	5.13	-0.38	-6.8
OTC	23.25	4.50	McAfee Associates	10.00	2.00	25.0
OTC	11.63	2.00	Meca Software	5.50	-0.25	-4.3
OTC	12.00	5.25	Mentor Graphics	9.75	0.88	9.9
OTC	46.00	26.25	Micro Focus	30.25	0.38	1.3
OTC	13.25	4.38	Microgbafx Inc.	6.63	0.25	3.9
OTC	98.00	70.38	Microsoft Corp.	71.75	-3.75	-5.0
OTC	56.38	17.25	Oracle Corp.(H)	51.25	-2.00	-3.8
OTC	39.75	18.38	Parametric Technology(H)	37.25	-1.38	-3.6
OTC	40.50	22.50	Peoplesoft	33.88	-2.38	-6.6
OTC	7.13	3.50	Phoenix Technologies	4.13	-0.25	-5.7
OTC	40.00	22.00	Powersoft	27.50	-1.75	-6.0
OTC	61.50	17.00	Platinum Software	37.25	-2.75	-6.9
OTC	25.00	10.75	Platinum Technology	13.00	-0.75	-5.5
OTC	61.50	32.25	Progress Software Corp.	48.25	-4.25	-8.1
OTC	7.38	2.56	Quarterdeck Office Sys.	3.06	0.06	2.1
OTC	32.00	15.00	Rainbow Technologies Inc.	27.50	-1.00	-3.5
OTC	11.25	4.00	Rasterops(H)	10.38	0.00	0.0
OTC	15.25	5.63	Ross Systems	10.25	0.75	7.9
OTC	27.75	9.63	Sapiens Intl. Corp. N.V.	22.75	-0.75	-3.2
OTC	14.50	5.50	Software Publishing Corp.	7.13	0.13	1.8
OTC	14.13	2.63	Software Toolworks Inc.	13.38	0.50	3.9
OTC	2.75	0.75	Spinnaker Software	1.63	0.06	4.0
OTC	13.75	3.25	State of the Art(H)	12.88	0.63	5.1
NYS	24.63	15.00	Sterling Software Inc.	22.63	-0.50	-2.2
OTC	21.63	8.00	Struct. Dynamics Research	20.50	0.63	3.1
OTC	77.50	29.00	Sybase Inc.	59.50	-13.75	-18.8
OTC	18.63	5.88	Symantec Corp.	15.75	0.63	4.1
OTC	25.50	10.00	System Software Assoc.	17.75	-4.50	-20.2
OTC	6.38	2.75	Tomlinc Corp.	4.13	0.13	3.1
OTC	24.00	11.25	Viewlogic Systems(H)	22.00	0.25	1.1
OTC	23.50	5.50	Walker Interactive Systems	6.00	0.25	4.3
OTC	3.19	1.00	Wordstar(L)	1.13	0.06	5.8
Specialized						
NYS	12.88	8.38	Advanced Micro Devices	11.13	0.25	0.8
NYS	26.00	9.38	Analog Devices Inc.(H)	23.50	-1.00	-4.1
OTC	35.00	8.00	Atmel Corp.	33.38	0.88	2.7
OTC	5.88	2.75	Chips and Technologies (H)	5.50	1.00	22.2
OTC	39.75	13.00	Cirrus Logic	26.00	0.00	0.0
NYS	16.75	7.88	Cypress Semiconductor Corp.	15.00	-0.88	-5.5
NYS	19.00	9.88	Dallas Semiconductor	17.13	-1.38	-7.4
OTC	67.25	28.81	Intel Corp.(H)	63.75	0.25	0.4
OTC	19.25	5.25	LSI Logic Corp.	17.25	-0.63	-3.5
OTC	24.25	11.66	Lattice Semiconductor	23.75	0.50	2.2
NYS	56.50	14.38	Micron Technology(H)	51.50	-1.25	-2.4
NYS	99.13	61.38	Motorola Inc.(H)	95.63	-0.38	-0.4
NYS	19.50	9.88	National Semiconductor	18.25	-0.25	-1.4
OTC	15.75	6.50	Sierra Semiconductor	8.25	0.88	11.9
OTC	51.75	24.50	SynOptics	48.00	-2.00	-4.0
NYS	84.25	38.13	Texas Instruments(H)	80.75	0.38	0.5
OTC	15.13	6.50	VLSI Technology	13.63	0.00	0.0
OTC	13.25	2.63	Weitek	12.00	-0.63	-5.0
ASE	9.63	3.63	Western Digital Corp.	5.75	-0.13	-2.1
OTC	46.25	14.50	Xilinx(H)	42.50	-2.50	-5.6
OTC	33.00	15.88	Zilog Inc.	30.25	-0.75	-2.4
Peripherals: Disk and Tape						
OTC	48.00	15.63	American Power Conversion	43.75	-1.25	-2.8
OTC	20.16	15.50	Banctec Inc.	18.25	-0.50	-2.7
OTC	18.00	3.75	Cambex Corp.	3.75	-0.25	-6.3
ASE	18.38	3.88	Cognitronics Corp.	5.38	-0.50	-8.5
NYS	25.50	9.00	Conner Peripherals	11.25	-1.38	-10.9
OTC	38.50	13.00	Creative Technologies Inc.	30.75	-0.63	-2.9
OTC	30.75	11.00	Data Race Inc.	13.75	0.50	3.8
ASE	13.25	4.75	Dataram Corp.	7.88	-0.75	-8.7
NYS	34.25	5.34	EMC Corp.(H)	32.88	0.50	1.5
OTC	10.50	5.38	Emulex Corp.	6.63	-0.75	-10.2
OTC	19.00	13.25	Evans & Sutherland	16.75	-0.25	-1.5
OTC	25.00	7.50	Exabyte	10.00	-0.13	-1.2
OTC	30.25	7.13	Intelligent Info. Systems	30.25	3.25	12.0
OTC	8.88	3.38	Iomega Corp.(L)	3.75	0.13	3.4
OTC	15.25	5.75	IPL Systems Inc.	6.50	-1.00	-13.3
OTC	24.00	14.25	Komag Inc.	20.25	-2.25	-10.0
OTC	19.63	4.38	Maxtor Corp.	6.50	0.13	2.0
OTC	10.75	5.75	Micropolis Corp.	7.25	0.00	0.0
NYS	117.00	97.00	3M Corp	100.63	1.13	1.0
OTC	7.75	6.00	Printronix Inc.	6.50	-0.50	-7.1
NYS	17.25	6.88	Qms Inc.	9.00	-0.25	-2.7
OTC	17.88	9.50	Quantum Corp.	12.00	-0.88	-6.8
OTC	7.38	3.13	Radius Inc.	4.50	0.25	5.9
NYS	16.50	8.13	Recognition Equipment	15.75	1.25	8.6
OTC	13.88	3.75	Rexon Inc.	4.50	-0.50	-10.0
OTC	22.38	12.00	Seagate Technology	19.63	-0.88	-4.3
NYS	45.00	18.00	Storage Technology	29.13	2.13	7.9
NYS	27.88	17.63	Tektronix Inc.	25.13	0.50	2.0
NYS	88.88	70.25	Xerox Corp.	74.13	-0.50	-0.7
Services						
OTC	23.75	14.88	American Mgmt. Systems	17.75	0.00	0.0
NYS	4.75	2.38	Amacomp Inc.	3.00	-0.13	-4.0
OTC	35.75	16.75	Analysts Int'l	34.75	0.13	0.4
NYS	56.13	43.00	Auto Data Processing	47.88	-0.38	-0.8
NYS	17.25	13.00	Ceridian Corp.	16.88	1.50	9.8
NYS	17.38	13.13	Comdisco Inc.	14.38	0.00	0.0
OTC	9.50	4.50	Computer Horizons(H)	9.25	0.00	0.0
NYS	91.63	64.00	Computer Sciences(H)	88.25	2.00	2.2
NYS	9.25	6.00	Computer Task Group	6.00	-0.38	-5.9
NYS	40.50	19.00	Comsusa Inc.	26.38	-1.00	-3.7
OTC	14.25	6.00	Corporate Software	11.00	0.00	0.0
OTC	12.75	6.63	Egghead Discount Software	7.38	-1.63	-18.1
NYS	35.88	26.00	General Motors E (EDS)	30.75	0.13	0.4
OTC	25.50	10.50	Inacom Corp.	20.50	1.50	7.9
OTC	17.38	8.13	Intelligent Electronics(H)	16.50	-0.63	-3.6
OTC	13.25	7.00	Medisel	13.25	0.88	7.1
OTC	24.50	5.75	Microage Inc.	21.75	-0.25	-1.1
OTC	44.75	26.75	Paychex	30.50	1.33	4.6
NYS	87.25	21.63	Policy Management Sys.	29.88	-0.25	-1.0
NYS	43.63	30.75	Reynolds and Reynolds	41.00	-2.13	-4.9
NYS	18.13	11.38	SEI Corp.(H)	18.13	1.13	6.6
OTC	24.38	17.50	Shared Medical Systems	22.50	1.75	8.4
OTC	12.63	5.25	SHL Systemhouse	10.38	0.13	1.2
OTC	30.75	20.00	Software Spectrum Inc.	25.00	0.25	1.0
OTC	39.25	23.75	Sungard Data Systems	36.75	-0.25	-0.7
NYS	4.38	1.13	Ultimate Corp.	2.88	-0.13	-4.2

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

Sequoia posts profit

Sequoia Systems, Inc. in Marlboro, Mass., reported a net profit for its fourth quarter but an overall loss for the year. Revenue for fiscal 1993, ended June 30, was $41 million and its net loss was $31 million. That includes $17.8 million in charges related to restructuring and settlement of class action litigation. For fiscal 1992, Sequoia reported a net loss of $9.9 million, on revenue of $62.6 million. For the fourth quarter, the firm achieved net profits of $750,000, on revenue of $10.5 million. This compares with revenue of $15.3 million and a net loss of $3.7 million, recorded in the same period a year ago. Fourth-quarter 1993 results include a $575,000 contribution to settlement of a shareholder suit.

Tech stocks stay flat

"The Red Herring Tech 200," an index of the Top 200 high-growth tech stocks, dropped only 0.2%, narrowly avoiding a summer slump. While wide-area network stocks increased by 7.9%, followed by semiconductor stocks at 7.8%, enterprise computing stocks dropped 14.5%. "Riding the client/server wave is proving profitable for many companies, and those who missed the wave are sinking," editor Zachary Herlick said.

CEO suit moved

An investigation targeting Symantec Corp. President and Chief Executive Officer Gordon E. Eubanks Jr. and Executive Vice President Eugene Wang has been turned over to the California State Attorney General's office. Wang is accused by his former employer, Borland International, Inc., of spiriting away confidential information.

SHORT TAKE Eric B. Kim was elected vice president of new technology at Dun & Bradstreet Corp. He was vice president of advanced technologies at D&B.

Healthy HP feels a few twinges

Despite a profit gain, sputtering mainframe alternative program raises red flag

By Mark Halper
PALO ALTO, CALIF.

While the bloom has not fallen off the financial rose at Hewlett-Packard Co., the atypically profitable hardware company is, by its own account, feeling a few thorns in its side.

Despite HP's recently reported 44% profit gain — especially impressive in the face of wilting margins at other hardware suppliers — its earnings of $271 million for the third quarter ended July 31 fell short of analysts' expectations.

Hambrecht & Quist, Inc. analyst Robert Herwick said HP's numbers came in about 10% less than expected.

Profit squeeze?

An HP spokeswoman claimed that much of the perceived profit shortcomings resulted from slowness in the company's electronic test and measurement business, where sales dipped from $557 million in the same quarter a year ago to $554 million as the defense market continues to weaken. However, analysts pointed out that HP appears to be facing a profit squeeze from both ends of the computer market.

HP's Lewis Platt *failed to address in a statement perceived unmet sales expectations at the high end*

For example, while HP Chief Executive Lewis Platt cited several areas of concern in the company's recent quarterly report [CW, Aug. 23], one of the most notable to the financial community is a growing reliance on commodity items sold through indirect channels, where severe competition for products such as printers, PCs and local-area networks keeps squeezing profits.

Lowering expenses

The HP spokeswoman countered that HP's printer business, even though it relies on the indirect channel, has a higher-than-average profit margin within HP because of exceptionally low operating expenses.

She said HP is working toward lowering operating expenses in other product areas through such means as early retirement, curbing new hires and reducing administrative costs.

Meanwhile, the shift in HP's business mix toward a heavier contribution from PCs, printers and LAN products helps underscore a shortcoming that Platt, for all his candidness in the recent financial disclosure, failed to address: a perception of unmet sales expectations at the high end.

Specifically, despite brazen talk during the last 15 months about replacing mainframes with HP 9000 and 3000 minicomputers, the company's big iron replacement campaign seems to have slowed down following an early spurt during which HP sold 200 of its Corporate Business Systems in the months following those computers' May 1992 introduction [CW, Aug. 9].

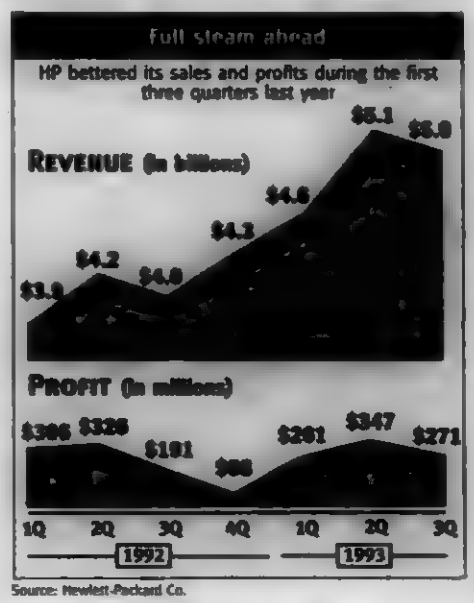
Slice and slash

Among the factors believed to be curbing sales are high price tags that HP slashed last quarter. HP lowered prices on a four-processor model of the Unix version of the Corporate Business Server from $868,500 to $360,000 last June. "They took some relatively aggressive pricing action," said Salomon Brothers, Inc. analyst John Jones. "Gross margins shifted lower than we expected."

Jones said that HP slashed high-end prices not only to spur sales but also to make room for forthcoming new products [CW, Aug. 9].

The spokeswoman claimed that sales of corporate business systems grew in the last two quarters but declined to quantify that. She noted, however, that the price reductions have lowered margins.

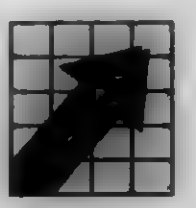
The company has also introduced lower-priced midrange Unix minicomputers and plans new MPE product introductions for September. HP also plans to unveil more powerful corporate business systems later this year.



Source: Hewlett-Packard Co.

Counterpoint

Because it consistently bucks the industry downturn, HP has raised analyst expectations to what some HP watchers said is an unrealistic level. Eric Fisher at Fisher Systems Consulting criticized Wall Street for focusing too stringently on quarterly hopes. "It's the kind of short-term thinking that leads American companies to lose competitiveness against Japanese firms, where the short term is five years," Fisher said.



Upward climb

For the nine months ended July 31, HP revenue increased 21% to $14.6 billion, and earnings grew 8% to $879 million.

Also troubling HP are inventory levels and sluggish growth overseas.

In one of several cautionary notes, Platt said in a prepared statement two weeks ago that "the sharp rise in inventory levels this quarter is a concern."

Analysts took that statement in part as a sign that HP is still working to resolve order fulfillment difficulties it has encountered as it uses an archaic ordering system to process brisk sales.

The spokeswoman confirmed that has been a factor and said HP is still working on building a more efficient ordering system. Inventory grew also after HP stockpiled dynamic random-access memory products to avoid a possible shortage, stuffed the pipeline with its new OmniBook notebook computer and switched from air delivery to ground delivery as a cost-cutting measure for certain products, she said.

Herwick said Platt probably overstated the concern about inventory levels and said the blip in inventories reflects an increase in unfinished goods caused by bottlenecks in production and delivery of hot items such as the OmniBook.

Trouble abroad

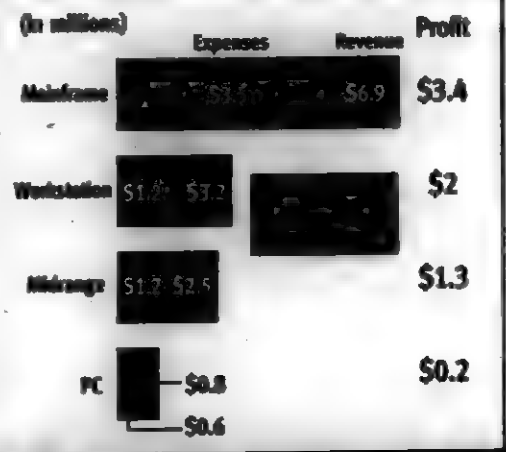
Platt also warned that Europe, where "order growth slowed substantially," continues to be a trouble spot because of what HP said is Europe's recessionary economy. Orders in Europe increased only 10% during the year-earlier quarter, compared with a 28% growth in the second quarter on a year-earlier basis.

HP reported combined orders in the U.S. and international markets grew 19% in the third quarter to $4.7 billion. U.S. orders were up 24% to $2.2 billion. Asia Pacific orders grew 17%, compared with 23% in the second quarter.

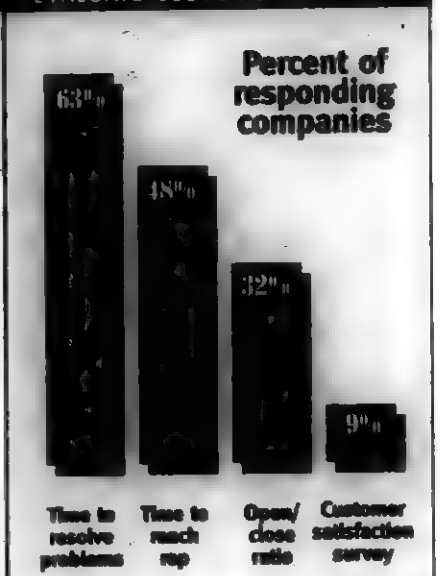
Herwick further pointed out that the company took a revenue hit in several European countries as the dollar gained value against international currencies in the third quarter.

TOTAL SERVICE FINANCIALS

Mainframe software vendors derive significant revenues from service primarily because clients tend to be large companies with large user bases. On the flip side, PC vendors tend to deal with smaller clients, and while revenues can be considered healthy, expenses are also relatively high.

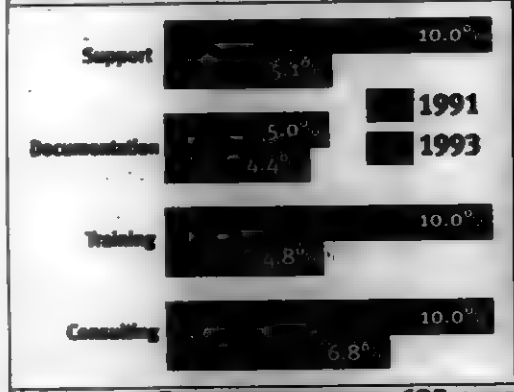


HOW SOFTWARE VENDORS EVALUATE CUSTOMER SUPPORT



MEDIAN TURNOVER RATES

The nation's economic condition has resulted in lower turnover among service staff employees



PER-YEAR FEES

How do your yearly support fees stack up?

	Minimum	Mean	Maximum
Mainframe	$11,250	$11,250	$11,250
Midrange	$3,000	$9,125	$15,500
PC	$15	$1,743	$10,000
Workstation	$2,625	$4,834	$5,625

RESPONDENT BASE: 120 SOFTWARE SERVICE PROVIDERS

Source: Customer Care, Inc., Tarrytown, N.Y.

The 5th Wave *by* Rich Tennant

InsideLines

Two, two mints in one

IBM is finally doing what users have been hammering on it to do for years: come out with an integrated strategy for managing the AIX/Ethernet and OS/2/Token Ring sides of its house. LAN Network Manager, IBM's OS/2-based management system, will be reincarnated this fall with a LAN NetView product, which IBM is positioning as a domain manager for its AIX-based enterprise management platform, NetView/6000. The two network management platforms will be able to communicate via Common Management Information Protocol and will have application portability as well, IBM's Art Gilbert said. IBM is porting to NetView/6000 and LAN NetView applications such as LAN Management Utilities/2, so it can manage OS/2, DOS and Windows workstations directly.

Broadened scope

Novell, meanwhile, is preparing a distributed version of NetWare Management System that will finally be based on NLMs rather than on a centralized Windows console. One of the first NLMs will be LANalyzer, Novell's LAN diagnostic and monitoring system. The rollout is rumored to be slated for Networld in October.

Navigating by nature

Microsoft is readying another version of its ODBC interface for delivery at a developers' conference in Seattle next month. The release promises support for the Win32 programming interfaces used to create applications on Windows NT, the ability for all drivers to scroll backward and forward through a database and, most importantly, equal support for both relational and navigational databases, according to a company spokeswoman. The support for navigational databases is intended to thwart any support Borland may be able to drum up for its rival database standard, the Independent Database Application Programming Interface.

It ain't fair!

Microsoft last week backed out of a Windows NT vs. OS/2 shootout that would have compared performance on single-tasking, 16Mbyte 486-based desktops. Microsoft agreed to that configuration but also wanted to demonstrate the two operating systems running on Intel- and RISC-based multiprocessor servers. The organizer of the event, Barnett Bank in Jacksonville, Fla., proposed that Microsoft give its server demonstrations as part of a 20-minute rebuttal to IBM. Microsoft also turned that down because it said there would not be enough time to properly demonstrate what it believes are the superior strengths of NT.

Moving on

Meanwhile, Russ Harrison, former CIO at McKesson Corp., has left the pharmaceuticals firm to become chairman and CEO of SNet Systems, a 5-year-old health care systems integrator. Harrison's role at McKesson had changed following the appointment of former IBMer David K. McDowell as president and chief operating officer in January 1992. He, too, has not yet been replaced.

Harvard University consultant Scott Bradner bestowed some self-designed awards on internetworking vendors at the traditional Interop unveiling of his independent router performance test results. One honor, The Dribble Award, went to Wellfleet, as its Backbone Node router dropped packets on about 75% of its forwarded data. Gandalf walked away with the Bits Per Pound trophy for its ability to shove gazillions of packets through a cigarette-case-size bridge. (Only trouble was, a software glitch kept them from arriving at their destination.) Cisco was the loser of that award because of the 125-pound mass of its high-end Cisco 7000 — which, by the way, it withdrew from the benchmarking in the eleventh hour reportedly because the company was "between product cycles." Finally, Most Improved Router went to the IBM 6611, which nearly doubled performance this year. Of course, IBM had the farthest to go. "Now they're only half as ridiculous," Bradner said. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-4031 or 76537,2412, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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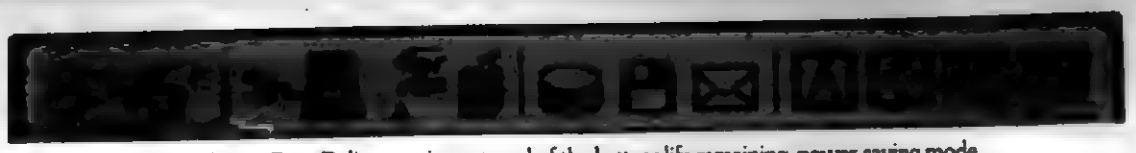

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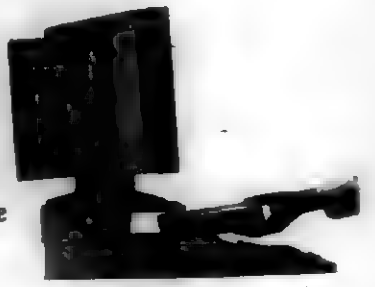

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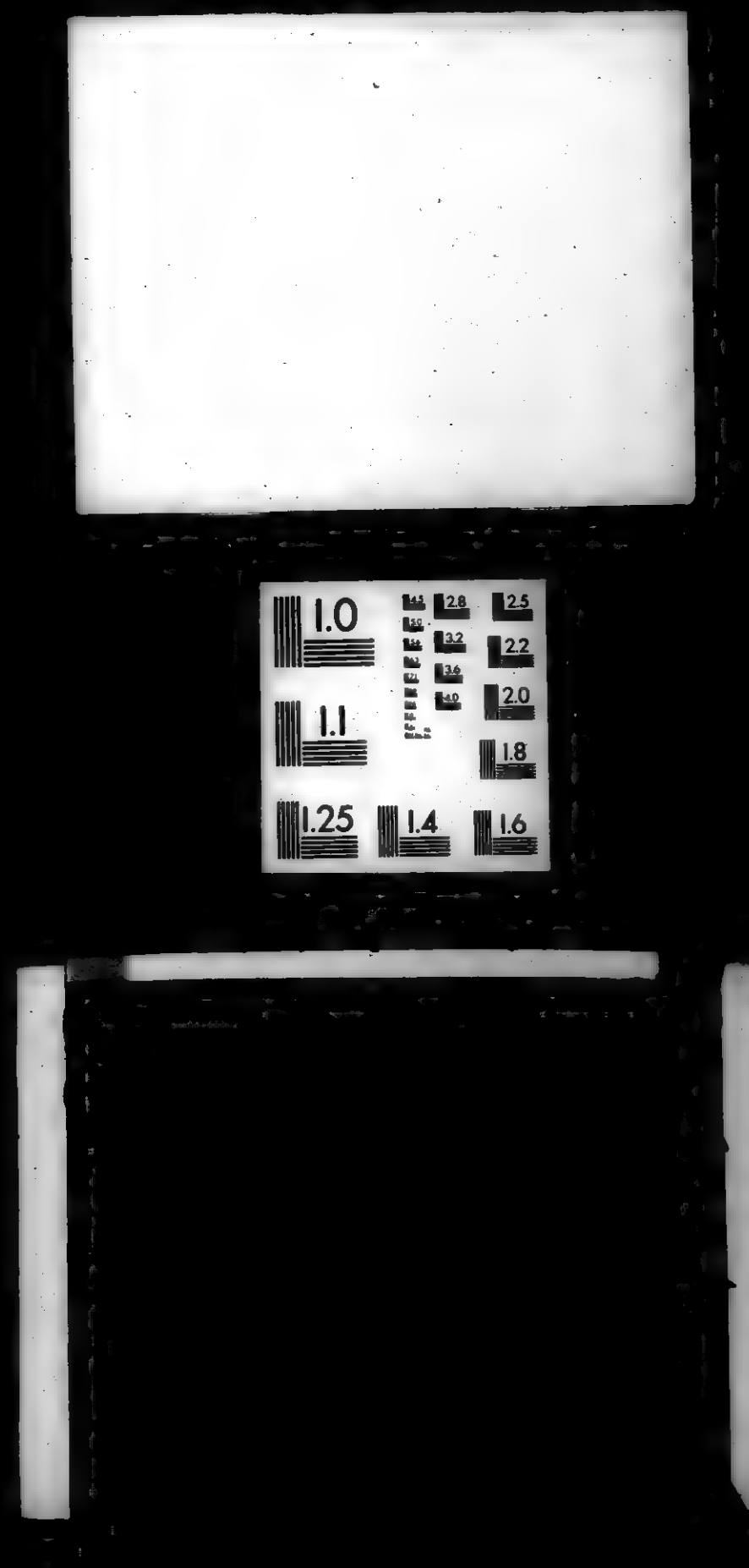
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COMPUTERWORLD

Oracle Office to throw down the gauntlet to Notes

Groupware blueprint adds image, voice to Oracle DBMS

By Kim S. Nash
REDWOOD SHORES, CALIF.

Oracle Corp. plans to disclose blueprints for a groupware product a la Lotus Notes during its annual International Oracle User Group conference later this month. The database maker is also expected to unveil several so-called "media server" add-on modules that will let its Oracle database handle voice, images and full-motion video, sources said.

Larry Ellison: *Plans multimedia demo*

Not content to let Lotus Development Corp. control a burgeoning groupware market, Oracle plans to eventually remake Oracle Office into a Notes rival, according to analysts and users familiar with Oracle's product plans.

Oracle Office is a set of electronic-mail, scheduling and directory service applications linked to the Oracle relational database. A groupware version of Oracle Office is expected to be delivered in mid- to late 1994, sources said.

Lotus and Oracle have discussed linking Notes with the Oracle database, analysts said, but a revamped Oracle Office would put the database maker in competition with Lotus.

Oracle, *page 24*

IBM Office struggles

Key accounts defect despite new OfficeVision initiatives, products

By Johanna Ambrosio

IBM is fighting to keep OfficeVision — its much-delayed and maligned office automation framework — alive even as some key customers are leaving the fold.

For example, IBM's recent introduction of some OfficeVision components that run on local-area networks (see story page 16) has not been enough to stop some large accounts from kissing the whole thing good-bye. Southern California Edison Co., a huge utility in Rosemead, Calif., will by early next year move its 10,000 OfficeVision end users to an as-yet undetermined alternative system.

"OfficeVision just does not meet our long-term direction for client/server," said David Tommela, manager of information technologies. He said the utility looked into the IBM LAN offerings but decided to go with another supplier. Whichever environment it chooses will eventually support 17,000 people.

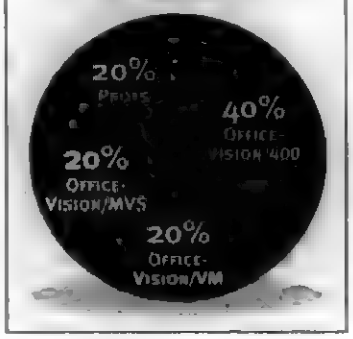
Despite these defections, Richard Sullivan, IBM's director of office and publishing marketing, insisted that "OfficeVision is alive and well and still growing." He claimed the user base is growing by approximately 14% annually, but he did not break out what percentage of that figure was new accounts vs. nodes added to existing OfficeVision installations. Overall, IBM claims some 5 million end

OfficeVision, *page 16*

Mixing it up

According to IBM reports, the number of OfficeVision end users is growing by 14% annually

BREAKDOWN OF 9 MILLION OFFICEVISION END USERS WORLDWIDE



OFFICE VISION

IBM says most of the new account growth in OfficeVision comes from the AS/400. About 90% of all AS/400s going out the door have OfficeVision installed.

Looming specter of NT unifying Unix

By Jean S. Bozman

The alignment last week of more than 75 Unix vendors behind a common set of Unix application programming interfaces fired a broadside at an old foe, Microsoft Corp., whose Windows NT operating system is just moving into the early stages of delivery.

However, users and analysts cautioned that the alliance's impact may be lessened by a mid-1994 delivery schedule.

"Microsoft has done more to unify Unix than 20 years of history."
— Alan Fadder, executive director of Washington, D.C., Area Unix Users Group

The weapon wielded by the Unix vendors at their New York announcement last week was economics (see story page 8).

A common set of APIs will reduce the cost of creating packaged Unix applications, making it easier and cheaper for developers such as Lotus Development Corp., Borland International, Inc. and Oracle Corp. to write to the Unix client/server environment. This is critical if Unix is to compete with

Unix/NT war, *page 9*

SEVENTH ANNUAL
SPECIAL REPORT
ON PAY TRENDS

WOMEN are making inroads into higher-paying, more responsible jobs in the traditionally male-dominated field of information systems.

But don't cheer yet: Female IS managers still earn an average of 15% less than their male counterparts — a distinct improvement over the 21% shortfall posted last year but still a telling testament to the gender gap.

IS compensation overall rose an average of 3% to 5% this year.

See page 91.

IBM PC Co. wins users; backlog threatens gains

By Michael Fitzgerald
NEW YORK

As IBM PC Co. marks its first anniversary, analysts and many users said the independent company has erased much of the stigma associated with the IBM name. But all sides agreed the PC Co. still has lots to do before it makes its way back to the head of the class.

Its most pressing piece of homework is to end its relentless backlog problems. And then there is the need to pack more users into a cheering section currently weighted more heavily in the analyst community.

Results from a *Computerworld* survey of 100 information systems managers last week indicated that while many users no longer see IBM's PC effort as uncompetitive, a good many have made it only to neutral ground and are still reserving judgment.

There is no question that an unshackled IBM PC Co. is serving as an example to the rest of its struggling parent's units.

"They've taken a business that was spiraling downward and revitalized it," said Richard Zwetch-

PC Co., *page 14*

IBM report card

ROBERT CORRIGAN, president of the IBM PC Co., gave his company an A for organization and a C- for delivery. Analysts were generally more positive, giving the PC Co. a solid A-/B+ for becoming proactive.

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■ More than 75 leading Unix vendors unite to create a common set of application programming interfaces. *Page 8*

■ **Digital** makes a bid for wider Alpha support with the introduction of a Pentium-class chip for $3,000 to $4,000 Microsoft Windows NT PCs. *Page 10*

■ Extra! **Microsoft** begins to act on its promise to tie a messaging function into Windows. *Page 12*

■ Unable to meet demand for the Thinkpad, **IBM PC Co.** announces a new line with a different, and more easily obtainable, screen technology. *Page 14*

DESKTOP COMPUTING

■ **Apple** uses the Macintosh operating system as a lure to build interest in the PowerPC platform. *Page 37*

WORKGROUP COMPUTING

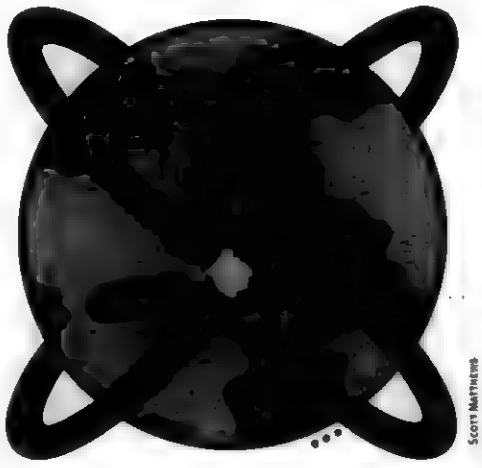
■ **Oracle** finally agrees to support **Banyan**'s Vines network operating system, but not with its latest link product. *Page 51*

ENTERPRISE NETWORKING

■ Users and vendors agree that Simple Network Management Protocol needs help with enterprise networks. *Page 63*

LARGE SYSTEMS

■ Long-awaited commercial applications for massively parallel processor computing finally arrive. *Page 71*



Scott Matthews

Enterprise Networking: *The Internet is bringng life-saving information to developing nations.* **Page 63**

■ **IBM** is about to introduce an automated tape library for the AS/400. *Page 71*

APPLICATION DEVELOPMENT

■ **Computer Associates** is winning over previously skeptical Clipper users. *Page 81*

MANAGEMENT

■ Salaries are up slightly, according to *Computerworld*'s seventh annual Salary Survey, although largesse more often takes the form of merit bonuses. *Page 91*

IN DEPTH

■ In a little more than 2,000 days we'll flip our calendars to the year 2000. Many mission-critical systems may not survive the date change. *Page 105*

COMPUTER INDUSTRY

■ **Control Data Systems** celebrates its first year of independence and four profitable quarters. *Page 133*

CAREERS

■ Flexibility is one of the draws of contract programming, but sign up with the wrong broker and you can kiss that benefit goodbye. Some agencies have been criticized for excessively restrictive contracts. *Pages 113 and 117*

MARKETPLACE

■ Household names- they aren't, but IS executives tell us these products are great. *Page 126*

GREAT FINDS

COMMENTARY

■ RDBMS vendors aren't rushing to provide the support for objects that leading-edge companies need, Charles Babcock observes. *Page 6*

■ Editor-in-chief Bill Laberis suggests that the relative improvement in women's pay seen in *Computerworld*'s 1993 Salary Survey may mean downsizing is squeezing out discrimination. *Page 32*

■ Tim Lynch at Florida Power and Light says OOP has its place, but it isn't the miracle advocates would have you believe. *Page 33*

■ Patricia Seybold says you can't have an information-rich organization until you convince people to share. *Page 33*

■ Wait for the simplicity that vendors always promise with the next release, Ellis Booker writes, and opportunity will pass you by. *Page 74*

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Executive Briefing

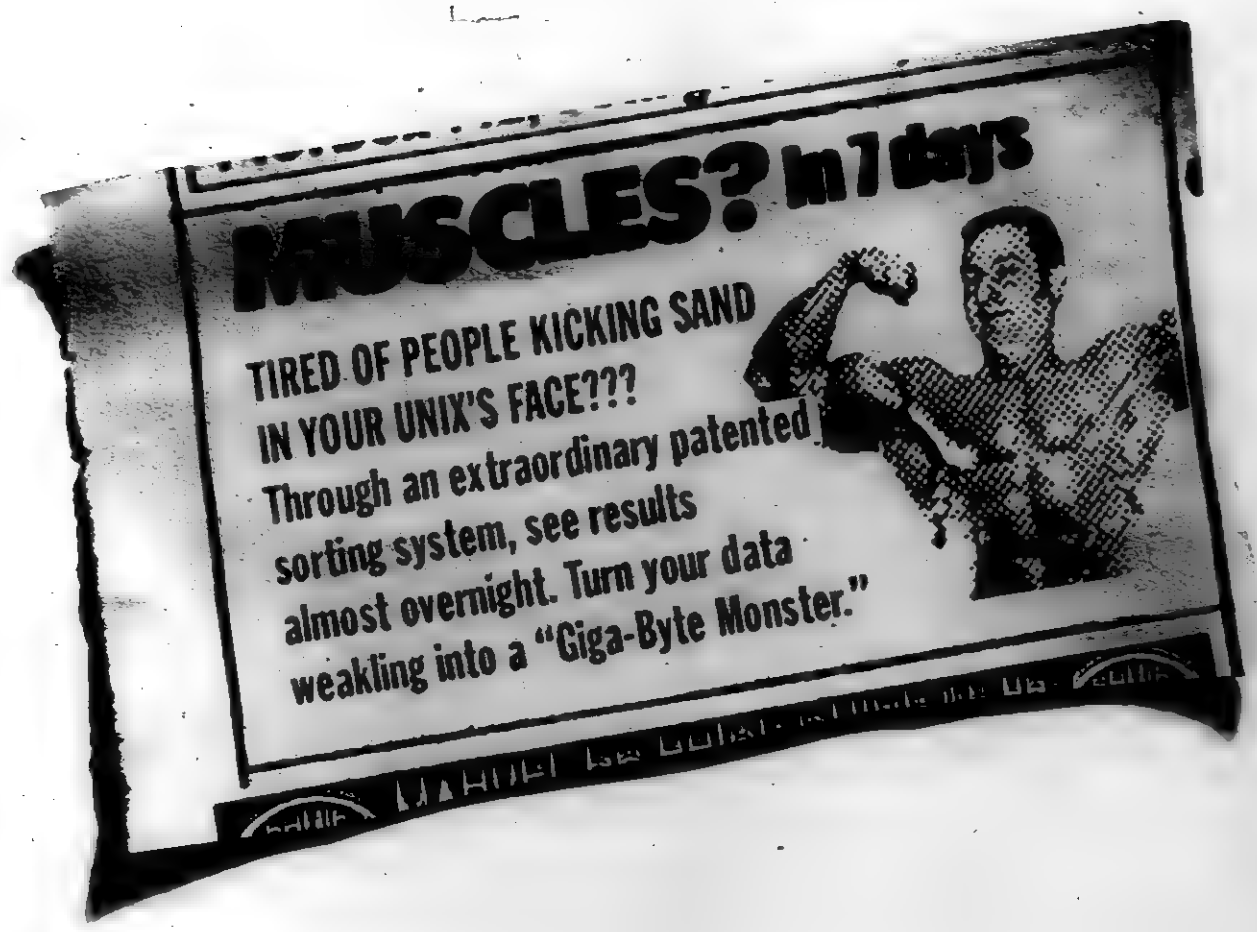
Good news, but... could describe a lot of the news this week, starting with this nugget from our seventh annual Salary Survey: CIO salaries are climbing slightly after an ominous dip last year. Less encouraging is the consensus that downsizing and streamlining will continue unabated, and CIOs who don't keep up technologically are prime targets. ***Page 91***

Mixed mixed messages in terms of technology developments: Leading Unix vendors have announced their intention to create consistent APIs for Unix client/server applications, which could mean lower costs for users in terms of packaged software as well as training and integration. Only problem is, the APIs won't appear until the middle of next year, and it could be two years before customers see real benefits. *Pages 1 and 6*

Token Ring users *might* be happy to hear that an IEEE working group is taking up the issue of how to speed up the Token Ring architecture. FDDI and ATM are already options for those who require more speed, but both entail changing hardware and cabling. Some observers are concerned, however, that this effort, in which **IBM** and **Proteon** plan to participate, will produce more confusion than actual benefit. *Page 54*

Companies that have ventured into use of SNMP for large-scale network management say they are already plenty confused. No matter what it's called, working with this protocol is not simple. **DHL Worldwide** had to develop agent technology to handle local polling and install a utility so devices could send periodic "I'm here" signals because messages were being lost enroute to **Hewlett-Packard**'s SNMP-based OpenView. *Page 63*

Users are chafing at the high price of Lotus Notes and opting for lower priced E-mail applications that offer hooks into Notes. *Page 4*. Meanwhile, new competition has appeared on the horizon. **Oracle**, which once huddled with **Lotus** on the subject of linking Notes with the Oracle database, has decided to move ahead with a full-fledged product of its own. *Page 1*. And **Microsoft** is working on integrating E-mail with its "Chicago" version of Windows, which would strengthen its hand in the workgroup area. *Page 12*. Despite customer protests and the specter of competition, Lotus is standing firm on pricing and offering only long-term improvement to its application development environment. It also has a new service option. *Page 4*



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News Shorts

Microsoft reveals talks about Excel 5.0

Microsoft Corp. last week detailed some features that will be in Excel 5.0 this fall, including several IntelliSense agents to automate common tasks that currently require multiple keystrokes. Microsoft is trying to deflect some of the interest in low-priced versions of **Borland International, Inc.**'s Quattro Pro spreadsheet announced late last month [CW, Aug. 30], while seeking to divert Lotus Development Corp. 1-2-3 users from the recently launched 1-2-3 Release 4.

Novell patches NetWare 4.X security

Novell, Inc. announced last week a security enhancement to the log-in utility for NetWare 4.X. The enhancement eliminates security vulnerability where a user's name and password could be temporarily swapped to disk when running in a DOS environment with a small memory configuration, Novell said. Earlier NetWare versions require no enhancement. The new file, named login.exe v4.02, is available at no charge from resellers.

Cray to release MPP

Cray Research, Inc. will unveil on Sept. 27 in Washington, D.C., its long-awaited massively parallel processor (MPP) system, the T3D, which is based on the **Digital Equipment Corp.** Alpha chip. Although Cray declined to provide details, the company has said in the past that the first product in its multiphase MPP program would be able to grow to 512 or perhaps 1,024 processors. Taking the performance of a single Alpha and multiplying it by 1,000, this would give a 1,000-processor T3D a performance of around 150 billion floating-point operations per second. Observers predict the T3D will cost between $15 million and $90 million, depending on configuration.

Perot president takes leave of absence

Perot Systems Corp. President Pat Horner has taken an indefinite leave. Chairman Morton Meyerson described Horner's leave as a sabbatical and said he does not know when Horner will return or whether he will stay with the company. Meyerson has not named an individual to replace Horner. Instead, he has regrouped executive ranks into two teams to separately oversee the U.S. and European operations.

SHORT TAKES **Symantec Corp.** has agreed to acquire Fifth Generation Systems, Inc., a Baton Rouge, La., utilities software maker, in a stock swap worth about $44 million. The move is subject to government and shareholder approval and is expected to be completed in the next 30 days.... Roy Camblin, a former information systems executive and a leading advocate of open client/server computing at **Wells Fargo & Co.**, has joined **Oracle Corp.** as senior vice president and chief information officer.... **Compaq Computer Corp.** cut prices on some desktop PCs and added the 33-MHz 486SX to its DeskPro/M and ProLinea lines. Price cuts came on all ProLinea 4/25 models and the DeskPro 486S/25M.... **Dell Computer Corp.** replaced its current 486/L with the OptiPlex L family, which will start at $1,278 for a 25-MHz 1486SX-based system with a monitor.... **Borland** said last week that it will ship a Unix version of its dBase IV Version 2.0 database product this fall, and an OpenVMS version in the first quarter of 1994.... **Legent Corp.** has acquired **Corporate Microsystems, Inc.**, a Lebanon, N.H., provider of software distribution and file transfer software for Unix and OS/2 platforms.... **Lotus Development Corp.** last week launched SmartSuite for OS/2. Unlike SmartSuite for Windows, SmartSuite for OS/2 is based on 1-2-3G for OS/2, not Release 4 of 1-2-3.

News shorts, *page 16*

Lotus puts nix on runtime . . .

By Michael Vizard
CAMBRIDGE, MASS.

Despite pressure from users to deliver a runtime option for Notes, which would help accelerate acceptance of the groupware environment, Lotus Development Corp. executives said they intend to stand firm with their existing pricing model.

Currently, Notes is priced at $495. But users are asking Lotus to deliver a runtime version of Notes that would be priced somewhat lower [CW, Aug. 16].

This runtime version would essentially strip the application development capability from Notes, thereby allowing users to deploy Notes applications at a lower cost. Users argue that Lotus would benefit from a pricing model that would encourage companies to deploy Notes on every desktop in their organizations before rivals such as Microsoft Corp. deliver competitive products.

Food for thought

"It's a real controversy. When you start talking about a 1,000-user installation, the cost of the licenses — along with support issues and application development — becomes a barrier," said Joe King, president of Crossroad Partners, Inc., a Notes application development firm based in Shrewsbury, N.J.

The cost of deploying Notes could be reduced, however, with a cheaper runtime license that would essentially convert the $495 version of Notes into a full development license — a pricing model that mirrors the relational database market.

"If I'm a corporate site with 9,000 licenses, all those people are not developing applications. So what I want is a runtime license to make it a lot cheaper to distribute applications," said Brownell Chalstrom, president of Chalstrom Consulting, Inc. in Oakland, Calif.

> Users and resellers said they doubt Lotus has the resources to support the widespread adoption of a runtime version.

"If it was broken down and packaged like that we would deploy a lot more licenses," said Mary Dooman, engineering director at New York Telephone Co., which already has 1,500 Notes licenses at her site and 9,000 licenses installed overall.

But Jeff Papows, vice president of the Notes division, said that while there is no technical reason why Lotus cannot offer a runtime license for Notes, current business issues make such a move unlikely.

Difficult to track

Specifically, Papows claimed Lotus would have no way of monitoring which users have a runtime vs. a full development license, and Lotus is not prepared at this time to accept a lower-margin, higher-volume pricing model for a product that is still relatively young.

Users and resellers said they doubt Lotus has the resources on hand to support the widespread adoption of a runtime version of Notes.

However, as time goes by and network monitoring tools improve, Lotus may be willing to reconsider its position, Papows said.

He said a runtime license would be a disservice to end users who, like spreadsheet users, may want to develop their own applications.

But users and resellers said Lotus is making too much of the end-user development issue, and the company has more to gain from a runtime license than it has to lose.

. . . but addresses Notes support, service problems

By Michael Vizard
CAMBRIDGE, MASS.

Executives at Lotus Development Corp. last week detailed plans to overcome what are widely seen as the two major shortcomings in its Notes groupware environment: a lack of support services and application development tools.

This month, Lotus will launch its first 24-hour, seven-day-a-week support service for Notes.

"We've been looking forward to this service. We need the flexibility because so much of the technical support issues happen outside of normal business hours," said Mary Dooman, engineering director at New York Telephone Co.

The addition of these services is expected to go a long way toward redeeming Lotus' reputation for poor response time to Notes inquiries [CW, July 12]. It is generally held that the rapid deployment of Notes exceeded the ability of its support staff to keep pace.

"Lotus' support for Notes has been up and down like a roller coaster. Things are getting better, but their support people keep getting hired away by resellers," said Joe King, president of Crossroad Partners, Inc., a developer of custom Notes applications in Shrewsbury, N.J.

Latest Lotus Notes services

- **Knowledge base.** Users can obtain copy of the database that Notes support specialists use to answer technical questions. Contains all the technical notes, troubleshooting scripts and a suggestion box.
- **Single point of contact.** Provides users with one-on-one relationships with senior Notes technical support analysts who are assigned to individual accounts.
- **Round-the-clock telephone support.** Systems administrators have access to technical support 24 hours a day.

"It's like growing pains. When you find someone at Lotus who is good, you want to hire them," said Cliff Harrington, project manager for Notes at Rockwell International in Anaheim, Calif., a 900-user site.

To solve this problem, Lotus now has 50 people working in its Notes Premium service programs, which can be obtained for $2,500 a year for each Notes administrator or $150 per hourly phone call.

Lotus also has 12 people working in its Basic support program, which is available for $295 per year for each administrator or $50 per hourly call (see chart).

Notes support may be picking up, but improvements to its application development environment are moving much slower.

Last week at an IBM conference for OS/2 held in Lake Buena Vista, Fla. (see story page 20), Lotus Chief Technical Officer John Landry said Lotus will not release a Visual Basic language tool for Notes, called LotusScript, until the time when Notes 4.0 ships next year.

Notes development tools currently consist of a set of template applications created by Lotus that can be modified by end users, a series of @Commands that can be used to modify forms, a Notes macro language and a Notes application programming interface that is written in C.

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Charles Babcock

SQL vs. objects

Object-oriented systems are gaining ground in some progressive IS shops, but their use is hampered by the fact that business data residing in relational database systems is not easily available to them. RDBMSs do not support the manipulation of objects, which means the data must be kept in two places or clumsily transferred in and out of the relational systems.

For several years, relational vendors have been saying not to worry, object support is just around the corner. But as you listen to some relational authorities, their responses on this question start to sound suspicious. Instead of getting a time frame for object support, one tends to get a put-down of the young object-oriented DBMSs.

In the June 14 issue of *Computerworld*, expert C. J. Date stated, "A relational system that implements domains properly would be able to do all the things that object-oriented advocates claim object-oriented systems can do. . . ." This statement may be true as far as it goes, but it begs a very simple question: Which relational systems implement domains properly? The answer is, "none using SQL," which covers all the relational systems in commercial use.

Date carried the argument a step further in a July 12 letter to the editor when he said: "Relational technology does not necessarily require complex objects to be broken down into components to be stored in the database."

No, theories about the relational model *don't* require it, but SQL *does*. Which do you suppose database programmers are building their new systems with?

Let's take a look at the SQL problem. In its initial implementation, SQL supported a handful of simple data types on which it could carry out its SELECT, JOIN and other operations. When the standard was expanded by the ANSI X3H2 committee in 1992, more complex data types were added, such as date/time, which could be made up of several pieces of data, all stored in a single field. But date/time is still a far cry from the unpredictable, user-defined mix of data types found in objects.

The closest relational systems get to dealing with objects is the binary large object, also known as a Blob, which sort of sounds like the real thing but is actually a baby step in the right direction. Blobs tend to be images, long text strings, video or voice stored as a uniform data type in a kind of "binary bucket," in the words of Fred Carter, chief architect at Ingres.

Storing and retrieving Blobs is not the same thing as full-fledged support of object-class libraries. The database management system can do little with a Blob except put it away and retrieve it. It usually takes an application to seize the data and reconstruct it into an image, etc.

This limitation will give way as the ANSI X3H2 committee adds object support to the next version of SQL. SQL III may be published in 1995, "but more likely in 1996," says Jim Melton, a Digital database architect who serves as editor for the committee.

Oracle is playing an active role before X3H2 and is committed to including object support in Oracle8. Company spokesmen estimate Oracle8 will be available in early 1995. Informix, a pioneer in the field, also won't wait for the standard to be published before it adds object management features.

But all of this remains somewhat up in the stratosphere. No one knows for sure when any vendor will have object support or how extensive that support will be. And the ANSI committee must act if support is to be uniform. ANSI panels have been known to fall behind their timetables on less complicated matters than this.

To my mind, the interest in object-oriented programming has caught the relational vendors somewhat unawares. Their systems cannot be replaced willy-nilly by object-oriented database systems, and I do not know of any users contemplating doing so. But then again, some users will have to wait two to three years before an ingredient they need is added to their systems.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Distributed management: Enterprise network savior?

By Elisabeth Horwitt

The upcoming crop of distributed network management products — some of which will be unveiled this month — could finally provide corporations with the type of platform they need to manage their network installations enterprisewide.

From IBM, Hewlett-Packard Co., Novell, Inc. and Sun Microsystems, Inc., the next-generation platforms, like their predecessors, are based on Simple Network Management Protocol (SNMP) but are said to use a variety of methods to get beyond SNMP's limitations as an enterprise management system.

SNMP's centralized polling architecture tends to overload internetwork bandwidth and is not nearly scalable or flexible enough for many users (see story page 67). And while SNMP Version 2.0 does provide some important new features, such as manager-to-manager communications and security, it nonetheless retains the basic centralized polling blueprint.

With the exception of Sun, all vendors' SNMP Version 2.0 delivery plans remain vague. Novell, for example, is concerned about how to integrate SNMP Version 2.0 security features with its own security, a company spokesman said (see story below).

Rather than relying on SNMP Version 2.0, the upcoming generation of distributed management products will be based on a mix of proprietary protocols and other standards. A key component will be distributed domain managers that use SNMP and the Remote Network Monitoring (Rmon) protocol to monitor and manage particular subsections or aspects of the corporate network.

Such systems can talk to one another or to a centralized "manager of managers" using either the Common Management Information Protocol (CMIP) or a proprietary protocol. Most will share data via a distributed database management system. The end result is that users will gain a correlated, enterprisewide view of the network via a location-independent console with a graphical user interface.

However, the real challenge for vendors is to support true cross-industry interoperability so customers can mix and match whatever products best perform a particular management function, said Sam Schuler, a principal at The Yankee Group, a research firm in Boston.

"Vendors must recognize that regardless of personal involvement in any specific network protocol, such as CMIP or SNMP, they will coexist. Therefore, they must interoperate," said John McShane, manager of network management system development at DHL Systems, Inc.

Even so, the upcoming product wave may be just what some major corporations are looking for. "We're very interested in a truly distributed network management system that allows you to do your polling locally, maybe using SNMP, and then use CMIP across the wide area," said Jim Moorhouse, manager of network management strategies at Motorola, Inc.

And a growing spate of alliances, coupled with the burgeoning support of industry standards, demonstrates a slow acceptance of what customers are telling their suppliers: No one supplier can do it all when it comes to managing all aspects of an enterprisewide distributed computing environment.

The lowdown on upcoming strategies

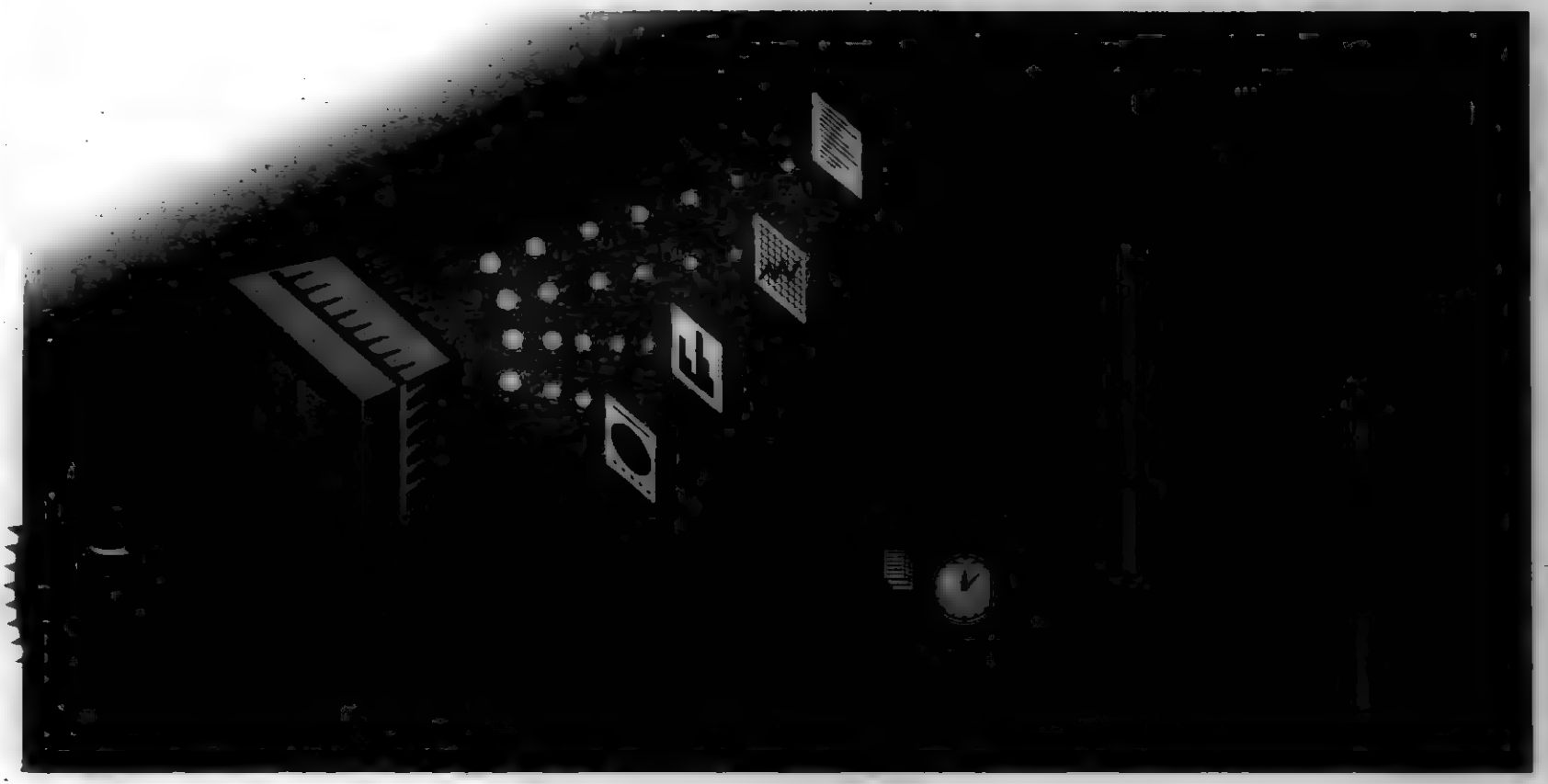
Leading network management suppliers are taking different slants on providing enterprisewide, distributed network management. Their plans are as follows:

Hewlett-Packard:
- **Platform:** OpenView for Unix.
- **Unique features:** "Event handler" will collect data across domains and update the distributed databases.
- **Domain managers:** OpenView for Windows, HP's Rmon-based LAN diagnostic tools and assorted partner products.
- **Protocols:** SNMP Version 1.0 and 2.0, CMIP and Distributed Management Environment (DME).
- **Rollout:** Throughout the next year.

Sun Microsystems:
- **Platform:** SunNet Manager.
- **Unique features:** Object-based "co-optive management" through distributed applications.
- **Domain managers:** Novell's NetWare Management System (NMS) is in the works.
- **Protocols:** SNMP Version 1.0 and 2.0 and CMIP.
- **Rollout:** SNMP Version 2.0 next month; the next generation in the second half of 1994.

IBM:
- **Platform:** NetView/6000.
- **Unique features:** Distributed domain management products based on SystemView application programming interfaces and DME protocols.
- **Domain managers:** System Monitor, local NetView/6000 console; Entry Level NetView/6000 manages about 32 Ethernet and Unix devices; LAN NetView (intro this fall) manages approximately 100 OS/2 and Token Ring network devices. Digital Equipment Corp.'s version of NetView/6000, in the works, will provide management of Digital systems and Microsoft Corp.'s Windows NT.
- **Protocols:** SNMP Version 1.0, CMIP, DME.
- **Rollout:** In progress.

Novell:
- **Product:** NMS.
- **Unique features:** NMS on NetWare Loadable Modules; location-independent, Windows-based management console.
- **Domain products:** Novell's LANalyzer NLM for distributed Rmon-compliant LAN analysis; NetWare SNMP agent.
- **Protocols:** SNMP, SNMP Version 2.0.
- **Rollout:** Expected to start at Networld '93 early next month.



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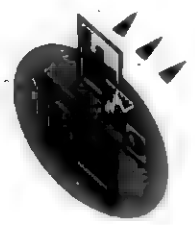

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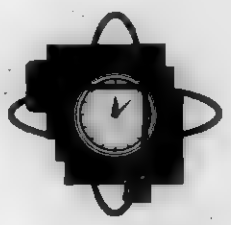

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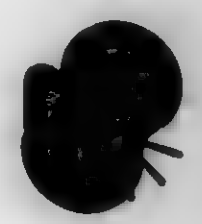


Automatically enforces your data set allocation standards and rules for both non-SMS and SMS data.

Unix unification charges ahead

Users laud plan for common specification, though it may be two years off

By Thomas Hoffman
NEW YORK

More than 75 Unix vendors last week outlined a plan that will reduce the effort it now takes to get an application to run across different flavors of the multibued operating system.

Users cheered the idea, but it could be two years before they see the results of this unification treaty. And just as important to some users is what the Unix providers did not address: systems management and security issues.

The unification effort, detailed last week, calls for the vendors to co-develop and implement a specification outlining a common set of application programming interfaces (API) for 40 varieties of Unix-based operating systems, including IBM's AIX, Hewlett-Packard Co.'s HP/UX and Sun Microsystems, Inc.'s Solaris.

Seagram's Jack Cooper *feels 'like Rip Van Winkle' waiting for a Unix specification*

Making life easy

The common API specification should become available to independent software vendors by mid-1994. It will let developers write a single application that is portable across all compliant Unix system platforms. Today, corporate users and other developers have to port applications to get them to run under a different Unix version, which costs time and money.

"We see this today as a triumph of economic logic," said Peter Cunningham, president of Unix International, Inc.

The specification is expected to significantly reduce development time and costs for independent software vendors — savings that will ultimately be passed on to users. Cunningham estimated that the specification could provide the Unix industry with up to $150 million in cost savings in the next 12 to 18 months.

"It's a long time coming," said Tom McGowan, corporate vice president and senior systems officer at New York Life Brokerage, which relies on Sun Unix servers to support its operations between Kansas City, Mo., and New York.

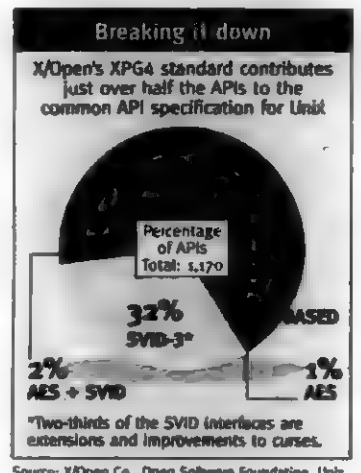
"The name of the game is business software — and being able to run that software in multiple operating environments," McGowan added.

The specification, which includes 1,170 APIs, was selected from 50 Unix applications, including programs from AutoDesk, Inc., Lotus Development Corp. and WordPerfect Corp.

The APIs, which will address kernel-level interfaces between Unix platforms, are based on industry standards such as the X/Open Co.'s X/Open Portability Guide, the System V Interface Definition and the Open Software Foundation's Application Environment Specification.

The APIs include those used for file system calls, standard I/O commands, Transmission Control Protocol/Internet Protocol and Berkeley Software Distribution 4.3 Reno sockets.

Unix applications will not have to be modified if they comply with the standards used to make up the specification, according to Jeanne M. Baccash, director of Unix System Laboratories, Inc.'s architecture and product planning.



"No vendor will get compliance probably until the middle of 1995," predicted Paul McGuckin, program director for midrange computer strategies at Gartner Group, Inc. in Santa Clara, Calif.

The long timetables drew the ire of several users who have been waiting years for commonality among Unix platforms.

"The length of time causes us some concern. I feel like Rip Van Winkle waiting for this to happen," said Jack Cooper, chief information officer at Joseph E. Seagram & Co. in New York, a large HP Unix server site.

In response, most of the key Unix systems vendors said their versions of the operating system already comply with more than 90% of the draft specification.

Users are already looking beyond API unification to other issues they would like addressed on a similar global level. These include thorny issues such as the lack of effective systems management and security capabilities available on most Unix environments today.

"Systems management is something that scares me because we've grown up using very tightly controlled systems, and the tools we've been given for Unix just don't do the job," said Woody Woodard, director of operations and technical services at The Home Depot, Inc.

Sybase tool plan threatens Powersoft

By Kim S. Nash
SAN FRANCISCO

As detailed last week, Sybase, Inc.'s delivery schedule for client/server application development tools puts it squarely in competition with Powersoft Corp., one of the database developer's biggest third-party tools suppliers. However, the fur will not really fly until late 1994, when the bulk of Sybase's promised Momentum product line will be out in full force.

The Momentum line is an attempt to tie in Sybase's character-based APT Workbench with more modern object-oriented tools acquired by Sybase during the past 18 months, such as Gain Technology, Inc.'s Gain Momentum [CW, Aug. 16].

Central to the line is Build Momentum, an object-oriented tool set for creating client/server software with a variety of graphical user interfaces.

Sybase has historically encouraged third-party suppliers, particularly Powersoft, to answer user demand for tools that Sybase could not supply. As a result, analysts estimated that 60% to 75% of Powersoft's 1,000-site installed base are Sybase SQL Server database customers.

Now Sybase wants to take back some of that ground, according to Aaron Zornes, a Burlingame, Calif.-based analyst at Meta Group, Inc. And its Momentum product line overlaps with many of Powersoft's offerings.

"They're trying to overcome their historic inertia in this market with a two-year flight plan," Zornes said. "But two years is a long way to go," he added, referring to the delivery schedule Sybase outlined.

Out of focus

The fact that some parts of the blueprint are blurry is also problematic for Sybase. For example, a repository is needed to make the pieces of Momentum work together, but no warehouse is in sight. Sybase executives alluded to such a product but did not give specifics.

Also missing is a firm commitment to standards such as the Open Software Foundation's Distributed Computing Environment (DCE), which users need for managing disparate hardware and software over far-flung networks, Zornes said. Then again, Powersoft and others have not pledged support for DCE either.

Nevertheless, Sybase is serious about horning in on the ever-crowded application development tools market, observers said. That will put pressure on Powersoft, Uniface Corp. and other tool makers that sell to Sybase users.

Although Sybase Chief Executive Officer Mark Hoffman said the company's Momentum product family is not an assault on Powersoft's PowerBuilder line, he acknowledged that Momentum was designed to compete "head-to-head with all tools on the market."

Powersoft, meanwhile, has adopted a wait-and-see attitude. "Our customers aren't likely to shift positions in midstream just because Sybase is entering the fray," said Tom Herring, vice president of marketing and business development.

Wanted: Low-cost RDBMSs

Unix database powerhouses have no ready answer to the gauntlet Microsoft has thrown down in the form of low-ball pricing for Windows NT and the database that goes with it.

The four biggest relational database makers — Oracle Corp., Sybase, Informix Software, Inc. and The ASK Group, Inc. — will have to cough up less expensive versions of their Unix databases to compete with Microsoft at the below-64-user, departmental level, according to Bill Shattuck, an analyst at Montgomery Securities, a San Francisco brokerage firm.

"The problem is that Sybase, Oracle and the rest of those guys address both the high-end and low-end markets with one expensive product," Shattuck said.

Microsoft has not published prices for SQL Server for NT yet, but its pricing is expected to be in proportion to NT itself. Shattuck estimated a list price of about $6,000 for a 50-user database system compared with $25,000 to $50,000 for a similar setup from the Unix players.

"That kind of discrepancy won't hold up," he noted.

The Big 4 accounted for 53% of nearly $2 billion in relational database sales last year. However, they may see market shares slip in 1994 if Microsoft's SQL Server database for NT attracts enough departmental users with its comparably small price tag. Lite Unix database products are in the works at Sybase and Oracle, according to sources. — *Kim S. Nash*

Unix/NT war

CONTINUED FROM PAGE 1

the Windows family on the desktop.

"For Unix to be a viable desktop in the balance of the 1990s, it must improve application portability," said Tom Wilmott, a vice president at Aberdeen Group, a Boston market research firm. "[Independent software vendors] can no longer afford, and will not sustain, investments of $20,000 to $50,000 per platform per application release."

"I would say it's 90% to do with the economics of the cost of porting," agreed Geoff Morris, president and chief executive officer of X/Open Co., which will test, certify and "brand" Unix-standard software packages that support the common APIs. "We've been trying to tackle this issue of creating a wide-scale economy for easily porting a lot of applications to the Unix environment."

There is reason for optimism, some Unix advocates said. "We're hoping [the APIs] will work; they will make in-house development simpler and faster in a multiplatform enterprise," said Alan Fedder, executive director of the 1,200-member Washington, D.C., Area Unix Users Group.

Client side key

The battle over common APIs will be fought on the client side rather than on the server side, where Unix is well-entrenched, industry analysts said.

Gartner Group, Inc. analysts put the 1992 worldwide Unix market, including operating systems and hardware, at $11.6 billion. That should grow to $35 billion by 1997, said Paul McGuckin, program director at Gartner Group's Midrange Computing Strategies Service in Santa Clara, Calif.

McGuckin predicted the Windows NT server market, including hardware, software and operating system, will be worth $13 billion in 1997. Microsoft, meanwhile, said it had no comment on the unified APIs.

Some users find a single-system concept — at least on the desktop — appealing. Maintenance and interoperation costs will be lower for consistent APIs in client/server computing.

"The fewer operating systems I have to contend with, the easier it is going to be to train people and to make a seamless environment across the network," said Gene Friedman, vice president of applied technology at The Chase Manhattan Bank NA.

Unix vendors have tried to strengthen their hand by piecing together a Unix desktop through the Common Open Systems Environment process, which began in March.

The first fruits will emerge next month, with a Common Desktop Environment conference. Hewlett-Packard Co., IBM and Sun Microsystems, Inc. have endorsed Sun's Windows-compatible interface for the desktop, called Windows Application Binary Interface.

Morris said the new Unix APIs, set to ship by mid-1994, will solve the problem. "There will inevitably be some tweaking [of code]," he said, "but the coverage will be 100% in many cases. Even if it's 95%, a 5% variation is no big deal."

Waiting for change

Some application vendors, questioned last week, were less sure.

"Anything that can be done [to make improvements] will make me happy, but I don't expect any change in the next 12 months," said Jack Noonan, president and CEO of SPSS, Inc., a $39 million statistical analysis software firm in Chicago. "Right now, you have to recompile for each platform, testing every single part of the product, because you don't know where the bugs will show up."

In contrast, Microsoft's NT provides a consistent, if simplified, environment for graphical user interface (GUI)-based client/server applications, Noonan said.

"Even if the [Unix] APIs work perfectly so I can recompile and ship products, I haven't solved the problem of shipping information between [GUI-based Unix] applications and the problem of inconsistent recompilers and print servers from system vendors," he said.

Meanwhile, users such as Craig Goldman, chief information officer at Chase Manhattan, said they are pleased.

"We've been looking for one Unix for years and years," he noted, "and now, because of the threat from Microsoft, all of the Unix vendors are together."

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Digital readying lower-cost Alpha chip

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. will next week introduce a reduced-cost Alpha AXP microprocessor targeted for use in $3,000 to $4,000 PCs running Microsoft Corp.'s Windows NT, sources said. Digital is hoping the new device will start generating the higher volumes needed to attract users and software vendors to Alpha.

Building a high-volume Alpha PC business is critical, analysts said, because Digital executives have indicated that the company must sell 4 million to 5 million Alpha chips per year to financially justify its huge investment in the technology. "They need economies of scale," said Chris Christiansen, an International Data Corp. analyst.

Digital also has to increase sales in order to persuade independent software vendors and other major PC makers to support Alpha, said Linley Gwennap, senior editor of the "Microprocessor Report" newsletter in Sebastopol, Calif.

True low-cost Alpha chips enabling $2,000 NT PCs are still a year or two away, but systems based on the new DECchip 21066 should have enough of a price/performance lead over machines based on Intel Corp.'s Pentium and 486DX2 microprocessors to start generating some business, Gwennap said.

The 21066 is expected to provide performance similar to or better than the Pentium chip for about the same price as a 486DX2, sources said. Pentium-based systems typically sell for $5,000 or more at this point, analysts said, while 486DX2 machines configured to run NT fall into the same $3,000 to $4,000 price range that Digital is eyeing.

Measuring up

Specifications of Digital's upcoming DECchip 21066 microprocessor as they compare with Intel's Pentium chip

	DECchip 21066	Pentium
Clock speed	33 MHz external, up to 166 MHz internal	66 MHz
SPECint92* / SPECfp92*	65* / 98*	64.5 / 56.9
Power consumption	About 20 watts	16 watts
Price	$350 to $700	$926

*Estimates based on Digital information

Sampling of the 21066 is due to start this quarter, and Digital has said it plans to release systems based on it in 1994.

Setting its sights higher

The 21066 will be positioned as an engine for single-processor PCs running NT. Analysts said Digital is looking for the chip to be more volume-oriented than the original DECchip 21064 used in the DECpc AXP 150 machine introduced in May as the company's first NT platform (see story page 47).

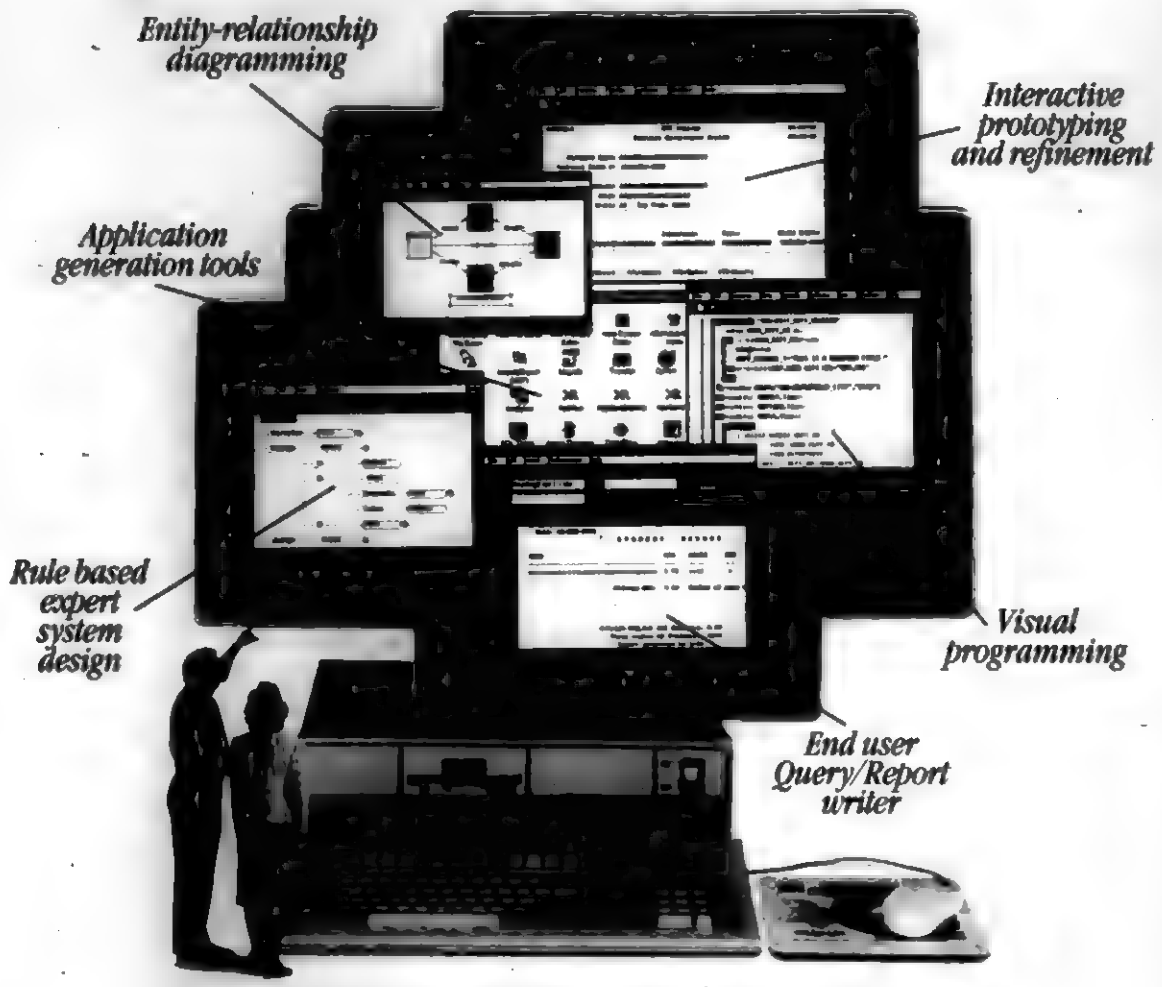
The AXP 150 starts at $6,795, and follow-on models due out this fall based on a tweaked version of the 21064 are not expected to go much below the $5,000 level — still too high to hit the sweet spots of the PC marketplace, users and other industry observers said.

"The $3,000 level is the PC mentality, while $7,000 is the workstation mentality," noted Steve Ruger, MIS manager at Smith Industries Ltd., an aerospace company in Malvern, Pa. "All the corporate burden you have to live with [to get approval for a purchase] changes" as the price increases.

"Digital had to go high-end at first to get attention, but now they have to turn the whole thing around into a cost-based strategy," Gwennap added.

Andrew Allison, editor of the "RISC Management" newsletter in Carmel, Calif., said a fast volume push is important for Alpha because Silicon Graphics, Inc. has "a clear cost advantage" now for its Mips Technologies, Inc. architecture.

"Wow, that's what I call pushing the boundaries..."



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WAN options

Frame relay upstages ATM

By Joanie M. Wexler

Companies infatuated with emerging Asynchronous Transfer Mode (ATM) networks could be passing up significant cost savings if they ignore maturing frame-relay technology while holding out for ATM.

"I am amazed that the average communications manager is skipping frame relay for ATM when we're saving so much with frame relay today," said Jim Fey, director of strategic technologies at PMI Mortgage Insurance Co. in San Francisco.

Other made similar observations in the aftermath of recent nationwide ATM service announcements from Sprint Corp., WilTel and MFS Datanet, Inc. [CW, Aug. 23 and 30].

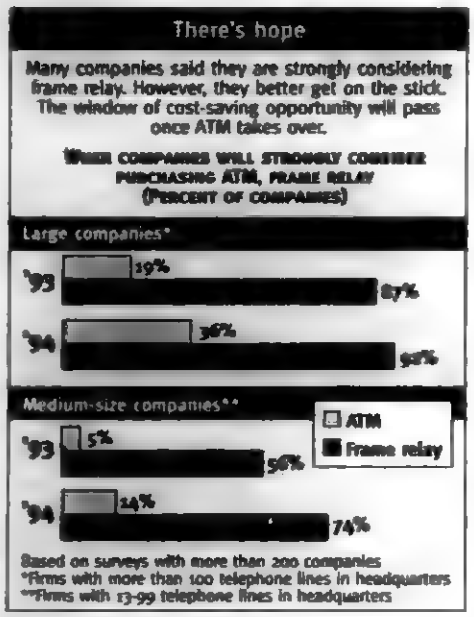
A key reason not to leapfrog frame relay for ATM, they said, is that most firms' wide-area networks today transport primarily data, which is better suited to frame relay, rather than the data/voice/video mix that high-speed ATM is optimized to carry.

"We don't need to combine voice, video and data yet," said William Anderson, senior vice president and manager of operational services at Seafirst Bank in Seattle. In fact, he questioned the economies of blending voice and data using high-speed, expensive communications gear.

Similarly, at Convex Computer Corp., a two-year frame-relay user in Richardson, Texas, "the bulk of our traffic is data; it is not clear that voice, video and data together is a near-term goal," said Coyne Gibson, a network planner.

Meanwhile, users said frame relay is saving them 10% to 30% over their private line networks while upping their network response times. PMI, a year-long nationwide frame-relay service, for example, reported a sixfold throughput improvement along with a 10% cost drop over private lines.

Other companies cited comparable gains. Gibson said Convex has shaved a third off its WAN costs. Anderson said Seafirst has sliced one second from bank transactions across its 300 branch sites, a one-third response time gain.



Source: Quality Strategies, Washington, D.C.

Other reasons users might consider interim frame relay is because, unlike ATM, it is already widely available, and ATM local access prices are far higher. For example, Sprint's ATM service requires a dedicated T3 (45M bit/sec.) line from a corporate location to the local exchange carrier's central office. This can cost $4,000 a month per site, compared with about $600 per month for frame relay.

"There are not very many corporate pockets deep enough for a dedicated T3 at every one of their locations," Gibson said.

TeleChoice, Inc., a consultancy in Verona, N.J., "absolutely sees a stalling" of multidrop or 56K bit/sec. private network operators waiting for ATM, said Chris Finn, senior analyst. "They're missing the boat. ATM won't scale down well to the 256K bit/sec. speeds they need today for their LAN interconnections" because of its associated overhead.

Overseas use

In addition, it is uncertain when international firms will have ATM available outside the U.S., said Reuben Lantto, director of international telecommunications at Cargill, Inc. in Minneapolis.

He said frame relay is "the only thing that's priced right internationally today," though he does view frame relay as an interim step to ATM. He advised users planning to migrate from public frame relay to ATM to stick with the same carrier to alleviate network interoperability headaches.

Not all users share the frame-relay enthusiasm.

"ATM is the future, and frame relay has outlived its usefulness before it's really taken off," said Doug Spencer, division supervisor at the network control center of Commonwealth Edison's Joliet, Ill., network control center. "By the time we'd convert our communications gear to accept frame relay, ATM would be here, and we'd have to do it all over again."

On the other hand, "you can wait around for the Holy Grail as long as you want," Anderson said. "But unless you take advantage of what's here today, you'll never move forward."

Microsoft's Capone sending a message — to Windows apps

By Lynda Radosevich and Ed Scannell

Microsoft Corp. is working on a project that will integrate messaging functions into the next version of Windows, which is expected to be delivered in 1994. The effort could provide users with a cheaper mail engine while helping Microsoft to cement workgroup applications to the Windows operating system.

Meanwhile, Microsoft archrival Lotus Development Corp. is in flux with its electronic-mail offerings. Several key CC:Mail employees recently left the company. Separately, Lotus decided to withdraw the product from its desktop software bundle, called SmartSuite.

While Microsoft trails in its installed base, it is moving forward, currently knee-deep in a project code-named "Capone" that seeks to integrate messaging functions into the "Chicago" version of Windows, slated for co-delivery in 1994. Users would reportedly save money by not having to buy a separate mail engine.

The plan is to include a messaging "middle" layer, based on Microsoft Application Programming Interface (MAPI), with Chicago. Microsoft wants workgroup computing in which existing Windows applications can use messaging services inherent in the operating system to become "workgroup" applications.

Also, Capone would allow the applications to access back-end directory services and independent messaging transports, such as X.400 and Novell, Inc.'s Messaging Handling Service.

"Our goal is to have the messaging piece be a part of the operating systems rather than an add-on piece that doesn't always work," said Jim Lisiak, a systems engineer at Chevron Information Technology Co., a Microsoft Mail customer, in San Ramon, Calif. Tying the messaging application programming interfaces and protocols closer to the operating system gives corporate programmers more control when developing workgroup applications, he said.

The plan pits Microsoft against local-area network E-mail kingpin Lotus, which of course has no operating systems to combine with CC:Mail but is allied with IBM, which has OS/2.

Utopia at home

A separate project at Microsoft, called Utopia, is in the early stages of exploring how to direct the future of computing in the home. Included in the project is David Thatcher, formerly a leading Windows NT developer at Microsoft.

Capone "is a major potential threat to CC:Mail," said David Ferris, editor of industry newsletter "Ferris E-Mail Analyzer" in San Francisco. While it makes sense architecturally, Microsoft is getting a late start, and CC:Mail has a large and entrenched customer base, he added.

Mixed messages

Meanwhile, CC:Mail customers are hoping that Lotus will clarify its intentions for integrating its Notes groupware software and CC:Mail. Since it took over CC:Mail in 1991, customers said Lotus has been sending mixed signals about its plans.

"I'd like help clearing up the confusion over whether I want to use Notes or CC:Mail for messaging. They never really let us know where they were going with each," said Kevin Danehy, senior business systems analyst at Millipore Corp., a chemical filter manufacturer in Bedford, Mass.

Such confusion has impacted CC:Mail internally as well. Last month, Rex Cardinale, CC:Mail vice president and general manager, and several other key players left the company. "I left because of disagreement over the long-term strategy for CC:Mail," Cardinale said. He and Lotus officials declined further comment. However, a company spokesman said Lotus will make announcements in this area at a CC:Mail user conference this month in San Francisco.

Lotus meanwhile has pulled CC:Mail from its suite of bundled products, which are sold at a discount. The company said its customers do not make mail decisions based on bundling deals, but several analysts questioned the wisdom of that move because Microsoft has been successful at promoting Microsoft Mail through suites.

Publicly, Lotus officials have stated that the company will continue to develop back-end services for Notes and CC:Mail. The client/server strategy will use Notes Mail as the back-end service for Notes and CC:Mail front ends. Also, the company said it is working on an update to the current CC:Mail back end, a shared-file system nicknamed Sequoia, that will synchronize the product across different platforms. Sequoia will also add hierarchical directories and user-defined address fields.

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PC Co. addresses ThinkPad backlog

Passive-matrix color model expected to shore up line

By Michael Fitzgerald

SOMERS, N.Y.

With sales threatening to slip away because of its inability to meet demand, the IBM PC Co. will try to ease supply problems and stem any defections from its crucial ThinkPad notebook brand by announcing the ThinkPad 750 line this week, according to sources close to the company.

While it may sound odd to address supply problems by adding more products, the sources said the company believes it can alleviate backlogs for its worst offender — ThinkPads with active-matrix color screens — by offering customers a new option: passive-matrix color technology.

Currently, high-end ThinkPads come only in monochrome or active-matrix color versions, and active-matrix color screens are in short supply throughout the industry [CW, Aug. 9].

Scott Bower, director of marketing for the mobile computing group at the PC Co., refused to comment on the unannounced products but confirmed that the company believes it may have a way around the shortages.

"The passive-matrix screen is pretty good, so they may be able to alleviate demand with that," said Andrew M. Seybold, editor in chief of "The Outlook on Mobile Computing," a Brookdale, Calif., newsletter.

The PC Co. is expected to gloss over supply issues and stress the multimedia orientation of the new products, sources said. Analysts and users said the new products seem to have the right stuff specificationwise (see chart), but they want to see the PC Co. actually deliver them.

No new orders

"I'd be interested in seeing it. I'd be interested to see any [ThinkPad] I've ordered," said Jerald S. Noble, director of telecommunications and PC support at the American Cancer Society in Austin, Texas. A call to IBM Direct revealed that IBM had stopped taking orders on the 720C a month and a half ago, after it had sold out its planned production. IBM will continue to manufacture the 720 series, but "we'll never take another order," a sales representative said.

And, according to the latest list of hot products from ComputerLand Corp.'s Datago distribution subsidiary, the ThinkPad 720C dropped from sixth to eighth place, and the ThinkPad 720 fell from fourth to ninth. PC Co. sources confirmed that the backlog trouble has started to cost the company sales.

One analyst said she thought the PC Co.'s strategy could be a sleeper. "It has some very compelling capabilities to it and could draw real interest in the market, especially looking at the amount of people who use portables for presentations," said Janet Cole, an analyst at Dataquest, Inc. in San Jose, Calif.

ThinkPad 750

PROCESSOR:
33-MHZ 486SL from Intel Corp.

MODELS:
- 5.5 lb. monochrome
- 5.9 lb. dual-scan passive color
- 6.4 lb. active color
- Pen and keyboard convertible

BATTERY LIFE:
Up to eight hours on active color; 12 hours on monochrome.

DOCKING STATION:
6.5 lbs., integrated handle, built-in dual stereo speakers, CD-ROM drive.

FEATURES:
- Removable 2.88M-byte floppy, replaceable with CDPD cellular and wireless modem options.
- Built-in speaker and I/O jack.
- Two port replicators, including one with a PCMCIA slot.

'Intel inside'

Sources said the new products will have a floppy drive that can be removed in favor of a cellular digital packet data (CDPD) modem setup or a wireless modem. All four models will also use Intel Corp.'s 33-MHz 486SL chip, the first time IBM has used an Intel chip in its high-end notebook line. IBM has reduced the weight, down to as low as 5.5 pounds, and nearly doubled battery life, according to sources. Pricing is expected to be close to comparable models of the 720, which does not include a passive-matrix color version or a convertible. The PC Co. will not discontinue the 720, however.

PC Co. wins users

CONTINUED FROM PAGE 1

kenbaum, research manager at International Data Corp. (IDC) in Framingham, Mass.

"They've regained leadership in market share and in coming out with innovative technology, brand segmentation and distribution," he said.

IDC research puts the PC Co. on track to garner 12.5% of the market, a 2% gain over 1992, worth as much as $1.4 billion in extra sales.

Analysts may cheer, but users, though optimistic, are cautious. Half of the *Computerworld* survey respondents did not put IBM on the short buy list for PCs; 39% said they are not considering purchasing an IBM computer at all.

"They are going in the right direction, but I still look at Compaq as the leader in the PC industry," said Roy Gregory, manager of personal computing at Scrivner, Inc., a large food wholesaler in Oklahoma City. Scrivner buys from Compaq Computer Corp., the PC Co. and NCR Corp.

Gregory's praise for IBM is tempered somewhat by the fact that he wants a more industry-standard PC Co. ValuePoint. Almost 10% of the 200 ValuePoints he purchased would not run certain software programs that his Personal System/2s and other systems will run, he said.

Little praise

But then praise of any sort was rarely heard about IBM's PC efforts before it formed the PC Co. last September. Faced with rapidly dropping market share, zero profitability and alienated customers, users and analysts viewed the new entity with skepticism at best.

Besides ending its market share slump and becoming profitable, the PC Co. now appears more responsive to customer needs.

"I certainly do think they have gotten better, particularly in answering our questions," said Jerald S. Noble, director of telecommunications and PC support at the American Cancer Society in Austin, Texas. The American Cancer Society is a true Blue shop with heavy investments in PS/2s.

Rave reviews

Users touted greatly reduced pricing as the most significant plus for the PC Co. The ThinkPad notebook line received nearly universal raves, and the PC Co.'s emphasis on rapid product development has brought it back in line with industry competitors.

The ValuePoint was cited as IBM's first strong "industry-standard" offering in years.

In addition, the PC Co. has offered a variety of improvements to service — most notably toll-free telephone support and a three-year warranty on PS/2s — and has added a variety of channels, giving people new ways to buy its products.

Still, lower prices, better products and expanded distribution channels have all helped create horrible backlog problems, which remains the key gripe for virtually every user contacted (see story at left). For example, Noble said difficulty in getting the IBM PCs he ordered has become so serious that he may look at other PC vendors.

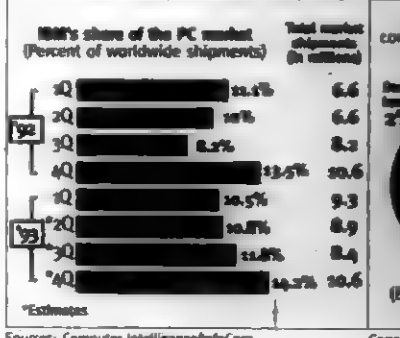
Meanwhile, the PC Co. will take a stab at easing some of its supply problems on its hot-selling ThinkPad line by releasing a new model on Wednesday, according to sources (see story above).

Besides the new ThinkPads, the company is expected to tweak continued user interest with a series of product announcements in the next two months. Prominent new features will include Pentium-upgradable PS/2s with Video Electronics Standard Association local-bus graphics and a slew of other features and options [CW, May 31], refreshed Server 85s and 95s, PS/1s that are Pentium-upgradable and a new ValuePoint series that will combine Pentium with the Peripheral Component Interconnect local bus pushed by Intel Corp.

While sources said these announcements will not be particularly outstanding, they will demonstrate that the PC Co. remains committed to aggressively approaching the market.

No pain, no gain

IBM's year-old PC Co. is expected to continue to grow its market share . . .



Sources: Computer Intelligence/InfoCorp, Santa Clara, Calif.

. . . but needs to work on customer attitudes

PC mea culpa

While the PC Co. is sending plenty of units out the door, it has severe backlogs for the ThinkPad; the PS/2 line has stubborn backlogs, and similar troubles have cropped up with its new Ambra line along with spot problems with ValuePoint.

Though the PC Co. is not alone in having a backlog, that is one reason why its growth is being outstripped by some other companies, such as red-hot Compaq.

Robert Corrigan, the PC Co.'s president, acknowledged the problem but could not say if the PC Co. will catch up to demand in the fourth quarter.

"We are clearly behind in our ability to respond to market demand, and I should have been more ambitious in planning," Corrigan said. "We pegged things [a year ago] for 40% growth, and I just didn't have the guts to go higher than that. It was an executive decision and I made it, and I feel bad about that now."

OS/2 beefed up to take on Windows NT

By Ed Scannell

In a move to bolster OS/2 2.1 against pressure from Microsoft Corp.'s Windows NT, IBM's Personal Software Products (PSP) division last week showed off an early version of its symmetrical multiprocessing technology.

During the last couple of months, a few hardware makers, including AST Research, Inc., have shown OS/2 2.1 performing four-way symmetrical multiprocessing on servers powered by four 50-MHz Intel Corp. I486-based processors.

IBM plans to ship the technology, under joint development with Intel, late this year or early next. It will likely be preloaded on some IBM PC Co. servers, according to Lois Dimpfel, PSP director of Personal Operating Systems and the PSP Programming Center.

Lois Dimpfel: *PSP remains committed to improving the performance of OS/2 2.X*

On offensive

Originally, PSP did not plan to introduce such capabilities into OS/2 until delivery of its microkernel-based version, called WorkPlace OS, which is not expected until the first half of 1994. But with Microsoft promoting Windows NT's multiprocessing capabilities as an advantage over OS/2 2.1, IBM is going on the offensive.

At IBM's developer conference in Orlando, Fla., last week, Dimpfel said PSP remains committed to improving the performance of OS/2 2.X to run more acceptably on systems with 4M bytes of memory.

She added that IBM can deliver a speedier, 4M-byte version by year's end without sacrificing any major features. This will involve technical improvements such as streamlining the operating system's memory management.

PSP will probably not sell a separate shrink-wrapped version of the improved operating system but will deliver it bundled with IBM and various OEM systems.

Aggressive 1-year-old

The more aggressive OS/2 strategy coincides with the IBM PC Co.'s first-year anniversary as a more autonomous unit (see story page 1). It has been a good year for both the hardware and software sides of IBM's PC units.

The combined revenue of PSP and its LAN Systems Group, according to some observers, was in the neighborhood of $500 million. IBM officials would not comment.

If true, the combined group would be the fourth-largest micro software company in the U.S. Earnings, however, may be a different story with most believing the operations to be barely profitable during the last year.

Still, most observers have noticed a marked improvement in PSP's aggressive stance, particularly in the area of marketing and merchandising, the latter particularly through resellers.

"The reorganization PSP went through has made them more visible. They are getting a lot more shelf space for their products among retailers," said John Dunkle, vice president at WorkGroup Technologies, Inc. in Hampton, N.H.

Sense of direction

To successfully fend off Microsoft, however, Dunkle and others said PSP must do a much better job communicating how its operating systems strategically fit in with the rest of IBM's operating systems as well as those being developed outside IBM by companies such as Taligent.

"Users need to know how to get from point A today to point B in 1996 with something like Taligent," Dunkle said.

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— *David M. Carlson, Kmart Corporation*

"With SCO Open Desktop, we have gained a significant competitive edge and taken a big step toward becoming the most technologically advanced stock exchange in the world."
— *Wayne Fowler, Toronto Stock Exchange*

"SCO operating systems have helped us ride the Intel technology curve and use industry-standard hardware to deliver state-of-the-art information services to our customers."
— *David Cutright, Thomson Financial Networks*

"Our 4,700 stores use PC-based multiuser SCO systems to integrate point of sale and accounting while updating headquarters at any time."
— *Henry Tinding, Tandy Corporation*

CONSULTANTS

"SCO provides us with a wide range of open system solutions that enable us to offer our customers a long-range, incremental growth path based on proven and reliable software."
— *Denny Allen, Price Waterhouse*

"The concern for corporate users is that Windows NT has only minimum implementations of open system protocols and services."
— *David Langlois, Wollongong Group*

"While NT will be ported to other platforms, it will probably take a decade or more of effort to offer the same availability as UNIX."
— *Peter B. Varhol, Computer Technology Research Corp.*

In a recent survey of midrange UNIX System users ...
"SCO was the overwhelming favorite" of those intending to standardize on a single OS.
"Windows NT was not even mentioned."
— *David M. Smith, International Data Corporation*

JOURNALISTS

"SCO has been producing multiuser, multitasking operating systems on Intel since 1979, and those years of experience have allowed it to build leadership in the areas of peripherals support and existing applications support."
— *Mitch Wagner, Open Systems Today, 5/93*

"Unlike relative newcomers UnixWare, Solaris and NextStep, SCO UNIX has a gigantic number of applications available, evidenced by the three-volume compendium of hardware, software and development tools."
— *Quoblobar R. Safi, PC WEEK, 6/93*

"Power UNIX users will dismiss UnixWare out of hand...device driver support sorely lacking ... few applications compared to SCO...documentation lacking ... the Personal Edition is a significantly crippled version of UNIX."
— *Alan Southerton and Michael Burgard, UnixWorld, 7/93*

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News Shorts

Judge denies Microsoft's request

A **Microsoft Corp.** motion against **Stac Electronics, Inc.** was denied by a U.S. District Court judge last week. Microsoft had asked the court to enjoin Stac from selling its Stacker 3.1 compression software for Windows and DOS because of alleged patent infringement. The trial is set for Dec. 14.

Net analyzers make friends

Network General Corp. said last week it has formed a joint technology and marketing relationship with **3Com Corp.** to allow interoperability between 3Com's Remote Monitor analysis software and Network General's Sniffer protocol analyzer.

Data preservers need apply

The deadline for submitting nomination forms for the 1993 Data Preservation Awards has been extended from Sept. 1 to Oct. 15. Co-sponsored by **3M Co.** and the **Association of Personal Computer User Groups**, the awards are aimed at reducing the nearly $4 billion in productivity losses associated with inadequate backup in the U.S. each year. Nomination forms can be obtained by calling (800) 888-1889.

Electronic pornography ring cracked

Federal law enforcement officials have brought charges against six people in an effort to crack an international child pornography ring that has flourished using an electronic bulletin board. Department of Justice officials said the board, known as Bamse, is based in Denmark. Those dialing in can download a variety of child-related pornography in the form of graphic images, text and computer games, said George Burgasser, acting chief of the Justice Department's child exploitation and obscenity section. More charges may be filed.

Optical system charges into stores

Financial and Credit Services in Mason, Ohio, a division of **Federated Department Stores, Inc.** in Cincinnati, will install a $1.3 million optical character recognition (OCR) system. The company will use the system to process some 150,000 remittance credit-card payments daily. The OCR system, an Image Remittance System 4500 from **Recognition International, Inc.** in Dallas, will be installed next month.

Pieper bids adieu

Novell Inc. announced the late-August departure of Roel Pieper, president and chief executive officer of Unix System Laboratories, Inc., which Novell acquired in July. Pieper had reported to Kanwal Rekhi, Novell executive vice president and general manager of Novell's new Unix Systems Group, since July. USL said Pieper made no statement about any new position he might take at another company. He joined USL in December 1990, after serving as chief technology officer at Software AG of North America.

SHORT TAKES **Micrografx, Inc.** will sponsor the Fifth Annual Chili Cook-Off at Comdex Fall in Las Vegas Nov. 16, to benefit the **National Center for Missing and Exploited Children.** To participate, contact Kate Potts at (214) 994-6413. . . . A federal court in New York has dismissed remaining trade secret claims **Computer Associates International, Inc.** had earlier filed in a civil lawsuit against **Altai, Inc.** . . . Joseph W. Boutureira has been named vice president, information services at the Jersey City, N.J., office of the **American Institute of Certified Public Accountants.** He was formerly vice president of operations at the Canadian Imperial Bank of Commerce.

IBM Office struggles

CONTINUED FROM PAGE 1

users linked to OfficeVision running on its VM, MVS or OS/400 midrange and mainframe machines in the U.S.

Still, there is little doubt that OfficeVision is fighting for its life. Most industry watchers dismiss it as yesterday's technology, of little value to anyone outside the installed base. Customers today are looking for broader-based LAN products than what IBM has to offer, said John Logan, an analyst at Aberdeen Group in Boston. "Customers want not just calendar and E-mail but faxing and imaging as well."

Then, too, the OfficeVision framework that IBM unveiled in May 1989 with great fanfare as a way to integrate calendar, word processing and electronic mail across its major platforms ran into early problems with delays (see time line at right) and has a major image problem with many users.

"OfficeVision is an oxymoron," said John Wood, vice president at Royal Bank of Canada in Toronto. "We never really figured out what it was." Although still using IBM's mainframe-based Distributed Office System, the bank never switched over to the OfficeVision product line.

Abandon ship

Adding insult to injury, some large users are leaving the product behind — or are at least considering doing so. The Chase Manhattan Bank NA in New York will migrate its remaining end users off OfficeVision over time, according to Craig Goldman, chief information officer at the bank. Only about 20% of office systems users are still hooked up to OfficeVision running on the bank's MVS-based mainframe, he said, and as those users move to PCs, OfficeVision will disappear. Nor will IBM's own LAN-based offerings make inroads here: "Our LAN office software standards are [Lotus Development Corp.'s] Notes and CC:Mail," Goldman said.

Not that this has escaped IBM's attention. IBM has been reselling both Lotus packages as the core of its OfficeVision LAN product line since June 1992, after discontinuing development of its own troubled LAN offering [CW, June 8, 1992]. Even more recently, the company has introduced its own LAN office packages, including a workgroup calendar, gateways to link the various LAN and host components and a version of its current personal information manager that acts as a front end to host OfficeVision systems.

Focus: Connectivity

The focus now, Sullivan said, is on providing connectivity among the different IBM OfficeVision platforms, bringing out new host versions to keep the installed base happy and introducing more of its own workgroup products for the LAN. He said these will include software for work flow and forms.

IBM is targeting large enterprises that want the LAN environment to work with a mainframe or midrange computer of some sort, primarily those of IBM's own making. The company is working on Unix versions that will run on servers and workstations from other vendors. "We're continuing to invest," Sullivan said. Some 700 dedicated OfficeVision programmers work out of a Dallas laboratory. In addition, 500 programmers at other laboratories worldwide also work on OfficeVision products.

Trail of OfficeVision woe

[illegible] 1988	IBM announces OfficeVision, its first Systems Application Architecture application to run under VM, OS/2, MVS and OS/400.
[illegible] 1990	Second release of OfficeVision is delayed.
[illegible] 1990	An IBM executive indicates OfficeVision will recognize Windows and Unix. Windows products have been delivered but a Unix version has not.
[illegible] 1991	IBM acknowledges more problems with OfficeVision. It will not provide a new date for Release 2.0 but moves development responsibility from Application Solutions to Programming Systems.
[illegible] 1991	IBM misses second revised delivery date for second generation of OfficeVision LAN.
[illegible] 1992	IBM kills the OS/2 LAN version and instead sells Notes and CC:Mail packages.
[illegible] 1993	IBM announces more OfficeVision LAN products, including a way to coordinate E-mail addresses between the LAN and host.

Yet despite all the problems, IBM has some time. Many large customers cannot make a switch yet because of their continued reliance on mainframes. "A lot of the companies that use it really depend on it," said Stuart Woodring, an analyst at Forrester Research, Inc. in Cambridge, Mass. "That's why they can't just dump OfficeVision. But over time, as LANs improve the ability to support large numbers of people, more customers will leave it."

Typical of this environment is the New York City Computer Service Center, which, according to Assistant Commissioner Alice Geisler, runs its business on OfficeVision. The agency's 800 users schedule their meetings and keep in touch with one another through it.

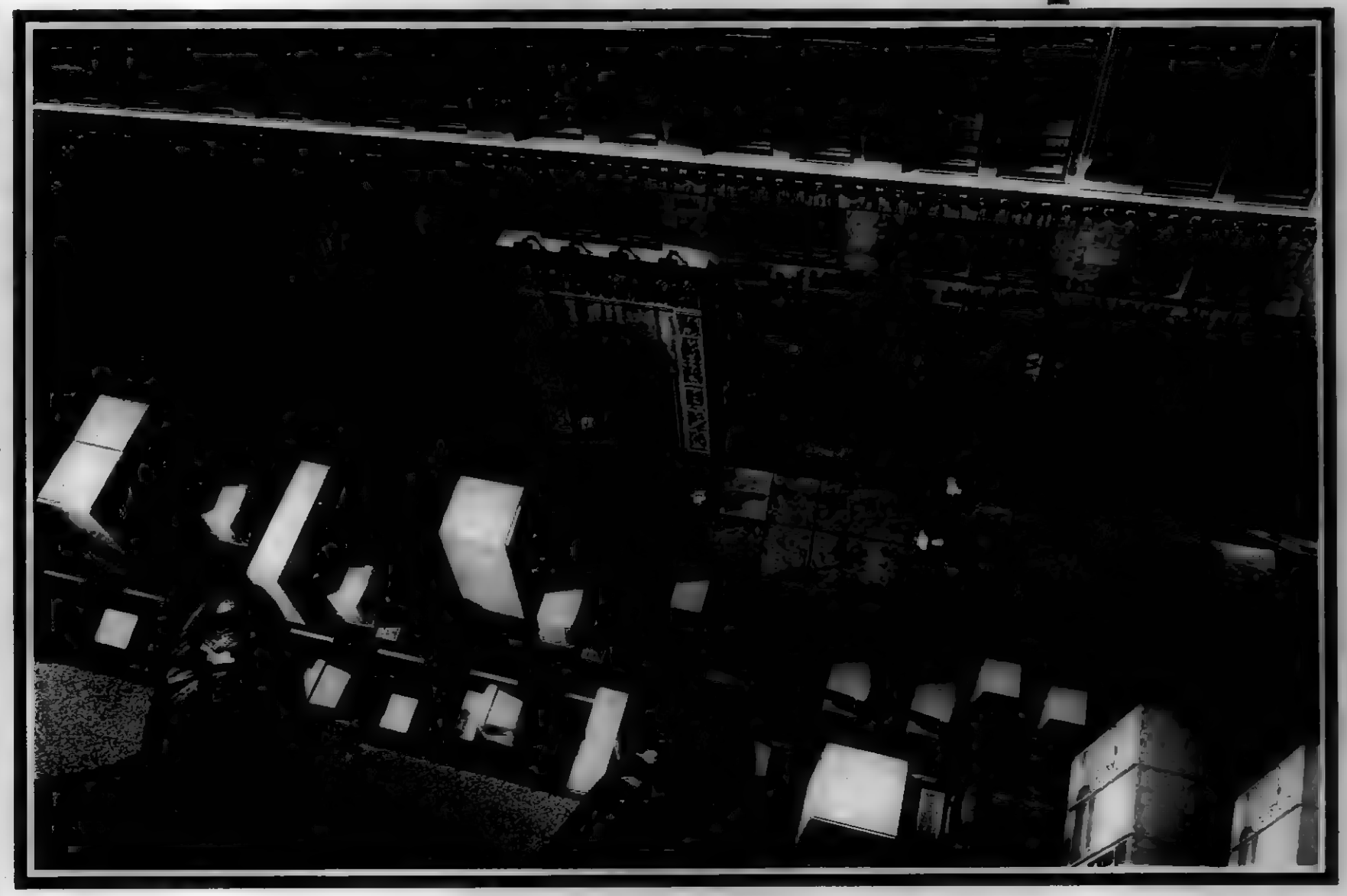
That might change. The new building the agency is moving to will be wired for LANs, and Geisler said the agency will look into how to best provide the office services. "OfficeVision has served us well, but we have some decisions to make," she said.

A refreshed OfficeVision lineup

IBM's OfficeVision lineup includes the following newer components:

- **Current OfficeVision:** A family of products that runs partially on IBM mainframes, minis and, in part, on Windows-based PCs. Positioned as an OfficeVision front end, among other tasks the products allow users to grab electronic mail from the host, process it on the PC and then upload responses back to the host. The VM version has been shipping for a year; the OS/400 and MVS versions recently shipped. The product so far counts at least 500 installations, IBM said.
- **Address Book Synchronization/2:** An E-mail address synchronization program that runs on OS/2 LANs and VM hosts.
- **Time and Place/2 for OS/2 and Windows:** Provides workgroup scheduling.
- **Mail LAN Gateway/2:** Exchanges E-mail between Lotus' Notes and three OfficeVision host platforms.
- **Forms management software for VM.** IBM announced two other packages, but without delivery dates: a full text search and retrieval package that will allow OS/2 and Windows users to look through documents created on WordPerfect, Microsoft Corp.'s Word, DB2/2 and others; and a thesaurus for OS/2.

Rightsizing?
Think Before You Leap.



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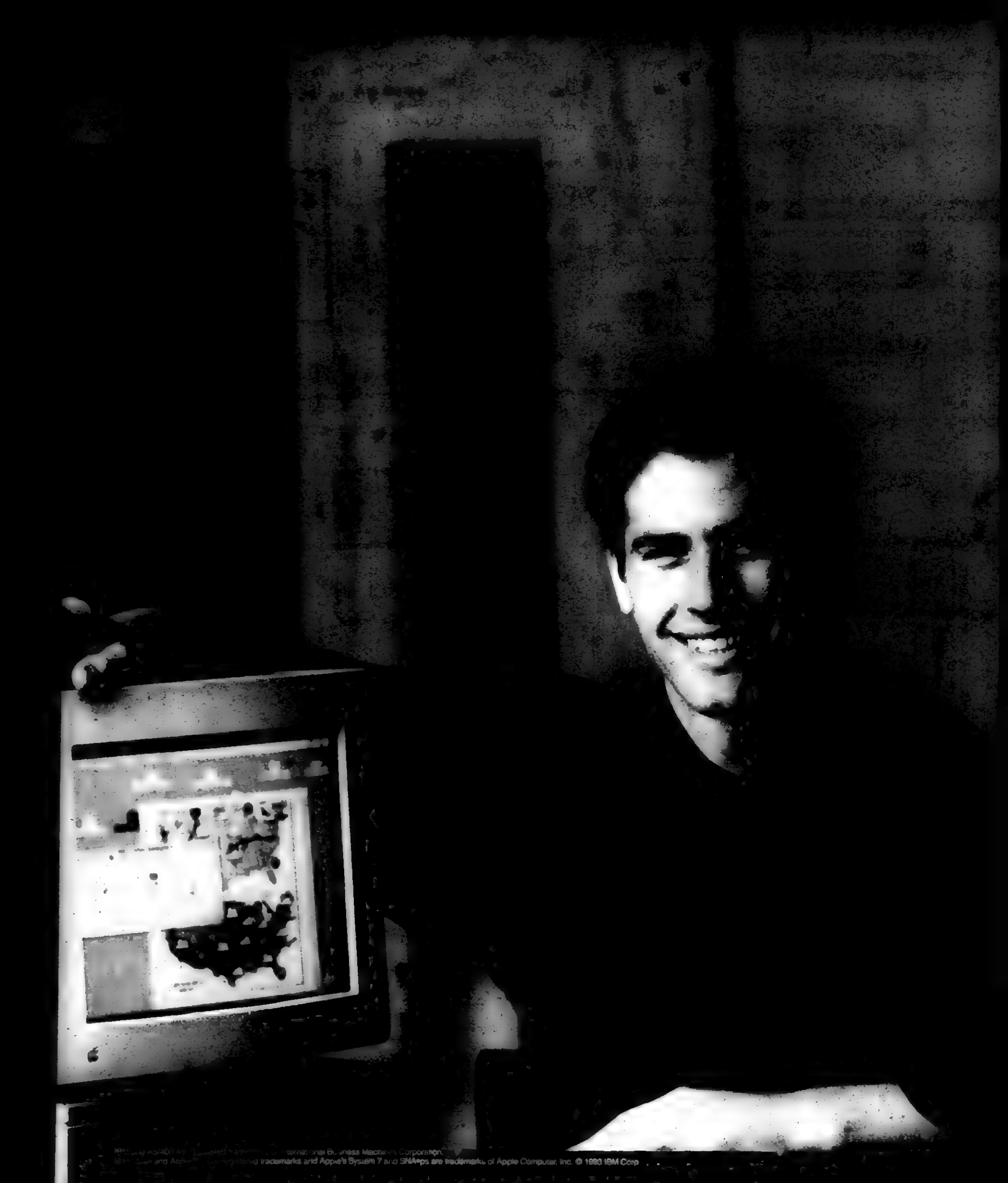

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IBM to fortify OS/2 with object frameworks

By Michael Vizard
LAKE BUENA VISTA, FLA.

IBM last week outlined a strategy for integrating its next generation of object technology into OS/2 as part of an overall campaign to create a robust object-oriented operating system before Microsoft Corp. does.

Detailed at IBM's Personal Software Products Group's Technical Interchange here last week, the IBM plan calls for layering a series of object frameworks in place of each of the procedural code-based system services that now make up OS/2.

When completed, this operating system should provide developers with a platform on which they can more easily create applications, while giving users an environment where applications are tightly integrated.

These framework services will be plugged into IBM's System Object Model (SOM), which was designed to give developers a language-neutral repository for exchanging data between applications created using different tools. SOM is necessary because each object-oriented language tool available today specifies its own storage format, making interoperability across tools virtually impossible.

"My job right now is to make sure that the tool developers include support for SOM in their tools," said Cliff Reeves, IBM program director for object-oriented technology. "In the end, you're going to see a sea of objects," he added.

Thus far, IBM has delivered a persistence framework for SOM, which is responsible for storing objects and searching for them, and a replication framework, which makes it possible for objects to share data.

In the fourth quarter of this year, IBM will add on top of OS/2 a two-dimensional graphics framework and a collection of minor procedural services that have been developed by Taligent [CW, July 26].

Other Taligent frameworks that will be delivered in 1994 for OS/2 include a three-dimensional graphics framework, a text framework and an internationalization framework that will help translate data across countries.

Meanwhile, Reeves said IBM is continuing to build an infrastructure for these object frameworks. Later this month, IBM will deliver its Distributed SOM (DSOM), which will allow objects to be exchanged across platforms. IBM is working to extend DSOM out to Application System/400 and MVS systems.

Battle lines

But whether IBM can leverage its object models on OS/2, which is a widely used application development platform, into a commercial success against Microsoft remains to be seen. Microsoft is layering its own object model, called the Object Linking and Embedding (OLE) 2.0 interface, on top of Windows and is positioning its Windows NT system as an application development platform for building OLE 2.0 applications.

However, OLE is confined to Windows environments, while DSOM is supported by Apple Computer, Inc. and a variety of Unix vendors.

"SOM is considered to be a technologically better solution that is superior in terms of openness," said Curt Monash, editor of the "Monash Newsletter" in New York.

"People are pretty excited about SOM because it provides language independence," added Noah Ross, chief technology officer at Cap Gemini Sogeti USA in New York.

Ross said he received an SOM tool kit a couple of weeks ago and is looking forward to a DSOM tool kit later this month.

"Right now, most people are developing applications for single systems, but in the future, being able to have a cross-platform tool that works across processes will be pretty important," Ross said.

He said DSOM creates an object-oriented environment under which information systems chiefs can easily create application development teams.

"DSOM will make it easier to manage application development projects by implementing a standard that makes reusability of objects a reality," Ross said.

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Bill Jones, MIS, age 38

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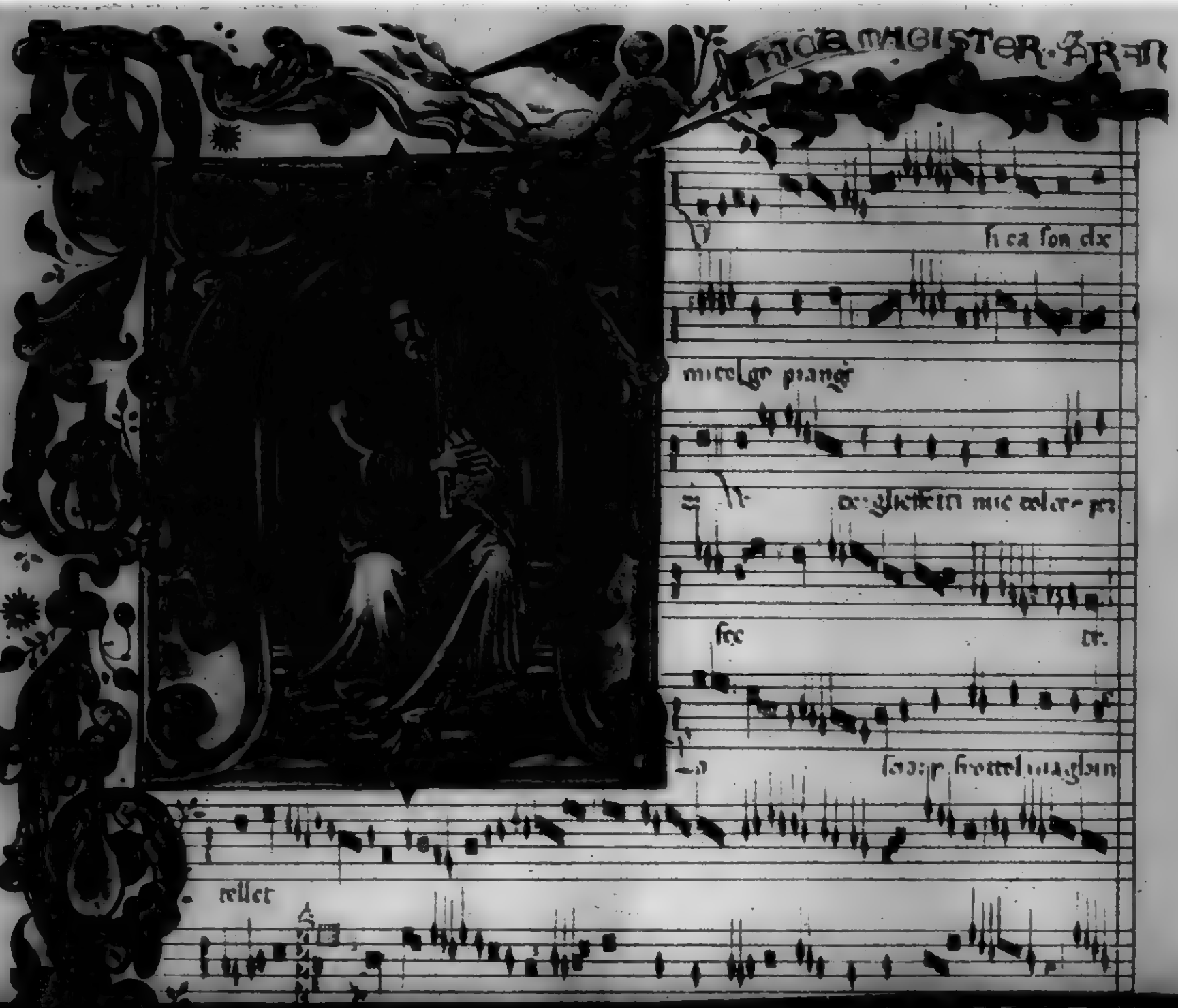

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Oracle throws down gauntlet to Notes

CONTINUED FROM PAGE 1

Oracle declined to comment on the talks but acknowledged that groupware is part of its future.

"We expect to have a complementary product [to Notes], and there will be competitive features as well," said Larry Stevens, vice president of office automation products. Stevens declined to comment on product specifics.

Nevertheless, Oracle Office groupware has piqued user interest. "I'm intrigued," said Gary Falsken, manager of network operations and strategy at Wells Fargo Bank in San Francisco, who has talked with Oracle about the product.

The bank plans to test an imaging application for signature verification on checks. An Oracle database and integrated applications capable of adeptly moving such dense data open up the possibility of going bankwide with the use of imaging and video, Falsken said.

Moreover, groupware access to a SQL database one-ups Notes, according to Ron Creswell, head of a Lotus special interest group within IOUG. Otherwise happy Notes users have griped about the limitations of being cut off from corporate data housed in SQL databases such as those from Oracle, IBM and Sybase, Inc. [CW, Aug. 16]. Lotus is building drivers to some SQL databases.

Further, IOUG attendees can expect to see demonstrations of several database servers targeted at various media, such as images, voice and video.

The products grew out of Oracle's partnership with US West and other telecommunications firms for building cable and wireless networks to provide video and other New Age consumer services on demand.

Oracle is ahead of other database makers with its planned multimedia support, "but it's not like the company can step in and dominate," said Bob Kim, an analyst at S. G. Warburg & Co. in New York.

For example, a potential glitch in Oracle's plans for a multimedia groupware product is making the system easy enough for "Joe office worker" to navigate it, Kim said.

"Being visionary is good, but so is being practical," he added.

Meanwhile, Media Server is an umbrella term for several modules that cater to different aspects of multimedia, such as full-motion video, voice processing and imaging. The products, which Oracle will demonstrate at IOUG, are being tested at a handful of corporate and telecommunications sites, said Chief Executive Officer Larry Ellison.

A US West pilot in the works, for example, delivers video E-mail to several thousand homes. Video on demand will be added to the test bed early next year, an Oracle executive said.

Delivery of Media Server is expected in phases starting next month with Media Library, a tool for managing and tracking material that passes through the server. By the end of the year, compact disc-quality sound and 30 frame/sec. video is expected, Ellison said.

Step ahead

Oracle plans to build several features into a groupware product that Notes does not handle:

- **Compatibility** with other E-mail products.
- **Access to SQL** databases.
- **Ability to handle** voice, video and imaging.
- **Development tools** for building groupware applications.

Different tack

In contrast to Notes, which is based on a series of 1G-byte databases built on top of an object file system, the Oracle approach will be based on Binary Large Object extensions made to the Oracle relational database management engine. Lotus contends that SQL databases are ill-suited to handle unstructured text in document format that requires an object database.

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USDA sows plan to overhaul systems

Common architecture would benefit farmers dealing with multiple agencies

By Gary H. Anthes and Jean S. Bozman
WASHINGTON, D.C.

Under pressure from vocal critics, the U.S. Department of Agriculture (USDA) is expected to announce a plan this month to re-engineer its business processes to provide one-stop information systems services for the nation's farmers.

In the process, it will overhaul many of its key computer systems, rewriting proprietary applications to run on a nationwide open systems network by 1996 (see story below).

The vehicle for this re-engineering project is the USDA's Info Share project, which will guide the agency's move from multiple proprietary computer systems to a flexible and open computer architecture. Despite the scope and need for the project, the agency gave no estimate of expected savings.

John Okay, director of the USDA's Office of Information Resources Management, said the program, which is getting under way this year, will lead to productivity gains through increased automation as well as cost savings through the elimination of redundant processing.

In March, USDA IS managers met in Baltimore to begin mapping the move to open systems, Unix file servers and the increased use of shrink-wrapped software.

The USDA oversees a sector of the economy accounting for 17% of the gross national product, 20 million jobs and 10% of export sales.

Source: USDA

"There are going to be common, shared applications that will serve the same clients," said Gerry Kroshus, co-manager of the Info Share re-engineering program here. "That currently doesn't exist [here at the agency]."

Some 45,000 end users will be affected by the computer systems overhaul, he said. Specifically, the Info Share program will involve six of the largest of the USDA's 40-plus agencies: the Soil Conservation Service, the Agricultural Stabilization and Conservation Service (ASCS), the Farmers Home Administration, Federal Crop Insurance Corp., the Rural Development Administration and the USDA's Extension Service.

One of the project's chief goals, according to Okay, is to establish common databases supported by a common data dictionary. A key benefit is that farmers who deal with several USDA agencies will be able to see one automated data input that will be viewed, in some cases, from their own PCs, he explained.

That would replace redundant forms filled out at multiple local offices, as is now the case. "Today, information is shared by handing paper back and forth," Okay said.

Long-distance access

Until now, users have logged on to mainframes at the USDA's National Computer Center in Kansas City, Mo., and from dumb terminals in regional and branch offices. Worse yet, farmers have to drive long distances to get to those USDA agency offices to obtain services. Some farmers fear that a pending USDA reorganization will consolidate branch offices and lengthen travel time.

Business processes as well as computers need to be updated, farmers said. Ronald Dahlen, a farmer who serves on the North Dakota Farmer's Union board of directors in Jamestown, N.D., said farmers' business questions or problems often get bumped up from local ASCS offices to other levels of the organization. That slows response to farmers' inquiries. "It has to go up through the state to Washington [D.C.] and back," Dahlen said. "This is something that could be simplified in a lot of cases."

USDA's John Okay: *Seeks common data dictionary*

The fundamental problem is that USDA agencies use separate systems, many of which are not capable of sharing data. Another problem is that thousands of aging USDA computers are seven years old or older, making spare parts scarce and interoperability impossible.

New learners

Farmers are fast becoming computer-oriented, said Jeff Smedsrud, executive vice president at Communicating for Agriculture, Inc., a nonprofit national farmers association with 80,000 members. A 1987 survey of the membership found that just 13% used PCs; now, 44% use PCs. In 1987, few farmers surveyed used faxes; now, at least 15% use them to access data from suppliers and service firms, he said.

The move to open systems will begin with the addition of a nationwide Transmission Control Protocol/Internet Protocol (TCP/IP) to the existing IBM Systems Network Architecture (SNA) network, according to Kroshus.

However, the exact specifications of the USDA's new systems may not be ironed out for a year. Standards compliance will be a key factor in deciding which computer products to include, among them support for Posix, TCP/IP and the International Standards Organization's Open Systems Interconnect networking standards, Kroshus said. Unix systems are being considered but may not be used for all applications, IS executives at the USDA said.

USDA's Henry A. Bauer: *Farmers will dial in from their home PCs*

Prior to specific product bids for Info Share, USDA is planning an informational conference this fall for potential vendors. It is already setting up a TCP/IP network that will coexist with its SNA network.

Both networking protocols will access the same front-end processors in the Kansas City computer room.

Getting connected

Next spring, a pilot test of the TCP/IP system will link counties throughout Kentucky with the Kansas City data center and with the USDA's Washington, D.C., headquarters, Kroshus said.

Ultimately, client/server computing is likely to play a large role in connecting rural USDA offices with central-site data repositories.

"I see a lot of farmers sitting in their home with a PC and dialing into our systems," said Henry A. Bauer, director of the National Computer Center's office of information resources management in Kansas City. "I believe Secretary [of Agriculture Mike] Espy has made it very clear that we're going to do business differently and that it will be more user-friendly."

Gore's government review will harvest Info Share

Under fire for alleged management lapses and poor use of IS funds, the USDA is finally moving to get its house in order. To start with, the $60 billion agency plans to fall in line with Vice President Albert Gore's plan to reorganize the way government agencies do business with the public.

In fact, Gore's National Performance Review recommendations, which are set to be announced tomorrow, are likely to include the USDA's Info Share project, said John Okay, director of the USDA's Office of Information Resources Management.

Shortly after the Gore program is revealed, Agriculture Secretary Mike Espy is slated to announce his plan for reorganizing the entire USDA, something a team of senior agriculture officials has been working on for several months.

Separately, Espy designated the Info Share program a "reinvention laboratory," meaning it is spotlighted as a wellspring of ideas and techniques for possible application throughout the huge department.

Technology is not the biggest challenge of Info Share, Okay said. "It is an interagency coordination, trying to meld the requirements of different agencies [with] quite different missions in order to come up with joint acquisition, implementation, training, development and maintenance plans," he added.

Info Share will lead to productivity gains through increased automation as well as unspecified cost savings through the elimination of redundant processing. Okay gave no target figure for savings, however.

An overhaul of USDA systems is long overdue, according to critics. In June of last year, the U.S. General Accounting Office blasted a USDA plan to spend $2 billion on a number of new computer systems for a number of its agencies over five years because it did not address restructuring and downsizing issues. However, the USDA estimated it saved $50 million over five years because of the consolidation of five regional data centers into one National Computer Center in Kansas City, Mo.

But at a congressional hearing in July, witnesses took turns criticizing the USDA bureaucracy and calling for the agency's reorganization. "[The] USDA now is simply too big, too complex, too divided and uncoordinated," said Charles Bingman, professor of public administration at George Washington University in Washington, D.C.

He called for the "full integration" of the agencies' missions, staffs, databases and information systems. Info Share, as it now stands, does not go quite that far.

—Gary H. Anthes

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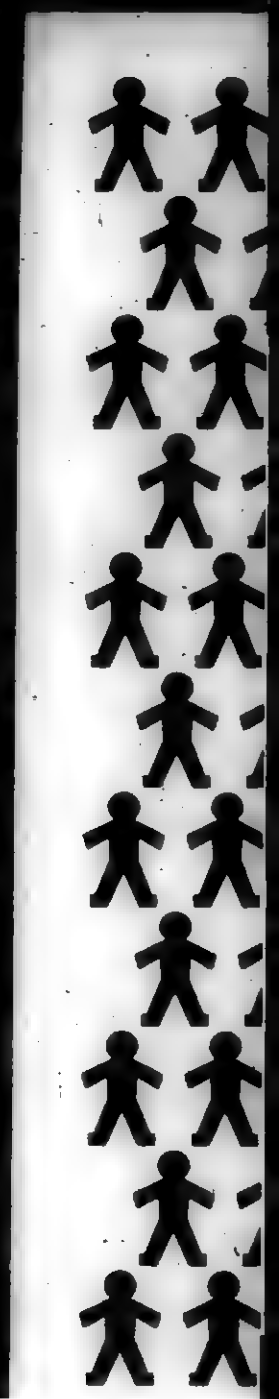

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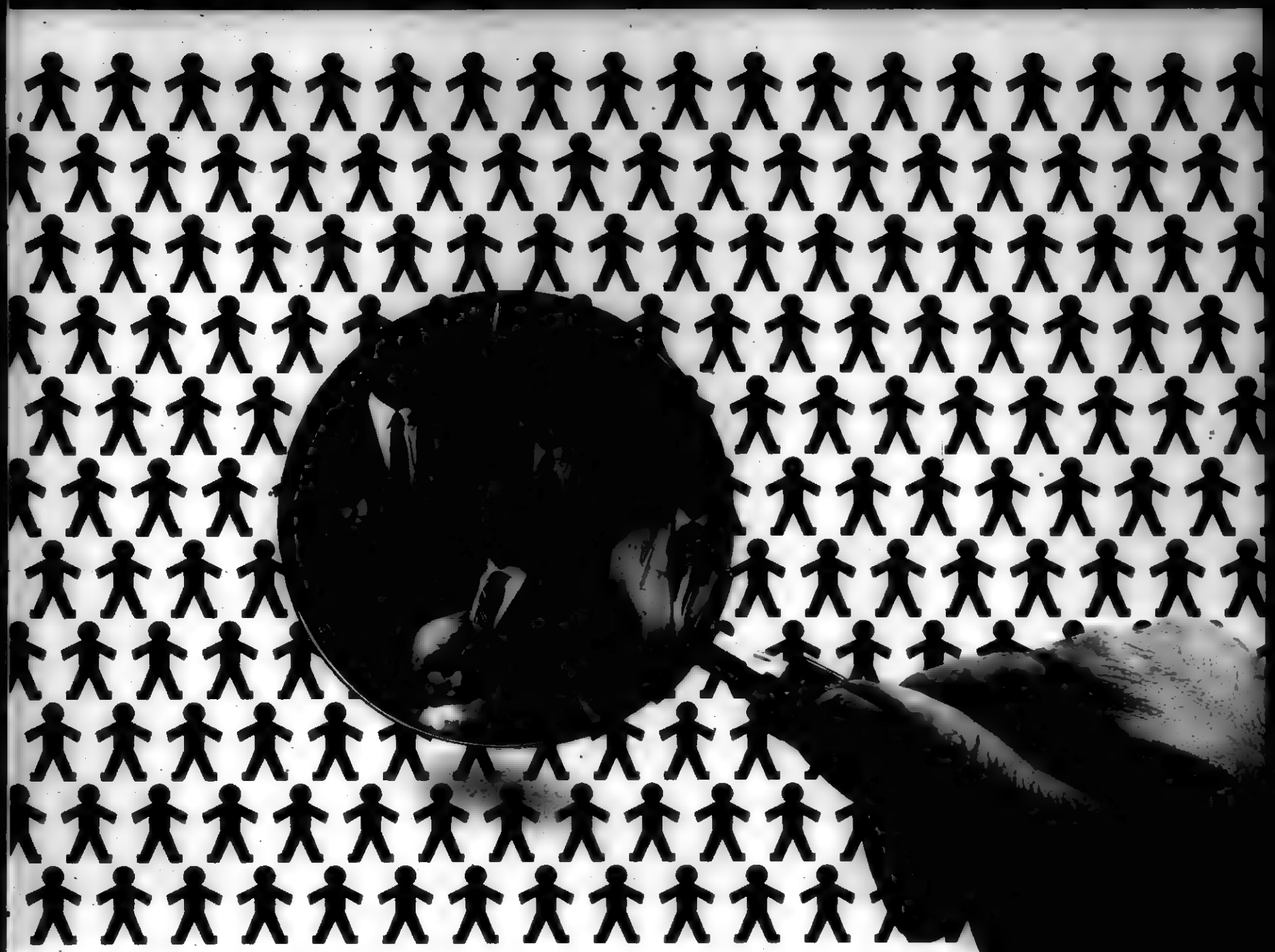

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Justice for all

And now for some good news.

While women in IS still earn less than men in similar roles, the pay gap between the genders is definitely narrowing. In fact, according to our seventh annual salary survey (see story page 91), the gap is narrowing rather smartly.

One analyst generously attributed this trend to the Clinton administration's emphasis on female and minority hiring. I suppose we could credit Clinton for the nice weather we've had this summer as well. But the salary levels we sampled were likely set before the new administration could have had any impact on them. So there must be another reason.

I think the reason is that the drum-tight job market in this era of downsizing is working in favor of the best employees. Put simply, when management is pruning the corporate garden, what's left behind usually is the strong growth — regardless of race, gender, etc. That is, there is less and less room for discrimination in a world where only the best will survive.

Some discrepancies in pay do persist, including some big ones in the upper salary reaches. But that may have more to do with the actual years of experience on the job gained by the average woman than with discrimination. That experience gap, too, will evaporate in time.

Other interesting if not encouraging trends are emerging from the data. Managers are finding much more innovative and ultimately fairer ways of compensating IS professionals. Over time, the percentage of salary increases attributed to annual merit raises is shrinking in proportion to the increases given in bonus awards. Bonuses in most organizations are tied to superior performance. Too bad we don't compensate teachers the same way.

So in all, some pretty encouraging news from this, the single most comprehensive survey of IS professionals' salaries.

Star search

For 20 years, the Boston Red Sox had the greatest pure hitter in baseball. Despite the presence of Ted Williams in the lineup, however, the team itself seldom finished better than third place.

Which brings up an immutable fact of organizational life. There is no substitute for teamwork. In recognition of this truism, *Computerworld* is searching for candidates to honor in our second annual Re-engineering Team of the Year Award.

Rather than seeking out any one individual glory hound, we want to give credit where credit is due — to the entire team. For further instructions on how to nominate or be nominated for this award, watch for the promotion we'll be running starting next week. Or call Allan E. Alter or Joe Maglitta here for details. The deadline for submitting nominations is Oct. 15.

Bill Laberis

Bill Laberis, *Editor in chief*

Information Age

"The content challenge" [CW, Aug. 2] is proof our culture is breaking away from the narrowness of the Age of Data into the Age of Information. Notice I didn't say the Age of Content. Why add another new abstraction to our already overloaded lives? This ignores the real problem and sends us off course, chasing content instead of distinguishing between data and information. I can just see it: "content-enabled systems," "universal content viewers," "content specialists," etc.

This article helps us see the vital difference between data and information. We have been conditioned to call everything that goes into or comes out of a computer "information." Most techies believe they have it stored all over their systems, and most users believe it will improve their lives if they can just access it. This is partly what Peter Drucker called "role confusion."

The word "information" has become so diluted it's sterile. Isn't that reassuring? Here we are trying to compete in a global arena using information as our most-effective weapon, only to discover we're shooting blanks. Let's tackle the real issues so we can create some real ammo. To paraphrase: "Content is impressive, content is good, but it's information that does all the work."

Kevin Stumpf
Kitchener, Ontario

SQL Server secure

Regarding "Security lapse bedevils users of SQL Server" [CW, Aug. 2]: Contrary to the impression conveyed, there is no lapse in SQL Server security that reduces data safety. Rather, the problem that Kevin Kenefic at Houston Lighting and Power Co. described is one of management: the difficulty of administering multiple servers as needs expand beyond workgroup and departmental use. This issue is not unique to SQL Server.

Microsoft understands this issue well. Every one of the 30,000-plus OS/2 SQL Server installations are deployed in client/server configurations.

That is why in our current suite of products for the Windows NT operating system we have tackled this problem directly by building specific enhancements into SQL Server to ease the administration and management of large-scale client/server networks.

I spent time with the writer explaining these enhancements in our product, but they were not discussed in the story. This is unfortunate because the reader is left with a very misleading impression of our products and our response to this important customer requirement.

Gary Voth
Senior product manager
Microsoft Corp.
Redmond, Wash.

Notes supporter

In your Aug. 16 issue, I was quoted as advocating that Lotus release a much cheaper runtime version of Notes to increase market penetration. While this is essentially accurate, my quote was taken out of context: I was at a user group meeting at Groupware '93 in San Jose, Calif., and I made the comments in the form of a question to challenge Lotus Notes executives.

As someone who has been working with Notes since the summer of 1990, I want to point out that I think Notes is worth every penny Lotus charges, and given the vast resources Lotus has spent developing it, the price it charges is more than fair. However, Lotus Notes, like the telephone, E-mail or fax machine, increases in value proportionately to the number of users, and I fear Lotus will lose a chance to make Notes the de facto standard by using an economic model that works better for refrigerators than software.

I believe that it would be better for companies to have pricing that encourages them to install Notes on every desktop as soon as possible than pricing that encourages them to run expensive, time-consuming analyses.

Carolyn Coughlin Weissberg
San Francisco

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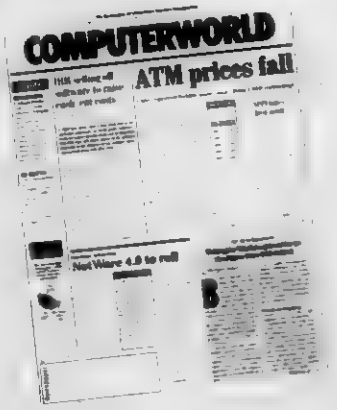

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Object orientation isn't salvation

Tim Lynch

I don't know about you, but I'm getting awfully tired of the gospel of object-oriented programming (OOP). I'm sick of being told that OOP is some kind of magical, mystical route to programming nirvana that only certain enlightened people can follow. It is kind of like the TV evangelists who say, "You won't be saved if your belief is not strong [and if you don't send me $50]."

It is annoying to continually read articles in which Cobol and its functionality are maligned and misdescribed. Cobol enables a conscientious coder to create maintainable business applications. Of all the business systems I have helped design, code, implement and maintain — and there have been many, in many languages and environments — those written in Cobol have been the easiest to maintain after the contract development team has left.

C++ is great if you want to create code that only you can maintain. Using it makes for job security (which, these days, is probably not a bad idea), but it is a step back toward the assembly language at a time when we in IS should be moving toward higher-level languages. (The visual development tools that are coming on the market are a step in the right direction.)

I have experienced OOP technology at a high level through classes, books and seminars and at the application level using a visual development tool. I know what I'm talking about when I say OOP is nowhere near as difficult to grasp

Dan Duncan

as its proponents would have you believe.

The usual line is that it will take time, possibly even years, for an individual to fully grasp OOP. Some, we are told, just aren't capable of understanding it at all and should be fired. I'm not quite sure how this lack of ability can be detected, but I have my suspicions about what the "experts" will say. Several articles I've seen recently have mentioned that the first few programs developed with OOP may look somewhat like structured programs. (I hope so!)

Who are they trying to kid? If it takes a genius to handle this stuff, then the vendors might as well back off and stop hawking it now because there is a shortage of Ph.D.s clamoring to pound out code.

What we have here are marketers (abetted by some self-promoting programmers) trying to sell mystery and hope to CIOs who are under pressure to cut costs using technology.

Show me a business system developed using OOP that does not look like a system developed using some structured techniques, and I'll show you a business system that Einstein could not maintain.

Show me inheritance, and I'll show you a Copy Lib member, an Include and a program template. Show me a modular system developed using OOP, and I'll show you a common Cobol linkage program that is called by 100 different programs to properly format a Social Security number. Show me a client/server system without a mainframe that accesses 2 million rows of data on-line ad hoc, and I'll show you a network crash.

Sure some of the new stuff is great, but it is not mature and should not be portrayed as the best and only way to go.

Don't buy the line that programmers can't understand this wonderful new technology. We can understand it all right, we just don't think it's the Second Coming.

Lynch is a senior analyst at Florida Power and Light Co. and previously worked at Electronic Data Systems.

Data-hording habit dies hard

ADVENTURES IN INFORMATION *by* Patricia B. Seybold

You want an information-centered organization. You want information flowing cleanly from your customers' customers to your suppliers' suppliers and circulating throughout to stimulate ideas and action and deliver timely feedback.

Worthy goal, but how do you manage to achieve it? You can't have a completely open door policy or valuable, proprietary information will leak out. You can't *force* different departments to share hard-won data and carefully analyzed information. Yet, until the corporate culture changes from one of information hoarding to one of information sharing, your efforts to streamline processes, improve customer satisfaction and cut time to market will be doomed.

Until the corporate culture changes from one of information hoarding to one of information sharing, your efforts to streamline processes will be doomed.

The popular approach is to gather all the data from different departments and corral it into one megalithic repository, where it can be carefully maintained and protected. Then, the idea is, everyone in the company can dip into it according to their station and their "need to know." The gateways to and from customers and suppliers are carefully monitored.

Problem is, this model doesn't work. Information flows in, but it is passed through a screening process before it's allowed to commingle. And information flows out, but only in a careful trickle after raging internal debates about appropriate disclosure.

So what does work?

Strategic technology planners are now favoring something one developer has dubbed the "maitre d' approach," which allows the "owning" departments to retain custody of the data and oversee its distribution. My application requests services from your database and, depending on my application's station in life and what quid pro quo I'm willing to offer, I'll get the level of information service befitting my stature.

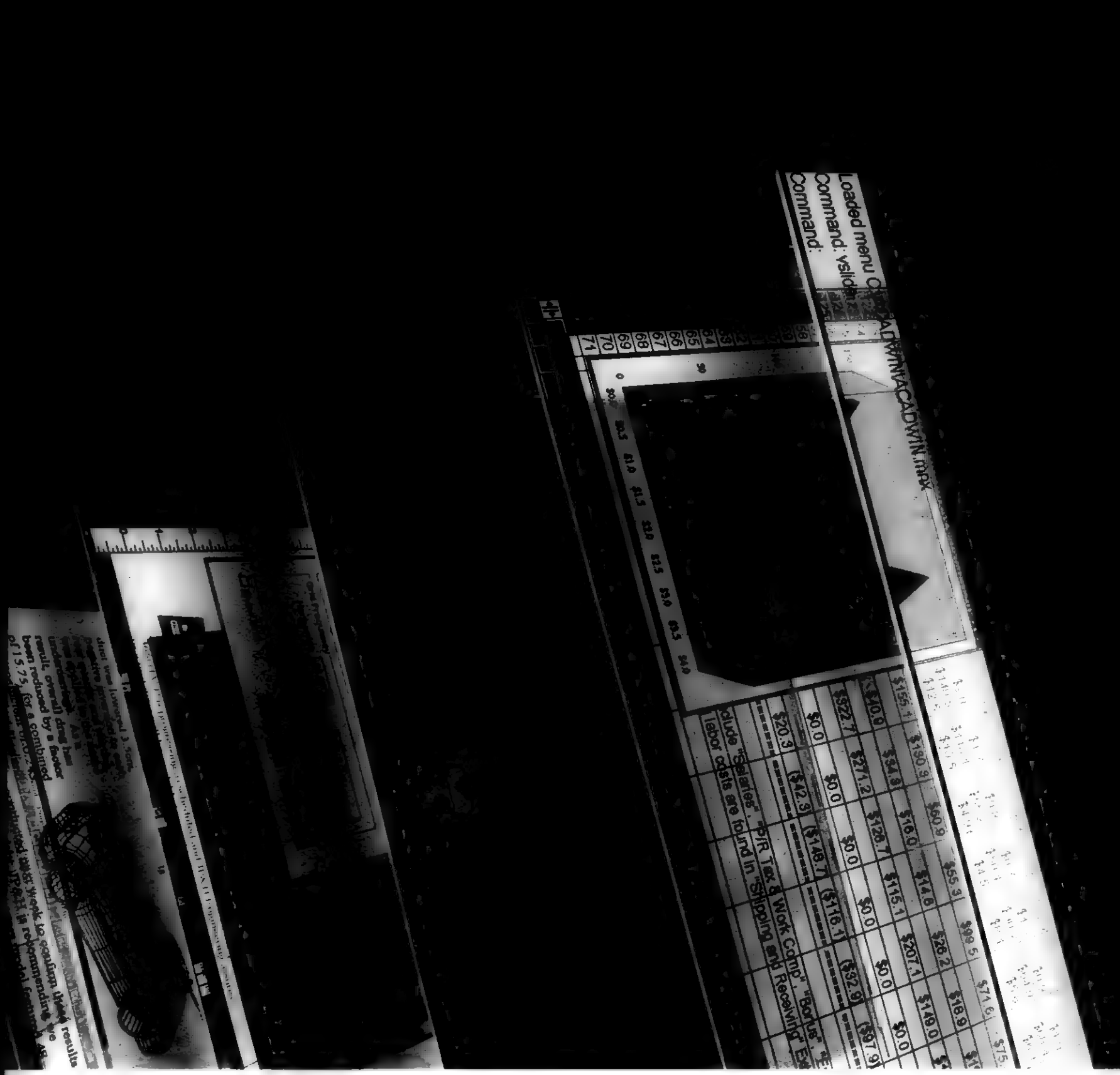
It's pretty straightforward stuff. If you want people to share information, you have to offer them information that's more valuable than what they're "giving up." But the logic isn't always so clear to those you have to convince, whose judgment may be clouded by ingrained and unexamined assumptions about "how we do business."

Let me give you an example: The distribution division of a large manufacturing firm had established a state-of-the-art, just-in-time inventory management system with one of its largest clients. In gratitude, this client, a major retailer, offered to share its database of item sales for each store.

When the folks in the manufacturer's product marketing department heard that offer they began to salivate, thinking about what they could do with this treasure trove of detailed, micromarket information. But the executives in the sales organization threw out a red flag. "We don't want to get that close to our customers," they said. "That's why we sell through brokers."

You see the problem. That kind of knee-jerk response may seem ridiculous to observers, but it's grounded in long-standing and well-intentioned business practice. The road to the information-centered organization is a mine field of good intentions.

Seybold is president of the Patricia Seybold Office Computing Group in Boston, which specializes in distributed computing for networked organizations. Her Notes address is Patricia Seybold @ PSOCG. Her Internet address is PSeybold @ MCImail.com.



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Apple baits PowerPC with Mac license

By James Daly
CUPERTINO, CALIF.

High-ranking officials at Apple Computer, Inc. said they hope to build enthusiasm for the upcoming PowerPC microprocessor platform by licensing the Macintosh operating system to other PC makers interested in using the chip in new models, sources close to the company have indicated.

Apple officials have reportedly offered System 7 to hardware vendors interested in developing PowerPC-based computers that would run System 7 and Macintosh applications. Popular IBM PC clone makers Gateway 2000, Inc. and Dell Computer Corp. reportedly top the list, but officials from both firms declined to confirm those reports.

Until now, Apple officials have indicated that other vendors will be able to run Macintosh software only in an emulation window under the PowerOpen Unix environment, which is expected to be available by mid-1994.

If the licensing overture reaches a first movement, it could break nearly a decade of keeping the Macintosh operating system proprietary. Such a move would represent a fundamental shifting of gears for the company, where even two years ago such a licensing scheme would have been branded heretical.

Earlier this year, reports also surfaced that Apple engineers are experimenting with a modified version of System 7.1 that would run on DOS-based machines using Intel Corp.'s i486 microprocessor.

Analysts said Apple could walk on a slender ledge with the licensing scheme. On one hand, it could be an excellent method of building momentum. "A good analogy would be the wars between VHS and the beta videotape format in the 1980s," said Pieter Hartsook, editor of Macintosh-centric newsletter "The Hartsook Letter" in Alameda, Calif. "Sony's beta design was a technologically superior product, but it didn't stand the onslaught of companies like JVC, Philips and RCA. PowerPC may be a technologically superior product, but people have to see that the momentum is there."

The strategy could backfire, however, if Apple continues to be plagued by a shortage of hardware while a competitor such as Dell has an ample supply of System 7-equipped models.

Apple is expected to ship its first PowerPC Macintosh by the middle of next year. Clones with System 7 installed would follow perhaps six or nine months later "so Apple could get a leg up," one source said.

Apple users have mixed feelings about purchasing non-Apple PowerPCs equipped with System 7. Some, recognizing that hardware has become a commodity item, said they would appreciate any effort to lower the traditionally higher cost of the Macintosh.

"No one has ever bought a Macintosh just because there is a little Apple on the outside of the box; you buy it for the operating system," said Bob Anderson, a senior analyst at A. O. Smith Automotive Products Co. in Milwaukee. His company is an all-Macintosh shop with about 400 machines in the main office and 200 to 250 more spread throughout the country.

Such a move could make the Macintosh platform more attractive to third-party software developers, Anderson added.

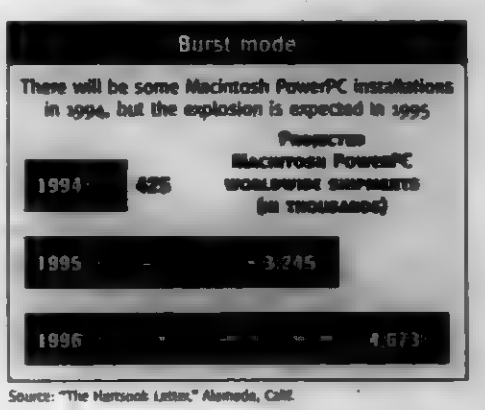
Process problems?

But reservations remain among some end users, who wonder whether such a half-breed system could present operational difficulties. "Part of the magic of the Mac is that you have the hardware and software so tightly linked," said Dave Lustig, manager of technical services at Bose Corp. in Framingham, Mass.

"Apple has been able to tightly couple the [operating system] with the hardware, but when you license a system, you lose that control," said Tim Yancy, a unit manager at Southern California Edison in Rosemead, Calif. Yancy, who works with more than 2,500 Macintoshes, added, "Look at the compatibility problems when you run some software on different DOS machines."

The PowerPC chip is a collaborative effort of Apple, IBM and Motorola, Inc. and is based on the reduced instruction set computing technology. The chip design will be used by both Apple and IBM as the basis for their next generation of desktop computers. Apple Chairman John Sculley said that all Macintosh computers will eventually use PowerPC chips instead of the Motorola 68000 chips that now power the line.

Apple officials have also said the Centris 610, 650 and Quadra 800 will be upgradable to the PowerPC platform. Low-end machines and the PowerBook are expected to make the transition in late 1994 or early 1995.



Database

Microsoft adds support to ODBC

By Michael Vizard
REDMOND, WASH.

Microsoft Corp. is readying another version of its Open Database Connectivity (ODBC) interface, which forms the heart of its SQL-based client/server computing strategy.

ODBC is Microsoft's implementation of the SQL Access Group standard, which is intended to provide a common SQL interface for accessing databases from multiple vendors.

The new release promises support for the Win32 programming interface used to create applications on Windows NT, the ability for all drivers to scroll backward and forward through a database and, most important, equal support for both relational and navigational databases, according to a company spokeswoman.

It will be made available in beta-test form during a developer's conference this month in Seattle.

By adding full support for navigational databases, the new version of ODBC will put databases such as Microsoft's FoxPro and Borland International, Inc.'s dBase IV on an equal footing with SQL databases in terms of supporting SQL calls from PC applications.

The support for navigational databases is intended to negate any support Borland may be able to drum up for its rival database standard, the Independent Database Application Programming Interface (IDAPI).

Led by Borland, Lotus Development Corp., IBM and Novell, Inc., the IDAPI initiative was launched last year in response to Microsoft's ODBC effort and promised to provide a common interface to both SQL databases and navigational databases such as dBase IV.

Applications link

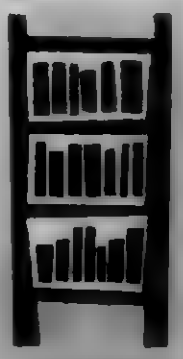
Microsoft has championed ODBC as the primary interface it will use to link its applications to databases. It recently delivered one version of the interface. But thus far, ODBC has drawn criticism for introducing yet another layer of software that reduces performance. Borland, meanwhile, has yet to deliver a full IDAPI specification.

"The consensus out there is that you have to trade off performance and functionality to use ODBC, and adding support for navigational databases builds onto an already shaky premise," said Rich Finkelstein, president of Performance Computing, Inc. in Chicago. Still, he added that ODBC is somewhat useful in applications that generate simple SQL calls.

For example, American Airlines in Dallas plans to use ODBC to link some custom-built Visual Basic applications with a variety of databases. "The applications aren't heavy users of databases, and it's easier to support one piece of code to link to multiple databases," said Jay Ferguson, a senior engineer at the airline.

According to Colleen Lambert, product manager for ODBC, Microsoft's SQL implementation has received something of a bum rap. "ODBC was first implemented in Visual Basic and Access, which have separate overhead issues that create a lot of connections. The only time there is a performance issue with ODBC is when your application has a lot of connections and disconnections," Lambert said.

As such, developers of transaction-oriented applications are expected to support the native interfaces to databases from vendors such as Oracle Corp. and Sybase, Inc., while using ODBC and IDAPI as secondary interfaces to provide access to data that is infrequently accessed.



Library links

American Airlines is building applications using Dynamic Link Libraries from Q+E Software, Inc. in Raleigh, N.C., which announced at the Software Developers' Conference in Boston last week that it will deliver ODBC support in its Q+E Database Library next month.

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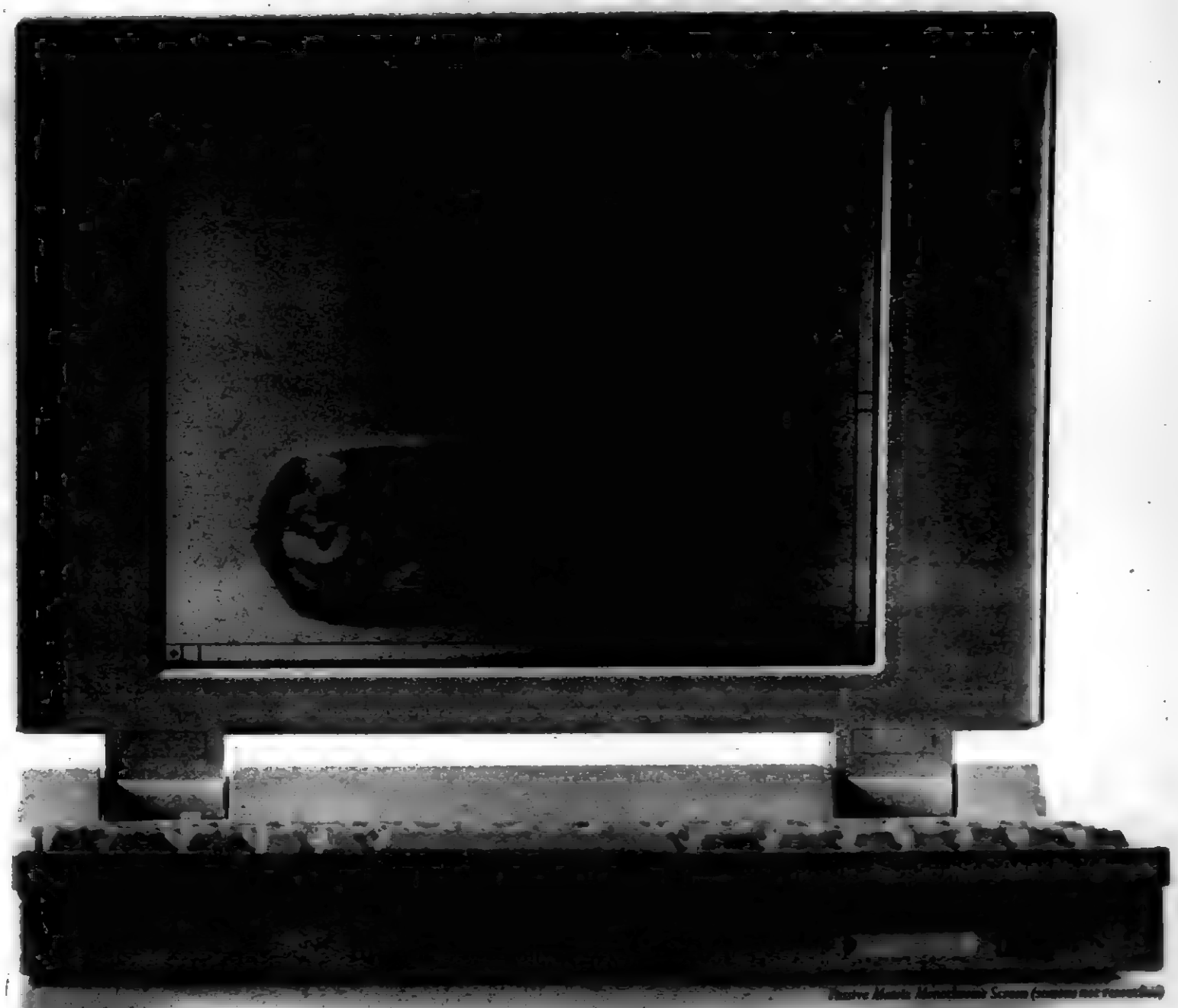

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Digital develops notebook line

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. may be moving away from the "not-invented-here" syndrome, as evidenced by the company's recent decision to drop its network management software and license IBM's NetView/6000 software. But that does not apply to notebook PCs, where the opposite is happening.

Currently reliant on AST Research, Inc. for notebooks, Digital's PC unit wants to do its own thing in an effort to expand its limited presence in the notebook market. A notebook line is being developed internally to debut in the first half of 1994, Digital officials confirmed.

With profit margins becoming more and more razor thin, Jesse Parker, director of product management at the PC unit, said Digital hopes to make more money by cutting out — or at least reducing its reliance on — the middleman. "Whenever you do it yourself, it's more profitable," he noted.

Heading for the top

Digital also acknowledged it must become more of a force at the notebook level to meet its goal of becoming one of the Top 5 PC vendors by mid-1995. "We're committed to being a full-line supplier, and we recognize the need to have high-volume notebook products," Parker said.

Digital, which brought its desktop PC production back in-house a year ago, may not cut the notebook cord completely. New externally sourced notebooks are reportedly due by the end of 1993, and Parker did not rule out continuing to buy some products from AST in the future.

He would not comment on the specifics of the notebooks being developed at Digital, but analysts said they expect the systems to be based on Intel Corp.'s I486 microprocessors. Digital's notebook offering is now topped by a 25-MHz 386SL-based machine unveiled last January.

Richard Zwetchkenbaum, a PC hardware analyst at International Data Corp. in Framingham, Mass., said Digital's move to make its own notebooks is not surprising. "For them to participate in the fastest-growing part of the PC market only makes sense," he noted.

Picking up speed

Digital, which took a year to refresh its DECpc LP desktop line, plans to shorten product cycles to "six or seven months" to keep current on functionality and pricing, said Jesse Parker, director of product management at its PC unit. Digital does not expect to go below the six-month threshold, though.

Neal Hill, an analyst at Forrester Research, Inc. in Cambridge, Mass., added that Robert Palmer, Digital's president and chief executive officer, recently singled out mobile computing and multimedia as the only two areas where the company still funds pure research.

Both analysts said they would not count out Digital's chances of making a go of it in notebooks, despite the company's late start. "I think they can be viable," Zwetchkenbaum said. "If there's anything that marks the notebook industry, it's not brand loyalty."

Bob Cloninger, data processing manager at OK Industries, Inc., a poultry processor and longtime Digital customer in Fort Smith, Ark., said he has not seen "any compelling reason" to buy Digital PCs beyond the handful of desktop machines he purchased last year.

However, he added that he would not be adverse to at least trying out the promised notebooks. "I'm always open to what Digital is doing," he said. "They've done some pretty good stuff for me in the past, and there's no reason to think they won't continue to do that."

Anticipating low demand

With the start of shipments looming for Digital's Alpha AXP-based PC running Microsoft Corp.'s Windows NT, both analysts and Digital keep downplaying expectations that the DECpc AXP 150 will be greeted by much pent-up demand (see story page 47).

Scott Miller, a PC hardware analyst at Computer Intelligence/InfoCorp, said he does not expect the Alpha-based machine to have much short-term impact on the PC market. Several other analysts agreed, and Digital did not quibble with that point of view.

"NT adoption will take some time," acknowledged Jesse Parker, director of product management at Digital's PC business unit. "There's no doubt that the overwhelming majority of the business is for Intel PCs, and that's where the overwhelming majority of our efforts is focused."

Andre Hallam, a senior office automation analyst at Children's Hospital of Eastern Ontario in Ottawa, said he has an AXP 150 machine on order, but only for trial purposes. "Initially we just want to play around with it," he said. "We have to see where it fits into our strategy." — *Craig Stedman*

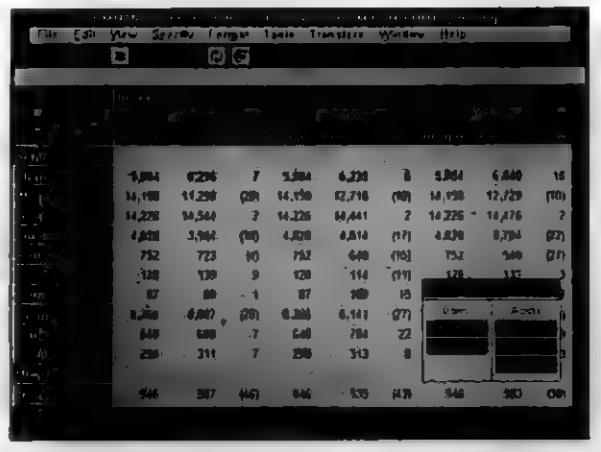
Comshare spreadsheet debuts

By Michael Vizard
ANN ARBOR, MICH.

■ Comshare, Inc. has launched a multidimensional modeling spreadsheet for Windows that marries the traditional spreadsheet with a database to give users the ability to model large data sets.

Called Commander Prism, the Comshare offering is a Windows follow-on to the company's existing multidimensional DOS product, One-Up. However, Commander Prism supports significantly larger data sets, provides a more robust set of analysis tools using the Windows interface and does calculations faster.

Because of these features, Kraft General Foods, a subsidiary of Philip Morris Cos., intends to migrate from One-Up to Commander Prism, according to K. C. Madden, a business decision-support consultant at the company's Rye Brook, N.Y., headquarters.



Commander Prism *lets users save up to 32,000 views of data*

Improv needs improvement

According to Madden, Kraft evaluated Commander Prism against the Improv multidimensional spreadsheet for Windows from Lotus Development Corp. but found that Improv was not robust enough to meet Kraft's needs.

"For our applications, Improv's a toy," Madden said. For example, Madden said his users need to be able to look at data sets that span as many as 70 business units, 80 product categories and 25 line items.

Improv, Madden said, is not large enough to support these kinds of data sets, and traditional spreadsheets will not do the job because of limited multidimensional capabilities.

"Improv can't deal with models that are bigger than available memory, and with traditional spreadsheets all you can really do is print out the basics, and then everybody has to build a new spreadsheet every time they want to see a different view. The Comshare products have a far superior way of doing this because it slices, dices and indexes the model using the database," Madden said.

Specifically, Commander Prism allows users to predefine and save up to 32,000 different views of data.

Commander Prism requires 4M bytes of random-access memory and costs $960.

Zenith Data boosts notebook features

By Michael Fitzgerald
BUFFALO GROVE, ILL.

Zenith Data Systems added six new models to its line of Z-Note notebooks and brought out four new versions of its Z-Lite subnotebook.

The refreshed products are named the Z-Note+. Zenith Data added a new pointing device, Notepoint, which is attached to the front and center of the notebook, and a version of its port replicator with built-in Token Ring.

All the new Z-Notes use either a 25-MHz or 33-MHz 1486SL from Intel Corp., a 200M-byte hard drive and 4M bytes of 3.3V low-voltage random-access memory, except the Z-Note 433LNC+, which will ship with 8M bytes of standard RAM next month.

Two models have a thin-film transistor active-matrix color screen, two use a DualBrite passive-matrix color screen, and two have monochrome screens. Prices range from $2,599 to $4,599.

The new Z-Lite 425L subnotebooks maintain their 3.9-pound weight but use the 3.3V version of the 25-MHz 486SL in place of the 80386SL in the original. Zenith Data said the low-power chip will extend battery life up to six hours. The Z-Lite has a back-lit, 8½-in. screen and will have up to a 170M-byte hard drive. It also uses Litepoint, a device that attaches to the front and center of the keyboard.

Portable sampler

Model	CPU	Memory	Storage	Display	Price
425LN+ Model 200	486SL 25-MHz	4M bytes	200M bytes	Monochrome	$2,599
425LNC+ Model 200	486SL 25-MHz	4M bytes	200M bytes	Active-matrix color	$3,899
433LNC+ Model 200	486SL 33-MHz	8M bytes	200M bytes	Active-matrix color	$4,399
Z-Lite 425L Model 85	486SL 25-MHz	4M bytes	85M bytes	Super VGA video	$1,899
Z-Lite 425L Model 170W	486SL 25-MHz	Not listed	170M bytes	Super VGA video	$2,499

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Compaq joins consumer market

By Michael Fitzgerald

Compaq Computer Corp.'s first foray into the consumer PC hardware market was followed last week by AST Research, Inc.'s expansion of its own consumer product line.

Compaq, which analysts said was the last of the major PC vendors to enter the consumer market, introduced two models of its new Presario family, which will sell through superstores and retailers.

The Presario family includes the Presario 425, which features a CPU integrated with a 14-in. Super VGA monitor. The $1,399 machine is based on Intel Corp.'s 25-MHz 1486SX. The Presario 425 includes a built-in telephone answering machine and fax/modem and uses only one power cord. Compaq also released the $1,299 Presario 633, with a 33-MHz 1486SX processor from Intel.

Analysts said Compaq's move into the home market was necessary for its continued growth and should not distract the company from its traditional corporate market.

All-consuming

"The consumer market is a large portion of business now, and PC vendors can't ignore it if they want to be leaders. If you look at the seven largest vendors, Apple and IBM and AST have been in it for a long time, Packard Bell is focused on it, Dell and Gateway have long served that market, and Compaq was conspicuous by its absence," said Eric Lewis, an IDC analyst.

"Compaq has to broaden their reach to keep growing, and they're big enough that they should be able to pay attention to each of their markets," said Eric Lewis, an analyst at International Data Corp.'s Mountain View, Calif., office. Lewis said Compaq needed to expand its line to compete more effectively with vendors such as AST or IBM PC Co. Compaq promised more Presario models, including minitowers, by year's end.

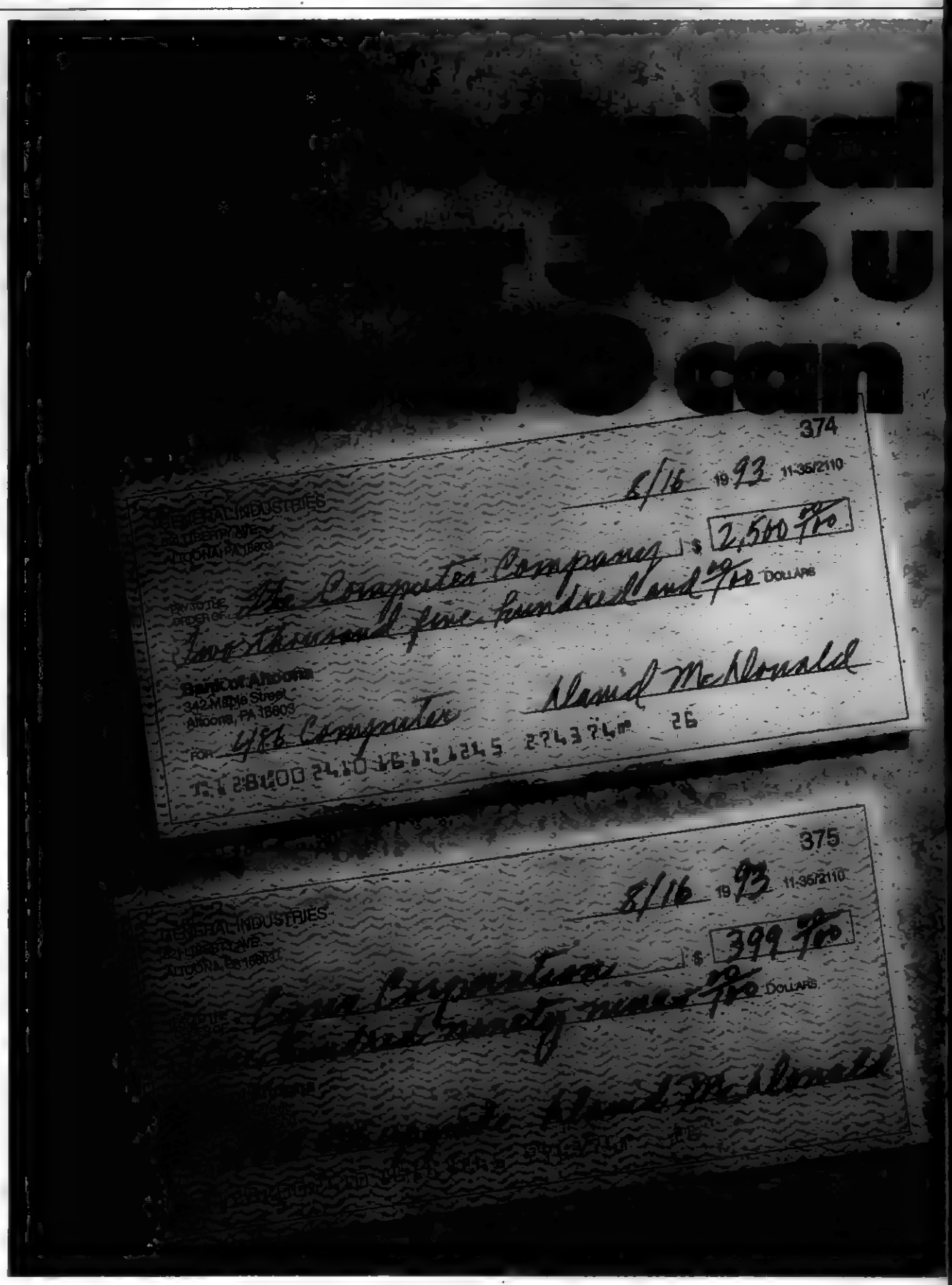
AST, meanwhile, beefed up its Advantage consumer line, adding a multimedia PC, minitowers and color notebooks to the product line. The Advantage Adventure will feature built-in CD-ROM drives, local-bus graphics, a 16-bit stereo sound card and speakers. It will come in a 33-MHz 486SX-based desktop model and a minitower model with the 33/66-MHz 486DX2, selling for a base price of $1,899.

AST also released its Explorer notebook line, which includes a monochrome version as well as a $2,699 dual-scan passive-matrix color version and a $3,699 active-matrix color version. The systems are based on Intel's 25-MHz 486SX.

AST will offer the Advantage Plus, a "green" minitower with six slots and six bays, up to 2M bytes of video random-access memory and AST's hardware/software local-bus graphics implementation. The Plus will be 486-based but Pentium upgradable. Prices start at $1,999.

AST will also sell the Advantage Pro desktop starting at $1,199 with a 25-MHz 486SX, a 170M-byte hard drive and local-bus graphics. AST will offer 33-MHz 486SX and DX models and a 33/66-MHz DX2.

Presario *becomes Compaq's consumer entry*



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Software

Lucid Corp. has introduced the Lucid 3-D for Windows spreadsheet.

The product provides true three-dimensional spreadsheet modeling with unlimited linked layers and offers cell formatting capabilities that include colors, fonts, borders and numeric and alignment options. Features such as drag-and-drop editing, multidimensional spreadsheets, direct linking to palmtops and more than 140 functions with add-in function packs are also included.

Lucid 3-D for Windows costs $129.95.

▶ *Lucid*
Suite 450
101 W. Renner Road
Richardson, Texas 75082
(214) 994-8100

Hewlett-Packard Co. has announced Release 2.0 of Dashboard for Windows, an upgrade to its push-button utility panel for Windows.

Twenty-five enhancements and features have been added to this version including snap-off tool bars, a DOS command line, quick-launch buttons, sizing options, custom colors, custom fonts, hot keys and hot mouse clicks.

Dashboard for Windows Release 2.0 is priced at $99.

▶ *Hewlett-Packard*
PC Software Division
974 E. Arques Ave.
Sunnyvale, Calif. 94086
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MS Word 2.0	1.0x	2.0x
Microgrids Designer 3.1	1.0x	2.6x

Hardware

Iomega Corp. has announced LaserSafe Plus, a 1.3G-byte magneto-optical drive for Macintosh and IBM-compatible computers.

The product was designed for high-speed text and image database storage; as a high-speed backup alternative to tape; for data archival; and for high-capacity on-line storage.

According to the company, the product offers an average seek time of 19 msec, latency at 6.25 msec, 2.2M bytes per second sustained read and 1.1M byte per second sustained write. It provides media with a 30-year life expectancy.

LaserSafe Plus costs $4,995. The 1.3G-byte disk costs $299.

▶ *Iomega*
1821 W. 4000 South
Roy, Utah 84067
(801) 778-1000

Product shorts

Central Point Software, Inc. has announced Central Point Backup Version 8.0 for DOS and Central Point Backup Version 2.0 for Windows. Both feature data encryption, expanded virus protection, tape tools, file viewers and retry options for busy files. Cost: $129.95 each. Central Point Software, Beaverton, Ore. (503) 690-8088. . . . **Commax Technologies, Inc.** has introduced Smartbook, a 9½-in., active-matrix, color notebook that employs Intel Corp.'s i486 processor. Smartbook's display can connect to an external monitor. Cost: $4,631. Commax Technologies, San Jose, Calif. (408) 435-5000. . . . **Intuit, Inc.** has introduced Quicken 4 for Macintosh, an upgrade to its personal and small business finance software. Features such as automatic transaction entry, investment tracking and financial planning calculators are included. Cost: $69.95. Intuit, Menlo Park, Calif. (415) 322-0573. . . . **TeamWorks Technologies, Inc.** has introduced PaperBridge for Access, document image management software optimized for Microsoft Corp.'s Access relational database management system for Windows. The add-on product permits Access databases to include images of paper documents. Cost: $245. TeamWorks Technologies, Marlboro, Mass. (508) 460-0053.

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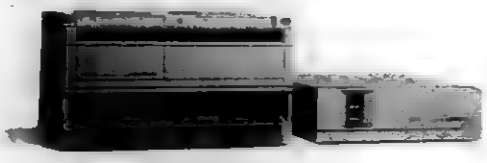

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Digital's DECpc AXP 150:

High reliability, ease of use provide users with strong value for dollar

DECpc AXP 150

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ Evaluators of Digital Equipment Corp.'s DECpc AXP 150 reduced instruction set computing workstation said it provides very high value and reliability in a desktop system running Microsoft Corp.'s Windows NT.

■ The evaluators said they were not overly impressed with Digital's levels of technical support and documentation and that the system would cost slightly more to support at their organizations compared with other desktop systems.

Currently in the final stages of beta testing, the DECpc AXP (Alpha) platform — reportedly the fastest processor on the market — has a healthy number of evaluators in industry, government and academia.

Many, of course, are longtime "Digital shops." Others are simply looking for a high-powered desktop workstation that will run their current DOS/Windows applications. The AXP is positioned as a faster, reasonably priced substitute to Intel Corp. I486-based and Pentium desktop PCs.

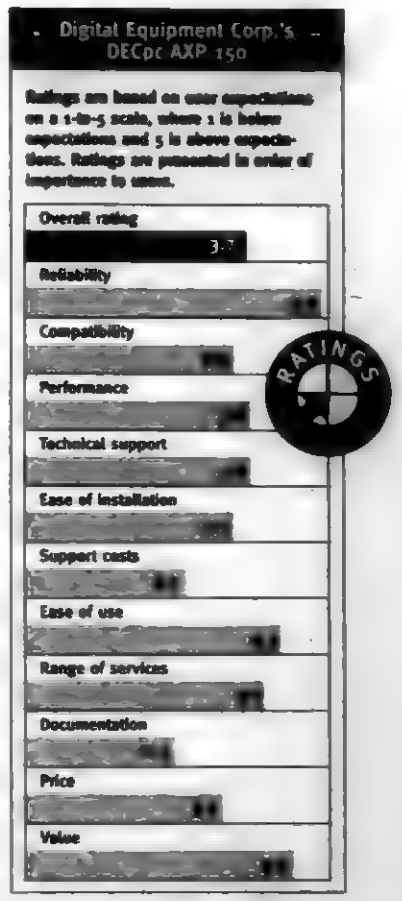
For this evaluation, *Computerworld* surveyed four technical staffers who have been evaluating the DECpc AXP 150 for two to nine months. The evaluators include a product manager from a software company; the group leader from a research laboratory; an information systems manager from a major stock exchange; and a computer systems analyst from a federal agency in Washington, D.C.

All of the evaluators had positive impressions of the DECpc AXP 150, with purchase plans ranging from three to 150 or more units in the next year (see chart below).

The evaluators had done extensive compatibility testing of current DOS/Windows applications used in their organizations. In addition, each evaluator had at least one in-house application that was destined for migration to Microsoft Corp.'s Windows NT operating system running on the DECpc AXP 150. They said the performance of the machine was dramatically better than that of a comparably equipped I486 or Pentium machine running the same operating system and applications.

The typical configuration of the evaluation machines was 32M bytes of random-access memory, a 0.5G- to 1G-byte hard disk and Digital's 600M-byte CD-ROM drive. The stock exchange evaluator said most systems would be configured with 64M bytes of memory.

The format for this evaluation was prepared with the assistance of Howard Rubin Associates and Technology Investment Strategies Corp.



Reliability

The evaluators concurred that the DECpc AXP 150 provided flawless hardware reliability. None had experienced a single hardware failure. The software company evaluator said the current version of the DECpc firmware required additional fine-tuning. He expected a number of design shortcomings to be resolved during the next few weeks.

Compatibility

Three of the four evaluators said the compatibility of Windows NT with the DOS/Windows operating system was a high priority. They said they expected that many packaged applications would be ported to the new operating system during the next few months.

The stock exchange evaluator said he expected that at least two specialized trading packages would have to be run in DOS/Windows emulation mode for the next year or so. None said they had run 32-bit, native applications on the machine.

The federal agency evaluator said he was concerned that his preferred C compiler and debuggers would not be designed to work specifically with the Alpha AXP processor.

Stock exchange: "We compiled some of our [in-house] Windows software, and that worked really well. It ran significantly better."

Research lab: "There were two [DOS/Windows] applications that didn't run. One required a memory extender."

Federal agency: "I haven't found an application that won't run under NT, including relatively unconventional code."

Performance

The evaluators were prohibited by their Digital beta-test agreements from running formal performance benchmarks on the DECpc AXP 150. However, all had an intuitive

DECpc AXP 150, *page 49*

Installation descriptions for users who evaluated the DECpc AXP 150 workstation

	Software company	Research laboratory	Stock exchange	Federal agency
DECpc AXP 150s installed	1	1	1	1
Time installed	6 MONTHS	2 MONTHS	9 MONTHS	2 MONTHS
No. of units to be deployed	3	10	150	20
Intended application(s)	MESSAGING, NETWORK MANAGEMENT	DATA ACQUISITION, PACKAGED SOFTWARE	TRADING SYSTEMS, PACKAGED SOFTWARE	NETWORK SERVERS
Environment	DIGITAL SHOP	MIXED UNIX, DOS/WINDOWS	DIGITAL SHOP, DOS/WINDOWS	DIGITAL SHOP, MIXED UNIX
Evaluation priorities	OS SUPPORT (OPENVMS, WINDOWS NT, OSF/1)	PC GROWTH PATH	EASE OF USE, VENDOR LOYALTY	PERFORMANCE, MULTITASKING, VENDOR LOYALTY

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- Survey the key elements of Abstract Syntax Notation One (ASN.1), the language used to define SNMP message formats.
- Understand how TCP/IP and the related Internet protocols such as UDP and IP support SNMP.
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Evaluators said high scores

flawed by deficient technical support, documentation

CONTINUED FROM PAGE 47

sense of its performance compared with other workstations, generally I486 machines running at 33 and 50 MHz.

The stock exchange evaluator had used an automated "worst-case user" scenario to determine whether the machine would meet formal requirements (trader workstations must handle three times the worst-case scenario). The DECpc AXP 150 "worked fine," he said.

Software company: "It performs quite well, and you can see noticeable improvements compared to similar applications running on Intel platforms."

Stock exchange: "It ran substantially faster [than I486 machines], and we expect it will run faster with the new C compiler."

Research lab: "If you run in [DOS/Windows] emulation mode, performance is about the same as a 486. If you recompile [for Windows NT], it's substantially faster."

Federal agency: "This machine is running [DOS/Windows applications] through the X86 compatibility module and still has better performance than my 486."

Technical support

None of the evaluators required extensive technical support from Digital. The research lab relied on in-house support staff, and the stock exchange had turned to the CompuServe bulletin board system to ask other DECpc users for technical assistance.

Federal agency: "I have fundamental questions about who's going to support NT. Digital's answer is, 'No one really knows.' That's in negotiation right now. And I want to know who's going to develop applications and support this machine."

Ease of installation

The evaluators were interested primarily in the installation of Windows NT on the DECpc hardware. None reported any problems installing the operating system from CD-ROM.

The software company — with an extensive interest in OpenVMS operating system support — said the steps required to perform firmware updates needed improvement because an accidental interruption in the update routine could lead to "an unbootable system."

Stock exchange: "It was a little more involved than I expected. It wouldn't connect to the network."

The familiar graphical interface of the Windows NT operating system would leave internal support costs fairly stable, the evaluators said. Only the stock exchange evaluator anticipated a sizable increase in support costs. However, he attributed this to a massive migration from Digital terminals to desktop workstations.

Ease of use

The evaluators said the DECpc system would be very easy for users to master, given its reliance on the Windows NT interface and the portability of Windows applications.

The software company evaluator said that switching to and from the Digital OpenVMS and Windows NT operating systems was sometimes a problem. He attributed this to the state of the AXP 150 firmware and said he expected the procedure would be improved by Digital prior to final system release.

Software company: "[Ease of use is good] mostly because of NT, not because of anything special Digital has done."

Stock exchange: "Since we've off-loaded the central systems from handling our terminals, we can provide a lot of added-value features without it costing anything on the central systems."

Federal agency: "NT is Windows, with the exception of administration and security. I'd call it the fastest I've ever learned a new operating system."

Range of services

Most DECpc services and utilities derive from Windows NT. The software company evaluator said that the AXP 150 version of Windows NT had slightly better utilities than those included in Intel versions of the operating system.

Software company: "You can find other systems with RISC processors, but they run [a single] operating system."

Stock exchange: "The operating system is a lot more robust, so we can check for resources and we can warn users when a machine is about to die."

Documentation

Digital needs to expand the availability of DECpc documentation. Of the four evaluators, three were not aware of the range of user and technical manuals. The evaluators were also unhappy with the CD-ROM delivery of Windows NT documentation. Printing it was a nuisance.

Stock exchange: "It was awful. I asked for Alpha documentation and got a programmer's manual for the Alpha chip. There was no documentation with the compiler. None whatsoever."

Federal agency: "Most of the [Windows NT] documentation is on-line, and I'm not comfortable with it. They expect you to print it, and I don't have three days to print manuals-worth of documentation."

DECpc AXP 150 features

- Uses Digital's Alpha AXP RISC processor running at 150 MHz.
- Includes Microsoft's Windows NT operating system.
- Includes six Extended Industry Standard Architecture (/O slots.
- List price is $9,995 with 32MB bytes of RAM, 426M-byte hard disk and 600M-byte CD-ROM.

Price

The "developer's configuration" of the DECpc AXP 150 is about $1,200 more expensive than a comparably equipped 486 system running at 66 MHz. The evaluators said they thought this was a reasonable premium given the speed and performance of the machine.

Software company: "It is $1,200 more than a comparably equipped DECpc 466ST [with a 66-MHz I486]."

Stock exchange: "The Intel [I486] machines are costing about $5,000, and these will be in the $6,500 range."

Research lab: "The price is comparable to a [Sun Microsystems, Inc.] IPX workstation, which is pretty good. It's reasonable."

Federal agency: "If I had to price a Pentium machine with the same configuration, I don't think I could touch it for [$7,000]."

Value

The value of the DECpc AXP 150 is very high, the evaluators said. They noted they were impressed with its implementation of Windows NT and its ability to run almost all standard DOS/Windows applications.

Research lab: "We'll have to see how [the DECpc systems] pan out. Performance is better than a SPARC IPX."

Federal agency: "I can't find a machine with this kind of performance, for this kind of money."

Written by senior editor Garry Ray.

Digital responds

▶ **Documentation and technical support:** Customer experience has to date been with beta documentation. Final versions are just now being distributed to selected beta-test sites. As Windows NT moves from beta testing to shipment, Digital offers the PC industry's widest range of traditional and professional services to help customers successfully implement and manage Windows NT solutions. Those services are available on a worldwide basis across AXP and Intel platforms.

▶ **Third-party software support:** The Alpha AXP running Windows NT has received enthusiastic support from software vendors. More than 500 applications are committed to ship by year's end, and thousands more software developers are busy moving their software to this platform.

▶ **Alpha as an NT platform:** Digital believes that Alpha AXP systems will win significant volumes in the burgeoning Windows systems market. Still, the DECpc AXP 150 will account for only one of every five Windows NT systems that Digital will deliver.

▶ **AXP enhancements to Windows NT:** The Windows NT you could buy from Digital is the same Windows NT you could buy at a local computer store. Digital has transparently enhanced some I/O functions within Windows NT to leverage the performance of Alpha's 64-bit capabilities.

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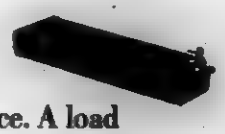

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Federal mediators opt to side with LANs

By Gary H. Anthes
WASHINGTON, D.C.

People at the Federal Mediation and Conciliation Service (FMCS) may be masters at the art of compromise, but the tiny agency has declared a take-no-prisoners war against its information systems costs. The victim will be the service's mainframe computer, due to be wheeled out and not replaced next year.

The demise of the mainframe at FMCS marks a rapid progression in IS at the agency, which just a decade ago had no computers of any kind. In 1983, Richard P. Scivetti, director of automated services, was brought in to automate the records and procedures by which the agency tracked labor agreements, mediated labor-management disputes and acted as the middleman in helping companies and unions avoid strikes.

The agency was drowning in paper, Scivetti said, with the forms sent in by company management and unions overflowing from offices into the lunchroom and hallways.

FMCS maintains detailed biographies on some 1,750 professional arbitrators around the country, and it sends lists of suggested arbitrators to companies and unions in response to their requests for help in labor disputes. Generating a list carefully tailored to a particular dispute would take FMCS seven to 10 days using the paper files.

FMCS bought a used IBM 4341, automated the arbitration system and reduced that time to less than a day.

Scivetti also brought in the Adabas database management system and the Natural fourth-generation language from Software AG of North America, Inc. to automate the major paper flows. He brought in some Cobol applications as well but gradually moved everything to Software AG products. "I converted everything to Adabas and Natural because I thought I might want to change platforms some day. I saw Software AG as hardware-independent."

Now that vision is paying off. The 1988 five-year plan anticipated that by 1993, the mainframe — by 1988 an IBM 4381, also bought used — would have to be replaced by another mainframe or by "some sort of LAN arrangement," Scivetti said. Ultimately, a squeezed budget dictated client/server.

FMCS has now completed the first phase of its move to distributed computing, having developed a procurement system for an OS/2-based local-area network. During the next 16 months, FMCS will port its Natural/Adabas applications off the mainframe, with each of the major application areas — case processing, arbitration, finance — targeted for its own Intel Corp. 1486-based server.

Because Natural and Adabas are the same in both environments, an application can be transmitted electronically, recompiled and brought up in just hours, Scivetti said. He acknowledged his job was easier than that of many organizations moving to client/server because all his major applications were written in Natural and Adabas.

Ethernet LANs in the agency's nine-story building here are connected by a fiber-optic backbone running between floors. The high-capacity backbone will allow Scivetti to locate all 10 servers in one room, which will help him

Fed mediators, *page 58*

ON SITE

Board speeds Oracle client/server apps

By Kim S. Nash

Solbourne Computer, Inc. in Longmont, Colo., recently unveiled a high-capacity memory board specifically designed to boost the performance of Oracle Corp.'s client/server financial applications, which some users have said hog processor and memory needs.

Although other users disagreed that Oracle's accounts payable, general ledger and other financial systems unexpectedly eat up resources, enough Solbourne customers had talked about the situation to prompt the hardware maker to action.

Typically, shops running Oracle Financials experience "explosive growth of data and [number of] users once they've been using the application for a time," said Lisa Drake, director of marketing at Solbourne. The financial applications generate large sort routines that can be cumbersome to plow through, she said. Solbourne's 512M-byte memory board was designed to let users temporarily stash whole tables and indexes in memory, which gets the data out of the way of a processor working through a user query.

Necessary upgrades

Some users of other hardware have reported unplanned memory or processor upgrades to accommodate Oracle Financials. Boudin Bakeries in San Francisco originally planned on 48M bytes of memory to run general ledger, accounts payable and fixed assets but added 16M bytes more after going live with the system this spring, according to Eric Schumacker, information systems manager for the retail side of the bakery.

"The applications themselves we're very pleased with," Schumacker said, adding that the memory upgrade was not "major . . . but still was needed." Boudin installed the software in February on a Wyse 7000 Model 740i multiprocessing server from Wyse Technology, Inc.

Other users said the upgrade requirements were not necessarily any fault of the Oracle software itself. Rather, a qualitative change in the way people operate client/server applications can require more processing and memory muscle. For example, the nature of the work of financial users can require them to open multiple application sessions and keep them open all day, according to Mark Farnham, database architect at Burlington Coat Factory in Lebanon, N.H.

"Sometimes users don't take into account that client/server is more than moving software around to different hardware. Client/server changes how you work, too," said Farnham, who is also president of the Oracle Applications User Group.

In general, Farnham noted, most applications can benefit from added memory, whether or not they need it to actually get the job done. Burlington Coat Factory runs Oracle's general ledger, accounts payable and purchasing applications on several Sequent Computer Systems, Inc. Symmetry Unix multiprocessing machines.

The systems also require "a lot of memory," Farnham acknowledged — 320M bytes, to be exact. "With Oracle, the more memory you can throw at cache, the better the overall performance," he said.

Oracle adds Vines support, but Version 2.0 lacks link

By Kim S. Nash
REDWOOD SHORES, CALIF.

After two years of cajoling from several users, Oracle Corp. has begun to support Banyan Systems, Inc.'s Vines network operating system. The fly in the ointment, however, is that while Oracle's SQLNet 1.0 link connects Oracle database users directly to Vines, the latest version — SQLNet 2.0 — does not. And Oracle has not committed to adding Banyan support to the newest version of the product.

Banyan and Oracle recently announced a SQLNet driver for Vines to let users access Oracle 7 databases running on PCs and workstations running The Santa Cruz Operation's SCO Unix operating system.

While users are happy to have the Vines connection they have been waiting for, they griped about not being able to take advantage of new features in SQLNet 2.0, such as better performance monitoring and administration capabilities.

"This answers a lot of our troubles . . . but we might still find ourselves up against a brick wall not being able to run SQLNet 2.0," said David Kreines, project manager at Educational Test-

Vines, *page 58*

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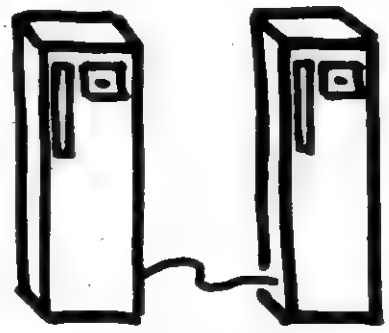

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Ocean-floor images sail worldwide

By Jean S. Bozman
WOODS HOLE, MASS.

When Woods Hole Oceanographic Institution scientists send a remotely operated vehicle (ROV) into the ocean depths, they use distributed computing technology to immediately view ocean-floor images. And, by extending a shipboard local-area network through the Internet, they now send those same images via satellite to other laboratories worldwide.

Leveraging the power of fiber-optic communications and Unix workstations, the scientists relay images from 20,000 feet below the ocean surface to a ship floating overhead. The Internet data feeds were tried for the first time this spring during an underwater survey in Mexico's Sea of Cortez, scientists here said.

Woods Hole was assisted by Electronic Data Systems Corp. in Plano, Texas, in extending the Internet links down to the ocean floor.

"We extended the Internet by real-time satellite link to the ship and down to the vehicle," explained W. Kenneth Stewart, head of Woods Hole's Deep Submergence Lab.

Using a technique called multicasting, the newly acquired data was broadcast to several sites around the world, he said. The images were broadcast in "near-real time" due to subsecond lags in processing the imaging signals, according to Stewart.

SunOS apps not ready

One factor in the slight delay was the scientists' use of Sun Microsystems, Inc.'s SunOS operating system, Stewart said. The lab has not yet converted many of its SunOS applications to Sun's new Solaris 2.X operating system, which is compatible with Unix System V Release 4. Conversion work will start this fall, he said, after the lab's prime diving season is over.

One real-time Sun application is already in use: A shipboard Scalable Processor Architecture workstation uses a VXWorks real-time operating system for sonar processing. Sonar signals, critical for proper positioning of the ROV, require response time on the order of 100 microseconds, Stewart said.

Woods Hole *scientists can send real-time images from 20,000 feet below the ocean's surface to labs worldwide*

Roving submersibles use a 100M bit/sec. fiber-optic datastream, which is split into 10 10M bit/sec. segments, Stewart said. That way, telemetry, digital data, digitized sonar and broadcast-quality video can share the total available bandwidth. The fiber-optic link is tethered to the institute's ship, which is outfitted with up to a dozen workstations.

The ROV's remote-sensing system is comparable to limited data communications from Woods Hole's famed Alvin submersible, a pressurized vehicle that carries a pilot and two scientists. Alvin has an underwater telephone and can transfer data at 1,200 bit/sec., Stewart said.

"A typical dive cycle is eight to 10 hours, and you only get to spend three to four hours of that on the bottom," he said. "There's a lot of economics driving the use of unmanned submersibles."

Hooked on Unix

Woods Hole's use of Unix workstations is extensive. The oceanographic lab has about 160 Unix workstations, including 125 Sun workstations (see story at right).

The new multicasting technique opens up possibilities for global cooperation on oceanic research. But everyday work at the lab also depends on networks of peered Unix workstations and the Internet.

"We use electronic mail for communications with colleagues, send source code over the [Internet] network and transfer files," Stewart said. "Most of our real-time systems are on the Internet, and we can do first-pass processing that way."

All we want for Christmas

By year's end, one mainstay of the Woods Hole Oceanographic Institution's computing environment will be gone. A cluster of two Digital Equipment Corp. VAX 8000 machines will be unplugged in hopes of saving money and completing a transition to distributed computing.

"My expectation is that we will not have a chargeback, time-sharing system here after Dec. 31," said Robert C. Groman, director of the Information Systems Center (ISC). Planned for several years, the migration will cap a gradual move to data processing within research projects, he said.

Two factors have driven the change: increasing desktop capability and project-based purchases. "The improvements in PCs and workstations have outstripped the power of the central machine," Groman said. The VAXs have 800 accounts for 150 users — down from 700 accounts for 350 users several years ago.

The VAX shutdown will not mark the end of the ISC's support of the laboratory's 950-user community. More than 20 ISC staff members will shift their attention to supporting 160-plus Unix workstations — including 125 Sun workstations — and 300 PCs on campus. A growing number are Silicon Graphics, Inc. workstations used for high-resolution imaging.

"I talk about managing diversity," Groman said. "We have project-based funding, so it's counterproductive to have hard-and-fast rules that dictate what hardware people can buy."

—Jean S. Bozman

Faster Token Ring explored, not established

By Lynda Radosevich

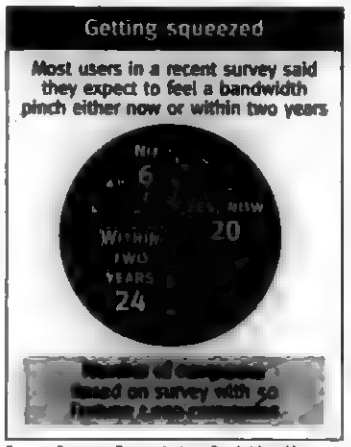
Like their Ethernet-based counterparts, Token Ring shops may see the emergence of some high-speed, local-area network options aimed at helping them migrate to more powerful LANs while preserving their investment in existing Token Ring hardware.

A working group from the IEEE 802.5 committee in charge of setting Token Ring standards this month will begin accepting technology proposals for speeding up the token architecture. Two major players, IBM and Proteon, Inc., plan to participate with proposals.

Unlike Ethernet, the Token Ring architecture has not been targeted for upgrading in the recent past because it performs better under heavy loads than Ethernet, and it results in fewer bottlenecks. For customers who have seen bottlenecks, Fiber Distributed Data Interface (FDDI) is a common solution. However, IBM is looking at methods to help users upgrade LAN segments without replacing cabling, hubs, routers and, in one scenario, adapter cards, said Bob Roth, manager of network access systems technical marketing at IBM.

For Jerry Noble, director of telecommunications at the American Cancer Society, a 4M/16M-bit/sec. Token Ring shop in Austin, Texas, the idea holds promise.

"Now I don't see the need for higher-speed Token Ring, but for future upgrades, I would like to keep the same hardware and cabling and just figure out a better way to use it," Noble said.



However, Tom Nolle, president of consulting firm CIMI Corp. in Voorhees, N.J., criticized the effort on IBM's part. Other technologies that can meet users' high-bandwidth requirements, such as 100M bit/sec. Ethernet and Asynchronous Transfer Mode (ATM) switched Ethernet, are further along in the development cycle and offer more appropriate technological bases for high-speed networking than souped-up versions of Token Ring. Adding new options will muddy the water, he said.

Paul Callahan, a senior analyst at Forrester Research, Inc. in Cambridge, Mass., said IBM is sending confusing messages because "they clearly stated that they will make ATM compete with Token Ring prices at the desktop."

Bandwidth is growing incrementally at the desktop, where people are "extremely reluctant to spend money." Furthermore, FDDI and ATM are the dominant backbone technologies so there is not much room for high-speed Token Ring in a crowded market, Callahan said.

The options for boosting Token Ring fall into two categories. First is a higher-speed network that retains Token Ring frames but updates the signaling. This would require managers to switch adapters but would allow the use of existing management and routing software and expertise in the move to a higher-speed network, said Jim Carlo, a TI technical staffer and vice chairman of the 802.5 committee. The other option is a switched technology that begins to look a lot like 100-BaseVG, the fast Ethernetlike technology proposed by Hewlett-Packard Co. and AT&T.

"I think it's a little too soon to tell whether a separate standard will come out of this or whether a proposal is made to other committees, like 100BaseVG," Carlo said.

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NCR adds app processor

System is targeted at downsizing projects

By Thomas Hoffman
SAN DIEGO

NCR Corp. recently introduced a system designed to help mainframe users downsize applications to Unix environments while retaining on-line transaction processor (OLTP) and batch capabilities.

Composed of eight Intel Corp. 1486 microprocessors, the NCR 3600 Unix Application Processor is an engine designed to help users rewrite and downsize applications from IBM-class mainframes to NCR 3600 massively parallel processing (MPP) Unix-based machines. Pricing starts at $350,000. NCR is targeting users of its DBC/1012 massively parallel database systems.

Filling a user need

Peter Kastner, a vice president at Aberdeen Group, a market research firm in Boston, said the application processor will fill a need for NCR 3600 users by helping to meld the decision-support capabilities of the NCR DBC/1012 with the batch processing and OLTP capabilities that mainframe computers typically provide.

The application processor delivers those capabilities by allowing Oracle Corp. and Sybase, Inc. relational database management systems to run production applications simultaneously with DBC-derived decision-support applications, Kastner said.

Used by top firms

The DBC/1012, which NCR obtained through its acquisition last year of Teradata Corp., is a massively parallel database engine used by 150 Fortune 1,000 companies, including several leading brokerage houses, airlines and retailers such as Wal-Mart Stores, Inc. and Kmart Corp. The systems provide decision support, including analyses of customer buying habits.

The system to which NCR is trying to move IBM-based software, the NCR 3600, is a Unix-based MPP machine powered by dozens of interwoven 486 chips that break down and analyze problems at their simplest levels. A typical NCR 3600 system starts at $1 million.

Peter A. Dorsman, vice president of worldwide marketing at NCR's Large Computer Products Division, said his company plans to add Intel's Pentium processors to the application processor later this year.

Fed mediators

CONTINUED FROM PAGE 51

manage LAN assets and control the environment. He said that could be important when the agency upgrades to servers with Intel's Pentium processors.

Scivetti said the move to client/server will require an investment of $650,000 and will knock $100,000 off his $1 million IS budget, mostly from reduced hardware maintenance and software license fees. He said that figure is conservative; it does not take into account that the agency would have had to soon replace the mainframe if it did not downsize.

He also said the move off the mainframe would make it easier and cheaper to add new capabilities to the infrastructure. "In the mainframe world, every time you want to do something, IBM says, 'Well, you gotta have this software or that hardware,' or, 'Your this or that is a little too slow or has to be reconfigured.'"

FMCS plans to add imaging capabilities and a fax server, both of which will be greatly facilitated by the LAN environment, he said.

Vines

CONTINUED FROM PAGE 51

ing Service, Inc. in Princeton, N.J.

Furthermore, a third product — SCO Unix — is required to make the Vines connection. Educational Testing, therefore, had to purchase an SCO Unix license to give its 2,000 Vines users access to the Oracle database, Kreines said. "But I do not have to buy more hardware at least," he added. The company's SystemPro server from Compaq Computer Corp. should suffice, he said.

However, for those users looking for a larger, more scalable platform, Banyan plans to support Vines on Hewlett-Packard Co. boxes shortly.

Meanwhile, Kreines, who is also chairman of the annual conference hosted by the International Oracle User group, said Vines support from Oracle has been a long time coming. "Oracle pays attention to the loudest demand, and clearly there are more people asking for support for protocols" other than Vines, he explained. "But we're making progress."

Several Oracle users are waiting for Vines support on various Unix boxes. Public Service Gas and Electric Co. of New Jersey, for example, sought an Oracle/Vines link on which to base a few planned client/server application development projects.

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Alfa, Inc. has introduced a fiber desktop link for its family of high-performance Fiber Distributed Data Interface (FDDI) concentrators and adapter cards.

As a fiber alternative to copper-based desktop links, the plug-and-play desktop connection avoids electromagnetic and radio frequency interference, and it allows for greater distances than twisted-pair FDDI products, according to the company.

Alfa's new products were designed to reduce error rates and increase network bandwidth. They can be used for distributed multimedia applications.

The concentrators cost $4,500, or approximately $562 per port. Adapter card prices range from $795 to $1,495.

▶ *Alfa*
110 Breeds Hill Road
Hyannis, Mass. 02601
(508) 790-6901

Altium, an IBM subsidiary, has announced that it has started shipping its computer-aided design (CAD) software on the Unix-based Hewlett-Packard Co. HP Apollo 9000 Series 700 workstations.

According to the company, Micro CADAM supports heterogeneous, worldwide networks because it provides identical function and direct data-sharing across multiple environments.

The Micro CADAM product family consists of Micro CADAM Plus, a mechanical design tool; Data Transfer, for exchanging model data with mainframe-based CADAM systems; Alternate Character Sets, for drawing annotation in non-English characters; Micro CADAM LDX for CAD library management, data extraction and bill-of-material generation.

In addition, Micro CADAM Access is an open architecture that allows Micro CADAM users to write programs that interface the data in the Micro CADAM model with other business processes, including family of parts management and program scheduling.

Micro CADAM View allows for paperless communication across the corporation.

Micro CADAM Plus on the Unix platform costs $4,795.

▶ *Altium*
1935 N. Buena Vista St.
Burbank, Calif. 91504
(818) 841-9470

Powercore, Inc. has introduced Version 2 of Network Scheduler 3.

According to the company, the product provides workgroups with a single source for calendaring/scheduling independent of a computer platform, messaging system and network operating system.

Network Scheduler 3 has an intuitive graphical user interface and offers Macintosh support.

Features include more intuitive views, expanded reporting capabilities, a wider variety of user options and improved drag-and-drop features, the company said.

In addition, a tab style user interface lets users toggle between daily, weekly and monthly views by selecting tabs similar to those in a paper-based date book.

The new version will be available Sept. 27.

Network Scheduler 3 Version 2 costs $495 for five users and $1,995 for 25 users.

▶ *Powercore*
1 Diversatech Drive
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(815) 468-3737

WangDAT, Inc., a subsidiary of Rexon, Inc., has introduced the DX Series DDS-2 digital audio tape (DAT) drives.

The series includes the 4G-byte Model 3300DX and the 8G-byte Model 3400DX data compression version.

According to the company, on highly compressible data, the 3400DX can store up to 16G byte (4-to-1 compression). A 1M-byte data buffer enhances the drives' system performance, and a 40-second file search time is provided for fast data recovery.

The drives also permit downloading of firmware updates to flash memory through Small Computer Systems Interface (SCSI) bus transfer or DAT tape downloading, the company said. The DX Series drives include SCSI-1 and SCSI-2 interfaces and use the company's SCSI interface architecture and firmware.

The 4G-byte 3300DX costs $1,465, and the 8G- to 16G-byte 3400DX costs $1,660.

▶ *Rexon*
41 Moreland Road
Simi Valley, Calif. 93065
(805) 583-5255

Symbiotics, Inc. has announced an OS/2 version of Networks Connect, a network Dynamic Data Exchange and clipboard product that enables users on a network to hot-link data between applications. The software is compatible with Networks Connect, the company's existing Windows version. Cost: $149 per user. Symbiotics, Cambridge, Mass. (617) 876-3635.... **Image Machines Corp.** has announced ImageCenter Version 2.2, Windows imaging software. The processes of viewing, scanning, editing and printing raster images are combined into a Windows application for end users or systems integrators. The product can operate in stand-alone mode or can use software and hardware options. Cost: $995. Image Machines, Herndon, Va. (703) 709-7475.

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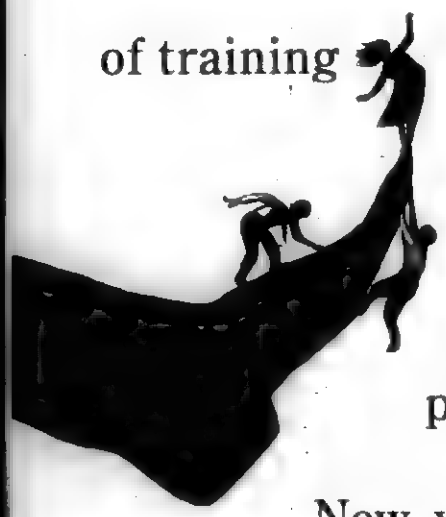

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Network needs outpace SNMP

By Elisabeth Horwitt
SAN FRANCISCO

The bloom seemed to be off the Simple Network Management Protocol (SNMP) rose at the recent Interop '93 August show, with users and vendors saying that the de facto network management standard needs serious work if it is to cope with increasingly complex enterprise network management environments.

While some strides have been made with such efforts as SNMP Version 2 and promises by some enterprise management vendors (see story page 66), such moves are vaguely defined and far off.

"SNMP is oversold" and burdened with "expectations beyond its capabilities," John McShane, manager of network management system development at DHL Systems, Inc., warned his audience at an Interop session. "I suggest applying SNMP to the wide-area network with caution."

SNMP drawbacks

- **Polling thousands of devices** regularly uses up too much bandwidth.
- **No guaranteed delivery** of critical alerts, particularly over a WAN.
- **Protocols** for managing a particular type of device vary from one vendor to the next.

Network gridlock

What companies such as DHL Worldwide Express are encountering, as they roll SNMP management across their companies, is a great deal of traffic congestion that derives from the standard's centralized polling-based method of managing distributed devices, according to Andre Hughes, a senior manager at Andersen Consulting.

The package handler had a particularly tough time with its SNMP-based network management system because overseas lines tend to be unreliable and high-speed leased connections hard to come by, McShane said.

DHL had installed Hewlett-Packard Co.'s SNMP-based system, OpenView, and could not figure out why its error message indicators were going from green to red to green like traffic lights. The problem: Messages between managed devices and OpenView were getting lost en route because of the inherent unreliability of overseas lines and of Trans-

SNMP, *page 66*

Internet lends global helping hand

By Joanie M. Wexler
SAN FRANCISCO

In Pakistan, scientists received instructions for safely incinerating a toxic waste dump in time to prevent a chemical disaster. In Kenya, a doctor saved a life by quickly finding information on how to administer a new medication.

These examples of true bottom-line electronic networking benefits showed their colors recently when representatives from 67 developing nations spoke out about their dreams and efforts with communications technology at the Interop '93 August trade show here.

Individuals involved in projects to build modern communications infrastructures in their respective homelands gathered to share experiences and knowledge at a showside roundtable.

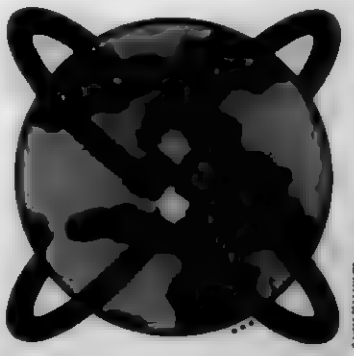
The international visitors came to the U.S. on funding from a consortium of companies, including Novell, Inc., and scholarships provided by Interop Co. to attend the back-to-back Internet community-sponsored INET '93 and Interop '93 shows late last month.

Global village

Their goal was to glean education they could put to use in developing their respective nation's fledgling electronic communications highways. These systems include links into the Internet, the 100-country academic and research network that is the main vehicle for creating a "global village" for sharing information across geographical, economic and cultural boundaries.

This should ultimately foster improved educational, health care and political systems for all countries. Many of the Interop representatives had encouraging stories to relate.

Hasan Rizvi, a physicist from Pakistan, has established data links among 42 educational institutions in his country under a United Nations program. Pakistan "stands at the periphery of the global village today" with an X.25 public data network and four connections to the Internet, he said.



Rizvi related the hazardous waste story: "An unscrupulous operator dumped 2½ tons of toxic material in a public place in [the city of] Karachi." Although Karachi scientists were able to identify the substance, they were uncertain how to dispose of it.

An "electronic SOS" went out via the Internet to members of the Association for Progress of Conservation, including Greenet, Econet, Peacenet and the U.S. Environmental Protection Agency. Rizvi cited an "overwhelming" response by electronic mail and fax that resulted in scientists learning how to incinerate the substance safely.

Meanwhile, another call for help over the Internet allowed a Kenyan doctor to quickly get information on how to administer a new medication to a critically ill patient, said Shem Ochuodobo, Kenya's delegate. "We could not get the hard copy of the article about this medication anywhere in Kenya, but we were able to download it from the Internet and put it on the doctor's desk" in time to save the patient's life, he said.

Chile's Ernesto Laval, a university technologist, said he expects to have full access to the Internet "in a couple of years." At that time, he plans to have a network pilot in place involving primary and middle schools in isolated parts of the country where education is rudimentary.

Tierno S. Bah from the Republic of Guinea told of his efforts at being the first to start a competitive telecommunications infrastructure in his nation since the collapse of the Communist bloc. He is setting up a packet-radio backbone network in his country, he said, because a cabled infrastructure is too costly.

Satisfied with satellites

Bah said he was disappointed that satellite communications had low visibility at the shows. "Americans scoff at satellites because they say there are delays associated with it," he said. "But we're willing to live with them."

Finally, Predrag Pale from Croatia said he hopes that computer networks will discourage further conflict in his war-torn country.

"In the autumn of 1991, when there was little chance we'd survive the [civil] war," the country's few technologists persuaded the government to spend $1 million on Unix-based networks that "allow people to grow together and lessen the opportunity for misunderstanding and conflict," he said.

Reporter's Notebook

Microsoft and its Windows NT were notably absent in the mating dance that vendors of network management platforms, applications and managed devices customarily do at Interop. **Digital** and **IBM** spokespeople confirmed that their new alliance will enable IBM's NetView/6000 platform to manage NT, first on Digital's Alpha and then, very probably, on Microsoft's Intel platforms of choice.

Microsoft itself has spoken of providing integration of its own NT systems management product, Hermes, with the leading network management platforms.

This would be a key move for Microsoft if it wants to keep up with rival **Novell**, which has already announced integration of its NetWare Management System with Sun's SunNet Manager and has hinted at similar alliances to come. Microsoft and Novell support SNMP on their servers, but such links provide only primitive management.

INTEROP '93 AUGUST

HP announced that within 12 months it will provide an expert analysis application for network monitoring that will integrate incoming data from its two LAN diagnostic products: HP LanProbe and Netmetrix from HP acquisition Metrix Network Systems, Inc. By the end of next year, HP will have "standards-based applications that will combine the best of both products," an HP spokesperson said.

Unipress Software has ported LAN Manager to Sun's Solaris and Novell's UnixWare platforms.

The X.400 standard switched into high gear. **OSIware** and **Soft-Switch** introduced fax gateway software for X.400 networks. OSIware also rolled out a Unix-based messaging router, the final piece of its backbone software line based on the 1988 version of the X.400 protocol. Also, **Enterprise Solutions** announced a 1988 X.400 messaging switch.

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Network needs outpace SNMP

CONTINUED FROM PAGE 63

mission Control Protocol/Internet Protocol implementations that carry SNMP, McShane said.

Because it could not afford to install 1.5M bit/sec. leased lines out to all 40 of its sites worldwide, DHL developed its own "sophisticated agents" that do their own local polling and send only significant data to the central OpenView platform, McShane said.

In addition, the company implemented a utility permitting each device to periodically send a "confidence signal" that lets the management system know "I'm still here," he said.

While SNMP Version 2 may resolve some of DHL's difficulties with the protocol (see story page 67), McShane said he had gotten mixed messages about how easy it will be to have a mixed installation of Version 1 and Version 2 devices managed by the same platform. Indeed, the plethora of potential network management standards, including SNMP Version 2, the Open Software Foundation's Distributed Management Environment and Common Management Information Protocol, is extremely confusing to users, he indicated.

> The plethora of potential network management standards is extremely confusing to users.

The latest enhanced generation of DHL's enterprise-wide network management system is scheduled to be implemented by the first half of next year, McShane said.

No two vendors' plans alike

Naturally, every vendor has a slightly different distributed management scenario.

Novell, Inc.'s distributed domain management nodes will consist of NetWare servers equipped with NetWare Loadable Modules (NLM) that will enable both to function as managed devices and managers, according to Novell product line manager Steve Dauber. For example, a Novell LANalyzer NLM, still unannounced, will enable a NetWare server to monitor and diagnose LAN traffic, Dauber said.

Hewlett-Packard is setting up its OpenView for Windows platform as a domain manager for the Unix version of its product, a company spokesman said.

And IBM is due to announce shortly LAN NetView, an OS/2 "workgroup manager" for OS/2 Token Ring networks that will act as a domain manager to IBM's enterprise manager, NetView/6000, according to Bill Warner, IBM's director of network management.

Increasingly popular are alliances that have one vendor's management system acting as a domain manager to another's enterprise manager.

Novell's NetWare Management System is due to become a domain manager for Sun Microsystems, Inc.'s SunNet Manager. And several vendors hope to develop links that allow Microsoft Corp.'s Hermes to report Windows NT management data to their systems.

—Elisabeth Horwitt

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CHOOSING THE WORLD'S BIGGEST DATABASE COMPANY MAY SEEM SAFE.

Newest SNMP leaves unanswered questions, too

By Elisabeth Horwitt
SAN FRANCISCO

A packed ballroom of users and vendors at the Interop '93 August show got a preview from developers of how Simple Network Management Protocol (SNMP) Version 2 will resolve — and in some cases, fail to resolve — the major limitations of the first version. The overall conclusion: The jury is still out on whether SNMP Version 2 will provide the robust network management environment that users need for the enterprise.

SNMP Version 2 is said to remedy several Version 1 problems, such as the lack of security and the inability to access large chunks of information at one time.

One major question raised, however, was whether SNMP Version 2 would finally allow managed devices to initiate communications with the managed system, instead of waiting to be polled. This is a key concern for corporations that find SNMP's regular polling feature too bandwidth-intensive and would like managed systems to initiate contact with the manager only when they have something important to say.

Four SNMP Version 2 developers in attendance confirmed that the new version will retain the old centralized polling architecture. Allowing managed devices to initiate communication with the management system would add to the complexity and cost of such systems and risk broadcast storms on the network, said developer Steve Wallbusser at Carnegie Mellon University in Pittsburgh.

"SNMP Version 2 is the same concept as SNMP: agents, polling and traps," said Jim Morehouse, manager of network management strategies at Motorola, Inc. His company is still hoping that Common Management Information Protocol (CMIP) will do the job.

Midlevel layer

On the other hand, SNMP Version 2 does support manager-to-manager communications, just like CMIP, the developers said. And in the works now is a management information base (MIB) that will allow a "midlevel" management system to manage local devices and report up to a central system.

Other SNMP MIBs that developers are working on include the following:

- A ping MIB that would allow the management station to check the status of remote devices.
- An aggregate MIB that would allow an agent on a managed device to do calculations on network statistics and send just the answers, not the raw data, to the management system.
- A history MIB that would keep records of activity on remote systems for later access.

Another concern that users voiced was whether Data Encryption Standard (DES) export restrictions will dissuade vendors from implementing the security piece of SNMP Version 2, which is based on DES.

Some vendors will probably not implement Version 2 security because of export restrictions and because the security feature may prove too memory-hungry for smaller devices, the developers noted.

Users also expressed concerns about interoperability between SNMP Version 1 and Version 2 devices and systems. However, network management platforms will support both protocols, letting users mix the two types on managed devices, the developers said.

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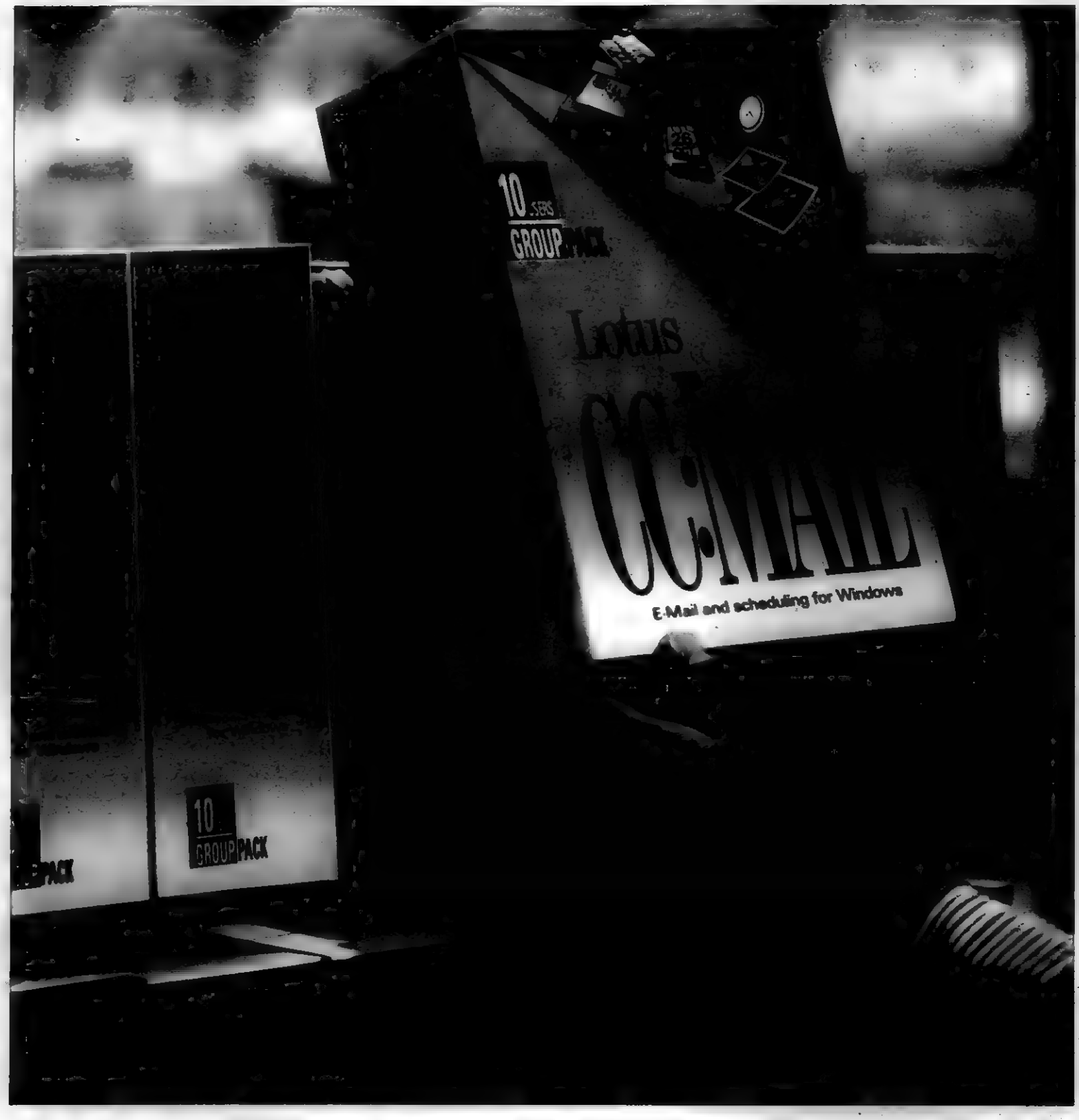

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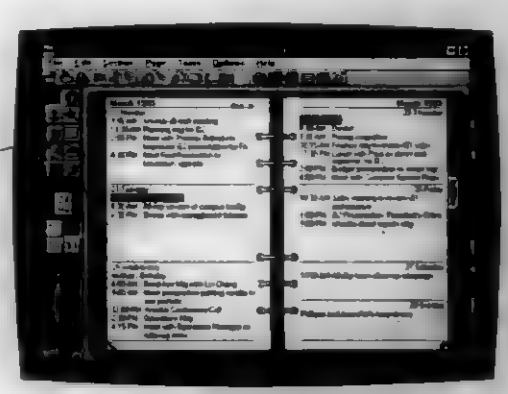

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Centralized security package verifies IDs

By James Daly
CAMBRIDGE, MASS

Network security administrators entrusted with keeping intruders out of their companies' systems got a little help recently from Security Dynamics, Inc., which announced an updated server software package that centrally authenticates a user's identity.

ACE/Server Version 1.2 allows supervisors to centrally manage user access to network resources via gateway, remote dial-up or direct connection.

Most network intruders typically exploit the weakest link on the network — the static password. ACE/Server Version 1.2 is used in conjunction with the company's SecureID Card, a credit-card-size card that displays a randomly generated access code that automatically changes every 60 seconds.

To access a protected network, a user enters his password or personal identification number and the code currently displayed on the SecureID card. After the ACE/Server verifies that both factors are correct, the user is granted access.

Also, passwords are never exposed on the network, and ACE/Server's central administration software monitors every network access attempt — both authorized and unauthorized. Such detailed activity audit trails assure user accountability and provide a substantial deterrent to insider abuse, company officials said.

The ACE/Server updates expand its range of protection by offering new support for several platforms, including Hewlett-Packard Co.'s HP/UX, Silicon Graphics, Inc.'s Irix and Motorola, Inc.'s System V/88.

Version 1.2 is also compatible with Sun Microsystems, Inc.'s SunOS, Digital Equipment Corp.'s Ultrix and IBM's AIX system environments.

The refreshed package also features node authentication, which prevents an unauthorized workstation from masquerading as an authorized ACE/Server client.

Briefs

Firefox takes on Novell OSI line

Novell, Inc. and **Firefox Communications Ltd.** in West Midlands, England, have agreed that Firefox will assume development, sales, marketing and support of Novell's NetWare File Transfer Access and Management (FTAM) product. FTAM is a series of NetWare Loadable Modules that allow Open Systems Interconnect FTAM hosts to access NetWare file systems. It will also still be sold through existing Novell distribution channels, according to the company.

UB/BBN venture: First fruits

LightStream Corp., the joint venture between **Ungermann-Bass, Inc.** and **Bolt Beranek and Newman, Inc.** (BBN) to develop and market Asynchronous Transfer Mode products, recently announced its first product. The $25,000-and-up EagleSwitch is scheduled to ship this fall.

Hotel chain picks MCI

Carlson Cos., the $9.9 billion parent company for a chain of hotels and restaurants, picked **MCI Telecommunications Corp.** to provide private network and 800 services. For instance, Radisson Hotels International will use MCI 800 services exclusively for its worldwide reservation number.

Linking the cables

Leading cable operators in the U.S. have signed an agreement with **Mercury Communications**, a national network, that allows them to switch their own telecommunications traffic and retain a greater percentage of revenues. The companies, including Encom, General Cable, Nynex Corp., Southwestern Bell, TeleWest Communications and Videotron, also signed a reciprocity agreement with worldwide carrier BT by which the companies pay one another equal rates for equivalent services.

SHORT TAKES **Wellfleet Communications, Inc.** agreed to license **Data Connection Ltd.** of London's SNAP APPN Network Node software and develop APPN Network Node support for its multiprotocol routers. Wellfleet has also signed an agreement with **IBM** to license its Advanced Peer-to-Peer Networking (APPN) architecture, which allows Wellfleet to label its products as APPN-compliant.... **Retix** entered the wireless/mobile market last month when it landed a contract with **McCaw Cellular Communications, Inc.** to supply routing and Open Systems Interconnect technology to McCaw's wireless data network.

[redacted]

Tom Sawyer Software Corp. has started shipping the Network Layout Assistant for SunNet Manager 2.0 and 2.1.

According to the company, the Network Layout Assistant is a product designed to bring network device mapping facilities to SunNet Manager.

The product reads the network information in a user's SunNet Manager database and automatically repositions the device icons and their connections.

Features include automated device placement with three layout styles: hierarchical, circular and symmetrical. Grouping is controlled automatically based on Internet Protocol (IP) address, IP network masks or through an administrative grouping dialog panel, the company said.

A single-user license costs $895.

▶ *Tom Sawyer Software*
1824B Fourth St.
Berkeley, Calif. 94710
(510) 848-0853

Brightwork Development, Inc. has announced SiteMeter 4.0, a utility product that offers multiplatform metering support for DOS and Windows clients connected to Novell, Inc. NetWare local-area networks.

According to the company, SiteMeter is a Windows-based product that was designed to centralize the task of metering network software.

Workstation administration and the need for menu-based, stub file and TSR metering methods are eliminated.

SiteMeter 4.0 is priced at $495 for a 100-user file server license and $995 for a 250-user file server license.

▶ *Brightwork Development*
766 Shrewsbury Ave.
Jerral Center West
Tinton Falls, N.J. 07724
(908) 530-0440

BlueLine Software, Inc. has announced Vital Signs for VTAM 3.0 (VSE 3.0), a network and VTAM performance monitor.

The product offers new monitoring capabilities that permit users to interface directly with Sterling Software, Inc.'s Net/Master for exception reporting.

VSE 3.0 can collect and display X.25 Network Packet Switching Interface statistics for firms with X.25 communications lines including private international networks and sites with public packet-switching networks.

According to the company, the data can be used to monitor traffic volume, errors and line utilization.

VSE 3.0 prices range from $8,680 to $50,000.

▶ *BlueLine Software*
Suite 690
5775 Wayzata Blvd.
Minneapolis, Minn. 55416
(612) 542-1072

Control Data Systems, Inc. has announced the Open Systems Dynamic Network (ODN), a network integration product designed to provide a dynamic link between IBM's Systems Network Architecture (SNA) and devices based on Transmission Control Protocol/Internet Protocol (TCP/IP).

According to the company, ODN provides a series of gateways that support direct access between TCP/IP-based devices and SNA VTAM applications, eliminating the need for additional user training or modifications to the IBM environment. ODN can access a host of Unix platforms and applications and help improve the performance of legacy mainframes, the company said.

The base price for an ODN gateway is $65,000.

▶ *Control Data Systems*
4201 Lexington Ave. North
Arden Hills, Minn. 55126
(612) 482-4484

Compression Labs, Inc. has announced a feature expansion of the Eclipse 8100 family of videoconferencing products.

A 27-in. monitor version of the Eclipse 8100 (domestic) and the Eclipse 8100I (international) small-group videoconferencing systems were introduced.

The 27-in. Eclipse version includes GraphiCam, a document camera that offers a 10-to-1 zooming magnification capability. According to the company, the 27-in. monitor displays larger images facilitating more extensive graphics.

Other features include standards- and proprietary-based video algorithms, standards-based full duplex audio and network interfaces.

A complete 27-in. Eclipse costs $22,900 for the domestic version and $27,900 for the international version.

▶ *Compression Labs*
2860 Junction Ave.
San Jose, Calif. 95134
(408) 435-300

Product shorts

Concord Communications, Inc. has introduced the TRAK/Remote Poller, a software module designed to automatically gather, store and forward critical data from remote networks back to a central site at regular intervals. Cost: $3,000. Concord Communications, Mariboro, Mass. (508) 460-4646.... **Alloy**, a division of **Impulse Technologies, Inc.**, has introduced MultiPeer 2.0 for both DOS and Windows environments with built-in Novell, Inc. NetWare connectivity. The product provides seamless integration of DOS, Windows and NetWare workstations on the same network. The software is available in single-, three-, five- and 10-user licenses. Cost: Ranges from $99 to $769. Alloy, Littleton, Mass. (508) 486-0001.... **Simpact Associates, Inc.** has announced Freeway, a family of programmable gateway communications servers. The product provides wide-area networking connectivity for LAN-based systems such as Unix, TCP/IP and those from Digital Equipment Corp. and IBM. Freeway provides from eight to 64 ports of connectivity. Cost: Starts at $12,500. Simpact Associates, San Diego, Calif. (619) 565-1865.... **StrataCom, Inc.** has introduced a standards-based Asynchronous Transfer Mode (ATM) user network interface card for its IPX networking switch that permits access to ATM networks at T1 or E1 speeds. Cost: $12,000 to $18,000 per port. StrataCom, San Jose, Calif. (408) 294-7600.

MPP: Ready for commercial break

By Ellis Booker and Johanna Ambrosio

■ Once as rare as hens' teeth, commercial applications for massively parallel processor (MPP) computing finally seem to be coming within reach even as some established MPP vendors struggle to break into the commercial market.

Despite turmoil at some companies, such as Thinking Machines Corp. in Cambridge, Mass., a growing list of hardware vendors have stepped up to the MPP challenge, promising products to push this technology into mainstream business environments. These include IBM and NCR Corp. and a handful of commercial software developers, among them Oracle Corp. and Candle Corp.

Until now, MPP has been associated almost exclusively with research systems. For this reason, users remain extremely cautious about this promising but unproved architecture. Early users have also complained that MPP vendors have not adequately met the commercial market's expectations for tools or support.

Bag of goodies

David Audley, director at Prudential Securities, Inc. in New York, has been a parallel processing user since 1988, when the company installed Intel Corp. machines for heavy-duty mathematical analysis.

Back then, Audley said, "We expected very little from the vendors, and we didn't get anything we didn't expect."

Parallel view

MASSIVELY PARALLEL PROCESSORS COMMERCIAL DATA PROCESSING REVENUE (IN MILLIONS)

* Estimated

Source: Smaby Group, Inc., Minneapolis

Now, however, the parallel vendors are beginning to provide some of "the goodies," as Audley calls them, for functions such as systems management and standards for operating systems and communications. They are also starting to allow a single systems image for the whole computing environment.

At Travelers Corp. in Hartford, Conn., Lawrence Bacon, senior vice president of information systems, is "interested" in parallel processing for both batch processing and database access. But he has not purchased such a machine yet. "There isn't really anything in the transaction environment without having to reinvent your environment," he explained. For the data retrieval side, he said, "we have not come up with the perfect blend of application need, software and hardware capability."

Lots of commercial users are curious, however.

"At the supercomputing shows, you'll find people walking around with names of banks and retail chains on their badges," said Michael P. Burwen, president of Palo Alto Management Group, Inc. in Mountain View, Calif.

Expansion expected

Burwen is extremely bullish, and he predicted the annual market will be worth $4 billion by 1997, nearly half of it coming from business applications, particularly on-line transaction processing. He also said the 15 or so vendors selling MPP hardware today will expand to at least 30 by mid-1994; he said he expects 8,000 MPP systems worldwide by 1997.

One of the furthest along of Thinking Machines' 100 or so CM-5 users is Epsilon, a wholly owned subsidiary of American Express Co. in Burlington, Mass. Next month, in fact, Epsilon will deploy at American Express a production version of Quantum, an MPP-based database application. Specifics about Quantum are being tightly held.

Several Wall Street firms are also kicking the tires of MPP systems as a way to conduct complex queries in less time [CW, Oct. 12]. Likewise, some automobile manufacturers have decided that MPP is their future [CW, Aug. 9].

MPP, *page 74*

Turnover

Thinking Machines two weeks ago announced the resignation of President Harvey L. Weiss. Weiss, a 20-year Digital Equipment Corp. executive who joined Thinking Machines in June 1991, will be replaced by Richard P. Fishman, a corporate lawyer and managing partner at the law firm that has represented Thinking Machines for the last year and a half.

A company spokeswoman said the new president will continue Weiss' efforts to bring the company's products in line with the needs of commercial customers.

But the move surprised industry analysts, many of whom had expected Thinking Machines to appoint an executive from the commercial computer industry.

"It's a surprising choice, for sure," said Gary Smaby, president of Smaby Group, Inc., a Minneapolis research firm. He pointed to an available crop of executives from companies such as IBM and Digital. "Typically, the talent that it takes to be an adviser to one company or several companies is different than the talent it takes to run a company," he said.

Smaby added, however, that it was not "unprecedented" for corporate counsel to become effective heads of high-tech companies.

—Ellis Booker

IBM to release AS/400 tape library

By Craig Stedman

IBM's expected introduction this week of an automated tape library for Application System/400 computers may help legitimize the concept with AS/400 users, but analysts and other vendors said demand for the libraries is likely to remain limited to a subset of large AS/400 shops for now.

AdStar, IBM's storage subsidiary, confirmed that it accelerated the shipment schedule for the library from the first half of 1994 to late this year. The unit will reportedly support about 200 of AdStar's 3490E half-inch cartridge tapes, with future expansion planned to the 2,000-tape range.

Now comes the hard part: finding a market. Some early adopters of AS/400 tape libraries introduced by other vendors [CW, March 29] said the systems have been both useful and reliable, but analysts said tape remains something of an alien concept to most AS/400 users compared with their mainframe brethren.

"The typical AS/400 shop doesn't use a lot of tape because they tend to keep everything online," noted David Andrews, managing partner at ADM Consulting, Inc. in Cheshire, Conn. Andrews said he expects a reasonable library market to develop over time, but only at large customer sites.

Trust in tapes

Tape libraries are "a real leap of faith for an AS/400 manager" who is used to the machine's single-level disk storage format, added Kevin Beam, director of research at Reliability Ratings, Inc. in Needham, Mass. Performance is also an issue, he said: Because of constraints in the OS/400 operating system, files stored on tape must be put back on disk drives before they can be accessed.

Ed Taylor, director of MIS at Fender Musical Instruments Corp. in Scottsdale, Ariz., said it takes three to five minutes to bring up customer invoices stored on XL/Datacomp, Inc.'s Nearline ACS 9708 library of 8mm cartridges, in part because of the need to involve disk drives.

Taylor added, though, that fast access times are not critical to Fender, and he gave the Nearline unit a strong thumbs-up as a lower-cost alternative to expanding his disk arrays. "In terms of buying more [disk storage], this will help us put that off for a long time," he said.

Ken Sadowski, operations manager at Intergroup Healthcare Corp. in Tucson, Ariz., said he has also had good results using both the 8mm XL/Datacomp library and its newer ACS 9708 half-inch model for data backup.

"It's just a little easier from a management perspective to kick it off and let it run," than to rely on manual backup procedures, he noted.

Not sold

Other users expressed little interest in libraries, though. Dennis Pyburn, vice president of information systems at Insta-Care Pharmacy Services, Inc. in Woburn, Mass., said reductions in disk pricing had made it cost-effective for Insta-Care to simply mirror all of its disk-based storage.

Brad Graham, marketing manager for tape products at XL/Datacomp, said libraries would probably appeal only to users with more than 10G bytes of storage. "We're obviously marketing to 9406 customers," he said, referring to IBM's high-end AS/400 system platform.

The competition

The compressed target market for AS/400 tape libraries is not doing much to hinder competition. Both XL/Datacomp and Memorex Telex N.V. are already shipping libraries, and IBM is expected to be followed into the market by EMC Corp. and IPL Systems, Inc. EMC said it plans to ship a unit supporting "several hundred" half-inch cartridges in late 1993 or early 1994, while IPL is looking to release a lower-end 8mm library that initially could handle 10 or 20 cartridges next year.

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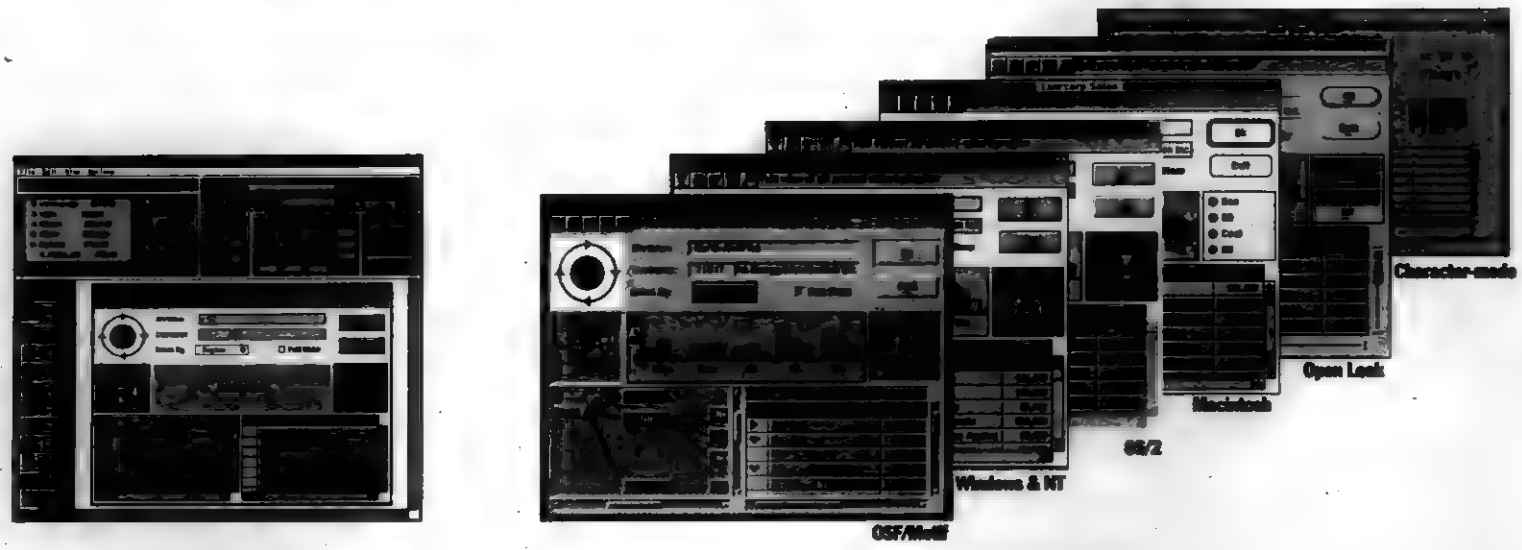

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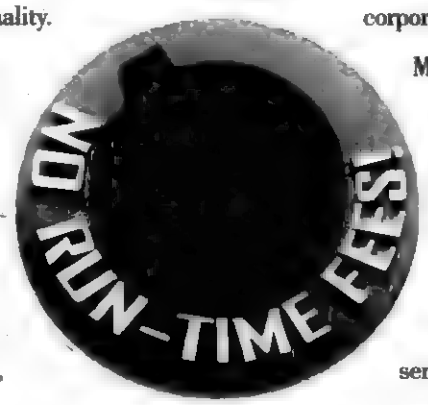

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Software AG adds to Adabas

By Gary H. Anthes
RESTON, VA.

■ Software AG of North America, Inc. will introduce a product feature later this year that can significantly boost performance of its Adabas database management system on customers' largest mainframes.

Adabas Symmetric Multiprocessor, or Adasmp, allows users with multiprocessor IBM MVS/ESA systems to distribute activity against a single database over multiple processors, with one doing updates while others work in a parallel, read-only mode.

"It removes the single-CPU bottleneck," said Scott Watanabe, senior research and development specialist at Software AG.

Watanabe said Adasmp, which will ship free to MVS/ESA customers early next year, is geared for high-volume online transaction processing and "heavy access" batch processing.

Greg Dzieweczynski, technical manager for database services for the state of Minnesota, is a beta-test user of Adasmp. In a series of benchmark tests, he found it improved response time by 40% and throughput by 20% on average when simulating an application using IBM's Teleprocessing Network Simulator at 90 CICS trans./sec. At 40 CICS trans./sec., response time was improved 16% and throughput 47% on average, he said.

"It was exciting to see the benefits of the product," Dzieweczynski said. "Increased throughput and better response time are the two key factors."

He said the value of the approach is likely to increase as new generations of mainframes employ more and more processors. By 1995 or 1996, mainframes could have 32 processors, the maximum number Adasmp now supports, he said.

However, Dzieweczynski cautioned users not to assume that performance would increase linearly with the number of processors devoted to the task. He found, for example, that while devoting six Adabas "nuclei," or logical processors, to read-only chores improved response time and total throughput over the old one-processor approach, even better results were obtained when just two read-only nuclei were defined (see chart). Paging, I/O contention and overhead slowed the systems down when too many processors were pressed into service, Dzieweczynski said, although he conceded that performance tuning might have improved results.

Test case

Benchmark tests at the state of Minnesota showed response time gains of more than 40% with the Adabas Symmetric Multiprocessor

	5.5 sec.	2.9 sec.	3.2 sec.
	888	1,114	1,010

The multiprocessing capability is mostly based on code already in Adabas, Watanabe said. Functions such as lockout protection, restart and recovery are handled in much the same way as when Adabas is used in its traditional one-processor mode, he said.

However, Adasmp uses a new "router" that sends access commands to the read-only processors and update commands to the update processor while dynamically balancing the work load across all processors.

Watanabe said part of the purpose of Adasmp is to show users "we are still working on the development of Adabas." Software AG's flagship product introduced 23 years ago.

Software AG gave users attending its national data management symposium here a sneak preview of another upcoming product, dubbed "Adabas, Looking GUI," or Adagui. It is a graphical user interface (GUI) to Adabas that lets users see what is going on inside the database management system in real time.

Inside look

Adagui allows users to see, in a variety of colors and graphical formats, CPU use and activity, dual-protection log use and status, format pool use, thread status, work pool use, work protection area status, I/O activity and file use and activity. Users can choose which databases to examine and can select sampling intervals from one to 60 seconds.

Adagui requires a PC with 8M bytes of memory and an Intel Corp. 1486 processor running Windows and Software AG's Entire Net-Work and Entire Net-Work for Windows. It also needs a Transmission Control Protocol/Internet Protocol connection to the mainframe and Novell, Inc.'s LAN WorkPlace for DOS. It will be available free on request in November.

"Adabas has had problems in terms of glitz," Watanabe said. "Now we are bringing the glitz."

Watanabe said Software AG is also developing GUI front ends for its Natural fourth-generation language and for its Entire Net-Work middleware products.

EDS rival bids low, lands General Motors contract

By Mark Halper
IRVINE, CALIF.

Outsourcing is not all in the family at General Motors Corp., where subsidiary Packard Hughes Interconnect has struck a deal with a small, hungry vendor that agreed to a new twist in partnering and in pricing models.

In selecting relative unknown Software Maintenance Specialists (SMS), Santa Ana, Calif.-based Packard Hughes decided against a bid from fellow GM subsidiary, outsourcing giant Electronic Data Systems Corp.

The three-year, $1.86 million deal calls for SMS to run Packard Hughes' business and manufacturing operations while Packard Hughes shifts to an IBM RISC System/6000-based operation over AIX [CW, Aug. 30].

Stephen Knox, Packard Hughes director of information systems, explained that SMS agreed to a deal giving Packard Hughes a price break on the project's linchpin technology, COPICS Enhanced software from AGS Information Services, Inc.

The Communications-Oriented Production Information Control System manufacturing and business software is tailored to companies in the defense industry, where many struggling businesses are contemplating hiring outsourcers as an IS cost-cutting maneuver.

What Knox proposed to the vendors that bid for his outsourcing business was that they give him the software at little or no charge and use his company as a showcase when courting potential defense customers who doubt the ability of an outsourcer to run COPICS Enhanced while assisting in a client/server transition.

"If they give me a good price and get us up and running, then they can go to the others and say, 'See, we did it,'" Knox said.

Lowest bidder

Of the four bidders — Pyramid Information Systems and the data processing group at GM's Hughes Aircraft Co. subsidiary were the other two — only SMS could offer a break. In fact, Knox said, SMS' price was unbeatable. It offered the software at no extra charge, to the astonishment of the other bidders.

OUT sourcing

Showtime

In what resembles a marketing partnership, SMS gives Packard Hughes free software and then uses the outsourcing project as a showcase for potential customers in L.A.'s troubled defense industry. Possible future sites include the following:

- **DataTape**, a Pasadena, Calif.-based Kodak subsidiary.
- **Hughes Aircraft's Electronic Dynamics Division** in Torrance, Calif.
- **Hughes' Microelectronics Division** in Newport Beach, Calif.

"EDS said they couldn't give it to us at no charge, and they were surprised at SMS' ability to do that," he said. EDS had already adjusted pricing to match an earlier low bid by SMS but was unwilling to offer a software giveaway, Knox said.

In a sense, Packard Hughes went in tandem with SMS on a deal that would reward the GM subsidiary for being the guinea pig in an SMS thrust into the defense manufacturing sector.

The software is a boon to Packard Hughes because unlike the earlier version, known simply as COPICS, the enhanced version includes migration tools for converting to CIMAPPS, or Computer Integrated Manufacturing Advantage Production Planning Series, a client/server manufacturing and ordering system Packard Hughes plans to use on its RS/6000 system.

The arrangement was not purely a free ride for Packard Hughes because the company later agreed to pay to add its Foley, Ala., and Fort Defiance, Ariz., manufacturing operations to the outsourcing scheme. Initially, the SMS contract covered the company's manufacturing and business facilities here and in Tijuana, Mexico.

Knox credited SMS with breaking ranks with traditional pricing mechanisms and charging for the additions on a basis that takes into account end-user links rather than mainframe CPU cycles.

SMS will charge Packard Hughes an extra $5,000 per month for each of the two locations when they are added, based on a formula that adjusts monthly pricing up or down by $5,000 every time the combined PC and terminal count changes by 50 units.

According to Knox, SMS priced the data processing portion of the early part of the deal on a per-end-user-box basis. Packard Hughes ties into a 3090 mainframe through a combination of 250 3270 terminals and PCs and pays $30,000 per month, or $6,000 per group of 50 boxes. The box charges account for a little more than half of the $1.86 million contract.

Knox estimated the outsourcing deal will save him $1 million a year over the three years and pointed out that the loss-riddled company desperately needs that money.

"We are the plankton of the food chain," Knox said. "We can't afford an IS budget that's 3% of our revenue." In its last fiscal year ended Dec. 31, Packard Hughes lost $2 million on $80 million in revenue.

Although this round of IS overhaul went to SMS, Knox said another being planned — a forthcoming computer-aided design project — could stay in the GM family.

"That's EDS' forte," Knox said, noting he plans to solicit a proposal from EDS when the time comes.

Ellis Booker

Serve up simplicity

Substitute the word "cooking" for "information system" in the following sentence:

"The best information system should be simple, understandable to anyone and, with a proper methodology (i.e., 'recipe'), easy to reproduce."

Only people who dine exclusively at McDonald's would be inclined to believe this nonsense.

A desire for simplicity — in lifestyles, cuisines and information systems — has become something of an obsession of late. Unfortunately, simplicity is not always achievable, nor is it always an appropriate consideration before stepping into the kitchen.

> Business rarely has the leisure to wait for that "simple, modular, fail-safe" way of developing new applications.

Consider this: Despite several thousand years of practice, chefs everywhere (except maybe those in England) have failed to settle into a single, uniform kind of "world cooking." To satisfy our taste buds and our information services needs, we will always need "chefs," individuals blessed with a special something that cannot be mass produced, bottled or captured as a set of rules and methods on a hard disk.

But is it effective?

Simple cooking is, certainly, one kind of cooking. But it's not the only kind. What's more, simple cooking may not be "effective" cooking — it may not win awards or restaurant customers.

Likewise, the behemoth programing job that resulted in American Airline's Sabre passenger reservation system was not a simple dish to make, but it did win the airline key advantage in its marketplace.

Would American Airlines have preferred a simple, modular and easy-to-maintain alternative? Of course.

But business rarely has the leisure to wait for that "simple, modular, fail-safe" way of developing new applications promised by vendors and, all too often, trumpeted by the computer trade press. (Like weekend cooks on the lookout for newfangled cutlery and gizmos that slice and dice, how often have IS shops bought tools — CASE, artificial intelligence, neural networking, etc. — that were advertised as a way around complexity?)

Inflated hopes

Compounding the problem has been the very success of some of these labor-saving devices and approaches — an *expectation* that simplicity and seamlessness is already out there.

Users given an easy-to-learn, easy-to-navigate graphical front end will, almost instantly, ask for features and capabilities far beyond what they had with their old systems. Maybe this is the not-so-secret reason why IS staffs have been reluctant to deploy Windows. After cooking palatable but nononsense steak 'n' potatoes all their lives, these staffers dread being asked to invent dishes to satisfy the hungry, increasingly sophisticated diners.

A better strategy is to strive for simplicity while accepting complexity. Remember that creation, either of a fabulous dinner for four or an application program for the accounts payable department, is often a messy business. The outcome is what matters.

Cooks have known this truth all along: "The proof is in the pudding."

Booker is *Computerworld*'s senior editor, advanced technology.

MPP: Ready for commercial break

CONTINUED FROM PAGE 71

Such commercial uses are crucial to the viability of the MPP marketplace, according to analysts.

"It's safe to say that if the [MPP] industry generated $260 million in total revenue, then this industry niche has not turned profitable," said Gary Smaby, president of Smaby Group, Inc., a Minneapolis-based research firm.

But Smaby and others contend that the commercial MPP marketplace is on the cusp of significant growth. One prime reason, they said, is the coming availability of software already familiar to commercial users that will run on MPP architectures. John Senor, a vice president at Information Builders, Inc. in New York, spoke for many when he said, "We're looking at 1994." Included among the MPP software players are the following:

- Oracle has about 15 commercial customers running its database management system on parallel machines, said Gadi Maier, vice president of the company's massively parallel endeavors. The product is already available on machines from NCR, Kendall Square Research and Thinking Machines, among others. Versions have been announced for virtually all the other players as well.
- Information Builders' Focus fourth-generation language already supports some parallel processing features under Unix, but additional features will be added next year, around the same time the company's EDA/SQL database middleware will run on parallel processors. "We will be able to put EDA on a server in front of databases that don't run on parallel machines, and EDA will be the parallel mechanism," Senor said.
- Candle Corp. in Los Angeles will have by next year a tool set to help tune IBM's parallel machine.

Meanwhile, traditional IS hardware suppliers are trying to move existing customers to parallel possibilities. IBM has started to talk at user groups about a tool to parallelize some applications (see story below), and NCR already offers software and services for users of its I and V proprietary mainframes to move them to its System 3000 Unix machines.

Delivery dates

IBM's parallel database engine is on track for delivery later this year [CW, Aug. 9]. NCR, which already has a database machine, has pushed back the delivery of its top-end, massively parallel system, the System 3700, to the "1995 time frame," according to a company spokeswoman. "We want to release it at the peak of the market," she said.

Traditional supercomputer companies, likewise, have joined the MPP fray. Convex Computer Corp. in Richardson, Texas, plans to bring forth an MPP system based on Hewlett-Packard Co.'s Precision Architecture-RISC processor. That system, slated for delivery in the first half of 1994, will range in price from $500,000 to a couple of million dollars, according to Convex Vice President of Marketing Jim Balthazar.

But Convex's history underscores the difficulty MPP vendors will likely encounter: Despite a concerted effort to move beyond the technical/scientific sector, Convex only counts a third of its business from sales into what might be called commercial settings.

Make way for Batch Pipes

IBM has for some time talked about its parallel database machine due by year's end [CW, Jan 18]. But some of the company's technical managers have begun talking to user groups about software that allows some existing applications to be parallelized, even without the upcoming hardware.

Called Batch Pipes for MVS, the software — for which IBM managers have not specified a delivery date — essentially speeds up the processing time of applications that work with BSAM and QSAM access methods, which many large shops use to run their large batch-processing jobs.

Currently, the first job processes the data and puts it into another data set. Once the whole job has been completed, the second job grabs the second data set and gets started.

With Batch Pipes, instead of having to wait for the entire first job to be completed, the second job will be able to begin once the first job passes it a record. Essentially, the two jobs run at the same time.

So far, fewer than 10 customers are beta-testing Batch Pipes, said Al Hechler, IBM's solution manager, even though the program does not begin in earnest until next month. IBM had issued a statement of direction about Batch Pipes back in July, although at that point it was unnamed.

The software will work on any of IBM's multiprocessor machines, Hechler said, and requires MVS Version 4.2 or later. To use Batch Pipes, customers need to change at least two job control language statements; the exact number depends on the number of jobs in the application being run through Batch Pipes.

David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh, said this sounds "very helpful in terms of speeding up the batch process. We're constantly facing shorter batch windows."

— Johanna Ambrosio

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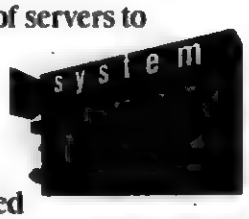

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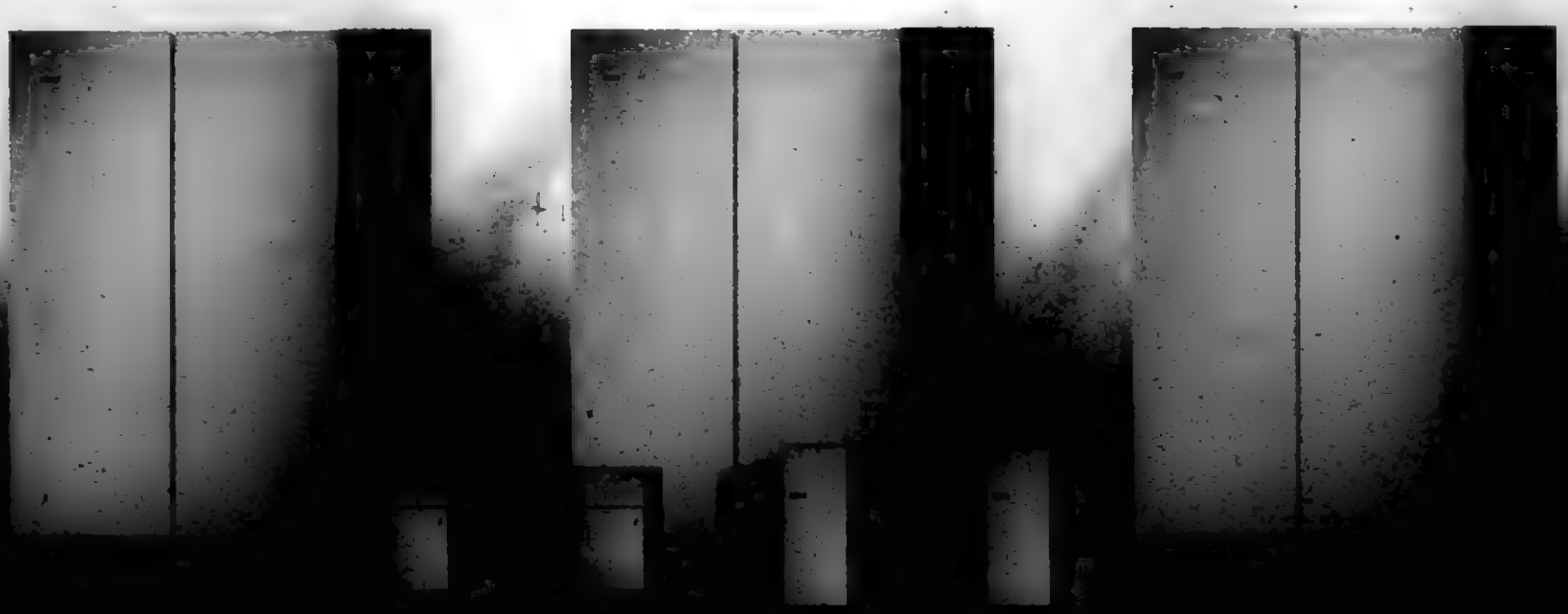
3550
Sets new standards of price/performance between departmental servers and our high-end, massively parallel enterprise servers.



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High-performance with data integrity and reliability plus investment protection for future growth.

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3445
Optimized for faster I/O and LAN performance, this desktop unit is ideal as a high-performance network or database server.

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Supports as-400, OS/2, and Unix, OpenVMS, and Novell NetWare. Advanced data reliability features. Intelligent UPS offers up to 6 minutes of backup power.

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3550 to design and develop their newest operating system. Since we committed to Unix in 1980, we've been adding mainframe reliability features to optimize it for mission-critical applications. The result is the first commercial Unix that meets the U.S. government's tough B-1 standard. Our LifeKeeper™ software and advanced RAID technology add unmatched fault-resiliency. With a goal of 99.99% system availability.

intel inside

Outstanding Price/Performance.

All our servers offer exceptional price/performance. Including several models rated first in their class by Transaction Processing Council benchmarks.

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Our servers are designed to be easily upgraded to Intel's new Pentium™ microprocessor. And its successor. The System 3000 family further protects your investment with numerous components that are upgradeable in place, making expandability fast and simple.

For more information on the System 3000 family, phone 1 800 CALL-NCR.

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Up to 16 Pentium chips deliver more power for on-line transaction processing, decision support, and large database applications.

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From 2 to 16 i486 processors in a tightly-coupled architecture plus dual 64-bit system buses and LifeKeeper FRS add up to a world-class server just a step below our massively-parallel systems.

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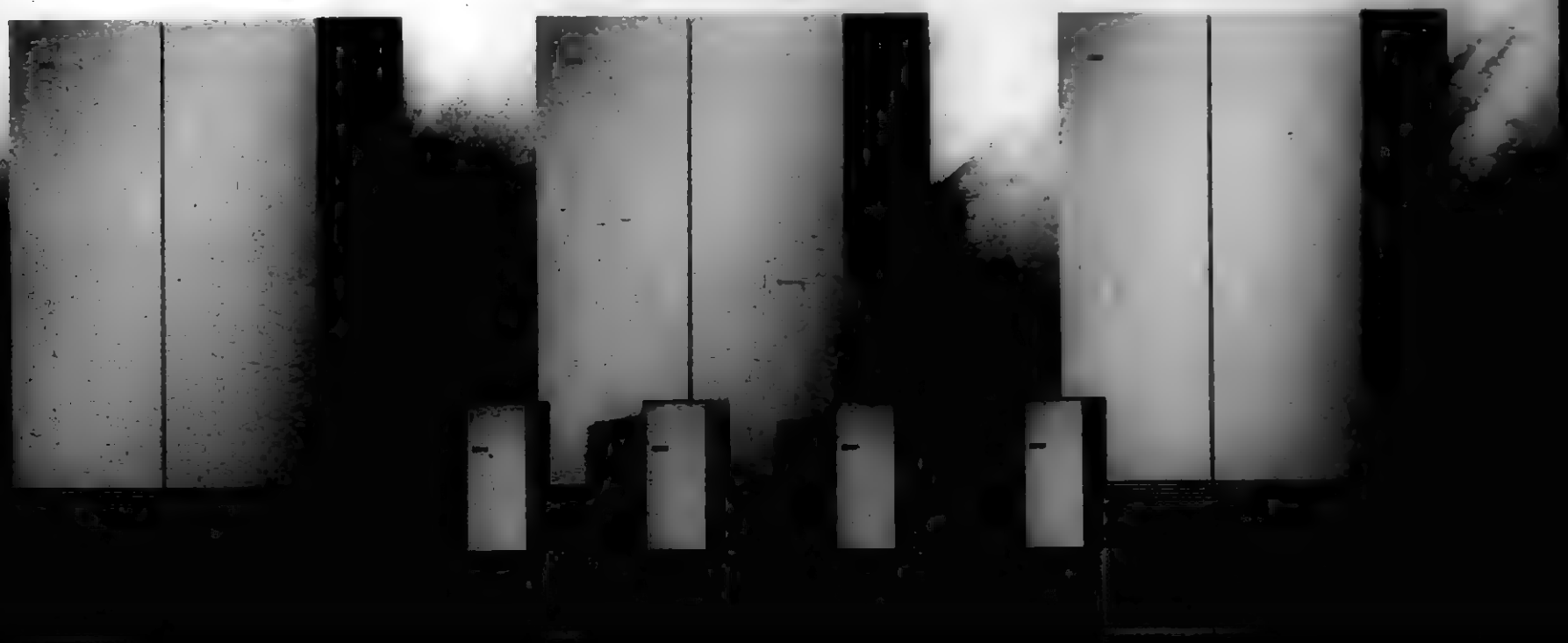
The top of our midrange line isn't the end of our family. Up to 32 Pentium chips deliver exceptional power, while LifeKeeper FRS offers mainframe-class reliability.



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The price/performance leader for replicated branch and departmental installations. Supports from 2 to 12 processors and comes with LifeKeeper FRS.

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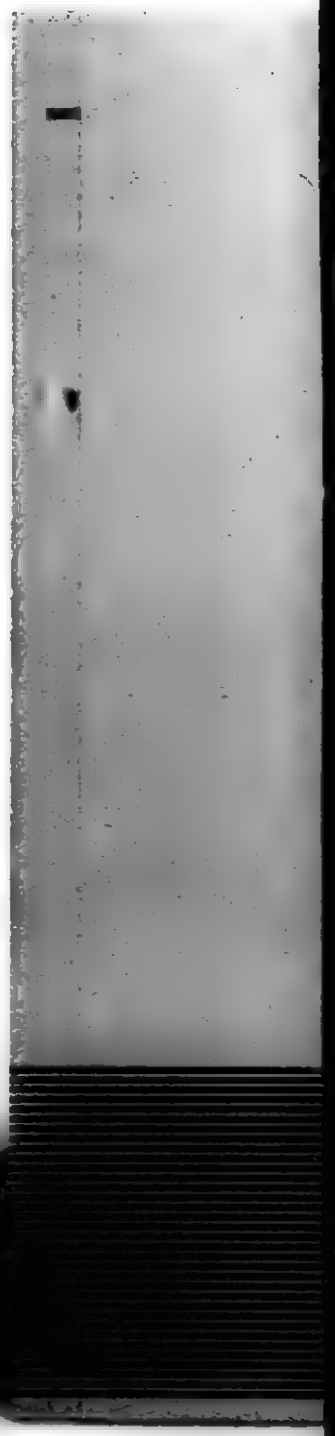

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We Can Help You Integrate Our Systems Into Your Enterprise. Anywhere In The World.

AT&T/NCR's global presence means we can help you quickly take advantage of our new, more cost-efficient technology anywhere in the world. Our representatives can work with your staff to develop solutions tailored to your enterprise's particular needs. We'll integrate multi-vendor environments and maintain them as well.

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NetSoft has announced Version 3.0 of Elite/400 IWS and Elite/400 DSP, 5250 emulators for Windows to IBM Application System/400 connectivity.

According to the company, highlights of the new product rollout include the following: support for Novell, Inc.'s NetWare for SAA using the SPX II protocol; support for Twinax links; a third-generation application called the NS/Router; a high-performance file-transfer system that is 50% faster than competing products; and variable font sizing, menu bar hiding and other enhancements.

The Elite/400 IWS 3.0 and the Elite/400 DSP 3.0 each cost $295.

▶ *NetSoft*
39 Argonaut
Laguna Hills, Calif. 92656
(714) 768-4013

Platinum Technology, Inc. has introduced Platinum Detector, software designed for analyzing DB2 application performance at meaningful levels of granularity, the company said.

Platinum Detector provides access to DB2 trace performance information at the application, package/database request module, plan and SQL call level.

The product lets users save historical application performance data; view the status of all available subsystems; conserve time and system resources with the ability to access any DB2 subsystem; and use functionality within all other Platinum products through Detector global commands.

The product is IBM MVS/ESA- and MVS/XA-compatible.

Platinum Detector Version 1.0 is priced from $20,873 to $121,474, depending on CPU size.

▶ *Platinum Technology*
1815 S. Meyers Road
Oakbrook Terrace, Ill. 60181
(708) 620-5000

Quantech Systems, Inc. has introduced The Order Marshal, a native IBM Application System/400 mail order, catalog and fulfillment system.

The Order Marshal offers standard functions that include order entry, inquiry/customer tracking, form-letter customization, returns and refund processing, electronic telemarketer order processing, United Parcel Service, Inc. manifest, cash-on-delivery tracking, customer service and marketing support and user-maintained system controls and security.

Credit-card processing is available as an optional module, and users can market their customer database with the Mailing List Rental module, according to the company.

The Order Marshal costs $9,975.

▶ *Quantech Systems*
Suite 200
300 Brinkby Ave.
Reno, Nev. 89515
(702) 829-5666

Raxco, Inc. has introduced UIS-Autostor, a hierarchical storage management system.

According to the company, the product automatically manages disk space by transparently moving data between storage media (file shelving) using an automatic storage management system. File shelving is a new VMS concept designed to keep disk space free for new and active files, the company said.

The product automatically makes copies that are housed in various storage media for security purposes, eliminating the need for data backup.

UIS-Autostor maintains a log of all shelve and unshelve actions via a comprehensive reporting facility.

Pricing for UIS-Autostor begins at $5,850.

▶ *Raxco*
2440 Research Blvd.
Rockville, Md. 20850
(301) 258-2620

KEA Systems Ltd. has announced Version 3.0 of the KEAterm series.

New application integration features are highlighted with this release. KEAterm is an advanced software emulation of Digital Equipment Corp.'s VT terminals, enabling users to integrate multiple host applications into the Windows environment.

Access to text applications on a VAX or Unix host system is provided by KEAterm 420, and KEAterm 340 allows for access to host text and graphics applications, according to the company.

Additional features include copy and paste with links that allow users of KEAterm 3.0 to highlight an area on the emulation screen with a mouse and then with a Dynamic Data Exchange (DDE) link, paste it into a Windows application such as Excel.

Transmission Control Protocol/Internet Protocol (TCP/IP) Windows Sockets that allow KEAterm to interface with any TCP/IP stack that supports Microsoft Corp.'s Telent socket standard are also provided. KEAterm supports DDE and has a variety of extensions, including International Standards Organization language support.

A single-user package of KEAterm 420 costs $245. KEAterm 340 is priced at $395.

▶ *KEA Systems*
Unit 101
North Fraser Way
British Columbia, Canada V5J 5G1
(604) 431-0727

Briefs

Softworks, a vendor of systems management software, has agreed to jointly develop training materials with **Amdahl Corp.**'s education and training division. The courses will focus on maintenance of and disaster recovery techniques for ICF and VSAM catalogs.

In other training news, **Datathon, Inc.** in Northridge, Calif., announced Version 8.1 of TrainEase, its multimedia tool for developing presentations on the Application System/400 and mainframes. TrainEase runs on PCs but captures keystrokes and data from the larger machines; it also supports full video.

Lockheed Information Technology Corp. has awarded a five-year multimillion-dollar contract to **Bell Atlantic Business Systems Services** for service of its Denver data center and some other sites. According to reports, Bell Atlantic will support three IBM 3090 600J mainframes, as well as Digital Equipment Corp. minicomputers and Storage Technology Corp. tape silos.

Encore Computer Corp. has signed on to market **Information Management Co.**'s version of the Tuxedo transaction processing monitor for use with its massively parallel Infinity 90 mainframe alternatives. Encore also will resell Information Management's Open TransPort for MVS software, which gives Tuxedo users transparent access to data stored on IBM's MVS-based mainframes via the Transmission Control Protocol/Internet Protocol.

Wang Laboratories, Inc. has started shipping a version of its Pace for Open Systems application development software for **Hewlett-Packard Co.**'s HP 9000 Series 800 line of Unix business servers. Pace is the second package ported to the HP systems by Wang, which released its Open/image software for the HP 9000 in June.

NCR Corp. and **PeopleSoft, Inc.** have signed a deal to jointly market PeopleSoft's client/server financial and human resources software on NCR's System 3000 hardware platforms. NCR is also licensing both the financial and human resources products for internal use at its U.S. operations, as a replacement for existing mainframe applications.

Maspar Computer Corp. in Sunnyvale, Calif. has signed an agreement with **MRJ, Inc.** under which MRJ will offer systems integration and consulting services to customers of Maspar's massively parallel processors. The two companies are also porting MRJ's ParaSort software for sorting through large databases to the Maspar hardware. Shipments are scheduled for the fourth quarter.

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CA wins over Nantucket users

Users praise CA for accelerated development of the acquisition's products

By Thomas Hoffman
ORLANDO, FLA.

When Computer Associates International, Inc. acquired Nantucket Corp. in June 1992, George Smith, like many other Nantucket Clipper users, had what he termed "grave concerns."

Throughout its 17-year history, CA had developed a reputation for acquiring software vendors for their technologies, customer bases and maintenance revenue, but it had typically done little to enhance the products.

Smith, an independent consultant who is president of the Connecticut Clipper user group, was among the Clipper users who feared that Clipper, an Xbase development environment for DOS programs, would gather dust.

But 14 months after CA acquired the $40 million Los Angeles-based Nantucket, the bulk of those fears have been put to rest. Six months ago, CA rolled out a Clipper upgrade, Release 5.2, which included a complete Novell, Inc. NetWare operating system interface.

Next month, CA will begin beta testing CA-Visual Objects, an object-oriented Windows development environment based on technologies it inherited from Nantucket. Since then, CA has added visual development tools, class libraries and SQL access to the product set.

CA-Visual Objects, *a Windows development environment, may have had a speedier development cycle because of CA's greater resources*

Needed help

With greater resources than Nantucket, CA likely sped the development of CA-Visual Objects, according to several early alpha testers of the product, including Smith.

"With Nantucket, who knows when we would have seen Visual Objects?" he asked.

CA drew criticism last month from a few users who had experienced bugs with CA-Clipper 5.2, including problems with memory management and indexing. However, CA reportedly moved quickly to address the problems and has made three patches to the software since its release.

CA executives said the glitches affected a small number of users and have since been resolved. Those claims were backed up by several sources close to the situation, including William T. Ota, chief executive officer and publisher of *Clipper Advisor*, a bimonthly magazine for CA-Clipper users published by Advisor Communications International, Inc. in San Diego.

"The bulk of the complaints came from a handful of Clipper users who made waves over CompuServe," Ota said.

Tad Frysinger, manager of information services at Colorado Commodities Management Corp. in Boulder, Colo., uses CA-Clipper 5.2 and said he has not had any problems with the development system. Still, he said he believes CA has moved quickly to eliminate problems others have experienced with the software. "CA is doing a crack job of patching things up," Frysinger said.

Analysts estimated that CA-Visual Objects will begin shipping by mid-1994, putting the product well behind the curve for established Windows development suites such as Microsoft Corp.'s Visual Basic for Windows and Powersoft Corp.'s PowerBuilder for Windows.

Worth the wait

Despite the delay, many CA-Visual Objects alpha testers said they are impressed enough with the test version to wait on a production package.

"I'm willing to wait [for Visual Objects] because we don't want anything that's half-baked," said Ginny Caughey, a vice president at Carolina Software, Inc., a Wilmington, N.C., developer of applications for local governments.

Caughey said she prefers CA-Visual Objects over competitive products such as Visual Basic and PowerBuilder because she believes CA-Visual Objects has a more comprehensive tool set than the others. She does not want to have to rely on third-party vendors for add-on products "that might not be there when I need them," she said.

"I'm going to hold off and wait for Visual Objects. It's worth the wait," said Craig Yellick, a vice president at Alto MicroComputer, Inc., a Minneapolis-based consulting and development firm. Yellick said he was impressed with CA-Visual Objects' Integrated Development Environment, which offers a full set of visual tools to generate object-oriented code.

Clipper compatibility

CA-Visual Objects, an object-oriented Windows application development suite, is compatible with CA-Clipper for DOS, an Xbase application development environment. Based on early testing of the product, CA-Visual Objects was designed to run Clipper applications faster under a Windows environment without any memory limitations, according to Marc Sokol, director of product strategy at CA.

CD-ROM systems

IBM program to assist OS/2 users, developers

By Ed Scannell

Hoping to give a much-needed boost to application development for OS/2 2.1, IBM's Personal Software Products group has formally announced a developer's assistance program, which includes a wide range of tools and services.

The Developer Connection for OS/2 includes a technical component of the program that has 400M bytes of code on a CD-ROM with more than 80 development and testing tools and 50,000 pages of on-line technical information.

Besides the latest OS/2 2.1 code, the Developer Connection CD-ROM features the Developer's Toolkit for OS/2 2.1, the Multimedia Presentation Manager/2 Toolkit and the Pen for OS/2 Developers Toolkit.

Also included is a full-function version of Personal Software Products' Communication Manager 1.0 as well as a browser and search engine to help programmers more quickly locate specific pieces of code to speed the development process.

"The whole idea [of the Developer Connection] is to get developers what we believe are the best and latest tools for OS/2 to create client/server applications," said Barbara Britt, product manager for OS/2 development tools.

The Personal Software Products group plans to provide CD-ROM updates four times a year with new or improved versions of existing tools, Britt added.

IBM's Personal Software Products has been beta testing the tools during the past year under the name of the Professional Developer's Kit.

"This set of tools should help push some developers sitting on the fence about starting or finishing OS/2 applications," said Randell Flint, president of Sundial Systems, Inc., which has delivered one of the first 32-bit applications to take full advantage of OS/2's Workplace Shell.

Some of the services that are part of the program include access to the Developer Connection forum on CompuServe.

Through the forum, developers have access to IBM's OS/2 developers to untangle technical problems as well as share ideas.

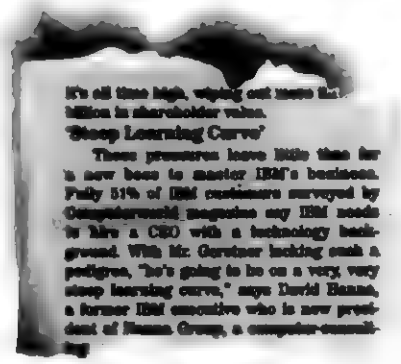
Developers also get a newsletter advising them of Personal Software Products latest thinking on OS/2 technical strategies.

The Developer Connection for OS/2 includes more than 50,000 pages of technical information on a CD-ROM.

In addition, programmers have access to 32-bit tools for creating applications for the WorkPlace operating system, the microkernel version of OS/2 expected in the first half of 1994.

System requirements for the Developer Connection CD-ROM are 6M bytes of main memory — although 10 is advised — OS/2 2.0 or later and an OS/2-compatible CD-ROM drive.

Available now, the Developer Connection has an introductory price of $149. After Nov. 30 the price jumps to $199.

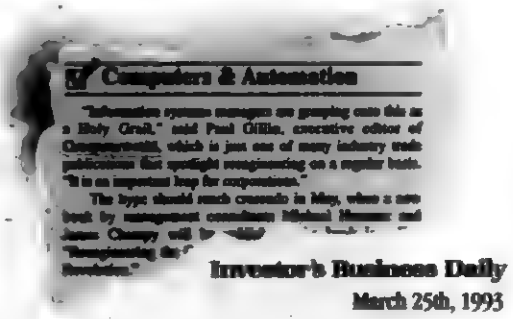


It's all time high, wiping out more than ... billion in shareholder value.

'Steep Learning Curve'

Those pressures leave little time for a new boss to master IBM's business. Fully 51% of IBM customers surveyed by Computerworld magazine say IBM needs to hire a CEO with a technology background. With Mr. Gerstner lacking such a pedigree, "he's going to be on a very, very steep learning curve," says David Hanna, a former IBM executive who is now president of Hanna Group, a computer-consulting ...

THE WALL STREET JOURNAL.
March 25th, 1993

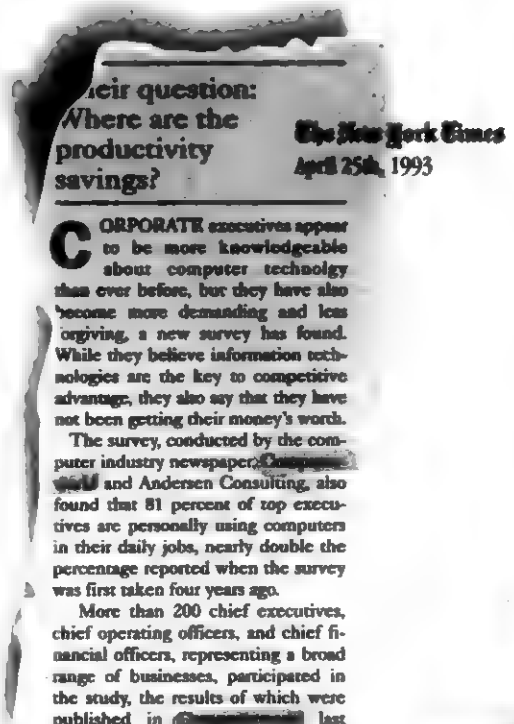


Computers & Automation

"Information systems managers are grasping onto this as a Holy Grail," said Paul Gillin, executive editor of Computerworld, which is just one of many industry trade publications that spotlight reengineering on a regular basis. "It is an important leap for corporations."

The hype should reach crescendo in May, when a new book by management consultants Michael Hammer and James Champy will be ... "Reengineering the ... Revolution."

Investor's Business Daily
March 25th, 1993



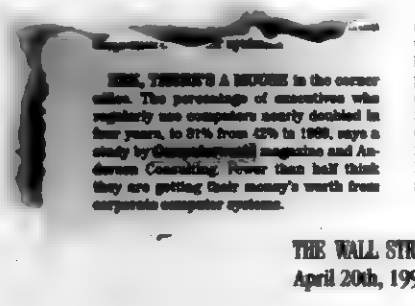
...eir question: Where are the productivity savings?

The New York Times
April 25th, 1993

CORPORATE executives appear to be more knowledgeable about computer technology than ever before, but they have also become more demanding and less forgiving, a new survey has found. While they believe information technologies are the key to competitive advantage, they also say that they have not been getting their money's worth.

The survey, conducted by the computer industry newspaper Computer... and Andersen Consulting, also found that 81 percent of top executives are personally using computers in their daily jobs, nearly double the percentage reported when the survey was first taken four years ago.

More than 200 chief executives, chief operating officers, and chief financial officers, representing a broad range of businesses, participated in the study, the results of which were published in ... last week. Annual company sales ranged from $250 million to $20 billion.



...ers were large, private-owned, real-tim... compu... netwo... Boca ...

THE WALL STREET JOURNAL
April 20th, 1993

The New York Times
March 25th, 1993

...CUSTOMERS HAVE THEIR SAY TOO

IBM directors should forget about hiring another salesguy to replace John Akers as CEO. And whoever he is, Aker's successor should fire a whole lot more people. So says a Computerworld survey of executives at 100 companies that spend at least half their computer budgets on IBM products. The participants, who work at the likes of Kmart and Parker Hannifin, a maker of pneumatic and hydraulic components, also said IBM's reorganization into smaller business units should go further. Computerworld, in addition, interviewed various computer industry luminaries, including Steve Jobs. The Next CEO marveled that none of IBM's machines from mainframes to PC's uses the same software. Says Jobs: "IBM's troubles stem from the fact that they approach everything from a hardware strategy, and the Nineties is a software decade."

Not everybody agreed that breaking up is the way for IBM to go. Said Larry Ellison, CEO and co-founder of Oracle, a software company: "This is the

...her, Richard is a retired I.B.M. vice president.

A survey of some 100 of I.B.M.'s largest customers by Computerworld magazine found that 51 percent preferred someone with a technical background to be the computer giant's new chief executive, while 36 percent said technical expertise was not essential and 13 percent had no opinion.

But some industry ... technology ...

...93 · FORTUNE 11

FORTUNE
April 5th, 1993

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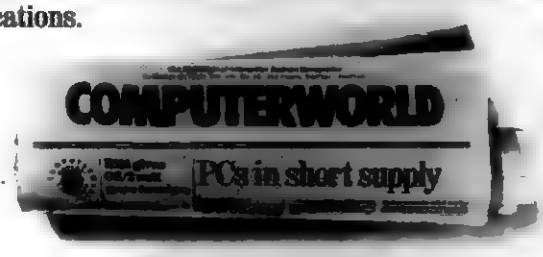
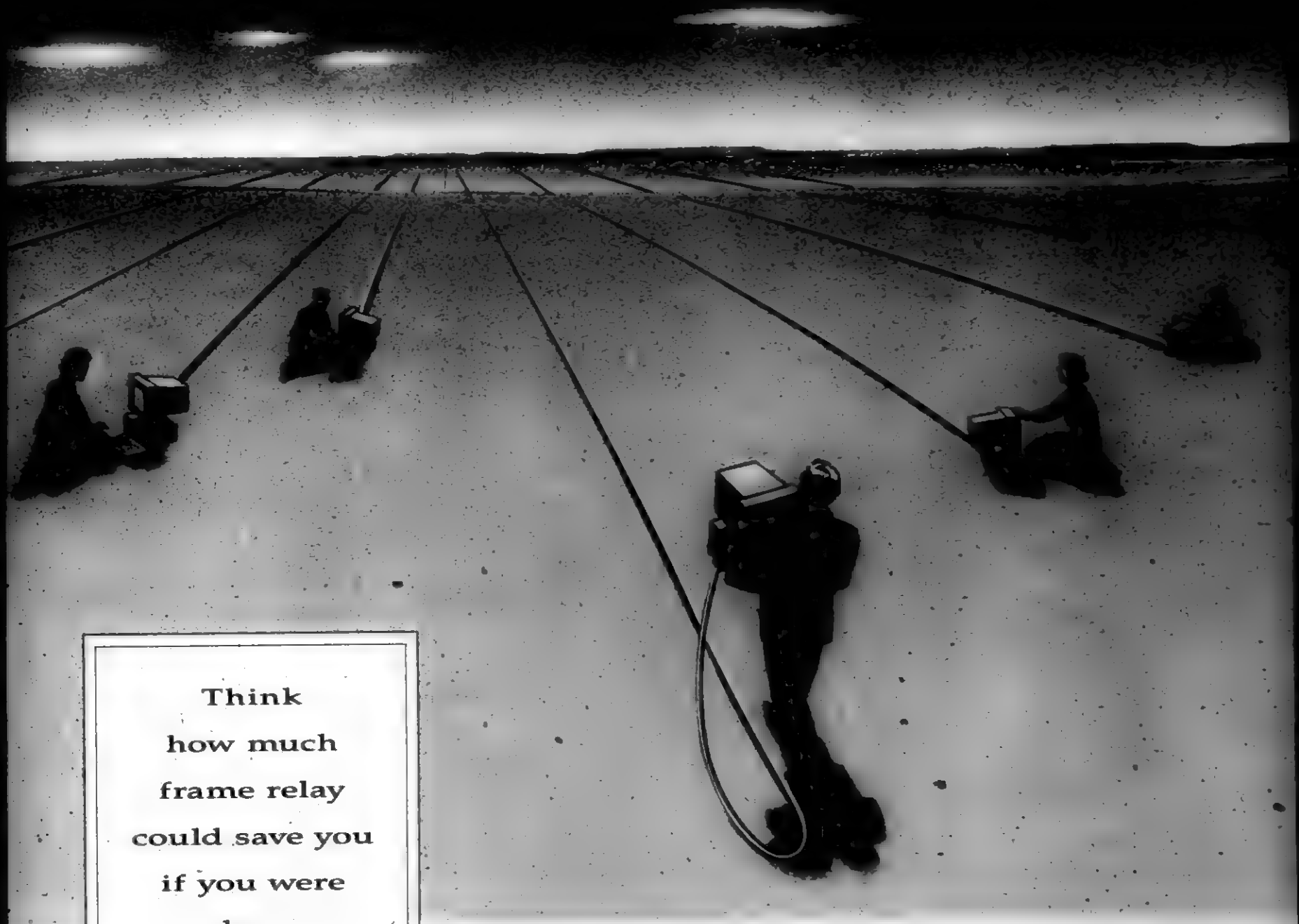


The Newspaper of IS



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We're all connected.

New York Telephone

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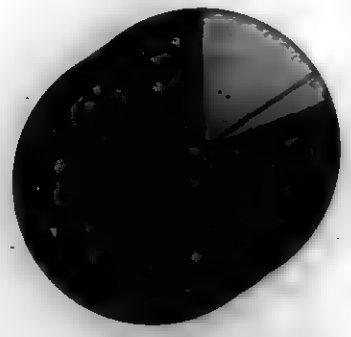
*Buffalo nodes become operational in September, Albany nodes in October, 1993. © New York Telephone 1993

Why is Compuware the company so many turn to for programming productivity tools?



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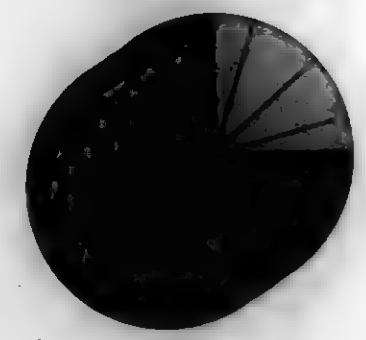

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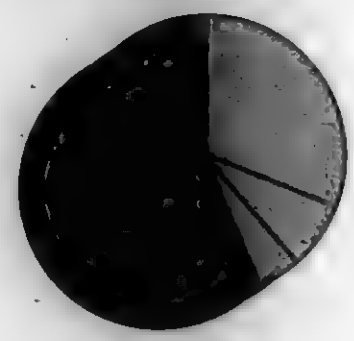

Automated Testing Tool Purchases

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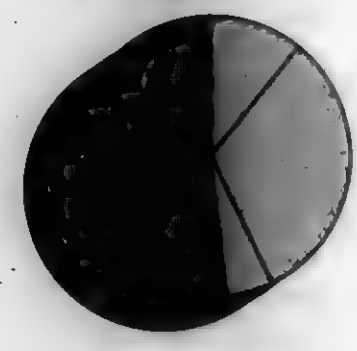

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Digital takes aim at Unix tool area

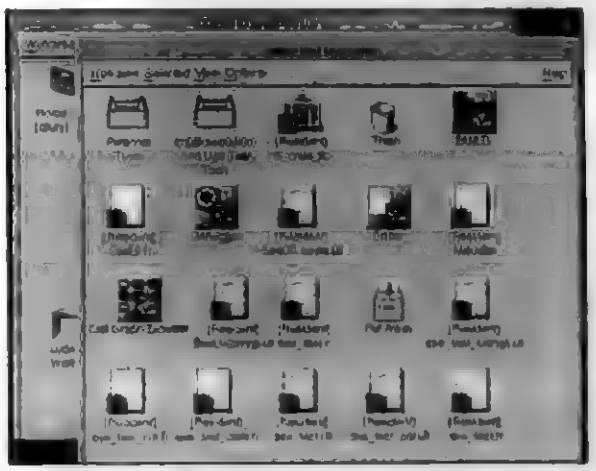
By Melinda-Carol Ballou

Digital Equipment Corp. is now shipping its Cohesionworx, a development environment for Unix, and Cohesion Team/See, a set of software tools for managing data and development across various Unix environments.

These Digital products target Softbench from Hewlett-Packard Co. in the Unix tools arena. They offer more effective messaging services than those used by Softbench to coordinate the various development processes through Digital's Application Control Architecture (ACA), according to Tony Picardi, an analyst at market research firm International Data Corp. in Framingham, Mass. The big issue for Digital, as usual, will be its ability to prioritize and focus on the products to get the message out, Picardi said.

"Team/See offers a packaged way to integrate tools so users don't have to figure it out for themselves, for instance," Picardi said. "[Digital has] underestimated the number of people who need that and should be making some noise about it."

Cohesionworx offers a graphical user interface based on IXI Ltd.'s IXI desktop, which has been extended to include icons representing Cohesionworx for shared access to data and invocation of tools existing on the network. Users can also create work areas and tool boxes to store data and to support specific development tasks, Digital officials said.



Cohesionworx *offers a GUI based on the IXI desktop, which has been extended to include icons*

Also available with Cohesionworx are control services via Digital's ACA Services. These services support messaging among tools, the dynamic addition of tools and servers and execution prioritizing. ACA is compliant with the Object Management Group's Common Object Request Broker Architecture, an emerging standard for the communication of objects across the network.

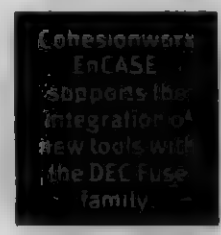
The following software development tools are included with Cohesionworx: DEC Fuse coding, editing and debugging tools for development in C, C++, Fortran and Pascal, with support planned for Ada. The DEC Fuse Code Manager supports version control and file sharing for development teams.

In addition, Cohesionworx EnCASE supports the integration of new tools with the DEC Fuse family.

Digital's Cohesion Team/See offers an interface to invoke tools across Digital's OSF/1 and Sun Microsystems, Inc.'s SunOS. It includes PCMS configuration management software from SQL, Inc. for tracking the development process — documents, specifications, change and control management, for instance.

Also included with Team/See is a product information browser that lets development teams search and check out software components; "to do" lists to keep track of tasks that require completion; a library finder to manage multiple libraries; and work-area templates to enable large development teams to better organize their responsibilities.

Optional products, which can be purchased from Digital and integrated with Team/See, include Cadre Technologies, Inc.'s Teamwork, Interactive Development Environment's Software through Pictures and Interleaf, Inc.'s Interleaf.



Cohesionworx Version 1.0, Cohesionworx for C++ Version 1.0 and Cohesionworx EnCASE are priced respectively at $2,300, $1,000 and $2,400. The products are shipping now on Digital's Alpha AXP workstations hosting the DEC OSF/1 operating system and on Sun SPARCstations and SPARCservers running SunOS Version 4.1.3. They will be available on HP systems running HP/UX in December. Cohesion Team/See is shipping now, and its license fee is $5,500.

CASE tools

Silicon Graphics sharpens vision

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Silicon Graphics, Inc.'s (SGI) CASEVision/WorkShop computer-aided software engineering (CASE) tool plays on the visual nature of its Unix computing platform, users of the year-old software package said. Users can trap "bugs" in dialog boxes and spot "memory leaks" by viewing colorful pictures of CPU use.

Early users of WorkShop 1.0 expect Version 2.0, set to ship this month, to provide better programmer productivity through the tight integration of separate programs. "You can run your programs and try to find out where you're spending your CPU time all on one screen," said John Grieggs, a software design engineer at the Jet Propulsion Laboratories in Pasadena, Calif., who saw a beta-test copy of WorkShop 2.0.

The visual nature of the lower CASE tools is the basis of the developer environment, users said. "It's actually built to be a graphical debugger from the ground up, not just a graphical interface thrown on top of a text-based debugger," Grieggs said. He tests source code on an SGI Indigo workstation.

Another WorkShop 1.0 user, Jonathan Coker, a senior engineer at McDonnell Douglas Aerospace Corp. in St. Louis, said visual techniques spur efficient coding in flight simulation programs. The shift from traditional debuggers was as dramatic as moving from a Microsoft Corp. DOS environment to a Windows graphical user interface, he said. He added that he expects tighter integration between WorkShop modules to further reduce development time.

WorkShop 2.0 contains several basic elements: a static analyzer for C, C++ and Fortran languages; a source-level debugger; a performance analyzer; and a "build" manager. It also has four options: C and C++ interpreters, an analyzer for parallel-processing applications and a graphical test environment. The WorkShop tester highlights poor performance with visual cues such as colors and sharp "spikes" of elapsed CPU time.

A market boost

Analysts said SGI built CASEVision in 1991 to provide a tool set for its graphics-oriented Unix machines. "There weren't many third-party tools targeting SGI products," explained Paul McGuckin, an analyst at Gartner Group, Inc.'s Midrange Computing Strategies Service.

"You 'fly' through your program, looking at the size and age of files," he said. It could be used to develop C and C++ code for use on other types of Unix machines, but that is probably not commonplace, McGuckin said.

When it ships this month, the core WorkShop package will be priced at $2,000. It will also be bundled with an entry-level SGI Indy computer as a developer's workstation, which is priced at $5,995. The C++ interpreter is priced at $3,000, the C interpreter at $1,000, the parallel-processing analyzer at $3,500 and the tester at $1,000.

Vendor offerings boost database flexibility

By Melinda-Carol Ballou
BOSTON

In addition to the major C++ announcements made by Symantec Corp. and Microsoft Corp. [CW, Aug. 16 and 30], a series of other products revealed at the recent Software Development Conference may facilitate the application development process and enhance the ability of users to access information.

▶ **Poet Software Corp.** in Santa Clara, Calif., introduced a low-cost version of the company's object database system aimed at individual C++ programmers. Poet Personal Edition for Windows supports Microsoft's Windows and Windows NT, DOS, Novell, Inc.'s ELM, Next, Inc.'s Next 486, Apple Computer, Inc.'s Macintosh, IBM's OS/2 and various Unix platforms at both the source and binary file format levels, officials said. It is available now for $99. As of January, it will sell for $139.

▶ **Q+E Software** in Raleigh, N.C., announced an upgrade to the Q+E Database Library, the company's database management system-independent development tool. The new version supports all major DBMSs via Microsoft's Open Database Connectivity and includes a set of Dynamic Link Libraries that can be called to perform database access functions. Offered with the product are more than 20 SQL and Q+E PC database drivers, a query builder, a data dictionary, a find function and data conversion tools. Q+E Database Library 2 runs on Windows and will support OS/2 by the end of 1993 with Macintosh, Windows NT and Unix support by the first half of 1994. It is priced at $699.

▶ **ProtoView Development Corp.** in Dayton, N.J., introduced SQLView, a visual database access system for Windows that uses the Q+E Library. SQLView offers access to about 30 databases, including IBM's DB2, Oracle Corp.'s Oracle and Sybase, Inc.'s SQL Server. The system consists of two components: a visual component to handle standard database operations and an application programming interface for direct database calls. It also offers a SQLView Data Table Lens to let developers view or modify a database row by row or column by column. It is priced at $295, which includes Q+E data drivers.

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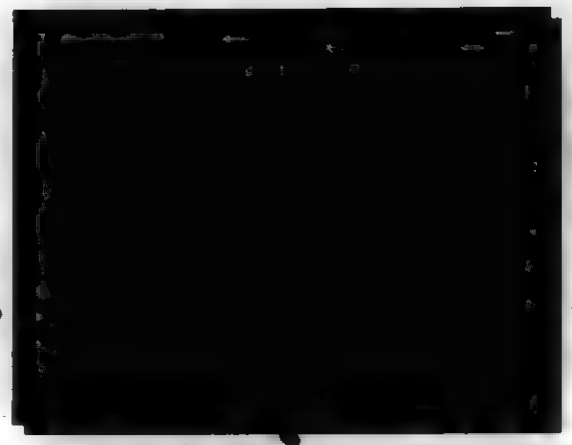

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Netron rolls out Caplink

By Melinda-Carol Ballou

Corporate developers looking for a way to write network-transparent client/server applications just got a boon from Netron, Inc. In addition, Netron announced Caplink, a link between its development tools and Bachman Information Systems, Inc.'s Bachman/Analyst.

Bachman/Analyst records business requirements, and Netron's Cap is an object-oriented construction tool that lets developers implement the technical design of the application, Netron officials said.

While Bachman has no embedded technical design details, there are no explicit business requirements in the Netron specifications, the Netron officials said. Caplink, the interface between the two, offers an association model that creates references between the logical design objects in the Netron tools and the business requirements present in the Bachman tools.

Because the Bachman and Netron tools are independent of each other, developers can change the technical implementation of a system without changing the business model and vice versa. This allows users to separate business requirements from the technical design of an application and thus address the same business needs on diverse platforms without major technical changes.

In its initial version, Caplink offers an interface to Bachman/Analyst that extracts data attribute information from the Bachman product and supplies it to Netron's Cap.

Staying with Cobol, CICS

Capeco Software Ltd., a Canadian manufacturer of DB2 software for the life insurance industry, recently completed a pilot project using the interface. The developers at the company were already using the Bachman tools. But they wanted to create a client/server application while remaining in the Cobol and CICS environments, where they already have most of their investment, according to Pat Ireson, senior vice president of product development.

"These tools were a logical extension of our existing environment rather than being revolutionary," she said. "The learning curve was not that steep . . . and these tools allowed us to do a logical data representation based on business needs rather than being tied to technical restrictions," Ireson said.

This gave Ireson's site greater flexibility because many integrated computer-aided software engineering tools embed the business requirements into the technical specifications for the application.

For its part, Netron/Connect allows portability across major communications protocols, including Named Pipes, NetBIOS, Transmission Control Protocol/Internet Protocol, Advanced Program-to-Program Communications, CPIC and CICS LU6.2. It also allows developers to design, construct, test and debug client/server applications in stand-alone workstation environments, including OS/2, MS-DOS, Unix, VAX and MVS/TSO platforms, according to officials.

Netron/Connect offers design templates and eliminates the need to know about the complex, low-level application programming interface coding requirements for Cobol.

Netron/Connect and Caplink to Bachman 2.0 are available now and are priced at $1,500 and $2,000, respectively.

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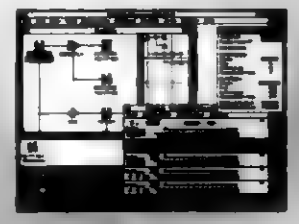

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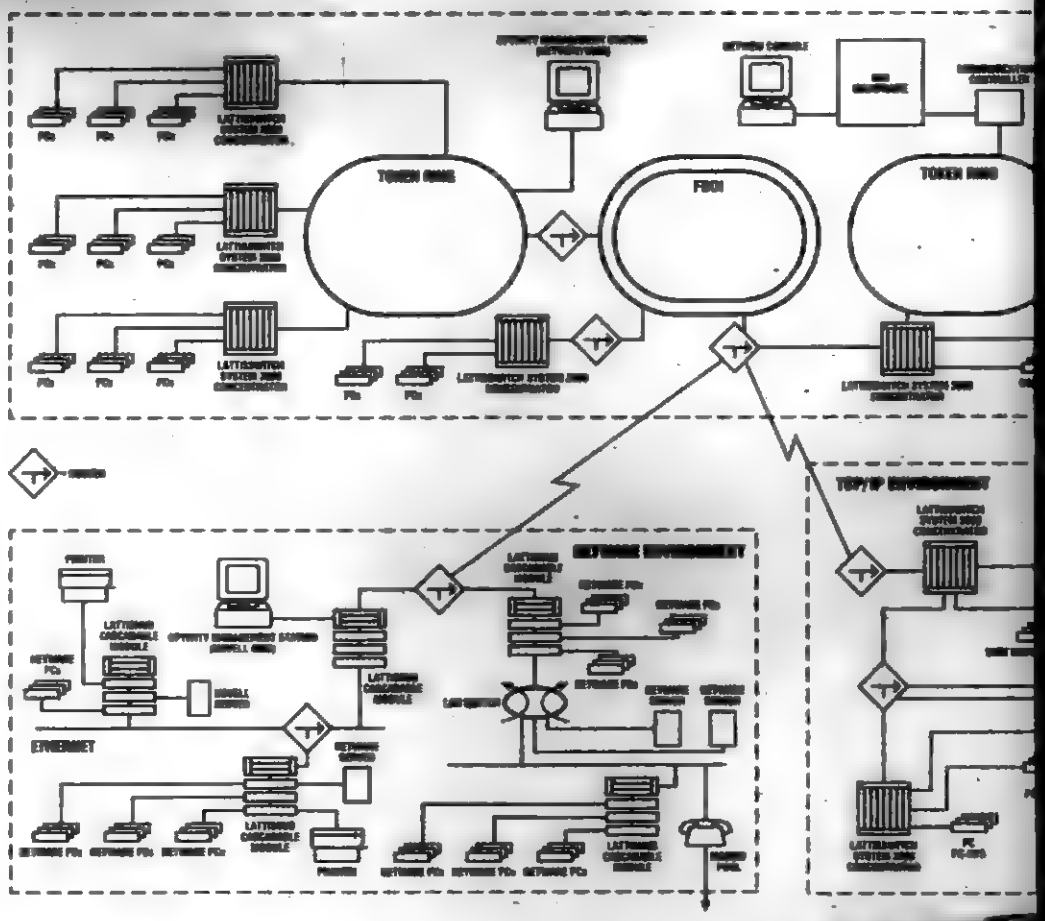

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Extended Systems has announced the Advantage Xbase Server.

According to the company, the Advantage Xbase Server can improve the multiuser performance and integrity of networked CA-Clipper applications without rewriting any code.

The solution consists of a Clipper Replaceable Database Driver that seamlessly integrates with existing Clipper 5.01 or 5.2 applications and a NetWare Loadable Module that runs on a Novell, Inc. NetWare v3.11 or 4.0 file server.

Advantage Xbase Server prices range from $895 for the five-user version to $7,495 for the 1,000-user version. The Advantage Xbase Server Software Developer's Kit, which houses everything needed to create client/server CA-Clipper applications, costs $249.

▶ *Extended Systems*
5777 N. Meeker Ave.
Boise, Idaho 83704
(406) 587-7575

Digitalk, Inc. has announced Version 2.0 of its object-oriented programming environment for the Macintosh.

Smalltalk/V for Macintosh features a portable architecture using a new event-driven user interface framework that lets users move applications between Smalltalk/V for Macintosh and OS/2 and Windows platforms faster and more easily, according to the company.

The product also offers high-level object-oriented support for advanced System 7 features such as Data Access Language/Data Access Manager; full support for multiple text fonts, styles and colors; an object filer for easy retrieval; and sharing of objects between users and applications.

Smalltalk/V Version 2.0 for Macintosh costs $495.

▶ *Digitalk*
9841 Airport Blvd.
Los Angeles, Calif. 90045
(310) 645-1082

Visual Numerics, Inc. has announced Exponent Graphics for X and Exponent Graphics for C Version 2.0, which are both graphics products.

According to the company, the products enable users to increase productivity by reducing up to 95% the time and code required to generate complex data plots.

Exponent Graphics for X includes more than 30 high-level two- and three-dimensional plot types used in business and scientific applications. A library of Open Software Foundation Motif-based graphing widgets is provided.

Users can customize their graphing plots with a built-in interactive graphical user interface. Exponent Graphics for X provides more than 190 X Window System resources. Exponent Graphics for C Version 2.0 is an interactive graphics library for C programmers.

A single-user license for Exponent Graphics for X costs $3,995. Exponent Graphics for C Version 2.0 costs $3,495 for a single-user license.

▶ *Visual Numerics*
6230 Lookout Road
Boulder, Colo. 80301
(303) 530-9000

Kenan Technologies has announced the availability of Multiway, a product that combines a multidimensional database with a fourth-generation language optimized for development of large-scale analysis and reporting applications.

According to the company, Multiway is an integral component of its Acumate product line. Acumate supports end-user access to corporate data and offers an environment for data analysis and reporting, data integration and application development.

Features for Multiway include analysis tools for statistical, time series and financial functions; a modeling language for calculating sensitivity; a multidimensional database engine with support for unlimited dimensions and positions, intelligent time handling, sparse matrix handling and scalability for industrial-size data; and true client/server implementation with an open application programming interface, shared processing and support for multiple users, platforms and standards.

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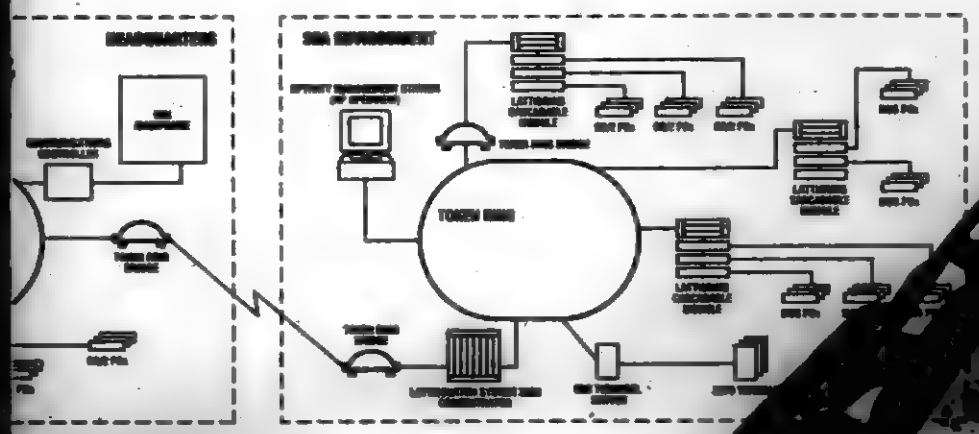

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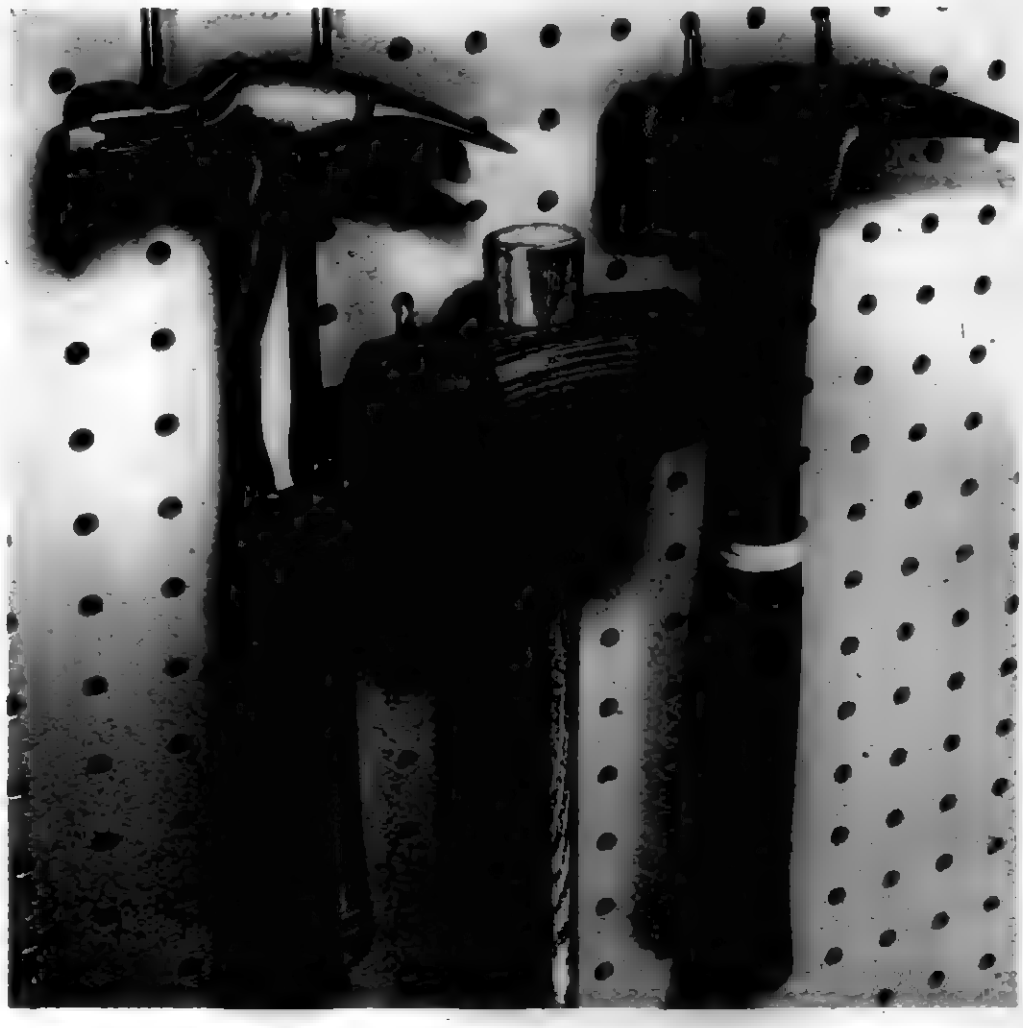

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SEVENTH ANNUAL
SPECIAL REPORT
ON PAY TRENDS

At last, the gap narrows

By Candee Wilde

When Revell J. Edelman, now vice president of data processing at a New Jersey savings and loan bank, circulated her resume 10 years ago, most employers assumed that she was a man.

"When they called and found out I was a woman, 50% hung up," she recalls. "The discrimination was horrendous."

What a difference a decade makes. If *Computerworld*'s Annual Salary Survey is any indication, things have improved even during the last 12 months.

In our 1992 survey, many women in information systems, especially managers, reported earnings up to 20% lower than those of their male counterparts. Now, however, the tide appears to be changing — and dramatically. Women are starting to close the gap between their earnings and the higher sums typically paid to their male colleagues (see chart page 1).

Overall compensation for 1,239 IS professionals polled rose a modest average of 4% this year. Pay for some positions, including chief information officer, rose a bit more. Others did less well. In a number of companies, bonuses, not pay raises, have become the favored reward. On average, women still earn less than men for similar jobs.

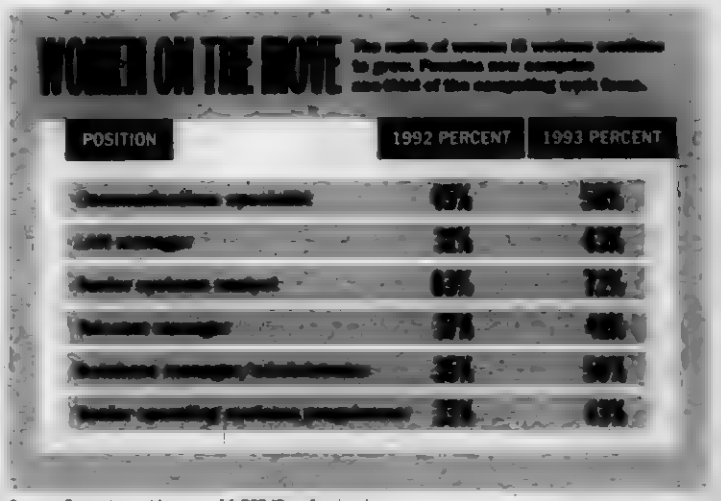
But the rapidly expanding ranks of more-experienced women seems likely to change that. This year's poll showed unmistakably that females are moving into more responsible, higher-paying IS jobs in far greater numbers.

As local-area network managers, for instance, women hold 42.9% of the positions, compared with 31% last year. Similarly, the percent of women serving as PC end-user specialists jumped from 45% in 1992 to 58%.

"The biggest change we've seen is since the Clinton administration has come in, there has been a new emphasis on minority and female recruiting," says Jay Gaines, president of Jay Gaines & Co., a New York-

Gap narrows, *page 94*

Women are finally moving up the pay and prestige scale. CIOs and programmers of both sexes also have extra reason to smile. Overall, pay hikes average 4%.



Source: *Computerworld* survey of 1,239 IS professionals

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Gap narrows

CONTINUED FROM PAGE 91

based recruiting company. "Previously, the emphasis on those themes was more muted. Now we're getting a lot of pressure from clients for this type of hiring."

IS remains a strong male bastion, though: Two-thirds of those polled were men, a pretty decent representation of the computing population at large. Still, the trend toward more gender-balanced departments is undeniable. Take Columbia Savings Bank SLA in Fair Lawn, N.J., where Edelman works. "My department is run by women," Edelman says.

Benefits preferences tell part of the story. Traditionally, men held many high-level posts because, Edelman and others note, women didn't want to work the "crazy hours" associated with the jobs. Some women say they feel that accounts for their historically lower pay.

Our poll found that hasn't changed too much: Many women said they preferred more regular hours. They also were more likely to take advantage of flexible-time programs or part-time work.

Days of mega-raises gone

While fortunes varied from positions, industries and regions, few are getting clubbed or starred this year (see charts this page). Gaines says that doesn't necessarily mean IS can start looking for hefty bonuses and compensation hikes like in the old days.

"The ongoing themes are re-engineering and streamlining, and that means companies are going to run significantly leaner," Gaines said.

Other experts say continued corporate downsizing remains a big threat to IS pros, especially those who don't stay current with rapidly developing technology.

A notable bright spot is CIOs. Technology bosses enjoyed a 2.8% hike, a stark contrast from last year's 3.5% decline. Many recruiters report CIO recruiting has surged in 1993 after several lackluster years.

A strong enterprisewide focus of many businesses has kept top CIOs in "strong demand," says John A. Challenger, president of the Chicago-based recruiting firm Challenger, Gray & Christmas. "Companies are looking for the very top people in the field who can work out their information needs and implement them effectively," he explains.

At the other end of the spectrum, help desk operators (where women outnumber men) suffered a painful 8.9% drop in pay. Experts differ on what the dip means.

Larry Kane, president of Alternative Resources Corp. in Lincolnshire, Ill., notes the dramatic rise in the level of expertise and the level of assistance help desk operators are expected to provide. He considers it one of the faster-growing positions in the IS field, so he's puzzled.

It's possible, he says, that many help desk operators may have failed to keep up with technology development. Thus, their salaries fell. Last year, help desk operators earned an average salary of $30,873, with average additional compensation of $1,049. This year, average salaries dipped to $27,260, with the typical bonus falling to $850.

Scott Novey, manager of microcomputing and communications at Sola Optical, Inc. in Petaluma, Calif., reports that salary increases at his company reflect this trend. In the past, Sola Optical's IS employees had been at the "higher end of the pay scale," he says.

"The company has elected to make itself more mainstream and position itself more in the middle of the pay range. Consequently, merit increase percentages have been declining slowly," he says.

Bonus babies

Sola Optical offers two bonus programs: One uses a formula based on the company's profit level and the employees' salary, while the other, for managers, is "goal-oriented," he explains, based on the degree to which a manager meets a set of objectives established with a supervisor.

Kristyn Gomes, an MIS supervisor at Calcitek in Carlsbad, Calif., says her company has developed a salary matrix based on job points, which are awarded during an annual performance review with a supervisor.

"This way, you can see how you're in line with other people with the same number of job points even if they don't have the same job," she says. "Overall, our company has good benefits packages, and the opportunities they provide for advancement for women and expanding my technical knowledge are really good."

Sarah Reidy, computer systems manager at the nonprofit Population Action International in Washington, D.C., also praised her company's benefits package but was less optimistic about the position of female manager.

"Sometimes, I'm not taken as seriously as my male counterparts," Reidy says. It takes perseverance, she says, just to get the information she needs to do her job.

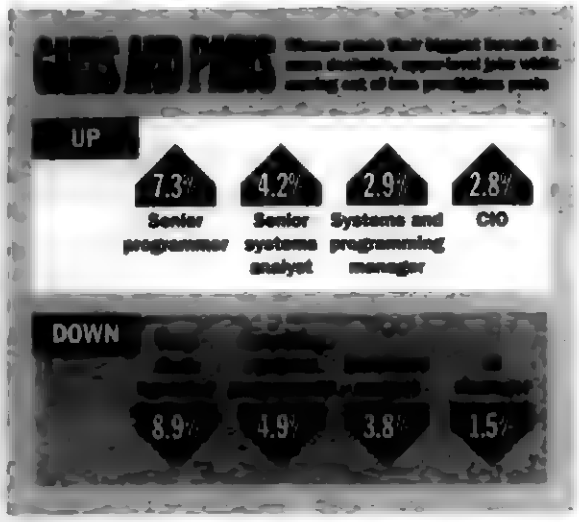
For those who persevere and excel, bonuses have become the preferred tidbit.

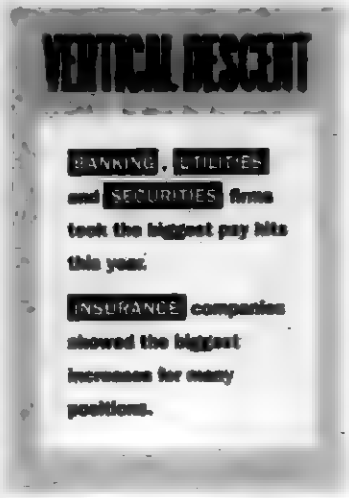
Electrogias in Santa Clara, Calif., illustrates a trend popular among smaller companies. Bonuses are tied to company profits and an individual's performance, according to J. B. Shah, the company's director of MIS/telecommunications. Bonuses give employees the chance to enhance the modest salary increases — 3% to 6% — of the past few years.

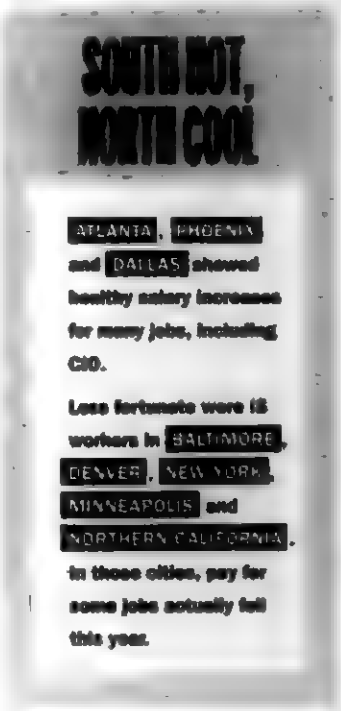
That policy is echoed by the survey. Most respondents say they believe that salaries for their positions are no better elsewhere. Many say they feel bonuses should be the true vehicle of compensation for superior work.

Thus Edelman and other women are opting to stay put, convinced that the cash isn't necessarily greener elsewhere. Stay tuned. ■

Wilde is a free-lance writer based in Easton, Conn.







TOUGHER TIMES SPARK ENTREPRENEURS

Continued downsizing has rekindled a great American tradition among blacks, minorities and others in IS: casting out on your own.

Fewer jobs and slower compensation growth have prompted many — especially senior, highly paid corporate IS executives — to start their own consultancies, according to George Williams, national vice president of the Black Data Processing Associates (BDPA).

"A lot of top people are being downsized," Williams said at the 2,500-member group's annual convention in Kansas City, Mo., last month. "And for some of them, their only opportunity is to start a consultancy."

Williams and other attendees agree that, in general, the continued shrinkage of companies has provided an unwelcome wake-up call for everyone in IS, including top veteran managers.

"There is [job] shrinkage," agrees Roger Dunn, president of the New York BDPA chapter. "It's the undertow of the wave of technology." Even those not directly affected by downsizing fear it, he says.

Raises have also come more slowly in recent years, BDPA members note. "There's a flexibility if someone is good, or they have seniority or they're adaptable," says one Midwest consultant who does not wish to be identified. "But some people have gone without a raise for several years."

To remain on the corporate payroll, information technology professionals need to be vigilant about corporate plans, attendees agree.

"It's so critical to be in the driver's seat in your career," says Linda G. Cooper, president of LGC & Associates, a Kansas City diversity consulting firm. "You should always be ready so that you don't get blindsided." She adds that IS professionals should take the initiative to get more technical training — even if their firm does not provide it.

Another way to combat that fear is to master new skills for client/server computing, says BDPA President Diane L. Davis. Cobol programmers were encouraged here to learn Unix, C and object-oriented programming.

The Washington, D.C., organization, founded in 1976, has a national database of hundreds of resumes to document members' skills to potential employers.

—*Jean S. Bozman*

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IS MANAGEMENT				COMMUNICATIONS			SYSTEMS & PROGRAMMING		
CIO/VP Director IS	IS manager/ supervisor	Network manager (WAN or WAN/LAN)	Network administrator (WAN or WAN/LAN)	LAN manager/ administrator	Telecommunications manager	Communications specialist	Systems & programming manager	Project manager	Senior systems analyst
Average: $89,858 Bonus: $8,777 Total: $78,733	Average: $54,581 Bonus: $4,527 Total: $50,628	Average: $47,226 Bonus: $3,958 Total: $51,184	Average: $40,994 Bonus: $1,737 Total: $42,731	Average: $38,647 Bonus: $1,895 Total: $40,542	Average: $48,461 Bonus: $2,977 Total: $51,438	Average: $37,540 Bonus: $1,630 Total: $39,170	Average: $55,113 Bonus: $4,167 Total: $59,280	Average: $51,150 Bonus: $3,107 Total: $54,257	Average: $46,595 Bonus: $2,930 Total: $49,515
INDUSTRY									
Computer $85,666	Computer $64,214	Computer $70,000	Computer $50,000	Mfg. $41,306	Trans. $62,500	Utils. $43,500	Media $60,000	Computer $55,857	Utils. $52,036
Insurance $77,667	Insurance $60,767	Securities $53,571	Trans. $46,166	Media $41,200	Utils. $57,500	Computer $43,333	Real Est. $56,500	Media $55,250	Trans. $51,000
Securities $76,785	Securities $59,496	Bus. Svc. $53,333	Govt. $43,975	Computer $41,166	Insurance $54,300	Media $40,000	Computer $52,666	Trans. $54,583	Securities $50,333
Banking $74,062	Trans. $58,053	Utils. $52,727	Media $41,000	Trans. $40,000	Securities $53,333	Mfg. $39,197	Securities $51,000	Insurance $53,190	Media $49,142
Mfg. $73,500	Utils. $50,375	Insurance $51,206	Utils. $40,454	Insurance $40,781	Media $52,500	Govt. $38,930	Utils. $50,166	Real Est. $53,000	Retail $48,750
Media $72,500	Mfg. $50,053	Real Est. $51,000	Education $40,161	Govt. $40,240	Computer $50,000	Bus. Svc. $36,833	Insurance $50,718	Mfg. $52,777	Govt. $48,695
Real Est. $72,500	Media $50,000	Trans. $51,000	Banking $40,142	Real Est. $38,500	Govt. $48,639	Health $38,500	Health $50,125	Govt. $52,629	Nonprft. $46,500
Utils. $72,226	Govt. $50,903	Govt. $49,525	Mfg. $39,900	Utils. $37,448	Banking $46,000	Insurance $37,082	Banking $50,042	Bus. Svc. $51,050	Insurance $46,400
Bus. Svc. $71,855	Banking $50,214	Nonprft. $49,500	Health $39,938	Retail $36,500	Mfg. $46,466	Nonprft. $37,500	Govt. $54,437	Retail $50,350	Mfg. $46,250
Health $71,197	Real Est. $54,533	Mfg. $46,927	Bus. Svc. $38,888	Banking $36,357	Bus. Svc. $45,000	Real Est. $37,000	Bus. Svc. $54,156	Health $49,535	Health $46,027
Trans. $70,000	Nonprft. $52,928	Banking $44,000	Retail $38,166	Securities $35,750	Health $44,357	Trans. $34,444	Mfg. $53,896	Banking $49,125	Banking $45,955
Govt. $65,241	Bus. Svc. $51,979	Health $44,540	Insurance $37,944	Health $34,500	Retail $43,722	Banking $34,045	Retail $53,300	Utils. $48,387	Computer $44,383
Retail $64,867	Health $49,986	Retail $43,158	Securities $37,500	Bus. Svc. $34,250	Education $41,000	Securities $33,500	Trans. $53,142	Nonprft. $45,000	Real Est. $43,333
Nonprft. $60,813	Retail $48,791	Education $37,450	Real Est. $33,000	Nonprft. $33,500	Nonprft. $0	Education $32,600	Nonprft. $47,000	Securities $43,500	Education $40,906
Education $59,421	Education $45,296	Media $34,337	Nonprft. $0	Education $32,061	Real Est. $0	Retail $28,875	Education $43,000	Education $37,926	Bus. Svc. $35,625
REGION									
Other $95,000	N.Y. $62,004	N.Y. $56,772	Detroit $53,300	N. Calif. $51,000	Chicago $59,686	N. Calif. $51,300	S. Calif. $51,552	N.Y. $57,156	S. Calif. $54,666
N.Y. $80,038	Other $57,500	Chicago $56,050	N. Calif. $45,733	Chicago $46,750	Balt./D.C. $57,428	Balt./D.C. $42,633	N. Calif. $50,675	S. Calif. $56,333	N. Calif. $51,083
Atlanta $79,000	N. Calif. $50,720	Detroit $53,375	N.Y. $45,142	S. Calif. $43,214	Detroit $54,357	Pacif. NW $42,192	N.Y. $50,562	Balt./D.C. $55,261	Chicago $49,227
N. Calif. $78,596	Balt./D.C. $50,472	Balt./D.C. $52,845	Boston $44,000	Texas $41,656	S. Calif. $54,200	Boston $41,625	Boston $57,500	Ariz. $54,833	Ariz. $48,388
S. Calif. $78,057	S. Calif. $57,826	Denver $48,868	Balt./D.C. $43,656	Detroit $40,272	Texas $52,461	Chicago $40,846	Balt./D.C. $56,947	Boston $54,411	Atlanta $48,166
Boston $74,400	Texas $56,837	S. Calif. $48,083	Chicago $43,384	Balt./D.C. $39,143	N. Calif. $51,454	Detroit $37,807	Atlanta $56,284	Chicago $52,323	N.Y. $47,960
Balt./D.C. $74,274	Chicago $55,811	Boston $47,295	Ariz. $42,833	Boston $38,450	Florida $50,886	Texas $36,916	Minn. $56,000	Detroit $51,866	Boston $47,625
Chicago $73,000	Atlanta $55,071	N. Calif. $46,583	S. Calif. $41,000	N.Y. $37,900	Minn. $49,750	S. Calif. $36,000	Chicago $55,904	Texas $50,470	Balt./D.C. $46,952
Texas $72,000	Boston $54,944	Ariz. $46,499	Atlanta $40,035	Pacif. NW $36,447	N.Y. $48,358	Ariz. $33,727	Ariz. $54,531	Denver $49,533	Texas $46,500
Detroit $65,200	Detroit $53,405	Minn. $45,818	Texas $39,678	Florida $35,666	Ariz. $45,916	Minn. $33,714	Texas $54,000	N. Calif. $49,428	Minn. $46,000
Denver $64,438	Ariz. $52,375	Texas $43,962	Denver $39,750	Denver $35,535	Atlanta $45,857	Florida $32,937	Detroit $53,782	Atlanta $47,900	Pacif. NW $44,700
Florida $63,500	Minn. $51,575	Florida $42,666	Florida $38,500	Atlanta $34,531	Boston $43,618	Atlanta $32,554	Denver $52,800	Florida $46,842	Denver $44,040
Ariz. $63,413	Pacif. NW $50,787	Atlanta $41,566	Pacif. NW $36,343	Minn. $33,900	Pacif. NW $39,825	N.Y. $32,500	Florida $50,000	Minn. $45,500	Detroit $43,576
Minn. $62,981	Denver $49,851	Pacif. NW $38,525	Minn. $33,928	Ariz. $31,700	Other $38,750	Denver $31,633	Pacif. NW $46,921	Pacif. NW $43,370	Florida $43,027
Pacif. NW $60,031	Florida $49,297	Other $34,000	Other $29,000	Other $31,000	Denver $37,842	Other $28,500	Other $42,500	Other $36,500	Other $31,500
COMPANY SIZE									
Under $500M: $60,155 $500M – $4000M: $74,386 $4000M and up: $80,300	Under $500M: $47,995 $500M – $4000M: $56,777 $4000M and up: $66,716	Under $500M: $41,546 $500M – $4000M: $50,240 $4000M and up: $52,973	Under $500M: $46,583 $500M – $4000M: $42,246 $4000M and up: $44,571	Under $500M: $33,751 $500M – $4000M: $38,071 $4000M and up: $42,734	Under $500M: $38,763 $500M – $4000M: $47,703 $4000M and up: $53,222	Under $500M: $33,558 $500M – $4000M: $36,051 $4000M and up: $40,362	Under $500M: $48,000 $500M – $4000M: $53,958 $4000M and up: $63,575	Under $500M: $46,474 $500M – $4000M: $50,855 $4000M and up: $54,936	Under $500M: $43,633 $500M – $4000M: $47,200 $4000M and up: $49,251

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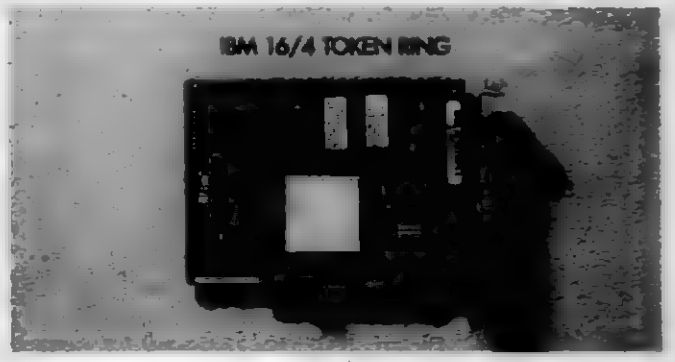

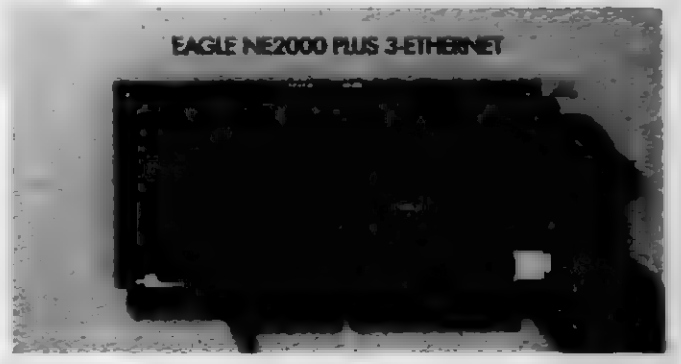

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SYSTEMS & PROGRAMMING								SERVICES & OPERATIONS			
Systems analyst	Senior programmer/ analyst	Programmer/ Analyst	Senior programmer	Programmer	Computer security administrator/ analyst	Database manager/ administrator	Help desk analyst	Technical services manager	Senior operating systems programmer
Average: $40,500 Bonus: $1,052 Total: $42,450	Average: $42,050 Bonus: $1,795 Total: $44,055	Average: $35,751 Bonus: $1,977 Total: $37,728	Average: $39,777 Bonus: $1,274 Total: $41,051	Average: $30,401 Bonus: $1,674 Total: $32,105	Average: $41,425 Bonus: $1,714 Total: $43,140	Average: $48,050 Bonus: $2,691 Total: $50,741	Average: $41,747 Bonus: $1,532 Total: $43,279	Average: $52,465 Bonus: $3,762 Total: $56,227	Average: $48,867 Bonus: $1,878 Total: $50,745
INDUSTRY											
Trans. $46,000	Media $48,000	Real Est. $46,000	Mfg. $44,159	Media $35,000	Trans. $53,000	Mfg. $61,785	Retail $52,042	Trans. $59,700	Retail $54,125
Retail $43,815	Utils. $46,916	Media $40,071	Real Est. $43,000	Real Est. $34,000	Govt. $47,700	Insurance $51,650	Bus. Svc. $47,625	Insurance $58,862	Securities $53,500
Utils. $42,285	Banking $45,450	Utils. $38,156	Govt. $41,552	Nonprft. $33,005	Education $46,000	Utils. $50,285	Govt. $46,815	Bus. Svc. $56,388	Utils. $53,250
Govt. $42,100	Insurance $45,300	Insurance $37,348	Health $41,428	Insurance $32,333	Health $45,000	Govt. $48,155	Insurance $43,050	Securities $56,250	Trans. $53,125
Insurance $42,052	Mfg. $43,000	Govt. $37,214	Insurance $40,000	Govt. $32,050	Securities $45,000	Banking $44,500	Mfg. $41,345	Computer $55,000	Banking $52,000
Mfg. $41,007	Trans. $43,526	Mfg. $36,524	Media $40,000	Trans. $32,000	Media $43,005	Securities $44,000	Utils. $40,083	Mfg. $54,979	Bus. Svc. $52,333
Media $41,000	Govt. $42,550	Trans. $35,918	Trans. $39,750	Banking $31,083	Banking $42,300	Trans. $43,500	Banking $39,000	Govt. $54,517	Insurance $51,083
Health $39,718	Securities $42,200	Banking $35,205	Retail $39,562	Mfg. $30,000	Insurance $39,500	Education $43,437	Trans. $37,500	Nonprft. $54,000	Computer $50,186
Computer $38,619	Nonprft. $41,333	Securities $35,166	Banking $39,125	Securities $30,400	Mfg. $38,714	Media $43,214	Nonprft. $37,000	Health $53,052	Govt. $49,054
Securities $37,500	Retail $41,230	Health $34,406	Bus. Svc. $34,700	Health $29,857	Bus. Svc. $38,666	Health $42,781	Education $36,166	Banking $50,909	Health $48,555
Education $37,230	Computer $40,667	Nonprft. $34,426	Utils. $32,506	Retail $29,133	Utils. $38,000	Bus. Svc. $42,191	Health $34,000	Real Est. $50,166	Media $47,666
Banking $36,857	Bus. Svc. $40,679	Retail $34,177	Education $39,000	Education $28,187	Retail $35,000	Retail $40,158	Computer $32,612	Media $50,000	Mfg. $47,032
Nonprft. $36,000	Health $38,961	Education $32,598	Securities $38,000	Utils. $26,153	Computer $29,515	Nonprft. $38,000	Media $32,500	Education $45,277	Education $41,777
Bus. Svc. $32,000	Real Est. $38,000	Bus. Svc. $31,751	Computer $16,027	Bus. Svc. $26,102	Nonprft. $0	Computer $31,713	Real Est. $0	Utils. $43,777	Nonprft. $19,000
Real Est. $0	Education $35,026	Computer $31,116	Nonprft. $0	Computer $25,761	Real Est. $0	Real Est. $0	Securities $0	Retail $41,613	Real Est. $0
REGION											
N. Calif. $50,214	N. Calif. $50,206	N.Y. $42,119	N. Calif. $53,288	N. Calif. $40,846	N.Y. $40,000	Atlanta $65,055	N. Calif. $54,750	Other $60,500	N. Calif. $54,683
S. Calif. $46,000	N.Y. $47,763	N. Calif. $41,676	S. Calif. $40,000	N.Y. $34,000	N. Calif. $47,000	N.Y. $53,777	N.Y. $50,057	Chicago $61,571	N.Y. $52,416
N.Y. $44,944	S. Calif. $46,696	S. Calif. $37,742	Ariz. $44,926	S. Calif. $33,642	Ariz. $46,583	N. Calif. $51,571	S. Calif. $50,000	N.Y. $61,461	Other $50,500
Ariz. $43,000	Boston $44,346	Balt./D.C. $37,651	N.Y. $44,833	Texas $31,526	Chicago $44,200	Chicago $51,214	Atlanta $44,057	N. Calif. $60,125	Boston $54,142
Chicago $43,107	Texas $44,240	Texas $37,322	Other $43,000	Ariz. $31,041	Florida $44,000	Minn. $50,357	Texas $43,944	S. Calif. $54,650	Chicago $50,053
Florida $41,100	Balt./D.C. $43,742	Detroit $37,100	Texas $40,780	Boston $30,937	Balt./D.C. $43,006	Other $49,500	Chicago $43,926	Balt./D.C. $54,600	Detroit $50,306
Texas $41,086	Detroit $42,521	Chicago $36,263	Boston $40,428	Chicago $30,052	Denver $43,000	Detroit $45,923	Detroit $42,086	Florida $54,000	Balt./D.C. $50,071
Pacif. NW $40,045	Atlanta $42,476	Florida $35,160	Denver $40,125	Atlanta $30,366	Other $42,000	Texas $45,583	Pacif. NW $42,050	Boston $53,536	Florida $49,222
Detroit $39,500	Chicago $41,578	Pacif. NW $34,519	Chicago $39,500	Detroit $30,000	Pacif. NW $41,916	Balt./D.C. $44,814	Balt./D.C. $41,951	Atlanta $53,527	Texas $47,944
Atlanta $39,184	Minn. $41,466	Minn. $33,096	Detroit $39,500	Balt./D.C. $29,172	Detroit $39,928	Denver $42,000	Denver $40,000	Detroit $51,176	Atlanta $47,461
Denver $39,081	Florida $40,000	Atlanta $33,015	Pacif. NW $36,386	Denver $28,882	Boston $37,700	S. Calif. $40,875	Other $39,500	Minn. $50,500	Pacif. NW $44,546
Boston $37,815	Ariz. $40,743	Boston $33,007	Atlanta $36,750	Minn. $28,470	Minn. $36,000	Pacif. NW $40,843	Ariz. $37,062	Pacif. NW $49,236	Denver $44,000
Minn. $37,286	Denver $39,983	Denver $33,101	Minn. $36,750	Pacif. NW $27,681	Atlanta $36,186	Ariz. $40,836	Minn. $36,500	Denver $47,428	Ariz. $42,444
Balt./D.C. $35,429	Pacif. NW $38,987	Ariz. $32,171	Balt./D.C. $31,700	Florida $26,044	Texas $32,400	Florida $40,500	Florida $33,333	Texas $42,862	Minn. $41,214
Other $28,000	Other $28,250	Other $26,000	Florida $30,750	Other $22,300	S. Calif. $31,000	Boston $38,500	Boston $28,414	Ariz. $41,170	S. Calif. $41,166
COMPANY SIZE											
Under $500M: $36,087 $500M – $4000M: $42,350 $4000M and up: $41,341	Under $500M: $40,134 $500M – $4000M: $43,204 $4000M and up: $45,041	Under $500M: $33,306 $500M – $4000M: $36,544 $4000M and up: $38,196	Under $500M: $37,777 $500M – $4000M: $39,833 $4000M and up: $39,862	Under $500M: $28,461 $500M – $4000M: $31,125 $4000M and up: $31,878	Under $500M: $45,400 $500M – $4000M: $37,848 $4000M and up: $43,619	Under $500M: $50,132 $500M – $4000M: $46,741 $4000M and up: $40,000	Under $500M: $39,282 $500M – $4000M: $42,681 $4000M and up: $38,057	Under $500M: $43,925 $500M – $4000M: $51,571 $4000M and up: $50,341	Under $500M: $41,348 $500M – $4000M: $47,821 $4000M and up: $53,941

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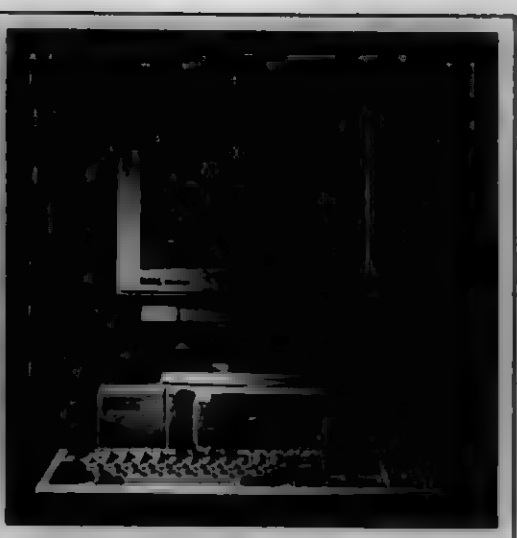

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SPECIAL REPORT

SERVICES & OPERATIONS — END-USER SUPPORT

Operating system programmer	Information center manager	Computer operator	Client/server computing	Help desk manager/technical support manager	Help desk operator	PC technical support specialist	Business analyst
Average: $38,889 Bonus: $1,986 Total: $41,083	Average: $42,952 Bonus: $2,818 Total: $45,770	Average: $24,000 Bonus: $1,311 Total: $25,000	Average: $43,275 Bonus: $3,500 Total: $46,000	Average: $38,466 Bonus: $2,126 Total: $40,634	Average: $27,299 Bonus: $850 Total: $28,117	Average: $31,238 Bonus: $1,489 Total: $32,727	Average: $40,530 Bonus: $1,888 Total: $42,418
INDUSTRY							
Utils. $46,333	Real Est. $60,000	Securities $27,363	Real Est. $59,666	Computer $60,000	Computer $35,000	Govt. $34,908	Computer $51,500
Insurance $44,875	Media $55,750	Utils. $27,294	Insurance $54,187	Trans. $46,375	Govt. $31,800	Insurance $34,005	Bus. Svc. $50,833
Govt. $43,852	Computer $50,857	Computer $27,250	Utils. $53,333	Insurance $42,541	Media $31,000	Computer $34,000	Govt. $45,750
Trans. $42,000	Utils. $49,495	Media $27,125	Trans. $49,875	Nonprft. $42,000	Bus. Svc. $28,125	Utils. $32,005	Mfg. $42,023
Retail $40,750	Trans. $47,062	Mfg. $26,200	Banking $47,333	Bus. Svc. $46,416	Mfg. $29,050	Health $31,903	Trans. $41,500
Nonprft. $40,000	Insurance $47,000	Govt. $25,962	Govt. $46,421	Mfg. $40,142	Health $28,555	Real Est. $31,875	Health $40,500
Banking $39,000	Banking $46,488	Insurance $24,583	Computer $45,100	Securities $40,000	Insurance $28,214	Mfg. $31,253	Nonprft. $39,000
Health $39,000	Govt. $43,040	Real Est. $24,571	Bus. Svc. $44,750	Health $38,700	Banking $26,785	Bus. Svc. $30,875	Insurance $37,950
Securities $38,000	Bus. Svc. $42,461	Education $24,437	Securities $43,200	Banking $38,500	Utils. $26,571	Trans. $30,461	Education $37,500
Education $37,300	Mfg. $42,457	Banking $24,174	Health $42,000	Govt. $38,160	Trans. $25,500	Media $29,642	Utils. $36,500
Mfg. $36,924	Securities $41,333	Bus. Svc. $22,884	Mfg. $41,330	Retail $34,358	Nonprft. $25,000	Banking $28,142	Retail $35,500
Media $35,000	Health $41,225	Trans. $22,791	Retail $39,384	Real Est. $33,000	Securities $23,285	Education $27,712	Securities $35,000
Bus. Svc. $34,922	Education $38,375	Retail $21,381	Nonprft. $35,000	Utils. $32,757	Education $21,250	Retail $27,307	Banking $31,005
Computer $33,500	Nonprft. $38,000	Health $21,343	Education $34,361	Education $30,000	Retail $20,733	Nonprft. $26,000	Media $27,000
Real Est. $0	Retail $36,575	Nonprft. $21,000	Media $26,500	Media $29,833	Real Est. $0	Securities $26,375	Real Est. $0
REGION							
N.Y. $46,400	N. Calif. $54,700	N. Calif. $30,200	Texas $51,916	Florida $46,833	Chicago $30,958	N. Calif. $30,233	Other $57,500
Texas $44,295	Balt./D.C. $47,286	Atlanta $28,640	N. Calif. $50,250	N. Calif. $45,142	Boston $30,333	Balt./D.C. $35,000	Balt./D.C. $40,714
Florida $42,000	N.Y. $45,500	Balt./D.C. $27,000	N.Y. $46,094	N.Y. $44,571	Pacif. NW $30,181	N.Y. $35,264	N.Y. $40,333
Chicago $41,000	S. Calif. $44,095	N.Y. $26,100	Chicago $46,772	Chicago $43,000	Balt./D.C. $30,136	S. Calif. $33,229	Florida $45,750
Denver $40,000	Denver $43,500	S. Calif. $25,336	Other $46,000	S. Calif. $41,950	N. Calif. $29,142	Boston $32,400	Detroit $45,166
N. Calif. $40,125	Texas $42,962	Boston $24,985	S. Calif. $45,142	Minn. $38,200	N.Y. $27,918	Chicago $31,700	Denver $43,200
Boston $39,757	Chicago $42,458	Pacif. NW $24,900	Balt./D.C. $44,500	Boston $38,550	Ariz. $27,833	Detroit $30,437	N. Calif. $41,400
S. Calif. $39,000	Boston $42,357	Chicago $24,253	Minn. $44,166	Detroit $37,700	Denver $27,666	Pacif. NW $30,243	Chicago $40,228
Balt./D.C. $39,000	Florida $41,482	Detroit $24,097	Boston $43,850	Balt./D.C. $37,235	Detroit $26,291	Texas $29,833	Boston $40,166
Detroit $38,681	Minn. $41,277	Texas $23,940	Detroit $43,625	Denver $36,300	S. Calif. $26,272	Minn. $29,750	Pacif. NW $39,928
Ariz. $38,333	Pacif. NW $41,057	Minn. $23,000	Denver $39,500	Pacif. NW $35,405	Atlanta $25,150	Atlanta $29,428	S. Calif. $38,625
Atlanta $35,833	Atlanta $41,000	Denver $22,716	Florida $39,461	Atlanta $34,750	Texas $25,117	Ariz. $28,223	Minn. $35,000
Pacif. NW $35,255	Detroit $39,650	Other $22,500	Atlanta $39,357	Texas $33,000	Minn. $24,800	Denver $28,551	Texas $31,150
Other $33,500	Ariz. $37,435	Florida $21,457	Ariz. $37,257	Ariz. $31,558	Other $23,750	Florida $27,326	Ariz. $31,000
Minn. $31,500	Other $35,000	Ariz. $19,328	Pacif. NW $34,586	Other $30,000	Florida $23,272	Other $25,000	Atlanta $27,000
COMPANY SIZE							
Under $00M: $35,120 $00M – $00M: $36,833 $000M and up: $41,613	Under $00M: $38,730 $00M – $00M: $42,412 $000M and up: $48,728	Under $00M: $24,823 $00M – $00M: $24,466 $000M and up: $26,370	Under $00M: $34,900 $00M – $00M: $43,785 $000M and up: $53,231	Under $00M: $33,296 $00M – $00M: $38,028 $000M and up: $41,671	Under $00M: $25,519 $00M – $00M: $28,429 $000M and up: $29,163	Under $00M: $28,577 $00M – $00M: $32,012 $000M and up: $32,583	Under $00M: $40,054 $00M – $00M: $39,483 $000M and up: $41,492

METHODOLOGY

Computerworld's Seventh Annual Salary Survey includes responses from 1,239 information systems professionals. Names were selected from lists supplied by the Association for Systems Management, the Applied Computer Research directory, *Computerworld*'s subscriber base, the *Computerworld* Buyer's Database and the 1992 *Premier 100*. Surveys were mailed on June 23 and results tabulated by IDG Research Services in Framingham, Mass.

▶ ABOUT THE RESPONDENTS

Sex:
Male: 1,009
Female: 189

Age:
Under 25: 0.9%
25-34: 33.3%
35-44: 54.3%
45-54: 10.5%
55-64: 0.9%
No response: 0.1%

Report to:
Corporate management: 76.5%
User business management 13.3%
Other: 10.2%

Company size:
Average annual revenue or assets: $698 million

Industry:
Banking: 4.3%
Insurance: 5.5%
Securities: 1.8%
Government: 11.9%
Wholesale/Retail: 14%
Education: 6.9%
Utilities: 2.9%
Manufacturing: 28%
Health care: 6.7%
Media: 2.1%
Business services: 6.2%
Agriculture/Mining/Construction: 1.8%
Transportation: 2.3%
Nonprofit: 1.6%
Computer-related: 1.4%
Real estate: 1.4%
Other: 1.2%

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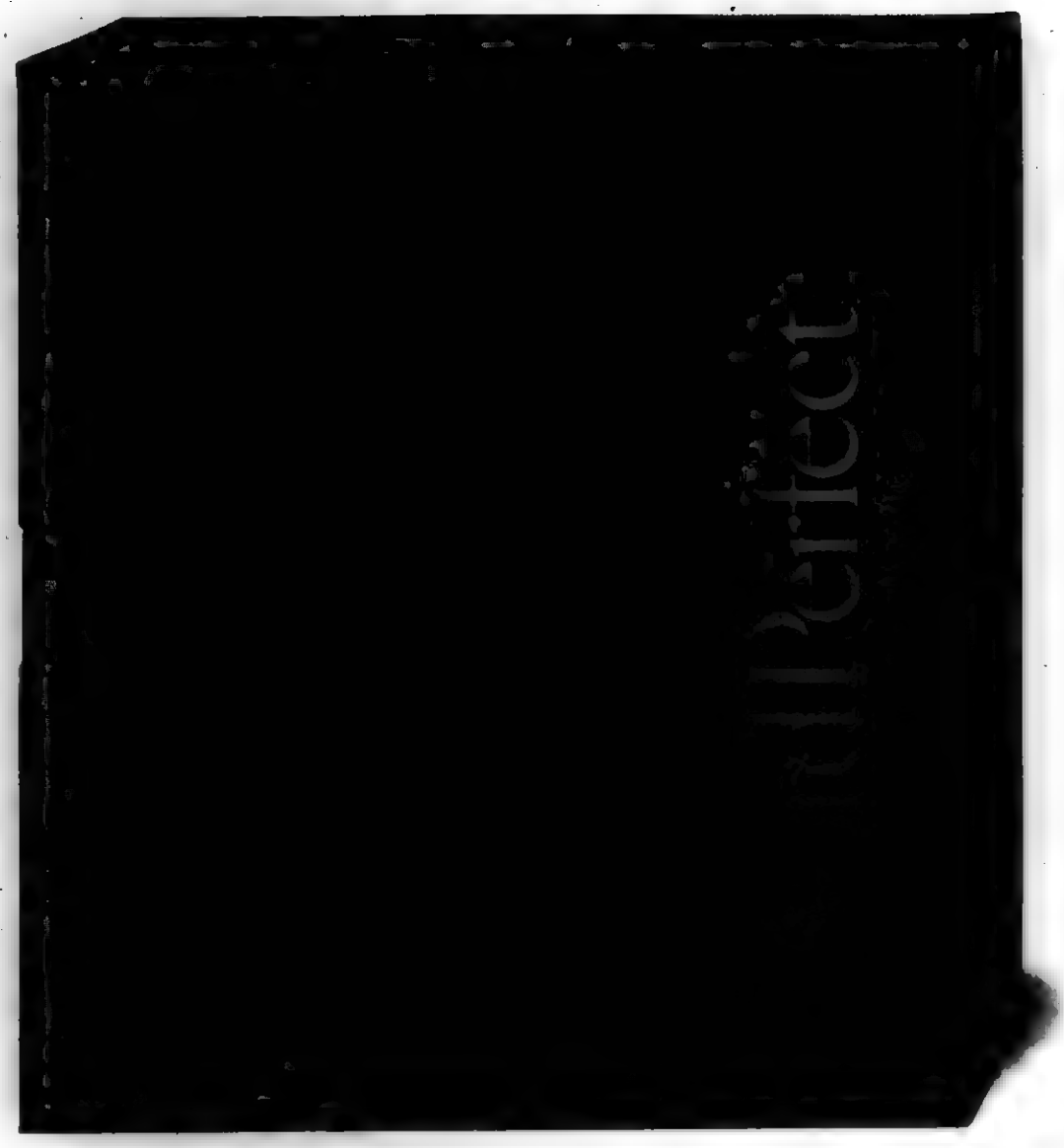

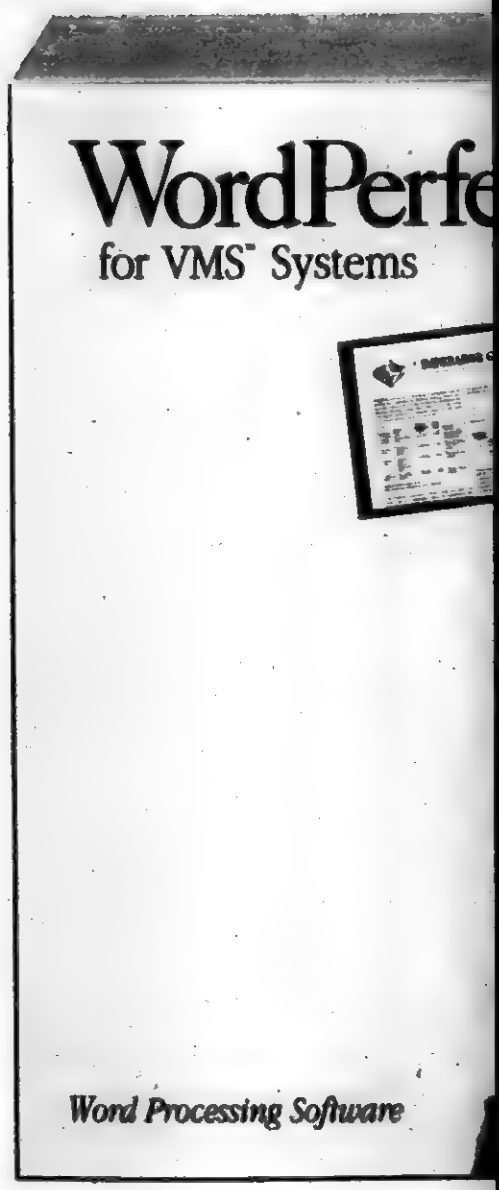

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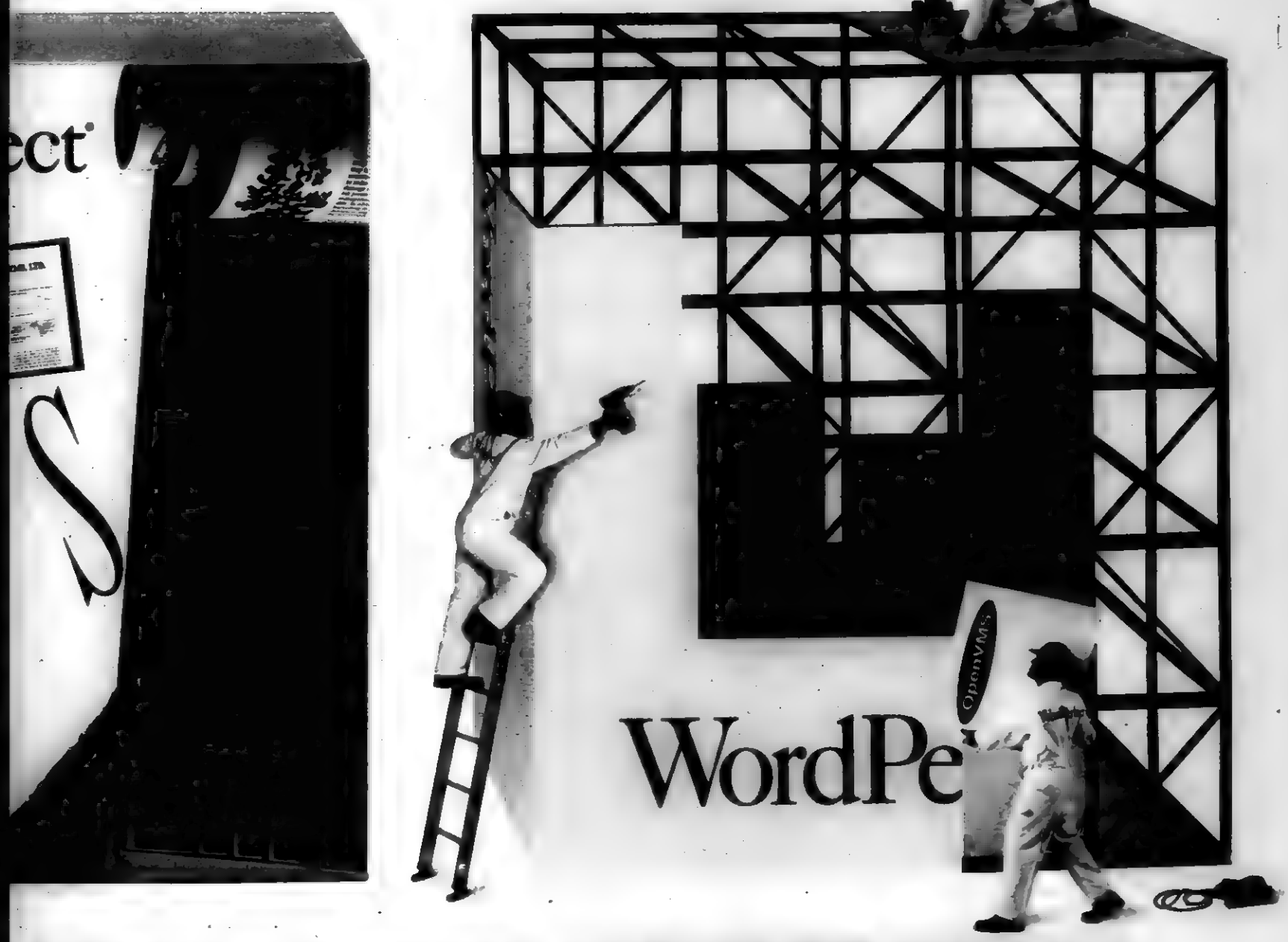

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Calendar

SEPT. 19-SEPT. 25

1993 SIM Conference. Washington, D.C., Sept. 19-22 — Contact: Gregg Lapin, Society for Information Management, Chicago, Ill. (312) 644-6610.

1993 Interex Hewlett-Packard Computer Users Conference/Expo. San Francisco, Sept. 19-23 — Contact: Interex, Sunnyvale, Calif. (408) 747-0227.

Business Excellence For Top Management. Kansas City, Mo., Sept. 21-23 — Contact: Joanne Gordon, Sandra Conn Associates, Inc., Chicago, Ill. (312) 327-0082.

Mobile World. San Jose, Calif., Sept. 21-23 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Second IEEE Network Management and Control Workshop. Tarrytown, N.Y., Sept. 21-23 — Contact: Hart Rasmussen, Workshop/Tutorial Registration, CATT, Hawthorne, N.Y. (914) 347-6942.

Expo '93. New York, Sept. 21-23 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

Document World '93. Hartford, Conn., Sept. 22-23 — Contact: Key Productions, Inc., Hartford, Conn. (203) 247-8383.

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DOOMSDAY

The date change in the year 2000 — an event that may trigger fatal errors in mission-critical systems — is only 2,308 days away. Many IS people are unprepared or unconcerned.

BY PETER DE JAGER

Have you ever been in a car accident? Time seems to slow down as you realize you're going to crash into the car ahead of you.

It's too late to avoid it — you're going to crash. All you can do now is watch it happen.

The information systems community is heading toward an event more devastating than a car crash. We are heading toward the year 2000. We are heading toward a failure of our standard date format: MM/DD/YY.

Unfortunately, unlike the car crash, time will not slow down for us. If anything, we're accelerating toward disaster.

THE COST FOR PROGRAMMING TO ADJUST ALL SYSTEMS FOR THE YEAR 2000: $50 BILLION.

This is a good news/bad news story. First the bad news: There is very little good news. There is no way to avoid the fact that our information systems are based on a faulty standard that will cost the worldwide computer community billions of dollars in programming effort.

Perhaps more importantly, we are going to suffer a credibility crisis. We and our computers were supposed to make life easier; this was our promise. What we have delivered is a catastrophe.

The problem is twofold: the date issue itself and, more importantly, our reluctance to address the problem.

THE COST WHEN YOU ADD DESIGN, MANAGEMENT, HARDWARE, SOFTWARE AND SUPPORT: $75 BILLION.

Source: Cost and programmer time estimates come from Bill Goodwin, editor and publisher of "Tick, Tick, Tick," a newsletter for people concerned about the impact of the year 2000.

Problem ID

What exactly is the "problem"? To save storage space — and perhaps reduce the amount of keystrokes necessary to enter a year — most IS groups have allocated two digits to the year. For example, "1993" is stored as "93" in our data files, and "2000" will be stored as "00." These two-digit dates exist on millions of data files used as input to millions of applications.

This two-digit date affects data manipulation, primarily subtractions and comparisons. For instance, I was born in 1955. If I ask the computer to calculate how old I am today, it subtracts 55 from 93 and announces that I'm 38.

So far so good. But what happens in the year 2000? The computer will subtract 55 from 00 and will state that I am -55 years

Doomsday, *page 108*

Robert Neubecker

While other mainframe disk companies have been slow to deliver high data availability, the new Symmetrix 5500 ICDA™ from EMC was designed for IBM and compatible mainframe sites that need continuous operation – 24 hours a day, seven days a week. With redundant hardware

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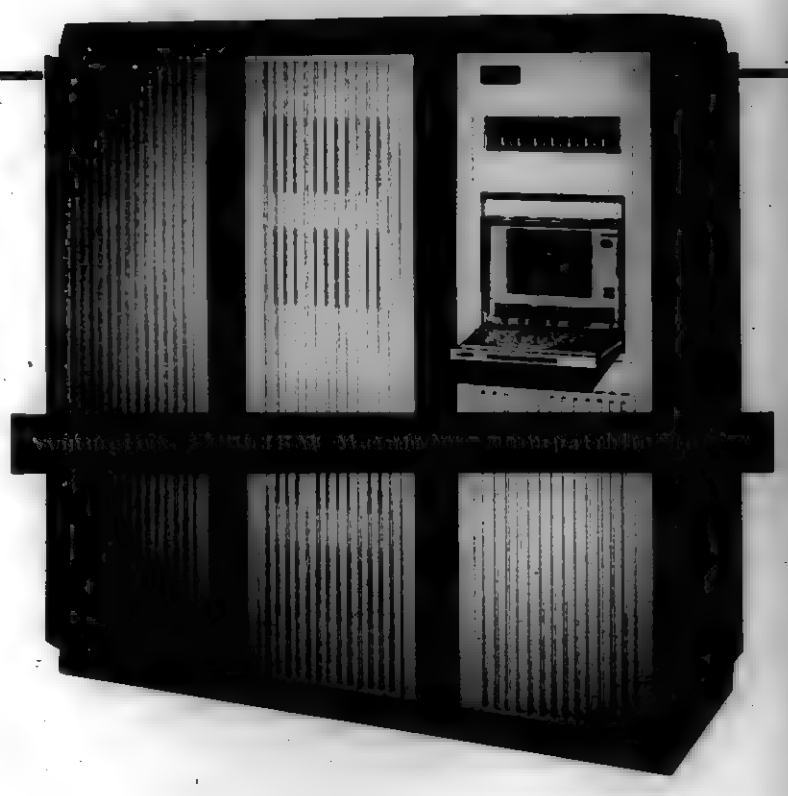

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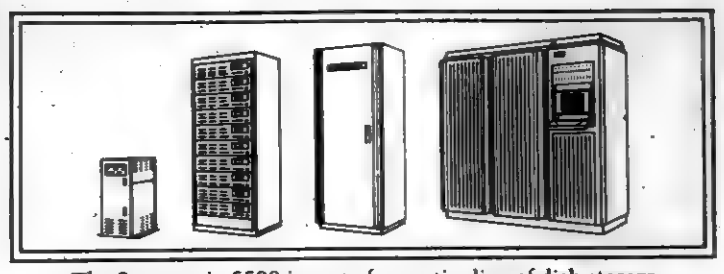

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TOOLS FOR 2000

[redacted]

A single set of calendar routines with a 10,000-year date range from 1 A.D. to 9999 A.D. It allows 99 different date formats, 18 different holiday tables and 2,450 definitions of the workweek.

Routines can accept dates without modification by defaulting to the century based on the cutoff year of a company's choice.

[redacted]

Helps standardize data access and relational processing routines in mainframe Cobol programs. Basically, IS downloads a Cobol program onto a PC and analyzes it using CPAA.

CPAA lists all data names that appear to contain dates. The data definitions for each data name are listed and will help determine whether the year is stored in a two- or four-digit field. The system also offers source-code lists of all programs using or defining a specified data name. There can now identify those data components that will cause problems or any data names that were not on the initial list.

[redacted]

The product reportedly helps identify all date occurrences and their primary and secondary relationships. It is said to handle affected data sets, databases, files, data name definitions and data-storage locations, as well as data names used at the line-of-code level.

[redacted]

Billed as a "re-engineering" tool for Cobol and CICS. Version 2.2 has a D-Day feature that gives users the capability to highlight date operations within a program. This is said to enable maintenance modifications to accommodate the century change.

[redacted]

Date and time testing tool for MVS/ESA and XA that claims to support all languages. It lets users test jobs using different dates without requiring a separate test system and without affecting other jobs running at the same time.

Doomsday, *from page 106*

old. This error will affect any calculation that produces or uses time spans, such as an interest calculation.

If you have some data records and want to sort them by date (e.g., 1965, 1905, 1966), the resulting sequence would be 1905, 1965, 1966. However, if you add in a date record such as 2015, the computer, which reads only the last two digits of the date, sees 05, 15, 65, 66 and sorts them incorrectly.

AVERAGE TIME NEEDED FOR CODE 2000: 7 DAYS PER PROGRAM.

These are just two types of calculations that are going to produce garbage. There are others.

The task facing us is to identify and correct all the date data and check the integrity of all calculations involving date information. We must correct the data residing in all data files or write code to handle the problem.

The starting point

How do we identify the problem data and the associated calculations? We have few, if any, standards for labeling data used in date calculations. The only choice we have is to examine each line of code and make the necessary changes.

One IS person I know of performed an internal survey and came up with the following results: Of 104 systems, 18 would fail in the year 2000. These 18 mission-critical systems were made up of 8,174 programs and data-entry screens as well as some 3,313 databases. With less than seven years to go, someone is going to be working overtime.

By the way, this initial survey required 10 weeks of effort. Ten weeks just to identify the problem areas.

How many systems do you have? How many lines of code do you have in your organization? How many data files? How many maintenance programmers?

The problem extends beyond mere calculations and into the I/O processes of every application. Can you enter 2000 into your data screen, or can you enter only two digits, forcing the input of 00? Can your hard-copy reports print four digits?

The crisis is very real and potentially very costly. Ken Orr, principal at the Ken Orr Institute, and Larry Martin, president of Data Dimensions, Inc., estimate that Fortune 50 organizations will each have to spend about 35 to 40 cents per line of code to convert all their existing systems to accept the change from the year 1999 to 2000.

TOTAL PROGRAMMING TIME FOR ALL SYSTEMS: 1.2 MILLION MAN-YEARS.

That translates into about $50 million to $100 million for each company. The mind boggles at a maintenance problem with that price tag.

And the costs could be even higher. "The truth is, until we work through a complete cycle with some large organization, we are not going to really know," Orr says.

I have spoken at association meetings and seminars, and when I ask for a show of hands of people addressing the problem, the response is underwhelming. If I get one in 10 respondents, I'm facing an enlightened group.

Typically, all I get are snickers and comments such as, "I won't be in this position or this company in the year 2000. It's not my problem."

This attitude in the computing community is the real problem. It is very difficult for us to acknowledge that we made a "little" error that will cost companies millions of dollars. It is also a "pay me now or pay me later" situation.

"We in the IS industry have not been paying our way," says Gerald Weinberg, author of *Quality Software Management* and winner of the 1991 J. D. Warnier Prize for Excellence in Information Science. "We have been building up a 'national debt' just as surely as the U.S. has been building up a money debt. It will be paid by our children — our successors — one way or another," Weinberg says.

We don't have a choice. We must start addressing the problem today or there won't be enough time to solve it. Status quo means applications that will produce meaningless results in the new millennium.

Weinberg says he believes this procrastination is an indication of deep management malaise. "If software engineering managers cannot manage a change that they've had 1,000 years to prepare for, how can we expect them to manage a change that happens without notice? In other words, if this change causes a crisis in your organization, *everything* will cause a crisis in your organization — and often *nothing*

Bearings firm goes on offense

BY LORY ZOTTOLA DIX

Torrington Co. doesn't have time for seers predicting dire consequences when the final tick of the clock strikes a change to the year 2000. That's because this bearings manufacturing company, a division of Ingersoll-Rand Co., is too busy doing something about it.

In 1991, at the suggestion of an employee and as part of its drive toward total quality management, Torrington convened a seven-member team, headed by programmer/analyst Bob Hartman-Berrier, to tackle the century date change issue. The Torrington, Conn.-based company knew that because certain of its programs stored dates by their final two digits, a changeover to the year 2000 could mean fatal errors that might throw its global systems into an uproar.

The group brainstormed about problems areas — the company has a mix of mainframes, minicomputers, PCs and local-area networks — and interviewed businesspeople throughout the firm.

Members took an inventory of in-house and outside software products. They sent a questionnaire to Torrington's 90 vendors (30 mainframe and minicomputer, 60 PC) to gauge product support for four-digit years.

Vendor responses were encouraging. Of the 90% mainframe and 60% PC vendors that returned the survey, nearly all of them either could accommodate the century date or had fixes in the works.

The in-house inventory showed that 30% of Torrington's programs and 25% of its files and databases required changes, Hartman-Berrier says. At 25 hours per program and 40 hours per database file to reformat, unload and reload, the team

JUST DO IT

Here's what's on Torrington's to-do list to prepare for 2000:

1. Set standards. All in-house and vendor system files and any date fields will have a four-digit year. (Status: Done.)
2. Accommodate legacy systems. Despite its move to a distributed environment, the company will maintain its mainframes. It is actively seeking a mainframe compiler that supports four-digit years, something its current compiler doesn't do. (Status: In progress.)
3. Investigate and buy a data analysis tool to identify location of date fields within programs. (Status: Will be complete in 12 to 18 months.)
4. Develop bridge modules. Some programs, especially those dealing with forecasting, will need to work with the century date as early as 1996. These "critical" systems (such as payroll and job scheduling) will need bridge modules to handle century rollover. These software fixes are a less time-intensive alternative to changing native code. (Status: Will be complete in 12 to 18 months.)
5. Identify critical systems needing bridge modules and prioritize them. (Status: In progress.)
6. Do it. Put the recommendations in action.

will cause a crisis."

The inability of the industry to even think about such a project is troublesome. "No one wants to step up to the issue — not [IS] management, not the vendors, not the industry gurus," Orr says. "As with all legacy systems, this problem is messy, expensive and unromantic. No one wants to go in and tell management they have a multimillion-dollar requirement just to keep the business running and that they really have no options."

The reason nothing is being done, says Capers Jones, chairman at Software Productivity Research, Inc., is that the software industry isn't used to taking long-term preventative steps. "I expect that most companies will not start worrying about the problem until 1999," Jones says. "For some, this will be too late."

Now the good news

There is good news. Object-oriented systems may be able to help. Faced with the huge maintenance costs of fixing their systems, firms may opt to rewrite systems from scratch using object-oriented programming techniques. Tom Love, IBM vice president of the Object-Oriented Group, is a proponent of this theory.

Some companies are unveiling testing and inventory tools that may ease the identification of trouble spots.

Others are hoping that bombarding people with information is the best remedy. To that end, William Goodwin in Brooklyn, N.Y., publishes a newsletter entitled "Tick, Tick, Tick," which brings together people in the IS industry concerned about the impact of the year 2000.

But is the warning falling on deaf ears?

TICK, TICK, TICK

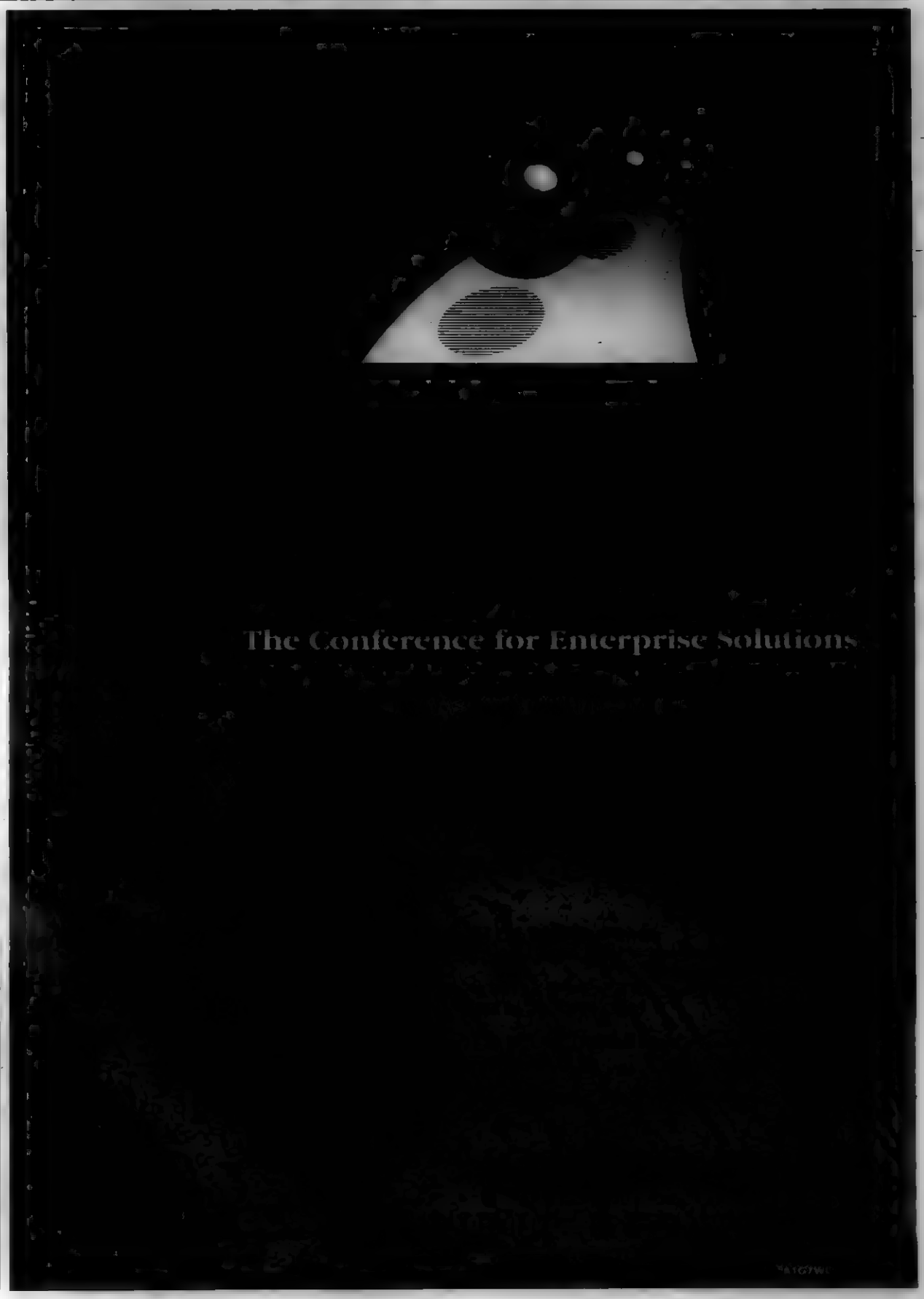
The newsletter "Tick, Tick, Tick," which focuses on the impact the year 2000 will have on systems, is having a Worst-Case Scenario contest. The newsletter is seeking the most creative idea of what could happen on 01/01/2000.

The prize is a free subscription to the newsletter. Send entries to "Tick, Tick, Tick," P.O. Box 020535, Brooklyn, N.Y. 11202-0012 (718) 643-7824.

"I feel like a lone voice crying in the wilderness," says Brian Pitts, one of Goodwin's subscribers and project manager at Berry Co. in Dayton, Ohio. "Current economic conditions are making this problem more difficult to address. Management is focused on short-term results and is placing long-term negative consequences on the back burner."

The next seven years will be filled with dire predictions. "You are going to become very, very tired of millennium moaners telling you that your software will fail as it enters the new millennium," says Nicholas Zvegintzov, publisher of *Software Maintenance News*. "But be patient with them. There really is something to be said for them." ■

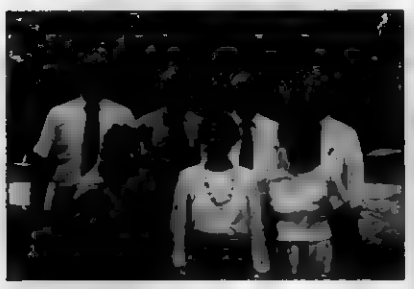
De Jager is an industry speaker on the topics of change, creativity and management of technology. He can be reached at (416) 792-8706 or via CompuServe (76611,2576) and MCI Mail (PDEJAGER).



expects the work load to be heavy.

Costs have been a little trickier to pinpoint. While Hartman-Berrier says worst-case costs to revamp systems could reach $3.5 million, the best-case could be one-tenth that figure.

Hartman-Berrier and Ken Even, manager of corporate support, hesitate to commit to a number on project cost because of the firm's move to a distributed setup. "Distributed systems may mean we remove some applications, keep others. If we remove a system, we don't have to change it, reducing our labor efforts



The Torrington 2000 team: *(front): Traci Winegar, Alison Anstett, Evelyn Palazzini; (back): John Draghi, Bill Beyer, Bob Bouchard, Hartman-Berrier*

and resources," Hartman-Berrier says. "We can take a felt-tip marker and strike programs and files from our list."

His advice to other IS professionals is to "plan, plan, plan and act, act, act." The year 2000 is coming. ■

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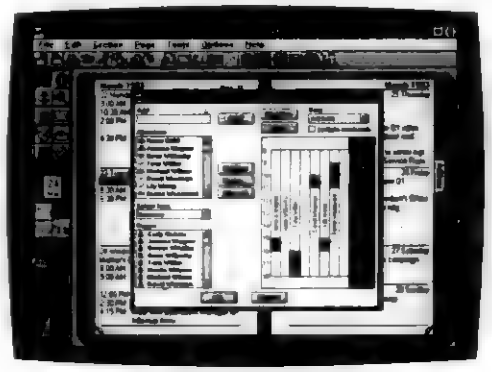

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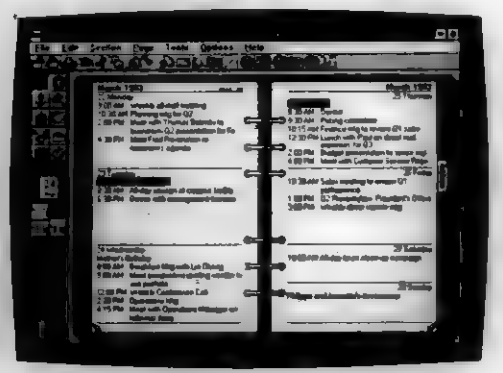

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Survival strategies for the contract programmer

CONTRACT ARRANGEMENTS

True independents

Basic one-person shops. They find work and do it alone. Independent programmers can work through brokerages — most of which prefer to be called consultancies — and become brokered independents.

Brokered independents

Independent developers paid per project by brokers who find clients for them. Neither the true nor brokered independent situation offers many benefits or job security.

Brokered employees

Full-time employees of a brokerage. These employees are paid a salary whether or not they are working on a project. They spend most of their time in client companies and enjoy the benefits of developing in different environments and industries without the financial risks of going it alone.

By Joe Panepinto

IT'S INEVITABLE. Whether by necessity or choice, a software developer or programmer will spend some career time outside the comfort of an in-house information systems department. But before you hang out a shingle and go to work as a contract employee, there are a number of things you should know.

Experience

A career as a contract programmer, regardless of whether your services are brokered, has a number of requirements. Most experts in the business agree that you need a minimum of three years of hard-core programming and development experience.

Once you're on your own, you're also responsible for your own technical training and tuition, says Ray Rauth, vice president of Independent Computer Consultants Association, an industry organization in St. Louis.

Marketable skills

Hot skills for contract programming include client/server relational database management system experience with products from Oracle Corp., Sybase, Inc. and Powersoft Corp. There is also a growing but still niche need for C++ language and object-oriented programming.

Experts, however, are split on the benefits of specializing. A specialized skill such as C++ may call for a higher rate, but the contractor may have to cover a much wider geographic area to find work. "I've seen people specialize in all sorts of things — vertical or horizontal markets, a particular technology, whatever," says Dheeraj Khera, a contract programmer and president of Khera Communications, Inc. in Rockville, Md.

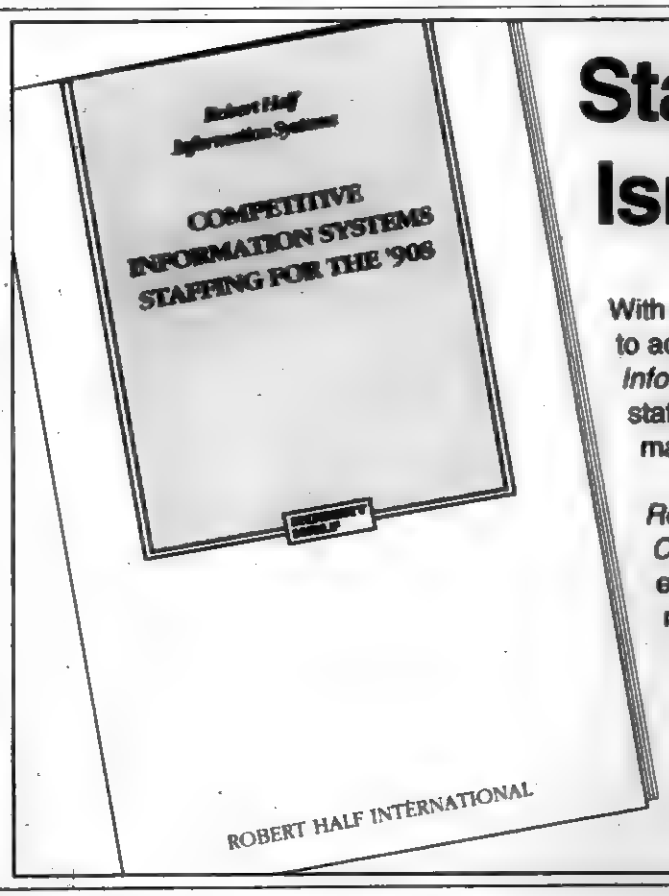
Gaining expertise

Many programmers gain experience and credibility by working through the ranks at software firms that, for one reason or another, no longer need their services. For instance, when Microsoft Corp. bought Fox Software, Inc. in Toledo, Ohio, last year, it moved operations, leaving a slew of FoxPro programmers behind. The former director of technical support at Fox, Howard Moskowitz, took advantage of this and created a consulting and contract programming firm — HJM Consulting — specializing in FoxPro.

HJM Consulting has three full-time Fox programmers on staff and another five to seven specialized and senior Fox programmers available on a contract basis.

Panepinto is a free-lance writer in Amherst, Mass.

Making a living



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PROTECT yourself

For now, the contract employment industry conforms to few regulations. Be sure you can live with the restrictions.

By James Daly

If you're ready to give contract work a try and are thinking of working with a contract labor firm, choose carefully. Some employees say certain agencies can be restrictive.

In a speech to the Independent Computer Consultants Association (ICCA) earlier this month, high-tech author Alan Canton described a whole host of abuses by so-called "body shops," the agencies that address the growing need to place engineers and programmers in short-term positions.

"Can you imagine an agent coercing a recently laid-off engineer to sign a contract saying he can be terminated without notice, but he can't quit the project for any reason without paying the agency a large dollar amount as liquidated damages?" Canton asks.

Canton, the Sacramento, Calif.-based author of *ComputerMoney: Making Serious Dollars in High-Tech Consulting*, also warns about the clause that says the agent won't pay the contract employee until, when or if he gets paid.

Brokers deal with independent contractors on an hourly rate for a fixed contract length. They make their money by matching independent contractors with clients and taking a cut of the contractor's pay, usually anywhere from 20% to 50%. Although some brokers are mom-and-pop outfits with four or five people, some of the larger brokerages contract with more than 250 employees.

Policing the market

Canton says federal regulation and licensing would keep the unscrupulous characters out of the business as well as prevent abusive, restrictive and unethical practices. It would also provide a forum for resolving disputes that is quicker and cheaper than the courts.

Free-lance software and hardware consultants say they've learned to live with the sword of Damocles hanging over their heads.

"I was always nervous about challenging employment clauses because I figured I'd lose the work," says Mike Lips, who worked as an independent software consultant for nearly 15 years in San Francisco. "Most agencies figure that if you don't sign the contract, they can find someone else to fill the position."

With a constricting economy and a decline in the number of full-time jobs, the market for contract software and hardware programmers is booming. David Arie, a director at the Northern California chapter of the ICCA, estimates there are as many as 200 temporary agencies in the San Francisco Bay area alone, up from only a few dozen several years ago.

"It can be a very restrictive business," Arie says. "If a temp doesn't have any counsel and all they are looking for is a job, they can really get slammed."

Dog-eat-dog

Brokers claim self-defense. "A business has to operate on the philosophy that it needs to make money, and some of these measures are self-protective," says Joanne Peterson, president of Abator Information Services, Inc., a temporary services agency in Pittsburgh. "But they should be able to do that in a more caring manner."

Arie says that contract work has become more difficult since the implementation of Section 1706 of the Tax Reform Act of 1986. Section 1706 tightened the rules about what kind of work constitutes free-lance programming. If an employee does not meet the strict definitions of Section 1706, the employing client could be liable for withholding taxes and benefits. As a result, temporary agencies have mushroomed.

While Canton says body shops have a place in the employment picture, he believes people are too dependent on them. He argues that it is not that difficult to find your own client and avoid the need for agents.

"There is big money to be made brokering people," Canton says. "That's why there are so many agents." Full-time employment agents must be licensed, and Canton asks why the same requirement does not apply to temporary agents.

bells

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VAX Applications Programmer
VAX/VMS systems knowledge, 2+ years C or Pascal required, as is knowledge of telecommunications and data communications protocols.

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C/Unix/Oracle/SQL/4GL
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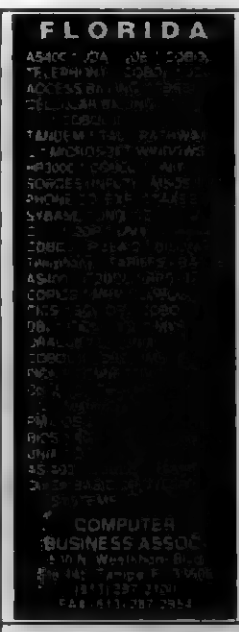

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Qualified candidates will have a Bachelor's degree and a minimum of three (3) years management or supervisory experience in a technical environment. The ability to coordinate, schedule and monitor complex processes is a must. Technical awareness of the AS400 and its capabilities is also required.

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Responsible for the development and support of a quality assurance testing environment. Experience with AS400 CL, AS400 utilities and AS400 systems administration and an Associates degree in Computer Science is required. Analytical and problem solving skills are also required.

ACP Systems Programmer

Responsibilities include the support of the ACP systems level software and other phases of systems programming work - systems software evaluation thru implementation and tuning.

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S/WARE ENGINEER-MECHANICAL ENGINEERING APPLICATIONS (REF. #64663) to consult with clients to ascertain & define their business req or problem areas & utilize tech expertise to provide solutions to clients' needs, including analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl designing & developing an object oriented Product Structure Editor for managing CAD/CAM data. Duties require interfacing with existing data structures & CAD/CAM sys using Sun SparcStation 10, DecStation 5000, PRIME, UNIX, C, C++, X WINDOWS & MOTIF. ED & EXP: Bachelor's in Mechanical Engg & 2 yrs exp in the job offered or 2 yrs exp as S/ware Engg or Sys Officer. REL EXP: in whole or in part, using C, C++, UNIX, VAX/VMS & X-WINDOWS & Developing Graphic User Interface Apps for Mechanical Engg Design purposes. $46,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #64660) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl analyzing, designing & developing a Loss Management & Claims Litigation Sys. Responsibilities incl process flow & data flow design; data modeling identification, tech support & overall design of app entry part of the sys; meeting with users to gather reqs; & converting database sys. Tech support provided will be for design of app using CICS, DB2, VSAM, IMS/DB on IBM-3090 using IBM-3090, IBM PC 386/486, MVS/XA, DB2, PC-CICS, XDB, DB2, TELON, TOTAL, MARK IV, SQL, TSO, CUSTS, EASYTRIEVE. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, development of app, sys conversion; & using IBM 3090, IBM 386, MVS/XA, DB2, CICS, VSAM, IMS/DB, TOTAL, TSO & EASYTRIEVE. $34,000/yr. 40 hr/wk.

SOFTWARE CONSULTANT (REF. #64193) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys incl an integrated banking plage. Responsibilities incl analysis info, gathering, data modeling, process flow & data flow design, process & procedure modeling, tech issues resolution, project mgmt incl task scheduling & monitoring. Duties incl developing an industry standard banking plage to be implemented on different platforms & using different CASE Tools incl ORACLE CASE, IEF case tools on UNIX, MVS, OS/2 & MS-DOS platforms, & ORACLE, DB2/CICS, IMS DB/DC, & DMS II. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal, or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, development of an integrated banking sys; project mgmt; & using UNIX, MVS, ORACLE, CICS, IMS DB/DC, & DMS II. $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #64083) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solution to clients' needs, incl analyze, design, develop & implement comp s/ware for clients' EDP sys. Duties incl analyse design & development of accounting & business apps sys. Responsibilities incl process flow & data flow design, data modeling identification, tech support & overall design of the apps & meetings with users to gather reqs. Tech support provided will be for design of apps using IBM 3090, IBM AS/400, MVS/ESA, CICS, DB2, TSO, OS/400, COBOL II, COBOL/400, RPG/400 & IEF. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal, or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Sys Manager, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, programming for financial sys, & using IBM 3090, IBM AS/400, MVS/ESA, CICS, DB2, COBOL II, COBOL/400, RPG/400 & IEF. $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #64793) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analysis, design, development & implementing comp s/ware for clients' EDP sys. Duties incl: development of Analytical Data Management Integrated Network/Laboratory Information Management Sys (ADMIN/LIMS). ADMIN/LIMS a worldwide information management sys to support drug product manufacturing, product development, stability evaluation, laboratory testing & clinical trial for pharmaceutical industry. Sys contains 5 apps: Analytical Data Management (ADM), Specification & Method Management (SMM), Lot Release (LR), Stability evaluation (ST) & Results Entry (RE). Responsibilities include: program construction for LR, ST & RE apps, development of utilities to provide infrastructure to project & database development & data base administration for performance tuning & data support conversion using DEC VAX using VMS Operating Sys, ORACLE RDBMS Version 6, SQL*FORMS Version 3, PL/SQL, SQL*REPORTWRITER, SQL*MENU Version 5 & C. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal, or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, database design, sys conversion, performance tuning & tech support, & using VAX, ORACLE RDBMS, SQL *FORMS & C. $34,000/yr. 40 hr/wk.

ASSISTANT SOFTWARE ENGINEER (REF. #66593) to consult with clients to ascertain & define their business reqs or problem areas & utilize techn expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP processing sys, incl a corporate reporting sys. Duties incl: functional enhancements & re-engineering of Business Activity Monitoring Sys on IBM 3090. Duties require capturing existing sys in TRAPS; data & process redesign with functional enhancements using ADW; sys development & testing using IBM 3090, TRAPS, ADW, MICROFOCUS COBOL WORKBENCH, APS, IDMS/R & DB2. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 18 months exp in the job offered or 18 months exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, application sys development; sys testing & re-engineering; & using IBM 3090, TRAPS, ADW, IDMS/R, APS, MICROFOCUS COBOL WORKBENCH & DB2. $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF.: #64480) to consult with clients to ascertain & define their business reqs or problem areas & utilizing tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl a labor distribution sys which will interact with other modules as well as with other DB2 & VSAM apps. Responsibilities incl business area analysis, tech support, coordination with the DBA during design phase, interaction with user group for gathering reqs & app design using IMS DB/DC COBOL interface using IBM 3090, MVS/XA, TSO/ISPF, IMS DB, VSAM, DB2, IMS DC, CICS, SOL/DMF, COBOL, IMS-XPERT, EXPEDITOR, SAS & various other tools. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg, Consultant or Tech Support Executive. Will accept 2 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp: REL EXP: in whole or in part, s/ware development & tech support; & using IBM 3090, MVS/XA, IMS DB/DC, DB2, VSAM, CICS, SAS & COBOL. $34,000/yr. 40 hr/wk.

PROGRAMMER ANALYST (REF. #64363) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients. EDP sys. Duties incl: setting up an integrated database for various State agencies. Responsibilities incl conducting user interviews, reqs identification, tech analysis, data modeling, sys design, development & integrated testing & using IBM ES 9000, MVS ESA, DB2, CICS, COBOL & CASE TOOLS. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, Sys Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp: REL EXP: in whole or in part, application & data s/ware development; & using IBM ES 9XXX, MVS, DB2, CICS & COBOL or COBOL II. $34,000/yr. 40 hr/wk.

SOFTWARE CONSULTANT (REF. #70790) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analysis, design, development & implementing comp s/ware for clients' EDP sys, incl analysis, design, development, testing & maintenance of UNIX sys for engg users, & Graphical User Interfaces GUI for apps running on different sys such as DEC, HP & SUN Workstations. Responsibilities incl design & development of intelligent (GUI). Porting of sys to various h/ware platforms. Development of standards & tools for various phases of the s/ware life cycle using DEC, HP h/ware, UNIX/ULTRIX, VMS Operating Sys, X-Windows & OSF/MOTIF Libraries, RDB/VMS, ORACLE & C. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp: REL EXP: in whole or in part, graphic sys & user interface development; sys testing & porting; & using VMS, RDB/VMS, ORACLE, OSF/MOTIF, C & WINDOWS LIBRARY. $34,000/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF. #70493) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl development of TS-TCP (TCP/IP based Terminal Server) sys to provide connectivity to both synchronous & asynchronous terminals using "telnet" sessions; writing Installation & Configuration programs for the product & sys testing, using Honeywell-Bull DPX series & DPX2000 comp, TU & 960 Socket network transport interfaces, 'C' & 80x86 assembly languages & INSTAUT s/ware from HPI. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp: 2 yrs of related exp must incl s/ware development for data communications purposes. REL EXP: must also incl, in whole or in part, s/ware development using DPX2000, UNIX, C, 8086 Assembly, INSTAUT, TCP/IP PROTOCOLS & BSD 4.2 compatible socket libraries. $34,000/yr. 40 hr/wk.

SR. SYSTEMS ANALYST/PROGRAMMER (REF. #70583) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzes, design, developing & implementing comp s/ware for clients' EDP sys. Duties incl: analyze, design & develop an integrated welfare sys. Responsibilities incl gathering reqs from customers, analyze & design process flow & data flow, overall design of the Eligibility Determination & Benefit Calculation & Application Entry modules & tech support. The tech support provided will be for the design of apps using IMS/VS DB/DC, on IBM Mainframes using IBM 9021, IBM 3090, MVS/ESA, IMS/XPERT, IMS/VS DB-DC, DB2, TELON, ADF, VS COBOL II, TSO/ISPF, BTS, CUSTS, FILEAID, ABENDAID, DIALOG MANAGER & SCRIPT/BOOKMASTER for design & documentation. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp: REL EXP: in whole or in part, design & development of app sys using IBM 3090, MVS/ESA, IMS/VS, DB-DC, DB2, ADF, TSO/ISPF, CUSTS, DIALOG MANAGER & SCRIPT/BOOKMASTER. $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #70283) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing & developing comp s/ware for clients' EDP sys. Duties incl: managing the quality assurance aspect of a large s/ware development project incl developing the Methodology which defines the life cycle phases, procedures, tools & deliverables, developing various standards & guidelines, designing a Graphical User Interface, managing a team participating in reviews & testing, monitor the project to timely inform the management of any potential problems in the project, involves using or overseeing analyst using the IBM mainframe, PC, MS-Windows, Excelerator, MS-Project, MS-Word, MS-Excel, COBOL, CICS, DB2, TSO & ISPF. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp: 2 years of related exp must incl, managing large s/ware development projects. REL EXP: must also include managing quality assurance project & s/ware development in an MS/Window Environment, designing a Graphical User Interface & using EXCELERATOR Case Tool & COBOL. $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #68293) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing & developing & implementing comp s/ware for clients' EDP sys. Duties incl: analyze, design & develop an integrated welfare sys. Responsibilities incl: process flow & data flow design, developing program specifications using Structure Charts & Module Action Diagram & Program Construction, tech support & overall design for the Eligibility Determination Benefit Calculation part of sys & meeting with end-users for req gathering & acceptance of comp programs. The tech support provided will be for design of apps using IMS-DC on IBM 3090, using IBM 3090, MVS/ESA, IMS/DC, CICS, TELON PWS, DB2, XDB ISPF/TSO, REXX, COBOL & Design Workstation of Application Development Workbench (ADW). ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp: REL EXP: in whole or in part, application development; meeting with end-users for requirement gathering; and using IBM mainframe, MVS/ESA, CICS, DB2, TSO/ISPF, REXX, & COBOL. $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST (REF. #70893) wanted. Duties: to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware incl unit & sys testing of FAST (Flexible App. Software Tool). Fast is a multiplatform client-server based app generation tool. Responsibilities incl designing sys test plans, writing scripts & generating apps, performing various tests to verify the graphical user interface, & using UNISYS B20, IBM PC, BTOS/CTOS, MS-DOS, XVT PL/M & C. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp: REL EXP: in whole or in part, sys development; unit & sys testing; & using UNISYS B20, BTOS/CTOS, MS-DOS, PL/M & C. $34,000/yr. 40 hr/wk.

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Senior Systems Analyst with Chicago, Illinois manufacturer: Duties: The senior systems analyst will be responsible for directing business systems development projects, including design and engineering of on-line transaction systems, to meet the needs of the employer in the fields of sales, marketing, and manufacturing; and for directing the maintenance of existing business systems in these fields. Specific duties with respect to business systems development will include directing: (1) all phases of such projects from defining business requirements to implementation; (2) the use of CASE tools in the development of logical processes and data models to improve productivity in the development of new business systems; (3) the preparation of technical designs and specifications meeting business requirements; (4) the preparation and monitoring of detailed project plans; (5) the training of users of new business systems; and (6) the design and engineering of on-line transaction systems to improve manufacturing productivity. Duties with respect to business systems maintenance include responsibility for directing: (1) the analysis and resolution of problems with existing business systems; and (2) the analysis and impact assessment of enhancement requests. Education requirements: Masters of Science or equivalent degree from foreign university in computer science or industrial engineering. Experience requirements: one year as senior systems analyst, systems analyst and programmer, systems analyst, assistant systems analyst or any combination of these positions. The position requires one (1) year of experience as a systems analyst and programmer or systems analyst, specializing in business systems development in an IBM (or IBM compatible) mainframe environment. Previous experience should include: 1) Business systems development using fourth generation computer languages (4GL), in CSP - SQL/DB2; 2) Technical design and program specification; 3) Programming using COBOL, COBOL II, and COBOL/DL; 4) CICS; 5) Business systems analysis and business requirements definition; 6) Direction of business systems development projects, including project planning, and monitoring and supervision of programming activities; 7) Sales/order processing applications project exceeding twenty (20) man years of effort; 8) Programming and/or analysis using IMS/DB and IMS/DC in an IBM or IBM compatible mainframe environment; and 9) Analysis of manufacturing productivity. Must have proof of legal authority to work permanently in the U.S. Salary: $53,000 per year; hours per week: 40; work schedule: 8:00 a.m. - 5:00 p.m.; Applicants should send their resume to: Illinois Department of Employment Security, 401 S. State Street, 3 South, Chicago, IL 60605. Attn: Mary Miller. Reference: # V-L 10589-M. No calls. An employer paid ad. Send 2 copies of resume.

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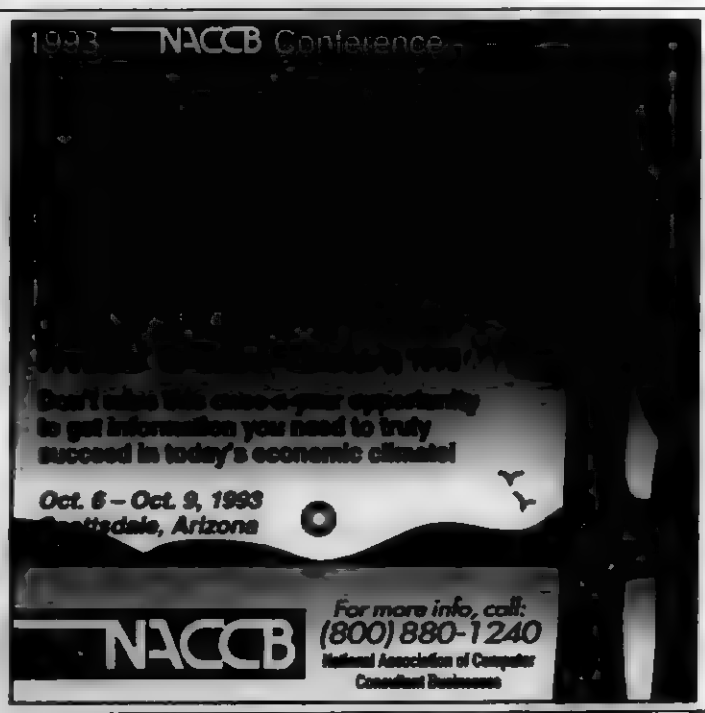

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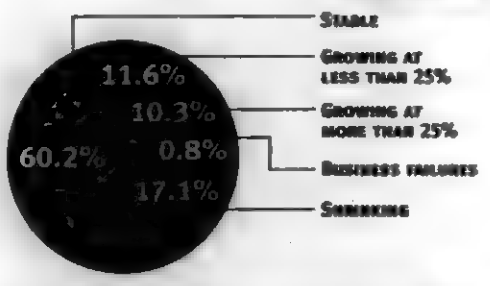

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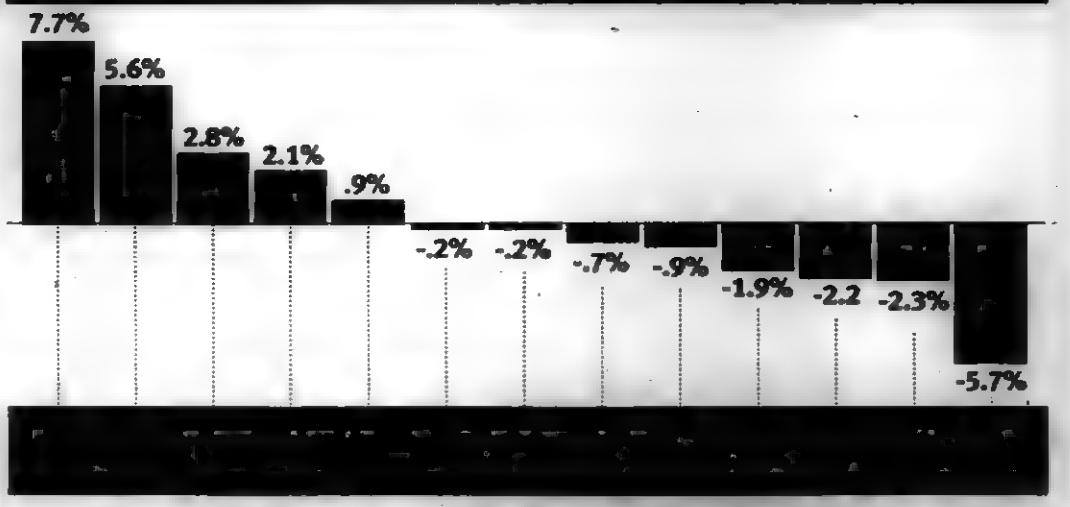

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GREAT FINDS

Little-known tools that meet important needs

By Julie Hart

There are thousands of good software tools on the market, and it's almost impossible to try them all. This often means that lesser-known products get swept under the rug. In a search for a few hidden gems, *Computerworld* asked information systems professionals to nominate tools they couldn't live without.

Hart is a free-lance writer in San Jose, Calif.

[redacted]

Pacbase is a computer-aided software engineering (CASE) tool recommended by Mike Heapby, vice president of Distributed Systems Engineering at National Data Corp. in Atlanta.

Benefit Pacbase's cross-platform capabilities let programmers generate code on one platform and then migrate the results to another. "Before Pacbase we had people who knew nothing about OS/2, Unix or even PC-DOS, and now they're very capable of creating code for all these platforms."

[redacted]

Daka International, Inc. in Danvers, Mass., nominates SPEEDII, a scaled-down CASE tool. "SPEEDII is a perfect solution for legacy systems," says Bob Canaway, director of technical services.

Benefit "With SPEEDII, we can keep our Wang running current applications without spending a lot of time in development." Without it, Canaway produces a typical Cobol application in about a month, whereas a comparable SPEEDII application can be built in 10 to 12 hours.

[redacted]

Jim DePriest, manager of manufacturing systems at Martha White Foods in Nashville, named Easy View for its troubleshooting capabilities. Easy View reduces the need for data file utilities (DFU) and queries required to view or change the contents of database files.

Benefit DePriest estimates Easy View slices troubleshooting time by 25%. "Easy View enhances the DFU found in the AS/400 by letting me go into data files and manipulate fields," he says.

[redacted]

Crane & Co. in Dalton, Mass., guarantees around-the-clock operation of its IBM Application System/400-based real-time manufacturing systems. Key to this commitment is Mimix, a backup utility.

Benefit Before implementing Mimix, Crane maintained daily backup tapes, and if the system went down, data that hadn't been saved to tape was lost. Now, Crane's system is always operational with zero data loss, says Neil Marshall, manager of systems and programming.

[redacted]

National Amusements in Dedham, Mass., uses Rumba to enhance PC Support, IBM's terminal emulation package for the AS/400. Rumba provides users with an icon-based interface to perform uploads and downloads between PCs and the AS/400.

Benefit "Rumba has really eased our maintenance burden," says Joe Mollo, MIS manager. "Power users can change parameters on their own, and novice users can click on built-in menus to invoke AS/400 applications."

[redacted]

Programmers at Davey Tree Expert Co. in Kent, Ohio, frequently use Universe CASE on an AS/400 to automatically generate RPG code, saving hundreds of hours in programming time.

Benefit David Strickland, assistant manager of IS, estimates 70% is shaved from development time of inquiry programs and 50% when developing on-line interactive programs and batch reporting programs. "It's like having a fifth programmer," Strickland says. "I'm more focused on analysis and design."

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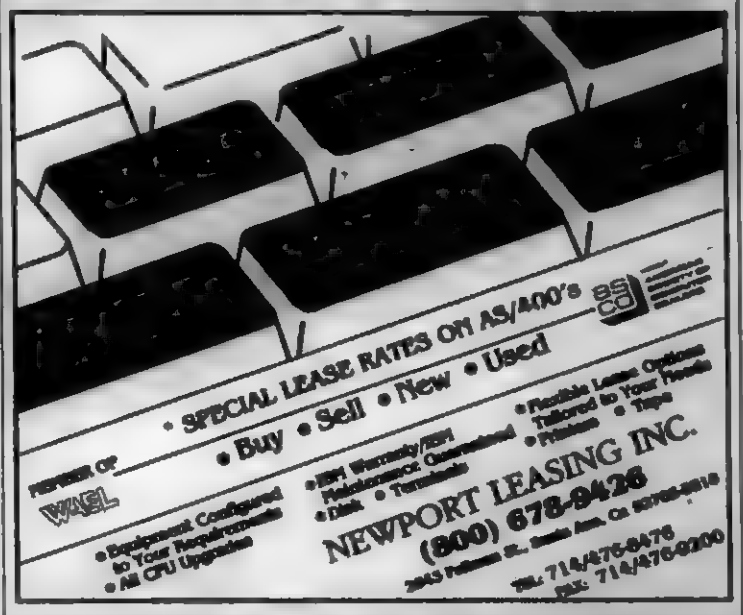

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PLEASE NOTE: In evaluating a Consultant's response to this advertisement, the Authority considers only the information which is supplied in the Federal SF254/255 forms and information contained in Transit Authority Consultant Evaluation Reports on file, for work performed on prior Authority Projects. The Authority, therefore, requires all Consultants to refrain from submitting any material other than what has been requested. Send submission to:

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New York City Transit Authority, Procurement,
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The New York City Financial Information Services Agency has issued two (2) formal Requests for Information as to the general availability of: (1) a COBOL Tester ,& Compiler Add-on for Intersolv's CASE Tool, APS; and (2) an Add-on Utility, simulating DB2 on a PC Platform to a COBOL Tester, Compiler & Debugger Add-on for Intersolv's CASE Tool, APS. Responses due by 5pm, 9/16/93. *For Information, call Dorothy Duncan at (212) 306-5229.* Further details may be found within the RFI.

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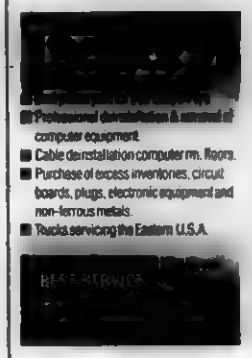

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Gainers

Percent

Micrognosis Inc.	31.8
Compuware Inc.	30.8
IPL Systems Inc.	29.1
Kendall Square Research(H)	22.2
Centigram Communications	20.4
VLSI Technology	19.3
Computer Horizons(H)	18.9
Computer Task Group	18.8

Dollar

Matsushita Electronics	8.13
Centigram Communications	5.75
Micrognosis Corp.	4.50
Kendall Square Research(H)	4.50
Tandy Corp.	4.25
Shiva Data Systems	3.50
Intelligent Info. Systems(H)	3.50
Compusa Inc.	3.50

Losers

Percent

Sequoia Systems Inc.	-17.0
Interleaf Inc.	-12.1
Meca Software	-11.4
Edmark Corp.	-11.1
Gateway Communications	-10.7
Cray Computer	-8.8
Artel Communication Corp.	-8.8
Western Digital Corp.	-8.7

Dollar

Newbridge Networks Corp.(U)	-3.88
Cisco Systems Inc.	-3.13
Texas Instruments	-3.00
Cabletron Systems	-2.63
Synoptics Communications	-2.00
Advanced Micro Devices	-1.88
Wellfleet Communications	-1.88
Chipcom Corp.	-1.75

A long, strange trip

Mobile data/fax modem maker Megahertz Corp. (MEGZ) is positioned for rapid growth, according to several Wall Street firms. The Salt Lake City company announced record revenue and earnings in the quarter ending June 30. It has taken a strange road to success, however.

Founded in 1985, Megahertz entered a reverse merger in 1986 with Vector Development, a small public company with a "penny stock," according to David Spafford, Megahertz's executive vice president.

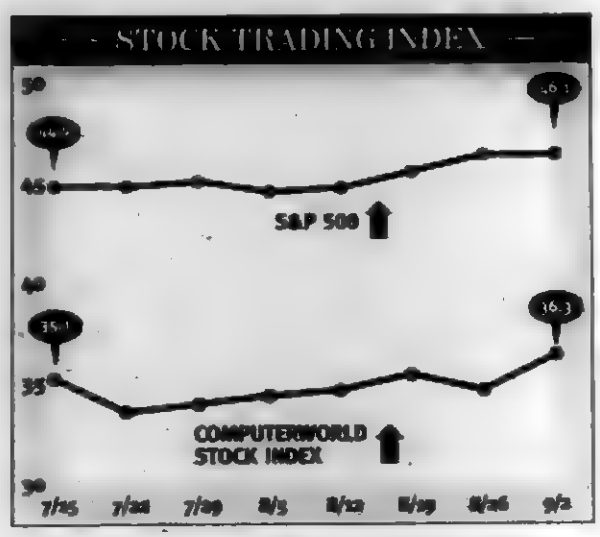
Not much synergy came of the combination. By 1988, Megahertz and its smaller parent company were faring poorly. Megahertz was bought out of the vehicle by a public holding company, VyStar Group, Inc., which turned Megahertz into a private subsidiary.

The company's fortunes finally improved. By last year, Megahertz was significantly outperforming everything else in VyStar's odd mix of holdings, which also included an air-conditioning enhancement manufacturer.

VyStar, its own stock wallowing as low as 3, decided to shed some dead weight. Selling off its other properties, VyStar underwent a 2-for-1 stock split, changed its name to Megahertz Corp., installed the Megahertz subsidiary's management team atop the whole corporation and made a new public offering with a share value of 13.

"The corporate structure is very clean now," said William K. Woodruff & Co. analyst Vernon Essi. Megahertz shares have jumped to over 18.

— Derek Slater



Each	52-Week Range			Sept. 6 2PM	Wk Net Change	Wk Pct Change
Communications and Network Services						UP 183
OTC	40.00	11.50	3 COM Corp.	26.13	-0.75	-2.8
NYS	87.13	63.38	American Info Techs Corp.(H)	87.00	3.38	4.0
NYS	65.00	46.63	AT&T	62.75	0.50	0.8
OTC	4.06	0.75	Artel Communication Corp.	3.25	-0.31	-8.8
OTC	24.50	12.50	Banyan Systems Inc.	19.50	1.50	8.3
NYS	64.13	44.50	Bell Atlantic Corp.(H)	61.88	2.75	4.5
NYS	60.00	46.75	Bellsouth Corp (H)	60.00	2.88	5.0
NYS	14.75	3.63	Bolt, Beranek & Newman	10.75	-0.63	-5.5
OTC	18.50	9.50	Brooktrout Technology	11.75	-0.50	-4.1
NYS	119.00	56.63	Cabletron Systems	105.38	-2.63	-2.4
OTC	34.00	5.88	Centigram Communications	34.00	5.75	20.4
OTC	55.50	20.25	Chipcom Corp	50.00	-1.75	-3.4
OTC	59.25	24.00	Cisco Systems Inc.	68.38	-3.13	-6.1
OTC	16.38	5.50	Compression Labs Inc.	14.25	0.00	0.0
OTC	36.00	16.25	CrossComm	24.00	-1.50	-5.9
OTC	4.63	1.50	Data Switch Corp.	2.63	-0.13	-4.5
NYS	19.88	12.38	Digital Comm. Assoc.	13.38	-0.63	-4.5
OTC	12.75	3.75	Digital Systems Int'l Inc.	4.63	0.63	15.6
OTC	66.25	8.50	DSC Communications(H)	66.25	3.38	5.4
OTC	9.50	4.75	Fibronix Int'l Inc.	6.00	0.88	17.1
OTC	24.00	8.75	Filenet Corp	14.25	0.50	3.6
OTC	4.38	1.50	Gandalf Technologies Inc.	2.63	0.00	0.0
OTC	2.06	0.75	Gateway Communications	0.97	-0.09	-8.8
NYS	15.75	3.13	General Datacomm Inds.	11.50	-0.75	-6.1
ASE	3.75	2.00	Go Video	2.75	0.38	15.8
NYS	37.75	32.38	GTE Corp.	36.63	0.13	0.3
NYS	94.75	62.75	ITT Corp.(H)	92.13	-1.50	-1.6
OTC	29.88	16.81	MCI Communications Corp.	29.00	2.50	9.4
OTC	6.50	1.50	Microcom Inc.	2.38	0.56	31.0
OTC	24.25	3.50	Netrix Corp.	5.50	-0.38	-6.4
OTC	19.00	7.00	Network Computing Devices	7.75	0.00	0.0
NYS	15.00	5.38	Network Equipment Tech.	9.00	-0.63	-6.5
OTC	20.13	8.00	Network General	12.88	0.25	2.0
OTC	15.75	6.88	Network Systems Corp.	8.38	0.00	0.0
OTC	73.88	7.88	Newbridge Networks Corp.(H)	69.63	-3.88	-5.3
NYS	46.00	21.38	Northern Telecom Ltd.	27.00	0.88	3.3
OTC	35.25	17.63	Novell Inc.	19.00	-0.25	-1.3
NYS	92.75	79.00	Nynex Corp.(H)	92.38	3.38	3.8
OTC	30.00	14.50	Octel Communications Corp.	20.25	0.25	1.3
OTC	6.13	3.38	Penril Data Comm Networks	4.25	0.25	6.3
OTC	30.50	12.25	Picturetel Corp.	17.38	0.88	5.3
OTC	15.25	3.63	Proteon Inc.	5.38	0.25	4.9
NYS	37.75	17.00	Scientific Atlanta Inc.(H)	36.63	0.63	1.7
NYS	45.63	31.75	Southwestern Bell Corp.(H)	45.50	1.50	3.4
NYS	37.25	22.25	Sprint Corp.(H)	37.13	0.25	0.7
OTC	27.00	12.50	Standard Microsystems Corp.	18.75	-0.38	-2.0
OTC	18.50	9.00	Stratacom Inc.	13.00	0.00	0.0
OTC	42.75	12.75	Synoptics Communications	26.63	-2.00	-7.0
OTC	6.63	2.88	Telebit Corp.	4.88	0.13	2.6
OTC	13.88	2.38	Telematics Int'l Inc.(H)	13.88	1.00	7.8
OTC	30.00	14.00	US Robotics	30.00	1.00	3.4
NYS	47.75	35.25	US West Inc.	47.00	1.00	2.2
OTC	56.00	19.38	Wellfleet Communications	47.75	-1.88	-3.8
OTC	19.00	7.25	Xircom	18.75	1.00	5.6
PC and Workstations						UP 115
OTC	5.56	2.50	Advanced Logic Research	3.00	-0.13	-4.0
OTC	65.25	25.25	Apple Computer Inc.	25.50	-0.88	-3.3
OTC	24.25	12.25	AST Research Inc.	15.50	0.75	5.1
NYS	9.25	2.50	Commodore Int'l	3.63	0.25	7.4
NYS	61.75	31.00	Compaq Computer Corp.	55.38	2.63	5.0
OTC	49.88	13.50	Dell Computer Corp.	18.00	0.00	0.0
NYS	89.25	50.25	Hewlett Packard Co.	72.75	-1.13	-1.5
NYS	41.00	17.63	Silicon Graphics	40.38	1.00	2.5
OTC	41.00	24.00	Sun Microsystems Inc.	27.50	2.38	9.5
NYS	33.75	23.38	Tandy Corp.	33.75	4.25	14.4
OTC	7.00	2.75	Zeos International Ltd.	3.13	0.00	0.0
Large Systems						UP 120
ASE	15.13	4.63	Amdahl Corp.	4.81	0.00	0.0
NYS	8.75	3.63	Convex Computer	4.25	-0.25	-5.6
OTC	6.13	2.25	Cray Computer	3.13	-0.38	-10.7
NYS	30.88	19.00	Cray Research Inc.	23.50	0.63	2.7
NYS	13.88	7.75	Data General Corp.	9.25	0.25	2.8
NYS	69.25	30.38	Digital Equipment Corp.	42.38	1.75	4.3
NYS	44.00	28.75	Harris Corp.	40.50	-0.50	-1.2
NYS	88.75	40.63	IBM	45.88	2.13	4.9
OTC	24.75	5.50	Kendall Square Research(H)	24.75	4.50	22.2
NYS	141.50	83.00	Matsushita Electronics	141.50	8.13	6.1
OTC	23.75	8.25	Netframe	13.88	-0.25	-1.8
OTC	22.75	9.25	Parallan Computer(H)	22.75	2.75	13.8
OTC	23.25	6.00	Pyramid Technology(H)	21.00	-1.63	-7.2
OTC	24.00	11.75	Sequent Computer Sys.	14.88	-0.38	-2.5
OTC	8.75	1.38	Sequoia Systems Inc.	2.75	-0.56	-17.0
NYS	48.38	20.25	Stratus Computer Inc.	25.25	-0.13	-0.5
NYS	16.88	8.50	Tandem Computers Inc.	9.88	1.13	12.9
OTC	23.50	10.63	TriCord Systems	19.25	0.13	0.7
NYS	13.88	7.75	Unisys Corp.	10.88	0.13	1.1
Software						UP 1 31
OTC	37.00	12.63	Adobe Systems Inc.	20.75	0.00	0.0
OTC	20.75	10.25	Aldus Corp.	18.00	0.50	2.9
OTC	11.25	5.50	American Software Inc.	7.50	0.50	7.1
OTC	28.13	9.50	ASK Computer Systems	11.25	-0.13	-1.1
OTC	56.75	38.75	Autodesk Inc.	48.75	3.13	6.8
OTC	8.75	2.50	Bachman Info. Systems	3.75	-0.25	-6.3
OTC	43.00	28.00	BGS Systems Inc.(L)	30.00	1.00	3.4
OTC	84.13	38.75	BMC Software Inc.	56.38	-1.75	-3.0
OTC	28.25	18.00	Boole & Babbage	23.50	-0.13	-0.5
OTC	49.00	15.25	Borland Int'l Inc.	18.50	0.75	4.2
OTC	5.00	2.75	CE Software	3.25	0.13	4.0
ASE	40.25	10.41	Cheyenne Software Inc.(H)	37.00	-0.75	-2.0
OTC	19.50	8.25	ChipSoft	14.00	-1.00	-6.7
OTC	8.88	5.63	Cognos Inc.	8.25	0.13	1.5
NYS	31.38	14.38	Computer Associates	30.88	0.88	2.9
NYS	11.25	2.75	Computervision Corp.	3.25	-0.13	-3.7
OTC	34.25	19.25	Compuware Corp.	27.25	-0.75	-2.7
OTC	14.75	5.75	Comshare Inc.	9.75	2.25	30.0
OTC	29.75	10.75	Corel Corp.(H)	28.25	0.50	1.8
OTC	15.25	5.00	Easel Corp.	5.75	-0.25	-4.2
OTC	25.25	12.00	4th Dimension	18.00	-1.00	-5.3
OTC	19.50	5.25	Frame Technology	8.13	0.38	4.8
OTC	17.50	8.38	Group I Software	10.00	0.00	0.0
OTC	35.25	14.50	Gupta	17.38	0.13	0.7
OTC	10.25	4.13	Hogan Systems Inc.	9.38	0.50	5.6
OTC	25.75	11.25	IMRS	18.75	0.00	0.0
OTC	39.25	21.50	Information Resources(H)	39.25	2.00	5.4
OTC	27.25	9.38	Informix Corp.	23.00	2.75	13.6
OTC	15.00	8.50	Intergraph Corp.	11.00	0.00	0.0
OTC	13.63	6.00	Interleaf Inc.	6.88	-0.13	-1.8
OTC	18.00	4.75	Intersolv Inc.	7.25	-1.00	-12.1
OTC	16.00	7.75	Knowledgeware Inc.	11.25	0.50	4.7
OTC	54.75	15.50	Legent Corp.	19.88	0.13	0.6
OTC	40.13	14.75	Lotus Development	33.50	2.75	8.9
OTC	23.00	4.75	MathSoft(L)	5.25	0.13	2.4
OTC	23.25	4.50	McAfee Associates	9.50	-0.50	-5.0
OTC	11.63	2.50	Meca Software	4.88	-0.63	-11.4
OTC	12.00	5.25	Mentor Graphics	10.00	0.25	2.6
OTC	46.00	26.25	Micro Focus	29.25	-1.00	-3.3
OTC	13.25	4.38	Micrografx Inc.	6.56	-0.06	-0.9
OTC	98.00	70.38	Microsoft Corp.	76.25	4.50	6.3
OTC	56.88	18.25	Oracle Corp.(H)	52.75	1.50	2.9
OTC	40.00	21.38	Parametric Technology(H)	39.50	2.25	6.0
OTC	40.50	22.50	Peoplesoft	34.25	0.38	1.1
OTC	7.13	3.75	Phoenix Technologies	4.38	0.25	6.1
OTC	40.00	22.00	Powersoft	27.25	-0.25	-0.9
OTC	41.50	17.00	Platinum Software	25.75	0.92	3.7
OTC	25.00	10.75	Platinum Technology	12.50	-0.50	-3.8
OTC	61.50	32.25	Progress Software Corp.	49.75	1.50	3.1
OTC	7.38	2.56	Quarterdeck Office Sys.	2.94	-0.13	-4.1
OTC	32.00	15.00	Rainbow Technologies Inc.	27.50	0.00	0.0
OTC	11.38	6.00	Rasterops(H)	10.50	0.13	1.2
OTC	15.25	3.63	Ross Systems	11.00	0.75	7.3
OTC	27.75	9.63	Sapiens Intl. Corp. N.V.	26.25	3.50	15.4
OTC	14.50	5.50	Software Publishing Corp.	7.25	0.13	1.8
OTC	14.25	2.63	Software Toolworks Inc.(H)	12.75	-0.63	-4.7
OTC	2.75	0.75	Spinnaker Software	1.63	0.00	0.0
OTC	13.75	3.25	State of the Art	13.25	0.38	2.9
NYS	24.63	15.00	Sterling Software Inc.	22.75	0.13	0.6
OTC	21.63	8.00	Struct. Dynamics Research	20.00	-0.50	-2.4
OTC	77.50	30.00	Sybase Inc.	60.75	1.25	2.1
OTC	18.63	5.88	Symantec Corp.	16.88	1.13	7.1
OTC	25.50	10.00	System Software Assoc.	17.50	-0.25	-1.4
OTC	6.38	2.75	Tenzec Corp.	4.00	-0.13	-3.0
OTC	24.25	11.25	ViewLogic Systems(H)	21.75	-0.25	-1.1
OTC	23.50	5.50	Walker Interactive Systems	6.00	0.00	0.0
OTC	3.19	1.00	Wordstar	1.19	0.06	5.6
Semiconductors						UP 1 44
NYS	32.88	10.63	Advanced Micro Devices	29.25	-1.88	-6.0
NYS	26.13	9.75	Analog Devices Inc.	26.13	2.63	11.2
OTC	35.00	9.13	Atmel Corp.	32.75	-0.63	-1.9
OTC	6.25	2.75	Chips and Technologies (H)	5.63	0.13	2.3
OTC	39.75	13.00	Cirrus Logic	24.63	-1.38	-5.3
NYS	16.75	7.88	Cypress Semiconductor Corp.	14.25	-0.75	-5.0
NYS	19.00	10.38	Dallas Semiconductor	17.50	0.38	2.2
OTC	67.25	30.13	Intel Corp.	63.00	-0.75	-1.2
NYS	19.25	5.38	LSI Logic Corp.	17.13	-0.13	-0.7
OTC	25.75	11.66	Lattice Semiconductor(H)	24.50	0.75	3.2
NYS	56.50	14.38	Micron Technology	51.63	0.13	0.2
NYS	99.13	41.38	Motorola Inc.	94.00	-1.63	-1.7
NYS	19.50	10.13	National Semiconductor	18.63	0.38	2.1
OTC	15.75	6.50	Sierra Semiconductor	8.00	-0.25	-3.0
OTC	51.75	24.75	SynOptys	49.75	1.75	3.6
NYS	84.25	39.00	Texas Instruments	77.75	-3.00	-3.7
OTC	16.25	6.50	VLSI Technology	16.25	2.63	19.3
OTC	13.25	2.63	Weitek	12.25	0.25	2.1
ASE	9.63	3.63	Western Digital Corp.	5.25	-0.50	-8.7
OTC	66.25	14.50	Xilinx	42.25	-0.25	-0.6
OTC	33.00	17.16	Zilog Inc.	32.00	1.75	5.8
Peripherals and Subsystems						UP 1 26
OTC	48.00	15.75	American Power Conversion	44.50	0.75	1.7
OTC	20.16	15.50	Banctec Inc.	18.75	0.50	2.7
OTC	18.00	3.56	Cambex Corp.(L)	4.00	0.25	6.7
ASE	18.38	3.88	Cognitronics Corp.	5.25	-0.13	-2.3
NYS	25.50	9.00	Conner Peripherals	11.00	-0.25	-2.2
OTC	38.50	13.00	Creative Technologies Inc.	21.25	0.50	2.4
OTC	30.75	11.00	Data Race Inc.	13.50	-0.25	-1.8
ASE	13.25	4.75	Databam Corp.	7.75	-0.13	-1.6
NYS	35.00	5.34	EMC Corp.(H)	32.38	-0.50	-1.5
OTC	10.50	5.38	Emulex Corp.	5.88	-0.75	-11.3
OTC	19.00	13.25	Evans & Sutherland	18.25	1.50	9.0
OTC	25.00	7.50	Exabyte	9.88	-0.13	-1.3
OTC	33.75	7.66	Intelligent Info. Systems(H)	33.75	3.50	11.6
OTC	8.88	3.38	Iomega Corp.	3.50	-0.25	-6.7
OTC	15.25	5.75	IPL Systems Inc.	8.00	1.50	23.1
OTC	24.00	14.25	Komag Inc.	18.50	-1.75	-8.6
OTC	19.63	4.38	Maxtor Corp.	6.00	-0.50	-7.7
OTC	10.75	5.75	Micropolis Corp.	7.25	0.00	0.0
NYS	137.00	97.00	3M Corp	107.50	-1.13	-1.0
OTC	7.75	4.00	Printronix Inc.	7.00	0.50	7.7
NYS	17.25	6.88	QMS Inc.	8.38	-0.63	-6.9
OTC	17.88	9.50	Quantum Corp.	12.63	0.63	5.2
OTC	7.25	3.13	Radius Inc.	5.13	0.63	13.9
NYS	16.50	9.13	Recognition Equipment	16.25	0.50	3.2
OTC	13.88	3.75	Reton Inc.	4.63	0.13	2.8
OTC	22.38	12.00	Seagate Technology	19.75	0.13	0.6
NYS	45.00	18.00	Storage Technology	30.50	1.38	4.7
NYS	37.88	17.63	Tektronix Inc.	24.13	-1.00	-4.0
NYS	88.88	70.25	Xerox Corp	72.50	-1.63	-2.2
Services						UP 1 12
OTC	23.75	14.88	American Mgmt. Systems	17.88	0.13	0.7
NYS	4.75	2.38	Analogic Inc.	2.88	-0.13	-4.2
OTC	35.75	17.50	Analysts Int'l	34.25	-0.50	-1.4
NYS	56.13	44.63	Auto Data Processing	48.88	1.00	2.1
NYS	17.25	13.00	Ceridian Corp.	16.63	-0.25	-1.5
NYS	17.38	13.13	Comdisco Inc.	14.50	0.13	0.9
OTC	11.00	4.50	Computer Horizons(H)	11.00	1.75	18.9
NYS	91.63	65.25	Computer Sciences	91.38	3.13	3.6
NYS	9.25	6.00	Computer Task Group	7.13	1.13	18.8
NYS	40.50	19.00	Compusa Inc.	29.88	3.50	13.3
OTC	14.25	7.00	Corporate Software	10.75	-0.25	-2.3
OTC	12.75	6.63	Egghead Discount Software	7.13	-0.25	-3.4
NYS	35.88	26.00	General Motors E (EDS)	31.88	1.63	5.4
OTC	25.50	10.50	Inacom Corp.	20.25	-0.25	-1.2
OTC	17.50	8.13	Intelligent Electronics(H)	16.50	0.00	0.0
OTC	15.13	7.13	Merisel(H)	15.00	1.75	13.2
OTC	24.50	5.75	Microage Inc.	22.25	0.50	2.3
OTC	33.00	17.84	Patchen(L)	31.25	0.75	2.5
NYS	87.25	21.63	Policy Management Sys.	24.25	0.38	1.6
NYS	43.63	20.75	Reynolds and Reynolds	41.25	0.25	0.6
OTC	19.00	12.00	SEI Corp.(H)	19.00	0.88	4.8
OTC	24.38	17.50	Shared Medical Systems	22.00	-0.50	-2.2
OTC	12.63	5.75	SHL Systemhouse	10.00	-0.38	-3.6
OTC	30.75	20.00	Software Spectrum Inc.	25.75	0.75	3.0
OTC	40.25	23.75	Sungard Data Systems	40.25	3.50	9.5
NYS	6.38	1.13	Ultimate Corp.	2.88	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

Developers merge

Intuit, Inc., a developer of financial applications, and Chipsoft, Inc., a maker of tax preparation software, have signed an agreement to merge. The merger, which is expected to be completed by December subject to shareholder and government approval, will enable the two firms to offer integrated software marrying both product lines. Chipsoft will become a subsidiary of Intuit. The deal is valued at approximately $225 million

Micrografx in black

Micrografx, Inc. returned to the black — barely — in its first fiscal quarter, ended June 30. The company reported revenue of $13.4 million and net income of $110,000 or $.01 per share compared with revenue of $14 million and net income of $89,000, or $.01 per share in the same period a year ago.

SHORT TAKES Larry Michels, former president, chief executive officer and chairman of The Santa Cruz Operation (SCO), was named chairman of General Automation, Inc. Michels recently retired from SCO amid charges of sexual harrassement. . . . Cayman Systems, Inc. appointed Brad Noblet as president and CEO. He replaces Ted Stabler, company co-founder, who was named chairman. . . . Richard P. Fishman has been named president and chief operating officer at Thinking Machines Corp. . . . Verity, Inc. has appointed Philippe Courtot as president, CEO and chairman. He was formerly president and CEO of CC:Mail. Courtot replaces Michael S. Pliner. . . . Paul Brainerd was named chairman of Aldus Corp. Still president, he will continue to serve as CEO until a replacement is found. . . . Symantec Corp. promoted Eilen W. Taylor to executive vice president and general manager of Peter Norton Computing Group. She has been acting general manager since May.

Flying solo, CDS now flying high

But Control Data Systems must wean self from mainframe revenue

By Ellis Booker
ARDEN HILLS, MINN.

With four profitable quarters behind him, Control Data Systems, Inc. President and Chief Executive Officer Jim Ousley can justifiably breathe a small sigh of relief. But he better not relax too much.

Not with a stated goal to shift Control Data Systems revenue streams away from proprietary mainframes — currently 38% of total revenue — and to instead have virtually all revenue come from open systems sales, systems integration services and consulting by 1995.

Control Data System's *James E. Ousley*

Ousley's guidance

Since its spin-off more than a year ago [CW, June 1, 1992] from Control Data Corp. (CDC) — since renamed Ceridian — Control Data Systems has prospered under Ousley's oft-praised "pragmatic" strategy of refashioning the company into a business focused on remarketing open systems platforms and offering systems integration services in the areas of manufacturing design, network communication and database management.

On the open systems front, Control Data Systems currently markets platforms from Silicon Graphics, Inc., which took a 10% stake in Control Data Systems in 1992; Sun Microsystems, Inc.; and, in a deal inked last month, the entire line of workstation and server products from Hewlett-Packard Co. The company also sells NEC Corp. supercomputers.

More recently, Control Data Systems has shifted its focus to address the second half of Ousley's strategy: augmenting high-end-oriented systems integration expertise with PC local-area network know-how through acquisitions and lessening the company's dependence on mainframe-based revenue.

Control Data Systems recently concluded a $22 million acquisition of LAN integrator Evernet Systems, Inc. and expects to finalize its purchase, for an as-yet unannounced amount, of $50 million Canadian integrator Antares Electronics, Inc. this quarter.

Evernet's experience in multivendor network integration, combined with Control Data Systems' experience with complex enterprise systems, will create a new Control Data Systems able to offer integration solutions on virtually all hardware and software platforms, said Arnie Tomaino, an analyst at International Data Corp., a market research firm in Framingham, Mass.

Unlike some of its systems vendors competitors — IBM, Digital Equipment Corp., etc. — Control Data Systems has given up its own hardware line and therefore does not have a vested interest in pushing one kind of integrated solution, according to analysts.

Stocks on the rise

In response to these moves, Wall Street has generally evaluated the company kindly, sending its stock price up 35% to 50% — to just over $12 — since the first day of trading, when the market closed at 7.

"Long term, I think [Wall Street] needs eight quarters of profit . . . and I think we will do that," Ousley said. By Control Data Systems' own assessments, in the four quarters before the spin-off, it would have posted a $175 million loss, with $130 million associated with restructuring charges. In the four quarters since the spin-off, the company has posted net earnings of $15.8 million.

Yet industry analysts pointed out that profitable quarters do not a business make. That is, while Control Data Systems has clearly cut operating, marketing and research and development expenses, is it attracting new business beyond its 1,800 or so existing Cyber sites? "The question is, are they in a harvest mode, getting business from their installed base?" asked Thomas Willmott, a vice president at Aberdeen Group in Boston.

Bad habits

Despite some successful forays into other businesses, the fact is that Control Data Systems has not entirely left the past behind. It has not shed its reliance on proprietary mainframes, the business that almost destroyed parent CDC, which lost more than $1 billion in the 1980s. About 40% of Control Data Systems revenue still comes from its remaining Cyber mainframe customer base.

Ousley responded that most of that 40% is maintenance. "I think we'll sell very few mainframes in 1994," he added. For now, the company's margins are "in the high 30%," according to Ousley, who noted that his business model calls for the company to be profitable with a 35% margin coming mostly from open systems sales, software and consulting. This compares with the 50% to 60% gross margins Control Data Systems once enjoyed on its Cyber sales.

Back-to-back

Since spinning off from Ceridian a year ago, Control Data Systems has posted four profitable quarters

PROFIT IN MILLIONS

1993	[illegible]	[illegible]
	First quarter	$4.3
1992	Fourth quarter	$ee
	Third quarter	$0.21

NCR/NEC union signals trend

By Michael Fitzgerald
DAYTON, OHIO

NCR Corp.'s announcement of a notebook OEM deal with NEC Corp. last week not only pads NCR's laptop line and heightens NEC's visibility in the notebook market but also signals consolidation in the portable industry.

NCR is relabeling NEC's high-end UltraLite Versa as the NCR Safari 3180, replacing the NCR Model 3170 as the high end of NCR's portable line. The 3170 was discontinued in July. NCR had been developing a product similar to NEC's Versa but scrapped it following the OEM deal with NEC.

In addition, the pact allows for future joint development.

Devoted partner

The deal with NEC means NCR is now focused on developing its notebook products with partners. NCR's current low-end model, the 3150, is a product of an effort with The Samsung Group. Nicole Kelly, director of marketing at NCR, said NCR will use this relationship to target future low-end products.

Analysts called the move pragmatic on the part of both companies.

After AT&T purchased NCR, the combined companies had problems bringing new notebooks to market in a timely fashion, analysts said. "NCR has done notebooks successfully, especially at the high end, but had fallen behind, so why should it waste expertise on things you can just as easily get someone else to make?" asked David Coursey, editor of "P.C. Letter" in San Mateo, Calif.

NEC, which has seen its U.S. and European fortunes flag in recent years, gains a broader marketing presence for Versa.

"This deal gives NEC volumes," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass. "NEC needs to raise its visibility."

Wysiwyg

Other than that, the document was complete

A report from the U.S. General Accounting Office outlining problems with the Securities and Exchange Commission's Electronic Data Gathering, Analysis and Retrieval system said the development project is years behind schedule and millions over budget. The original system requirements document delivered by a contractor "lacked a description of the system inputs, outputs and data characteristics."

Thought for the day

You know you've got a network virus when your node gets all stuffed up.

Tech trivia

1. Scott Adams sometimes puts his Internet E-mail address between his syndicated comic strip's panels. What comic strip does he draw?
2. What is the name of the legendary creature lurking in the depths of the Macintosh technical Hypercard stack?
3. Amiga was known for what product before developing its PC? Was it a foot-operated joystick, bread-baking machine or gas-powered hard-disk drive?

1. Dilbert
2. Claris, the dog-cow
3. Foot-operated joystick

Great names

Lindsay Metwall
Service manager
Takes care of sick systems for customers of computer reseller Sarcom in Worthington, Ohio

Source: Word Watch, The Database Group; The Computer Museum, Boston.

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The 5th Wave *by* Rich Tennant

Inside Lines

Plug-and-play party

Microsoft will have something of a coming-out party for "Chicago" in San Francisco this week when it will spill the technical details on how the unreleased operating system fits in with its new "Plug and Play framework" architecture. Also attending the briefing will be a raft of hardware makers — including IBM, Compaq and Intel — that will also lay out plans for how their products will take advantage of the Plug and Play architecture. The Plug and Play Version 1.0 spec, which was first distributed in June, defines a new BIOS, new devices and device drivers, as well as new software that enables Plug and Play to work across a range of hardware.

Barely managing

Banyan plans this week to fill a key hole in its Enterprise Network Services (ENS) strategy: networked storage management. While Banyan does provide some backup, users have been clamoring for a more network services-based solution. Integration with ENS would allow network administrators to program automatic back-up of clients across the enterprise, which could be accessed via Banyan's global directory service.

Get the picture?

Word is that Apple Chairman John Sculley was reportedly offered the head position at Kodak — but turned it down. Many insiders speculate Sculley will be gone from Apple shortly after the introduction of the first PowerPC-based Macintosh in January.

Bosom buddies no more

Officials at Next Computer are busy combating speculation that the company has had a falling out with longtime partner Canon, which pumped into Next more than $100 million in cash and credit in the past eight years. Seems Next has announced the public auction of all items from its former state-of-the-art hardware factory in Fremont, Calif. — the same factory Next officials said Canon was ready to buy lock, stock and barrel earlier this year. Next officials now admit that Canon's interest has diminished.

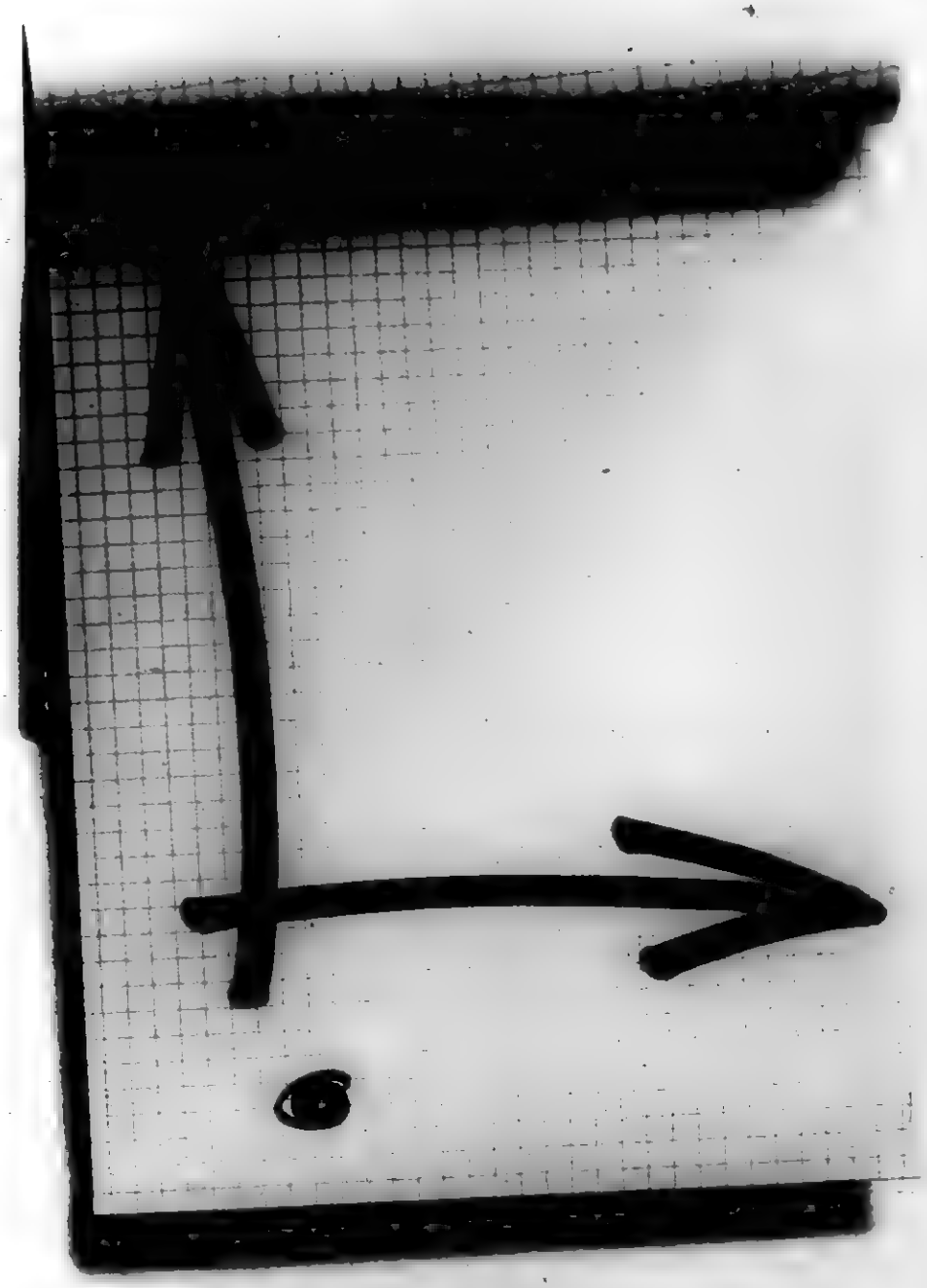
Holding hands

Compaq's Innovate technology summit will have at least one announcement not exclusively related to Compaq. On Tuesday, sources say Microsoft, Intel and VLSI will join Compaq to announce an alliance to define parameters for handheld devices in the DOS world. One source close to the effort said the alliance will try to deflate the "compute anywhere" hype generated by Apple's Newton but added that handhelds will be useful products before wireless standards settle in the middle of next year. Several sources said Compaq will not demonstrate its Mobile Companion prototype at Innovate, nor will Microsoft show WinPad.

Islands in the stream

Early adopters of Digital's DECpc AXP 150 PC running under Microsoft's Windows NT will have to wait a bit longer before they can tie the system — or Intel-based PCs, for that matter — into LANs based on Digital's Pathworks software. A Pathworks for Windows NT release that was due to ship this month will not ship until later in the year, Digital confirmed. At least one Pathworks customer said he was told not to expect the NT software until November.

Hey, go on and adopt a devil-may-care attitude and don't even bother striving to curb world hunger, cure cancer or save the environment. According to a new book, S.T.A.R., by Gary G. Bellessmen, our destiny is being controlled by a computer embedded deep inside the Earth hundreds of millions of years ago by an advanced civilization. The author asserts in his ultimate technology-gone-crazy work that the computer processes our every move and uses the data for a child's game called "The Game of Life." KR Associates in Cliffside, N.J., is distributing the book. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (503) 675-9081 or 75537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.



On The Excitement Scale, Where Does Managing Data In A Client/Server Environment Fall?

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COMPUTERWORLD

WITH THIS ISSUE: CW's 1993 PREMIER 100

LAN-to-host networking

SNA link pits Novell vs. Microsoft

By Elisabeth Horwitt

■ NetWare users with heavy IBM host connectivity needs could reap some big cost/performance benefits once Microsoft Corp. ships its challenge to Novell, Inc. in the Systems Network Architecture gateway market.

SNA Server, which is due to ship next month, is a Microsoft NT Advanced Server version of a 3-year-old OS/2 product co-developed with Digital Communications Associates, Inc. It offers functionality the same as or better than Novell's NetWare for SAA product at about one-fifth the price, claimed one beta-test user and Othniel Palomino, Microsoft product manager.

For example, one copy of SNA Server, priced at $6,000, is said to support more than 500 host sessions on up to 50 hosts. In contrast, it takes two copies of NetWare for SAA, for a total cost of about $30,000, to support 500-plus sessions, Novell conceded. Plus, Novell's gateway currently provides links to only two hosts.

SNA link, *page 12*

IBM to skirt Windows

By Ed Scannell

In an effort to sever its last tie with Microsoft Corp., IBM is working on an integration technology that would emulate Windows, freeing IBM from the royalties it now pays to Microsoft on every copy of OS/2 sold.

The project, which sources said they expect to be finished by year's end, could mean significant savings for IBM. It could also give the company the leverage it needs to more aggressively price OS/2.

Selected developers got their first look at the code last week, sources close to IBM said.

IBM is in no way attempting to completely reverse-engineer Windows to accomplish its goal. Instead, the integration technology, once installed on a PC, will identify the Windows code and the hardware it is running on and seamlessly integrate the code with OS/2. The technology may be built into a shrink-wrapped version of OS/2 or electronically distributed to user sites.

IBM has been paying Microsoft about $20 for every copy of OS/2 sold.

"What they have figured out how to do is tweak the major executables within Windows,"

IBM, *page 20*

Not a pretty view

Windows has matured, but pesky bugs, a lack of robust network management tools and a dearth of experts are hindering one shop's rollout.

See story page 107.

Client/server limits stall retailer

By Kim S. Nash
SEATTLE

As Microsoft Corp. prepares to unveil its SQL Server for Windows NT database later this month, at least one major beta-test customer has tripped over problems it has encountered building a critical client/server application that uses the technology.

Nordstrom, Inc., a $3.2 billion retailer here, has hit the ceiling trying to scale up a departmental client/server merchandising system built with Microsoft's Visual Basic.

Technology tussle

Nordstrom's client/server effort was snagged by a lack of administration utilities. Possible resolutions would be to:
•Make do with limited utilities built into Microsoft products.
•Buy third-party aids.
•Build tools in-house.
•Delay companywide implementation until Microsoft improves Windows NT utilities.

A lack of middleware to link NT to IBM's DB2 has held up plans to grow a multimillion-dollar, Windows NT-based decision-support system from a small pilot in Oregon to 900 users companywide, according to sources inside and outside of Nordstrom.

Sticking to it

Yet the retailer presses on, with no plans to abandon the mission-critical application. "There may be trouble — there always is when you're trying something new. But we're trying to work it out," said Dave Benton, head of systems services.

Historically cutthroat, the retail industry is becoming more so as the recession wears on. To stay competitive, Nordstrom must move

Retailer, *page 28*

Feds to downsize with IT

Gore report highlights technology projects

By Gary H. Anthes
WASHINGTON, D.C.

Information technology will play a central role in streamlining federal bureaucracy and improving public services, according to the Clinton administration's "reinventing government" plan revealed last week.

The report, a by-product of the six-month National Performance Review led by Vice President Al Gore, calls for wide deployment of networks, on-line databases and citizen-accessible applications intended to create an "electronic government" in which federal agencies establish digital links with one another and with the public.

"We are determined to move from an Industrial Age government to an Information Age government, from a government preoccupied

Feds, *page 16*

Treasury Dept.'s James Flyzik: *The National Performance Review team will showcase information technology 'because we have a champion in the vice president'*

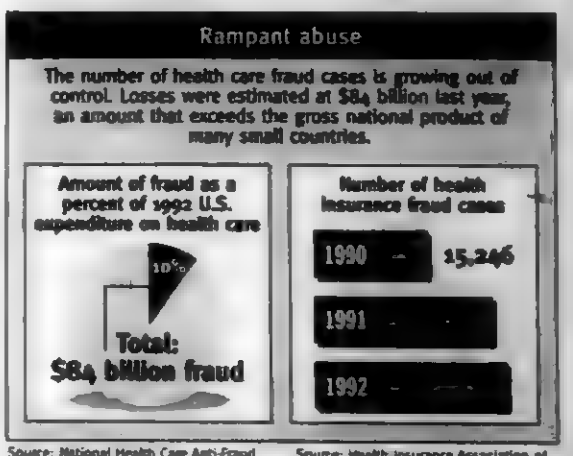
Health fraud: Computers at war

By Mitch Betts
WASHINGTON, D.C.

Sometimes, computers are part of the problem. In the 1980s, a man and his sons looted $16 million from Medicaid by programming their medical clinic's computer to generate phony claims for nearly 400,000 phantom patient visits.

But in a case of fighting fire with fire, computers can also be part of the solution to the nation's $84 billion problem with medical billing fraud and abuse. Many insurance

Health fraud, *page 14*



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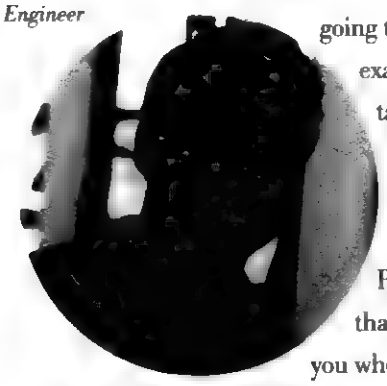
Jay Pancost
IBM Customer Engineer



To IBM Customer Engineer Jay Pancost, going the extra mile often means exactly that. His service calls take him to homes and offices from the Grand Canyon to the Hopi and Navajo reservations. "When you buy a PC," he says, "the company that made it should be there for you when you need them. I like the idea of a job where people are always glad to see me, even if they're sometimes surprised I would go so far off the beaten path." Wherever you may be, there are more than 10,000 IBM service representatives like Jay Pancost, in over 1,600 locations nationwide, at your service. Right where you want them.

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L-R: Alice Robinson, Gregg McGhee, Jeff Herman and Beverly Whitman, Custom Build Technicians, IBM Personal Computer Company

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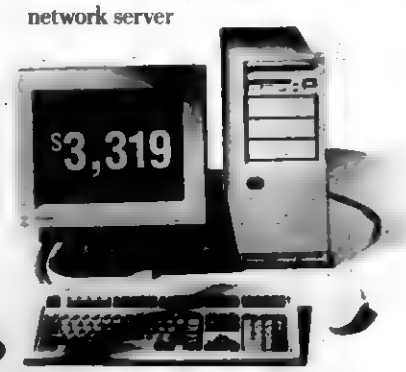

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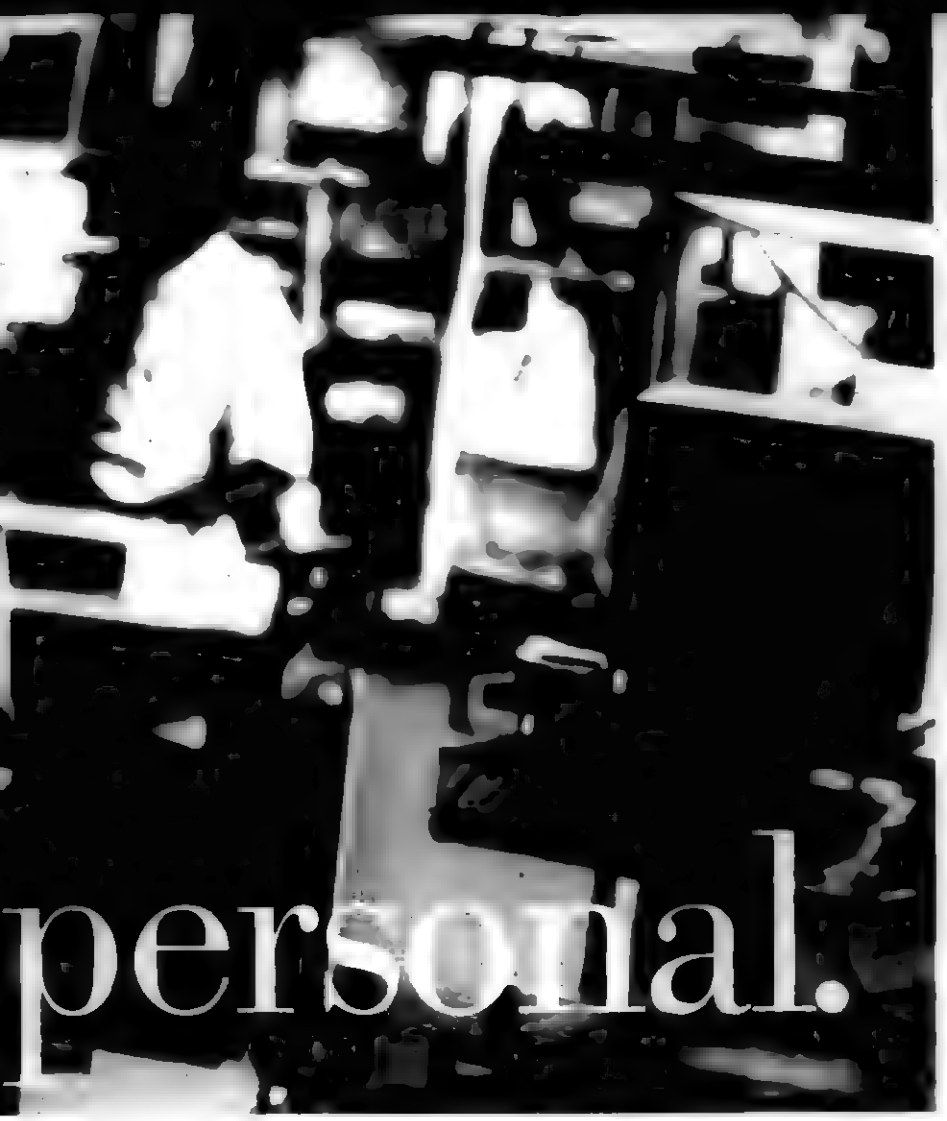

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Hard Drive/Memory	120MB/4MB	245MB/4MB	340MB/4MB	527MB/4MB
Diskette	3.5"	3.5"	3.5"	3.5"
Monitor	IBM 14V 14" SVGA NI	IBM 14V 14" SVGA NI	IBM 14V 14" SVGA NI	6318 14" SVGA III
Operating System	IBM DOS & WINDOWS	IBM DOS & WINDOWS	IBM DOS & WINDOWS	IBM DOS & WINDOWS
Price* / IBM Credit Lease**	**$1,899** / $68 per month	**$1,959** / $71 per month	**$2,379** / $86 per month	**$3,149** / $114 per month
Features	433DX/Si	433DX/S	466DX2/D	466DX2/T
Processor	i486DX/33 MHz	i486DX/33 MHz	i486DX2/66 MHz	i486DX2/66 MHz
Hard Drive/Memory	212MB/4MB	245MB/8MB	340MB/8MB	527MB/4MB
Diskette	3.5"	3.5"	3.5"	3.5"
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■ You can get low-cost videoconferencing on Unix workstations, but only if you're ready to build it yourself. *Page 49*

ENTERPRISE NETWORKING

■ **AT&T** wants your wide-area network business and is enhancing and expanding its offerings to get it. *Page 61*

SPECIAL REPORT

COMPUTERWORLD SEVENTH ANNUAL JOB SATISFACTION SURVEY 1993

■ **Two-thirds of IS managers say they are not working to their full potential, according to *Computerworld*'s seventh annual Job Satisfaction Survey. Reasons: lack of corporate direction, out-of-date skills and poor communication, say the 781 persons polled. *Page 97*.**

LARGE SYSTEMS

■ Companies with lots of distributed systems are developing practical methods of managing the scattered herd. *Page 71*

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COMMENTARY

■ Charles Babcock sees promise for a satisfactory union of SQL and objects in hybrid products such as UniSQL and OpenODB. *Page 6*

■ We're approaching the limits of absurdity with PC miniaturization, writes Harvey Newquist. *Page 33*

■ If government regulators move from auditing data files to dictating program specs, says Esther Dyson, we'll get software mediocrity. *Page 33*

■ **IBM** hung tough with OS/2 and has come back with a much improved Version 2.1, writes Paul Gillin, but **Microsoft** still holds a lot of the cards. *Page 41*

■ Subnotebooks are ideal for convenience users, says Jeffrey Henning. *Page 44*

■ Remote procedure calls aren't the only alternative for distributed applications, says Franco Vitaliano. Message passing can be a better route. *Page 64*

■ Re-engineering isn't a single process, Beth Gardner explains. It's a whole collection of improvement techniques. *Page 94*

QUOTE

"Health care costs are like a water balloon. Push on one side, and it pokes out the other."

— Marcia Radosevich, President Health Payment Review

UNQUOTE

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Executive Briefing

Information technology is expected to play a leading role in the Clinton administration's attempt to re-engineer government *(Page 1)*, but some governmental entities aren't waiting for the starting gun. The computer technology center at the U.S. House of Representatives has already enhanced its existing host-based Member Information Network with a new client/server-based system that provides easier and faster access to multiple databases. *Page 61*

In the business sector, a number of companies are looking to distributed systems as a growth aid. **Edward D. Jones & Co.**, a $550 million, privately held brokerage firm in Maryland, is moving to client/server to facilitate a 400-office expansion. *Page 53* And **Snapple Beverage Corp.**, which soared to the top tier of the beverage industry, is building a PC-based network equipped with EDI and MRP. Its goal: Better competitive armor in the form of tighter links with bottlers, packagers and distributors. *Page 74*

As **Nordstrom, Inc.** can attest, however, such transitions can be bumpy and frustrating. The company is on hold with plans to expand a pilot client/server merchandising system across the enterprise. Tie-up: Lack of middleware to connect NT to IBM's DB2. *Page 1* Nordstrom plans to soldier on, and that's what many firms are also doing as they hit rocky patches with distributed systems. **Teltrends, Inc.**, **Sandia National Labs** and **Provident Life and Accident Insurance Co.** are all wrestling with gaps in the supply of tools for distributed systems management and doing a lot of patchworking. *Page 71*

Is it any wonder that stress is up across the board in IS departments? *Page 97*

But now for some good news.... The next time you turn over your PC population, installing add-on devices may be a lot easier. **Microsoft** is spearheading a coalition of hardware and software vendors behind a standard that would allow computers to automatically resolve conflicts among various cards and devices. Won't happen for at least a computer generation, however. *Page 2*

When you *do* go shopping for that next PC, here's an important fact to keep in mind: Not all 486 PCs are created equal. A recent study of machines from eight leading 486 PC vendors found major differences in reliability. *Page 41*

Borland tips groupware hand

By Michael Vizard
NEW YORK

Borland International, Inc. will unveil this week the second element of its groupware strategy with the launch of a version of Paradox for Windows that will incorporate its Object Exchange (Obex) technology.

Borland will also introduce updates for Paradox for DOS and Windows, as well as a separate edition of Paradox targeted at developers of client/server applications, according to the company.

Obex, introduced in Borland's Quattro Pro spreadsheet late last month, is a layer of software that encapsulates data into objects that can be transferred over either network or electronic-mail protocols. Both WordPerfect Corp. and Novell, Inc. are expected to announce support for Obex running on top of WordPerfect Office and the Novell Message Handling Service.

As part of an overall plan that calls for the stratification of Paradox into multiple editions for different types of sites, only the workgroup edition and the developer's edition will support Obex. These two are also the only versions to support SQL links to Borland's InterBase database and Microsoft Corp.'s SQL Server, as well as databases from Oracle Corp. and Sybase, Inc. They will also support a network configuration utility that simplifies the distribution of multiple copies of Borland software.

The delivery of Obex within Paradox gives Borland a database component for its pending groupware battle with Lotus Development Corp.'s Notes package, which is built on top of an object file system created by Iris Associates in Westford, Mass.

Borland maintains that instead of requiring information systems shops to adopt a separate set of middleware services such as Notes, developers should be able to create groupware applications using relational databases and existing shrink-wrapped software.

In Borland's view, Obex will allow a user to make data available by publishing it on the network or E-mail system. Other users could then subscribe to that data.

Because Obex currently supports only unidirectional transmission of data that must be accepted by the intended user, Borland said it is likely to be favored by database administrators seeking to screen updates to SQL databases from end users.

However, Vince Casarez, product manager for Paradox, said Borland is working on support for bidirectional, synchronized transmissions — a feature in Notes that enables it to lend itself more to interactive electronic discussions.

SQL databases are not well-suited for groupware applications because they require documents to be layered on top of the row and column model created for SQL databases, according to John Landry, Lotus' chief technology officer. Notes, in contrast, is based on an object model that can be easily deployed on a range of devices, from wireless handheld boxes to supercomputers, he noted.

Casarez countered that Paradox can support the storing directly in its kernel of binary large objects as large as 256M bytes per document. He added that Notes currently provides no means for updating SQL databases and that applications such as Quattro Pro can run on wireless devices.

Scorecard

The workgroup edition of Paradox costs $495. Paradox 4.5 for Windows, which adds support for dBase file formats and a faster implementation of Borland's ObjectPAL language, is priced at $149.95. Paradox 4.5 for DOS is also priced at $149.95. The developer's edition, which provides source code and debuggers, is priced at $695. Competitive upgrades to the workgroup edition are priced at $149.95, while upgrades from Paradox for Windows or DOS are priced at $129.95.

Plug and Play seeks to curtail PC hardware upgrade headaches

By James Daly and Ed Scannell

For anyone installing PC add-on devices these days, it is usually a "plug-and-pray" proposition. Microsoft Corp. wants to take the religious fervor out of the PC configuration change equation.

So last week the Redmond, Wash., firm marshalled a broad-based group of both hardware and software companies to solve the age-old struggle of most PC users to get all those plug-in circuit cards to work together.

The plan, called Plug and Play, would have the computer — not the user — sort out the numerous electronic conflicts that typically arise among the myriad memory cards, disk drive controllers and other devices used to upgrade systems.

"It is absolutely critical that we have internal infrastructure designs that understand each other," said Gerald Holzhammer, manager of desktop architecture and technology at Intel Corp.

Although Apple Computer, Inc.'s Macintosh line has had a self-configuring feature for five years, the XT/AT bus on IBM-compatible PCs lacks any mechanism for configuration management.

Each add-in card is given an electronic address that the PC uses when communicating with the board. If add-in boards share an address, the computer will not work properly.

Jump start

Configuration of Industry Standard Architecture (ISA) cards is typically done by technically savvy users through "jumpers," which give each card a unique electronic address. Users are also usually required to edit system software configuration files.

"It's like saying you have to open the TV set to plug in the VCR, and then when you do it, the thing still doesn't work properly," said Brian Belmont, manager of PC software development at Compaq Computer Corp.

Plug and Play would require manufacturers to redesign their plug-in cards by adding about 25 cents' worth of computer chips, said Moshe Lichtman, manager of Windows hardware platforms at Microsoft.

The chips would then automatically identify the card when the computer system is started. Either the computer's operating system or a separate utility program would collect information on all available cards and assign each an address, Lichtman added.

At a glance

Operating system: IBM, Microsoft.

Networks: 3Com Corp.

Systems hardware: Compaq Computer Corp., AST Research, Inc., IBM.

Chips: Intel Corp., National Semiconductor Corp.

BIOS: Phoenix Technologies Ltd., SystemSoft Corp.

Limited use for PCs

Plug and Play design will be available in all future versions of Windows, and NT "would certainly adopt it," Lichtman said, adding that he expects the design to reach widespread acceptance by the end of 1994.

The Plug and Play scheme, however, will be of limited use to owners of most current IBM-compatible PCs because the feature cannot be added to existing cards.

Microsoft gave a brief demonstration of the capabilities of Plug and Play using an Alpha version of Windows 4.0, codenamed Chicago, running on a system with an XT/AT bus. Windows 4.0 is expected next year.

Company officials declined to talk about how they would integrate technical aspects of the Plug and Play architecture into Chicago or NT.

Although the Plug and Play design has drawn approval from such heavy hitters as Intel, IBM, National Semiconductor Corp., 3Com Corp. and Compaq, it still lacks support from one key player, Novell, Inc., which did not have a representative at last week's briefing. "I have not been able to find anyone here who's even heard of Plug and Play," a Novell spokesman said.

OS/2 version

While IBM's Personal Systems unit also did not have a representative at the briefing, Bill Hoke, PC director at IBM's Technology Center in Boca Raton, Fla., said Personal Systems plans to include various Plug and Play capabilities in a future version of OS/2.

Microsoft and Intel released Version 1.0 of the Plug and Play ISA specification early this year, and two Plug and Play ISA cards are already available: a Small Computer Systems Interface card from Future Domain Corp. and an audio card from Intel.

Belmont said Compaq will have a Plug and Play BIOS on its machines within six months. Acer America Corp. also expects to get a machine with the Plug and Play BIOS by early next year.

In addition, Intel has released a development kit that allows users to use Plug and Play ISA cards with Windows 3.1. The kit contains a configuration utility that becomes an integral part of the boot-up process, acting as a virtual device driver with Windows.

Best interests

Despite the various cooperative efforts among several hardware systems competitors to define the Plug and Play spec, its emergence should do little to diminish their tooth and nail competition. However, many hardware makers said they believe Plug and Play is a practical approach to jointly reducing support costs and growing sales.

"It is in our collective best interest to make some of these essential improvements to the PC architecture," said Carl Stork, Microsoft's director of Windows platform definition.

To many vendors, the Plug and Play design makes sense — and cents. A PC configuration change not only may be aggravating for users but also costs vendors money in support costs and discourages computer users from upgrading their components.

"The technical support calls come in droves with each new system update, so we're hoping that Plug and Play might be able to cut our tech support costs," said John Chang, director of product marketing at Acer America in San Jose, Calif. Greg Young, a product line manager at AST Research, Inc., estimated that 30% to 50% of AST's support calls are installation- or configuration-related.

— James Daly and Ed Scannell

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Sun to take clustered server tack

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Sun Microsystems, Inc. will try to retake the technological high ground at next week's Unix Expo in New York, where it is expected to unveil a clustered network file server.

Clustering is a way of boosting the throughput of Sun's current crop of Scalable Processor Architecture (SPARC) systems, which have been underpowered for some commercial applications, industry analysts said [CW, Aug. 23]. The new SPARCcluster1 network file server hosts two or four Sun SPARCserver 10 four-CPU machines. It is slated to ship by year's end.

Growing networks are pushing the limits of older Sun servers for memory, disk storage and backup. "I have a serious file server problem with about 120G bytes of disk on 10 [Sun] servers," said Peter Bishop, manager of computing resources at Cirrus Logic, Inc. in Fremont, Calif. Bishop has been beta-testing SPARCcluster1 for several months. "This will allow me to put more disk in one place than I'm able to do today."

Bishop plans to install SPARCcluster1s this fall to support 400 Sun workstation users at his firm, which makes computer circuits for laptop computers and peripheral controllers.

In the next three years, all major Sun servers will be available as clustered systems, including the eight-processor SPARCserver 1000 and 20-processor SPARCcenter 2000, Sun said.

The first generation of Sun clusters will be configured as network file servers only, said Stephen Zocchi, manager of server product marketing at Sun. A second generation will debut next year and run distributed databases, including Oracle Corp.'s Oracle 7 Parallel Server. A third generation of clusters, with support for high-speed fiber optic and Asynchronous Transfer Mode networks, is due in 1995, Zocchi said.

At first, the servers in the Sun cluster will be connected by a front-end Ethernet switch called the Sun ONT (for Optimum Network Throughput), which will allow workstations to view them as a single network resource. The second generation of clusters will also have a back-end distributed lock manager to connect the onboard servers to shared disk drives.

Clusters may also improve reliability in Sun networks, allowing them to keep running even if one server in the cluster fails, some users noted.

"With a cluster, you will be independent of problems with the power supply or the memory going bad because there's no single point of failure," said James Stikeleather, director of systems development at Kash n' Karry Food Stores, Inc., a $1.2 billion grocery chain in Tampa, Fla., that has 30 Sun servers. Database clusters will make individual servers "transparent" to end users because of mirrored database updates between servers, he said.

Centralized management of distributed software will be key to Unix servers hosting applications taken off aging mainframes, analysts said. To meet this need, Sun will bundle the SPARCcluster1 with system management software. It will also support Computer Associates International, Inc.'s CA-UniCenter and Tivoli Systems, Inc.'s TME.

Industry analysts said Sun servers often provide better price/performance than many Unix rivals but not always the highest raw speed. Future Sun systems will run the 64-bit UltraSPARC chip being developed by Sun and Texas Instruments, Inc. for 1995. Until then, clusters of 32-bit SuperSPARC processors will be harnessed together, supporting up to 500 Sun desktop clients.

Clusterized

Sun plans to pit its new SPARCcluster server against HP's 9000/H60

SPARCcluster1*	HP 9000/H60
• 2 SPARCserver 10 Model 41s	• 96-MHz PA-7100 RISC chip
• 512M bytes of main memory	• Uniprocessor
• Up to 108G bytes of storage	• Up to 2GB bytes of memory
• Up to 20 Ethernet LANs	• Up to 16 byte of storage
• Supports NFS file server software	• Up to 12 Ethernet LANs
• Price: $85,000	• Price: $83,000

*Quad processor version also available

Midrange systems

AS/400 infused with client/server features

By Craig Stedman
NEW YORK

IBM continued last week to press the client/server button on the Application System/400, introducing three models specifically configured as servers and laying out plans for other products aimed at erasing the midrange line's lingering host-centric stigma.

Many of the products will not be available until next year, including new database functionality, a faster Transmission Control Protocol/Internet Protocol implementation and an optional 486-based I/O processor that is supposed to speed the AS/400's file-serving performance.

Time enough

However, analysts and users said next year should be soon enough to get the AS/400 into the client/server game.

"You're talking eight to nine months from now, and we'll be lucky if we can even understand [client/server] and put a blueprint together for implementing it in that kind of time frame," said Scott Plumer, technical support project manager at Gannett Co.'s data center in Silver Spring, Md.

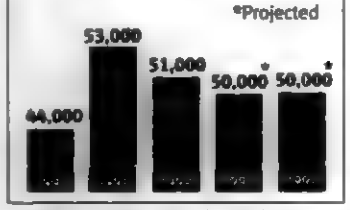
"IBM has plenty of time to get into the market," said David Andrews, managing partner at ADM Consulting, Inc. in Cheshire, Conn. However, he said he is not sure IBM is up to the task of reinventing the AS/400's image. The system has been marketed "very conservatively," leaving it mostly unknown outside the installed base, he said.

Susan Whitney, midrange systems director for IBM U.S., acknowledged that the AS/400 is still perceived as less attuned to open client/server computing than Unix machines. "We need the opportunity to sit down [with customers] and describe what we have to offer because we don't have the allure of Unix," she said.

Holding pattern

AS/400 shipments are expected to remain flat through next year while IBM improves the system's client/server support

AS/400 unit shipments



Source: ADM Consulting, Inc., Cheshire, Conn.

As expected, the three AS/400 Server Series models use higher-end central processors unlike regular AS/400s they correspond to in pricing [CW, June 28]. That enables the new machines to run CPU-intensive server applications three to five times faster, according to IBM.

The servers, along with the other products IBM detailed (see story at right), drew praise from some users. "This is almost like a coming-out party for the AS/400," Plumer said.

Plumer added that the 486-based I/O processor due out next year could let Gannett move its file-serving operations off PC local-area network servers running Novell, Inc.'s NetWare.

Needed stability

Patrick Stramecky, information services director at Garb-Ko, Inc., a convenience store franchiser in Saginaw, Mich., is also interested in using the AS/400 as a server. "To bring to the table the stability that's usually associated with the 400 would be a real blessing," he said.

However, Stramecky said he is not convinced IBM's Application Business Systems unit has "gotten out of the old proprietary mode." Garb-Ko, which is just upgrading from a System/38 to the AS/400, would have looked at alternatives if not for internal issues that made a change unwieldy, he said.

Jim Matsey, corporate director of information systems at Reynolds Metals Co. in Richmond, Va., said he does not expect to "look real seriously" at the AS/400 as a client/server platform until machines based on the PowerPC architecture are available in 1995.

The servers introduced last week are an interim step while IBM develops the PowerPC hardware, which should have built-in server capabilities on all models, Andrews said.

And now, introducing...

IBM's AS/400 product introduction last week included the following:

- AS/400 Server Series Models 100, 135 and 140, priced similar to the existing F02, F10 and F20 systems but with three to five times the processor performance in server applications. Hardware prices range from $15,500 to $57,000. The 100 and 135 will be available in December, the 140 next March.
- File Server I/O Processor, an optional 486-based unit due to ship in 1994. Exact schedule and pricing was not disclosed. Will support OS/2 LAN Manager initially; future NetWare support not ruled out.
- Packaged LAN-enabled Server Series configurations, bundled with IBM ValuePoint PCs for OS/2 or Windows and a new LocalTalk adapter for Macintosh.
- Software for transparent access between AS/400 and NetWare servers, plus increased interoperability with Unix workstations. IBM is also now reselling Apple Computer, Inc.'s Data Access Language server software for accessing AS/400 data from Macintosh systems.
- OS/400 operating system being rewritten to increase file server performance threefold. Available by end of 1994.
- Integrated OS/400 database to get support for various new functions, including triggers and stored procedures, Open Database Connectivity and OS/2 Integrated Database Application Programming Interface support also planned. Available late 1994.
- Transmission Control Protocol/Internet Protocol being rewritten for eightfold improvement, Advanced Program-to-Program Communications for threefold gain. Both due in 1994.
- Graphical user interface for printing AS/400 files and sending or displaying messages from Windows and OS/2 PCs. Available in 1994.
- Expanded memory capacities; higher-performance 9337 storage subsystems with new controller and write cache capabilities; 3494 tape library supporting 440 half-inch cartridges; four new midrange printers.

—Craig Stedman

RANK 1992	1991	COMP
1	1	GE MOTORS Detroit
2	2	EXXON Irving, Texas
3	3	FORD MOTOR Dearborn,
4	4	INTL. BUSINESS MA
5	5	GENERAL ELECTRIC
6	6	MOBIL Fairfax, Va.
7	7	PHILIP MORR
8	8	E.I. DU PO
9	10	CHEVRON
10	9	TEXACO Whi

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Charles Babcock

Hybrids step up to object handling

In this space last week, I said no commercial SQL databases implement full-bore object handling, but I hasten to add that there are several interesting hybrid systems that both store objects and use SQL.

To be sure, these systems incorporate many proprietary extensions to SQL or an extended pattern of table organization. But those variations merely make them more interesting. By taking a different approach, they have forged ahead of the RDBMS vendors and are getting a hearing before the ANSI X3H2 committee. That panel still faces the large task of getting SQL to deal with objects. Its solution may resemble one of these systems with both relational and object-oriented properties.

UniSQL/X is a hybrid best characterized as a relational database extended to achieve object handling capabilities. It is the product of UniSQL, Inc., an Austin, Texas, company founded in 1990 by Won Kim, a former database theorist at IBM's Almaden, Calif., facility. Kim also worked with the Microelectronics Computer Corp.

UniSQL was one of the systems that the Petrotechnical Open Software Corp. adopted a year ago for accessing many different types of data. Locating and using dissimiliar data has been the bane of the oil industry as its engineers try to search volumes of scattered seismic findings.

Kim stuck with the basic principle of relational database, organizing information in rows and columns of tables. But in UniSQL/X, a column of a table can have another table as a data type. Different types of data can then be related to one another in a nested sequence of tables, creating a vessel in which to store a complex object. UniSQL nests the tables by using pointers from table to table, which aids retrieval performance. This implementation also requires a modification to standard SQL — the addition of a path expression to the query, which names the targeted nested column.

The nested relationship lets UniSQL enforce integrity for domains — a set of related data with certain rules attached to it. With domain support, the name of your Federal Express driver might be added to a database of outside service people but could not be mistakenly added as a company employee. The employee domain would have a rule that required a department entry for each employee, and "Fedex" is not a department at most companies.

Kim also implemented enforcement of inheritance for tables created as "children" of parent tables, adding another object-oriented feature. UniSQL also creates unique identifiers for objects.

A second example, HP's OpenODB, is a hybrid of the opposite sort — an object-oriented system that front-ends an underlying relational database. HP has licensed OpenODB to Informix, which is expected to announce it as an object-oriented addition sometime next year.

OpenODB's SQL is standard SQL with many extensions for dealing with objects. Like UniSQL, OpenODB also creates a unique identifier for each object, and its approach for doing so has been adopted by the X3H2 committee working on SQL III. OpenODB's SQL has defined ways of grouping data in sets, lists or bags in an object-oriented style, with associated rules.

HP's product is capable of dealing with relational, object-oriented or legacy data in the same system, and for that reason it too has been tested and used by the Petrotechnical Open Software Corp.

For example, Michael Stonebreaker, founder of Ingres, continues his pioneering work with Postgres, another hybrid system. Other efforts are also underway.

These early approaches may never catch up with the relational vendors in terms of recovery, performance or tools, but at the moment they represent the best thinking on how to manipulate objects and large volumes of simple relational data.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Women cheer salary gap news

Acceptance, experience, promotions all closing gap

By Mitch Betts

"Hallelujah!" was how one woman in information systems management responded to the news that the earnings gap between men and women in the IS field is narrowing, albeit slowly and unevenly.

Computerworld's recent survey of 1,239 IS professionals showed that, on average, women earn 15% less than men. That disparity exists even within the same job titles [CW, Sept. 6]. However, that figure was an improvement over the 21% "gender gap" uncovered by a similar 1992 survey.

Why is the gap closing? "Acceptance, knowledge and experience, plus a little affirmative action to equalize pay," said Rose Gladstone, manager of business systems at Hoechst Celanese Corp. in Wichita, Kan.

"My impression is that the situation [for women in IS] is improving," said Elaine R. Bond, senior technology consultant at The Chase Manhattan Bank NA. "The longer women are in professional and managerial positions, over time that [salary] gap is going to close," she said.

Laraine Rodgers: *Senior execs not ready for women CIOs*

Indeed, the main reason the pay gap is narrowing is simply because women have worked in the IS field long enough to move into higher-paying management ranks, according to Magid Igbaria, professor of MIS at Drexel University in Philadelphia.

"Women in IS are closing the gap in education, training and experience... and that translates into better pay," said Igbaria, who studies IS career issues.

Not in high places

In *Computerworld*'s salary survey, the gender gap for chief information officers was especially small (6%), but there are still very few women in the top echelon. *Computerworld*'s 1992 study of the demographics of the IS profession showed that only seven out of 100 CIOs are women [CW, Feb. 1].

The reason for the "glass ceiling" that keeps women statistically bunched in the midlevel jobs is that "many senior executives are just not ready for a woman in that [CIO] role," said Laraine Rodgers, MIS director for the city of Phoenix.

The good news is that executive recruiters are now targeting women to fill senior IS positions, Rodgers and Bond said. The bad news is that women will be paid less than the men they replace.

For example, Rodgers said a woman now paid $90,000 a year will be recruited to replace a man making $300,000, but the woman will be offered only $200,000.

One female MIS director, who requested anonymity, said her pay is on par with men carrying the title of director, but the scope of her responsibilities and budget should place her at the higher-paying vice president level. The disparity is partly "gender-related," she said, and partly the result of the company's underappreciation of the importance and complexity of IS.

Glacial progress

Women in IS management are slowly closing the earnings gap with their male counterparts

	1992 Women's pay*	1993 Women's pay
CIO/VICE PRESIDENT	21%	6%
IS DIRECTOR/MANAGER	18%	15%
AVERAGE OF ALL IS JOBS	21%	15%

*Percentage that women's pay is less than men's

Source: *Computerworld* salary surveys

The salary survey, as well as interviews with women with varying experiences, showed that it is hard to generalize about the gender gap. The pay disparity increased from 8% to 11% for the job title of systems manager, for instance, but women holding the title PC manager actually make 6% more than men with that title.

Cinda A. Hallman, CIO at Du Pont Co. in Wilmington, Del., praised the knowledge-oriented IS profession as "good for women. It's relatively new compared with engineering and finance and lacks some of the traditional biases," she said.

She said that in her own IS organization, with 5,000 employees worldwide, there is absolutely no pay disparity for men and women in the same jobs.

Several female CIOs emphasized that their rise to the top required long hours and frequent moves to jump at new opportunities. Hallman, for example, said she has relocated seven times and spent eight years in foreign countries in her career.

Marina Mann, vice president of information technology at Electric Power Research Institute in Palo Alto, Calif., said she has noticed a cultural shift. "We spent years just getting men comfortable having us in the same room, and then we didn't get the rewards for our contributions. Now, we're becoming equal business partners," she said.

Elaine Bond: *'Over time that [salary] gap is going to close'*

Takes time

Cracks are appearing in the glass ceiling across the board in corporate America. Women in executive ranks have seen their salaries double in the past 10 years to an average of $187,000, according to a study of 400 female executives (vice president level and above) conducted by Korn/Ferry International and the University of California at Los Angeles.

But closing the gender gap completely will take at least a generation, and perhaps even longer than that, Bond said.

"I'm not sure the younger generation is a whole lot different, which reinforces the fact that this is a cultural issue. That doesn't change dramatically in a short amount of time," she said.

IBM strategy looks to custom apps

By Michael Vizard
CHICAGO

IBM is building a PC software business model based on object-oriented technology that it hopes will eventually enable it to become a supplier of custom PC applications for specific environments.

In theory, the IBM strategy is based on the assumption that information systems shops will outsource development of desktop applications to companies such as IBM, which can complete the project at a much cheaper cost by leveraging work already done for other companies.

The strategy behind IBM's planned return to desktop application development is based on the expectation that object technology, derived mainly from its Taligent project with Apple Computer, Inc., will drastically cut application development time, according to James Cannavino, IBM senior vice president for Personal Systems. Once this occurs, IBM will be able to cost-effectively deliver made-to-order applications for individual sites.

ROB NELSON

James Cannavino: *Sees IBM as player again*

Cannavino revealed IBM's plans while speaking at the Corporate Computer Professional Exposition held here last week, sponsored by the Corporate Association of Microcomputer Professionals.

"I believe that what happened in the hardware business in terms of reducing cycle times will eventually happen in the software business," Cannavino said. He was referring to the fact that users today can custom-design their PC orders. IBM wants to apply that model to software.

Back in the game

This market is drastically different from the current set of monolithic applications, such as Lotus Development Corp.'s 1-2-3 spreadsheet and WordPerfect Corp.'s WordPerfect word processing package, that dominate the PC industry. Unable to effectively compete in the shrink-wrapped PC software market, IBM withdrew from this arena in the late 1980s.

Last week, however, Cannavino characterized that move as a mistake that has resulted in IBM missing out on the development of important PC technology. But as the current shrink-wrapped market moves toward a more object-oriented model, Cannavino said he envisions IBM becoming a player once more.

However, before IBM is ready to supply custom applications on a large scale — probably not until mid-decade — it has to put in place an object-oriented infrastructure.

Thus far, IBM has delivered the initial components of a distributed system object model that allows applications to share objects, but the company still must deliver an object-oriented development environment that will make it easy for developers to find the objects they need to build a particular application.

In general, users said they are encouraged by IBM's intentions and that they believe IBM will deliver a more open environment than its rival Microsoft Corp., which is building an object-oriented environment called Cairo.

For example, John Dohm, a member of the OS/2 user group here who is moving from a utilities firm to a management consulting firm, cited Microsoft's decision to offer Visual Basic only with Microsoft applications as a sign that the company is pursuing a closed environment designed to force users to buy Microsoft applications.

Dohm added that Microsoft's strategy is aimed at turning end users into developers by giving them Visual Basic, while IBM's strategy appeals more to corporate developers. He said the Microsoft strategy encourages the creation of "data empires" through an organization by allowing end users to create applications that are incompatible with one another, poorly designed and difficult to support.

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VOLSER	DEVTYPE	NUMBER OF TRACKS	DSNS	>1 EXTS	ALLOCATED TRACKS	ALLOCATED EXTS	ALLOCATED %AL	FREE TRACKS	FREE AREAS	FREE LARGEST	FRAG INDEX	EMPTY VSAM	TRACKS IN PS	TRACKS IN PO	VTOC SIZE	VTOC %US	TIME (MIN)	COMP CODE
I8PLB0	3380	13275	104	9	8084	132	61	5191	31	2651	0.252	16	2	[redacted]	15	15		
	--AFTER-CPK-->		104	0	8084	105	63	5191	1	5191	0.000	16	2	[redacted]	15	48	1.1	0
I8PLB1	3380-K	39825	365	38	32234	[redacted]		7574	48	2051	0.243	48	416	[redacted]	15	48		
	--AFTER-CPK-->		365	3	32259	[redacted]		7574	1	7574	0.000	48	416	5242	15	47	3.9	0
I8PLB5	3380-K	39825	458	49	38650	615	97	1175	82	130	0.615	668	160	6422	15	61		
	--AF		458	2	33540	[redacted]	[redacted]	6285	2	5988	0.043	50	0	90	15	58	5.9	0
S8SLB0	3380		351	3	10279	[redacted]		2996	32	1650	0.213	2532	574	53	15	45		
	--AF		351	0	10279	[redacted]		2996	2	1503	0.098	2532	[redacted]	[redacted]	15	45	2.9	0
TS0WK1	3380	13275	249	7	7591	163	57	5684	31	2205	0.178	0	[redacted]	[redacted]	10	48		BY
	--AFTER-CPK-->		140	0	7682	141	56	5793	2	2909	0.098	0	[redacted]	[redacted]	10	48	1.8	PASS

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News Shorts

Novell files complaint against Microsoft

Claims of unfair competitive practices continue to hound **Microsoft Corp.**, as the company disclosed last week that **Novell, Inc.** has filed a complaint with the Commission of the European Communities Directorate-General for Competition. The Directorate-General is assessing the validity of the complaint, filed on June 30. In a statement, Microsoft's legal counsel said the firm intends to cooperate with the investigation, saying it believes the complaint has no merit.

Frederick Wang chosen for board seat

As **Wang Laboratories, Inc.** prepares to shed its Chapter 11 protection next week, Frederick Wang, the company's former president and chief operating officer, has been chosen by his family to fill the single seat given to the Wangs on the new board of directors being formed as part of the company's reorganization. Three Wang family members were directors prior to the Chapter 11 filing last year, and the family controlled 75% of the board seats altogether.

ASK, Oracle firm up data replication

The ASK Group, Inc.'s Ingres Products Division confirmed plans last week to ship a database replication product by the end of 1993 [CW, June 28]. The Ingres/Replicator is in beta testing at 10 sites and will be priced at 35% of the cost of an Ingres server. Separately, **Oracle Corp.** will demonstrate enhancements to its replication feature in two weeks at its annual user conference. However, Oracle declined to comment on pricing or availability of the planned feature.

World Trade Center looks into security

Following the February bombing of the World Trade Center, **The Port Authority of New York and New Jersey** is looking to information technology to provide tighter security for the complex. The agency last week sent out a request for prequalification information to vendors interested in developing an enhanced turnkey hardware and software security system.

Lotus bundles mail and scheduling

After deciding to pull CC:Mail from its discounted suite of Windows desktop applications, **Lotus Development Corp.** announced last week it will sell 10-user packages of CC:Mail for Windows bundled with the group version of Lotus Organizer, a personal information manager, for $845. Meanwhile, Lotus' recently announced suite of 32-bit applications for OS/2 desktops does include CC:Mail. That is because the OS/2 suite is more likely to be purchased by the information systems departments in charge of electronic-mail purchases, a Lotus spokesman said.

SHORT TAKES Roel Pieper, the former president of **Unix System Laboratories, Inc.**, has joined **Ungermann-Bass, Inc.** as president and chief executive officer. . . . Joseph J. Campbell has been promoted to senior vice president of IS and business processes at **Home Insurance Co.** in New York. He had been senior vice president of national mortgage processing. . . . **IBM PC Co.** last week dropped prices of its ImagePlus software for OS/2 by up to 75% and introduced enhancements including a better interface and support for more printers. . . . **Apple Computer, Inc.** announced last week it has begun shipping AppleSearch search and retrieval server software. AppleSearch lets users organize and retrieve unstructured information from complicated server databases. . . . **Digital Equipment Corp.** last week named Ronald Bohlin vice president of strategic services for its Digital Consulting organization

More news shorts, *page 16*

CASE vendor looks ahead

KnowledgeWare taps R&O repository in client/server push

By Melinda-Carol Ballou
ATLANTA

KnowledgeWare, Inc. will push forward into the client/server arena next month when the company announces a technology alliance with repository vendor R&O, Inc., multiplatform support for Application Development Workbench (ADW) I-CASE tools and better integration between ADW and KnowledgeWare's client/server tools, according to internal company sources.

A recent reorganization in which KnowledgeWare cut its mainframe development staff also allowed the firm to unify its integrated computer-aided software engineering (I-CASE) and client/server tools strategy, analysts said. Those vendors that do not push into the client/server world with traditional CASE tools in the next 10 months "will be locked out of the market," according to Jim Sinur, a director at Gartner Group, Inc. He said this announcement may mean the survival of ADW as a CASE tool for the '90s.

"Traditionally, KnowledgeWare has struggled with providing a data encyclopedia/repository." He added that if true, "the announcement with R&O will give them a leg up since this is the most advanced repository we've seen to date."

R&O's Rochade repository supports a range of operating systems, including MVS, VM, VMS, Unix, MS-DOS, OS/2 and Windows, with plans next year for Microsoft Corp. Windows NT support. The product also supports data interchanges with a range of CASE tools (see chart).

KnowledgeWare will also release a unidirectional bridge between ADW and ObjectView by year's end, with a bidirectional bridge slated for shipment during the first half of next year.

KnowledgeWare will distribute Rochade as its repository across the enterprise to complement KnowledgeWare's data encyclopedias, according to sources at KnowledgeWare.

The ADW interface for Rochade will enable ADW developers to choose which operating system they want to target for the repository and to run either their clients or servers in that environment, sources said.

ADW users were enthusiastic about the prospect of repository support for their ADW applications, though somewhat cautious about committing to the strategy before they had fully evaluated it.

"The biggest thing for us is moving the data closer to our customers — letting them access it from within their environments," said Tim Casper, a system architect at Kerr-McGee Corp., an energy and mined chemical firm in Oklahoma City.

In addition to support for R&O's repository, KnowledgeWare will be announcing the long-awaited release of Unix versions of ADW, as well as Windows and NT support for ADW, with shipments likely next year. Initially, users will be able to execute ADW applications on the different platforms, with full development support coming on Unix this year and on the other platforms next year.

Bridging vendors

KnowledgeWare is expected to offer ADW links to RTO, Inc.'s Rochade repository, which has interfaces to a range of CASE tools

	Bachman	Data Mgr.	Excelerator	TI IEF	Prism	Team-work*
KnowledgeWare ADW	●	■ ●	■ ←	■ ●	■	■
Bachman Information Systems, Inc. Bachman		■ ●	■ ←	■ ●	■	■
Advanced Software Products, Inc. Data Manager			■ ←	■ ●	■	■
Intersolv, Inc. Excelerator				■ →	■ →	■ →
Texas Instruments (TI/IEF					■	■
Software AG Predict						■

*Cadre Technologies, Inc.

Key: ■ Logical data model ● Logical process model ← Bridges from → Bridges to ↔ Bidirectional bridge

Source: Gartner Group, Inc., Stamford, Conn.

Alabama auditors take stock with pen computing for inventory management

By Michael Fitzgerald
MONTGOMERY, ALA.

Like the peasant in Monty Python's *Search for the Holy Grail*, pen computing will next week emit a bleating "I'm not dead yet," when the Alabama State Auditor's Department announces it will buy as much as $500,000 worth of pen computers.

The purchase may signify an easing in the supply problems that have plagued pen-based hardware makers, a factor that has limited access to pen systems.

For the Alabama state auditor, which tracks some 315,000 items — from the talking mechanical owls that greet tourists at Alabama's rest areas to airplanes — the pen systems are expected to help complete the state's annual inventory surveys in the required year time frame.

Don Kelly, the assistant state auditor for the state of Alabama, said pen-based pilots showed a 60% reduction in the time needed to conduct an inventory of equipment, which should let the auditor's department complete the audit annually.

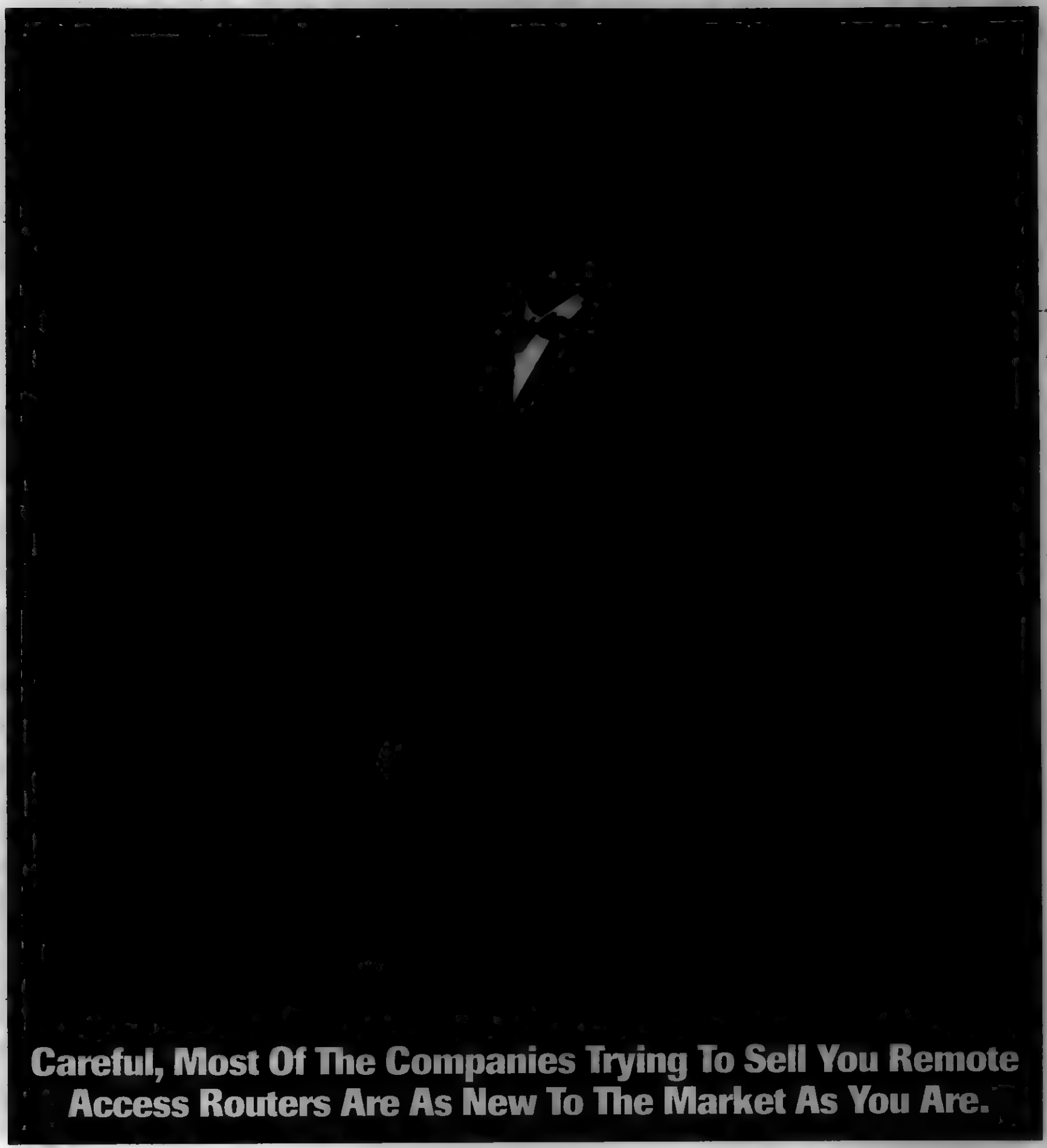
Kelly also said the systems should help the department and the state save money through reduced personnel use and better inventory controls.

The system transparently tracks when every transaction occurs. Because of this, the state expects to track its $500 million in inventory more effectively, which may lead to significant savings from not having to replace lost items.

The new auditing system is based on bar-coding. Auditors have so far installed bar codes on the property used by 40 of the state's 139 agencies. The bar code is scanned by one end of the pen, while the other end acts as a stylus, so a property officer can scan and write at the same time.

The state wrote its data-tracking application in Pen Pal Associates' Power Pen Pal 4.0, said Pete McCoy, technical specialist for the state. The state is buying Fujitsu Personal Systems, Inc.'s 325Point, a tablet-size system with a 386SX-class chip in it.

The state plans to roll out between 100 and 200 systems to its 200 property officers by the end of the first quarter of 1994.



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Banyan to simplify storage management

By Elisabeth Horwitt
WESTBORO, MASS.

Banyan Systems, Inc. last week promised by mid-1994 to provide administrators of distributed, multivendor client/server installations with the ability to manage storage devices with the same ease and degree of centralization they have long enjoyed on mainframes.

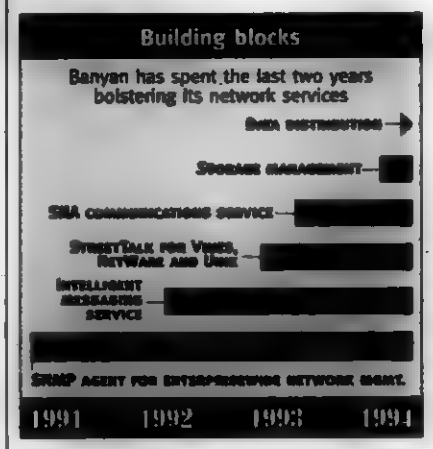
Banyan's storage management offerings, which constitute the next phase of its platform-independent network services architecture, cannot come too soon for large Banyan shops such as Pacific Gas & Electric Co. (PG&E).

"We've learned a lot of [useful] things in the mainframe world that we haven't yet taken down to the client/server world," with storage management being one of the keys, said Arthur Beckman, manager of client support services at the San Francisco utility. He has some 480 Banyan Vines servers in-house, many holding critical information and some holding 1G byte of data or more. As such, "the old method of equipping each server with a 100M-byte tape drive doesn't work anymore."

Banyan plans to address the needs of customers such as PG&E with a three-part rollout of storage management products that it will codevelop with Legato Systems, Inc., according to David Penzias, director of business development. Banyan recently bought a $500,000 stake in the storage management company.

The rollout phases are as follows:

•**Phase 1:** Enterprise Backup and Restore will deliver "mainframelike" centralized backup and restoration services in a heterogeneous client/server environment. Network administrators will be able to set up automated backup of client files to disk, as well as institute policies and procedures for backing up and restoring files throughout the company, Penzias said. The first deliverables are slated for mid-1994.



•**Phase 2:** Hierarchical storage management, a series of applications for automatically moving files from high-speed, high-end direct-access storage devices to lower-speed, lower-cost devices such as tape drives. This addresses users' need to clear their primary storage devices of files they may "only access once a year" but do not want to delete entirely, Beckman said. No time frame was given.

•**Phase 3:** Data Distribution Service, which will coordinate the movement and replication of files, directories, software packages and updates to disks located on different servers and clients throughout a company.

Potential applications include companywide software updates and the need to move daily records of transactions at individual outlets from local disks to a central repository, said Drew Wolff, Banyan senior product manager.

"Right now, users do this via 'Sneakernet' or large E-mail notes or by mailing disks back and forth or copying across PC subdirectories — none of which is particularly efficient," he said.

Banyan gave no time frame for the data distribution service.

The above offerings will be integrated with existing Banyan network services and will run across the client/server environments now supported by Banyan enterprise services: Novell, Inc.'s NetWare and Unix. They will also support the full range of clients, including DOS, Unix, Windows, Macintosh and OS/2, Banyan said.

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GSA Contract Number GS00K93AGS6403.

NetWare to manage remote users' access to corporate LANs

By Elisabeth Horwitt
PROVO, UTAH

Novell, Inc. last week announced a dial-in, dial-out NetWare Loadable Module (NLM) that it claimed will allow information systems managers to both satisfy and control the hordes of laptop-wielding users who want easy access to corporate LANs from the road and home.

This announcement does for NetWare what the AppleTalk Remote Access standard did for Macintosh users: It provides a standard for DOS machines remotely accessing NetWare local-area networks that third parties can build to, said Jay Batson, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Users have been waiting for Novell to do this so the remote LAN access market can really take off, he added. "However, what users really want is for Novell and Apple to both support the Point-to-Point Protocol (PPP)," which would potentially allow them to combine dial-in facilities for Macintosh and DOS/NetWare LAN users, Batson said. Both vendors have promised PPP support at undisclosed dates.

Outer bounds

The total market for LAN remote access and remote control products as well as incremental modem installations to support them, will grow from $529 million this year to almost $2 billion in 1996, according to an April '93 report from Forrester Research, Inc. called "Sizing the LAN Outer Network Market."

Get the connection

Novell's take on this potentially lucrative market is NetWare Connect, an NLM that is said to be the first product to support both dial-in and dial-out connections. This allows network administrators to use the same modem pools and ports for both incoming and outgoing calls, offering big cost savings, said Gerry Machi, vice president and general manager at Novell's interoperability group.

In addition, users can configure a Novell electronic-mail server to dial out via the NetWare Connect server, eliminating the need for a separate set of modems for E-mail.

The product is also said to provide a range of security and auditing features that enable administrators to track attempts at unauthorized access from outside, as well as track inside users' dial-out calls for accounting purposes.

NetWare Connect will also provide the communications underpinnings for the upcoming Novell client software product, Personal NetWare, that will facilitate and manage laptop users' access to LAN resources, Machi said.

For example, Personal NetWare will be able to "virtualize" a laptop's connection to LAN resources so that the user can disconnect from the LAN, prepare jobs to go over E-mail or printer connection, and then reconnect and send those jobs to the LAN, Machi said. In addition, updates made to the user's PC on the LAN will automatically update the laptop's database. Novell has not yet formally announced Personal NetWare.

NetWare Connect is currently scalable from two to 64 ports and will support hundreds of ports in a few months, Machi said.

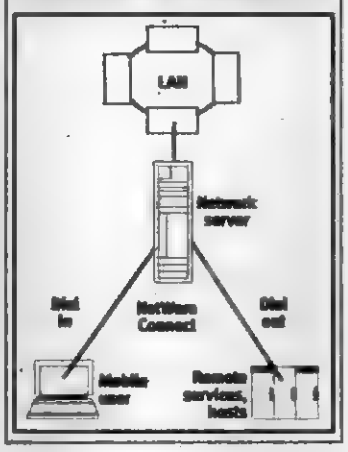
The NLM runs on NetWare v3.11 and 4.0. It supports remote control packages that enable a remote PC to dial into a local PC and operate it. NLM also runs with remote node packages that allow a remote PC to act as if it resides on the host LAN. It is manageable by Simple Network Management Protocol.

The product supports more than 100 third-party communications hardware and software products through its backward compatibility with NetWare Asynchronous Communications Services. Hardware support includes a range of network adapters supporting X.25, Integrated Services Digital Network and other wide-area network links.

Priced at $595 for a 2-port version and $5,995 for a 32-port version, the NLM is due to ship Oct. 8.

Two-way street

NetWare Connect provides both inbound and outbound connections for LAN and remote users

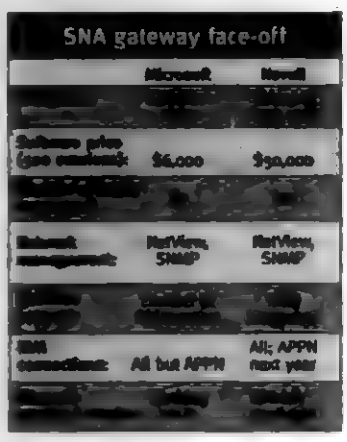


Novell vs. Microsoft

CONTINUED FROM COVER 1

Based on evaluations of both products, "NetWare for SAA and SNA Server are very, very close in terms of ease-of-use features and performance; both are very easy to configure and install," said Tony DeFeciani, manager of micro systems and communications at the New York State Assembly. As a result, the fact that "NetWare for SAA is much more expensive is important to us," he added.

Nevertheless, Microsoft may have trouble making inroads on NetWare for SAA, an established product that is regarded as "one of, if not the best, SNA gateway out there," said David Passmore, a director at Gartner Group, Inc., a market research firm in Stamford, Conn.



At stake is a highly lucrative market — Novell, with its 31% share, is reaping $80 million annually with its NetWare for SAA gateway. More important, Microsoft hopes to use SNA Server to establish a beachhead for its NT Advanced Server within Novell's NetWare local-area network installed base, which analysts estimated comprises about 68% of total network operating system installations.

Beta-test user Avco Financial Services, Inc. testified to SNA Server's power and ease of use. SNA Server "looked like one of the easiest products on the market to configure and manage," said Bill Mattox, systems consultant at the Irvine, Calif., financial company. And after three weeks of beta-testing, he said the product's performance has been up to par for 3270 applications. "Everything has been surprisingly smooth; I expected problems, but I really haven't found anything so far."

Avco, an OS/2 shop, has not done a comparable evaluation of Novell's product.

IBM host connectivity will be only one of several application fronts where Novell and Microsoft will slug it out for dominance of client/server installations, Passmore said. More often, a company's choice of a client/server platform will determine its SNA gateway, he added.

The New York State Assembly, for example, has dismissed NetWare for SAA because its choice of a client/server platform is now down to Unix and NT, DeFeciani said. If Unix is picked, "We don't know what we'll use as an SNA gateway."

Where the two gateways will really go head-to-head is in the growing number of corporations that install Microsoft's NT Advanced Server as an application server and NetWare as their file server, Passmore said. Then it will come down to whether users buy Microsoft's argument that NT, with its protected-mode, multiprocessor architecture, will make a better gateway platform than NetWare.

Also affecting user choices will be how fast Microsoft can catch up with Novell in gaining the support, and thus the value-added features, of key communications hardware and SNA software products. For example, Bustech, Inc. and Memorex Telex provide NetWare for SAA with a host channel connection that SNA Gateway still lacks.

Service eases wireless data transfers

By Joanie M. Wexler
HOFFMAN ESTATES, ILL.

Wireless data networking got easier for information systems staffers last week: Ameritech Corp. unwrapped a service that lets mobile workers run data over cellular links without the IS personnel having to fiddle with the host computer site.

The regional telephone company's modem pool service allows laptop-toting users to wirelessly transfer files, query databases and send messages via an Ameritech site that houses modems running cellular protocols.

The Ameritech gear then converts those protocols into the wired protocols recognized by the customer's host — such as IBM Systems Network Architecture — and shuttles the communications on from there, explained Bill Boehm, manager of data support at Ameritech.

Such a service "would help us preserve our investment in the modem technology that we've deployed firmwide," said Sherry Sunderman, telecommunications partner at Andersen Consulting in Chicago. Andersen is piloting this and other wireless data services.

The worldwide management consulting firm has not yet made any decisions among the various wireless wide-area networking approaches such as circuit-switched cellular, emerging cellular digital packet data (CDPD) and packet radio protocols from the likes of Ardis and RAM Mobile Data, Sunderman said.

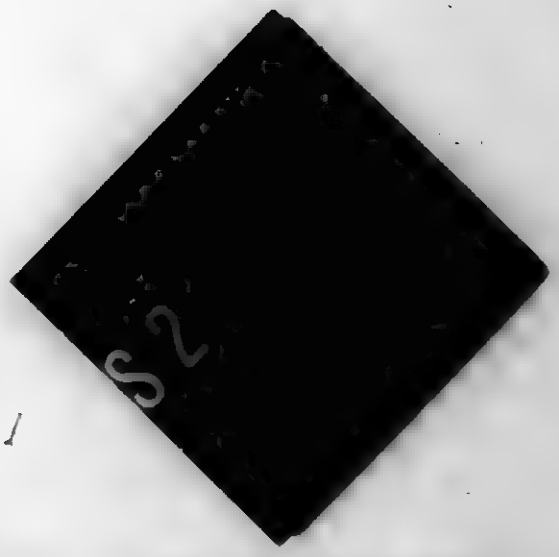
However, "our people are on the move constantly, and getting the right information when they need it is a high priority. We're not always in a position to connect in a land line mode," Sunderman said.

With 26,000 employees worldwide, it is important that Andersen monitor use and that the Ameritech service, dubbed Wireless Field Express, provide a monthly detailed list of data calls separated out from voice calls, she said.

To use the service today, mobile workers' laptops would need a cellular modem running the industry-standard MNP-10 connection protocol for circuit-switched cellular networks, Boehm said. The service eliminates the need for companies to outfit their host-site modems with cellular interfaces.

To accommodate different populations of users, Ameritech said it intends to soon add AT&T/Paradyne's Enhanced Throughput Cellular, a competitor to MNP-10. The carrier plans to support CDPD for statistical wireless data networking — where users pay by number of packets sent rather than for time connected — in 1994, Boehm said.

The MNP-10-based service is currently available in Chicago.



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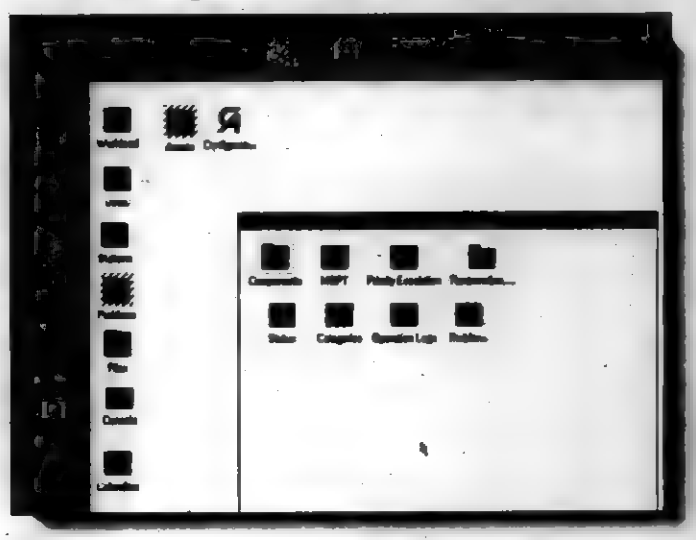

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Health fraud: Computers at war

CONTINUED FROM COVER 1

firms and managed-care companies are turning to sophisticated software that screens thousands of incoming claims for overcharges.

The expert systems come from little-known vendors such as Health Payment Review, Inc. in Boston, GMIS, Inc. in Malvern, Pa., and Medicode, Inc. in Salt Lake City. But they could become important soldiers in the Clinton administration's forthcoming assault on health care fraud and "profiteers."

Using the expertise of eminent physicians, the claims-auditing systems look for evidence of "code gaming," or manipulation of the five-digit codes for medical diagnoses and procedures to jack up the doctors' reimbursements.

Most medical fraud involves billing for work never done, but overpayments because of code gaming and errors amount to an estimated 1% of all health care spending, or about $6 billion last year, according to Marcia Radosevich, president of Health Payment Review.

Creative billing

One bill-padding technique is known as "code creep" or "upcoding," which means selecting a medical code for a more extensive surgical procedure or office visit than that which actually occurred. Another type of creative billing is "unbundling," where the doctor charges for individual tasks rather than using the less-expensive code that covers the whole procedure (see chart).

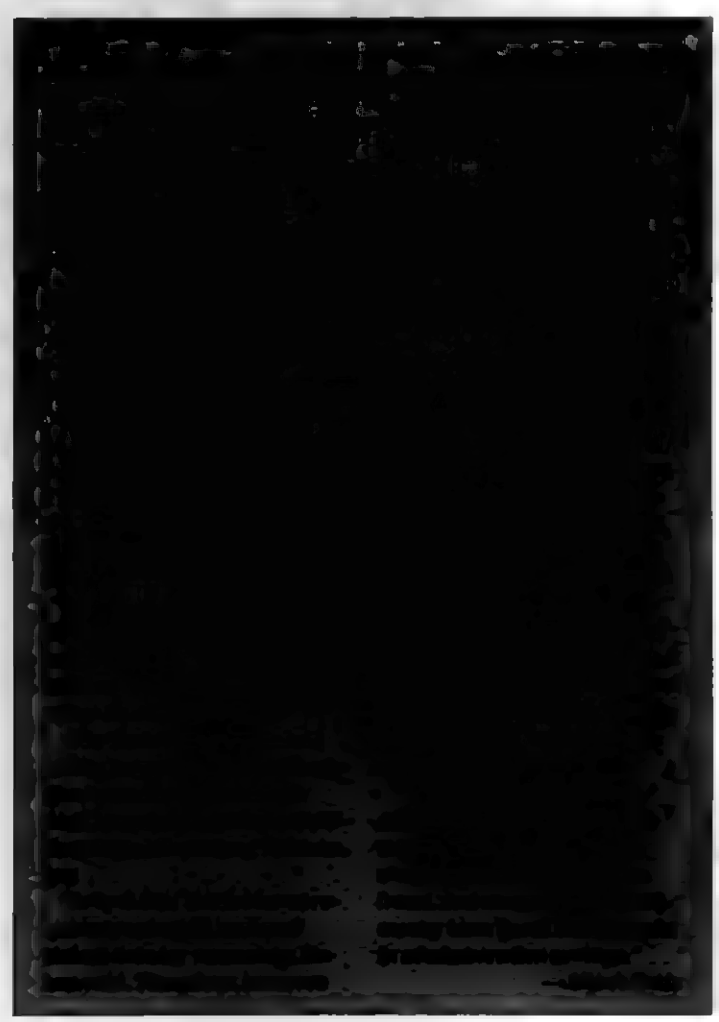
A 1991 spot check at one Medicare insurance carrier in Pennsylvania showed that code gaming produced overpayments of $468,397 in just two weeks, which is $12 million on an annualized basis, according to the inspector general at the U.S. Department of Health and Human Services.

Worst yet to come?

Code gaming may get worse if the Clinton administration's health care reform plan tries to roll back doctor's fees, experts said, because doctors will look for new tricks to make up for the loss of income.

Radosevich said that when the federal government cut reimbursements for anesthesiologists by 10% a few years ago, "all of a sudden we started seeing enormous unbundling problems and code creep problems" in claims submitted by anesthesiologists.

"Health care costs are like a water balloon," Radosevich said. "Push on one side, and it pokes out the other."



Unbundling medical codes

Doctors can raise their reimbursements by charging "a la carte" for separate tasks, rather than applying a single code that covers the whole procedure

27570	Manipulation of the knee	$473
29870	Diagnostic arthroscopy	$1,371
29875	Limited synovectomy	$2,568
29881	Knee arthroscopy/meniscectomy	$2,670
	TOTAL:	$7,082

Recommended code and payment:
29881 Knee arthroscopy/meniscectomy $2,670

Explanation: Procedures 29875, 29870 and 27570 are routinely performed as integral parts of an arthroscopic meniscectomy and are included in the global code 29881.

Source: Health Payment Review, Inc., Boston

Coding enablers

Sampling of firms that sell coding software to health care providers for "optimizing reimbursement":

- **3M Health Information Systems**, Murray, Utah.
- **Cabot Marsh Corp.**, Bethlehem, Pa.
- **CodeMaster Corp.**, Chicago.
- **HCIA, Inc.**, Ann Arbor, Mich.
- **Health Care Information Systems, Inc.**, Beaverton, Ore.
- **St. Anthony Publishing, Inc.**, Alexandria, Va.

Fraud database

There is a nationwide database of doctors cited for malpractice, but there is no database for tracking medical billing fraud. To rectify that problem, U.S. Reps. Fortney H. (Pete) Stark (D-Calif.) and Charles E. Schumer (D-N.Y.) and U.S. Sen. William S. Cohen (R-Maine) have drafted legislation to create a national database of people guilty of health care fraud.

The claims-auditing software is typically used by insurance companies and others on the payer side of the health care street focused on cost containment.

At Tufts Associated Health Plans, Inc. in Waltham, Mass., for instance, the software saves the health maintenance organization $4.5 million a year, according to Bob Chin, vice president of information systems until last month.

Tufts runs an expert system called CodeReview from Health Payment Review on a Hewlett-Packard Co. HP 3000 minicomputer. CodeReview and its competitors flag suspicious charges for manual review.

On the provider side, there is a mini industry of seminar, newsletter and consulting firms that promise doctors they can boost their reimbursements through more aggressive coding. One such company offers physicians a training manual for "turning your coding department into a profit center."

"Oftentimes the advice the consultants give is perfectly appropriate, but some cross the line," Radosevich said.

Dueling systems

Several sources claimed that there are shady firms that sell software or provide billing services that automatically change codes to boost reimbursements. For example, they automatically unbundle the global code for a hysterectomy into five component codes, Radosevich said, and then CodeReview rebundles them back into the single code.

"It's a case of dueling expert systems," she said.

In addition to that underworld, there is a controversial category of software called "encoders." Vendors said the decision-support software was designed to help medical records personnel arrive at the right codes, but the software also includes logic modules called "optimizers" that show users other coding options that could produce higher reimbursement.

The goal is to prompt coders to search the medical record for conditions or treatments they may have overlooked, vendors said, so the providers get all of the reimbursement they are rightfully owed. One Philadelphia hospital using an optimizer boosted its reimbursement by $1,266 per Medicare patient, for example.

However, optimizers can be abused by people intending to "rip off the system," according to Kathleen Fyffe, director of payment systems at the Health Insurance Association of America in Washington, D.C.

In essence, the software provides a road map for code gaming without automatically doing it. Literature for CodeMaster Corp.'s encoder, for example, said its optimizer does the following:

"Displays all options to the current DRG (diagnosis-related group), indicating what the actual alternative DRG would be, the hospital-specific dollar amount for that DRG (whether increased or decreased) and the specific changes to the coding necessary to effect the change."

"My guess is that users don't automatically pick the highest-priced code. They pick the one that's best for the case," said Melinda B. Resser, director of sales and marketing at CodeMaster in Chicago.

'Not encouraged'

Another vendor is Health Care Information Systems, Inc. in Beaverton, Ore. Asked whether his firm's InfoCoder supports code gaming, President Carl Cottrell said, "It allows them to do it, but it doesn't encourage it. The software shows coders what diagnoses they might be missing and gives them advice to get the exactly correct code."

Part of the problem is that selecting the right medical code is tricky and open to differences of opinion. "There is a fine line between working the system to get all you can legitimately — like the tax code — and making an intentional misrepresentation of what you did in order to get more money," said William J. Mahon, executive director of the National Health Care Anti-Fraud Association in Washington, D.C.

Those doctors and hospitals that take aggressive coding positions see it as a way to fight back against the cost-cutters of the managed-care insurance community, experts said. "Their position is to let the big insurance companies catch it," said J. Eric Sandhusen, president of Review Associates in Chicago.

Sandhusen, whose company sides with doctors in Medicare disputes, added that sometimes the claims-auditing software goes too far by denying claims that are justified because the case was particularly difficult. "There is overreaching on both sides," he said.

Novell to pull messaging into NetWare

By Lynda Radosevich

Novell, Inc. will release in the coming weeks a version of Global MHS (Message Handling Service) that shares the directory services in NetWare Version 4.0 rather than requiring users to maintain separate network and electronic-mail directories, as is currently the case.

The company is also considering bundling the Global MHS software with NetWare 4.0, said Mark Ryan, a senior product manager at Novell.

"That would make my life much easier. I've got a huge, scary directory tree with links between the network directory, [front-end] mail directory and MHS directory," said Randy Bryant, a senior technical specialist at Hurco Manufacturing, Inc. in Indianapolis.

Time-saver

An updated version of Da Vinci's E-mail software — the leading front-end software for Novell's messaging engine — includes graphical administration tools. Beta-test user Randy Bryant, a senior technical specialist at Hurco Manufacturing, Inc. in Indianapolis, said he can add and delete users with a "point and click rather than typing in a long string of parameters."

Also, Novell will include basic MHS services for free in the unannounced Version 3.12, company officials said. The basic version of MHS, however, does not support non-MHS platforms as Global MHS does.

Novell's messaging strategy is gaining ground in large organizations, partly because of its plans to integrate messaging into network operating system software, according to network managers and industry observers.

That headway, they said, is expected to be made by using Novell messaging software as a "back-end" mechanism to link different desktop E-mail packages. This is similar to the X.400 or Simple Mail Transport Protocol used by Open Systems Interconnect (OSI) and Transmission Control Protocol/Internet Protocol (TCP/IP) networks.

For example, Jake Hoffman, technology coordinator for the state of Idaho, began using Global MHS in July to link 27 kinds of E-mail in divisions throughout the state. The most common denominator of the packages was that 70% of them ran on a Novell server, so he chose Global MHS for the common transport rather than the X.400 protocol.

Novell's messaging software, enables NetWare networks to receive, store and distribute E-mail. The basic MHS is widely used to support desktop E-mail software in local-area networks. A more advanced version, Global MHS, lets NetWare servers exchange mail and directory information with servers on IBM Systems Network Architecture, TCP/IP or OSI networks.

"We're more interested in MHS mainly because it supports other environments," Hoffman said.

To increase MHS awareness and show that it is serious about messaging, Novell last month moved its formerly separate messaging unit into its NetWare group.

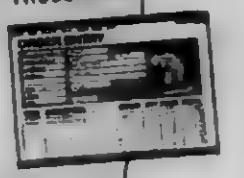
MHS front-end software developers, such as Da Vinci System Corp., are counting on Novell's messaging push to launch their products from the LAN into enterprise networks. Last week, Da Vinci introduced a version of its E-mail software that uses Global MHS to update the E-mail directory when new users are added to the NetWare directory.

"With a version of Global MHS installed and shipping free with every NetWare, I'm not too worried about it catching on," said Bill Nussey, Da Vinci president and chief executive officer.

However, analysts noted Novell still has a long way to go before large companies view MHS as a strategic enterprise E-mail system. In a recent study of 100 Fortune 1,000 corporations, approximately 1.5% of 1 million mailboxes were based on Da Vinci's E-Mail, which is by far the market leader in MHS products, said David Ferris, editor of "Ferris E-mail Analyzer" in San Francisco.

RemoteWare and the SEMINAR missed

AT THE VERY MOMENT AN EXPERT WAS EXPLAINING THE COST- AND SANITY-SAVING BENEFITS OF REMOTEWARE-CREATED AUTOMATED WORKFLOW SYSTEMS TO A ROOMFUL OF HIS FELLOW CLIENT/SERVER AFICIONADOS [redacted] was sitting in a tiny center seat, in coach, staring blankly at a fly nimbly exploring the OXYGEN PANEL above him. It had come down to a scheduling conflict. One more FREE product seminar, half-day, inevitably bad deli sandwiches... — potato chips that had gotten too close to the kosher dills and gone soggy. Or this junket to clean up yet another set of branch communication difficulties in Opelika, St. Louis, and San Antone. So the picture of this fly on the ceiling RUBBING ITS FRONT LEGS TOGETHER with an ominous delight didn't have the significance for him it might have had he seen that MEANWHILE, BACK AT THE SEMINAR THE REMOTEWARE FOLKS WERE SPINNING COLORFUL TALES OF SUCCESSFULLY-IMPLEMENTED FIELD COMMUNICATIONS SYSTEMS, HOLDING CHARLIE'S TECHNO-PEERS FROM COMPETING COMPANIES CAPTIVE WITH THE PROMISE OF THOUSANDS OF FULLY-AUTOMATED, EASY-TO-MANAGE AND UNATTENDED DIAL-UP COMM SESSIONS, AND RIVETING ACCOUNTS OF REAL COMPANIES WITH HUNDREDS OF MOBILE CORPORATE LAPTOPS AND REMOTE BRANCH OFFICES USING CENTRALLY-CREATED AND MANAGED ELECTRONIC FORMS, DOCUMENTS, AND REPORTS, ALL LINKED TO CENTRAL SYSTEMS AND DATABASES, AND ALL NEATLY SUPPORTED BY INTEGRAL ELECTRONIC SOFTWARE DISTRIBUTION CAPABILITIES! So these were the things Charlie was missing: solutions to the very problems that had made this one more night away from home a necessity. That, and what actually turned out to be a delicious RemoteWare lunch of pasta salad, FRENCH BAGUETTES with prosciutto and mozzarella, and fresh strawberries. But what did he know? He was headed to lunch with the fellas in San Antone. For bad deli sandwiches. And SOGGY CHIPS.



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News Shorts

Microsoft offers more NT options

Microsoft Corp. last week formally rolled out a fee-based, tiered support program for Windows NT that it hopes will help entrench the recently released operating system in large corporate accounts. The new support program, to be implemented Oct. 1, is called the Microsoft Support Network.

Apple shows IBM-compatible hardware

In a sign of the times, **Apple Computer, Inc.** last week introduced its first hardware product designed exclusively for IBM-compatibles. The CD Multimedia Kit for PCs was among three new multimedia kits due in stores this week. Prices will range from $550 to $700. They include a Sony Corp. CD-ROM drive, a 16-bit sound card and stereo speakers from Apple.

Powersoft announces tools availability

Powersoft Corp. announced pricing and availability for PowerBuilder 3.0 last week as expected [CW, Aug. 16] and did the same for its PowerMaker and PowerViewer products targeting end users. All three products will ship by the end of the month and are priced at $3,595, $949 and $199, respectively. As an introductory offer, Powersoft will offer PowerMaker for $89 and PowerViewer for $49 through the end of November.

Digital's Alpha does Windows

As expected, **Digital Equipment Corp.** last week introduced a lower-cost version of its Alpha AXP microprocessor targeted for use in PCs running **Microsoft**'s Windows NT and priced as low as $2,500. The 166-MHz DECchip 21066 has simulated performance ratings of 70 SPECint and 105 SPECfp and costs $395 in quantities of 5,000.

Sharp jumps on PDA bandwagon

Sharp Electronics Corp. said it would soon release a Personal Information Assistant, a cross between a personal digital assistant and a notebook computer that will include GeoWorks' Geos operating system. The PT-9000 will use both pen and keyboard input.

Management shake-up

Chicago-based systems integrator **Technology Solutions Co.** shook up its upper management late last week when its board asked for the resignations of company founder and Vice Chairman Albert D. Beedie Jr. and Vice Chairman Melvyn E. Bergstein. Their resignations come three months after both men relinquished their titles of co-chief executives.

Lotus mail catches up with rivals

Lotus Development Corp. is gearing up to follow electronic-mail rivals **WordPerfect Corp.** and **Microsoft Corp.** Lotus told attendees at the Corporate Computer Professional Exposition in Chicago last week that it will add support for sharing calendaring and scheduling notifications between IBM Profs and CC:Mail and Notes systems running Lotus Organizer. Both WordPerfect and Microsoft already provide this capability.

SHORT TAKES **The Wollongong Group** last week announced and began shipping the first network management platform to support Simple Network Management Protocol Version 2. Priced at $10,000, the Wollongong package got in just ahead of **Sun Microsystems, Inc.**'s SunConnect, which is scheduled to ship an SNMP V.2 version of SunNet Manager in the fourth quarter.... **KPMG Peat Marwick** announced last week it will begin providing systems integration services using **Next, Inc.**'s NextStep object-oriented software.

Feds to downsize with IT

CONTINUED FROM COVER 1

with sustaining itself to a government clearly focused on serving the people," Gore said.

"Information technology is going to be the most important tool for re-engineering functions in the government," agreed James J. Flyzik, co-leader of the NPR's information technology team and telecommunications director at the U.S. Department of the Treasury. "I think NPR management will showcase [information technology] largely because we have a champion in the vice president."

Gore's ideas, culled over six months mostly from efforts already under way in federal, state and local governments, include a national network serving law enforcement and public safety agencies; an integrated suite of government benefits distributed to holders of "smart cards"; electronic linkage of tax files at federal, state and local agencies; and the creation of a shared infrastructure that would knock down the walls separating the information systems in government agencies (see story below).

Asked why this effort to spruce up Uncle Sam's performance would succeed when so many earlier ones have failed, Flyzik said, "These are things government [information technology] managers want to do. Some of the reports in the past from outside consultants created a defensive posture."

Technology is ready

Charles N. Brownstein, co-leader of the information technology team and director of the Office of Planning and Assessment at the National Science Foundation, said technology is ready.

"For example, for government-wide E-mail, 10 years ago everyone would have had to write their own system. Now we've got Internet, X.400, multiprotocol routers and so forth," Brownstein said.

Fred Wood, senior associate at the U.S. Congress' Office of Technology Assessment, agreed that the maturity of technology today favors this latest reinventing government effort. "The Grace Commission [appointed by President Reagan] worked in a mainframe computer and plain-old-telephone-service environment, so the possibilities were far more limited than they are today," he said.

Wood said another positive factor behind the Gore effort is a stronger base of support in state and local governments, where the use of information technology to bring service improvements has blossomed in recent years. "It's no longer the case that the federal government is on its own," he said.

Flyzik said the information technology team was careful to avoid recommendations requiring long lead times, major new funding or new federal bureaucracies.

"We focused in on areas where there has already been a significant amount of effort," he said.

Electronic distribution

For example, the U.S. Department of Agriculture now distributes food stamps electronically in a number of places, and the NPR calls for the integration of additional benefits such as Medicare and Social Security payments.

Brownstein said most of the recommendations will be implemented by presidential orders, which will start flowing almost immediately. "Some of these things are just waiting to have a little structured authority around them."

He said President Clinton will establish interagency implementation teams with specific missions, schedules and outcomes that can be tracked.

"If I'm an [information technology] manager, I may hear about somebody doing something, but I don't pay much attention to it," Flyzik said. "But now there's a memorandum coming from the president that says if I want to build a program that distributes information to the public, there's a group over here coordinating all that, and I'd better start working with that group."

Virtual agencies

A key recommendation of the National Performance Review (NPR) is to develop an interagency information infrastructure.

"We need to look at what are the common elements the government needs for networks, computer centers, applications and so forth," said NPR information technology team co-leader James Flyzik. "We need to look at ways to share systems across government."

Flyzik and fellow team leader Charles Brownstein use terms such as "electronic government" and "virtual agency" to describe a government in which systems seamlessly mesh.

"We have the equivalent of a large data center sitting around on desktops all night long," Brownstein said. "We are not far from having operating systems that can use that power as a metacomputer to do large jobs at night or maybe without people noticing it while they are sitting around doing their word processing."

Client/server computing may obviate the need for a gigantic data center, Flyzik added. —*Gary H. Anthes*

NPR IT suggestions

The following are information technology recommendations from the National Performance Review:

▶ Overall:

- Provide strong leadership to integrate information technology into the business of government.

▶ Develop these "electronic government" applications:

- Integrated system for electronic benefits transfer.
- Electronic access to government data and services via 800 numbers, "kiosks" and electronic bulletin boards.
- A national network for law enforcement and public safety.
- Intergovernmental tax filing, reporting and payment processing.
- An international trade data system.
- A national environmental data index.
- Governmentwide electronic mail.

▶ Establish these frameworks:

- An integrated information infrastructure, including consolidated data centers.
- Systems and mechanisms to ensure privacy and security, including a Privacy Protection Board, privacy standards and a digital signature standard for unclassified data.
- Improved methods for information technology acquisition.
- Incentives for innovation, including performance-based contracting and a governmentwide venture capital fund for innovative information technology projects.
- Information technology training for federal employees; require certification for information technology managers.

Source: "Creating a Government That Works Better & Costs Less — Report of the National Performance Review"

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Multiple environments are no longer worlds apart. Even if you have Novell Netware on one network, HP-UX on another and EtherTalk on a third, the new HP LaserJet 4Si MX printer easily connects across platforms. Automatically.

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What's more, HP's LaserJet 4Si MX printer is ready to handle whatever needs come down the

that adapts to multiple environments.

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HEWLETT PACKARD

IBM to skirt Windows

CONTINUED FROM COVER 1

which reworks the code to achieve similar functions, one source close to IBM said. "And to do it in ways other than through the source code, which must be licensed from Microsoft," he added.

The technical goal of the project is to "make it fit with whatever users already have in place," said another source in the developer community.

An IBM spokesman declined to comment on the company's plans.

Some users said they are skeptical about IBM's ability to compatibly emulate Windows because they believe Microsoft will do its best to be a fast-moving target.

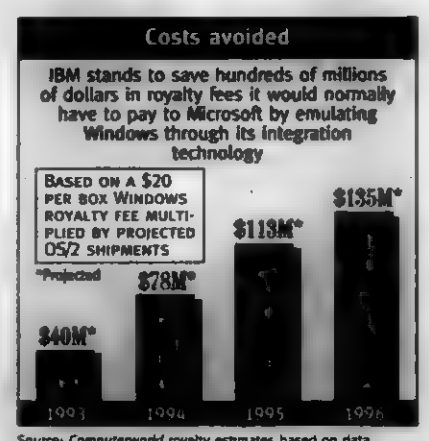
"If you look at the trouble [IBM] had with Windows apps under [OS/2] Version 2.0, I can't imagine the trouble they'll have with future versions of Windows," said one information systems manager at a large East Coast bank.

Some developers interviewed last week about the IBM internal project said they believe it is possible for IBM to strictly and legally emulate Windows' functions, but they added that it is far from a lightweight task.

"It sounds like a lot of work, but maybe the royalties are high enough that it could be worth the effort," said Paul Grayson, chairman at Micrografx, Inc.

IBM could deliver the technology in a variety of ways. One way is to sell a shrink-wrapped version of OS/2 equipped with the technology through retail stores. However, the company is exploring several alternatives, including electronic distribution, sources said, and has yet to settle on a primary distribution strategy.

As part of the "divorce settlement" hammered out by both companies last year, IBM has been paying Microsoft approximately $20 for every copy of OS/2 it sells, according to sources.



Source: *Computerworld* royalty estimates based on data provided by IBM and Microsoft. OS/2 projections based on International Data Corp. and InfoCorp estimates.

IBM had sold about 2 million copies of OS/2 2.0 as of year-end 1992. In June, the company announced it had shipped 250,000 copies of OS/2 2.1, just four weeks after it became available. Based on those figures, IBM probably paid Microsoft around $40 million in 1992 and is on a pace to pay another $40 million this year.

Under the terms of last year's agreement, both companies are obligated by midnight Sept. 16 to exchange all DOS, Windows and OS/2 source code from products both finished and still under development.

No code concerns

IBM officials have consistently said during the past year that they are not especially concerned about getting source code from finished and unfinished DOS and Windows products, including the unreleased 32-bit version of Windows, known as Chicago, but excluding Windows NT. IBM has full rights to clone Windows application programming interfaces, either with or without the use of the source code, in perpetuity.

This is the code that figures to be crucial if IBM is to continue making good on its promise that OS/2 will be "the integrating platform" for applications that are compatible with a variety of different operating systems.

Microsoft has the same rights with OS/2 source code in perpetuity and must pay IBM for any code it uses in future products. The company does not have rights to code from IBM's upcoming WorkPlace OS, the kernel of which comes from Carnegie Mellon University.

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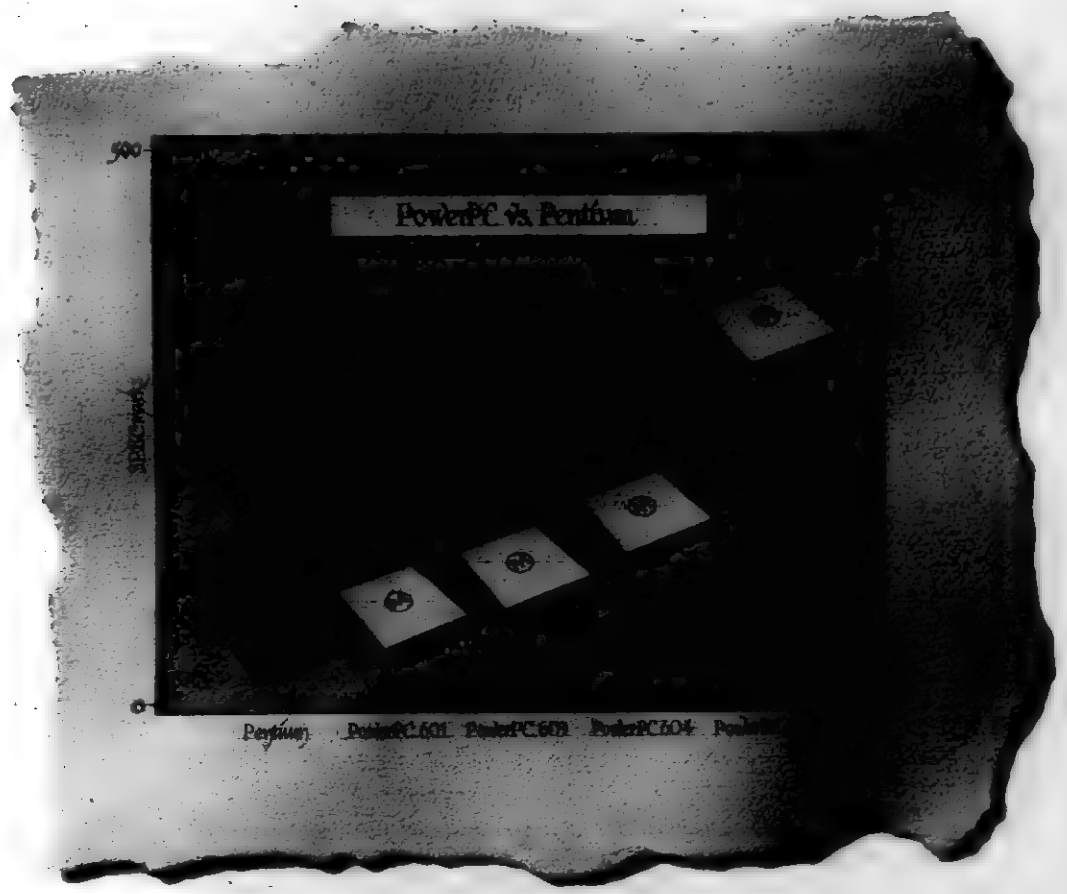

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MOTOROLA

Chemical maker profits from notebooks

By Michael Fitzgerald
NAPERVILLE, ILL.

Nalco Chemical Co., the world's largest specialty chemical manufacturer, last week began Phase III of a homegrown sales force automation project that it said has demonstrably increased its customer satisfaction levels and directly led to $26 million in sales in its first six months.

Nalco's project was driven by its sales group, with only one information systems member on the team that created the Nalco Computer Assisted Services (N-COMPAS) system.

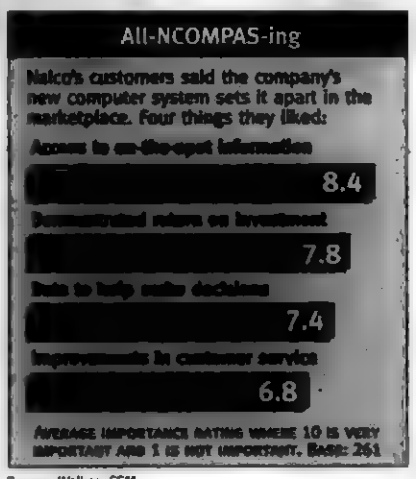
When the system is fully rolled out by the end of 1994, it will add traditional sales force automation tools such as contact management as well as specific sales force requests.

The notebook-based sales tool gives salespeople the ability to do the kind of on-the-spot information analysis that was previously locked in the $1.3 billion firm's mainframes.

Analysts said Nalco's effort to move valuable data off the mainframe and into the hands of salespeople is becoming a more common approach to doing business, thanks to a marked increase in the power of notebook computers.

"Where customer care divides the winners and losers in the 1990s, this is the kind of thing to put out in the field," said Barton Goldenberg, president of Information Systems Group, Inc., a Washington, D.C., consultancy.

Nalco last week ordered 600 notebooks to complete its rollout to the 1,260-member domestic sales force. All of its 386SX and 486SL-based notebooks run Micro CAPE, or Computer Assisted Program Evalution, a suite of proprietary analytical programs it had ported from its mainframes.



Source: Walker: CSM

A 250-member first phase was able to demonstrate that using the notebooks helped save $12 million in existing business as well as generate $14 million in new business during the project's first six months. Nalco officials declined to comment on sales generated since that time.

Keep customers happy

Increased sales were only part of the reason that Nalco management committed to the notebook project.

"We have to justify everything we do, and the only way we could expand the project beyond its initial stage was if we could prove that we had increased customer satisfaction," said Brent Richards, manager of sales training and chairman of the committee that developed N-COMPAS (see chart).

The 45 packages in Micro CAPE are directly responsible for this increase, according to Richards. Designed to give the Nalco sales representative access to a wide variety of analytical information needed to help customers, salient features include predictive analysis software for "what-if" scenarios; statistical process-control analysis; program optimization; return on investment computations; inventory management; and service reports.

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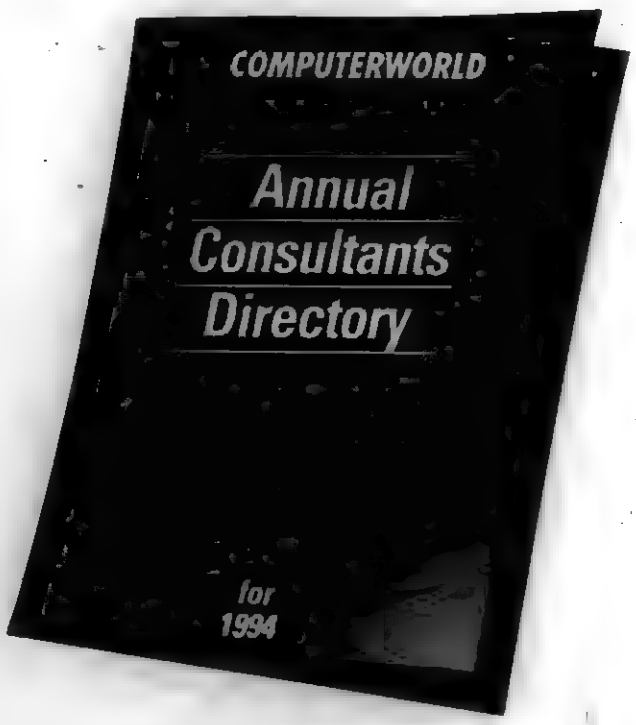

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SEPTEMBER 13, 1993 SECTION 2 OF

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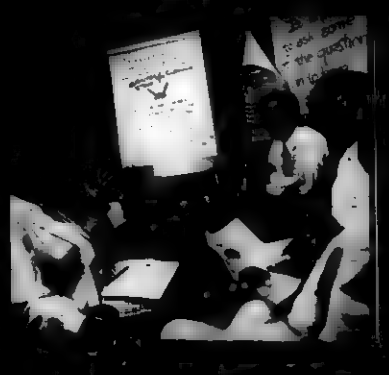
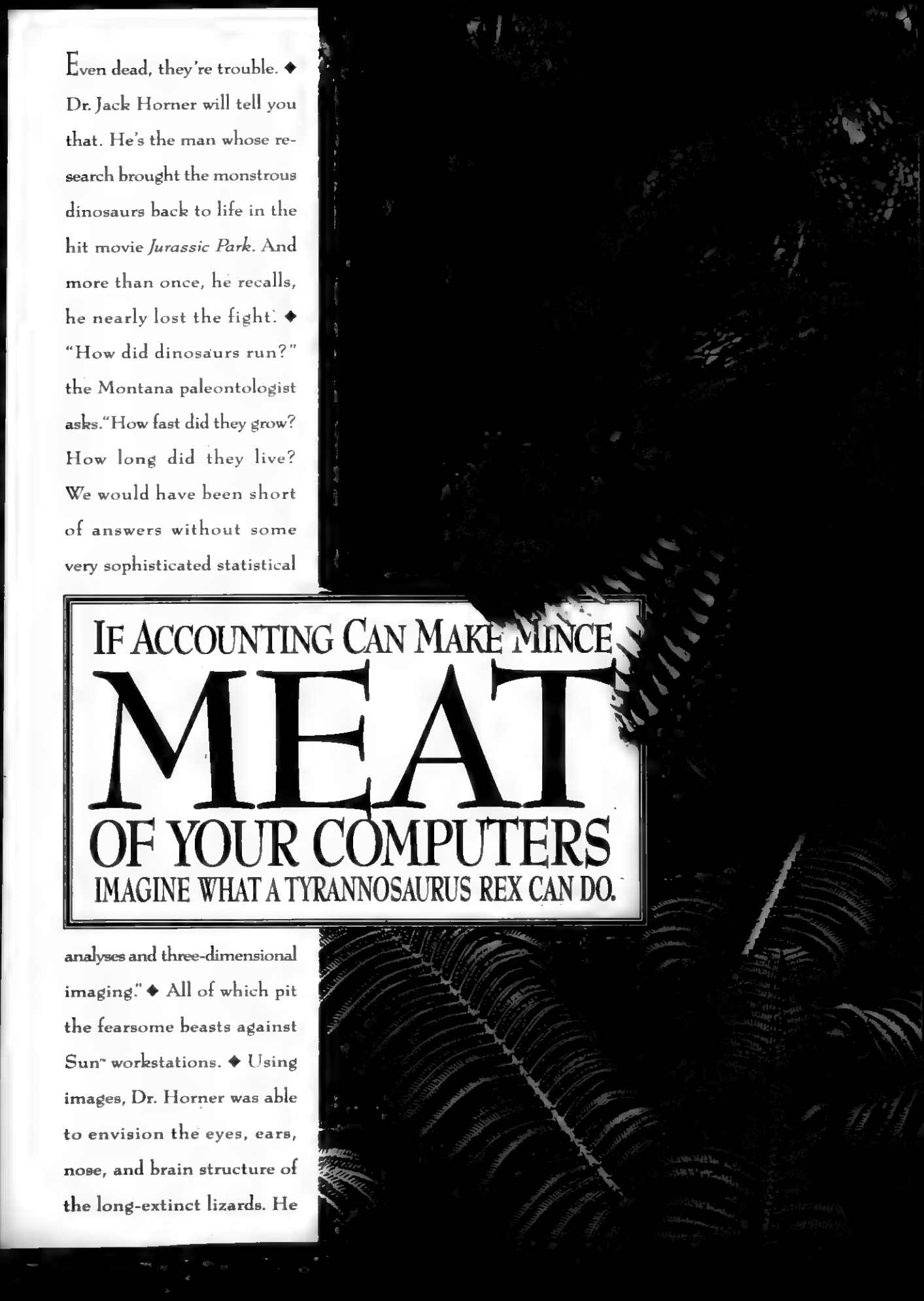
HOW THE BEST ARE PLAYING THE NEW BUSINESS GAME





Even dead, they're trouble. ◆ Dr. Jack Horner will tell you that. He's the man whose research brought the monstrous dinosaurs back to life in the hit movie *Jurassic Park*. And more than once, he recalls, he nearly lost the fight. ◆ "How did dinosaurs run?" the Montana paleontologist asks. "How fast did they grow? How long did they live? We would have been short of answers without some very sophisticated statistical analyses and three-dimensional imaging." ◆ All of which pit the fearsome beasts against Sun™ workstations. ◆ Using images, Dr. Horner was able to envision the eyes, ears, nose, and brain structure of the long-extinct lizards. He

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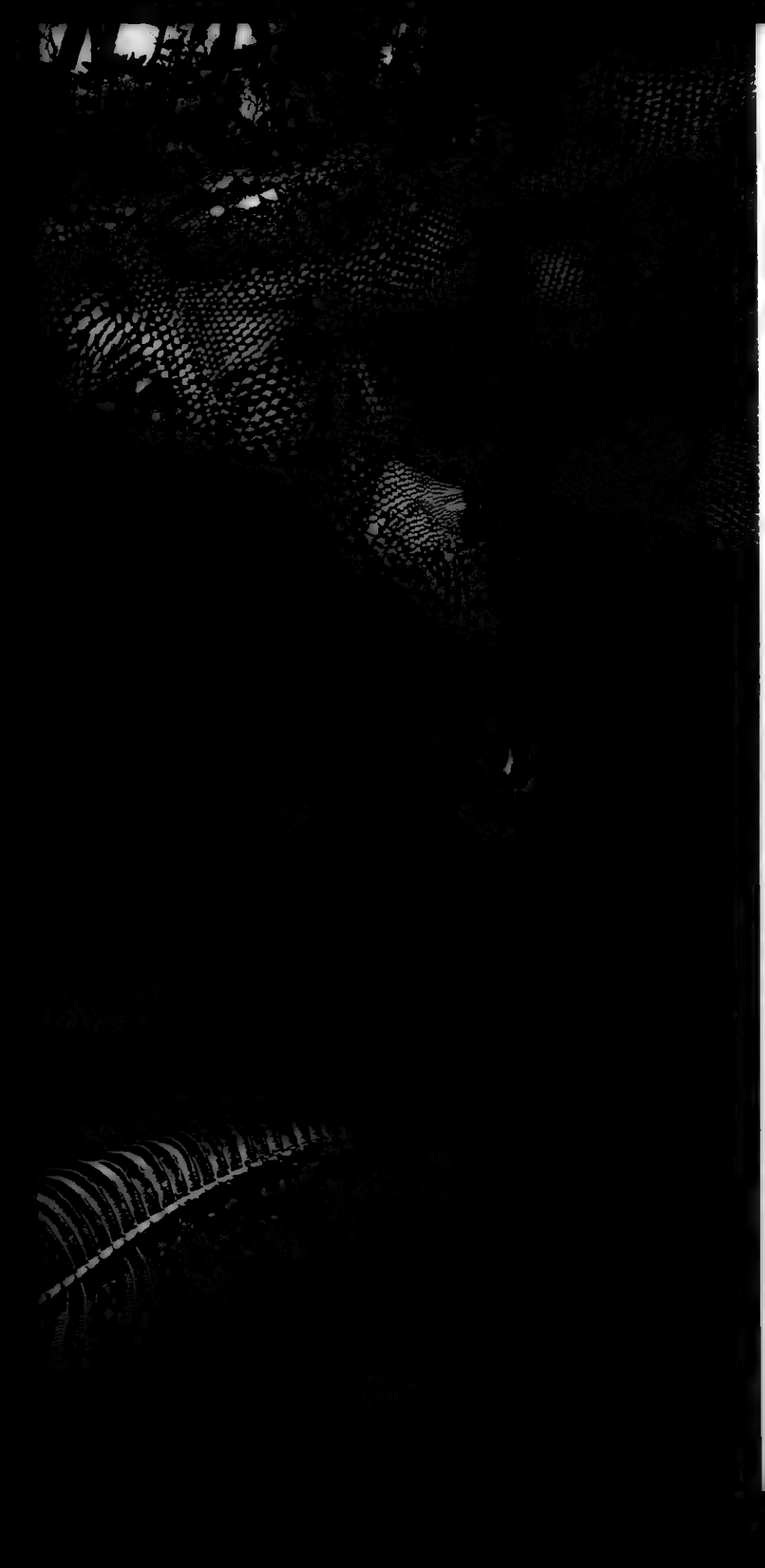

was also able to look at them three-dimensionally, right on the screen, from every conceivable angle, testing theory against fact. ◆ Using Sun, Dr. Horner was soon able to pin dinosaurs down, quantifying how well they could hear, even how they sounded. ◆ And what might a dinosaur say, should one meet you? ◆ Mostly, a kind of growling. ◆ "They weren't very intelligent," Horner says. ◆ But they were pretty hungry. ◆ Sun computers. Just the thing to handle a towering lizard, or whatever monstrous task you're facing. ◆ More than one million people are using Sun systems, powered by the SPARC® chip and the Solaris® operating environment, to gain a competitive advantage. Jack Horner is just one. To learn how you can benefit, call 1-800-426-5321, ext. 605.

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COMPUTERWORLD PREMIER 100

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PHOTOGRAPHY BY SIMON GRIFFITHS (LEFT) AND REID HORN (RIGHT)

The Computerworld Premier 100 team: *(from left): Anne McCrory, Joanne Kelleher, Nancy Koval, Erin Callaway, Joyce Chutchian-Ferranti and Michael Sullivan-Trainor.*

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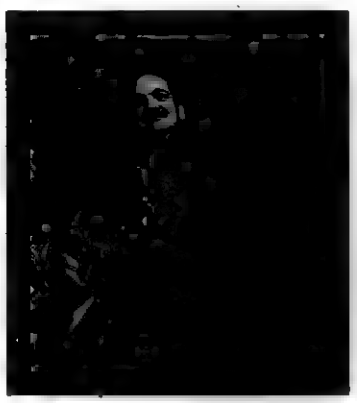

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PHOTOGRAPHY BY STELLA JOHNSON (TOP), JAMES SCHNEPF (MIDDLE) AND TOM ZIMBEROFF (BOTTOM)

Drawing outside THE LINES

THE BEST RULE THESE DAYS is that there aren't any rules, and if there is one attribute shared by this year's *Premier 100* organizations, it is their willingness to jettison old conventions and work in that dangerous white space where there are no preconceptions about how things should be done.

The spirit is infectious. We've also made some rather significant alterations this year, both in our selection process and in the information we present about these outstanding information systems organizations.

We've expanded our evaluation to take into account many factors that bear on excellence of technology management, including but not limited to assessments from top executives of these companies about the value that technology is adding to the business. We've also tried to give readers a closer look at the kinds of things these companies are doing with technology and the philosophies behind their actions.

When companies or people are chosen for this kind of honor, the question naturally arises: "What makes them so good?" We hope that by the time you've finished reading you'll have your answer *and* a scratch pad full of notes about tactics you might want to try.

As Michael Sullivan-Trainor, research manager and initiator of the *Premier 100*, makes clear in his

AEROSPACE	CONSUMER PRODUCTS AND SERVICES	FINANCIAL SERVICES	INDUSTRIAL AND AUTOMOTIVE PRODUCTS	MANUFACTURING
1 The Boeing Co.	1 Dibrell Brothers, Inc.	1 Banc One Corp.	1 Cummins Engine Co.	1 Rubbermaid, Inc.
2 Martin Marietta Corp.	2 Hon Industries, Inc.	2 Mellon Bank Corp.	2 Harley-Davidson, Inc.	2 Phelps Dodge Corp.
3 Northrop Corp.	3 The Dun & Bradstreet Corp.	3 Prudential Insurance Co.	3 Great American Management & Investment, Inc.	3 Westvaco Corp.
4 Allied Signal, Inc.	4 Helene Curtis Industries, Inc.	4 Chemical Banking Corp.	4 Outboard Marine Corp.	4 Bandag, Inc.
5 Grumman Corp.	5 Marriott Corp.	5 The Travelers	5 Deere & Co.	5 Raychem Corp.
6 Gencorp, Inc.	6 Reader's Digest Association, Inc.	6 Bankers Trust New York Corp.	6 Caterpillar, Inc.	6 Cone Mills Corp.
7 Textron, Inc.	7 Kellwood Co.	7 Crestar Financial Corp.	7 Navistar International Corp.	7 Polaroid Corp.
8 McDonnell Douglas Corp.	8 Browning-Ferris Industries, Inc.	8 Cigna Corp.	8 Harnischfeger Industries, Inc.	8 West Point-Pepperell, Inc.
9 General Dynamics Corp.	9 International Flavors and Fragrances, Inc.	9 American Express Co.	9 Nortek, Inc.	9 Willamette Industries, Inc.
10 Raytheon Co.	10 Emerson Electric Co.	10 Primerica Corp.	10 Tecumseh Products Co.	10 3M Co.

discussion of our annual Trend Survey, these companies and these IS executives do not live in some trouble-free parallel universe (see story page 8). They are struggling hard to keep budgets in trim, improve productivity and reduce inefficiencies of all kinds.

The companies listed below are grappling with those problems and many others and they are winning. Furthermore, they are making smart and aggressive use of information systems to do it.

Importance of teamwork

Chief executive officers and other top executives from *Premier 100* companies also take turns discussing what exactly they expect from their IS departments and their IS executives and how they view their own role in enabling the contribution.

In a one-on-one with managing editor Joyce Chutchian-Ferranti, Ron Gidwitz, CEO of cosmetics giant Helene Curtis Industries, describes his part as cheerleader to Thomas Gildea's technology quarterbacking.

Unorthodox? Maybe. But then there is very little that's down-the-line conventional about the ways in which IS departments are now orienting and organizing themselves.

You'll notice the word "team" pops up a lot. Team formation is only one aspect of the changes sweeping across the IS function. In an increasing number of instances, systems personnel are blending into other departments, becoming technically savvy members of the marketing department or distribution or whatever.

Some IS staffers are attending creativity seminars to break the hold of old habits. Others are climbing mountains together to learn the value of cooperation. Still others are leaving their keyboards to stand behind cashiers' desks or field customer calls, doing what Wal-Mart Executive Vice President Bob Martin refers to as "eating what we cook."

That cooking is taking place at microwave speed, too, as modular and iterative system development becomes the order of the day and, for many, applications become something you create today for possible replacement in six months.

These are big, difficult adjustments, but *Premier 100* companies tend to accentuate the positive. If systems are built quickly and obsoleted quickly, IS staffers aren't chained to the grind of maintenance for years at a time. Or if someone over at the plant has an idea for a system and you know you won't have a free hand or a free hour, then maybe the thing to do is give that person some funds and let him hire a contractor to go ahead without you.

Would you think of doing that? Well, Dan Dvorak at Whitman Co. subsidiary Pepsi Cola General Bottlers would. In fact, he did, and the system was a raging success. This drawing outside the lines thing really *can* work.

Joanne Kelleher, *Editor*

Acknowledgments

Computerworld *thanks the following consultants and research firms for their help in creating this year's* Premier 100: *Richard H. Nahmias, principal, Nahmias & Co.; G. Michael Ashmore, vice president, CSC Index, Inc.; Howard Rubin, president, Howard Rubin Associates, Inc.; First Market Research Corp.;* Computerworld *Database Division; and International Data Corp. We would also like to thank all the IS executives and their staffs for their time and patience in responding to our many inquiries.*

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3 Oryx Energy Co.	3 Hershey Foods Corp.	3 Carter Hawley Hale Stores, Inc.	3 Yellow Corp.	3 Carolina Power & Light Corp.
4 Rohm & Haas Co.	4 Kellogg Co.	4 Albertson's, Inc.	4 Roadway Services, Inc.	4 MCI Communications Corp.
5 Unocal Corp.	5 Pet, Inc.	5 JC Penney Co.	5 American President Cos.	5 SCECorp
6 The B. F. Goodrich Co.	6 Hormel Foods Corp.	6 Wal-Mart Stores, Inc.	6 Federal Express Corp.	6 GTE Corp.
7 Vulcan Materials Co.	7 Merck & Co.	7 The Limited, Inc.	7 Airborne Freight Corp.	7 Northeast Utilities
8 Sherwin-Williams Co.	8 Schering-Plough Corp.	8 Food Lion, Inc.	8 Union Pacific Corp.	8 Southwestern Bell Corp.
9 Amerada Hess Corp.	9 The Quaker Oats Co.	9 McDonald's Corp.	9 UAL Corp.	9 FPL Group, Inc.
10 FMC Corp.	10 Whitman Corp.	10 The Home Depot, Inc.	10 Consolidated Freightways, Inc.	10 AT&T

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IT'S all IN THE numbers

BY MICHAEL SULLIVAN-TRAINOR

The phrase "on the horns of a dilemma" could have been coined to describe the state of mind of *Premier 100* information systems executives in 1993. Every year we survey these leading executives about the issues, trends, challenges and choices they are facing. This year, it's clear that the often-opposed goals of budget-cutting and new application creation are, and will continue to be, the major preoccupations for these IS chiefs at least through next year.

For 1993, budget cutting and budget stretching have been foremost on the minds of IS executives: 45% put budget pressures at the top of their list of current challenges. But looking ahead and hearing an increased clamor for fresh systems, survey respondents reversed the order of top priorities for 1994 and emphasized demand for new applications.

Pressure points

Demand for new applications will soon outweigh budget pressures for the majority of IS executives, but business management expectations will also become more of an issue

	1993	1994
Budget pressures	1	2
Demand for new applications	2	1
Platform downsizing	3	4
Business management expectations	4	3
Network integration	5	6
Need for staff retraining	6	7
System integration	7	5

(Ranking based on 64 Premier 100 companies that named each issue as their biggest challenge)

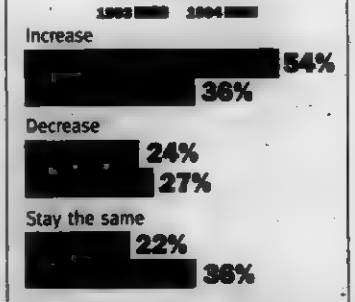
Resource stretch

This is no indication that IS executives expect to be rolling in resources anytime soon. Corporate wallets did open up a bit this year, but many who reported budget hikes this time around expect flat budgets next year. What the responses do seem to reflect, however, is the fact that the performance bar is rising rapidly for IS, as top managers look to information systems to help them make companies leaner, more responsive and more competitive.

In fact, business management expectations, which only 12% mentioned as a major challenge for 1993, take a major leap as IS executives contemplate challenges for 1994. Almost a third see satisfying these expectations as one of their biggest looming tasks.

Budget bounces

Percentage of respondents whose budgets are changing or remaining the same from the previous year



Expectations

The expectations of top corporate management are certainly a factor. While the number of IS executives who reported increased scrutiny from

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28 ❑ Electronics
64 ❑ Financial
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19 ❑ Pharmaceutical/chemicals
34 ❑ Publishing
12 ❑ Retail/wholesale
39 ❑ Telecommunications
06 ❑ Transportation
09 ❑ Other_____

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27 ❑ Communications
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10 ❑ Education/training
06 ❑ Engineering
05 ❑ Manufacturing
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Is funding for information services being transferred from IS to business units?

YES 55%

No 45%

top management and shareholders did drop back somewhat from last year's record high, 67% felt an uptick and fully 95% said they were either getting more attention from those quarters or about the same amount as last year. Because last year was unprecedented in terms of the glare under which IS felt it was operating, that's not exactly a sign of lessening attention.

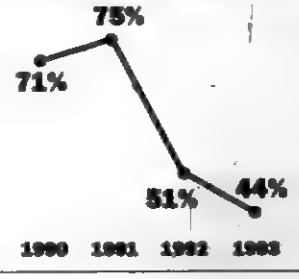
Equally significant, however, is the fact that more business units are willing and able to take on management of their own information systems if IS isn't up to the task. Lowered central IS budgets aren't all the result of belt-tightening, as is clear from the fact that 55% of the IS executives surveyed reported some funding for information services is now going directly to business units.

Power sharing

Does that mean IS is being cut out of the loop? In some cases, yes. In most cases, no. Much of the transfer of authority and funding is happening at the instigation of IS executives who realize if the imperative is service to internal customers and to the business, their job is less to control than to enable.

Backing off the edge

Percent of respondents who said leading-edge technology is critical or important to their organizations



Risk aversion

Given the turbulence of today's business environment, the pressing need for new, flexible applications and the integration tasks they already face, IS executives are not much inclined to experiment with untried technologies. Most want to stay well clear of what they refer to as the "bleeding edge." Interest in implementing leading-edge technology has plummeted during the past couple of years. In 1991, 75% of the IS executives at leading companies said it was critical or important. This year, only 44% reported that level of interest.

And that wariness extends not only to gee-whiz gizmos but to seemingly mainstream initiatives such as client/server and open systems. Although IS executives report high interest in both of these, it appears to be a browser's interest. Talk to them about actual implementation and the time frames are either long or vague. For example, 61% have no target date for downsizing the majority of applications and, of those who do, the greatest number see this happening in two to four years.

Customer service

There is a strong indication that IS and other executives are coming together on one concept: Providing the best customer service possible is the No. 1 business priority and therefore the No. 1 IS goal.

Our survey figures pinpoint sales and marketing as the user department receiving the most IS attention and the one that is most likely to be affected by re-engineering efforts. Manufacturing improvements are a second priority, with finance and administrative changes close behind.

All in all, the ride continues to be a rocky one for most IS executives. But there is little likelihood of a dull day. ■

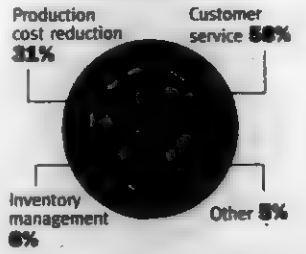
Client/servorizing

Most IS organizations say client/server will be the most critical technology for competitive success in the next five years

Client/server	45%
Open systems	20%
EDI	17%
Object-oriented	13%
Distributed RDBMS	8%
Wireless	8%
LANs	6%
EIS	5%
Imaging	3%
Groupware	3%
GUIs	3%

Attention-grabbers

What is the top business priority that IS supports?



Which user department receives the most IS attention?

Sales and marketing	58%
Manufacturing	27%
Finance/administration	19%
Distribution	13%
Engineering	5%
Research and development	3%
Corporate	3%

(Percent of respondents; multiple responses allowed)

No matter what business you're in or what process you're trying to improve, the basic goal these days is always the same . . .

EXPEDITE!

BY ALICE LAPLANTE

Ethel Dufbaeck uses WILIS to manage overseas stock orders at Becton, Dickinson

TWO YEARS AGO, Ethel Dufbaeck's job was a lot harder than it is today.

Back then, Dufbaeck was struggling to control rising customer complaints, inventory overstocking charges and inflated shipping costs. As inventory controller at Becton, Dickinson & Co.'s European affiliates, it is Dufbaeck's job to make sure overseas representatives of the $2.3 billion medical supplies and diagnostic equipment manufacturer have enough product on hand to meet customer demand. But it was difficult for Dufbaeck, who is based in Meylan, France, to get timely information from the firm's Franklin Lakes, N.J., headquarters. She would call, fax and otherwise scour the distribution chain for clues about when she could expect shipments to arrive at her Belgian distribution center.

"There was the time difference, so I'd wait until late afternoon to call my contacts in the U.S.," Dufbaeck remembers. "They would be busy, or out to lunch or on vacation. When they called back, I'd be busy. Sometimes it took two or three days to connect."

Shipping errors, warehouse delays and foreign customs bureaucracy could easily hold up product deliveries. So, lacking hard information, Dufbaeck often overstocked key items to avoid running out. She would also ask for emergency air delivery — much more expensive than ocean transport — only to find that a critical shipment had already arrived at customs.

That hasn't been necessary for roughly 18 months, however. Now, whenever Dufbaeck is

PHOTOGRAPHY BY ALAIN KELER/MATRIX

concerned about a shipment, she logs on to Becton, Dickinson's online Worldwide Inter-Company Logistics Information System (WILIS), which tells her what has been shipped and when she can expect it to arrive. "I even know the container number for each order so that when a shipment arrives at customs, I know how to prioritize unloading activities," she says.

Teaming up

WILIS is an example of an information system that U.S. businesses are discovering is virtually indispensable — a system that expedites delivery of products and services by unknotting the communications chain. It is also an example of what can be done when business and technology people put their heads together.

One hallmark of a stellar organization in this final decade of the century is that it no longer treats information technology as separate from the business but as an integral part. As a result, in really effective companies, system ideas are as likely to come from midlevel business managers, factory-line workers and clerks as they are from the information systems staff or top company managers. (For more on how IS organizations are reshaping themselves to accomplish this, see "The reincarnated organization," page 23.)

Tom McDonnell, WILIS project manager and technologist permanently assigned to Becton, Dickinson's International Distribution Services Division, sits in on strategic meetings as a senior member of the division's management team. As a result, he was acutely aware of logistical difficulties faced by Dufbaeck and her counterparts around the world.

Because McDonnell is also a member of the worldwide information technology team that oversees long-term IS goals and architectural directions, he knew the technological time was ripe to pull together some formerly disparate data sources into one on-line system: Roland "Chip" Cyr, vice president of information technology, was spearheading a move to a new global information architecture.

Whatever works

Convergence of needs and resources doesn't happen as a result of blind luck. Successful IS organizations don't take the chance that a business opportunity might go begging for a technology solution. They make sure savvy business executives not only know who to call when they see something on the horizon, but they also get the resources they need, even if it means reaching outside the company.

What is effective?
61%
of IS managers view systems management as the initiator of business process change.

That's what happened when Ken Moore, engineering manager at Pepsi-Cola General Bottlers, came up with a scheme to enhance maintenance operations at the Munster, Ind., plant where he worked. Moore brought his idea to Dan Dvorak, vice president of MIS at this $139 million canning and bottling subsidiary of Rolling Meadows, Ill.-based Whitman Corp.

Dvorak realized the economic value of what Moore was proposing — a system to track the use of Pepsi's bottling and canning equipment and automatically notify plant engineers when preventive-maintenance should be scheduled, work orders issued or storeroom inventory replenished. The only problem was that Dvorak was engrossed in a systems overhaul in 1992 that meant completely replacing all of Pepsi-Cola General Bottlers' hardware, software and telecommunications infrastructure.

His hands full, Dvorak might have put the project on a waiting list. Instead, he let Moore hire an external systems integrator to install a local-area network-based system in the Munster bot-

Ken Moore uses a LAN-based system to track the use of Pepsi equipment

PHOTOGRAPHY BY KEVIN HORAN

At effective companies, systems ideas are as likely to come from midlevel managers and line workers as from the IS staff.

tling plant. Word of success spread quickly, Dvorak says, and soon other Pepsi bottling plants began clamoring for the application.

Cost was a big concern when these requests started rolling in. Pepsi didn't have the funds to install PC LANs in each plant. Dvorak was busy switching Pepsi operations from a distributed IBM Application System/400 and System/36 architecture to a Hitachi Data Systems Corp. EX-60 mainframe, converting the separate and incompatible databases supporting Pepsi's 18 plants to a single relational database architecture. Dvorak says he thought the two projects could merge. So he took the functional model of the LAN software already running in Munster, developed a mainframe equivalent and installed it in Pepsi's Chicago plant. Before long, bottling facilities in Texas and Indiana were on the bandwagon.

> Using Ken Moore's systems as a model, IS developed a mainframe version for all the plants.

"This was a raging bargain from a cost point of view," Dvorak says. The LAN version would have racked up $500,000 in hardware and software expenses alone; the mainframe version — installed across all Pepsi plants — cost less than $100,000.

Technology transfer

If flexibility in providing resources is critical to giving business what it needs, when it needs it (see related story this page), so is creativity in finding ways to piggyback technology projects and exploit knowledge resources.

IS professionals at FMC Corp. are becoming experts at this particular efficiency exercise. FMC is a diversified $3.9 billion firm in the chemical, defense systems and heavy machinery industries. Because the company is highly decentralized, FMC strategic IS development projects are left to its operating divisions; the Dallas-based corporate data processing center acts as a facilitator to ensure that no one reinvents the wheel. (To read about how another company, The Hartford, handles this kind of coordination, see "The great platform leap," next page.)

Tinish Mehta did not intend to become a corporate resource when he decided to tackle a little process redesign in 1990, but that's exactly what he's become, thanks to the social networking skills of FMC's data center staff.

A manager in the finance department at FMC's $800 million Ground Systems Division in San Jose, Calif., Mehta put together a focus team in 1990 to study how the accounts payable function could be streamlined. He subsequently oversaw development of a client/server imaging system from FileNet Corp. that links to FMC's IMS accounts payable database in Dallas and automates the validation and payment of vendor invoices.

"This was an eye-opening experience," says Mehta, who acknowledges the project hit a number of snags, although he considers it a success.

To ensure that this experience — good and bad — didn't go to waste, Joe Dworak, a senior business analyst at FMC's corporate data center in Dallas, was brought into the loop. When Dworak heard that one of FMC's chemicals groups was also investigating imaging, he arranged for a "knowledge transfer" between that site and Mehta's group. "We're making sure that everything we learned about the hidden expenses and technological hurdles is passed along."

Although there is no rule that says divisions should consult the central IS staff on initiatives, Dworak says they are doing so more often. The reason? "They're finding that we're helpful at locating and leveraging the pockets of existing technology knowledge." ■

— Alice LaPlante is a free-lance writer in Palo Alto, Calif.

THE DRAFT PICK OPTION

HELPING BUSINESS units deal with emerging business situations often means giving them the firepower to do much of the work themselves.

In 1987, US West, Inc.'s Controller and Vice President of Finance Jim Helwig started looking for IS help. The 1984 divestiture of AT&T had left US West as the parent company of three Baby Bells: Mountain Bell, Northwest Bell and Pacific Northwest Bell. Helwig said he felt it was inevitable that these three entities merge operations and, when that happened, technology would play a key role in reconciling and optimizing financial functions.

In 1990, when US West consolidated its regional Bell operating companies, Helwig had a three-year head start. He made Judy Dimino, a technologist from US West's centralized IS group, part of his permanent staff, giving her a department of 70 certified public accountants and financial analysts to create requirements for a merged and improved financial system — Profit (Professional Financial Information Tools).

Dimino has a close working relationship with US West's IS department and with R. B. (Bob) West, US West's director of corporate systems, who provides her with programmers and technical consultants to code Profit applications.

The payoff? The $33 million Helwig has spent thus far has been funded by operational savings from the incremental rollout of Profit, which will be completed in 1995.

THE great PLATFORM leap

BY ALAN RADDING

If changing architectures have you and your staff ready to jump off the nearest high structure, you're not alone. *Premier 100* information systems departments wrestle with the same daunting array of unknowns: relational databases,

graphical user interfaces (GUI), legacy data, telecommunications and a confusing array of technologies. Many of them have discovered, however, that it's a lot easier to preserve sanity and steer clear of architectural disaster if you employ that time-honored safety technique known as the buddy system.

Buddies can take many forms. IS managers at some of these companies say the best course for them is to concentrate on design and planning. When it comes to implementation, they step back and leave the shirtsleeves work to their buddies — the vendors and integrators.

In other cases, the designated buddies are actually corporate technologists or IS managers from other areas of the company who share what they've learned on their own projects to keep their colleagues from stubbing their toes in the same places or investing time researching what's already known. And last but not least, there is the business-buddy option. Some companies are instituting a joint development process that pairs IS and business personnel in project teams, where development becomes everyone's primary job until an appropriate system is delivered.

Warner Schlais, director of planning and technology at UAL Corp. in Chicago, is an advocate of the first option. "Using the vendors and integrators minimizes the risk," he says. Of course, this isn't a labor-free solution. As Schlais explains, laying the groundwork for the contractor re-

Continued on page 16

ILLUSTRATION BY WARREN GEBERT

Even now, Chicago's scofflaws recall the sport warmly. ◆ You took a parking ticket. Folded it. Crumpled it. Then, simply booted it away. ◆ Thirteen thousand parking tickets written each day. Maybe, on a charitable day, 10 percent paid. ◆ But if you're thinking of playing that game these days, officials have one word of advice: Don't. ◆ Sun computers have been installed. And they are very, very effective. ◆ Claim the meter was broken, and a Hearing Officer will check a "meter database" on a Sun computer. Protest the ticket isn't yours, and a scanned image of the original is pulled from a database. Yell that you're in a hurry, and all these

How A New Type Of Computer Put A Stop To One Of Chicago's Favorite SPORTS.

jobs can be done at once, because Sun computers can do more than one job at once. ◆ "With document imaging based on Sun hardware, we save citizens time, and the city money," Judith Rice, Chicago's revenue director, proudly says. ◆ There's more to this story, of course—revenue increases of 400 percent, limiting property taxes—but it looks like our time is up. ◆ And you know what that means. ◆ Sun computers. Just the ticket, it seems, for the City of Chicago. ◆ More than 135,000 organizations are using Sun systems, powered by the SPARC® chip and the Solaris® operating environment, to gain a competitive edge. The City of Chicago is just one. To learn how you can benefit, call 1-800-426-5321, ext. 605.

Sun

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The Network Is The Computer

Continued from page 13

quires spelling out your requirements in painstaking detail. By the time his group at UAL pulled together its technical specifications and end-user definitions of required functionality, it had produced something close to the heft of a prolific author's collected works. The specification document for a client/server-based systems maintenance application, for instance, exceeded 100 pages.

That particular application was designed to give maintenance controllers faster and better-coordinated access to flight information and reports from pilots and ground crews.

Project manager Sandy Kingery says UAL couldn't have implemented the application alone. Combining Unix systems equipped with the Open Software Foundation's Motif as well as Sybase, Inc., IBM and Unisys Corp. mainframes and Integrated Services Digital Network (ISDN) voice and data services would have been overwhelming without outside assistance. But the experience also made clear the importance of knowing what you want and sticking to it.

61% of IS managers do not have a target date for downsizing most of their applications . . .

The design called for the use of ISDN, which would let developers give the controllers the ability to screen voice and data messages according to defined priorities. "We wanted an open systems interface to the ISDN Basic Rate telephone switch, but AT&T [the integrator] wanted to use its proprietary interface," Schlais recalls. The developers made it clear that if AT&T wanted the job, it would have to modify its interface to comply with their requirements.

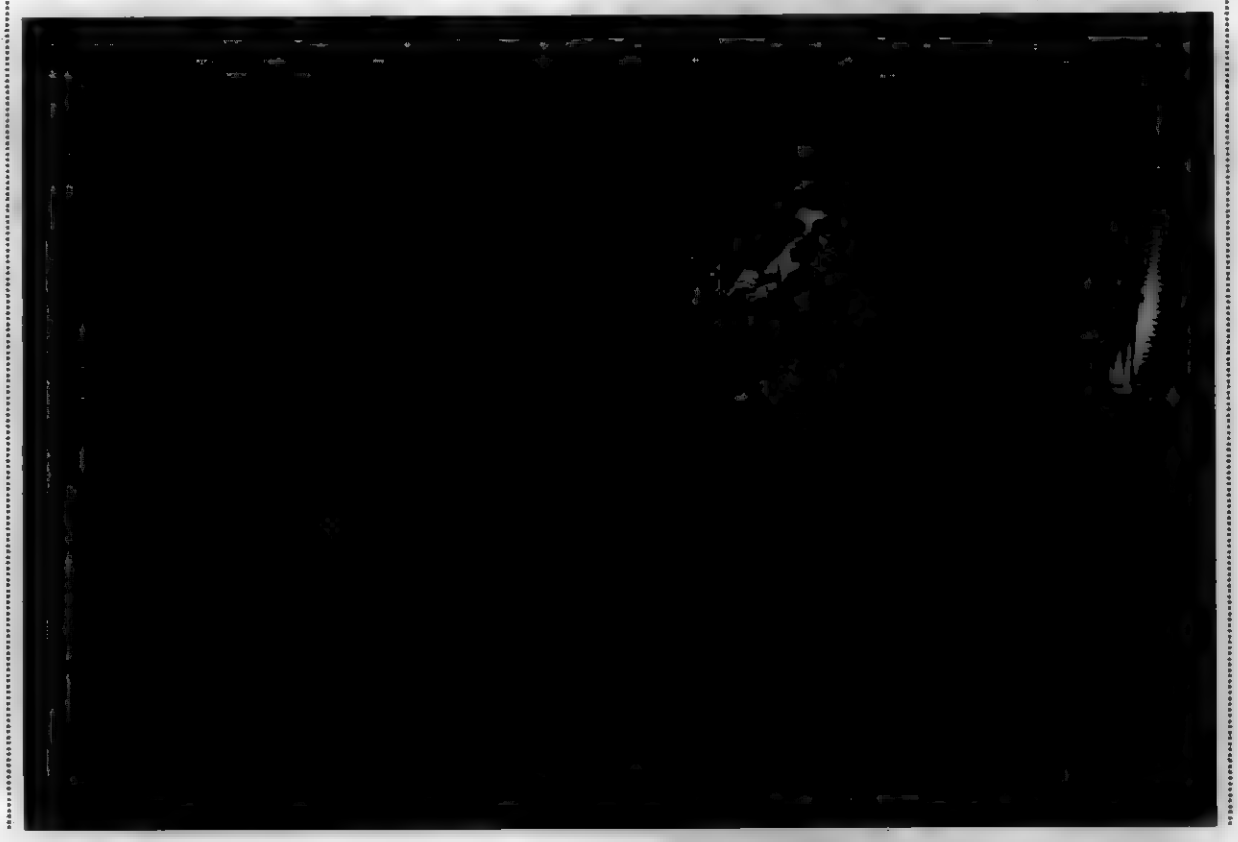
. . . and **26%** of those who do have a target date say it will happen in two to five years.

Since beginning its move toward a three-tiered architecture and distributed systems three years ago, Northrop Corp. has also discovered that vendor partnerships can ease the transition to new architectures and help keep overhead low. "There is no way we can keep up with technology by trying to do it all internally. We have to partner," says Herbert Anderson, vice president and general manager at the Northrop Information Services Center in Pico Rivera, Calif.

But Anderson says he expects true partnerships, not the usual vendor/customer relationship under a fancy name. "We're not just hiring subcontractors; we are creating an entire arrangement where we will share costs and share opportunities," he says.

For example, Northrop recently hired a vendor to write a system that other aerospace contractors may also want. Northrop developed the specifications and brought the business knowledge, while the vendor partner wrote the code. As part of the deal, Northrop insisted on a share of any future sales of the system.

At The Travelers, risk minimization is also accomplished through sharing, but on a strictly internal basis. What the company has done is create central pools of expertise that can help to



The Travelers' Ellen Rasmussen talks IS managers through the hard questions surrounding client/server conversion

PHOTOGRAPHY BY MAX AGUILERA-HELLWEG

transfer hard-won technology lessons across organizational boundaries. Ellen Rasmussen, who holds the title of technical director/client/server architect at the Hartford, Conn.-based life insurance company, might also be considered chief lifeguard/preventer of avoidable injuries.

First things first

In Rasmussen's estimation, the biggest mistake people make when they tackle client/server computing is to start with a tool and then try to bend business requirements to the capabilities of that tool. Her job, she says, is to make sure system development projects at the company take the reverse approach.

She does this, she says, by asking the whys and what-ifs, literally talking unit IS managers through an analytical process. This technique of constructive probing has now been formalized and institutionalized in a process called Technical Information Developer Support (TIDS, pronounced "tides") that puts Travelers' collective development experience at the fingertips of IS managers in individual business departments.

The way TIDS works is that all system design proposals for business units are submitted for review by a committee of Travelers' most experienced technologists, who discuss the goals and methods and offer suggestions for improvement.

The ultimate decision on how to proceed lies with the business unit, Rasmussen says, but the TIDS committee delivers a formal written report that stands as damning testimony if someone ignores its input and plunges headlong into a disaster.

Robert Tofil, IS director for Travelers' personal lines technology, brought the designs for a client/server-based counselor's workstation system to the TIDS committee. This system would replace a mainframe terminal used by customer service "reportentatives" (counselors) to find answers to customer questions, greatly expanding the amount of information available and the speed of access, as well as the variety of possible queries.

Tofil's design passed muster, but the committee questioned his implementation plan and recommended he put some client/server expertise on his team. Tofil subsequently engaged a Travelers technology transfer specialist suggested by the committee for 10 months to bring his people up to speed on database access, GUI technologies such as Easel Corp.'s Easel and OS/2.

Tofil says he likes the TIDS process because it provides an extra measure of comfort. "TIDS helps us avoid doing something stupid," such as venturing into client/server development without an experienced person on the team, he concludes.

At Carolina Power and Light Corp. (CPL) in Raleigh, N.C., the preferred method of avoiding missteps on ambitious architectural restructuring projects is through formal teaming of technical and nontechnical personnel on the system development teams. Every project is sponsored by a top corporate officer and carried out by co-managers, one from IS and one from the business unit. These teams work together, elbow to elbow, for the duration of a project, which may be several years.

This technique, which CPL's Chief Information Officer R. Thomas Dwyer says helps to ensure that emphasis is placed on process re-engineering rather than technology, recently carried the company though a massive re-architecting of its 20-year-old customer information management (CIM) system.

The CIM project, which began in 1988 and culminated in December of last year, involved transferring a reworked version of the customer service system from a strictly mainframe environment to local-area network-based PCs running a mixture of batch and on-line transactions accessing a DB2 on the mainframe. The first step, however, was identifying 250 customer service subprocesses as candidates for re-engineering.

Power teams: CPL's Thomas Dwyer (left) and business partner Norris Edge tackle CIM re-architecting

Bruce Anderson, manager of systems development and support and co-project manager, says there is no question that having business users as part of the team exerted a strong influence on the design.

Left to their own devices, Anderson says, developers would have given priority to the most complex transactions, such as a meter cut-off, but business representatives insisted the team concentrate on activities that take place while customers are on the phone with service representatives. "This meant that a billing question gets a higher performance priority than some more complex back-office task," he says. ■

— Alan Radding is a free-lance writer in Newton, Mass.

PHOTOGRAPHY BY SIMON GRIFFITHS

Behind every great CIO . . .

CEOs talk technology and tactics

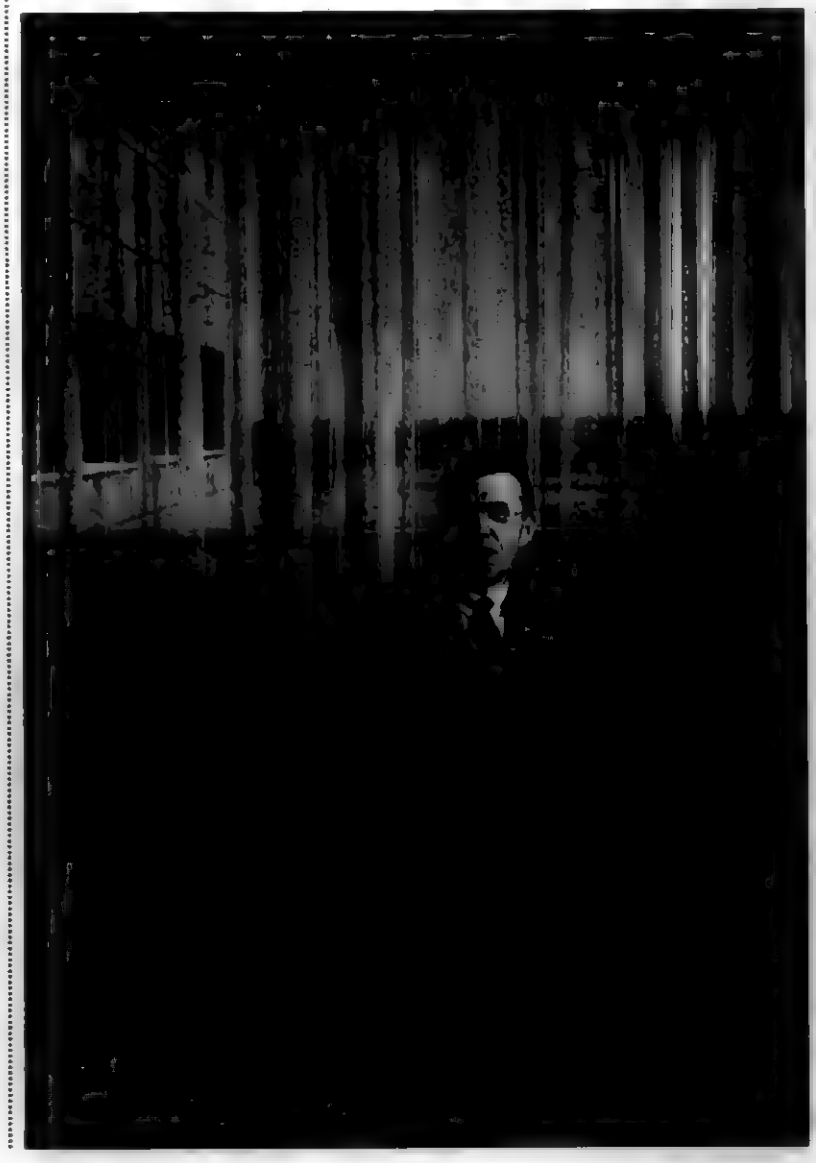
By Michael Sullivan-Trainor

Satisfy your users first, count your transactions second. That's the message for information systems executives who want to garner the highest performance ratings from their company's chief executives.

This year, the *Premier 100* added a chief executive criteria, in which CEOs, CFOs and COOs were asked to rate their IS department. Those executives who gave their IS organizations the highest ratings in the satisfaction survey were unanimous in placing happy users as the top priority for IS.

"The key to measuring IS performance is determining whether or not the IS organization is allowing its users to do what they need to do," says AMR Corp.'s CEO, Robert Crandall. "We want a larger percentage of industry revenue, and we can't get it unless IS provides its users with the right tools."

Crandall was among the 26% of chief executives who rated their IS organization as very good, the highest rating. The majority of top bosses, 58%, said their IS groups were good. Another 16% rated them average.



AMR's Robert Crandall: 'IS has got to change itself and be the educational arm within the company'

PHOTOGRAPHY BY REID HORN

How they measure

"Although we place a high value on the contribution of IS, we do not use specific performance measures to gauge its effectiveness," says Gencorp, Inc. CEO A. William Reynolds. "Rather, we measure the effectiveness of IS by the degree to which it supports the strategic plans of our business units. This support is the single greatest benefit provided by IS."

These executives collect their performance information both formally through meetings and user surveys and informally through chats with key users and IS personnel.

"If we're not happy with a part of information systems, it doesn't take me very long to find out," Crandall says.

Tight business ties

A whopping 64% of chief executives say IS is very closely linked to their business strategies. Another 34% say it is somewhat linked, and 2% say it's not very linked.

Even more significant is the fact that 94% of them say the role of technology is increasing.

"Information systems is one of our most important tools in assisting the firm to manage risk for ourselves and our clients," says Charles Sanford, CEO at Bankers Trust New York Corp.

"We couldn't run the company

Gencorp CEO A. William Reynolds measures IS based on how well it supports the strategic plan

without it," says Miles L. Marsh, CEO of Pet, Inc. "We need the ability to manipulate timely and accurate data about our business. Without information technology, we couldn't get the information we need."

Motivating CIOs

How do the most satisfied chief executives motivate their top IS executives? "Scare the crap out of them," Crandall says.

Seriously, Crandall spurs his top IS executives to action the same way he does other business executives. "Make sure everyone has a clear understanding of what the company as a whole faces. Give them world-class tools to work with. Expect them to be a leader in all the elements of their jobs. Ultimately you want them to motivate themselves," he says.

How IS executives are viewed by their bosses also plays a significant role in their motivation. "Involvement on the strategic planning process and support of the plan is also a major source of motivation to IS executives," Reynolds says.

"The information resources executives participate in the normal executive compensation arrangements. That's the hard side of the issue. On the soft side, our management is very inclusive, and information resources are viewed as an important part of senior management," Marsh says.

IS accomplishments

The benefits of IS are too numerous to count, many chief executives say. "Competitive superiority. You have to have a world-class IS operation as a key building block in the pyramid of a world-class airline," Crandall says.

The chief executives also named recent IS projects that contributed to their favorable views:

"We're changing from conventional systems development practices to development methods on PC platforms using client/server technology," says Albertson's, Inc. CEO Gary Michael. "The ability to develop easy-to-use systems in a short time is a paramount requirement for our corporation."

"Our information services is modifying the organization and skill set to keep up with all of the technology, which is constantly changing," Crandall says. "As user organizations handle more and more of the information technology issues, IS has got to change itself and be the educational arm within the company."

"We are supporting the 'Efficient Consumer Response' program within our industry. A number of our initiatives are directed at developing a closing link between the information systems of manufacturers and retailers to reduce inventory and cost," Marsh says.

Among the future technologies that chief executives see as important in the next five years are the following:

- **"Scanner technologies in the retail, warehouse, manufacturing and distribution areas.** These allow us to track detailed information about our business store by store. Access to this information is changing the way marketing is done in this business."
  —Miles L. Marsh
- **"Massively parallel processors, workstations and graphics/information displays** are the most important future technologies."
  — Robert L. Keiser, COO, Oryx Energy Co.
- **"We feel open systems and networks** will provide the framework for the information infrastructure that will allow Albertson's management to have timely information about all aspects of our business and be able to react accordingly."
  —Gary Michael
- **"All of the technologies are blending together** so that they are becoming indistinguishable. Integrating them is one of the greatest future challenges."
  —Robert Crandall ■

. . . is a savvy chief executive

PHOTOGRAPHY BY JACK VAN ANTWERP

INTERVIEW

'I'm The Guy Who Leads The Cheers'

BY JOYCE CHUTCHIAN-FERRANTI

Helene Curtis' CEO Ronald Gidwitz

RONALD GIDWITZ *is somewhat of a youngster among CEOs. That, he says, may have something to do with how he relates to information technology. So may the fact that he briefly worked as a Fortran programmer one summer between college years. Now, standing on the sidelines of information systems at Helene Curtis Industries, Inc., the $1.1 billion personal care products company, Gidwitz looks at IS as being the right arm to the business. Senior editor Joyce Chutchian-Ferranti spoke with Gidwitz about how he sees the impact of information technology in supporting business goals.*

How important is information technology to your company? Very important. The collection, dissemination and analysis of information can make a real difference in how we run our business. We spend a lot of time thinking about what we do and how we use our information and how we can do that better and more effectively.

How involved are you in IS decisions? I'm a great cheerleader. I'm the guy standing on the sidelines rooting for the players. I'm not involved with the intricacies of each system as it is going in, but I certainly am interested in how well we take advantage of the investments we make in systems.

What do you see as the proper role of the chief information officer? I think that if I'm a cheerleader, the CIO is the quarterback/playing coach. That's the guy who formulates the strategy, gets consensus and makes sure the execution is flawless.

As a chief executive, how do you communicate with IS executives? We communicate directly. I don't oversee things directly, but I look over their shoulder a lot. I'm involved in the strategic planning aspect. I review those plans and the annual operating plans.

Do you think having a knowledge of what systems can accomplish is the norm for CEOs? It's not the case now, but I think eventually it will be. There's clearly a generational difference between older executives and younger executives. Those who graduated from business school in the last 5 to 10 years and don't get a PC think they are being deprived of a piece of equipment that is going to make them effective.

On the other hand, you have executives who don't realize they can overcome the inability to use it. I'd like to think it's because I'm of the next generation of managers, which has some familiarity with this kind of technology. We didn't have computers when I was in school, but I did develop some programming skills in engineering school.

Where do you think most CEOs are in terms of technology? Most CEOs are somewhat older than I am and therefore are in many instances not regular consumers of data directly off the device. They get the information, but they get it through third parties.

Do you view IS as a support function or as a driver of the business? I don't believe it's a support function. They aren't directly involved in things like making calls on customers, but the systems are so integral to what we do that people couldn't live without them. We are looking to IS to help us develop our competitive edge to as fine a point as we can.

You've said that conditions are difficult in your markets; that you haven't, for example, seen a price increase for five years. Can IS make it easier to com-

pete and stay profitable in an adverse climate? There's not a whole lot of direct impact, but there are a number of ways technology has had an indirect impact. We've used IS to help us reduce our costs in a wide variety of areas, from distribution to order entry and our manufacturing processes. We've used them to help us do a more thorough job in our research area. Plus technology is a tremendous communications vehicle for our worldwide operations.

Can you think of a specific example of how information technology is supporting expansion, differentiation or any other important business goals for your company? It allows us to take marketing and sales data and translate it into information from which we can make real-time marketing decisions. By the same token, we can put that same information about our customers to work in our manufacturing plant and not have to guess at what the requirements are going to be for our factory.

How do you measure the effectiveness of your investments in information technology? Information is integral to everything we do. It's a process within a whole host of other business processes that enhance our business. We measure how good we are in terms of market share, sales growth and profitability.

What's the best thing that technology has done for you lately? It has made me far more mobile. I can be any place in the world now and it's almost the same as being in my office. I carry a laptop equipped with a fax board, and I can dial into facilities at the Chicago office and no longer be bound to the office. Also, although we're not quite there yet, we're seeing the creation of one virtual worldwide office.

You don't need to be all together to be able to interact well. We're using a variety of technologies. And that has enormous potential to be able to improve the effectiveness of how people work together.

How knowledgeable are you personally about computer systems? When I come into my office each morning, the first thing I do is turn on my machine. And then I get my coffee. I was a frustrated engineer when I was in school; I ended up being an economics major. I had programmed in Fortran, and for one of my summer jobs, I worked for an MIS department, so I feel quite comfortable with it.

Have computers improved the quality of planning and decision-making at the corporate level? Yes, but I would have said that 10 years ago. I think since then we've been incrementally honing our skills in those areas, and clearly, technology has helped us do that. But what strikes me particularly is the ability to be so much more productive. Information technology is helping us push aside all of the nonessential parts of what we do.

How has IS changed in the last few years? It hasn't changed all that much. It is an integral part of what we do. Asking how it has changed is like asking, "Has your right arm changed today?" It is just a part of us. ■

RONALD GIDWITZ: "We look at investments in information technology as investments in a tool for success"

PHOTOGRAPHY BY MICHAEL ABRAMSON

ILLUSTRATION BY FRANK VIVA

THE

REINCARNATED ORGANIZATION

Information services are changing shape and taking on new personalities

BY

Joanne Kelleher

When the world around you changes, you had better change, too. And that's exactly what effective information systems organizations are doing these days: Rapidly, and often radically, they are transforming themselves.

This isn't a matter of decentralization or recentralization. It isn't that simple.

Wal-Mart Stores, Inc. tried decentralization and a lot of other things in the past, says Bob Martin, executive vice president. All produced some benefits at the time, but none were sufficient by today's standards of what an IS organization must be and what it should do. That's why Wal-Mart decided to break the mold and start fresh with a structure predicated on something more fluid and dynamic than support of individual business functions.

The result? An information services staff largely composed of teams organized around strategic business goals that the company's executive committee identified. These goals are almost always broad-based, involving process and application changes in a variety of business functions. And as specific targets are achieved and new priorities emerge, teams disband and reform.

Anticipating support

This structure, Martin says, is flexible and much more compatible with the way businesses must operate now compared with the old functionally defined, react-mode model. "I've always taken the position that if users develop requirements and *then* come to IS, you're already behind."

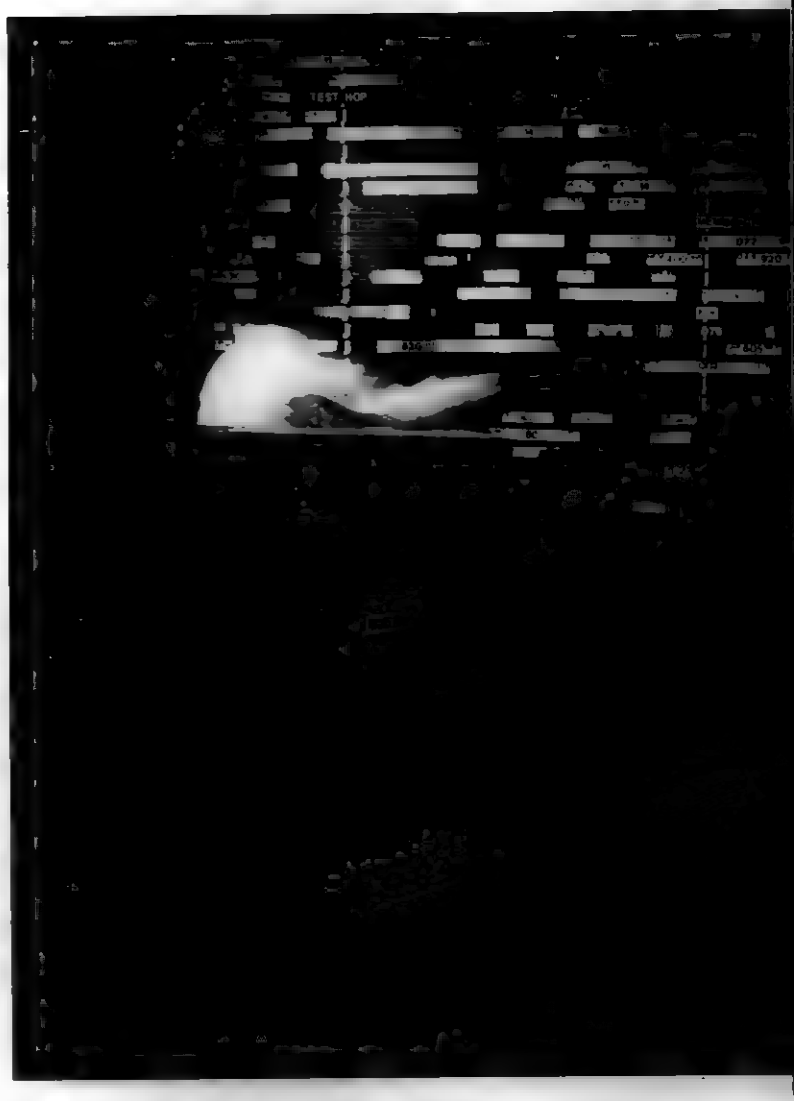
Dennis Jones, vice president and chief information officer at Federal Express Corp., says that when a company or department is in that situation, it is "behind the power curve." And that's not a place he wants his department to be. "One of the chronic complaints you hear about the information technology function is that it is slow and unresponsive," Jones says, "and I believe the reason for that is the tradition that says you wait for the user to come to you."

At Fedex, that is definitely not the current operating model.

Although the reporting structure remains centralized, and the entire information technology staff marches to the same "guiding principles," most of the information technology staff members now park their computers in user areas. Several scores of them share office space with sales personnel and go along on calls to serve as technical advisers to customers interested in the options for system-to-system information exchange.

At this point, almost half of the company's package-handling volume is processed either through Fedex-developed desktop systems at customer sites or customized electronic data interchange connections.

Fedex aircraft control personnel are able to get planes landed, unloaded and back in the air faster with a new graphics-based system



All told, about 90% of the information technology staff is now considered part of the internal customer base, Jones says, with the remainder serving as suppliers of support services. It's a structure that has been evolving for some time, according to Jones, but it has really come together in the past couple of years.

At Duke Power Co., change has been more abrupt and, in some ways, more radical. Jimmy Hicks acquired his title, vice president of information technology services (ITS), a little more than eight months ago, after participating in a study evaluating how information technology was delivered and used at the company.

When he became involved with the evaluation of IS, Hicks was a customer — vice president at Power Delivery — and that customer perspective is something he is trying hard to retain and embed in the working processes of his new department.

Since his arrival, the top priority for the ITS department has been to figure out how to live up to its new name (it was formerly called the IS department) and create mechanisms to ensure that its operating agenda directly reflects business strategy.

Business users have played a lead role in the change process. Managers from various areas of the company were drafted to work full-time for four months with the ITS staff, determining how things should work and what it would take to make these new processes practical.

A number of major alterations in service delivery are under way as a result of this groupthink effort. Already, more than half of the technology service providers have been shifted from the ITS organization into business departments.

Off the bucket brigade

For both groups, job terrain is changing as radically as surroundings. Using remote management and troubleshooting systems, Hicks says he hopes to take most of the firefighting out of support jobs, freeing time for problem prevention and system enhancement. "Right now, these people are spending 80% of their time putting out fires and 20% doing things that add value to the business," Hicks says. "We want to switch that around."

Top staffing shifts

Premier 100 companies are implementing the following types of staff structures:

1. Self-directed work teams
2. Staff in business units
3. Fewer programmers, more business analysts

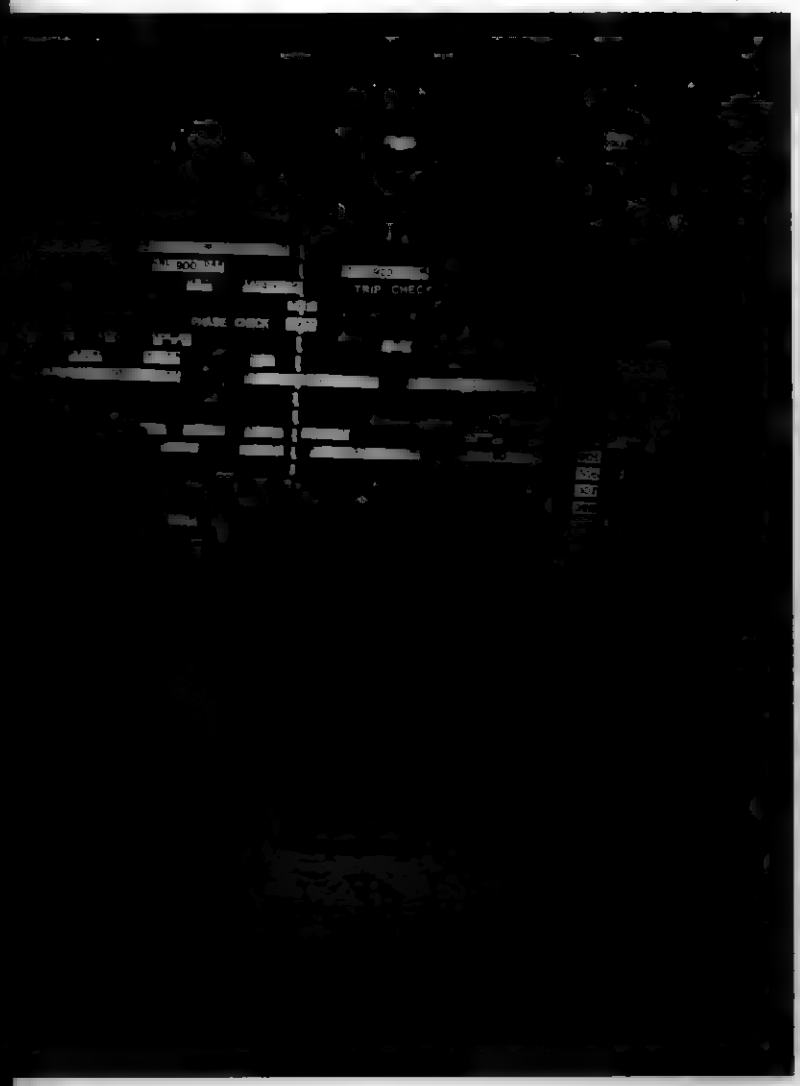
Application developers are learning to operate in a more modular and interactive mode. "We used to deliver major applications in big chunks," Hicks says. "We'd take on the world and spend three years designing and building a system. By the time it was delivered, the world had changed."

Not all the reforms entailed changes to the technology services function. Users had to mend some of their ways. In particular, they had to face the fact that diversity is not a desirable trait in systems.

"Getting the users to come up with single standards for desktop applications, network operating systems and network protocols was a struggle," Hicks says. "But they did it, and it is going to make a great difference."

Establishing standards and creating structures that help to ensure

PHOTOGRAPHY BY JACK KENNER



priority agreement between users and IS are recurring themes.

Recombining the elements

Phelps Dodge Corp. moved to head off problems with incompatible desktop systems and LANs a couple of years ago, moving the PC group into the domain of the telecommunications manager.

"A lot of the hidden cost of computing is PC support," explains Dudley A. "Mac" McRea, director of corporate IS. "And with more and more local-area networking, it is even more critical to make sure that, no matter what we do, everything is compatible and works everywhere."

The blending of skills and experience is also a theme in software development, where the company has created a software engineering group to work on client/server projects and provide a model of how such projects should be approached. It is no accident, McRae says, that the project manager was a mainframe database administrator.

"By bringing mainframe experience to this, we'll be addressing a lot of the big concerns about client/server — things like security and change management."

At Harley-Davidson, Inc., the primary vehicle for change is a companywide initiative called the Performance Effectiveness Process, which requires employees to evaluate their activities on a quarterly basis and draw up detailed commitments for upcoming work.

Goals and priorities are established not in isolation but in the context of teams made up of "stakeholders." In the case of IS, this means business users and suppliers of equipment and services, whether internal or external. No commitment is made unless all of the parties involved sign off on the goals and the specific targets by which progress will be measured.

The benefits of this approach are substantial, according to Rich Kolbe, IS director at Harley-Davidson. The process forces employees to analyze how and to what effect they are spending their time.

Randy Mott, vice president of the information services division at Wal-Mart, also counts a broadening of vision among the major benefits of his company's reshaping of IS.

"You get a cross-business focus as opposed to strictly departmental initiatives," he says of Wal-Mart's strategy teams approach. This offers the potential for more substantial and far-reaching improvements — not only because you work on business processes end to end but also because breaking down barriers between parts of the business helps dissolve walls between technical specialties.

In the past, Mott says, business requirements were too often forced to fit into existing technical niches. People would automatically grab for whatever they knew. Now that everyone has a broader frame of reference, they are less likely to default to narrow prescriptions.

Like Harley-Davidson, Wal-Mart is increasing the amount of individual responsibility. In the past, development managers at the company might have managed eight to 12 people, Mott says. Now, as "strategy managers," these same individuals might oversee twice as many. That, of course, gives each team member more influence, self-determination and responsibility.

Adjusting to new ways of thinking and operating isn't quick and easy. As Kolbe stresses, when you change organizational structure or job processes, you alter the dynamics of the workplace. "People feel more accountable, but they also feel more vulnerable ... outside their element of control. You can't change that in a day," he notes. ■

SMART RATIONING

When the budget is scarce, innovation is plentiful

BY JULIA KING

DOING MORE WITH LESS is as much a mantra at top-performing information systems organizations as anywhere else. *Premier 100* companies are not exempt from the current cost squeeze, but they approach this problem, as they do others, with a high-energy mix of "can-doism" and inventiveness.

At Engelhard Corp., a $2.5 billion specialty chemical manufacturer in Iselin, N.J., several years of aggressive cost-containment efforts, which resulted in successive budget declines, have made Stephen Pook, vice president of quality business design and information services, something of an expert in fat reduction. As his title suggests, however, there is more going on at Engelhard than simple belt-tightening.

Pook, who heads up a companywide re-engineering effort, is applying to the IS organization lessons in process change and quality improvement learned in other parts of the company.

For example, Pook is a strong advocate of regular price/performance benchmarking: Internal operations are regularly compared against outside providers, and anything that can't be done better and/or more economically in-house is outsourced.

PC support is now handled by an external provider. Engelhard closed down its data center and moved its IBM mainframes to facilities owned by PaineWebber, Inc. in nearby Secaucus, N.J.

33% of the Premier 100 have had staff cutbacks this year.

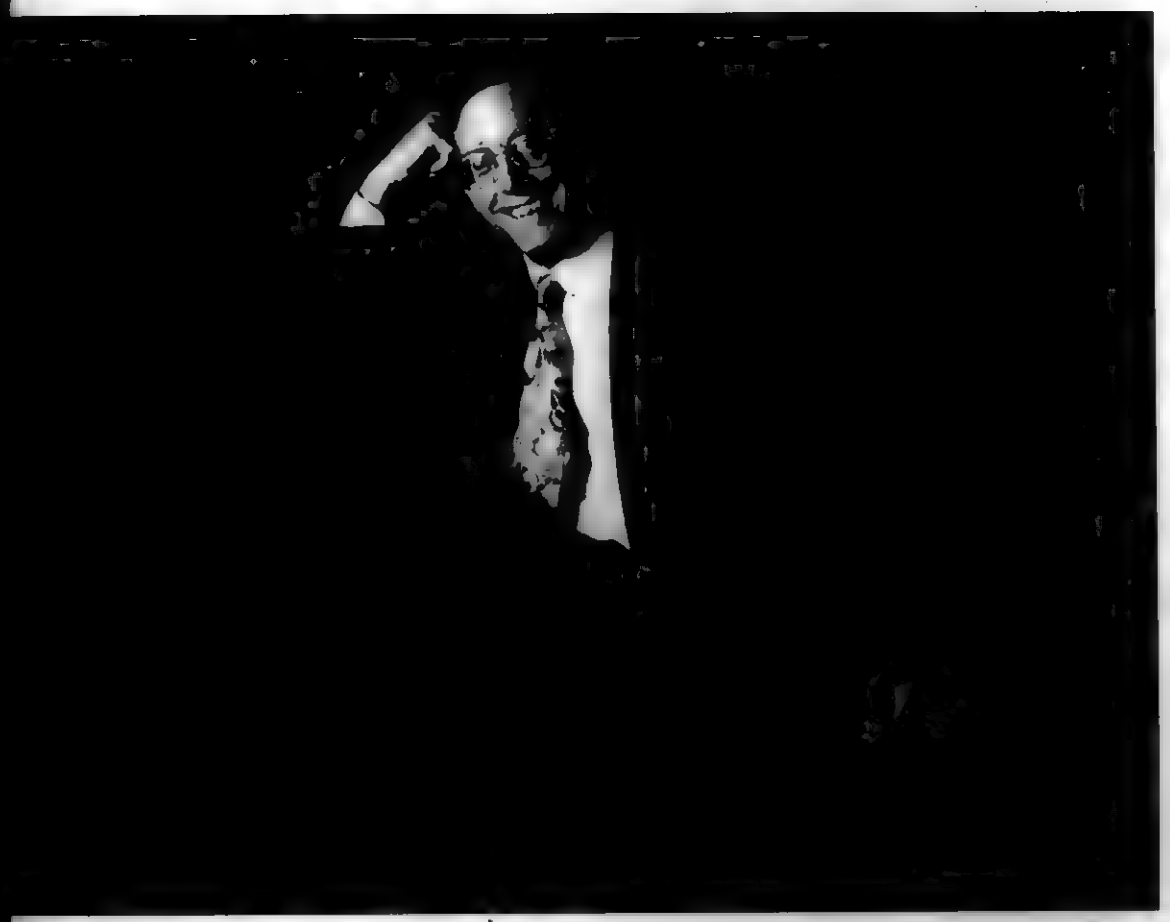
Any IS organization that's concerned about dollar efficiency ought to be regularly evaluating outside options, Pook says. "We need to think about IS not as a kingdom over which we have control but as a data processing utility. And, as the caretaker of that utility, we need to look for the most cost-effective way of delivering services."

In staffers' hands

What's particularly notable here is not so much that philosophy but that it has been communicated to and is carried out by teams of IS staff members who are given responsibility for improving the cost-effectiveness of particular processes. Sometimes these teams recommend outsourcing; sometimes they find other ways of gaining efficiencies — reassessing vendor contracts and vendor relationships, for example.

The process orientation is key, according to Pook, because it gives an entirely different view of the way things are accomplished from what can be achieved with conventional function-based thinking. Similar efforts throughout Engelhard are expected to yield between $60 million and $80 million during the next three years.

Not all *Premier 100* IS departments faced



with tight budgets go through the kind of extensive internal reorientation that Engelhard has gone through. Many, however, are looking hard at data centers as an area of overinvestment. Several have shut down satellite data centers, reducing real estate, hardware and personnel costs by concentrating their processing in large-scale — and often heavily automated — central sites.

45% face budget pressures.

One facility the goal

Dallas-based JC Penney Co. closed four data centers in 1989 and will close another three this year to operate one central "lights out" facility by the end of the year. As of July 1, scheduling and change control functions had been shifted to the central facility; monitoring and operations functions were slated to move over Aug. 1.

"So far, this has all been transparent to our store and catalog operations," says Jim Blanton, manager on the consolidation project.

Walt Tempe, manager of financial information services at Unocal Corp.'s Sugar Land, Texas, office, uses the same adjective to describe the shift of his processing from a local mainframe-equipped data center to a remote supercomputer site in La Brea, Calif. The changeover has been absolutely transparent, he says. "Our response time is just like we were still sitting next to the mainframe."

Thanks to an overall decline in the price of high-speed T1 links, this $10 billion Los Angeles-based petroleum and geothermal energy company has been able to close four IBM 3090-class data centers since 1986 and use multiple T1 facilities to tie all of its offices, including a computing-intensive geothermal and seismic research group in Houston, to that single, highly automated facility in California.

Unocal's Paul Jones saved millions by consolidating telecommunications service

Slice of the pie

But outsourcing and data center closings are only part of the picture. IS managers who are under pressure to do more with less are also rethinking old truisms about how to invest in equipment.

"One of our biggest headset changes is to view technology as a commodity and consider what is cheapest and best, rather than just buying from IBM," says Robert M. Menar, senior vice president of information services at Los Angeles-based Carter Hawley Hale Stores, Inc. A stint in Chapter 11 bankruptcy that ended in 1992 has given the retail chain a hard-nosed attitude about spending.

Between 1991 and 1992, Menar says, Carter

PHOTOGRAPHY BY ALAN LEVENSON

Hawley pocketed almost $7 million by swapping out 150 million instructions per second of IBM processing power and leasing used computer equipment from a third-party provider. The used equipment, he says, got the job done just as well as the IBM gear for which the company had been paying top dollar.

Like Carter Hawley, JC Penney also takes a commodity approach to acquiring information technology. Now all systems and software buys, including those that once went automatically to IBM, are put out to bid.

"What it amounts to is that we're buying better than we ever did," says Dave Evans, IS vice president at the $19 billion retail and catalog giant. Evans says savings typically range from 20% to 40%, depending on the type of equipment involved.

Buyer beware

"Try before you buy" are Evans' words of caution for other managers interested in following a similar course. "Generally, we set ourselves up five or six months ahead of time to test the equipment we're interested in buying," he says.

Despite the retailer's aggressive cost-cutting, "we don't feel we've made any sacrifices," Evans says. "Instead, we feel we've become significantly more efficient in the way we deliver computing services."

Today, for example, nearly all of the retailer's 3,000 suppliers conduct business with the company electronically, with 93% of purchase orders and 75% of invoices processed via electronic data interchange.

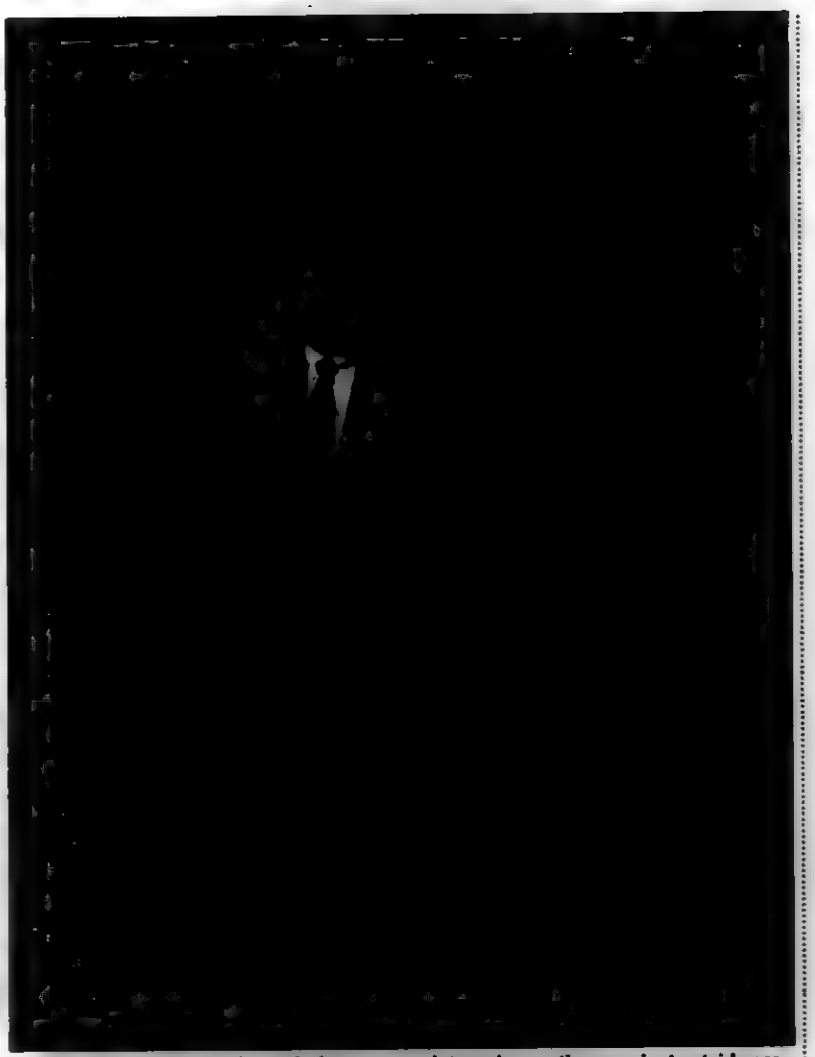
Switching gears

At Unocal, where the IS budget decreased by 20% in 1993, the quest for purchasing efficiency has led the company in a different direction. Instead of working with a greater number of suppliers, Unocal is actually consolidating its contracts and seeking volume discounts.

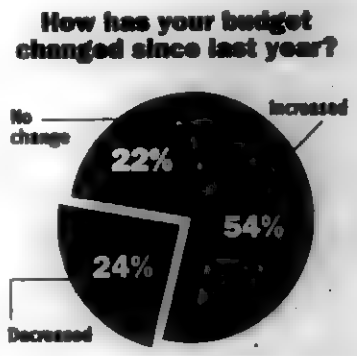
By throwing all of its voice and data network transmission business to MCI Communications Corp., for example, the company has cut communications and computing costs by "several million" dollars, according to IS director Paul Jones.

Previously, the company divided its telecommunications purchases among the Top 3 carriers.

Other cost-cutting measures at Unocal include buying PCs and terminals outright, instead of leasing, to eliminate recurring costs; relieving the 400-person IS department of PC purchasing and installation functions, turning these back over to the company's central purchasing department; and "basically, listening to users and not doing what they don't want," Jones says. "A lot of times, we would print out a 3½-in. document, and all that the user needed was two numbers."



Engelhard's Stephen Pook regularly compares internal operations against outside providers to identify possible efficiencies



Economies don't always have to come in the form of large, sweeping changes. At Engelhard, a decision made a few years ago to forego an expensive, discretionary upgrade of the company's IBM mainframes has saved several million dollars and cost nothing in terms of efficiency, according to Pook.

And Jones notes that a lot of the cost-cutting ideas implemented at his company were in the $10,000-and-under category. "But," Jones says, "if you get a thousand $2,000 ideas, you've got $2 million in savings. It's amazing how it adds up." ■

— Julia King is a free-lance technology writer in Ridley Park, Pa.

PHOTOGRAPHY BY MAX AGUILIERA-HELLWEG

YOU HAVE A MORE THAN ADEQUATE SUPPLY OF GOOD, TALENTED PROGRAMMERS, ANALYSTS AND SUPPORT STAFFERS. TROUBLE IS, THEY'RE WIRED FOR PLATFORMS, OPERATING SYSTEMS AND WAYS OF WORKING THAT DON'T MEET YOUR CURRENT REQUIREMENTS.

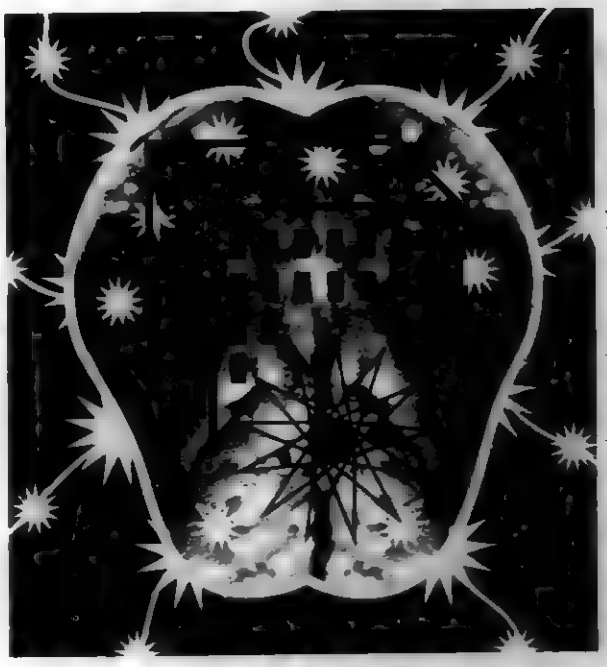
BRAIN STRAIN

BY DAVID BAUM

YOU MAY NOT WANT TO HEAR THIS, but devising a technology strategy is the easy part. Where things really get tough, says Ron Sonnenburg, director of information services at Deere & Co. in Moline, Ill., is in translating vision into reality.

What makes this so hard, not only at Deere but at most places, is the need to bring staffs up to speed quickly on technologies that are often radically different from anything they've encountered before. At Deere, for example, Sonnenburg's 1,500-plus systems people are experts in Cobol and IMS, twin bastions of aging mainframe systems everywhere. He wants to move his staff toward client/server, but making that transition is a little like trying to leap onto a moving train while juggling with one hand.

"We've got to keep the old systems alive while making the transition to the new, which is changing all the time," Sonnenburg says. And as if that's not enough, he adds, they have to do it without an increase in staff.



Skill reorientation is a problem most technically ambitious companies are facing. Stuart Woodring, an analyst at Forrester Research, Inc. in Cambridge, Mass., says a good number of Fortune 100 companies are floundering at retraining their systems staffs.

Balancing act

Lack of money is part of the problem, Woodring says, but there are other factors.

One is a reluctance to invest heavily in technical education until the current rate of change abates, he says. What if you spend a lot of money to train your whole staff in the wrong technology? Better to wait and make do than make a mistake of that magnitude.

It's a delicate balance, says Jimmy Hicks, vice president of information services at Duke Power Co. in Charlotte, N.C. "You need to constantly reassess just what the cutting edge is," he explains. "I try to see where the market is going before investing a lot of resources in a new solution. And that goes for training as well."

A gradual, test-the-waters approach can become crippling if it's too gradual, but Hicks says he believes some areas are more dangerous than others. "Object-oriented programming, for example, gets a lot of press, but all the vendors are start-up companies," he says.

Then there is the issue Sonnenburg mentioned: the maintenance requirements of old programs, which tie up existing information systems resources and make it extremely difficult to systematically expose and educate staff to newer technologies.

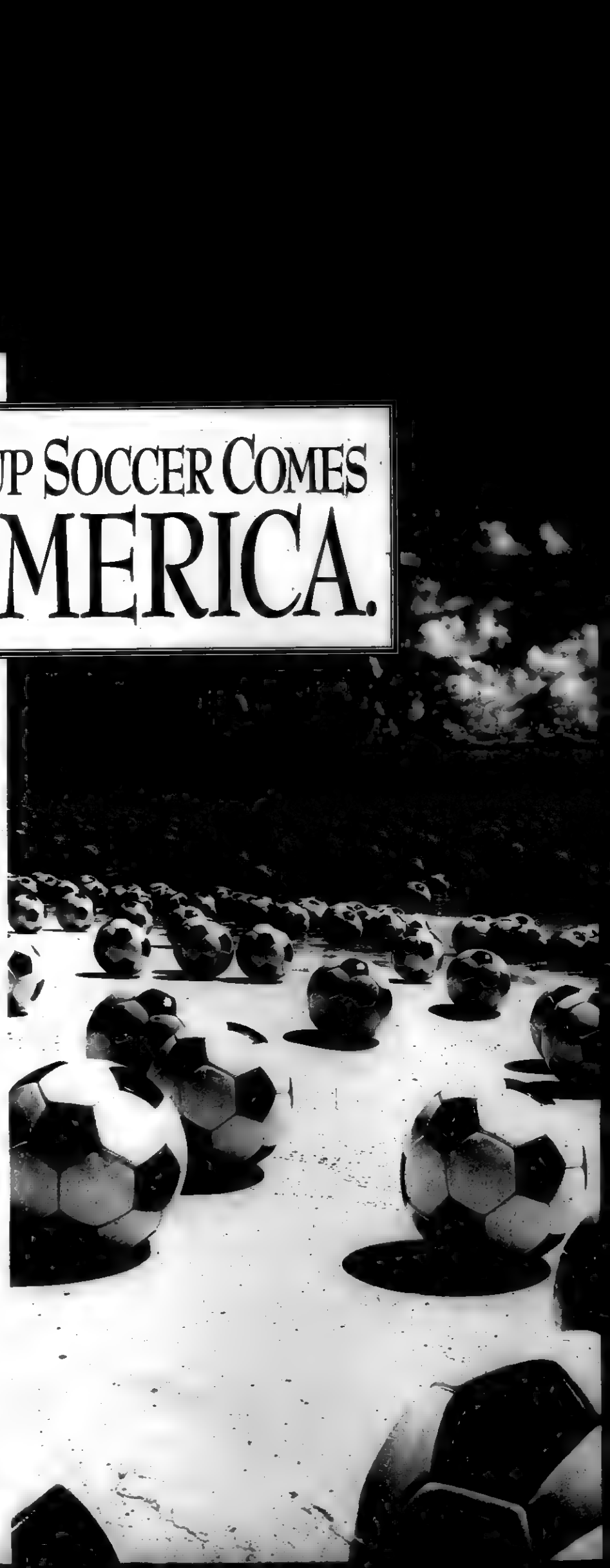
But Deere hopes to escape this dilemma. The company is serious about staff education, devoting 8% of its total systems budget to training — about twice the industry average. At the Lawn and Grounds Care Division in Horicon, Wis., for example, laying a careful foundation for client/server is a

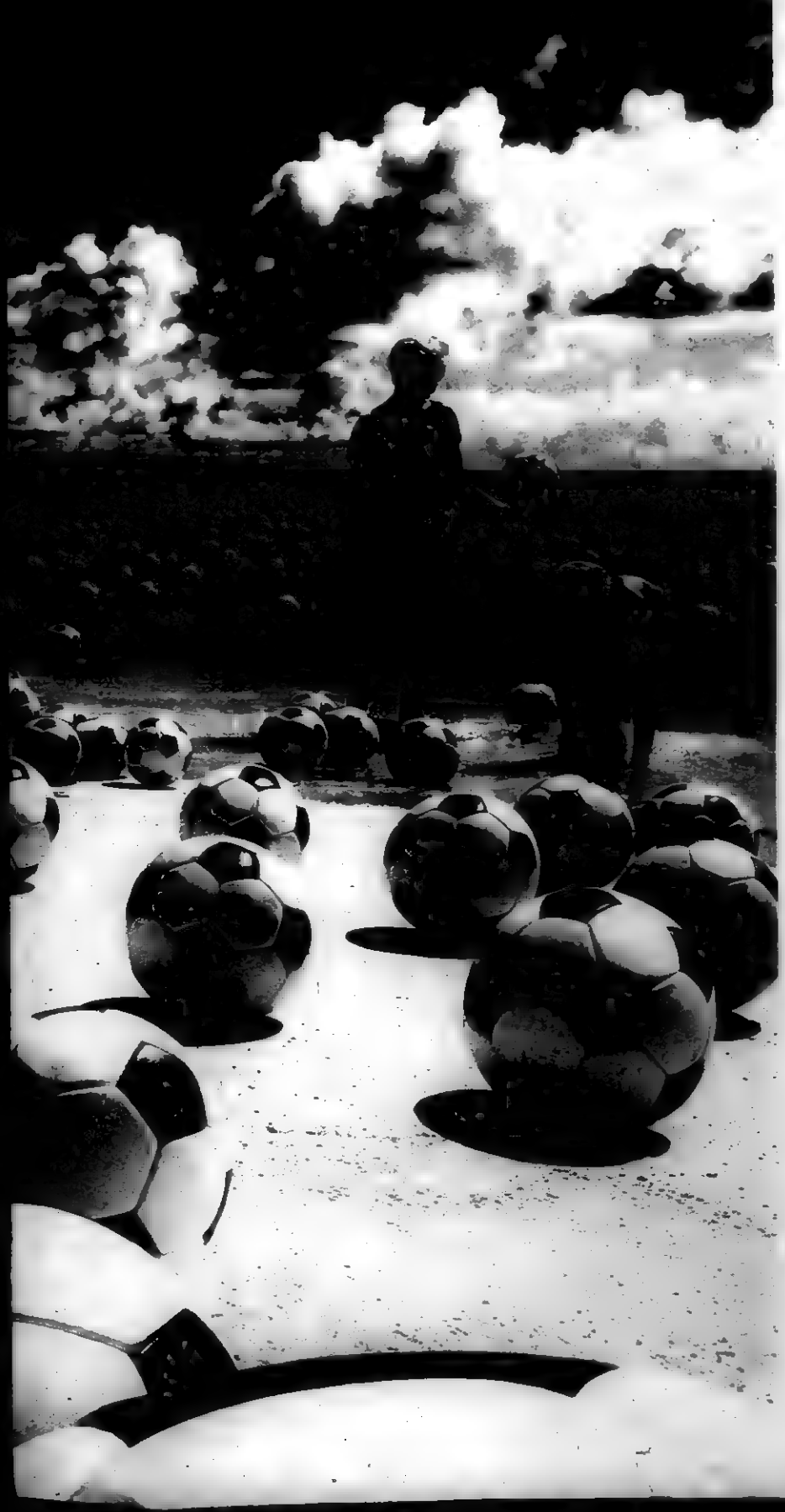
Continued on page 34

ILLUSTRATION BY JOHN HERSEY

WORLD CUP SOCCER COMES TO AMERICA.

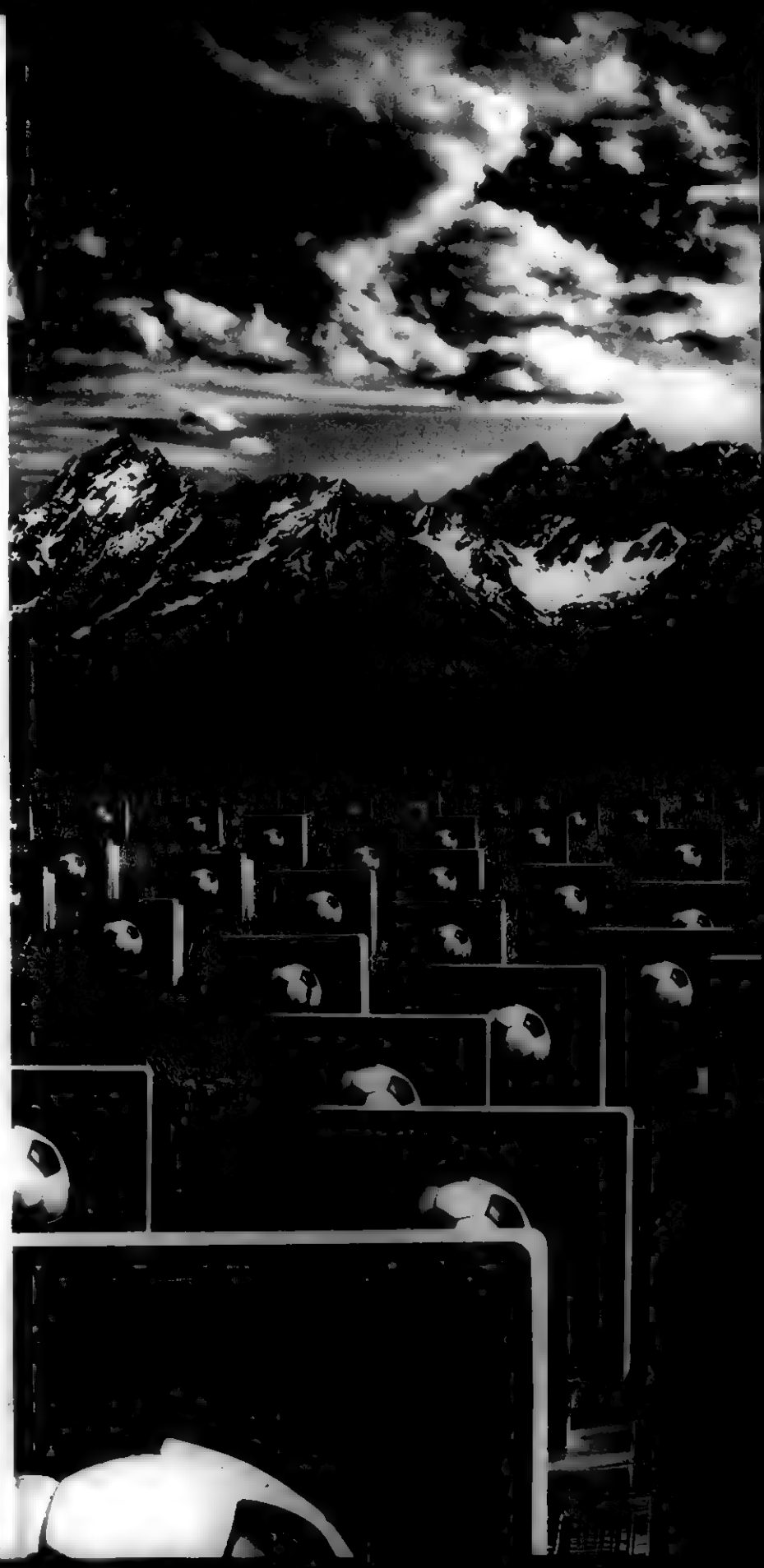
There are the little sports: The Super Bowl, The World Series, The Olympics. ◆ Then there is World Cup Soccer. ◆ An event so huge, even jaded sports fans still speak of it with wonder. ◆ Twenty-four of the best soccer teams from around the world will play fifty-two games in a four-week period, with a television audience of more than 32 *billion* people. ◆ When World Cup players meet on the field, they'll represent the pinnacle of achievement in a sport that last year alone saw more than 150 million *registered* athletes compete in 147 nations. ◆ Indeed, The World Cup is the single-

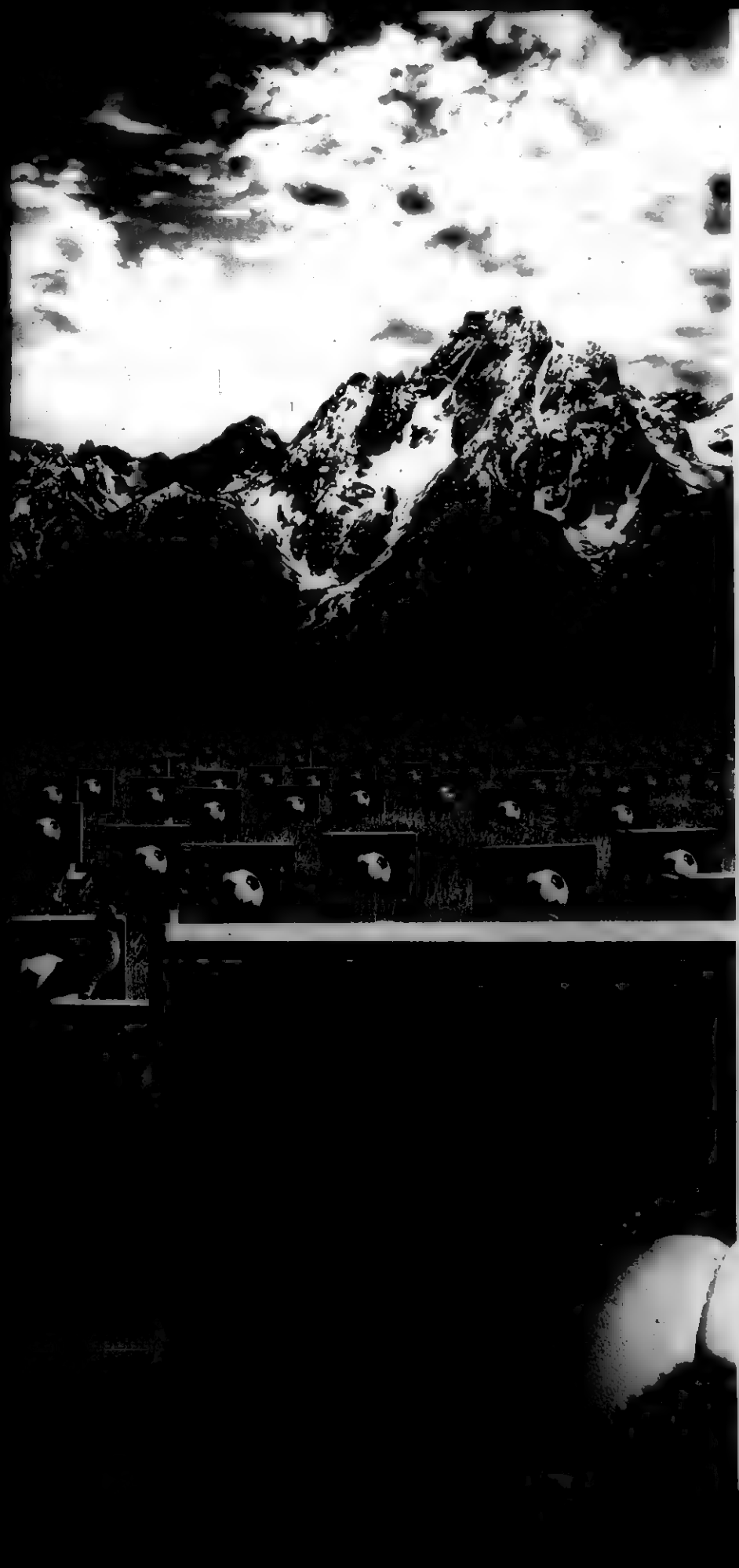




biggest sporting event in the world, based on a sport so ancient, it is almost woven into the genes of mankind itself. ◆ Before there was a Roman Empire, there was soccer. Before there was Michelangelo, there was soccer. Before the Mona Lisa smiled, soccer balls were being kicked throughout China, parts of Africa, and much of Europe. ◆ Now, as championship play in the World Cup soccer games kicks off next June, World Cup Soccer will reach America's shores for the very first time. ◆ Nine U.S. cities will host the final games: Boston, New York, Washington, D.C., Orlando, Chicago, Detroit, Dallas, Los Angeles, and San Francisco. With three and a half million tickets sold. And twenty-seven thousand volunteers. ◆ Behind it all, running the whole thing,

will be one special kind of computer. ◆ Sun? ◆ More than a thousand Sun workstations will be linked with fifteen Sun servers housed in three separate headquarters. Every mission-critical application will be run on Sun: Event management, office management, and database management. ◆ A global press corps numbering 10,000 to 15,000 will be photographed, credentialed, and registered in a database available to any World Cup official on the network, anywhere in the world. ◆ Press centers in soccer stadiums across the U.S. will be using Sun computers to access simultaneously the World Cup information systems. ◆ World Cup staff will be able to create, file, and transmit documents using either DOS or UNIX computer applications, reducing the need for computer retraining. ◆





And all this will take place across a network that brings video, text, and data to everyone's desktop. ◆ When the World Cup championships land in America in June 1994, more people will be watching than watched the landing on the moon. ◆ And a few eyes may also be on the computer that was judged simple to use, yet powerful enough to run the world's largest sporting event. ◆ More than 135,000 organizations are using Sun systems, powered by the SPARC* chip and the Solaris* operating environment, to gain a competitive advantage. The World Cup is just one. To learn how you can benefit, call 1-800-426-5321, ext. 605.

Sun

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Exclusive Computer Supplier To The 1994 World Cup

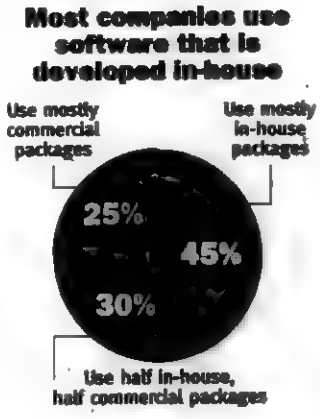
Continued from page 29

top priority. The division has appointed a small task force to establish standards and spearhead training efforts.

Dana Toraason, a member of the task force group, says the challenge isn't just acquainting systems personnel with the ins and outs of new tools but actually getting them to change the way they think. Otherwise, she says, "We'll build applications that still look like mainframe applications."

At Toraason's recommendation, classes were given in the Martin/Odell object-oriented programming methodology. The objective was learning to think in terms of modeling the enterprise rather than just one application. Once these concepts had been absorbed, other classes delved specifically into use of the Smalltalk language.

"It was like turning the world upside down," Toraason recalls. "For traditional Cobol programmers, using a language like Smalltalk is as much of an unlearning as a learning experience. Fortunately, we already have familiarity with reuse and black-boxing of Cobol subroutines, making it less of a leap as we adapt to the Smalltalk approach."



Deere has adopted a *Field of Dreams* model with the curriculum: "Build it and they will come." Team members are encouraged to follow their interests and preferences as they are exposed to new technologies.

The key here is patience. "It takes people a while to warm up to the idea of changing their whole technical environment," says Dave Kelley, manager of computer systems at Deere's Lawn and Grounds Care Division. His advice to others heading down the same road is: "Try to find a handful of champions who can share the vision with the rest of the organization and gradually broaden their horizons."

Federal Express Corp. leaves less to chance. According to Vice President and Chief Information Officer Dennis Jones, managers in the information technology group are expected to individually tailor training programs for the people who report to them. These programs are not strictly technical — basic survival skills such as project management are also part of the mix — but getting people safely and sanely through a period of major technical upheaval is clearly the overriding goal.

"Anytime you go through an enormous transition like the one facing us now — from mainframe model to client/server model — you have to cope with a lot of uncertainty and a lot of new learning requirements. Training can help you deal with both."

Knowledge gap

At Textron, Inc. in Providence, R.I., an internally developed standards and procedures document is used to bridge the gap between the general knowledge dispensed in training and the activities programmers must relearn as they move from developing with mainframe Cobol to Micro Focus, Inc.'s Cobol Workbench.

Formal training in OS/2 and Micro Focus Cobol can't do much more than scratch the surface, says Bob Edgar, manager of corporate business systems at Textron. "Even after you have had the OS/2 training, you probably only know a fraction of what OS/2 can do," he says. "The biggest challenges come with the shift to a multitasking environment, since it involves relearning how programmers work."

That's where the standards and procedures document and Bill Totten come in. Totten, a senior analyst on Edgar's team, is essentially codifying lessons learned during pilots of application development in the new environment. Still in preparation, the final document

WHY RETRAINING MAKES SENSE

Training can be costly: The average cost of equipping a staff member for a major change in the technical environment is about half the person's salary at the outset and then $5,000 every 18 months or so. Still, many *Premier 100* companies argue that it is far better to spend money on retraining than to bring in fresh recruits. New hires might have the technology down, but they won't know your organization or your business the way your current staff does.

"Our existing people are valuable partly because of their working knowledge of the business," says Dave Kelley, manager of computer systems at the Lawn and Grounds Care Division of Deere & Co. "We've found that's more important than having someone who knows a new operating system or set of programming tools."

This is true for a lot of companies that implement client/server systems. One reason is that many of the applications being planned and built cross numerous functional areas, and this large-scale integration requires broad organizational understanding. In personnel terms, that means it is easier to teach new technical information to existing staff members than to teach technically savvy newcomers about business processes.

The need to link new systems with legacy applications is also a strong argument for bringing current staff up to speed, rather than restaffing. "Don't underestimate the integration required during the transition as you connect new systems with old," says Dana Toraason, a member of a Deere task force to establish standards.

Textron's Bob Edgar (left) and Bill Totten are using lessons learned on pilot testing to break out of old frameworks

will include tips on project management, PC file maintenance and management, testing procedures, platform-to-platform integration and a host of intangibles he has uncovered during pilot programs.

"This document is geared specifically toward developing mainframe applications within a LAN environment," Totten says. "It's an evolving document tailored to our business, our systems, our architecture. Even the best plans for automation won't work the way you think they will unless you have procedures in place for how they pertain to your specific needs and work environment."

"Once you have a development workstation on your desk, you have your own processing environment," he adds. "The ability to check, edit, compile and animate code in one process can streamline the testing. But it is an entirely different approach and takes some getting used to."

Who does your application development?
28% Contractors
72% Internal staff

Takes times

Users also need time and assistance in getting used to the new styles of applications being produced and learning how to exploit new access tools.

At Harley-Davidson, Inc., MIS director Rich Kolbe says an important part of making that happen is a new training facility staffed with a former English teacher/computer salesperson and equipped with network-attached PCs that also connect to the company's Application System/400s.

End users come for instruction and to critique applications in process. IS personnel learn not only about new technologies but also about softer skills such as collaboration.

At Wal-Mart Stores, Inc., the education in user requirements is even more experiential. Programmers learn new skills through cross-pollination — working on projects that cross functional areas and technologies — and by regularly working stints in stores or distribution centers. ■

— David Baum is a Santa Barbara, Calif., free-lance technology writer.

PHOTOGRAPHY BY BRIAN SMALE

T·E·A·M PICTURES

No doubt about it, teamwork works. Here are just a few of the business/IS combinations that are scoring big at *Premier 100* companies:

The Boeing Co.

Jim Eaton (right) and Steve Henrikson set up an office in a Boeing warehouse in Seattle to build a client/server publishing system for training documentation. There, Eaton, system manager at the Commercial Airplanes Group (on the user environment side), and Henrikson, systems project manager at the Computer Services Group, have been managing a team to replace an old mainframe-based system with a client/server-based system. The new system makes training information more accessible to pilots and customers. "We wouldn't have been able to do this if we weren't located in the same place. It's helped us learn a lot more about what each person is doing, and build a better relationship," Henrikson says.

Outboard Marine Corp.

When Jack Feurig returned Dennis Ervin's call at 2 a.m. during the launch of their new networking system, Ervin realized that IS isn't the only organization with high demands and tight schedules at this $1 billion marine engine and boat manufacturer. For seven months, Feurig, director of market development and sales administration (front), worked closely with project managers Ervin (left) and Rich McCarthy (top center) to develop the PC-based Outboard Marine Network Integration system. The internal network gives sales and distribution staffs across the country direct access to information on product availability and allows outside dealers and sales staff to communicate electronically. "We still aren't programmers," Feurig says, "but we have a much greater understanding of what a system really is and how we can look at it as a tool rather than a restriction." Also pictured (right) is Harry Adams, director of systems and data processors.

PHOTOGRAPHY (ABOVE) BY MICHAEL ABRAMSON

American President Cos.

When Peter Weiss placed his first call to Terry Fitzpatrick, the tariff-tracking process at this container and cargo transportation company was a piecemeal nightmare of drifting invoice data. The many conference calls between Oakland, Calif.-based Weiss, senior manager of international systems (above) and Jersey City, N.J.-based Fitzpatrick, manager of finance and administration, paid off for this team, resulting in a standardized DB2 IEF system to automate tariff data records and invoices nationwide. "We built up a lot of open communication and trust, which helped us gain a better understanding of their business problems," Weiss says. "We had a lot of technical hurdles to jump, and we wouldn't have been able to do so without the communication and trust we had."

MCI Communications Corp.

Two years ago, Dan O'Connor and other members of business services realized they could dramatically improve sales force success if branch office personnel had easy access to information such as invoices and customer profiles. O'Connor (right) attempted to do this in the traditional way, with a lot of requests and paper forms passed back and forth to information systems. But when he finally teamed up with Joe Zuccari (left), director of systems engineering of the market segment, the time it took to deploy a branch automation system was suddenly cut in half. With a staff of about 40 people, the team designed Branchworks, which allowed branch sales and service people to access information in a matter of minutes instead of a few weeks. Zuccari says, "I have a much better understanding of our business and how our business process works, which allows me to better suit their needs. As a team, we can implement things much more quickly. Now my piloting and proving of concept cycle time goes way down because I understand the business more."

Kellwood Co.

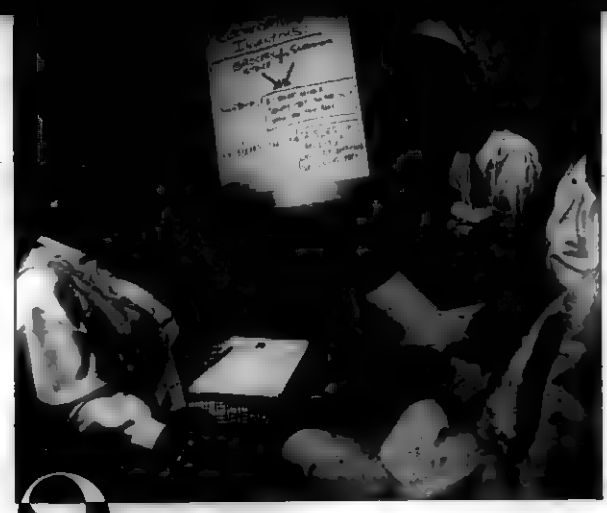
Consultants Ed Nelson and Sam Craig were well-acquainted with manufacturing requirements at Kellwood, a clothing and furnishings maker. But when the firm bought Decorp, a women's specialty dress house, in October 1990, its IS staff had to tailor Kellwood's manufacturing resource planning and payroll system to a different retail world. "Kellwood has traditionally been in business with department and chain stores," says Nelson (left), explaining why he and Craig (right) needed the expertise of Decorp's director of finance, Terry Davis, to do the job right. "With specialty stores, the number of dollars and invoices is smaller, and analysis and forecasts are different."

PHOTOGRAPHY (CLOCKWISE) BY TOM ZIMBEROFF, ANN STATES AND REID HORN

DO TRY THIS AT HOME

BY ERIN CALLAWAY

Safety-tested at Premier 100 *companies, these innovative tactics could work for you, too*



1 Data Esperanto

From its earliest use of electronic data interchange (EDI) in the 1980s, the information systems organization at Pet, Inc., a producer of prepared food and confections, decided all new internal systems would "talk EDI." Making adherence to EDI standards part of the requirements for all applications and building those standards into computer-aided software engineering tools and data modeling methods has eliminated the labor of after-the-fact translation of internally created documents into formats usable by external customers. The result: speedy communication.

2 Leaders-in-training

At The Travelers, to create IS leaders who understand the business structure, the company has constructed a management development program. The Accelerated Development Program for Tomorrow's IS Leaders, or Accent, selects high-potential new employees, including recent college graduates with computer science degrees, and rotates them through three IS positions and one nontechnical business position as part of their management training. Accent has produced many IS staff members who appreciate business needs, but the surprise benefit has been the number of trainees — 34% of the current graduates — who have chosen to stick with the business side upon completion.

3 Creative wire-heads

End users at Roadway Services, Inc. used to complain that, before they could even finish explaining their needs, staff members at Summit Information Systems, would offer an automation solution. Jerry Long, vice president of the IS operation, decided to break through this "wire-head way of solving problems" by arranging a workshop on creativity and interpersonal skills. Exercises included one that gave participants two unrelated items such as low-income housing and air transportation and asked them to develop the combination into a marketable product or service. The point was to teach IS staff members about teamwork, unconventional thinking and the importance of recognizing that "not every problem has a 100% solution."

4 Joined at the wallet

At Roadway Services, IS service levels aren't just the concern of the IS subsidiary, Summit Information Systems. Availability of on-line systems and on-time delivery of applications by IS are factored into corporate calculations of profit-sharing for all employees, right along with more traditional measures of business performance. Monetary interconnectedness seems to work. The number of on-line systems failures dropped from 365 in 1991 to only 120 in 1992.

5 Support your local IS

Rubbermaid Commercial Products, the Winchester, Va., division of Rubbermaid, Inc., recently invited IS managers at area businesses to attend the charter meeting of a noncompetitive coalition for shared information resources. Twenty-five people representing 18 companies attended to discuss goals. At the top of the agenda, according to Gary Senese, vice president of IS at Rubbermaid Commercial, was a discussion of cost-effective training methods, including an idea to have members with expertise in particular software — "power users" — train their coalition colleagues. The idea, Senese says, is to make the kind of casual skill-sharing that often occurs within firms an accessible community resource.

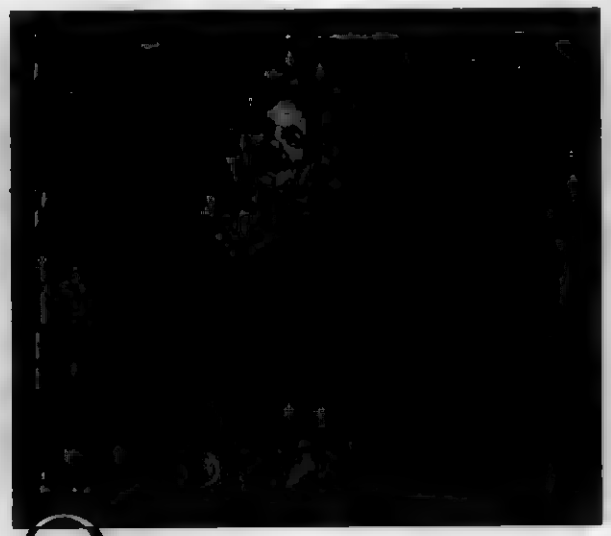
PHOTOGRAPHY BY JACK VAN ANTWERP

6 No more pass/fail

At Mellon Bank Corp., internal customers don't just evaluate IS services — they grade them. At the end of next quarter, Mellon's IS group will receive letter grades from each business unit for its overall quarterly performance and for each project it completes. The technology "report card" will allow Mellon IS to set tailored project goals based on the needs of individual units and then benchmark precisely those areas needing improvement. In addition, Mellon IS will use a generic card to grade the services it provides to all its customers.

7 Electronic prodding

Customers receive fast action on complaints these days at industrial and agricultural chemical producer Rohm & Haas Co., thanks to a worldwide complaint handling system that is tied into the order-entry system. The system automatically sends entered complaints through electronic-mail to an assigned "owner" and follow-up person and begins clocking the time for the problem to be resolved. If some action is not taken in a specified time, the system sends reminders to both people and continues to do so until the problem has been handled.



8 Idea drive

At Broan Manufacturing Co., a subsidiary of Nortek, Inc. and manufacturer of large home appliances, IS staff members are encouraged to participate in a companywide Fresh Idea Program, which is an incentive plan that invites company employees to present their ideas to a review committee of rotating representatives from each user department.

The committee accepts ideas based on several criteria such as safety and convenience, but bottom-line company savings is the key. Ron Yogerst, operations analyst at Broan, called the committee's attention recently to a wasteful five-page shipping form. This process led the company to develop a streamlined order-entry system that will save Broan nearly $8,000 annually. Yogerst's idea contributed to a total 1992 IS savings of $20,000.

9 Camp Depot

The IS staff at The Home Depot, Inc. is one group who knows about challenges and the importance of working together. For three years, IS staff members have participated in special Outward Bound programs that are held in the nearby mountains of North Carolina. Their most recent trip was to Franklin, N.C. This trip consisted of rock climbing, hiking, white water rafting and, of course, IS problem-solving. Besides learning how to survive in the wilderness, IS personnel learn to communicate efficiently and respect one another's strengths.

Working toward the common good is an idea that the organization puts into action in other ways as well. Each Christmas season, more than 80% of the IS staff volunteers for weekend retail shifts at Home Depot stores. But that's not all they do: This summer, the entire IS department has been spending their Saturdays building low-income housing with Habitat for Humanity.

10 'Isn't that your bolt?'

At Northrop Corp., a manufacturing shop floor system not only clears away paper clutter but also creates an easy-to-follow trail for every plane that is built. The system provides mechanics with on-line work instructions and records job progress and inspection check-offs. Used through the entire manufacturing process from instruction to inspection, the system makes it possible to trace problems back to a specific stage in manufacturing and to specific individuals who worked on the project. As a result of this system, production times have been reduced. The system times production as well, thus reducing the number of hours for each job. It also allows mechanics to identify which parts they installed. ■

PHOTOGRAPHY (LEFT) BY JAMES SCHNEPF

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Whatever happened to...

BY MICHAEL SULLIVAN-TRAINOR

The *Premier 100* ranking traces changes in the business and information systems activities of the largest public companies in the U.S. While each year our annual list highlights companies making an impact with technology in their businesses, it also indicates which companies have had business reversals or IS turmoil that knocked them out of the spotlight. The following companies have had such difficulties.

Aetna Life & Casualty Co. Ranked in the Top 5 in 1991, Aetna experienced an 89% decline in profit in 1992, partly because of trouble with real estate loans. The company reorganized its commercial and personal insurance and business services divisions into independent units. Parallel efforts were made to reduce and tighten the IS group. IS budget and staff were reduced significantly in 1992 and 1993.

Amoco Corp. After reaching a high of more than $2 billion in net income in 1988, Amoco profits have declined each year. The company reported a $74 million loss in 1992, along with a 12% reduction in employee head count.

Dow Chemical Co. Steady IS investments focusing on global communications projects failed to keep the company from dropping in the ranking in the face of profit problems. A $489 million loss in 1992 followed a 1991 reduction.

Eastman Kodak Co. While the jury is still out on outsourcing, Kodak has experienced significant ups and downs in its business causing its ranking to change as well.

Eli Lilly and Co. After making the ranking cut in 1991, Lilly was outdistanced by other strong-performing IS organizations. In acquisition mode in 1992, the company posted a 46% decline in profits.

Lockheed Corp. Now is a bad time for a company to have 70% of its business tied up in the defense industry. Lockheed is in the middle of a post-Cold War conversion to nondefense businesses. A $283 million 1992 loss reflects the urgency of this transition, which has also caused significant expense reductions.

Security Pacific Corp. Acquired in 1991 by BankAmerica Corp., Security Pacific's Automation Co. was one of the industry's strongest IS organizations. Since then, Bank America has been gradually merging with Security Pacific's operations.

Sears, Roebuck and Co. A consistent *Premier 100* winner, Sears dropped out of the Top 10 for the first time in 1993 due to continued struggles capped by a $3.9 billion loss in 1992. Its IS organization is moving to a more responsive service organization.

The Timken Co. Declining profit and flat revenue overshadowed a strong IS effort in factory automation, which brought Timken to prominence in the *Premier 100*. The company reported $4 million in profit on $1.6 billion in revenue last year. ■

Shifting rankings

Changing business circumstances have resulted in less prominence for the following former top-ranking *Premier 100* firms:

COMPANY	YEARS IN TOP 5
Aetna Life & Casualty Co. Insurance	1991
Amoco Corp. Petroleum	1988, 1991
Dow Chemical Co. Chemical	1988, 1989, 1990, 1991
Eastman Kodak Co. Manufacturing	1988, 1991
Eli Lilly and Co. Pharmaceuticals	1990, 1991
Lockheed Corp. Aerospace	1988, 1989, 1992
Security Pacific Corp. Banking	1989, 1990
Sears, Roebuck and Co. Retailing	1988, 1989, 1990, 1991, 1992
The Timken Co. Industrial	1989, 1990, 1991

ILLUSTRATION BY ROBERT NEUBECKER

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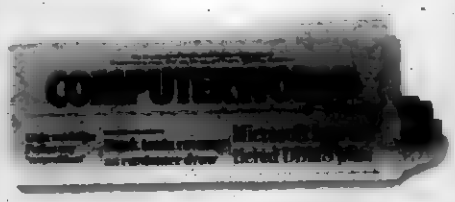

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22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., LAN Mgr., PC Mgr.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VAR's/Consulting Mgt.

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13. Treasurer, Controller, Financial Officer

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HOW We Measure Effectiveness

This year's *Premier 100* combines two methods of measuring information systems' effectiveness: The amount of investment in information technology in key areas and the quality of performance the company exhibits in its business and IS initiatives.

TARGET COMPANIES

Our target group consists exclusively of large, publicly traded corporations, ranging in revenue from $300 million to more than $100 billion. Only parent companies are ranked. Thirty-three industry groups are included as listed in the Fortune Industrial and Service 500.

SOURCES OF DATA

The data for this report come from a telephone and fax survey of 600 corporations. The top IS executive at the company is used as the primary source for all information, except chief executive and peer ratings (see below). Profit and revenue figures are from public sources, as are categorizations of the company's primary line of business. Where company sources cannot provide the data, we work with analysts, internal databases and public information to develop estimates for key figures.

INVESTMENTS

We begin with a look at the IS investment, which demonstrates whether the company is committed to technology at a rate that matches or surpasses its competitors. We measure IS budget as a percentage of revenue for the corporation's entire holdings, including all subsidiaries. This figure is compared to industry average spending for that company.

The IS investment is further examined by measures of staff spending, training spending and the value of major processors as a percentage of revenue. Taken together, these figures indicate whether the company is being cost-effective in staffing, without skimping on training or on acquiring new technology. More points are awarded for higher training and value ratios and lower staff ratios.

PC NETWORKS

Another measure of a proactive technology user is the spread of PCs and terminals among all employees. More points are awarded for a higher ratio of PCs and terminals as a percentage of employees.

This year, for the first time, we have also factored in the ratio of networked PCs to total PCs and granted additional points to the more highly connected companies.

BUSINESS PERFORMANCE

Reaching beyond these measures of cost-effectiveness is a set of criteria that reveal the results of these investments.

We measure five-year profit growth to determine if the technology is paying off in business success. While technology and profitability are not tightly coupled, few IS organizations can be said to be making an effective contribution to business success if the company isn't making money.

MANAGEMENT RATING

We look at how well-positioned the IS organizations are to match the business needs.

More points are awarded to companies with IS organizations that are tightly linked to business strategic plans, investment decision-making and company view. More points are also given to those with higher investments in technology research and development, more staff dedicated to new applications and improvement activity.

EXECUTIVE AND COMPETITOR VIEWS

Peer ratings are based on the responses to a peer survey of target companies. Companies were asked to name the Top 5 most-effective users of IS in their industry groups. Companies most frequently named No. 1 received the most points.

The chief executive rating is determined by asking executives of the target companies — CEOs, chief operating officers and chief financial officers — to rate their own organizations on a five-point scale, with the lowest rating for poor performance and the highest for very good performance. The chief executive ranking was applied to the Top 200 companies only, which were determined by all the other criteria. These ratings were factored into the final ranking to determine the Top 100.

WEIGHTING MEASURES

Our weighting system counts all the measures equally except the peer rating, which receives twice the value of any other area. ■

ILLUSTRATION BY JAVIER ROMERO DESIGN GROUP, INC.

Sun salutes an IS visionary

When Wells Fargo computer programmers came to their senior manager, Roy Camblin, with a "major catastrophe," he naturally expected the worst. It had been a challenge to convince the crew to downsize from a mainframe to a UNIX®, client-server platform. The mainframe wasn't broken, they had said, so why fix it?

And now, three-fourths of the way through the migration, they were presenting him with a design bug, ample evidence of their initial concern. "How long will it take to fix?" Camblin asked apprehensively.

"A day and a half," they responded.

Camblin heaved a sigh of relief.

In the mainframe world, these types of problems could take six to nine months to fix. It could cost the project. It could cost a manager his or her job.

"It actually took closer to a week to fix the bug," Camblin recalls. But it was at that critical point in the conversion that Camblin, already a believer in UNIX and the open systems, client-server solution, became an evangelist for the cause.

The pilot project at Wells Fargo's wholesale banking division in San Francisco was initiated in December 1991. The goal was to rightsize a department known as the risk management group using Oracle® software and Sun's Solaris® operating system, running on Sun SPARCserver™ and SPARCstation™ systems.

The conversion provided all the advantages Wells Fargo had hoped for in a computing solution: lower costs, flexibility, accessibility, speed and power.

It has convinced the bank to explore converting as many applications as possible to UNIX over the next few years.

Camblin's efforts have not gone unrecognized. He was named winner of the 1992 Sun Visionary of the Year Award, the first recipient of the annual title established by Sun Microsystems, Inc.

"Roy Camblin is undoubtedly one of the most trend-setting and forward-thinking information managers out there," says Bill Raduchel, Sun's chief information officer.

"He has gone out on a limb to reengineer at Wells Fargo by forsaking the traditional MIS models and developing an innovative approach for a complex, high-risk, high-security application."

Camblin's soft-spoken demeanor belies a rather dramatic resume, which includes performing in a circus in his college days and flying T-38s as an instructor in the Air Force and helicopters in the Army Reserves.

His career in information systems has been equally impressive, rising through the ranks of discount brokerage firm Charles Schwab & Co. and Wells Fargo's credit card division before assuming the senior vice presidency of systems and operations for its wholesale division.

But all that might seem tame compared to the past year. After being awarded the Sun Visionary title a year ago, the 46-year-old has risen from relative anonymity to a key role as a proponent of open systems and UNIX, interviewed and quoted by many of the major computer trade publications. He says he doesn't mind the attention, but he is quick to share the spotlight with his supervisors and subordinates at Wells Fargo.

"I provided the senior management – the leadership. But I don't pretend to be the one who figured everything out. It was a team effort," he says.

But it was Camblin who convinced the group to look to the future.

"I explained that tried-and-true methods won't get us to where we need to be three years from now," says Camblin.

"This is not just reengineering, or downsizing, or moving databases, or putting a more flexible front end on legacy systems. It's all those things and more. It's reengineering the way we do business."

As the champion of open systems and rightsizing technology, Sun Microsystems, Inc. established an annual award in 1992 to honor those who create an organization-wide, client-server solution that improves efficiency, saves money and puts technology into the hands of front-line employees.

The first award was presented to Wells Fargo senior vice president Roy Camblin, who received a $10,000 check to donate to the educational institution of his choice.

The recipient of the 1993 Sun Visionary of the Year award will be named at a ComputerWorld dinner in New York in October honoring their Premier 100 winners.

Sun

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MAKING THE G

Peer ratings:
You're doing something right when rivals respect you

While there are many ways to gauge information systems effectiveness, one of the most telling clues is how a company is viewed by its peers. Strong IS initiatives have a direct impact on competitors. Competitors are also well aware of weaknesses that they can exploit with their own IS efforts.

Since 1991, we have tracked the most well-respected IS organizations through the *Premier 100*'s annual Peer Rating. Companies are asked to choose the most effective users of IS in their industry (excluding themselves).

For three consecutive years, four firms have received the highest ratings in their industries: Air Products and Chemicals, Inc., The Boeing Co., Federal Express Corp. and Wal-Mart Stores, Inc. Here's what competing firms say about them:

Air Products and Chemicals "is successfully addressing business needs and networking."

Boeing "has a breadth and depth of technology applications in engineering and manufacturing. The company effectively uses its people resources and aligns IS with company goals."

Fedex "understands the importance of technology. The company has world-class shipment tracking and customer service systems. It's a standards-setter. We're very impressed with how they add value for their customers and generate customer enthusiasm for IS."

Wal-Mart "has strong point-of-sale and replenishment systems. Their centralized buyers can talk directly to their wholesalers through computer linkups, resulting in significant deals. The company pushes the limit of business by using technology."

Out with the old . . .

This year has brought in the following new firms with high ratings:

Abbott Laboratories, cited for its business partnerships.

AMR Corp., named for "the range of applications of technology and its reservation systems."

Cigna Corp., selected for its re-

Peer review

The following companies received the highest ratings from their fellow IS executives:

- Abbott Laboratories
- Air Products and Chemicals, Inc.
- AMR Corp.
- The Boeing Co.
- Cigna Corp.
- Federal Express Corp.
- The Travelers
- US West, Inc.
- Union Pacific Corp.
- UAL Corp.
- Wal-Mart Stores, Inc.

engineering efforts.

The Travelers, dedicated to research and development in technology. It has created an impressive insurance regulation/customization system that spans all 50 states.

US West, Inc., picked because it uses large IS applications to offer a range of service options.

Union Pacific Corp., for "top management participation in IS."

Beyond the highest-rated companies are those that competitors single out because of their outstanding IS initiatives. Some of the firms and the kudos offered by industry competitors follow:

Aerospace: Martin Marietta Corp. — "The company uses IS in an integrated fashion. From product definition through manufacturing, their cross-functional integration is the most seamless of any organization."

Consumer products and services: *The New York Times* — "They've been very innovative in past years. We usually use them as a guide as we try new things."

Financial services: United Services Automobile Association — "They have strong personnel, customer handling and work procedures as well as innovative image processing in customer service."

Industrial and automotive products: Ford Motor Co. — "The company is faster than the competition in exploring and adopting new ways of using IS."

Manufacturing: Xerox Corp. — "Management is successfully sponsoring new systems directions."

Petroleum and chemicals: The Dow Chemical Co. — "They are effectively using technology in strategic businesses."

Pharmaceuticals, food and beverages: Johnson & Johnson — "They have been a leader in engineering simpler application interfaces for customers and distributors."

Retailing and wholesaling: JC Penney Co. — "Changes have been made in IS, making the company more competitive by getting goods to the stores more efficiently."

Transportation: Airborne Freight Corp. — "High-quality applications combined with automation makes them extremely competitive."

Utilities: SCECorp — "The company uses technology and telecommunications effectively to support corporate strategies. It has capable management and a good IS infrastructure."

GRADE

Executive ratings:

The ingredients of outstanding management

To be truly effective, an IS group has to be more than efficient. It must contribute significantly to business success, and that won't happen without excellent management. Such management involves organizational structure, alignment of IS goals with business goals, management support and the deployment of resources to match objectives, among others.

In this year's *Premier 100* methodology, we introduce a set of categories that indicate effective IS management. Consultants Richard H. Nahmias at Nahmias & Co., Michael Ashmore at CSC Index, Inc. and Howard Rubin at Howard Rubin Associates contributed to the development of these criteria:

- **Structure:** How your IS organizational structure complements your company structure.
- **Strategic alignment:** How closely your strategic IS plan is linked to your strategic business plan.
- **Reporting level:** Who your top IS executive reports to.
- **Technology perception:** How senior management views technology.
- **User feedback:** Whether or how often you conduct user satisfaction surveys.
- **Investment methods:** How you determine where to make technology investments.
- **Focus of activities:** Where you focus the majority of your IS efforts.
  - Renovating the IS structure.
  - Automating.
  - Strategic value.
  - Re-engineering.
- **Application quality:** Technical and business quality of applications that support business lines and whether you will rewrite them.
- **User spending:** How much IS spending falls outside the IS group.
- **IS research:** Percentage of IS budget devoted to R&D.
- **Staff deployment:** Percentage of staff devoted to maintenance vs. application development.

One effectively managed company according to the criteria is Deere & Co., which achieved high ratings in a number of categories. Deere's IS organization is a hybrid structure. IS strategic plans are crafted separately from business plans but are linked to business strategies.

Management views the effective application of technology as the key to the company's success. Formal cost/benefit analysis using traditional measures is used to determine where to make investments.

The majority of IS activities are at the two extremes of IS efforts: renovating IS structure and re-engineering. Ten percent of the IS budget is devoted to renovation, 20% to automation, 60% to strategic value applications and 10% to re-engineering.

The business quality of applications is high across the board, with medium to high technical quality.

Two percent of Deere's IS budget goes to R&D. Sixty percent of the staffing budget is dedicated to maintenance and 40% to application development.

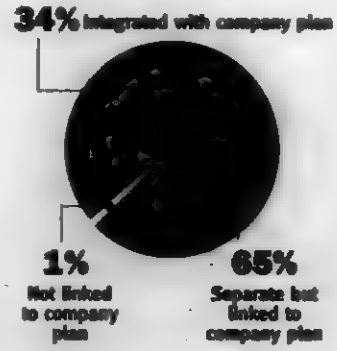
Unocal Corp. is another example of effective management. Its hybrid structure is matched by a hybrid IS organization. Strategic plans are separate but linked.

Traditional cost/benefit analysis is used to determine where to invest in IS, and annual user satisfaction surveys are conducted. The company is renovating its IS structure and dedicating 50% of its budget to the effort.

Application rewrites are under way. Staffing is divided 50/50 between maintenance and development expenditures. ■

Strategic planning

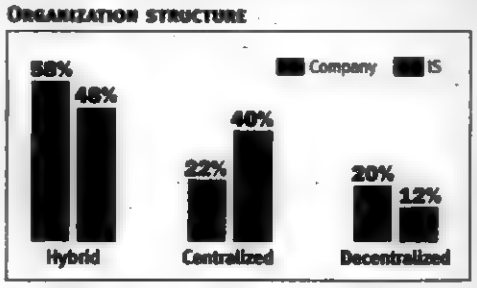
Only one-third of *Premier 100* companies do their IS planning as part of business plans



How do you match up?

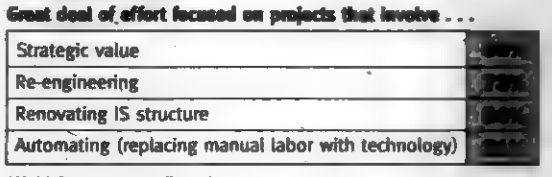
Premier 100 IS organizations have the following management views and policies:

ORGANIZATION STRUCTURE



ACTIVITY EMPHASIS*

Great deal of effort focused on projects that involve . . .



*Multiple responses allowed

MANAGEMENT'S TECHNOLOGY ATTITUDE

"Effective application of technology is key to success" — 82%

"Our business is technology-driven" — 8%

"Technology plays a supporting role" — 8%

Other — 2%

1993 industry rank	Company	Total score	Peer points	Chief executive points	Management points	IS budget (millions)
AEROSPACE						
1	The Boeing Co.	73,485	17,490	6,000	8,580	$1,509
2	Martin Marietta Corp.*	73,070	16,000	8,250	8,000	$301
3	Northrop Corp.	72,880	16,000	8,250	8,595	$222
4	Allied Signal, Inc.*	69,535	17,280	6,000	8,000	$345
5	Grumman Corp.	69,500	16,000	8,250	8,670	$146
6	Gencorp, Inc.*	67,845	16,000	7,500	8,000	$39
7	Textron, Inc.	67,755	16,000	6,000	8,640	$193
8	McDonnell Douglas Corp.*	67,285	16,000	7,500	8,000	$683
9	General Dynamics Corp.*	67,090	16,000	8,250	8,000	$350
10	Raytheon Co.*	63,980	16,000	6,000	8,000	$105
	Industry average	69,243	16,277	7,200	8,249	$389.3
CONSUMER PRODUCTS AND SERVICES						
1	Dibrell Brothers, Inc.*	77,170	16,000	8,250	8,000	$7.1
2	Hon Industries, Inc.*	76,470	16,000	9,000	8,000	$8.9
3	The Dun & Bradstreet Corp.*	74,335	16,000	6,000	8,000	$776.3
4	Helene Curtis Industries, Inc.	73,700	16,000	8,250	8,580	$25.6
5	Marriott Corp.*	73,650	16,000	6,000	8,000	$160
6	Reader's Digest Association, Inc.	73,315	16,000	6,000	8,000	$120
7	Kellwood Co.	73,015	16,000	8,250	8,000	$13.8
8	Browning-Ferris Industries, Inc.*	72,215	16,000	6,000	8,000	$20.7
9	International Flavors and Fragrances, Inc.*	71,820	16,000	6,000	8,000	$9.1
10	Emerson Electric Co.*	71,680	16,000	6,000	8,000	$71
	Industry average	73,737	16,000	6,975	8,058	$121.3
FINANCIAL SERVICES						
1	Banc One Corp.	79795	16,000	9,000	8,655	$387
2	Mellon Bank Corp.	78345	16,000	9,000	8,745	$135
3	Prudential Insurance Co.*	76470	16,000	6,000	8,000	$367.8
4	Chemical Banking Corp.*	71750	16,000	6,000	8,000	$625
5	The Travelers*	71435	17,550	9,000	8,000	$387.2

Listings continue on the following page

*Estimates are from *Computerworld* sources and not the companies

IS budget as % of revenue	% of IS budget for staff	% of IS budget for training	Processor market value (millions)	Processor market value as % of revenue	Total PCs and terminals	% of employees with PCs/terminals
5%	42%	.8%	$900	3%	118,500	80%
5.1%	40%	1%	$50	.84%	30,000	54%
4%	52%	.1%	$8	1.4%	22,000	65%
2.9%	40%	3%	$60	.5%	36,000	40%
4.2%	48%	4%	$75	2.1%	18,000	85%
2%	39.9%	1.4%	$5.5	2.8%	8,700	63%
2.3%	40%	5%	$75	8.9%	30,000	56%
3.9%	61%	5%	$137	.8%	75,000	86%
4%	53%	.8%	$113	1.3%	7,646	13%
1.2%	42.5%	3.1%	$60	.64%	34,000	53%
3.5%	45.8%	2.4%	$148.3	2.2%	37,984.6	59.5%
.7%	56.9%	2%	$16	1.4%	6,960	100%
1.3%	34%	2%	$15	2.1%	3,800	67%
16.3%	58%	2%	$150	3.1%	50,000	86%
2.5%	38.5%	1.5%	$8	.8%	3,720	120%
1.8%	42%	.8%	$20	2%	9,750	100%
4.5%	68%	5%	$29	1.5%	3,500	26%
1.5%	48%	.7%	$200	2%	11,000	78%
.6%	46%	3%	$79	2.3%	25,644	98%
.8%	42%	4%	$14	1.3%	3,469	82%
.9%	39%	4.7%	$42	.54%	52,568	75%
3.1%	47.3%	2.6%	$57.3	1.7%	17,041.1	83.2%
6.5%	27.9%	4%	$93	1.5%	42,000	100%
4.5%	48%	1%	$36	1.2%	25,000	100%
4%	42%	3%	$230	3%	81,000	80%
5.1%	63%	3%	$42	1.6%	20,000	50%
4%	50%	3%	$96.8	1%	30,000	100%

1993 industry rank	Company	Total score	Peer points	Chief executive points	Management points	IS budget (millions)
FINANCIAL SERVICES						
6	Bankers Trust New York Corp.	71,005	16,000	8,250	8,700	$450
7	Crestar Financial Corp.*	70,030	16,000	8,250	8,000	$73.7
8	Cigna Corp.*	69,605	17,460	6,000	8,000	$743.2
9	American Express Co.*	67,995	16,000	6,000	8,000	$1,078.4
10	Primerica Corp.	67,375	16,000	6,000	8,490	$358.8
	Industry average	72,381	16,301	7,350	8,259	$460.6
INDUSTRIAL AND AUTOMOTIVE PRODUCTS						
1	Cummins Engine Co.*	76,565	16,000	9,000	8,000	$32.1
2	Harley-Davidson, Inc.	74,160	16,000	8,250	8,715	$14.7
3	Great American Management & Investment, Inc.*	74,155	16,000	6,000	8,000	$10
4	Outboard Marine Corp.*	73,650	16,000	6,000	8,670	$19.7
5	Deere & Co.	73,060	16,000	6,000	8,685	$203
6	Caterpillar, Inc.	72,420	16,000	8,250	8,775	$383
7	Navistar International Corp.*	69,770	16,000	6,000	8,000	$76.3
8	Harnischfeger Industries, Inc.*	68,605	16,000	6,000	8,000	$28
9	Nortek, Inc.*	65,750	16,000	9,000	8,000	$89.5
10	Tecumseh Products Co.*	61,750	16,000	6,000	8,000	$13
	Industry average	70,988.5	16,000	7,050	8,285	$86.9
MANUFACTURING						
1	Rubbermaid, Inc.	78,050	16,000	8,250	8,000	$18
2	Phelps Dodge Corp.	76,725	16,000	8,250	8,730	$15.2
3	Westvaco Corp.	75,655	16,000	7,500	8,000	$31.5
4	Bandag, Inc.	75,335	16,000	6,000	8,000	$8.3
5	Raychem Corp.	74,790	16,000	8,250	8,000	$29.5
6	Cone Mills Corp.	74,335	16,000	7,500	8,000	$10.1
7	Polaroid Corp.	74,015	16,000	7,500	8,000	$66.5
8	West Point-Pepperell, Inc.	73,265	16,000	6,000	8,000	$17
9	Willamette Industries, Inc.	71,325	16,000	6,000	8,000	$18.6
10	3M Co.	71,300	16,000	6,000	8,000	$335
	Industry average	74,479.5	16,000	7,125	8,073	$55

*Estimates are from *Computerworld* sources and not the companies

IS budget as % of revenue	% of IS budget for staff	% of IS budget for training	Processor market value (millions)	Processor market value as % of revenue	Total PCs and terminals	% of employees with PCs/terminals
6.9%	49%	3%	$70	1.1%	15,000	100%
6.8%	41%	2%	$10	1%	5,300	90%
4%	50%	3%	$300	1.6%	52,000	100%
4%	40%	5%	$800	3%	115,000	100%
7%	51%	3%	$51	1%	15,500	100%
5.28%	46%	3%	$173	1.6%	40,080	92%
.9%	53.4%	.9%	$109.3	2.9%	23,000	100%
1.3%	38%	3%	$.8	1%	1,525	26%
.7%	42.7%	2%	$5	.4%	450	100%
1.8%	46%	3%	$8	.7%	8,400	100%
2.9%	49%	8%	$40	5.7%	20,500	60%
3.8%	52.1%	1.7%	$153.2	1.5%	36,000	71%
1.9%	43%	2%	$21	.5%	6,000	43%
2%	49.8%	1.7%	$25	1%	9,209	79%
1%	43%	2%	$5	.5%	2,200	41%
.9%	40%	5%	$6.5	.5%	5,000	39%
1.73%	46%	2.9%	$37.4	1.8%	11,228.4	66%
1%	46%	5%	$105.7	5.8%	35,205	100%
.6%	37%	2%	$3	3%	4,500	100%
1.4%	39%	4%	$211.4	1%	38,636	100%
1.4%	46%	4%	$36	2%	4,847	100%
2.3%	42%	3%	$11	.8%	7,107	62%
1%	41%	1.7%	$8	1%	13,825	98%
3%	28%	3%	$12	.5%	3,500	29%
1.1%	40%	5%	$45	3%	1,867	28%
.8%	36%	5%	$280	1%	39,391	100%
2.4%	55%	8%	$80	.5%	50,000	100%
1.5%	41%	4.1%	$79.2	1.9%	19,888	82%

1993 industry rank	Company	Total score	Peer points	Chief executive points	Management points	IS budget (millions)
PETROLEUM AND CHEMICALS						
1	Air Products and Chemicals, Inc.*	77,785	17,370	8,250	8,000	$51
2	Engelhard Corp.	76,670	16,000	8,250	8,610	$18.2
3	Oryx Energy Co.*	74,750	16,000	9,000	8,000	$26
4	Rohm & Haas Co.	74,745	16,000	8,250	8,790	$65
5	Unocal Corp.	74,325	16,000	8,250	8,700	$85
6	The B. F. Goodrich Co.*	72,690	16,000	6,000	8,000	$34
7	Vulcan Materials Co.*	72,500	16,000	6,000	8,000	$11
8	Sherwin-Williams Co.	71,870	16,000	6,000	8,580	$29.3
9	Amerada Hess Corp.*	70,725	16,000	6,000	8,000	$43
10	FMC Corp.	69,015	16,000	8,250	8,700	$100
	Industry average	73,508	16,137	7,425	8,338	$46.3
PHARMACEUTICALS, FOOD AND BEVERAGES						
1	Abbott Laboratories*	77,880	17,580	6,000	8,000	$170
2	Becton, Dickinson & Co.	75,910	16,000	8,250	8,700	$57.4
3	Hershey Foods Corp.*	74,285	16,000	7,500	8,000	$27.7
4	Kellogg Co.*	73,880	16,000	6,000	8,000	$48
5	Pet, Inc.*	73,505	16,000	8,250	8,000	$22.2
6	Hormel Foods Corp.*	72,205	16,000	6,000	8,000	$25.5
7	Merck & Co.	71,600	16,000	6,000	8,805	$200
8	Schering-Plough Corp.*	71,600	16,000	6,000	8,000	$67
9	The Quaker Oats Co.*	70,905	16,000	6,000	8,000	$71.3
10	Whitman Corp.	70,145	17,370	8,250	8,000	$11.9
	Industry average	73,192	16,295	6,825	8,151	$70.1
RETAILING AND WHOLESALING						
1	Winn-Dixie Stores, Inc.*	75,440	16,000	8,250	8,000	$98.8
2	Dillard Department Stores, Inc.*	73,415	16,000	6,000	8,000	$28.8
3	Carter Hawley Hale Stores, Inc.	72,975	16,000	6,000	8,775	$23.1
4	Albertson's, Inc.*	72,900	16,000	6,000	8,000	$101.7
5	JC Penney Co.	72,810	16,000	9,000	8,745	$176

Listings continue on the following page

*Estimates are from *Computerworld* sources and not the companies

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06 ❑ Transportation
09 ❑ Other _____

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IS budget as % of revenue	% of IS budget for staff	% of IS budget for training	Processor market value (millions)	Processor market value as % of revenue	Total PCs and terminals	% of employees with PCs/terminals
1.6%	35%	1%	$10	4.6%	14,500	100%
1.8%	61%	2%	$.3	.6%	3,500	66%
2%	40%	1%	$14	1%	769	48%
2.2%	40%	5%	$35	1.1%	8,500	43%
1%	38%	3%	$21	.23%	10,000	68%
1.3%	44%	2%	$58	2.2%	6,000	44%
1%	37%	3%	$5	.5%	6,400	100%
.67%	45%	4%	$30	1.1%	17,846	100%
.7%	46.6%	3.4%	$159	.25%	9,500	90%
2.5%	40%	3%	$43	1%	11,000	43%
1.5%	42.7%	2.7%	$37.5	1.3%	8,802	70.2%
2.2%	53%	2%	$157	2%	48,000	100%
2.4%	52%	1.5%	$20	.9%	7,100	37%
.9%	48%	3%	$10	.3%	13,700	100%
.8%	48%	4%	$60	1%	10,000	58%
1.3%	40%	3%	$34.2	2%	4,800	65%
.9%	39%	2%	$17	.6%	8,300	100%
1.6%	51%	5%	$130	1.5%	20,000	52%
1.6%	40%	.3%	$33	.8%	10,000	47%
1.3%	57%	4%	$21.1	.4%	6,500	31%
.57%	49.6%	4.5%	$23.7	1%	7,000	50%
1.4%	47.8%	2.9%	$50.6	1.05%	13,540	64%
.9%	37%	5%	$70	.7%	90,000	88%
.6%	23.6%	1%	$50	1%	17,593	52%
1.1%	45%	2%	$75	.9%	5,000	41%
1%	38%	4%	$152.6	1.5%	70,000	99%
.9%	45%	1%	$45	2.8%	90,000	47%

1993 industry rank	Company	Total score	Peer points	Chief executive points	Management points	IS budget (millions)
RETAILING AND WHOLESALING						
6	Wal-Mart Stores, Inc.	70,745	17,640	6,000	8,700	$335.5
7	The Limited, Inc.*	70,025	16,000	6,000	8,000	$44.3
8	Food Lion, Inc.	68,685	16,000	6,000	8,805	$28.8
9	McDonald's Corp.	67,150	16,000	6,000	8,580	$70
10	The Home Depot, Inc.	66,100	16,000	6,000	8,000	$70
	Industry average	71,025	16,164	6,525	8,361	$97.7
TRANSPORTATION						
1	Alexander & Baldwin, Inc.*	78,075	16,000	7,500	8,000	$27.9
2	AMR Corp.	77,795	17,370	9,000	8,755	$1,004
3	Yellow Corp.	77,360	16,000	9,000	8,655	$41
4	Roadway Services, Inc.	77,160	16,000	9,000	8,685	$140.7
5	American President Cos.	76,295	16,000	6,000	8,685	$68.9
6	Federal Express Corp.	75,695	16,000	9,000	8,655	$360
7	Airborne Freight Corp.	75,675	17,310	8,250	8,640	$50
8	Union Pacific Corp.	75,145	17,340	6,000	8,745	$251
9	UAL Corp.	75,125	17,310	6,000	8,000	$331.1
10	Consolidated Freightways, Inc.	73,925	16,000	6,000	8,580	$89.8
	Industry average	76,225	16,533	7,575	8,540	$236.4
UTILITIES						
1	US West, Inc.*	77,250	17,340	8,250	8,000	$400
2	Duke Power Co.	76,995	16,000	8,250	8,565	$76.6
3	Carolina Power & Light Corp.	76,950	16,000	8,250	8,655	$80.5
4	MCI Communications Corp.	76,655	16,000	6,000	8,580	$667
5	SCECorp*	75,140	16,000	6,000	8,000	$135
6	GTE Corp.	74,590	16,000	6,000	8,565	$762.8
7	Northeast Utilities	73,605	16,000	6,000	8,760	$69.4
8	Southwestern Bell Corp.*	73,385	16,000	6,000	8,000	$305
9	FPL Group, Inc.*	71,135	16,000	6,000	8,505	$71.2
10	AT&T	70,050	17,610	6,000	8,745	$3,700
	Industry average	74,576	16,295	6,675	8,438	$626.8

*Estimates are from *Computerworld* sources and not the companies

IS budget as % of revenue	% of IS budget for staff	% of IS budget for training	Processor market value (millions)	Processor market value as % of revenue	Total PCs and terminals	% of employees with PCs/terminals
.6%	35%	10%	$40	.2%	140,000	33%
.6%	37%	1%	$20	.3%	45,000	45%
.4%	20%	4%	$2	.1%	2,000	29%
1%	31%	1%	$12	.2%	4,500	25%
1%	36%	3%	$40	1%	5,000	72%
.8%	34.8%	3.2%	$50.7	.9%	38,909	53%
3.8%	36%	5%	$16	2.1%	8,700	100%
4%	39%	1%	$320	2.2%	139,570	100%
1.8%	54%	2%	$18.5	1%	4,700	100%
2.6%	38.7%	2.5%	$89.4	.7%	12,920	69%
2.8%	57%	1%	$6.3	.4%	5,223	115%
4.5%	48.8%	1%	$49.1	.6%	18,000	22%
3.4%	36%	1%	$9.2	.6%	10,600	68%
2.9%	47%	3%	$17	3%	19,857	100%
2.6%	19%	.5%	$18	.14%	2,480	76%
2.2%	53%	2%	$7	.2%	8,670	100%
3.1%	42.9%	1.9%	$55.1	1.1%	23,072	85%
3.9%	40%	5%	$50	.5%	60,000	94%
1.8%	44%	3.5%	$30.3	.7%	17,187	91%
2.9%	37%	6%	$28.5	1%	7,000	100%
6.3%	33%	4%	$400	3%	44,000	50%
1.7%	38%	3%	$56.7	.7%	11,000	64%
3.8%	21%	2%	$148	.7%	16,327	100%
2.2%	38%	5.3%	$93.3	2.9%	6,800	70%
3.1%	45%	4%	$10.5	1%	60,000	100%
1.4%	20.7%	1%	$160	3%	14,500	100%
5.7%	40%	5%	$675	1%	320,000	100%
3.3%	35.7%	3.9%	$165	1.5%	55,681.4	87%

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COMPUTERWORLD

The 1993 Premier 100

A list of Premier 100 *companies, top IS executives and page references.*
Page numbers refer to the first page of the article(s) in which the company is mentioned.

3M Co., David P. Drew, V.P., Information Technology, **52**

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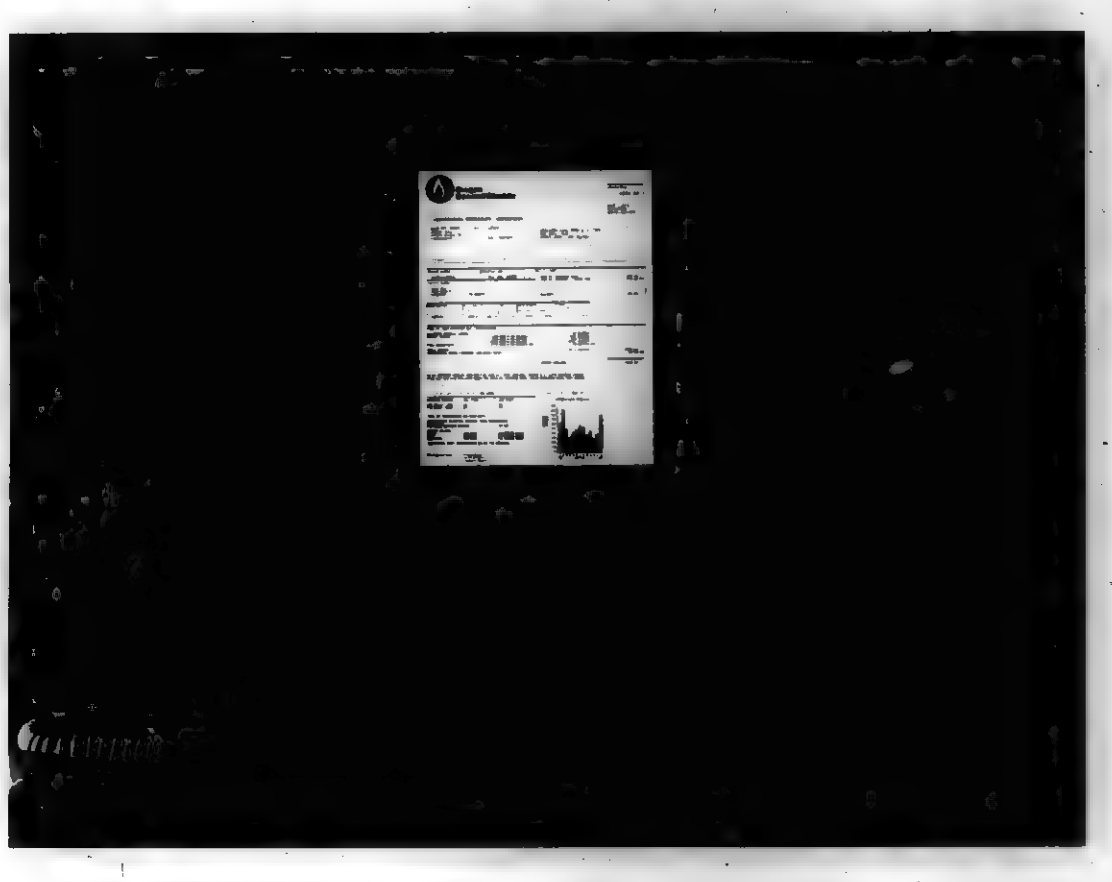

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Private lines jettisoned in favor of public networks

By Joanie M. Wexler
and Lynda Radosevich

The corporate migration from private to public data networking is off and running, thanks largely to frame relay.

Companies such as Dialog Information Services and Seafirst Bank in Seattle are taking the plunge with plans to entirely phase out their private networks in favor of public services. Other firms are halting the expansion of existing private lines and instead are growing their networks with public nodes.

The reasons for such moves, which often depend on the depreciation status of a company's equipment and breadth of its connectivity needs, include cost savings as coverage requirements widen and the ability to experiment with new technologies without making hefty equipment investments.

For example, coverage is a major impetus for Palo Alto, Calif.-based Dialog, which said last week it is dumping its private 55-node X.25 network for BT North America, Inc. frame-relay services. According to Dan Pritchard, director of data communications and systems programming, Dialog is looking to widen its traditional school and library customer base. This requires the extensive network connectivity afforded by broad-reaching public networks, he said.

Generally, "Public services can provide interconnection opportunities throughout the world where doing that independently can be prohibitively expensive," pointed out Dugal Easton, president of the Tele-Communications Association trade group.

Pritchard said he expects Dialog to save "millions" in capital investments and personnel costs within a few years by using public services.

Meanwhile, Seafirst Bank is phasing out its 45-node StrataCom, Inc. dedicated T1 network in favor of public US West and GTE Corp. frame-relay services, according to William Anderson, senior vice president and operational services manager.

Staying current

The reason is "to avoid technical obsolescence, capital infusion and recurring staff education every time we need to change" the network to accommodate new technologies, Anderson said.

Another StrataCom shop, Convex Computer Corp., has decided to stop expanding its private network. It recently replaced nine point-to-point private lines with public frame-relay services from WilTel to save money, said Coyne Gibson, a network systems architect.

StrataCom's equipment runs on customer premises equipment and in public carrier backbones such as those from WilTel, BT North America and AT&T. It can run as a standard T1 multiplexer or with an optional frame-relay interface.

The public/private straddling of the StrataCom gear could present StrataCom private network customers with some security where interoperability and service consistency is a concern, analysts noted.

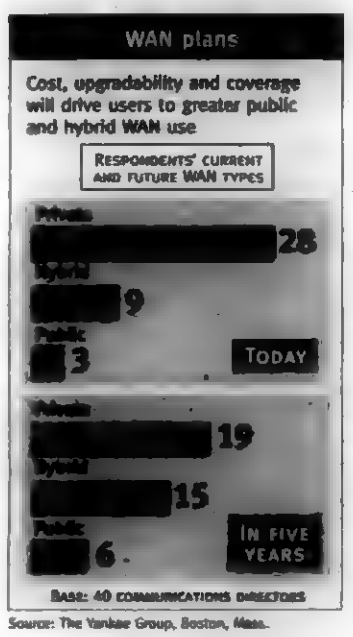
StrataCom said 65% to 70% of its business today remains in private user networks, but it expects that ratio to shift to a 50/50 split in the next few years.

"Private network growth has been slow over the last two years," said Alex Mendez, StrataCom's vice president of marketing. "People are intrigued by the cost savings" of frame relay, he said.

Some companies are ready to rid themselves entirely of private networks. Manulife Financial in Toronto uses all public services except for a private network needed to link U.S. and Canadian sites.

"I wouldn't see us using private networks in the future," said Mike Innell, assistant vice president of information technology development. "More sophistication is needed [on staff] for private networks, and telecommunications is not our business."

The current business climate "has reduced corporate manpower for maintaining networks, and this means a reduction of available people dedicated to telecommunications," Easton added.



Source: The Yankee Group, Boston, Mass.

Retailer stalled

CONTINUED FROM COVER 1

technology out of a central information systems shop to the store level, said Steve Johnson, an analyst at Andersen Consulting.

Once the system is installed, Nordstrom should see payback almost immediately, Johnson said. "Technology like this will help them make quick decisions, which is important in the zero-sum consumerism game," Johnson said. "If you want to grow sales, you have to do it at the expense of competitors."

Major hardware investment

Benton declined to say how much the project cost. However, the company has spent $4 million on hardware alone, according to NCR Corp., which supplied servers, PCs and networking gear.

Benton hedged on setting a preholiday deadline for getting the system installed at all sites. But he acknowledged that "we see this system as having high potential payback, so we'll get as much done before Christmas as possible."

The merchandising application will eventually give in-store buyers local access to daily sales information residing on a DB2 mainframe here for the entire 52-shop chain (see chart).

Buyers will be able to make faster, more informed decisions about ordering goods and setting prices. If $50 orange sweaters are gathering dust, for example, a buyer can cancel pending orders or slash prices.

However, problems have surfaced in getting NT to talk smoothly and quickly to DB2, where sales, inventory and pricing data collected from all stores nationwide resides.

Specifically, Microsoft does not support direct connections between SQL Server for NT and DB2. Third-party gateways are needed, but Nordstrom said it is uncertain whether it wants to spend more money on the gateways and whether the products will be robust enough to handle the heavy batch processing the retailer has in mind, Benton said.

Plus, large batch requests bogged down the client/server system during pilot tests in Oregon.

"We have to work out [on-line transaction processing] issues before we can take it any further," said Gordon Ridgeway, manager of data resources.

Also problematic are the gaping holes where client/server administration tools should be. Nordstrom cannot reproduce the 90%-plus uptime users have come to expect from the mainframe, Benton said.

Data backups are nettlesome, too, because no one utility completes the task. "You go through a series of steps that you never had to think about on the mainframe," he said.

Decision time

Still, Nordstrom finds itself at a crossroad: wait for Microsoft to build administration products and a gateway between DB2 and NT or buy third-party tools, of which precious few are suitable.

"Those guys don't have what we need," Ridgeway said. "They're waiting on the sidelines with the rest of the world until NT is really out there before they jump in."

Microsoft recommended gateways from either Rochester Software, Inc. or Micro Decisionware, Inc.

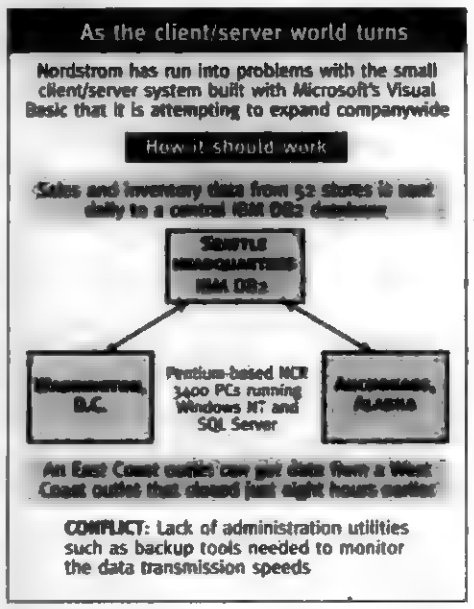
Open Database Connectivity interfaces are also an option, said Daniel Small, Microsoft's SQL product manager.

NT and SQL Server contain efficient administration and data access tools, Small contended. For example, SQL Object Manager builds database tables and generates triggers, he said.

The Oregon trial transferred about one-fourth the total volume of data expected once the entire company is brought on-line. Microsoft and NCR are not to blame for Nordstrom's difficulties, Benton said. Setbacks are a function of using unproven technology, he added.

The company chose NT in part because Microsoft vowed to make it a powerhouse client/server operating system, Benton said. Promised central administration of even far-flung distributed systems also convinced Nordstrom.

"That's their stated direction," Benton said. "We've never worked with Microsoft before, so we'll just wait and see."



Poor man's approach

It is not as if Nordstrom lacks client/server experience. The store's foray into the field was a small merchandising application two years ago. "It was a poor man's client/server, really, but it opened our eyes about what you can do with the technology," said Gordon Ridgeway, manager of data resources.

The first iteration of that application was a PC-based screen-scraper type of program that plucked data off an IBM mainframe and ran atop an electronic-mail package. Three updates later, the system runs on a local-area network with hooks into relational databases.

—*Kim S. Nash*

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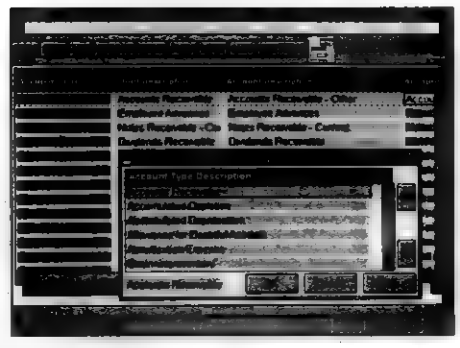

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The unforgiven

You could probably denude the Muir Woods with the number of stories that have been written about linking information systems strategies to corporate goals.

But sometimes the best lessons on this subject come through other means — like the U.S. mail. Here's a "how not-to" lesson I learned.

A few months back I cut up a credit card I'd had for 12 years. The card company had affectionately referred to me as a "member" and had even printed my longevity as a member in its "club" on my card.

Anyway, for 12 years I charged various items and paid my bills. In return, the company stuffed into my billing envelopes all sorts of advertisements, which I immediately pitched. That was a prime benefit of my membership, along with the junk mail I received from other vendors that no doubt purchased the card company's list. But I got little else.

So when better credit card deals came along, such as a card that gave me frequent flier miles for each dollar spent, I canceled my "membership." Boy, did the club get busy servicing me then! I got letters from the president imploring me to rejoin. Requests to fill out (on my own good time) surveys detailing why I left the club. Requests to call them and discuss how they could do a better job. In short, there simply wasn't enough I could do for them. *For them!* Hey, I'm the damn customer. Maybe if you had paid attention to *me*, you'd still have me as a client.

Just think of the wealth of data they had about me and how they could have converted that to real information on how to serve me better. For example, I travel a great deal — 100,000+ miles per year — and charge every cent along the way. Someone else used that information to lure me to their card.

Back to the club. They knew where I traveled and how often. What airline I prefer. Where I like to stay. They could easily have inferred my dining habits. (I eat at lots of places that have the word "sea" in their names.) Or the cars I rent and what agency I use. They could see I do a great deal of catalog shopping. That I make phone calls from airplanes. That I buy lots of things for kids. What publications I subscribe to. What charities I favor. That my bills get huge around Christmas. That I pay my bills like clockwork.

Oh, what they knew about me! Or did they? Maybe it was just data floating aimlessly in some computer system, never to be harnessed for executives who could then custom-design services and perks for me.

I get the sense too many IS managers relegate such strategic thinking to non-IS executives. What a shame. For isn't IS closest to the data? Why didn't the club's IS group demonstrate the treasure trove of information senior executives could have had at their disposal?

They've lost one customer. And if the reports are true, they've been losing lots of them recently. This is one example that drives to the heart of the promise and potential of IS — and to its failure.

Bill Laberis

Bill Laberis, *Editor in chief*

Essence of quality

Ben Rothke's column "What's excellence got to do with it?" [CW, Aug. 2] displays a simplistic and ultimately inaccurate perception of market forces.

Contrary to Rothke's suggestion that "making the best operating system was never Job 1 at Microsoft," DOS and Windows do a far better job of getting PCs to solve real-world computing problems than any of the alternatives.

Quality is rarely a fixed, measurable entity. But, like pornography, people know it when they see it, and the computer marketplace, like many others, generally moves in that direction.

Mr. Rothke, forget the apples-and-oranges comparisons and (re)read Robert M. Pirsig's *Zen and the Art of Motorcycle Maintenance*, if you want to get a better handle on the true essence of quality.

Steven Salemi
Santa Fe, N.M.

The cost of 'coding'

It was very disappointing to read Joanne Kelleher's editorial [CW, July 19].

"Quick coding" is the Achilles' heel of data processing and is the dirtiest of the dirty. It has cost U.S. business and government billions, perhaps trillions of dollars from the first programs written to today.

To tout "quick coding" at this stage is to do a serious disservice to data processing. There is an absolute inverse correlation between "quick coding" and quality programming. When "quick coding" is given priority over clearly understandable coding, they become mutually exclusive.

Jerry Stiner
New York

Security leaks

In regard to "Whither wireless security" [CW, Aug. 16], it is quite easy to read data right from computers and terminals whether it is broadcast or not.

While it certainly would be beneficial to encrypt all data that is broadcast, don't think that action secures systems.

It would be more cost-effective to ensure that users don't post passwords on their terminals or throw printouts with confidential data in their trash cans.

One major company secured its computing systems but overlooked the fact that its engineers discussed all the secret projects on their CB radios as they rode to work in the morning. Friday night at local watering holes were also major exposures as they discussed the week's events in ever louder voices as they unwound with their favorite beverages.

William B. Adams
Springfield, Va.

Problem addressed

Contrary to the impression conveyed by "Security lapse bedevils users of SQL Server" [CW, Aug. 2], there is no lapse in SQL Server security that reduces safety for data. Rather, the problem described is one of management: the difficulty of administering multiple servers as needs expand beyond workgroup and departmental use. This issue is not specific to SQL Server — virtually all our competitors are also affected by this.

In our current suite of products for the Windows NT operating system we have tackled this problem directly by building specific enhancements into SQL Server to ease the administration and management of large-scale client/server networks.

Microsoft SQL Server continues to offer compatibility with the Sybase security model. However, we have also enhanced SQL Server specifically to meet the kinds of requirements discussed in the article. SQL Server now directly integrates with network security — the first major DBMS to do so.

I spent time with the writer explaining these enhancements in our product, but they were not discussed in the story. This is unfortunate because the reader is left with a very misleading impression.

Gary Voth
Senior product manager
Microsoft Corp.
Redmond, Wash.

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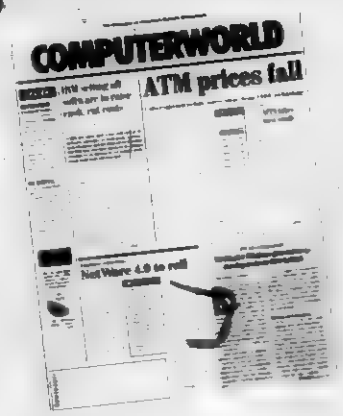

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   60. Government - State/Federal/Local
   65. Communications Systems/Public Utilities/Transportation
   70. Mining/Construction/Petroleum/Refining/Agriculture
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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How tiny do we really want computers to be?

Harvey Newquist

Smaller is not always better. Smaller airplane seats, smaller fast-food portions and smaller returns on investment are undesirable forms of shrinkage. And miniaturization of computers is rapidly moving into the same category.

The latest miniature computer, the subnotebook, is a mere mite with less size than a penpad, which in turn is smaller than a notebook computer, which is smaller than a laptop, which is smaller than. . . . you get the idea. Dedicated input devices for inventory or order taking should certainly be as compact as possible, but what about the reality of trying to do any sort of computing on these devices?

PAUL SCHLEMMER

As an industry, we've become so enthralled by our ability to miniaturize computers and computer components that we've forgotten about the law of diminishing returns. We do have to interact with these devices and, at least for the moment, that means using our eyes and fingers, which have their own low-end size requirements for dealing with the world around them. That's why we have microscopes and tweezers.

So let's stop and take a firm grasp of reality for a moment. Most notebook and laptop computers aren't all that big, relatively speaking. A decent size laptop like Apple's PowerBook is not much bigger or heavier than your average Stephen King hardcover novel. Granted, lighter is always desirable in something you have to carry, but cutting into the actual size of the machine limits our capacity to deal with it efficiently. Right now, the keys of the PowerBook I am writing on are perfectly spaced for my fingers. If they were any smaller, I'd hit several at once or completely miss the one I'm aiming for.

Many miniaturization proponents say that such problems will disappear with pen computing, which will allow you to simply handwrite queries and information you want to store. Well, I gave up handwriting six years ago when I decided that keyboards were a faster way to communicate. Today, I don't handwrite anything, except for the occasional credit card receipt, and even that gives me cramps. I have no interest in going backward, especially when the space provided isn't big enough to accommodate a complete thought.

There is also the issue of being able to see our data displayed. Those LCD panels are often not much larger than an Elvis stamp. Such visual effrontery reminds me of an encounter I had with a colleague employed at a Japanese consumer electronics firm. This company was known for its miniaturization capabilities, and this colleague couldn't help but brag a little. "It's amazing how we've gotten miniaturization down to a fine art," he began. "We can now make televisions so small that you can't even see them!" OK, something may have been lost in the translation, but what he meant to say was still pretty absurd.

Until we can get to the stage where we're implanting chips in our skulls, we have to accommodate our own biological limitations.

None of us can view microscopic data. None of us can push our fingers through the eye of a needle. And all of us have more important things to do than ponder how many PCs can dance on the head of a pin.

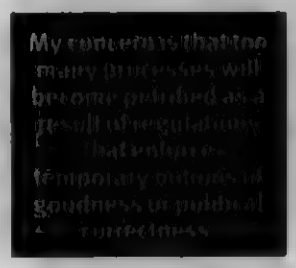
Newquist writes and consults on advanced technology at the Relayer Group in Scottsdale, Ariz.

Keep regulators out of program code

OPEN MIND *by* Esther Dyson

Modern industrial society is becoming increasingly regulated. We are required by an ever greater number of authorities to file reports on everything from employment practices and safety measures to product ingredients and the location of rest rooms.

For now, the government and its agencies usually ask for paper — descriptions of reality and the output of the computer programs that manage various processes. Likewise, nowadays accountants audit "books," but they are starting to audit electronic data files.



In the long run, it's likely that regulators and certification authorities will delve even further and start to rule on the code that implements these functions. Auditors will check your accounting system. The government will check the software that manages the data you keep about employees. There will be certain "acceptable" search techniques that can be used to find suitable candidates for new positions and specific acceptable ways of testing your cookies for freshness and quality.

All of these functions are implemented and managed by software, so your code will have to conform as well.

As technology makes it possible to quantify compliance in more kinds of businesses, "authorities" of various kinds are likely to do so. Instead of testing the results, they can simply ask to see the code that implements your processes — hiring practices, safety protection, pollution management, lending decisions.

This could raise complex issues of responsibility. Will buying your applications from a reputable vendor constitute evidence of due care — just as sending a sample for testing to a certified lab is evidence of due care for a doctor — or will you need to take additional steps to verify the procedural compliance of commercial software?

Of course, the positive side to all this is that good practices will be codified and shared, and commercial software vendors will probably rush to provide certified functionality at a cheaper price than customers could achieve in-house.

But there's a downside, too. This trend is similar to the total quality movement. On its face a benign force, it can also be a way of ruling out those who don't follow a rigid — and in the end, limiting — set of rules and procedures. The moment you specify what is good, you run the risk of eliminating what could be better.

My concern is that too many processes will become petrified as a result of regulations that enforce and perpetuate temporary notions of goodness or political correctness. Re-engineering, after all, is supposed to be about continual change, not a one-time shift to something else permanent. What is a legacy but something too costly, in money or explanations to regulators, to change? We already have enough of those.

If it were left totally to the market, I'm sure enterprising developers would continue to come up with new and improved ways of doing things. But, once there's a way to describe and specify them too precisely, regulators may limit businesses' flexibility.

There's always tension between certifiably good enough and the very best. We should guard against anything that might impede our ability to break the rules creatively.

Dyson is editor of "Release 1.0," and "Rel-East," newsletters on new technology and new computer markets in Eastern Europe.

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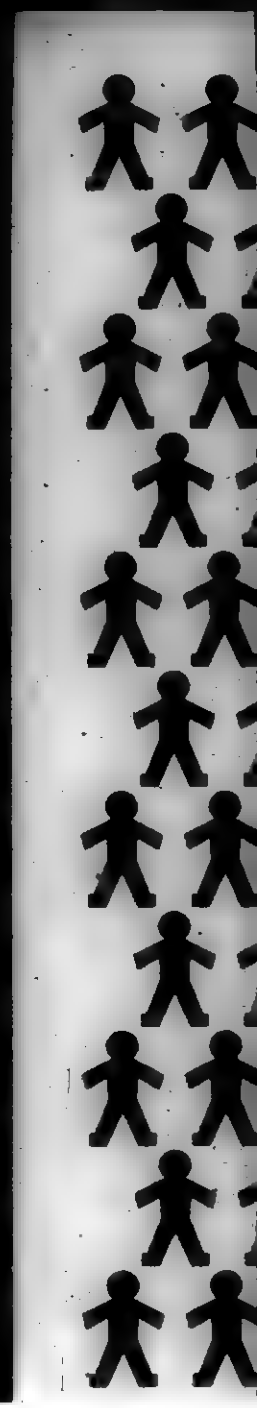

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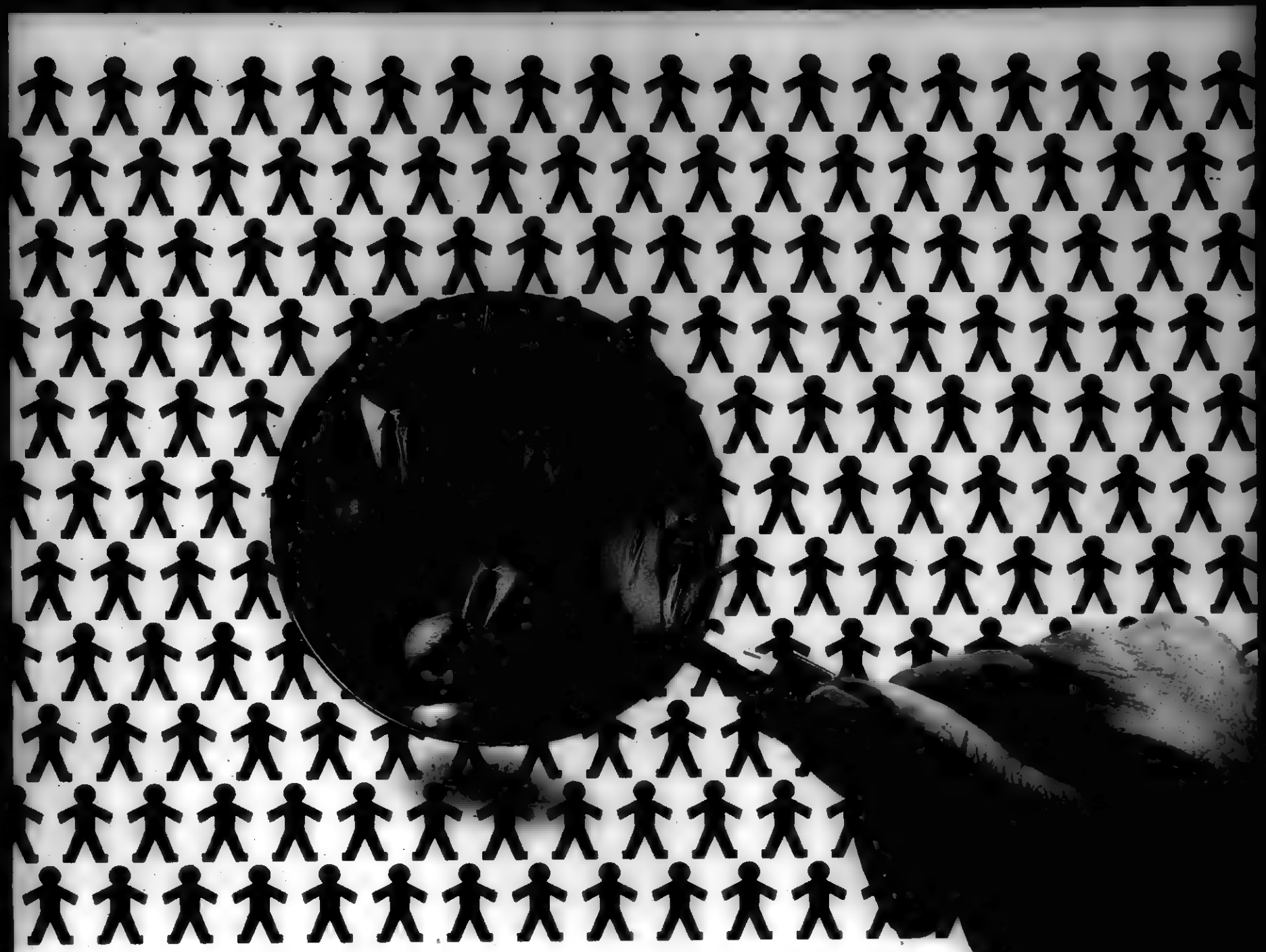

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Data protection unveiled for DOS 6.0 users

By Ed Scannell

PC-Kwik Corp. has developed a utility that warns MS-DOS 6.0 users when they are reportedly at risk of losing data due to cross-linked files.

The basis of this latest problem, according to PC-Kwik President Bruce Shafer, is a little-understood function in the operating system's SmartDrive feature that is responsible for optimizing disk seeking.

"The SmartDrive feature has a way of putting the FAT structure [that could result in] cross-linked files," Shafer said. "The cause of it is subtle, but it is easy to make happen."

Like an elevator

The DOS 6.0 SmartDrive lays down data in the order of the hard drive's tracks to avoid disk seeking, making its operations faster. This method is sometimes called "elevator seeking," Shafer explained.

"It stores data much in the way an elevator would drop passengers off by floor instead of by the order in which they got on," Shafer said.

The elevator seeking technique was borrowed from mainframes, Shafer noted. It worked well in that environment because there was reliable power, trained users were assumed, and the operating system was protected from the applications, he said.

None of these circumstances can be assumed with desktop systems running DOS today, Shafer said.

The PC-Kwik utility, called Jeopardy Detector, is currently available on a number of bulletin boards including CompuServe, according to Shafer. Users can order the product directly from the vendor for a shipping and handling charge of $6.50.

Jeopardy Detector "essentially does a real-time CHKDSK watching for the FAT to get out of sync with the directory's structure. Whenever there's a problem, the screen border turns red to warn users they are walking on thin ice," Shafer explained.

No complaints

Microsoft officials said they have not received complaints from users resulting from this specific problem. In fact, they said SmartDrive does not even use the elevator seeking technique.

"We don't have elevator seeking in SmartDrive 4.0, which we had in Windows 3.1, nor did we in [SmartDrive] 4.1, which is in MS-DOS 6.0," said Ben Slivka, MS-DOS development manager.

"SmartDrive is in Windows 3.1 and we have sold 25 million copies of that, but we don't have people beating down our doors saying that write caching is killing them. It just isn't happening," Slivka said.

IBM powers up PS/2 line

New program aims to keep large customers happy, give firms PC edge

By Michael Fitzgerald
SOMERS, N.Y.

IBM PC Co. is ramping up its attempt to revitalize the Personal System/2 line, officials said recently. The effort focuses on Premium Partners, a scheme to keep major customers happy through unusual hand-holding, and renewed models of the venerable PS/2 line.

The Premium Partners program took a tentative first step in May and now has some 80 corporate users involved in at least a small way, according to Alan Langston, the PC Co.'s manager of premium brand desktop systems. PC Co. officials discussed some elements of the plan previously, but at the time they said the program was still evolving [CW, July 12].

Corporate America, particularly "customers who are rolling out large projects," is the target market for Premium Partners, Langston said. He added that the PC Co. expects to open the program to no more than 200 large customers and that it will phase in new accounts over time, as the company builds up its support staff.

The smallest Premium Partner program will typically include a rollout of at least 1,200 PCs over one year, the PC Co. said.

The ability to create a program like Premium Partners has resulted from the PC Co.'s organization around brand teams, said James Turner, the outgoing general manager of the PC Co.'s Premium brand.

"I don't feel the whole weight of a $7 billion company on my shoulders — I'm focused just on our brand," he said.

Turner has needed to focus on his brand, which encompasses the PS/2, because it has lost a great deal of ground to upstart brands such as the PS/ValuePoint. In many eyes, the Premium brand is also the one part of the PC Co. that continues to exemplify the bad old days at IBM.

The new technology will come in the form of renewed Model 85 and 95 servers (now part of the Server brand at the PC Co.) and major en-

IBM, *page 42*

The PS/2 is no longer king of the hill at IBM PC Co. The PS/ValuePoint suits as many units sold, and the PS/1 is also growing faster, Jeffrey Hawsing, senior industry analyst at IDC Strategic Services in Norwell, Mass., said this illustration's laser-removed text is from the old Micro Channel Architecture-only days.

Premium Partners services

IBM PC Co.'s Premium Partners Program provides the following types of services for large projects. The smallest program typically includes a 1,200-PC rollout over one year.

▶ **Transition planning.** The PC Co. will brief the customers on upcoming products and work with them to test new features. The PC Co. also gets the rollout schedule for the project and assures the Premium Partner that the appropriate number of systems will be available at each step of the rollout.

▶ **Enhanced support.** The PC Co. assigns each project a "lab advocate" responsible for troubleshooting and answering questions. Besides the lab advocate, the PC Co. does not charge Premium Partners for access to a fee-based 800 number that is a step above HelpWare, the normal IBM support line.

▶ **Testing labs.** For a sliding fee, IBM will construct a test environment that duplicates the customer's so more accurate tests can be done to avoid problems during a rollout.

Database

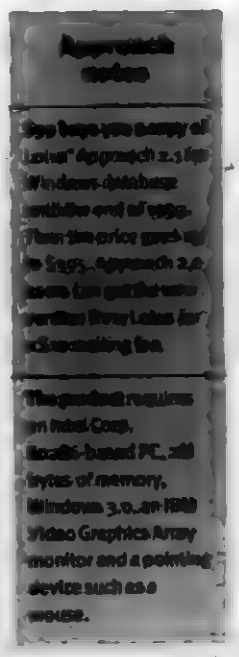
Lotus fills gaps with Approach

By Kim S. Nash
CAMBRIDGE, MASS.

Lotus Development Corp. this week plans to ship Approach 2.1 for Windows, a PC end-user database Lotus inherited with a $20 million-plus buyout of Approach Software Corp. in June. The product is expected to fill a hole in SmartSuite, Lotus' office applications bundle.

Furthermore, Lotus plans to integrate Approach with its Notes groupware offering. Users have complained that although Notes is a capable product, it is limited by a lack of access to large relational databases, such as those from Oracle Corp. and Sybase, Inc. [CW, Aug. 16].

Approach provides direct one- and two-way connections to several databases via so-called PowerKeys, which are built-in drivers to relational systems. Available at no extra fee, PowerKey links are provided for dBase, FoxPro, Paradox, Oracle, Sybase and DB2. Open Database Connectivity support allows access to other systems, such as those from Informix, Inc. and The ASK Group, Inc.'s Ingres Products Division.



For example, Akron, Ohio-based Goodyear Tire & Rubber Co. has installed Approach as a front-end reporting and data access tool for corporate data stored on Oracle databases.

Pluses and minuses

In broad strokes, Approach — like Microsoft Corp.'s Access and Borland International, Inc.'s FoxPro — is aimed at PC users. However, Approach does not contain programming tools as extensive as Access or FoxPro, said Kevin Harvey, general manager for Lotus' Approach.

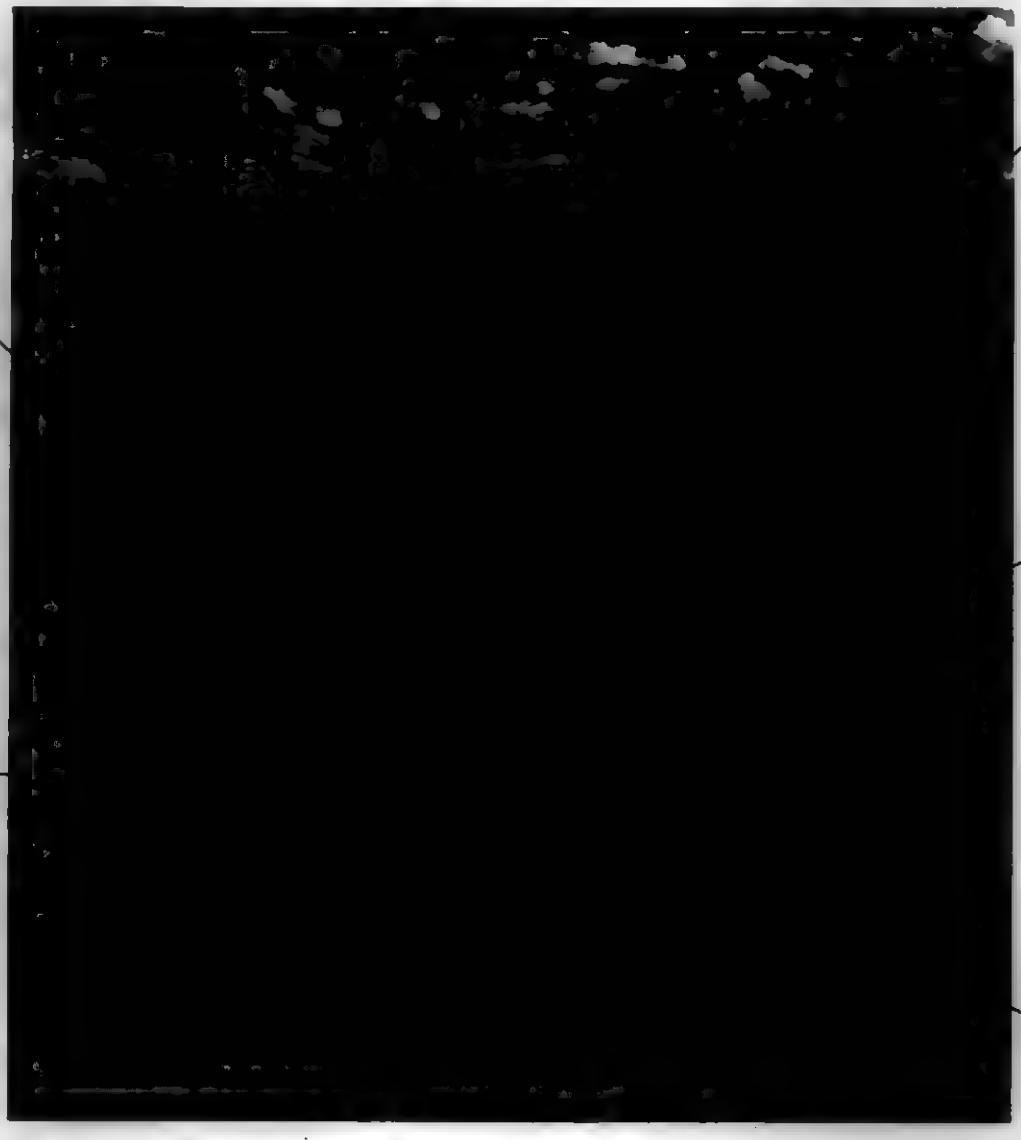
"It's more a database front end with simple programming capabilities," Harvey said.

In that regard, Approach is comparable to Symantec Corp.'s recently announced Q&A Write for Windows 4.0 or AskSam Systems' AskSam for Windows.

Users can build mailing lists and labels and basic reports with the product, based on data housed in other databases, spreadsheets or word processing applications. For example, BP Oil Co. expects to see a decrease in the time its information systems department spends facilitating user reports and data queries as a result

Lotus, *page 41*

Why PowerBook is popular with people who are in the middle of nowhere.



Office support. *PowerBook runs all the applications you need to run your business, no matter where it may be. Including inventory spreadsheets, databases and presentation software.*

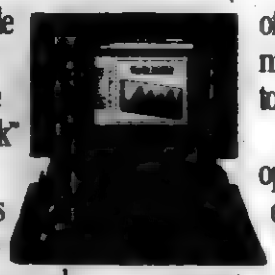
Industry support. *According to a recent article in* InfoWorld, *"It's difficult to imagine what Apple could have done better in designing the PowerBook Duo and Duo Dock. From the inject/eject mechanism to trackball location, the engineering is a masterpiece.""*

Road support. *Simply because you're out on the road doesn't mean you should be out of touch. If needed, help is just a phone call away. Our toll-free repair line is always there to assist at a moment's notice.*

Financial support. *PowerBook is so easy to use, it gets used more often to do more things. Saving you thousands of dollars in training and support costs.*

Back support. *There are PowerBook models that weigh as little as 4.2 lb. So they fit comfortably in any briefcase and can be easily carried from appointment to appointment.*

Business has a habit of taking people to some rather out-of-the-way places. Which is probably why more and more people are now taking Apple® PowerBook™ computers along for the trip.



No other notebook computer makes it so easy for businesspeople to stay productive when they're working out on the road.

PowerBook comes equipped with a complete set of built-in ports and easy-to-use communication software, so users stay connected to their office no matter where they go.

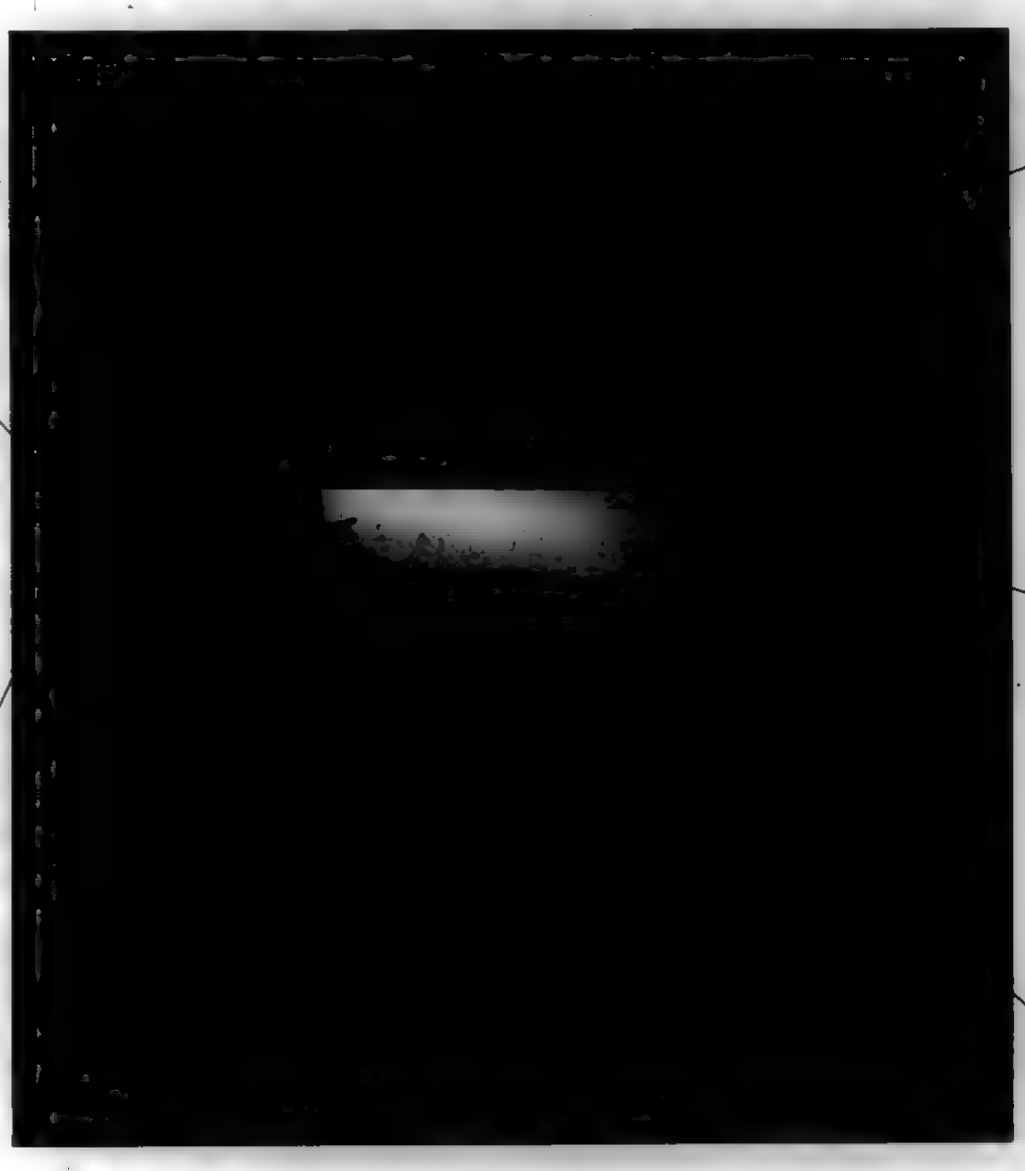
With AppleTalk® Remote Access and an optional fax/modem, PowerBook users can easily dial into their network back home to access information from their desktop computers. Such as up-to-the-minute sales and inventory figures. Servers and e-mail messages. Or even send and receive faxes at the touch of a button.

And PowerBook remains the only notebook computer uniquely designed for people whose jobs tend to take them away from their desks. Making it easier for them to get any kind of work done, anywhere it has to get done.

These days, business is taking people places they never dreamed of. And with a PowerBook at their side, there's no telling how far they'll go.

"InfoWorld, June 14, 1993. © 1993 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, AppleTalk, Macintosh and "The power to be your best" are registered trademarks of Apple Computer, Inc. PowerBook, PowerBook DUO.

Why PowerBook is popular with people who are in the middle of everything.



More flexible. *There are now two PowerBook Duo models that can instantly turn into powerful, fully expandable desktop systems when used with a Duo Dock. So you always have all your current files with you wherever you go.*

More compatible. *The optional PowerBook/DOS Companion™ kit provides software and connectors that make it easy to work with the MS-DOS and Windows files, printers and displays you already own.*

More colorful. *Presentations on the road take on new brilliance with a color PowerBook. Video-out capabilities allow you to hook up easily to a 16-inch monitor as well as most projection devices. Or present directly from the PowerBook active-matrix display.*

More informative. *You can use your PowerBook to integrate large amounts of information for sales forecasts, analyses and reporting. Everything you need to turn ordinary presentations into extraordinary ones.*

More popular. *Anyone can pick up an Apple PowerBook computer and start working right away — without having to learn arcane commands and cryptic codes other notebooks ask of you.*

PowerBook is also enormously popular among people whose responsibilities vary as much as their travel schedules.

One minute they're working at their desk on a sales forecast. The next, flying across the country to address a roomful of customers. And PowerBook is the only notebook computer specifically designed to keep up with the pace.

Away from your desk, Apple QuickTime™ software makes it incredibly easy for PowerBook users to put on stunning presentations to virtually any size audience. Complete with video, animation and sound.

And with a wide range of full-featured models to choose from, you can give different types of users the right tools for the jobs they have to do.

There are PowerBook computers that come with monochrome, gray-scale and color displays. With floppy disk drives and video-out capabilities. There are even PowerBook Duo™ models that can instantly be turned into fully expandable desktop computers when used with the Duo Dock. A bit of Apple engineering genius that *InfoWorld* magazine recently called "a masterpiece."

Because people never know where business may take them these days, PowerBook provides the power needed to get there.
The power to be your best.

Apple

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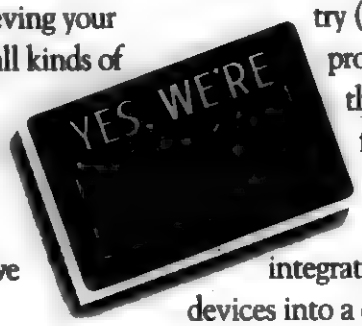
The Key To Integrating Your Network And Business Objectives Is An Open View.

Managing your network is managing your business. The key to success is clear vision with an open point of view. Because achieving your objectives requires making all kinds of things work well together.

The Racal Management System does just that. It is now integrated with HP's OpenView® platform (and we still interface with IBM® NetView™), so more companies than ever can move up to integrated network management.



Easily tailored, the Racal Management System is capable of managing the widest array of devices in the industry (including Racal's 350 products). Fact is, it's one of the best overall solutions for integrated management challenges. And when it comes to integrating legacy systems and devices into a common management environment, our Multivendor Integration ToolKit makes a difficult task simple and more affordable.

No wonder *Communications Week's* comprehensive 1993 SNMP Managers test series ranked the Racal Management System "a topnotch management platform" and praised "the degree to which the management of WAN equipment and facilities has been integrated with the system."

Look into network management with an open view. Call **1-800-RACAL-55** for a free information package about integrating your business and network objectives. It's a real eye-opener.

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Paul Gillin

The hype battle

You can't blame OS/2 users for engaging in a little "I told you so" right now.

The new Version 2.1 of OS/2 is a major improvement over its predecessor, incorporating much-improved Windows support, simpler installation and a nicer interface.

And that's not all. At the Personal Software Products Group's Technical Interchange in Orlando, Fla., late last month, IBMers also outlined to more than 2,100 attendees a lot of tasty future plans for OS/2. These include a smaller version that fits in 4M bytes of memory, a common object model that will greatly reduce the difficulty of porting OS/2 applications to other IBM operating systems and a general direction statement to embrace just about every open standard that means anything.

OS/2 is also benefiting from some early bad press about Microsoft's Windows NT, which has been berated for gorging on memory and disk space while not having a whole lot more to show for it than OS/2 has out of the box. The fact that NT is not the mother of all operating systems is seen by some as a vindication of OS/2.

OS/2 definition

But don't celebrate too much. True, IBM deserves a lot of credit for sticking with OS/2 during two years of incredible NT hype, but the Blue crew still has a lot of work to do to define just what OS/2 really is. Is it a desktop operating system? If so, then it needs application support, which is tough to get without mass-market interest, and the mass market isn't flocking to an OS/2 that doesn't have applications.

Is it a server platform for enterprise networking? If so, then OS/2 gets thrown into the soup with Unix, NetWare and NT, and frankly, its networking capabilities don't fare too well against them.

Is OS/2 something in between? If so, then that's a precarious position to be in. Witness the historically poor market performance of operating systems that try to expand out of their core platform.

Meanwhile, Microsoft has done a good job of delivering on its promises with NT. I've spent a little time hammering on it in a completely nonscientific setting and haven't been able to break it. As an operating system for someone with plenty of hardware to burn, it's tough to beat.

However, where OS/2 appears very strong is among corporate and vertical market developers who really need multitasking for background communications, transaction procession or multiple sessions in very specific applications. There is a large and committed community of those users. But IBM hasn't figured out how to translate that support into broad-based market appeal.

For one thing, it's too busy engaging in a war of fear, uncertainty and doubt (FUD) with Microsoft. Microsoft has been whispering for some time that when IBM loses the rights to Windows source code this month, it won't be able to maintain Windows compatibility.

However, IBM isn't above firing a FUD volley of its own. OS/2 backers point out that Microsoft can't seem to make up its mind about whether the future of Windows lies in NT or the 32-bit Chicago product due next year. Lois Dimpfel, IBM PSP director of Personal Operating Systems, notes that IBM has perpetual rights to use the Windows application programming interface, ensuring that OS/2 will remain compatible with all future 32-bit extensions to Windows and Windows NT.

The only curveball Microsoft could throw would be to introduce a new 16-bit programming call for Windows, which is something Dimpfel said she can't imagine Microsoft doing. And Windows NT itself doesn't exactly bat a thousand on Windows support.

Microsoft has also not done as bad a job defining the future of Windows as IBM would have you believe. While it was guilty of hyping NT's role initially, Microsoft has worked hard during the last year both to temper expectations about how many people would want to install a big, Unix-like operating system on their desktop and to point Windows 3.X users toward Chicago.

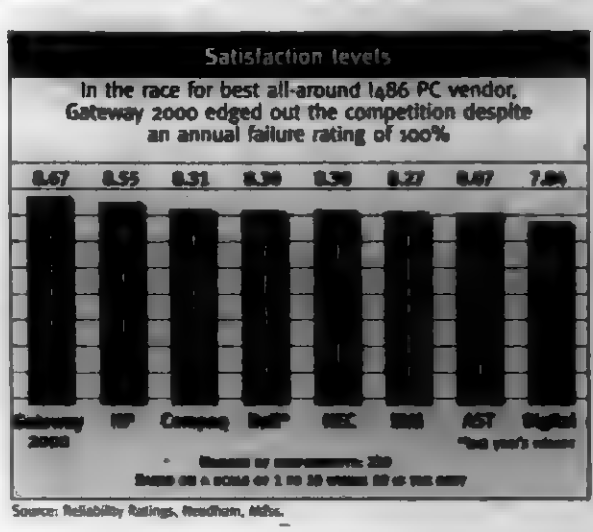
I have a soft spot for IBM in this area. OS/2 is the most efficient, flexible and reliable PC operating system on the market, and it's shipping today. IBM has stuck with it through a difficult two years, and it looks like that support will continue. But I just don't see this product breaking out of its niche, at least not while Microsoft has a finger on the FUD button and can keep OS/2 cornered between an uncertain position and Microsoft's promises of things yet to come.

Gillin is *Computerworld*'s editor. His MCI Mail address is 575-4120.

Survey rates 486 PCs

The same chip gains different results in different systems

By Stephen P. Kiett Jr.



Source: Reliability Ratings, Needham, Mass.

Are all 486-based PCs created equal? Not by a long shot, according to a recently released study of eight leading Intel Corp. 1486 PC vendors by Reliability Ratings in Needham, Mass.

"486-based systems are not a commodity," said Greg Strakosch, president of the market research firm. "Just because they all use Intel chips does not mean they are the same. People buying on these expectations — on price alone — may be disappointed with what they get. . . . Our results show a 50-fold difference between the least and most reliable."

The study rated 21 systems, including some from IBM's ValuePoint and Personal System/2 lines, Compaq Computer Corp.'s ProLinea and DeskPro, Digital Equipment Corp.'s DECpc family, Dell Computer Corp.'s Dimension 486DX/33 and Gateway 2000, Inc.'s 4DX-33. Data was collected from more than 250 end-user sites representing 28,000 486 PCs and more than 43 million hours of runtime.

Each vendor was rated on overall reliability, service, technical support, functionality, upgradability, price competitiveness, monitor and performance.

Average failure rate

According to the study, the average annual rate of failure ranged from 25% to 30%. Those failures included problems such as malfunctions with CPU boards, disk drives and keyboards. NEC Corp. had the best reliability score at 1.6%, followed by IBM with scores ranging from 3% to 6.22%. Gateway 2000 fared the worst with a 100% annual failure rate.

However, Gateway 2000 outgunned everyone for the highest overall customer satisfaction rating (see chart). More than 90% of the Gateway users surveyed said they would buy Gateway systems again.

While the Gateway 2000 responses appear to be in conflict with each other, Strakosch said they are due to the fact that people buy the Gateway 2000 systems "to get a great deal" on price. Therefore, Gateway users are much more tolerant of failures than are IBM, Hewlett-Packard Co. and Dell customers.

For example, while Strakosch said IBM had the most consistent marks across the board, it also had the second-lowest customer satisfaction rating.

"High customer expectations are like an anchor around IBM's neck," Strakosch said. "IBM's customers are intolerant of minor glitches, while the exact same customers grant clone-makers much greater leeway because of the perception of getting a better deal."

Bug reports

Users of Dell and Gateway 2000 PCs reported the greatest numbers of system bugs, Strakosch said. Gateway 2000's troubles revolved around the 4DX-33's system board, and Dell's were mainly with keyboards, monitors and mice.

One Gateway 2000 site with 100 4DX-33 systems installed reported 10 system board failures, Strakosch said. Gateway replaced the 10 failed boards as well as the remaining 90 systems, which lowered its reliability score dramatically.

In the report, Gateway 2000 said the problem was "an exceptional case" and that it "is confident that the [mean time between failure] levels reported here are worse than those of the installed universe of the model, or of other products in the company's line."

A Dell spokesperson confirmed that the company experienced problems with some of its peripheral products but attributed them to difficulties with its suppliers that have since been remedied.

"The 1993 study on 486 Reliability & Customer Satisfaction" is available for $295, according to Reliability Ratings.

Lotus fills in gaps

CONTINUED FROM PAGE 37

of using Approach, according to John Chamberlain, a PC manager at the company.

SQL hooks key

Meanwhile, Lotus is expected to roll out the first strains of Approach integration with Notes groupware within two to three months, Harvey confirmed. Approach's access to SQL databases will be key for Notes.

Separately, Lotus is working on drivers to link Notes to SQL engines but has yet to deliver those products [CW, Sept. 6].

SQL facilities as part of Notes would, for example, allow the system to better balance requests to corporate databases.

For instance, if 500 Notes users want to query a central SQL database, processing such a large number of ad hoc queries would likely be quite slow.

Approach could capture data from a SQL database at the start of a session and bring it down to the desktop level for users to manipulate locally.

That would diminish network traffic allowing data to be returned to the server after end users were finished with it.

Apple makes moves to squash Newton's bugs

By James Daly
CUPERTINO, CALIF.

Summer is the traditional time for bugs, and users found them everywhere. At the barbecue. At the beach. And in the Apple Computer, Inc. Newton personal digital assistant.

As the company rushes to complete the nationwide rollout of the Newton MessagePad this week, technicians are scrambling to simultaneously release an updated system software package designed to stamp out problems with the unit's power supply and handwriting translation capabilities.

"Like any new product, it needs a little fine-tuning," said James Joaquin, product line manager of Newton software and tools.

Handwriting, power problems

Participants on electronic forums like CompuServe have chastised Apple for the MessagePad's handwriting recognition and power difficulties. The MessagePad has even come under attack in the "Doonesbury" comic strip.

Users said the main problem is that handwritten words do not get translated into type. Some translated words may even get wiped out and replaced with a dot. Joaquin said the workaround was to reset the machine.

Power complaints include reports of units that will not automatically sleep and of others that shut down inexplicably while in use. Users who have received an alert when they turned on the Message Pad have found that pressing the reset button, which does not cause data loss, solves the problem temporarily.

Some battery problems reportedly also occur when the Newton runs with alkaline batteries instead of the nickel-cadmium rechargeable pack.

Joaquin said that while such difficulties are "rare" — complaints have been received from less than 5% of the customers, he said — the updated system software should correct them. It is expected to be available shortly on both Personal Computer Memory Card International Association cards and from on-line services.

User lessons

Apple has blamed some of the problems on the inexperience of users. Analysts said such difficulties frequently occur with any new technology.

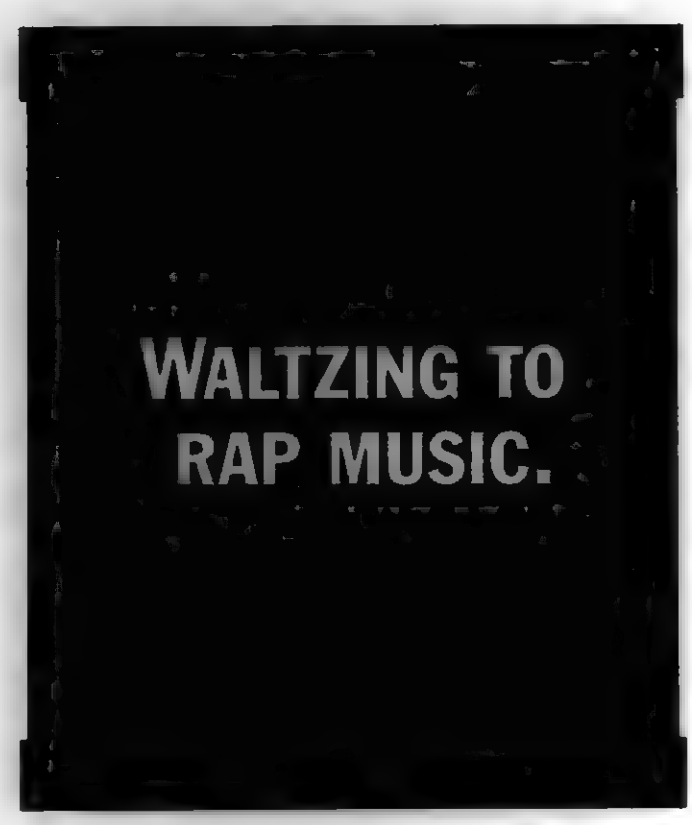
"It's like riding a bicycle; once you learn how to do it, it's easy," said Frank Rogan, an engineering software consultant in Beaverton, Ore.

Apple also plans to offer free training classes that will guide MessagePad customers in properly setting the recognition controls, which are crucial to proper handwriting translation, according to Joaquin.

Joaquin insisted that the key to Newton is adapting to it as much as it adapts to you. For users who clear "the hurdle of training," the Newton MessagePad should prove its worth, he said.

But some users have complained that the Newton trains you rather than vice versa.

Sharp Electronics, which made Newton's hardware, will reportedly ship its own ExpertPad Newton derivative with the upgraded software installed, sources close to the company said.



IBM powers PS/2

CONTINUED FROM PAGE 37

hancements to the PS/2 desktop line.

Turner, who will retire from IBM at the end of this month, worked with the late Don Estridge on the original IBM PC. "It's been a pendulum swing all the way back to [the Estridge] days in terms of our level of responsibility and enthusiasm. The only difference between now and then is the complexity of the industry," Turner said.

But the focus on large customers may be hurting the PC Co.'s sales elsewhere.

"We bought into the new company for the three-year warranty and pulled in 18 machines last December, but I'm real frustrated now with IBM," said Richard Chandler, director of computer operations at Radio City Music Hall Productions in New York. Chandler, who runs a small 160-PC shop, said he had trouble getting support from the PC Co. and has run into four-month waits and extra expense to get parts such as a Creative Labs, Inc. SoundBlaster card that runs on the Micro Channel Architecture.

His problems have caused him to not even consider the ValuePoint, turning instead to Compaq Computer Corp. and Dell Computer Corp. for new PCs.

Analysts said Premium Partners might remove the tarnish from the PS/2 name, but it is too early to tell. Insiders said that if the program fails, the PS/2 may not be something IBM can afford to carry.

"It could be a good opportunity — that kind of service is worth thousands of dollars, and if you're buying 2,000 systems, this can be worth a lot more money," said Richard Zwetchkenbaum, research manager at International Data Corp. in Framingham, Mass.

Zwetchkenbaum added that "If they didn't have the PS/2 line they probably wouldn't be profitable and would be losing customers. A lot of customers are committed to [the PS/2], and these are their highest-profile customers. Also, IBM initially said it would differentiate the premium brand with service and support, and everybody has caught up with them in terms of offering a three-year warranty."

Help desks made easier

By Stephen P. Klett Jr.
SAN FRANCISCO

A traditional help desk hot line often cannot immediately resolve the calls it receives. Calls that require further research or the assistance of experts are in danger of "falling through the cracks." Answer Computer, Inc. recently unveiled its next-generation automated help desk system with promises to seal these cracks by putting the expertise needed to solve users' problems at each service representative's fingertips.

An extension to Apriori 4.0, Apriori GT is a graphical user interface-based, process-driven support system that integrates work-flow management with problem/query management and resolution. It provides the help desk with a central, indexed source of data about users, known problems and proven solutions.

Beta-test users said Apriori's main benefit was that it eliminated the need for support staffers to be system experts, resulting in improved response times.

For example, Apriori GT enabled JC Penney Co. in Dallas to condense 10 support teams into three covering broader areas: point-of-sale, general office and floor-room systems. "Support staff now rely on Apriori's point-and-click capabilities to direct them to solutions rather than their own memory and manuals," said Dean Wortham, manager of the retailer's store systems hot line.

Wortham estimated that more than 80% of callers' questions are answered with the first call and that less than 5% of calls pertain to problems that have not been heard before and, therefore, are not documented in the system.

Features new to Apriori GT include the following:

- On-line access to the help desk database and documentation for all departments in a company.
- The ability to set conditional events to measure the quality of end-user support. For example, the system can be set to notify the appropriate manager if a user calls a representative with the same question three times in one week.
- A fax-back capability that gives users faxed copies of Apriori information.
- A utility called TexTracer that provides immediate access to printed, archived and on-line information.

Beta site

JC Penney has been using Apriori to support users at its more than 1,400 stores since 1990. It has been beta-testing Apriori GT for almost four months.

Wortham said TexTracer is one of Apriori GT's most intriguing features. "TexTracer will enable us to do searches based on strings of characters across multiple systems," he said. For example, support personnel will use TexTracer to access the same help desk screen that mainframe users see, enabling the support people to tell the users over the phone where to find help.

Apriori GT also contains Group Workflow Management, an application that allows the information systems department to tailor support to specific groups.

Analysts said this feature sets Apriori apart from other off-the-shelf automated help desk software packages.

Apriori GT is slated to ship late this month at prices starting at approximately $50,000 for a 10-user system.

The 'new' IBM

Skeptics said IBM PC Co. could never bounce back in the PC market because of the number of longtime IBMers employed there. Analysts said these long-entrenched Blue-brains have in fact helped lead the PC Co.'s turnaround (CW, Sept. 6).

"Even though they have 30-year IBMers in there, these people [have been] freed to do what they want to do," said Leslie Fiering, an analyst at Gartner Group, Inc. Fiering said the PC Co. benefits from its ability to tap into ongoing IBM research and development and its existing infrastructure.

"The PC Co. meets every IBMer's wildest fantasies: It leverages IBM's traditional strengths while getting away from many of the traditional burdens," Fiering added.

IBM business partners also gave the PC Co. high marks. "They are far more aggressive now," said Mark Eppley, chairman of Traveling Software, Inc. in Bothell, Wash.

Still, aggressiveness has its price.

The different brand teams "don't seem to talk to each other," said Jennifer Munson, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. She said this made the PC Co.'s product strategies lack coherence. Other observers agreed.

"At times the number of brands can be a bit confusing," said Steven Eskenazi, an analyst at Alex. Brown & Sons, Inc. "I'd like to see them have a bit more of a cohesive strategy."

But Robert Corrigan, the PC Co.'s president, cited the broad branding and distribution strategy implemented this year as something that has helped it regain market presence.

"I can take some risks now, like Ambra, without putting the whole business in jeopardy," he said.

Ambra, an IBM subsidiary that sells products without the IBM name, presents a radically different way of doing business for the PC Co.

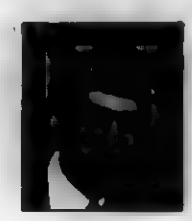
—Michael Fitzgerald

TYPING WITH BOXING GLOVES.

MOVING MISSION-CRITICAL APPLICATIONS TO CLIENT/SERVER.

Jeffrey Henning

Notebooks catering to power users



When you are choosing between subnotebook PCs and notebook PCs, begin by characterizing the potential users. Can you categorize them as power users or as . . . as what? Powerless users?

The lack of an industry term for the opposite of power users indicates a blind spot — a failure to place user needs above technology. Not everyone loves technology for its own sake. For the nontechies — you might call them convenience users — the computer is simply another piece of office equipment, albeit one they spend a lot of time with.

While power users are fascinated by the computer as both an end in itself and a means to an end, convenience users are interested only in the end results; they are more interested in accomplishing a task than understanding technology.

Instead of classifying our users by their preference for power or convenience, we superficially separate users by new tech vs. old tech: Will so-and-so demand new technology or put up with old technology? This failure to classify users is especially problematic when assessing notebooks vs. subnotebooks.

Poor fit

Convenience users are poorly served by today's portable PCs, which were designed to offer almost as much functionality as desktops. Convenience users want portability over functionality. Eventually, technology will give them both, but until then they will look for portability first. The trick for IS managers is to determine what level of functionality these users need.

"The lack of an industry term for the opposite of power users indicates a blind spot — a failure to place user needs above technology. Not everyone loves technology for its own sake."

For convenience users, the average notebook PC — at 6.2 pounds — is too heavy. Whenever users travel with a typical notebook they must consciously balance the advantages of having the computer with them against the disadvantages of lugging the computer around. Convenience users look to the day when PCs are "subconsciously portable" — that is, when a portable can be carried around without the user's having to make a conscious decision to carry it.

While portables are a long way from this, vendors hope subnotebooks are a step in the right direction. Unfortunately, most subnotebooks are subpar. To fit the components of a notebook PC into a package that weighs less than 4 pounds, quite a bit is left out — RAM, hard-disk capacity, a fax modem and a floppy disk drive.

The universal omission of the internal floppy disk drive alienates many prospective users because 40% of mobile professionals need to exchange information using floppies while traveling. The need to lug around an external drive makes a subnotebook heavier and less convenient.

Trade-offs

Most subnotebooks make too many trade-offs for convenience users. The notable exception is Hewlett-Packard's 2.9-pound OmniBook, which HP specifically designed for nonpower users. The OmniBook offers Microsoft Word and Excel in read-only memory to provide instant access to applications and to minimize the disadvantages of low hard-disk capacity.

While this is perfect for the convenience user, it is insulting to the power user, who will want to install applications of his own choice. The OmniBook uses only a 20-MHz 386 CPU. Power users will want a 486, but convenience users will appreciate the long battery life (five to eight hours) enabled by the 386.

Convenience users would take an internal floppy disk drive, trading off the burden of an extra pound in weight, but there are no products in the 4- to 5-pound range from any major vendor. This "heavy subnotebook" category or "light notebook" does not fit PC vendors' technology-driven view of the world, but such a product would better meet the needs of the oft-ignored convenience user.

Although it does not live up to the OmniBook, the current generation of subnotebooks is most suitable for people who need accessible computer power but who don't need to replicate the power of a modern desktop PC (these users may be making do with 286- or 386-based desktops).

Subnotebooks are best for word processing and spreadsheet addicts who miss the convenience of these applications when traveling.

Traditional notebooks, on the other hand, are intended to provide power users with functionality comparable to that of desktops. Notebook users will want word processors and spreadsheets as well as communications software, large databases and presentation packages.

In the quest for appropriate products, it is up to IS managers to make sure that convenience users aren't powerless.

PC vendors are biased. Not biased in favor of a race or gender but in favor of one type of customer — the power user. The power user is the favorite target customer for PC vendors because the power user is willing to pay handsomely for the benefits of advanced technology.

Henning is a senior industry analyst at BIS Strategic Decisions in Norwell, Mass.

Integrated circuitry

Texas Instruments demonstrates quick chip technology

By Ellis Booker

Claiming a significant advance in integrated circuit fabrication, Texas Instruments, Inc. said it produced a chip in just three days, a process that normally takes two to three weeks.

For the technical demonstration, TI used so-called single-wafer processing, in which all manufacturing steps take place on a single silicon wafer. The conventional fabrication of integrated circuits involves large numbers of wafers, processed in batch.

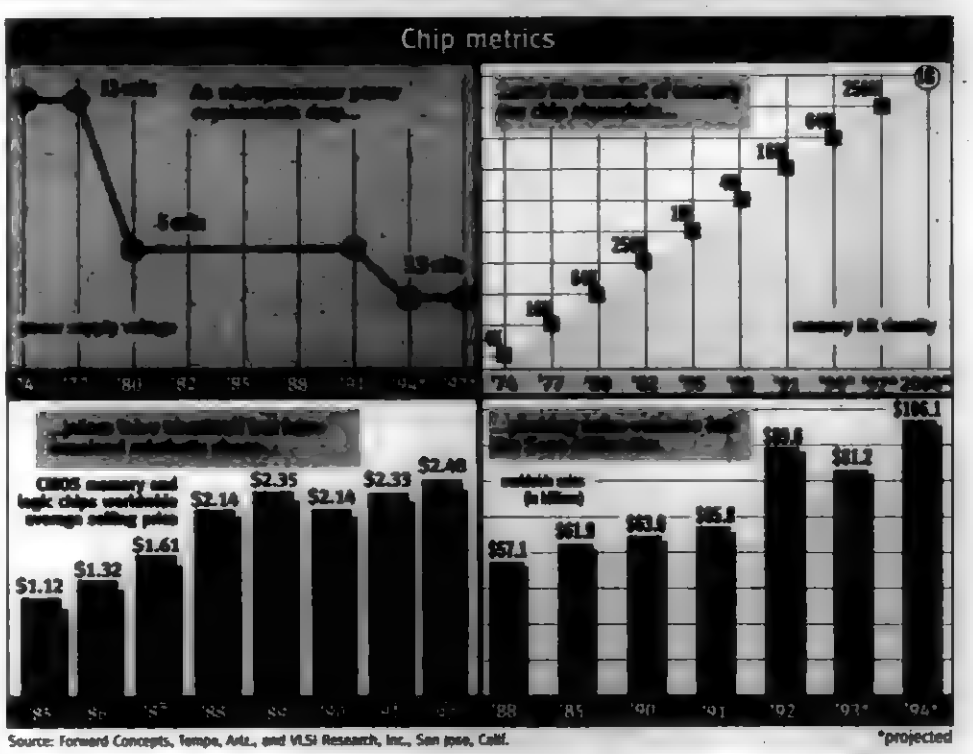
This "fab in box" approach has been talked about for years, said Will Strauss, president of Forward Concepts, a semiconductor market research firm in Tempe, Ariz.

Concept never materialized

"It's a concept that's been around for a long time; even the Russians have said they had it . . . but up until now no one has demonstrated it," said Strauss, who estimated that TI is a good two years away from any kind of working prototype of the concept.

For integrated circuit producers, however, the economics of such single-step fabrication are compelling and could translate into lower system prices for end users.

Currently, world-class semiconductor makers such as TI spend $500 million per chip-processing facility and its associated hardware.



Source: Forward Concepts, Tempe, Ariz., and VLSI Research, Inc., San Jose, Calif. *projected

Long-term savings

A single-step technology might cost only a few million dollars because the plethora of fabrication equipment (numerous tools, each dedicated to a single function) could be consolidated into one or more devices.

For the manufacturing technology demonstration, the complementary metal-oxide semiconductor logic and memory chips were fabricated at the company's semiconductor research laboratory in Dallas.

TI said it might use the rapid manufacturing method for TI custom chips or chip prototypes, which could be tested prior to volume production.

The chips were produced as part of TI's Microelectronics Manufacturing Science and Technology program, a U.S. Department of Defense initiative to develop next-generation semiconductors.

TI won the program contract in 1988. It was awarded by the U.S. Air Force and the Defense Advanced Research Projects Agency.

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Software Publishing Corp. has announced SuperBase 2.0 for Windows, its programmable relational PC database product.

According to the Santa Clara, Calif.-based company, SuperBase 2.0 features a wide-ranging image import, a manipulation and display capability, a relational advanced visual environment that provides an intelligent macro recorder, an automatic code-generation capability as well as Basic language support.

The single-user price for SuperBase 2.0 is $495.

▶ *Software Publishing*
(408) 986-8000

On Technology Corp. has announced that Meeting Maker XP, its group scheduler for the Macintosh, is now available for the Windows market.

The interoperable group scheduling product lets users of both platforms plan, schedule and confirm meetings using desktop computers, according to the Cambridge, Mass.-based company.

The software offers a Propose Meeting feature that schedules a time and date, chooses the required guests, prepares agendas and reserves conference rooms. The first available time for all required attendees is automatically located with the Auto-Pick feature.

Meeting Maker XP prices range from $57 to $79 per user.

▶ *On Technology*
(617) 374-1400

Telcor Systems Corp. has announced T/PortTwin, a dual-port version of its T/Port serial port adapter series.

According to the Natick, Mass.-based company, the T/PortTwin enables users to simultaneously send and receive data or fax communications in background mode, while they keep working in the foreground.

Users do not have to wait for file transfers to be completed before starting to work again in the foreground. A dedicated coprocessor and 16K-byte transmit and receive buffers are on each port of the product.

T/PortTwin costs $139.

▶ *Telcor Systems*
(508) 653-3996

Data General Corp. in Westboro, Mass., has introduced DG/Vilsion, a series of PCs, and the addition of several mid-range models to the Dasher II line of performance PCs.

Two models of DG/Vilsion are available. The DGVilsion 425R is based on the 25-MHz 1486SX microprocessor from Intel Corp., and the DG/Vilsion 433R is based on the 33-MHz 1486SX.

Both systems are certified to function as Novell, Inc. NetWare clients and feature 4M bytes of random-access memory (upgradable to 32M bytes); an overdrive socket for Pentium upgrades; integrated local bus graphics; one 3½-in. floppy disk drive; one 130M- or 213M-byte integrated drive electronics (IDE) hard drive; two available 5¼-in. IDE drive bays; and three full-size, 16-bit XT/AT bus expansion slots.

A keyboard and mouse are also included, and MS-DOS 6.0, Windows 3.1 and systems utilities are preinstalled.

Prices range from $1,450 to $2,595.

▶ *Data General*
(508) 366-8911

DeskStation Technology, Inc. in Lenexa, Kansas, has announced its Evolution Series reduced instruction set computing PCs for Microsoft Corp.'s Windows NT.

Powered by a Mips Technologies, Inc. R4400, the RPC 44LE (Limited Edition) is housed in a minitower chassis and offers the following: 16M bytes of random-access memory (expandable to 64M bytes); 512K bytes of secondary cache; a Small Computer Systems Interface-II subsystem with a 240M-byte hard disk drive; a S3-based video card; a 3½-in. floppy disk drive; a Sony CD-ROM drive; and a keyboard, mouse and preinstalled Windows NT.

The Evolution Series RPC 44LE can be used for Windows NT server applications such as scientific analysis, computer-aided design and engineering, desktop publishing and imaging, according to the company.

The product costs $4,495.

▶ *DeskStation Technology*
(913) 599-1900

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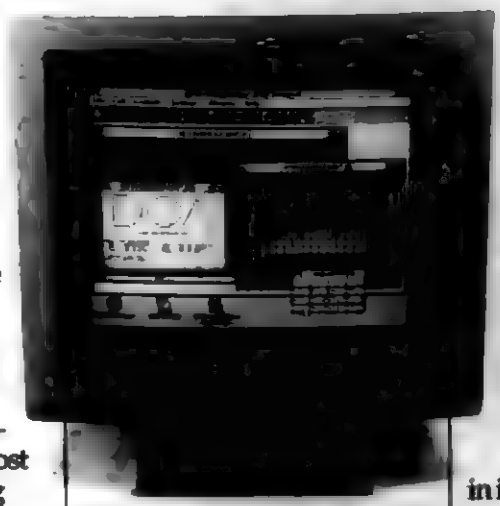

Multiple sessions, QuickPad and QuickBar productivity enhancers, and API graphics support are just a few of the strengths of IRMA WorkStation for Windows.

IRMA WorkStation for Windows is the only Windows 3270 software with a QuickBar for instant access to functions like File Transfer, as well as other common 3270 commands like Reset, Clear and Attention.

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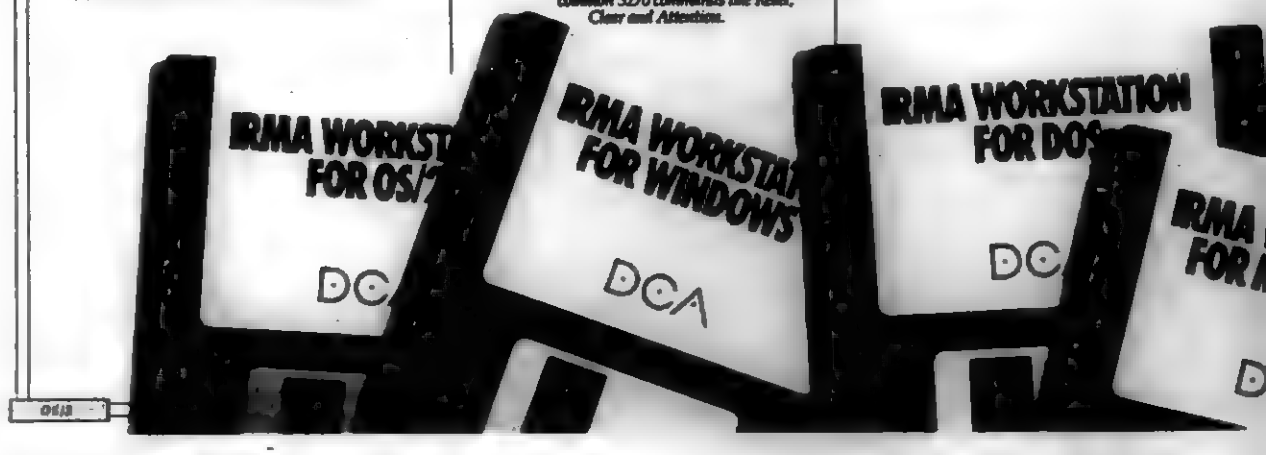


Product shorts

2010 Software Corp. has introduced Sherlock 2.0 for IBM PCs running Windows 3.1. The software provides a system for managing files with 254-character file descriptions instead of eight-character file names, according to the company. Cost: $139 for single users and $695 for a 10-station local-area network pack. 2010 Software, New York, N.Y. (212) 887-9555.

Systems Compatibility Corp. has announced Version 2.1 of Outside In for Windows, a file viewing and data import utility. This upgrade includes viewers for 15 new file formats, optional file conversions as well as support for Object Linking and Embedding in word processing files, the company reported. Cost: $89. Systems Compatibility, Chicago, Ill. (312) 329-0700.... **FLX Corp.** has announced FLX Visual HR, an integrated human resources and benefits management system for Windows. Unlimited history for all employee data is maintained on the system. The product provides more than 110 standard reports for benefits, compensation, government compliance and more, the company reported. Cost: Starts at less than $695. FLX, West Chester, Pa. (215) 696-6600.

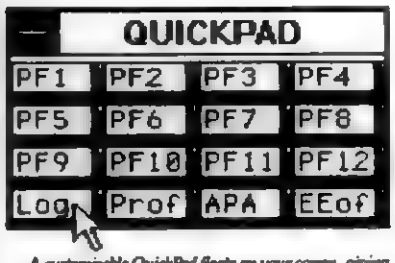
International Computers has introduced VideoOut, an IBM PC/AT/XT/386/486 compatible plug-in card and software that lets users display their computer screens on a TV or save them to videotape. Cost: $99. International Computers, Waurwatosa, Wis. (414) 764-8000.... **Epson America, Inc.** has announced ActionNote 4SLC/33, a notebook that offers improved power management, 30% faster processing and a brighter LCD screen than its predecessor, according to the company. Cost: Starts at $1,699. Epson America, Torrance, Calif. (310) 782-5161.

Lightning Computers has introduced the Thunderbox Ultimate Pentium, a 60-MHz, 64-bit Pentium system that provides the following: a 320M-byte FAST Small Computer Systems Interface-2 Quantum hard disk drive, 16M bytes of random-access memory, Hercules Graphite local bus graphics accelerator, Toshiba dual-speed CD-ROM and a Mediavision Pro Audio Spectrum sound card. In addition, a 17-in., flat-screen, noninterlaced Super Video Graphics Array monitor is included, according to the company. Cost: $6,995. Lightning Computers, San Francisco, Calif. (415) 543-3111.

Ares Software has introduced FontMinder 2.0, a font-management utility for Windows 3.1. Features include a refined interface, archiving, font previewing prior to installation, comprehensive type sample generation, portable font packs and an intelligent Adobe Systems, Inc. PostScript font downloader, according to the company. Cost: $79.95. Ares, Foster City, Calif. (415) 578-9090.

Intex Solutions, Inc. has announced that 16 of its spreadsheet enhancements are compatible with Lotus Development Corp.'s Lotus 1-2-3 Release 4.0. These enhancements include the following: a capacity analyst, clip artist, CFO spreadsheet applications, forms-to-go, spreadsheet scheduler, operations manager, Intex bond calculations, Intex mortgage-backed calculations, inventory analyst professional, among others. Cost: Starts at $99. Intex, Needham, Mass. (617) 449-6222.

Expert Software has introduced the Expert Travel Planner Gold Edition for Windows, a customizable travel program. Features include the ability to plan a trip to any destination using a network of freeways, tollways, primary and secondary roads within the U.S., Alaska, Canada and Mexico; print a detailed itinerary; choose from three route classes (quickest, shortest and most scenic); and customize maps using any combination of fonts and colors, according to the company. Cost: $49.95. Expert Software, Coral Gables, Fla. (305) 567-9990.



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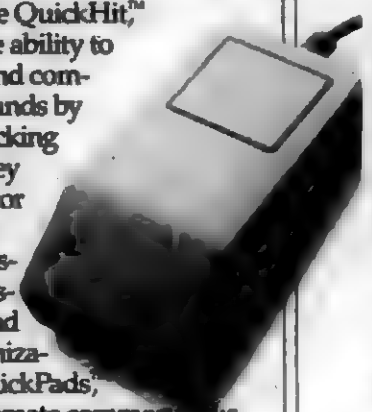

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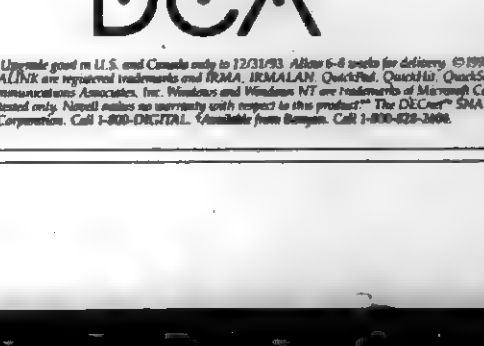

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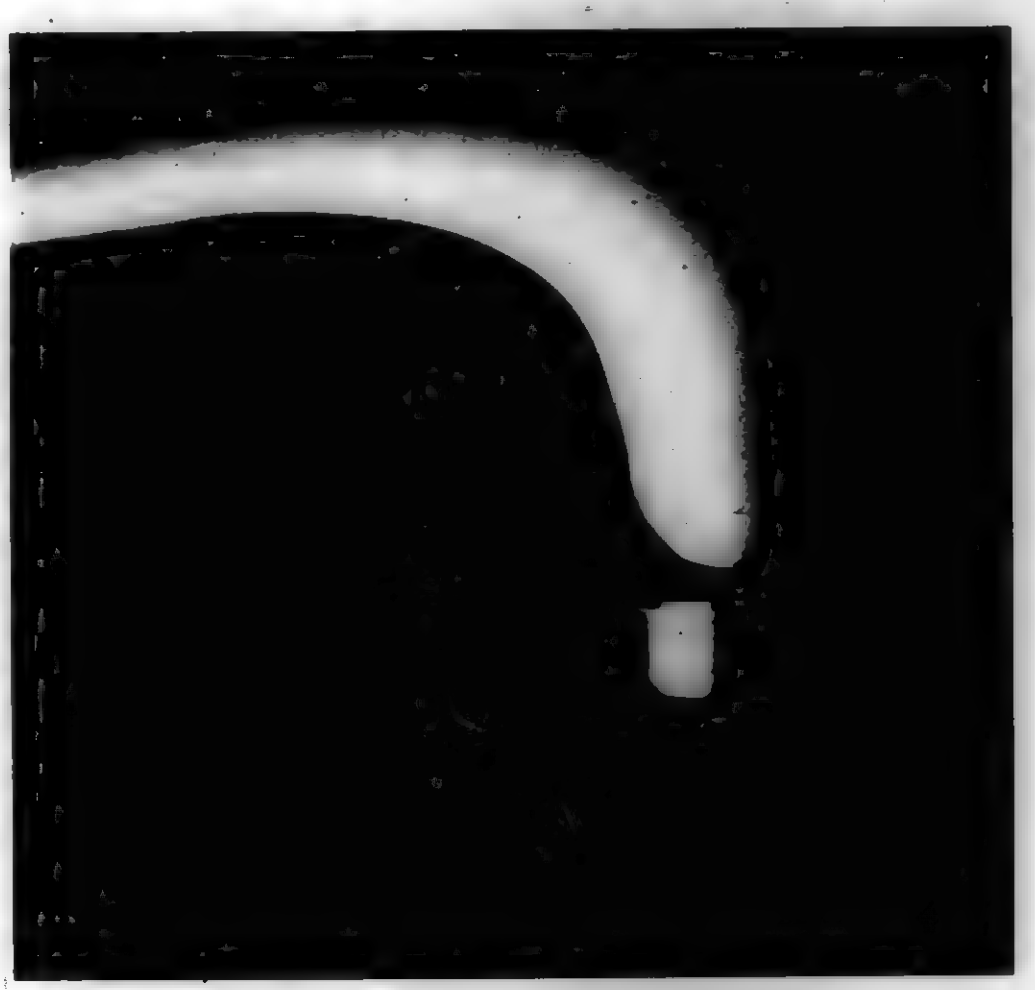

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Peer-to-peer technology faces uphill climb

IS executives remain unconvinced that peer networks fit their needs over server-based schemes

By Ed Scannell

■ While IBM's LAN Systems for Personal Software Products plans to ship a beta-test version of its peer-to-peer technology for OS/2 in the next month or so, the company remains unsure of just how broad-based the market opportunity is.

In LAN Systems' research during the last few months more than a few corporate information systems managers have told IBM executives they still prefer a server-based approach to computing over peer-to-peer.

"Peer-to-peer must act like a server. If it doesn't, IS doesn't much care. For them it must look like an adjunct to a client/server system," said Art Olbert, director of LAN Systems for Personal Software Products.

"If you can't introduce a product IS is comfortable with, chances are you are not going to get in the door," Olbert said.

Several corporate managers interviewed recently backed up most of Olbert's assertions, indicating that many peer-to-peer technologies are useful but remain either limited or not practical for many mission-critical applications.

"If all you are doing is eliminating 'Sneakernet' problems, then peer-to-peer will get you by. But if you want to protect the investment in your files, you are probably better off with a server-based environment," said John Chapman, a senior technology consultant at Amaco, Inc.'s technology introduction division in Chicago.

Overrated market

Despite all the attention that products such as Microsoft Corp.'s Windows for Workgroups have received from the media and analysts during the last year, Olbert said he thinks the peer-to-peer market is smaller than most believe.

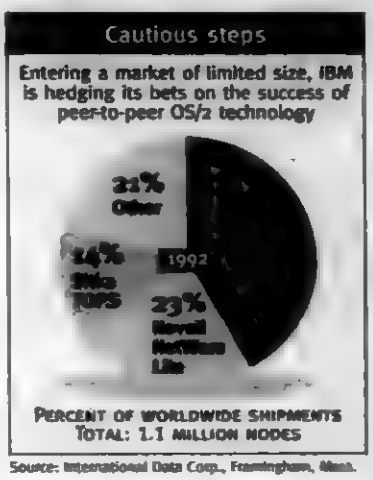
"The peer market, from what we can see, is not all that large," Olbert said.

Analysts at market research firm International Data Corp. in Framingham, Mass., estimated the peer-to-peer networking market at 1.1 million nodes (see chart).

The other opportunity for IBM in the peer-to-peer market, other than medium-size to large corporate accounts, is smaller businesses. But there, too, Olbert said he sees a couple of significant obstacles.

The first is in reaching these users in large volumes through available distribution channels. Many value-added resellers that would sell peer-to-peer networks to smaller customers either do not have the incentive or the expertise.

"There is a market for this if you look at what companies like ArtiSoft have done," Olbert said. "But I am really not certain we can get to [the small business] market with the kind of volumes we would like to see."



Source: International Data Corp., Framingham, Mass.

Administration woes

Another problem in selling to small businesses is that once a peer-to-peer network grows to more than five to 10 users, someone must be dedicated to taking care of its administrative aspects. This is something small companies typically cannot afford or have little expertise in.

"Once you grow beyond five users it becomes tough for them to administer. It can sometimes become counterproductive," Olbert said. "When you distribute that capability to the desktop, you can chew up a knowledge worker's time."

Currently, IBM offers peer-to-peer capabilities for file and print in its LAN Server 3.0 offering but not for database functions.

If it turns out that LAN Systems does not go forward in developing a separate peer-to-peer product, it might salvage the work done so far by wrapping it in with LAN Server, Olbert said.

Workstations

Want Unix videoconferencing? Build it yourself

By Jean S. Bozman

People who want to use their Unix workstations as videoconferencing machines had better be do-it-yourselfers: Most systems require an optional compression card, software and a sizable slice of network bandwidth.

But early users said the technology is worth the trouble. It offers low-cost links between co-workers across a university campus, scientists across an ocean or business partners across the world.

Strain on bandwidth

Compared with dedicated videoconferencing systems, such as those from PictureTel Corp. in Peabody, Mass., workstation solutions are much less expensive (see chart).

But many sites are just beginning to tap the technology, expressing concern that widespread conferences might strain the limited bandwidth on their local-area network campuses.

"Videoconferences on LANs are still for the early adopters," said Scott Winkler, a software analyst at Gartner Group, Inc.'s Software Management Strategies Service in Stamford, Conn. "It's for those who are willing to experiment, who are not afraid of making incorrect vendor decisions, but who see the benefits and are willing to take risks."

Among those risks are potential disruptions to the LAN, said Randy Robinson, manager of network information services at the NASA Ames Research Center near Mountain View, Calif.

"Network resources are not infinite," he said. "If you've got a dozen or so people trying to conference across the campus, everyone else would be competing for time on the network."

NASA Ames has more than 1,500 Unix workstations on campus, he said. A recent pilot test at less than 10 frames per second on a 10M bit/sec. LAN was abandoned after an unexplained network disruption, Robinson said.

Positive results

Other users have had better results. Randy Butler is team leader for networking development at the National Center for Supercomputing Applications at the University of Illinois' Urbana-Champaign campus. He uses Sun Microsystems,

Unix, *page 58*

Build your own

Leading workstation vendors are putting together workstations for videoconferencing

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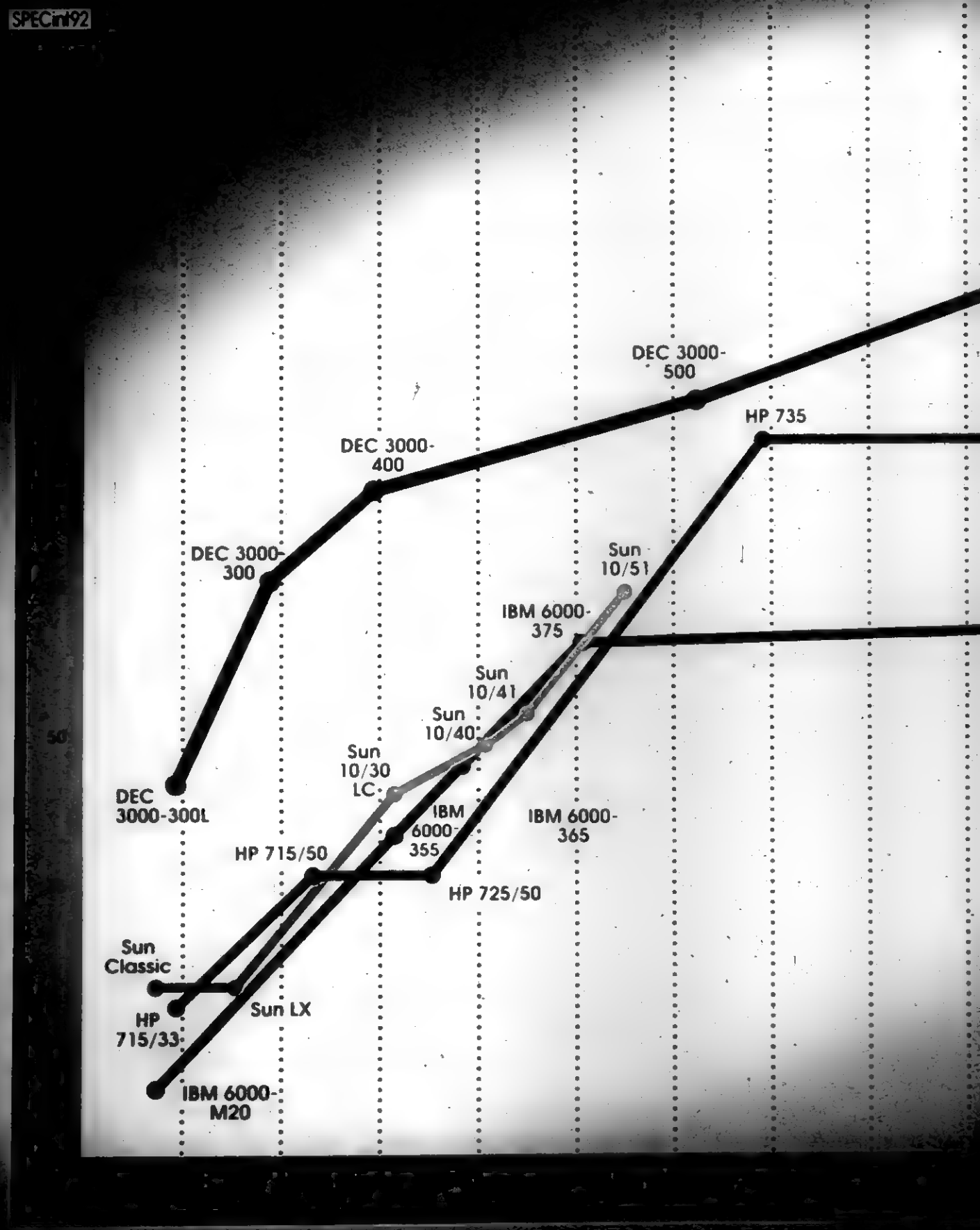
	DECstation 5000 $5,000-$12,000	TX Framebuffer $1,000 DEC Video/PIP $3,995		
	Series 700 workstations Model 715/33 $5,695 Model 725/50 $17,050 Model 735 $34,795	HP Video Line Card $2,275	Insoft, Inc. Communique $1,295	Ethernet FDDI ISDN
	Indy $4,995	Card included	In Person $495	Ethernet ISDN FDDI
	Indigo[2] $18,000	Indigo[2] Video $3,995		
	SPARCclassic $3,995	Sun Video Pix $795	Insoft Communique Rasterops $1,295 Parallax $1,695 XIL (X Imaging Library) fall announcement	ISDN Ethernet FDDI
	SPARCstation 10 $15,000-$45,000	Rasterops Corp. TV 2 card $1,599 Parallax Graphics, Inc. XVideo $4,995		

Down-the-road improvements

The Internet is developing a protocol, known as IP Multicast, that will efficiently route workstation videoconference calls across Unix networks by 1995. Typical Internet multicasts now send videoconference "packets" to users at rates of 200K to 700K bit/sec. However, full-motion video — without compression — would require 60M bit/sec. between any two workstations.



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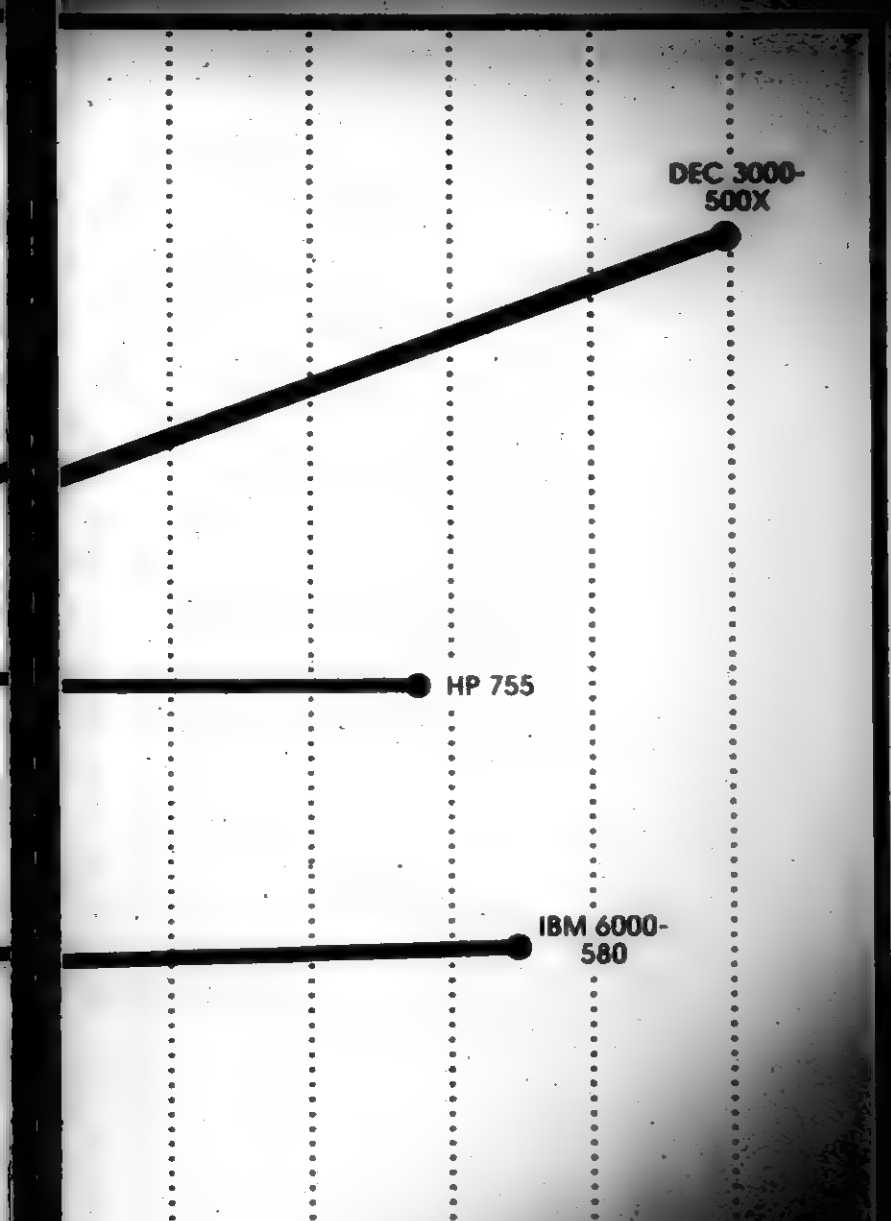

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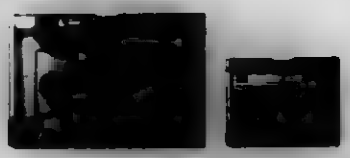

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Reliability

TV tuning made profitable

By Mitch Betts
ATHENS, GA.

When Hollywood's television moguls decide on their prime-time schedule for the new season, they rely a little on research and a lot on gut feelings. But in the face of declining profits and fierce competition, intuition may not be good enough.

Hoping to add a dose of scientific rigor to the art of TV programming, three faculty members from the University of Georgia have developed a computer program that takes hundreds of variables into account to produce the most profitable TV schedule.

> "Where a show is placed is infinitely more important than the content of the show," Michael Dann, veteran TV programmer.

The computer model, dubbed SPOT, or Scheduling of Programs Optimally for Television, was produced by business professors Srinivas K. Reddy, Jay E. Aronson and Antonie Stam and is about to emerge from the prototype stage.

Low-cost shows such as "Cops" from Fox can be more profitable than some highly rated shows

In a test of the prototype that used actual data from 1990, a cable TV network (which requested anonymity) found it would have seen a 1.4% increase in annual profits, or $4.5 million.

Aronson said that increase could be significant for networks with razor-thin profit margins. The system gives the network manager new insights into programming and counter-programming strategies, he said.

Aronson said the decision-support software works best on an IBM RISC System/6000 workstation but can be used on high-end PCs and mainframes as well.

The program's inputs include predicted ratings, competing and lead-in shows, historic patterns, advertising revenue potential and the cost of producing each show. The optimization model then juggles the schedule until it arrives at the network manager's main objective, which may be to maximize ratings, revenue or profits.

Traditionally, TV networks have tried to maximize ratings, but that may be changing as profits become a more pressing goal. Even a highly rated show can be unprofitable if it costs too much to produce, and a low-cost show with mediocre ratings can be profitable.

"The revenues of the major networks have not kept pace with rising program costs," Aronson said. The cost of producing an hour of prime-time network programming has jumped from $200,000 in 1971 to more than $1 million today.

Brokerage firm moves toward client/server

Front-end minicomputers replaced by POWERservers

By Thomas Hoffman
MARYLAND HEIGHTS, MO.

■ Edward D. Jones & Co., a $550 million, privately held brokerage based here, plans to add another 400 offices to its national total of 2,300 sites by the end of this year. Accommodating that growth called for a calculated plan to convert elements of its centralized information systems structure to a client/server computing format.

That plan culminated in the recent launch of a project to replace six IBM Series/1 front-end minicomputers with two IBM RISC System/6000 POWERserver Model 590 servers, according to Rich Malone, an Edward D. Jones partner responsible for data and voice communications at the firm. The servers will enable the company's branch offices to run certain applications locally, such as the development of local customer and prospect lists.

Edward D. Jones' Rich Malone: *Mainframes will be used to handle brokerage trades and back-office processing — even after client/server platform is installed*

For now, Edward D. Jones will continue to rely on its Burroughs Corp. (now part of Unisys Corp.) terminals until it decides on a client hardware platform. Malone said the brokerage is leaning toward either Unix or X Window System terminals from IBM or Sun Microsystems Computer Corp.

Proposed amendments

By early next month, when the RS/6000 machines become fully operational, the brokerage said it expects to have amended its Hughes Network Systems, Inc. satellite network. It will run the Ethernet local-area network protocol and the Transmission Control Protocol/Internet Protocol (TCP/IP) between branch terminals and IBM 3090 Model 500J and Amdahl Corp. 700A mainframes at its headquarters using Hughes' LANAdvantage network products.

Malone said that by replacing a proprietary Burroughs network protocol with Ethernet and TCP/IP capabilities, Edward D. Jones expects to increase network response time for branch users.

The move should also pave the way for future bandwidth requirements as the brokerage moves ahead with fax, image and video technologies across the network. At present, the Burroughs serial attachments can accommodate 9.6K bit/sec. In contrast, the Ethernet LAN will be able to handle 10M bit/sec., Malone said. The 4,000-plus Burroughs terminals will remain until the brokerage decides on a replacement workstation platform by year's end.

Mainframe to server

By using the servers to run some of the branch applications locally, Edward D. Jones hopes to move some of its centralized applications, such as the maintenance of regional customer files, from its mainframes to its servers. Still, brokerage trades and back-office processing will continue to be handled by the mainframes after the client/server architecture is completed, Malone said.

"By off-loading some processing off our mainframes, we expect that we'll only have to upgrade our mainframes once every two years or more instead of once a year as we had been," Malone said.

For now, the company is running the IBM RS/6000 servers on proprietary software developed in-house that would accommodate the Burroughs networking protocol. By mid-October, Edward D. Jones expects to have decided between IBM's OS/2 and Unix as the operating system to run the RS/6000 servers using the TCP/IP protocol.

Ventana Windows software debuts

By Michael Vizard
TUCSON, ARIZ.

Ventana Corp. plans in January to launch a Windows version of its electronic meeting software, which provides a mechanism for organizations to survey participants anonymously.

Previewed at the recent Groupware '93 show in San Jose, Calif., GroupSystems consists of a series of modules that are intended to help people organize and evaluate ideas in a group setting. Windows will provide a point-and-click interface to the existing product that should serve to increase activities in meetings.

"GroupSystems really enhances productivity because you can have multiple conversations going at the same time. People are just itching to get their hands on a mouse with the new version," said Carol Flament, joint application development facilitator at Southern New England Telephone Co. in North Haven, Conn.

At the core of the offering is an Agenda module where actual discussions are stored. Tools included in this module are an Electronic Brainstorming facility, a List Maker, a Group Outliner, a Topic Commenter and Voting.

Other components include a People module that lists who is in the meeting, a Board module that provides a white board for sharing comments, a Handout module that allows users to share documents such as spreadsheets and word processors in their native format and an Opinion module that rates the general mood of a group on a particular topic.

Southern New England Telephone has adopted the DOS version of GroupSystems to help facilitate business re-engineering discussions, post product reviews and advance customer focus groups.

According to Flament, GroupSystems gets people more involved in discussions because no one individual is identified during a meeting. The setup prevents one personality, such as the company chairman, from dominating the meeting, while also drawing comments from people who might not otherwise contribute ideas.

Flament said her organization currently uses GroupSystems as an aid to meetings convened in specific rooms, but she said she expects to deploy GroupSystems in a distributed fashion as users become more familiar with it.

"Right now, you still need a facilitator to walk people through the meeting," Flament said.

Pricing for GroupSystems starts at $24,900 for a 20-user license, which includes training and one year of maintenance. The package requires 4M bytes of random-access memory and can be used across any NetBIOS-compatible network.

Staying in touch

IBM licensed GroupSystems from Ventana in the late 1980s and marketed the product under the name TeamFocus. Southern New England Telephone adopted GroupSystems in place of TeamFocus. "We felt that Ventana was more in touch with the real world," said Carol Flament, joint application development facilitator.

Franco Vitaliano

Get the message?

With all the buzz about client/server, sooner or later your shop will try to develop an application based on remote procedure calls (RPC). It may even work.

In that case, you may find yourself trapped in a cargo-cult mentality — i.e., the great magical plane landed once, therefore we build a religion around this semi-mystical event and continue to hope for similar miracles.

The potential problem with any religion (technical or otherwise) is that it can blind you from exploring alternatives. In the case of client/server applications, the unexplored alternative to RPC is network message-passing systems.

When you use an RPC, essentially you lock two or more pieces of a distributed application together in a long-distance embrace. If the server is tied up with other calling clients, then you must wait. Only when the server is ready to deal with your client will your remote application be released. Thus, RPC client/server applications are inherently synchronous.

Distributed Computing Environment (DCE) RPC threads do not get around this because most implementations of Unix cannot handle more than one RPC thread at a time, so there are no re-entrant libraries.

Imagine for a moment what such a lockout could do to an RPC application's throughput on a busy network. Your RPC application's exquisitely cultivated performance could quickly go to seed.

Message-passing applications are much more capable of dealing with remotes. A message is typically passed from the client to a server, stacked in a queue, examined by one or more server applications and acted on when the server is able to. In other words, message-passing systems are asynchronous.

Connection essential

Some may argue an RPC's guaranteed connection between client and server is essential for some mission-critical applications, such as on-line transaction processing (OLTP). However, we are already beginning to see some OLTP systems emerging that use message-passing. For example, Pittsburgh-based Transarc's Encina OLTP system will soon be integrated with a message-passing product from Systems Strategies in New York.

Even IBM is developing message-passing products, such as its Message Queue Interface (MQI) for MVS as well as for some of its other platforms. In its Network Blueprint, IBM has elevated MQI to the same status as the DCE RPC and its own Common Programming Interface for Communications. Digital, IBM's perennial Avis, is also offering DECMessageQ. Digital's VMS-originated messaging product has already been used in some real-time distributed applications.

Both companies will likely expand their systems to their Unix and PC platforms as complete implementations in the future. Also at the high end of the messaging market is Covia Technologies in Rosemont, Ill., with its Integrator.

But perhaps the most exciting message-passing action is taking place at the LAN level, with several small companies slugging it out for mind/market share. Peer Logic in San Francisco has Pipes, which offers a system that is operating system-independent and network transport-independent. Via Pipes, a distributed PC application can flexibly communicate over a NetWare LAN to a Unix TCP/IP box. Essentially, Pipes packages a gateway inside each piece of the distributed application. Pipes MVS support is also promised soon. Message Express from Horizon Strategies in Needham, Mass., is vying for the same LAN market.

Unix shops that want to try a great no-cost network message-passing system can pick up a free copy of the Parallel Virtual Machine, PVM 3.X, off the Internet at Oak Ridge National Labs (ornl.gov).

So, the question is not whether message-passing is viable, but rather isn't it time you broke out of your RPC-cult mentality?

Vitaliano is a Boston-based writer specializing in distributed computing.

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computers, we can customize a hot site to meet the needs of your backup plan. And we encourage you to test your plan on-site at least once a year.

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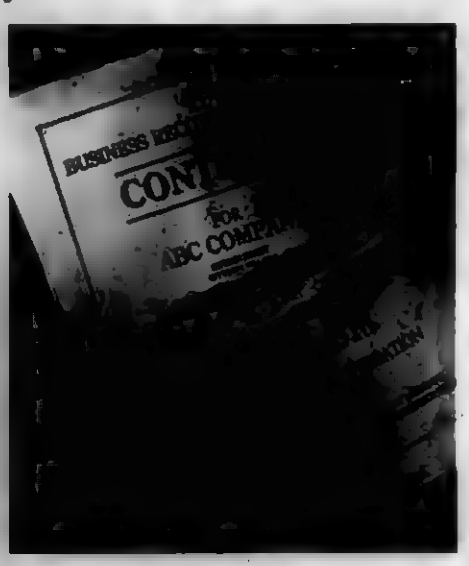

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Unix videoconferencing: A do-it-yourself proposition

CONTINUED FROM PAGE 49

Inc. workstations for daily videoconferences with co-workers in another building on the university campus.

The cue to videoconference can be quite informal. "You'll be typing away working on something, and you'll hear somebody saying, 'Are you out there?' and you'll say, 'Sure,'" Butler said.

However, every potential participant has preregistered with the videoconferencing software, he said. Sometimes, instead of dialing one another by telephone, workstation users conference-call, using only the audio portion of the videoconferencing link, according to Butler.

Technology link

The same technology can link scientists at Butler's site with scientists in other countries, using the Internet "multicasting" technique, he said. Bandwidth for the multicast is controlled by Internet systems managers, who are still trying to gauge the system capacity needed for workstation videoconferences, Butler said.

The Internet posts a list of "registered" users to let participants know who else is on the line. "The first time I jumped on the multicast," Butler said, "I saw a fellow I knew from Sweden."

> **"From a practical point of view, people need integrated solutions."**
> *—Jonathan Eunice, research director, Illuminata*

But even the Internet must make some changes to host workstation videoconferences on a regular basis. Stephen Casner, project leader at the University of Southern California's Information Sciences Institute in Marina Del Rey, is one of those developing the IP Multicast protocol, which is being reviewed for use on the Internet by 1995. "We've built a virtual network on top of the physical Internet and use workstations as the nodes that implement IP Multicast," Casner explained. "It would become more commonplace and more efficient if it were in the Internet routers themselves."

Trading one for another

Some user sites have begun to make trade-offs. Some forego full-motion video at 30 frame/sec. for a lower frame rate — which requires less bandwidth but shows up as jumpy motions. Images are shown in an X Window System on the workstation screen; smaller images demand less bandwidth, users said. Typical workstation conferences may use only 8 to 15 frame/sec.

Among the early adopters are the workstation companies themselves, including Digital Equipment Corp. and Hewlett-Packard Co., both of which use workstation videoconferences to link engineers who work in different states. Sun Microsystems, Inc. has been testing videoconferencing extensively in-house and used it for a Christmas address last year by Chief Executive Officer Scott McNealy that was broadcast throughout Sun's 20,000-node internal network.

Commonplace videoconferencing awaits the installation of high-speed fiber or Asynchronous Transfer Mode networks, greater use of multimedia software and better integration of hardware and software that support it. Until then, build-it-yourself solutions will continue to have a limited appeal.

"From a practical point of view, people need integrated solutions," said Jonathan Eunice, research director at Illuminata, a Pittsburgh research firm. "They're not going to go out and buy a compression card and a camera to make this work."

Two w
make a

If patience is a virtue, it would be tough to find anyone more virtuous than a 386 user.

Of course, you're not waiting to be canonized. You just want to get your spreadsheet crunched, printed and e-mailed before your boss's boss calls you looking for it.

Performance Benchmarks (figures indicate relative performance)	Intel i386	Cyrix 486 Upgrade
MS Excel 3.0	1.0x	2.1x
MS Word 2.0	1.0x	2.8x
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Benchmark tests run on IBM PS/2 Model 70/20MHz

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[redacted]

ZyLab, a division of Information Dimensions, Inc., has introduced ZyImage M/Series, a Windows-based document imaging and retrieval system compatible with Calera Recognition Systems, Inc.'s M/Series.

Calera's M/Series is a reduced instruction set computing-based line of production optical character recognition (OCR) hardware and software systems that the company claimed can perform OCR up to 1,000% faster than competing products.

ZyImage M/Series scans documents, performs OCR and indexes and stores the document image and the optically character-read text, according to Zylab in Buffalo Grove, Ill. With a single mouse click, users can retrieve a document by doing a full-text search. ZyImage M/Series was designed to handle high-volume and time-critical applications including research, litigation support and back-office conversion.

A scanning interface costs $1,995 for a single-user scan station module and $4,995 for a network license.

▶ *ZyLab*
(708) 459-8000

Lysis Corp. in Decatur, Ga., has introduced 2100, groupware for automation of customer support departments and help desks that use Windows as a graphical user interface.

The product was designed for client/server environments and is a desktop client that communicates with Unix-, Digital Equipment Corp. VAX- or Novell, Inc. NetWare-compatible servers. The support automation software enables users to keep track of outstanding problems until they are resolved, log incoming support calls, find answers stored in an answer base and share information among users in a workgroup.

▶ *Lysis*
(404) 378-3350

Intersecting Concepts has announced DiskMizer, a data-compression utility designed to double the capacity of Digital Equipment Corp.'s VAX hard disks.

The product uses the company's compression technology to develop one or more new Files-11 volumes to store data in compressed format. User applications access the compressed DiskMizer volumes identically to any other Files-11 volume, according to the Agoura Hills, Calif., company. DiskMizer can dynamically allocate space for compressed storage on any VAX/VMS ODS-2 hard disk.

It ships with an array of utilities that provide compression predicting, compression reporting, configuration and control and file-moving functionality.

Prices begin at $349.

▶ *Intersecting Concepts*
(818) 879-0066

Walker Interactive Systems, Inc. has announced Project Cost Management, a system that provides up-to-the-minute information for controlling projects from an operational perspective.

Project Cost Management was designed for distributed computing environments such as Unix-based systems and IBM mainframes, according to the San Francisco company. Its capabilities include monitoring, maintenance, expenditures, closures and handling project initiation. It provides information to support variance and exception reporting, performance evaluation and forecasting and planning.

Project Cost Management is integrated with the company's Accounts Payable, Inventory and Purchase Order Management systems and can integrate with non-Walker payroll packages for real-time access to all project-related data.

Prices range from $250,000 to $375,000.

▶ *Walker Interactive Systems*
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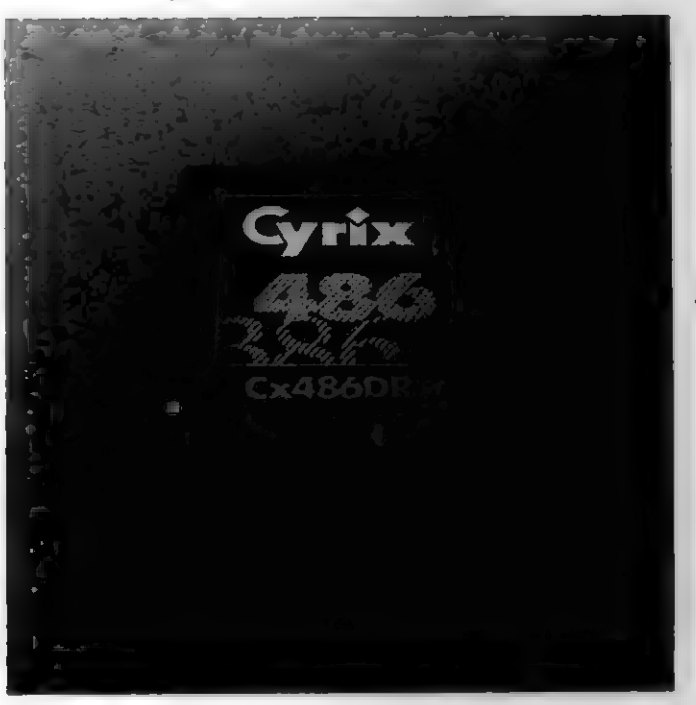

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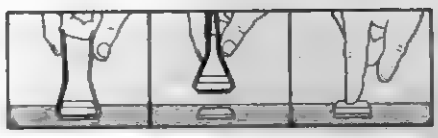

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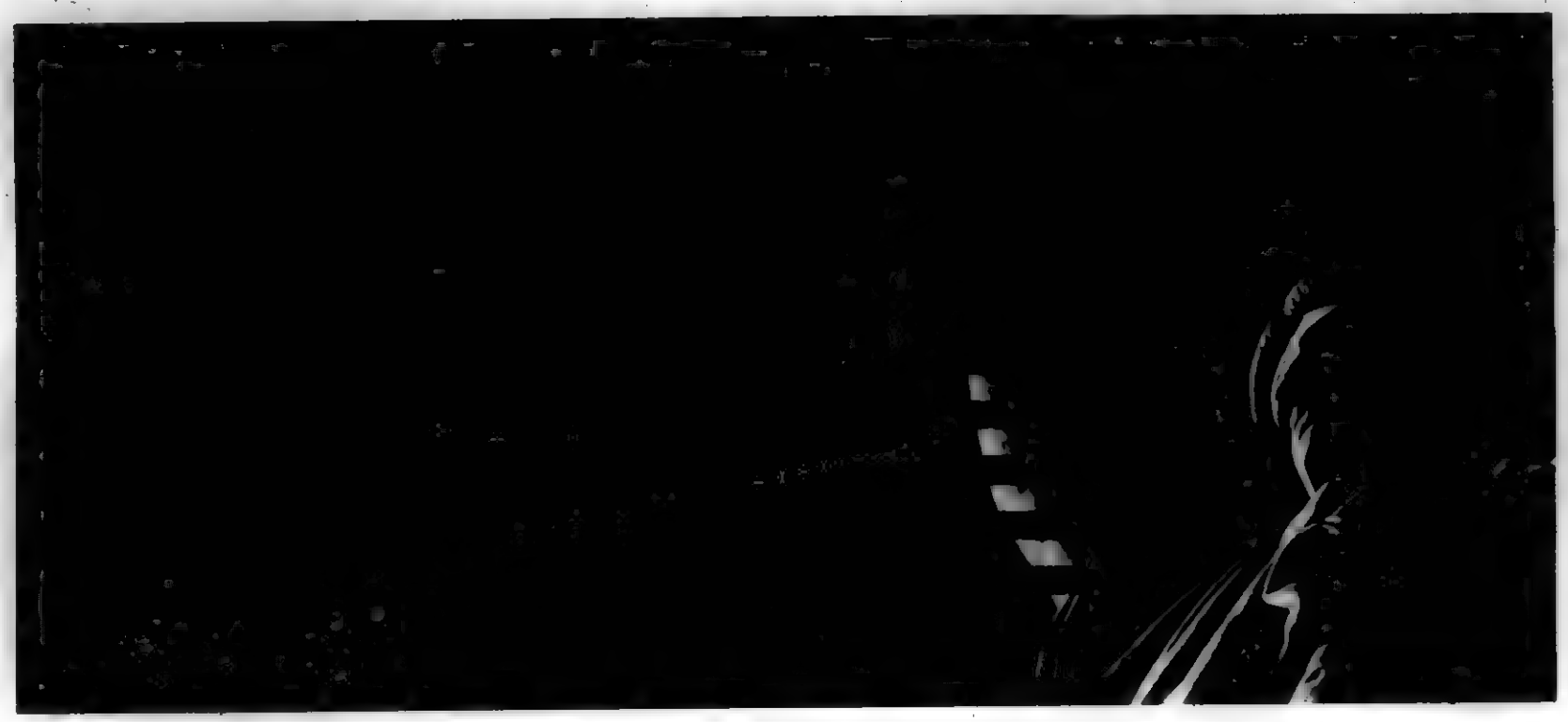

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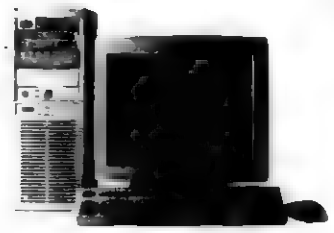

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AT&T fires wide-area barrage

Seeks to allay user expertise, security concerns

By Joanie M. Wexler

AT&T has been on a mission lately to refine its wide-area network offerings to keep pace with user concerns surrounding network management, security and billing.

Recent AT&T moves include the rollout of a packaged local-area network interconnect and an end-to-end network management offering, as well as backup and administrative enhancements to the AT&T dial-up Information Access Service (IAS).

Targeting users seeking outside wide-area expertise, AT&T introduced AccuWAN late last month. It is a bundled service that combines LAN-to-WAN access equipment and links, T1-and-below-speed WAN circuits and ongoing AT&T network management services down to the network adapter card level. Charges appear on one bill.

The package targets firms shy on WAN expertise or without traffic volumes to leverage Tariff 12 discounts, said Bob Aquilina, marketing vice president of AT&T Accunet services.

Wide-area needs

For example, beta-test customer White & Case, a New York-based law firm, is testing the service at three sites with an eye toward a possible expansion to its 23 global locations, said Grant Liang, director of information systems.

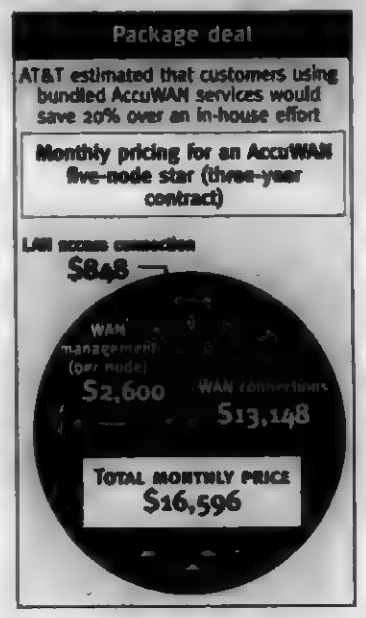
Liang said his main incentive is having AT&T monitor and help troubleshoot the WAN. "We do have a technical liaison at each remote office, but the expertise is limited," he said.

Aquilina said AccuWAN should save companies 20% over the cost of purchasing and managing the services separately (see chart). Liang pointed out, though, that the "full pricing for AccuWAN has not been defined yet," making cost analysis difficult.

In a separate move, AT&T said it will enhance its IAS dial-up data service for mobile and other remote users in the first quarter of next year. The "800" service allows scattered users to access corporate hosts by dialing one consistent, local, toll-free number from wherever they are.

AT&T plans to add fatter, 56K bit/sec. backup access pipes to existing 9.6K and 14.4K bit/sec. IAS backup. It also plans to add features that will allow central network administrators to remotely add and delete users and monitor call details on a user-ID basis.

Two IAS users, Northwestern Mutual Life Insurance Co. in Milwaukee and Pacific Brokerage Services, Inc. in Los Angeles, said they run a single ID and password for all IAS users, so the per-user administrative features would not apply to them.



However, although Northwestern Mutual already has dual 56K bit/sec. access lines to handle peak loads, and traffic can switch over to one if the other goes down, "it gives us the shivers to run on one line," said Hugh Hoffman, assistant director of IS. "So we would consider the 56K backup."

Similarly, Robert C. Rice, vice president at Pacific Brokerage, said that while he uses Metropolitan Fiber Systems, Inc.'s redundant fiber network for local access, he would be interested because there is always a possibility of an outage.

Meanwhile, in the higher-speed arena, last week AT&T announced a high-speed fractional T3 service aimed at users looking to aggregate lower-speed network traffic. Dubbed "T32," the dedicated offering will provide users looking for circuits less pricey than T3 with about three-fourths the bandwidth (32M bit/sec.) of the carrier's "T45" (45M bit/sec.) T3 service, according to an AT&T spokesman.

AT&T offered the following comparative pricing sample: A 1,000-mile T32 link from Addison, Texas, to Akron, Ohio, would run $55,000 per month, compared with $63,800 per month for a full T3. Neither price includes local access charges.

Rolm taps Windows

In a move that competes somewhat with AT&T/Novell, Inc. efforts to integrate telephone and PC functions, such as consolidating electronic and voice messaging, phone maker Rolm is making strides toward off-the-shelf applications based on Telephony Application Programming Interface (TAPI), a joint Windows-based offering from Intel Corp. and Microsoft Corp.

Rolm is building software modules for its RolmPhone 600 series that support TAPI. TAPI support would allow third-party developers to build PC applications that could interface with Rolm phones, or, via TAPI, other vendors' phones, said Tony Tizzot, Rolm group manager for systems marketing.

"This will allow users to go to the market for what they want instead of waiting for Rolm" to develop various kinds of horizontal applications, he said.

According to Jim Burton, principal at consultancy C-T Link in Weston, Mass., both the TAPI and AT&T/Novell approaches will find niches. "If you're a power user, you'll want the kind of [TAPI-based] interfaces Rolm has. But from an administrator's point of view, the server-based approach means you don't have to change anything at the desktop and is more suited to running a call center," he said. —*Joanie M. Wexler*

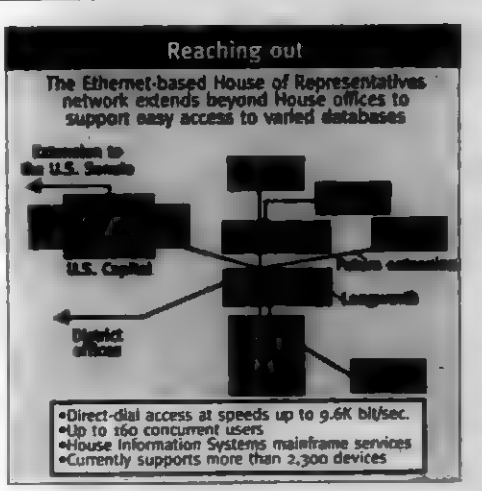
Capitol Hill net moves to client/server

By James Daly
WASHINGTON, D.C.

In the nation's capital, information is power. Those who lack it will do anything to gain it. Those who have it guard it ferociously.

Probably nowhere in this city is that quest for knowledge more acutely realized than in the halls of Congress, where the difference between knowing and not knowing can mean victory or defeat for amendments, entire bills or even congressmen on Election Day.

At the House Information Systems (HIS), the computer technology center of the U.S. House of Representatives, 254 staffers employ a $21.5 million annual budget to make sure every legislator is on equal informational footing.



It is a demanding task, said Hamish Murray, HIS director. "We have more than 400 members of the House, and every one of them needs to be treated like a CEO," Murray said.

That is getting easier these days, thanks to the installation of a new client/server-based informational system called Integrated Systems and Information Services (ISIS). The system, completed in January, provides congressmen and their staffs with an open door into government and legislative data that for years had been buried in a thicket of technology.

Plugged in

For nearly 15 years, HIS' chief informational bloodline has been the IBM host-based Member Information Network (MIN). The network provides approximately 12,000 users on Capitol Hill and hundreds of district offices nationwide with on-line access to a broad array of information resources. These include wire service news, regional demographic and statistical analyses as well as detailed information on legislative activity in the House.

Using MIN, members can pull up a wide variety of information, such as unemployment figures in their congressional district or the schedule for the upcoming week's floor action.

"Everything [is] in there, but it sometimes [isn't] all that easy to find," said Jack Belcher,

Capitol Hill, *page 68*

ON SITE

U.S. House of Representatives
Washington, D.C.

Challenge: To simplify data retrieval and manipulation for House members and staffs.

Technology: IBM ES/9000; Sun 690 server; Ethernet, NetWare and Macintosh networks.

Benefits: Common access to networks through single gateway.

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NetView for Alpha plans remain unsettled

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. is still putting together concrete plans for migrating users of its DECmcc network management software to IBM's NetView/6000 platform, which Digital recently licensed as the network manager for its Alpha AXP systems.

Digital said it expects to provide more details on the shift to NetView/6000 next month. But first, the company has to settle on a marketing and development strategy for NetView/6000, including a firm schedule for adding various Digital-plus support for terminal servers and wide-area network bridges, will start being added "over the next couple quarters," Biedrzycki said. However, the exact schedule of the rollout is still being plotted.

Pricing deals are planned for DECmcc users who want to move to Polycenter NetView, but the scope of the discounts has also not been finalized, Biedrzycki noted. Likewise, Digital is not providing details on migration tools that it said will convert databases from DECmcc to Polycenter NetView.

Meanwhile, only about half of the 50 or so applications developed by Digital for DECmcc are likely to be ported over to the NetView/6000 platform, Biedrzycki said. The company is reviewing the applications and is close to deciding on which ones will be left behind, he added.

Changing horses

After five years of pushing its DECmcc network manager, Digital is switching to IBM's NetView/6000 technology for Alpha AXP systems in order to gain access to more third-party applications than it was able to attract to DECmcc

specific management functions to the IBM technology.

"We don't have a specific plan right now that we're able to hang our hat on," said Dennis Biedrzycki, marketing manager for Digital's Polycenter management product line. Also still being worked out is a sharp cutback in the company's roster of network management applications, he added.

The first Alpha release of NetView/6000, which Digital will market as Polycenter NetView [CW, Aug. 30], will include support for DECnet Phase IV networking protocols when it ships in the first quarter of 1994 for use with the company's DEC OSF/1 operating system, Biedrzycki said.

Capabilities for managing DECnet/Open Systems Interconnect and Fiber Distributed Data Interface networks,

Engineering answers

Despite the lack of fleshed-out migration plans, Matt Holdrege, senior network specialist at PacifiCare Health Systems, Inc., a Cypress, Calif., health maintenance organization, said talks with Digital engineers had answered most of his concerns about the transition to Polycenter NetView.

Digital's move to use the IBM technology looks "promising" in terms of getting access to more third-party applications, Holdrege said, and all Polycenter applications important to PacifiCare appear likely to be ported to Polycenter NetView.

NetView deal clouds SunNet horizon

Digital's licensing of NetView/6000 is likely to make life more difficult for Sun Microsystems, Inc.'s SunNet Manager platform, analysts said.

SunNet Manager was the leading Unix network manager in unit shipments during 1992 and probably remains ahead of Hewlett-Packard Co.'s OpenView technology, although the two are now "very close," said Richard Villars, an analyst at International Data Corp. in Framingham, Mass.

And with Digital joining IBM and HP in supporting OpenView, the technology on which NetView/6000 is based, Villars and others said the status quo may not remain for long.

"Sun could really get rolled over here," said Wes Melling, an analyst at Gartner Group, Inc., a consultancy in Stamford, Conn. "They're going to have to be a very agile ferret to stand in front of an elephant stampede."

Charlie Robbins, an analyst at Aberdeen Group, a consulting firm in Boston, agreed that Sun is "kind of left holding the bag." Users and software vendors may now focus more on OpenView and its derivatives because of the combined weight of the trio backing that technology, he said.

—Craig Stedman

"I'm not expecting to lose anything," he said.

Frank Brake, director of international operations for technology business development at Newport News Shipbuilding and Drydock Co. in Newport News, Va., said he also is not worried about the prospect of converting from DECmcc.

The decision to drop DECmcc "was absolutely the right thing to do," Brake said, although he noted that Digital and IBM still have to follow through on their promises as they jointly port NetView/6000 to the Alpha line. "They've got a lot of wickets to go through," he said. "The proof of the pudding will be in the implementation."

"It all sounds good, but they've got a lot of work ahead of them," added Charlie Robbins, an analyst at Aberdeen Group, a consulting firm in Boston.

The DEC OSF/1 release of Polycenter NetView is scheduled to be followed by a version for Microsoft Corp.'s Windows NT in mid-1994 and one for Digital's OpenVMS operating system late next year or in early 1995, Biedrzycki said. He added that Digital decided it made more marketing sense to put OpenVMS third on the porting list.

Internet mail package upgraded

By Lynda Radosevich
SAN FRANCISCO

Qualcomm, Inc., a satellite communications company here, has introduced an updated commercial version of its electronic-mail software that is currently available for free on the Internet.

Called Eudora, the product adds a price tag, new features, service and support to the free package.

The main benefit of the package is its ability to send E-mail between PCs and Macintosh computers across Transmission Control Protocol/Internet Protocol networks (namely the Internet) without using translation software or dedicated servers.

Shipping this month, the Macintosh version's features include AppleEvent support and drag and drop attachment. The PC version supports Multiple Document Interface, a Windows feature, and is expected to ship near the end of the year.

Both versions offer message filtering as well as the ability to transport Multipurpose Internet Mail Extension documents.

The software costs $50 per user for fewer than 10 users and sequentially less for additional users.

ObjectView Tech Talk

Ethernet beckons telephone apps

By Joanie M. Wexler
ATLANTA

It will not be long before a corporate telephone call center can participate as a node on an Ethernet local-area network.

In a bold telecommunications/information systems integration move, San Jose, Calif.-based Aspect Telecommunications ventured into IS territory recently at the Incoming Call Center Management Conference here. The voice-oriented vendor unveiled a product suite for its CallCenter automatic call distributor (ACD) aimed at giving business managers a look at both real-time and historical telephone activity from their LAN-based PCs.

Aspect Telecommunications' *EnterpriseAccess gives LAN-based workers a view into the call center*

ACD is software that runs on a private branch exchange (PBX) or, as in Aspect's case, a software/hardware system that plugs into a PBX to route and distribute incoming voice calls. ACDs are prevalent in firms that base much of their business on telephone contact, such as airline reservation systems, catalog companies and technical support departments.

The purpose of Aspect's SQL-based EnterpriseAccess platform and corresponding Windows-based applications is to allow business users to monitor and analyze telephone activity as they would any piece of data factoring into the decision-making equation, said Roger D. Bacon, Aspect vice president of marketing. "For example, your workstation could tell you the call center is running 4,000 calls per hour since an ad campaign broke," he said.

One current CallCenter customer said the timing of EnterpriseAccess' arrival is "excellent for our needs. Our marketing representatives want to know more and more about call activity; they want to look at a screen and know how many calls are coming in," said Michael Clarke, telecommunications supervisor at Intuit, a Menlo Park, Calif., software maker.

This data is provided in most companies on a per-request basis, in report form, by the telecommunications staff.

However, "We're seeing a whole new kind of IS manager emerging: one who simply owns applications," said Nancy Jamison, senior industry analyst at research firm Dataquest, Inc. in San Jose, who said Aspect has "raised the bar" in reporting real-time statistics. "This [voice] will become just another application."

With the Aspect approach, executives should be able to see instantaneously how a Christmas coupon is performing or quickly change staffing to accommodate a call-flow shift if an airline suddenly slashes prices, she said.

Working in the other direction, corporate technical support staff receiving queries or complaints in the call center could "pop off a question to an engineer over the LAN while the caller is on the line, rather than having to call him back," she said.

The first iteration of EnterpriseAccess products is slated to ship in the fourth quarter, including the following:

- A $2,000 Ethernet Transmission Control Protocol/Internet Protocol link from the Aspect CallCenter to a company's LAN for viewing real-time activity.
- A $2,000 sister product for accessing after-the-fact call information.
- CustomView, a $14,995 Windows application development tool that allows a PC user to create customized views of call transaction events in progress.
- CustomView Director, $595, which lets users display these views on their PCs.
- CustomView Editor, a spreadsheet-based graphical report generator for historical information.

The EnterpriseAccess architecture "lets us take anything happening on the telephony side and plug it into the IS side of the house," Bacon said. He added that this will likely include Simple Network Management Protocol-based management for blending call center and networked systems management by late 1994 or early 1995.

Phones, LANs do smiling dance

Several companies participate in the computer-integrated telephony market, including IBM with its CallPath product. Such one-way, system-specific software connects incoming calls to corporate databases, a first step for merging IS and telephony with emphasis on faster call handling. In addition, firms such as San Jose, Calif.-based VMX, Inc. have announced voice-mail applications for LANs that let users store voice-mail as messages on their PCs.

Briefs

HP PC cards

Hewlett-Packard Co. announced Net Advisor PC Cards that are said to turn PCs on a Token Ring or Ethernet local-area network into analysis stations that can decode in real time a wide range of LAN protocols, such as Novell, Inc.'s IPX and Banyan Systems, Inc.'s Vines IP. An expert system is said to help the user identify network faults faster. The cards support Intel Corp. 80386- and 1486-based PCs. They are priced at $12,000 for a Token Ring or Ethernet card.

McData gateway

McData Corp. in Broomfield, Colo., announced enhancements to its LAN gateway to IBM Systems Network Architecture (SNA) hosts, based on Novell's NetWare for SAA. McData's Advanced SNA/IP Gateway supports SNA on top of Transaction Control Protocol/Internet Protocol (TCP/IP) so that NetWare for SAA clients can access hosts over an existing TCP/IP backbone, according to McData. Slated to be available in the first quarter of 1994, the package will be priced at approximately $1,500.

Bundle eases remote communications

By Michael Fitzgerald
BOTHELL, WASH.

In what could give users a way to eliminate mixing and matching separate software programs for modem, fax and remote system access, Traveling Software, Inc. has announced CommWorks for Windows, a package with five software utilities in one.

The five utilities in CommWorks for Windows are the following:

- **LapLink V**, its latest file transfer program.
- **LapLink Remote Access**, a two-way access program for remote users that runs in the background, allowing the system to be accessed while it is in use.
- **TS Fax**, which lets users annotate, send and receive faxes.
- **TS OnLine**, a communications package.
- **LapLink Alert**, which notifies users when they get items over the electronic transom.

While CommWorks was designed to let users replace their communications packages, such as Digital Communications Associates, Inc.'s CrossTalk modem package or Microcom, Inc.'s Carbon Copy remote access program, any of the five utilities can be deinstalled by users and mixed and matched with existing communications utilities.

Beta-test users credited CommWorks for Windows with making their lives easier.

"Our salespeople are not computer people, and CommWorks has allowed us a safe, easy way to update data," said Thomas Balzarini, "doctor of PCs" at Associated Grocers, Inc. in Seattle. "We'll definitely standardize on this — it's saved us a ton of grief. LapLink is hard to use for the average person, but CommWorks has made it nice and easy."

Feature-rich

"It has a lot of little features that can do good things for people who have notebooks and desktop PCs," Balzarini added. Balzarini said CommWorks seems to have enough solid features so that over time Associated Grocers would probably move to its utilities. For now, however, the company plans to strip out tools such as the modem package.

Traveling Software's goal is to replace communications utilities, said Mark Eppley, the company's chairman and chief executive officer. Eppley predicted that CommWorks was "the first of a generation of multifunction utilities" and that "stand-alone software packages like Procomm and WinFax will go away in the future."

Analysts praised the product and the concept but stopped short of supporting Eppley's contention.

"I don't think [other communications software] is going to get nuked, but it will certainly blur the categories between separate communications utilities," said Brent Williams, PC software program director at International Data Corp. in Mountain View, Calif.

CommWorks is based on Universal Communications Object technology, the communications engine that Traveling Software builds its applications around to allow data transfer among different platforms.

"Nobody has really been able to pull off putting together a bundle of communications products before. People have not been thinking in terms of putting together comprehensive communications offerings," Williams said.

CommWorks will cost $149.95 through year's end if purchased from Traveling Software and $199.95 if purchased from resellers. It costs $69.95 for current Traveling Software users.

Accounting and sales

can't seem

to get in tune.

Marketing

is fiddling around

on their own.

And basically,

everyone seems to be marching to their own drummer.

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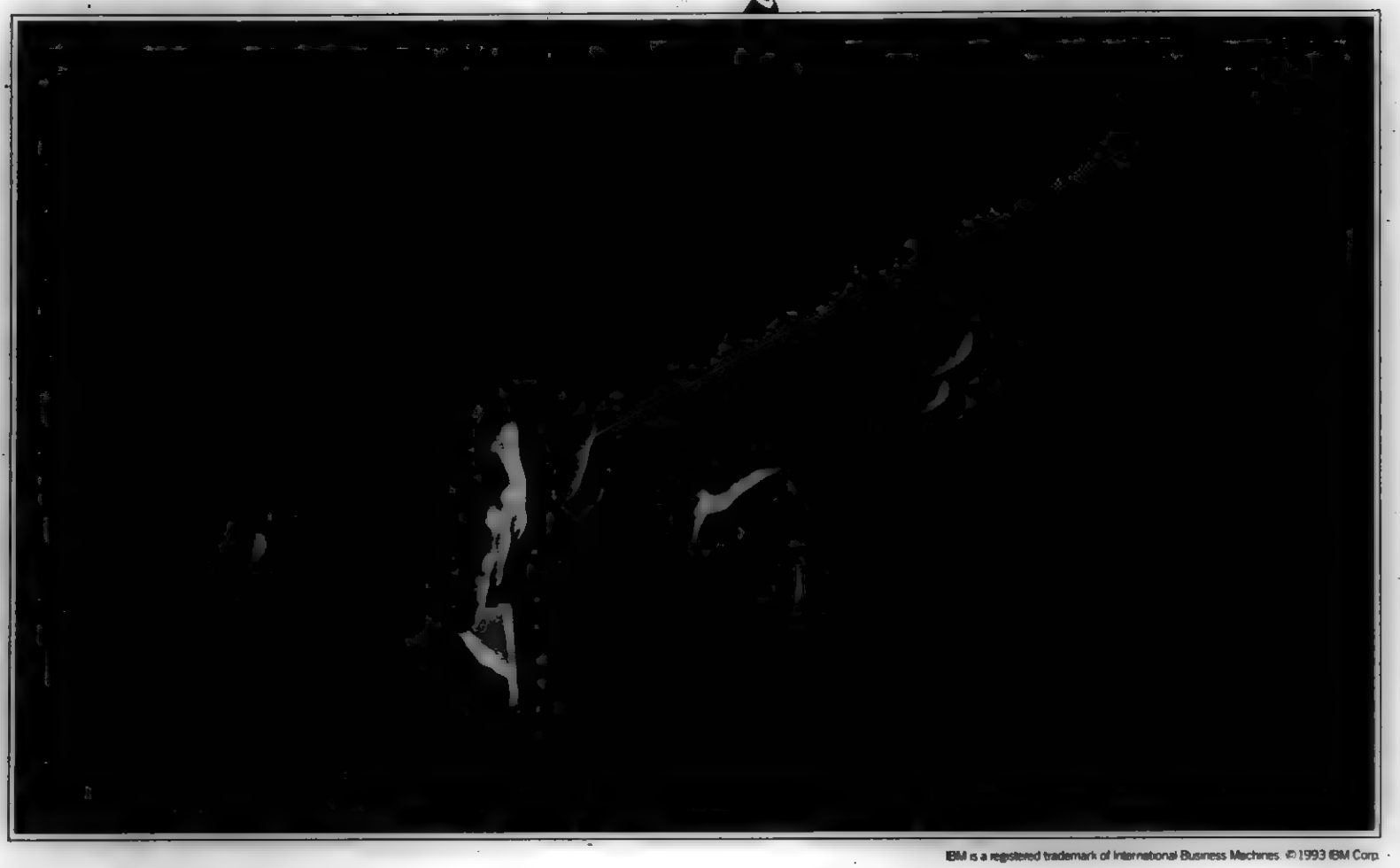
IBM Client/Server



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Capitol Hill

CONTINUED FROM PAGE 61

manager of information systems. For one thing, MIN has begun to show its age. For example, much of MIN's Cobol-based code is difficult to maintain. In addition, MIN's command-driven interface places heavy demands on HIS instructors who are already stretched by a member/staff turnover rate averaging 40% a year.

Worse still, information is distributed across 80 separate databases on a wide variety of hardware and software. As a result, MIN users have to know in advance which databases have the information they need, and they are often required to enter and exit multiple MIN applications to meld related pieces of information into a coherent whole.

Nearly three years ago, the HIS embarked on a project to migrate the IBM Enterprise System/9000-based MIN to the client/server design of ISIS.

Transparent access

"What we're trying to do with ISIS is let users stay in one application and go off and get information from another application without needing to know where the information is coming from," said Kathy Bye, deputy manager for the customer applications group.

Although ISIS was first developed for the Sun Microsystems, Inc. platform, HIS would have needed to port it to the VAX/VMS platform soon thereafter. HIS was not switching platforms but rather had to develop it on the Sun platform and make sure it worked before deploying it on others.

Because HIS had chosen Sybase, Inc.'s software as the database engine, it began using Sybase's APT Workbench. However, the fit turned out to be awkward. "APT is very transaction-oriented, meaning you'd pull down entire files instead of just rows of specific data," said Jim Daley, HIS database administrator. He added that he also found APT's programming interface difficult.

Instead, HIS switched to JYACC, Inc.'s JAM application builder, "which allowed us to do things with far less code and emphasized our information retrieval process," Daley said.

Congressional passageway

In September 1991, client development began in earnest and by this past spring, ISIS was providing the 103rd Congress with a single doorway into an elaborate informational network.

The House Internet supports more than 2,300 end devices on a wide range and growing number of computer systems. It comprises more than 150 Novell, Inc. NetWare networks, 35 Macintosh networks, 12 Digital Equipment Corp. VAX computers and eight Unix computers. There are more than 125 terminal servers, with a potential of 10 connections each.

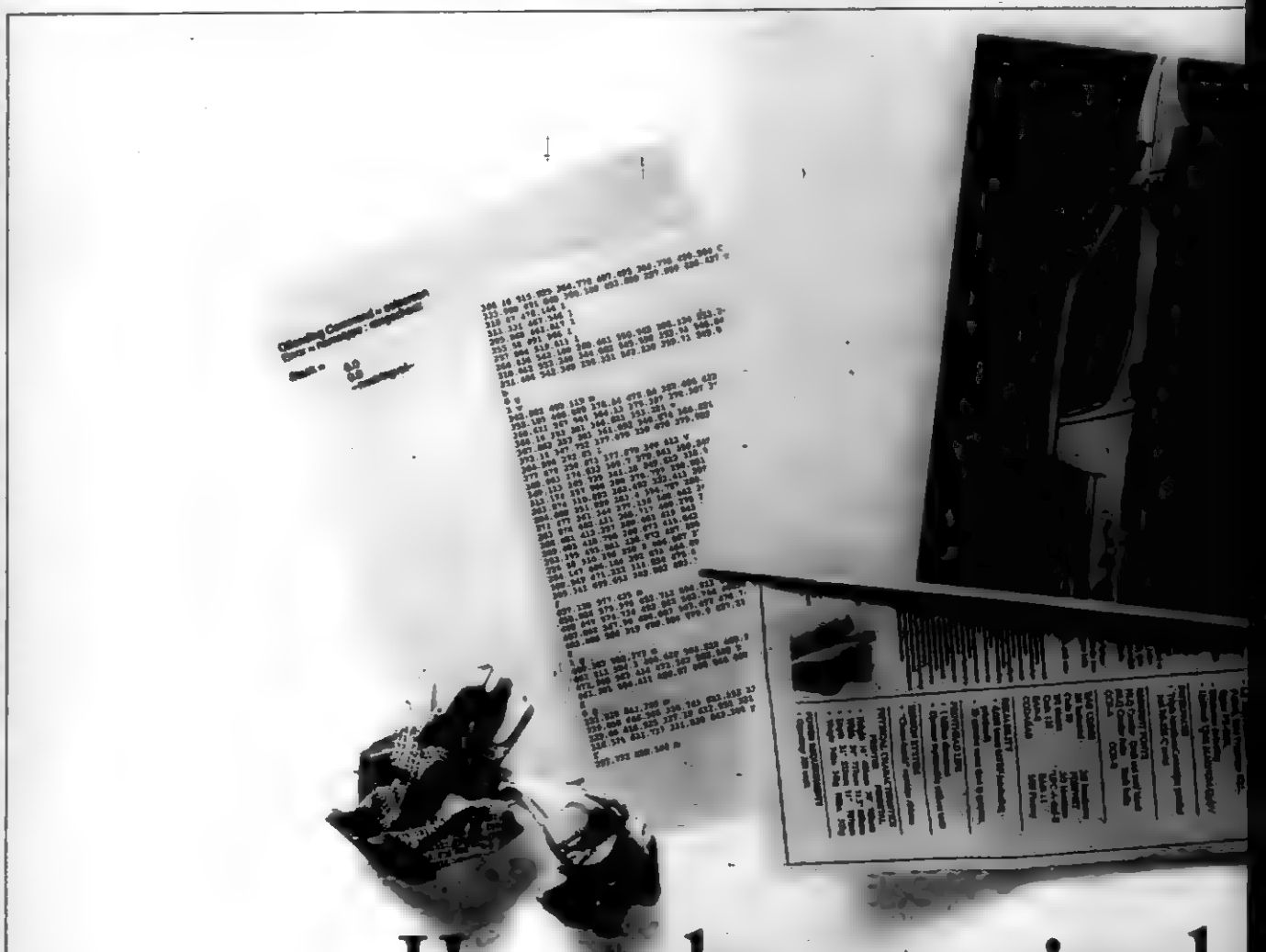
ISIS is organized using a "library" metaphor, with individual resources grouped within "bookshelves," or functional areas. For example, users on any of the more than 3,000 nodes on the House Ethernet can dial into the Newswire's "library." From there they can travel to the Associated Press and Reuters "bookshelves" and then finally pull down the story they are looking for.

Users no longer need to jump from one database to another to complete a task, Belcher said. "All related information is accessible from within one application," he noted.

Access to ISIS is available on a range of devices from low-end terminal displays through high-end PCs. Daley said they needed to build user interfaces for low-end clients on terminals attached to the Sun 690 server and midlevel clients on Digital terminals attached to VAXs.

The system can be custom-tailored to gather information that may be of specific interest to particular legislators. For example, San Francisco Congresswoman Nancy Pelosi may want to get news about earthquakes, while Dan Rostenkowski of Illinois may be interested in information about crop subsidies.

Users can still access information in MIN through a split-screen process, Belcher said. But as more information is moved from MIN into ISIS, MIN may become less important to users. "MIN is still operational and probably always will be," he said. "There are still people who just want to get in, grab a specific file and get out. But clearly, ISIS is the way of the future."



How to keep a mixed from becoming a mixed-

Sharing printers can be a real headache. No matter if it's emulation sensing, page orientation or resolution settings, something always seems to be going wrong. In fact, up to 50% of trouble calls to network administrators are printer related.

That's why we developed VPT™-Virtual Printer Technology™- and incorporated it into our new LZR 1580 and LZR 2080 network laser printers. VPT is a revolutionary new network architecture that enables a single printer to become 64 individually configured "virtual" printers.

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"It takes network printing one step beyond what any supplier has done so far."
—Bill Gott, InfoCorp, as quoted in InfoWorld

VPT provides users the benefits of having their very own printer while giving network administrators maximum flexibility and control. It also lets users access the more advanced features of

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[redacted]

Peer Networks in Santa Clara, Calif., has announced Torpedo.

The software add-in program is said to enable network administrators to use the commands of Lotus Development Corp.'s 1-2-3 spreadsheet to perform Simple Network Management Protocol (SNMP)-based network management.

Torpedo contains libraries that implement Lotus @ functions and macros that implement SNMP gets, sets and traps, which are used to set thresholds and collect management data from managed devices.

A Microsoft Corp. Excel version of Torpedo is scheduled for release at an undisclosed date.

Torpedo costs $10 per copy when bought in volume.

▶ *Peer Networks*
(408) 727-4111

Delrina Corp. has announced Delrina WinFax Pro for Networks, network-based fax software designed for Windows users.

According to the Toronto company, the product enables all users on a network to send and receive faxes directly from their PCs by sharing one or more standard fax modems.

Delrina WinFax Pro for Networks does not require a dedicated server. It uses any standard Class 1, Class 2 or Intel Corp. fax modem and WinFax Pro 3.0 fax communications software as its front end. The software is scalable.

Delrina WinFax Pro for Networks costs $399 and comes with a base package that includes two copies of network-capable WinFax Pro 3.0 and WinFax Pro for Networks Server.

▶ *Delrina*
(416) 441-3676

Scopus Technology, Inc. has announced the integration of SupportTeam, a customer service module of the ProTeam system, with the T-Server from Genesys, Inc. The T-Server is middleware that provides a common interface designed to enable easy integration of telephony devices with customer support applications.

According to the Emeryville, Calif., company, ProTeam is groupware that automates and integrates the operations of engineering, technical support, sales and marketing and quality assurance.

Because of the integration, customer support personnel can use devices such as private branch exchanges, automated call distributors, voice messaging systems, integrated voice-response units and predictive dialers for service environments.

A typical configuration designed for five support people and 20 engineers is priced at approximately $40,000.

▶ *Scopus Technology*
(510) 428-0500

ProTools, Inc. has announced support for distributed IBM Systems Network Architecture (SNA) environments.

According to the Beaverton, Ore., company, the ProTools Network Analysis series can now perform console-agent network analysis across interconnected SNA networks in conjunction with IBM's Communications Manager/2 and AnyNet/2 products.

ProTools' Network Analysis series offers Foundation Manager, which is a stand-alone analyzer and Systems Network Management Protocol Remote Monitoring (Rmon) management information base manager for up to 256 networks.

Two agents are also provided: Cornerstone Agent, a Rmon agent plus real-time analyzer; and ProbePlus, a hardware-only Rmon agent.

Foundation Manager costs $10,795. Cornerstone Agent and ProbePlus cost $1,550 and $3,995, respectively.

▶ *ProTools*
(503) 645-5400

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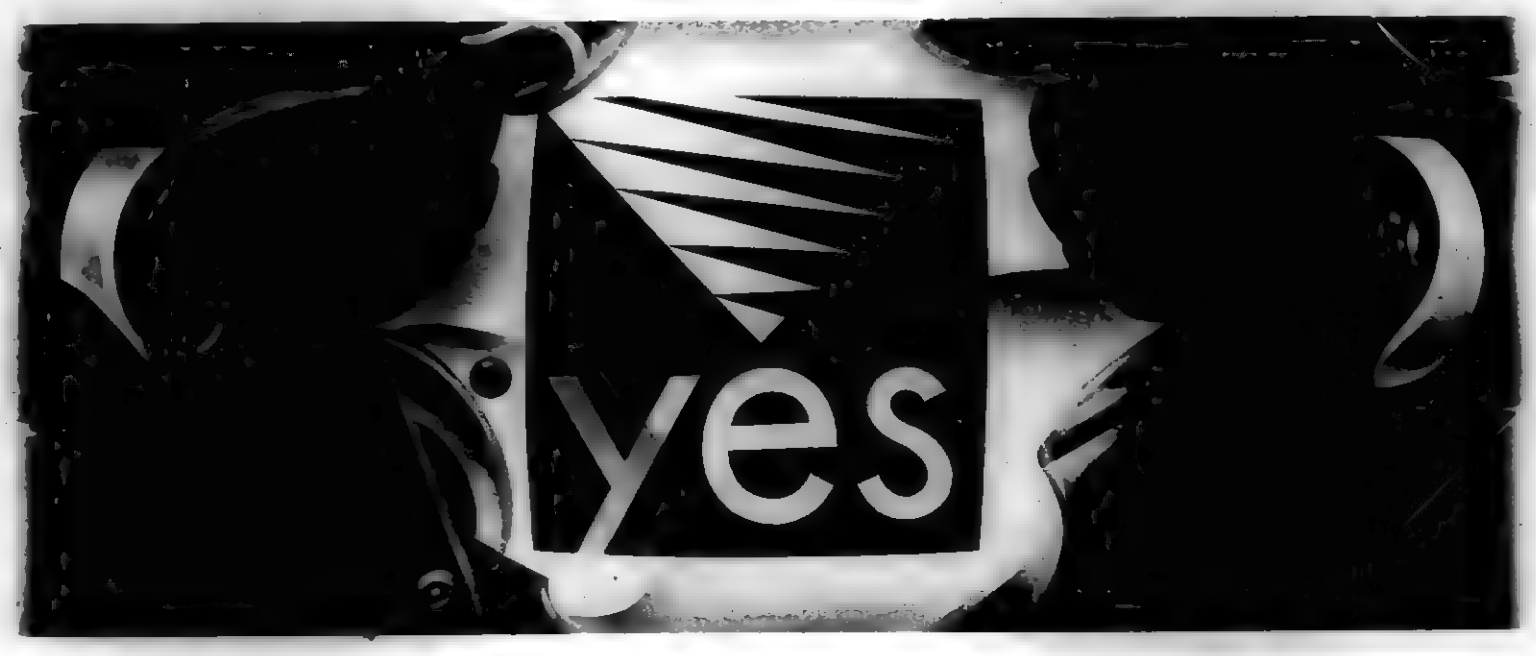

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Managing distributed systems dilemmas

By Johanna Ambrosio

Some users faced with a herd of scattered systems have begun adopting real solutions for managing them.

From tracking storage and work load across machines to determining a systems management architecture for the next decade, here is a look at three users who have tackled, or at least started to address, the distributed systems management beast.

Framework feat

In April, Tektronix, Inc. in Beaverton, Ore., began testing its Compute Systems Environment (CSE), a framework that defines and standardizes applications and interfaces for end users. It does pretty much the same for back-room operations, including systems management.

Bryce Schroeder manages technical computing for two Tektronix business units. His 22 employees support some 1,200 end users on 600 Sun Microsystems, Inc. Unix-based machines and 500 X Window System terminals.

Explanation time

"In a distributed environment, you're lost without tools and diagnostic capabilities. And it doesn't make the end user very happy when you can't tell him what the hell went wrong." — Bryce Schroeder, Tektronix

"CSE will deliver the same tools and data sets to every desktop inside the environment, so the engineer will see the same project information no matter where he or she sits," Schroeder said. "A consistent backroom environment comes along with it."

That back-room portion calls for five servers dedicated to specific tasks, including systems management, a general-purpose machine that hosts applications, a file server, a compute server and a database server.

Tektronix adopted this approach, Schroeder said, because "we need to provide consistently high performance, and the only way to do that is to tune. But you cannot tune in a distributed environment unless you can segment things into pieces."

All the software Tektronix uses for that task will reside on the systems management server. This includes Rdist, a Unix tool that provides copy and revision control across the network, and Sun's Network Information Service, which comes standard with the operating system and handles things such as password updates.

Other systems management tools include help desk software — the company is replacing its homegrown software with a package — and Tivoli Systems, Inc.'s Tivoli Management Environment, an object-oriented framework that includes applications and services.

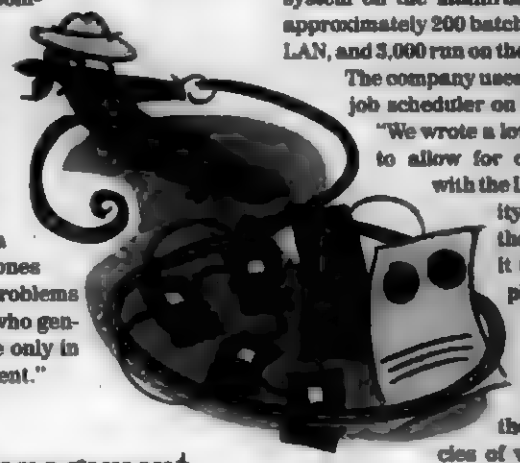
CSE goes into production this month; Schroeder said he hopes to have it rolled out to 75% of his end users by next June.

Data, data everywhere

You might reason that any organization using Convex Computer Corp. machines as dedicated file servers wants its data delivered quickly, and you would be correct. End users at Sandia National Laboratories in Albuquerque, N.M., access their data from disk at speeds of 50M bit/sec., according to Sue Kelly, a technical staff member in charge of storage services.

The production network includes two separate networks — one for classified work and the other for unclassified projects. Some 600 machines, evenly split between the two environments, include Hewlett-Packard Co. workstations, Sun machines, Digital Equipment Corp. VAXs and Cray Research, Inc. supercomputers. Each network has one Convex as a file server.

The lab uses OpenVHSM, a package from OpenVision in Pleasanton, Calif., to help get data from any machine to a user who requests it. "End users need to know the file name, but they don't have to know where it is stored," Kelly said. "They do have to be cognizant that if the file was created on a VAX and is being read on a Sun, they need to do some manipulation because of different data formats. We don't have a solution for that."



Because most of the end users are technically savvy engineers, Kelly said, "We do stand a chance. The ones that have problems are the ones who generally operate only in one environment."

LAN management

A few years ago, an end-user department at Provident Life & Accident Insurance Co. in Chattanooga, Tenn., began developing mission-critical business systems on PC local-area networks.

"They came to us and said they'd like some support," recalled Rick Reynolds, manager of operations support. Now the information systems group provides systems programming, scheduling and database support — "really the whole gamut," he said. Reynolds' specialty is scheduling batch jobs on both the mainframe and the PC LAN, which in this case runs under OS/2.

The mainframe and LAN worlds are intertwined, Reynolds said, because the results of some of the jobs run on the LAN — writing checks, for example — are sent up to the company's main financial system on the mainframe. Each night, approximately 200 batch jobs run on the LAN, and 3,000 run on the mainframe.

The company uses IBM's OPC-ESA job scheduler on the mainframe. "We wrote a lot of custom code to allow for communications with the LAN and the ability to start a job on the LAN and track it through to completion," Reynolds said. Also, the mainframe scheduler maintains the rules and policies of what runs when and where.

In addition to writing extensions to the mainframe package to handle LAN scheduling, Provident wrote a file-transfer program to move data quickly between the host and PC worlds. "What you get with OS/2 is OK if you want to move a word processing file," Reynolds said, "but if you want to do backups or anything large, you need high-volume data transfer."

Although there were some commercially available packages, Provident decided to do this part itself because "we were interested strictly in OS/2 and MVS — not HP or DEC or anything else — and we found we could write something that performed faster," Reynolds said.

HP to expand HP 3000 line at Interex

By Mark Halper
SAN FRANCISCO

Compared with Hewlett-Packard Co. HP 9000 Unix minicomputer users, HP 3000 customers are like ambivalent movie fans who can wait for the videotape release of the latest feature film.

That may explain why the HP 3000 development shop, with its MPE/IX operating system, sometimes trails the Unix 9000 side in new product announcements.

That trend will hold true later this month, when HP is expected to add models to the 3000 line with component specifications that mimic machines HP introduced to the 9000 series last June.

The introductions will coincide with the annual conference here of HP user group Interex, during which a number of software and third-party companies are also expected to unveil newwares.

In suspense

One mystery surrounding the conference is whether HP will choose this forum to take the wraps off its most powerful minicomputers ever — Corporate Business Systems that scale up to eight processors using the latest version of HP's Precision Architecture-RISC chip, the Model 7100.

HP is expected to boost the Corporate Business System series, which includes both Unix and MPE architectures, before the end of its fiscal year on Oct. 31 [CW, Aug. 9].

But one bit of hardware news is almost certain to emerge at the Interex gathering: HP will add boxes to the 3000 line that will incorporate some of the features it added to the 9000 in June.

Like the 9000 boxes, the new 3000 machines are expected to raise performance levels without raising price tags.

Furthermore, users said they expect HP to add dual-processor models to the 3000 line, much as it did in June to the 9000 series, when it also added more 7100-based machines.

An HP spokeswoman confirmed that the company is planning to introduce 3000 machines during the Interex show, but she declined to provide details.

HP maintains that its 9000 customer base is more interested in leading-edge technology than its 3000 user base because 9000 users tend to build their own solutions whereas 3000 users are often content to buy packaged solutions.

Industry watchers further explained that in the 9000's Unix world, HP is under more pressure to provide the latest and greatest goods because the firm faces more competition there than in the market for its relatively proprietary HP 3000.

HP, *page 78*

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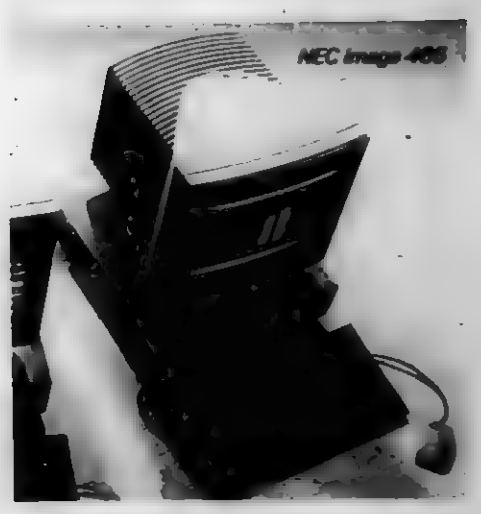

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Growth spurs IS overhaul at Snapple

By Thomas Hoffman
VALLEY STREAM, N.Y.

■ Until recently, information technology took a backseat at Snapple Beverage Corp. while the company enjoyed a dizzying climb to the top ranks of the beverage industry. But dramatic growth — and accelerated competition — have recently forced the company to alter its view of information technology.

Snapple, founded in 1972 as Unadulterated Food Products, Inc. by a handful of Brooklynites with a vision of selling all-natural fruit drinks to health food stores, catapulted onto grocery store shelves across the U.S. and into the hearts of Wall Street investors. The company, whose sales have doubled every year since 1988 to $232 million last year, has watched its stock price soar to $58 per share since its initial public offering of $20 per share last December.

Snapple has seized a commanding share of the $750 million U.S. ready-to-drink iced tea market. That industry, now flooded with entrants looking to cash in on the "New Age" beverage craze sweeping the country, will likely double in size by next year, according to Tom Pirko, president of BevMark, Inc., a Los Angeles-based beverage industry management consultancy. It is only one of several sectors where Pirko and other analysts expect tougher competition for Snapple.

Snapple will "have to be cutting-edge in the information systems revolution. They're going to have to be superintelligent and lightning-quick in their planning. It's as much an information game as it is a product game," Pirko said.

Snapple recently installed a distributed networked architecture to help meet those requirements. Late last month, it replaced an aging McDonnell Douglas Corp. mainframe system with a PC-based network designed to provide electronic data interchange (EDI) and material requirements planning (MRP) links to its co-packagers and distributors, said John-Philip Galinski, director of MIS.

Snapple to fit

Despite its impressive growth, analysts expect $232 million Snapple to face increased competition from partnerships between Coca-Cola Co. and Nestle SA, not to mention Pepsico, Inc.'s ties with Thomas J. Lipton, Inc.

The mainframe, removed last month, had been used to support Snapple's sales, marketing and back-office functions. Until last fall, Snapple did not even have an IS department. Those operations were overseen by the company's founders, controller and marketing department — hardly the type of IS strategy expected from an up-and-coming market force.

But that mind-set began to change in April 1992 when Unadulterated Food Products became Snapple Beverage Corp., after company founders Arnold Greenberg and Leonard Marsh teamed with Thomas H. Lee Co., a Boston-based leveraged buyout firm that paid $130 million for 61% of the company.

With competitors looming on the horizon, Greenberg and Marsh addressed Snapple's IS leadership gap by recruiting Galinski, who had been with the IS staff at Cablevision Systems Corp. in nearby Woodbury, N.Y.

Galinski moved quickly to develop an IS strategy for the firm, starting with a plan to tighten its ties with suppliers.

Because Snapple does not manufacture or distribute any of its products, the company required tighter communications links with the 16 to 24 bottlers that supply more than 300 distributors at peak season in the summer. So the company decided to replace the McDonnell Douglas system with a Novell, Inc. NetWare v3.11 network operating system capable of providing MRP and EDI connectivity from headquarters to those sites, according to Galinski. Snapple had no prior electronic connectivity with its manufacturers or distributors.

A manual past

In the past, Snapple communicated with its manufacturers and distributors over the telephone and entered the information manually onto the mainframe. With the EDI and MRP links, Snapple will be able to automatically download that information daily from its constituents by linking with them through dial-up modems and T-1 connections.

Overall, the PC-based network will cost Snapple approximately $500,000. The system, which includes Cabletron Systems, Inc. smart hubs, a mix of 150 Intel Corp. 80386-based PCs and an as-yet-undetermined set of network superservers, is a more cost-effective route than the IBM Application System/400-based manufacturing and accounting system that Snapple had pondered, Galinski said.

For example, Galinski said Snapple had considered Lawson Software's Lawson Accounting System package for an AS/400 platform, but the software alone would have cost Snapple $700,000 and required full-time on-line connectivity, he said.

Instead, Snapple took an alternate route with the PC-based network that will allow distributors and manufacturers to process their own information locally. The heart of the system, Galinski said, will be Computer Associates International, Inc.'s Accpac Plus for DOS accounting software.

"The MRP system includes advanced algorithms that will help us forecast demand for different Snapple flavors in various regions of the country," Galinski said. "It's more advanced than anything I've seen with any AS/400 software."

Snapple's John-Philip Galinski *wants 'cutting-edge' IS*

ON SITE

Snapple
Valley Stream, N.Y.

Challenge: To replace an aging mainframe system with a PC-based network equipped with EDI and MRP links.

Technology: Novell NetWare v3.11, Intel 80386 PCs, CA's Accpac Plus for DOS.

Expected results: Tighter communications links with its bottlers and distributors.

Cray to release MPP system

By Ellis Booker

Later this month, Cray Research, Inc. will unveil its long-awaited massively parallel processor (MPP) system, the T3D. The new Cray system is based on the Digital Equipment Corp. Alpha chip.

Although Cray declined to provide details in advance of the T3D's formal introduction, the company has said in the past that the first product in its multiphase MPP program would be able to grow to 512 or perhaps 1,024 processors.

Taking the performance of a single Alpha chip and multiplying it by 1,000, this would give a 1,000-processor T3D a performance of approximately 150 billion floating-point operations per second.

As for price, Cray observers predict the T3D will cost between $15 million and $30 million, depending on configuration.

The MPP market into which supercomputer pioneer Cray has stepped is thought by some analysts to be on the brink of significant expansion, with the number of MPP vendors doubling to 30 by next year and the number of systems shipped per year expected to grow from 750 to over 4,000 by 1997.

To date, however, no vendors have succeeded in establishing commercial applications for MPP, which many commercial customers still regard as a scientific research platform.

For Cray, however, this is a nonissue, analysts said.

"Cray is not marketing to the commercial community, which isn't to say they wouldn't like to or might not be planning to," said Michael P. Burwen, president of Palo Alto Management Group, Inc. in Mountain View, Calif. "At the moment, there's no indication Cray is building a business-oriented sales organization." He added that Cray will likely find a strategic partner if it decides to enter the commercial arena.

First of many

The first user of the T3D was the Pittsburgh Supercomputing Center, which said last week it had installed a 32-processor T3D prototype and coupled it to a 16-processor Cray C90, a traditional vector supercomputer. The two machines will work in tandem on problems ranging from global warming to those being addressed by biomedical researchers.

The Pittsburgh center's configuration will be 50 times faster than an earlier configuration, in which a Cray Y-MP supercomputer was linked to a Connection Machine CM-2, the MPP system from Thinking Machines Corp.

"The tight coupling between the T3D and C90 will make it much easier to exploit the parallelism of the T3D," said Michael Levine, co-scientific director of the center. As is the common practice at academic supercomputing sites, the Pittsburgh center and Cray will jointly develop applications software for the T3D.

Pittsburgh acquired the T3D with funds from the Commonwealth of Pennsylvania, the National Science Foundation, the Defense Advanced Research Projects Agency and the National Institutes of Health.

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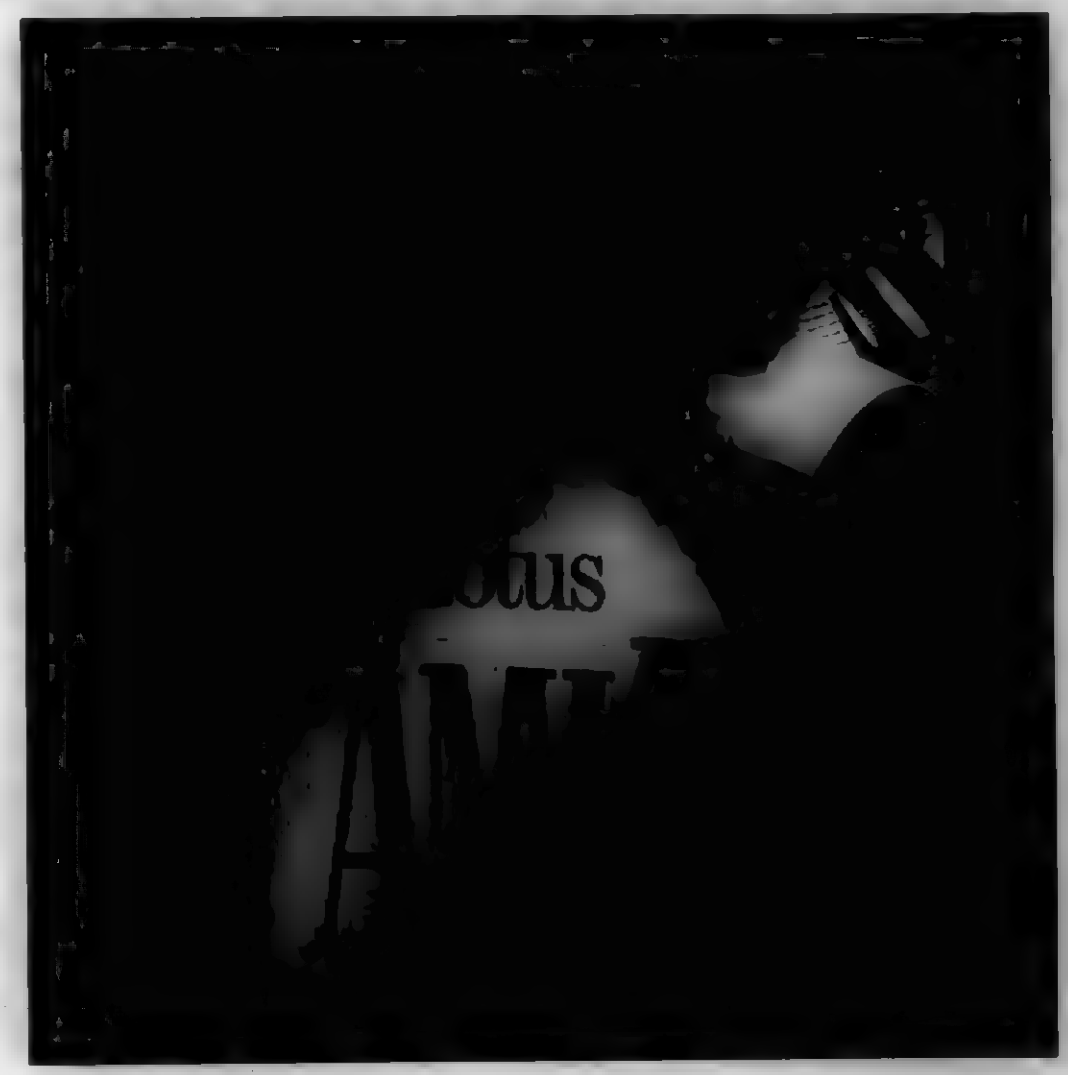

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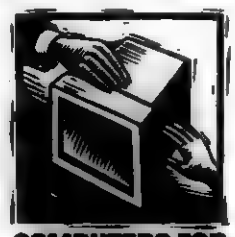

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COMPUTERWORLD

Medical agency prescribes record cure

Incorporates OCR into data entry system to speed paper processing

By Ellis Booker

An ambulance races to the scene of a multivehicle collision on a back road in Florida. Minutes later, in the back of that vehicle, a paramedic makes some hasty notations about the patient's condition on a paper form.

Eventually, a copy of that report will arrive at the state's Department of Emergency Medical Services (EMS), which receives reports from 260 providers, representing more than 8,000 emergency medical personnel and paramedics.

But until recently this agency could easily analyze only a portion of these reports and the valuable data they contained.

"Before, we were only able to look at about 200,000 records per year — only the trauma runs," said Karen White, a health and services facilities consultant for the state of Florida. Earlier this year, White successfully field-tested a computer-aided data entry product called Paper Keyboard ICR from Datacap, Inc. in Tarrytown, N.Y., that combines hand print, check box and optical character recognition (OCR).

Today, Florida's EMS agency can inspect more than 1.5 million records, and the redesigned paper forms contain 70 data elements — more than three times as much information as the old forms held.

According to users and analysts, while OCR and intelligent character recognition have made significant gains in just the past two years, the best approach is often a combination of technologies and, most important, a willingness to redesign long-cherished paper forms.

"Redesigning forms is certainly the easiest way out," said Kristy Holch, director of scanning market strategies at BIS Strategic Decisions in Norwell, Mass. "OCR is a very simple thing when it's in a controlled environment."

The trouble, according to Holch, is that the party interested in scanning the form (say, a manufacturer that wishes to scan a purchase form sent by a customer) may not have control over the paper form.

Controlled by others

The Illinois Department of Public Aid in Springfield is one place where the look of the OCR forms was largely dictated by other parties.

"Our forms comply with the data sets dictated by standards," said David Passoni, supervisor of forms control and forms design.

A Recognition International, Inc. customer since it began using production OCR forms in 1978, Passoni's department currently processes more than 12 million medical forms from medical providers across the state.

Because Illinois has been refining its Public Aid forms since 1978 — Passoni is now on his fourth generation of OCR scanner/readers — he suggested it is best to assume that the number of fields on a form will grow over time. The raw data requirements of users (in this case, the federal government) will not shrink but always grow.

"You want to leave as much room between data capture fields [on the form] as possible, to give you room to expand," Passoni said.

"What we sell is not recognition but data entry productivity; I think companies selling recognition are barking up the wrong tree," said Datacap President Mark Blau.

But Blau likewise noted the organizational obstacles to changing a form. "As soon as you get into forms redesign, it sort of opens a Pandora's box. Document forms are an organizational identity, and when you tinker with them, feathers get ruffled."

Florida's EMS agency, however, found the forms redesign a very valuable exercise. The system is used in conjunction with a PC document imaging system from Optika, linked to a VAX-based relational database from Data Access Corp. in Miami. The 486-class PCs runs over a Novell, Inc. local-area network.

One important design change was to put all handwriting on one side of the form and check-mark fields (also known as bubble marks) on the other.

The Florida project — the first intelligent character recognition project of its kind for an EMS agency — is set to be rolled out statewide next month. Volumes of more than 1.2 million forms are expected in the first year.

Keeps getting better

OCR has become far more dependable recently, thanks not only to better underlying algorithms for identifying single characters, but also because many OCR systems now use the context of the character (by word or even by looking at the entire document) in making determinations about each letter.

Another notable improvement has been in preprocessing the bit-mapped images — "cleaning up" smudges, enhancing faint or broken letters and properly orienting the page — before the OCR software kicks in.

It is surprising, however, that the OCR system for recognizing handwriting on pen-based computers is somewhat more accurate than its paper equivalents. This is because, unlike a static image of a character, extra information, including the order of the handstrokes and when the pen is picked up and put down, can be used to give hints about the identity of the character.

Sequoia awaits financier to back RISC-based line

By Craig Stedman

MARLBORO, MASS.

Sequoia Systems, Inc. has returned to profitability after flirting with a Chapter 11 bankruptcy filing in late 1992. But the fault-tolerant computer vendor's long-term product plans remain unsettled while it tries to find another company willing to help fund a delayed next-generation system.

Neil McMullan, Sequoia's president and chief executive officer, said in a recent interview that the company does not expect to ship a reduced instruction set computing (RISC) implementation of its product line until late 1995.

Originally, Sequoia was looking to have systems based on minority investor Hewlett-Packard Co.'s Precision Architecture-RISC architecture ready by the end of this year. "But our goal was to be a $100 million company as well as profitable and rich," McMullan noted.

Instead, Sequoia dropped to just $41 million in revenue for its fiscal year ended June 30, down from almost $63 million the year before. The company had to cut its spending sharply as a result, and the PA-RISC project was put on hold earlier this year, McMullan said.

Talks with HP aimed at getting more assistance in developing a PA-RISC machine have not been successful thus far. McMullan said the discussions are continuing but added that it is "certainly possible" that the PA-RISC project might be dropped altogether.

Sequoia is now talking with other vendors, including resellers Samsung Electronics and Toshiba Corp., about joint development deals involving other RISC architectures in case the PA-RISC concept is jettisoned, McMullan said.

HP continues to resell Sequoia machines based on Motorola, Inc.'s 68040 microprocessors, an HP spokesman said. He added, though, that there are "many options out there" in addition to Sequoia for providing a fault-tolerant PA-RISC system, if HP decides one is necessary.

Wooing users back

Neil McMullan, Sequoia's president and chief executive officer, conceded that it will be a while before the company can regain the trust of users made nervous by its financial problems. "They had to be worried that we might go away at some point," he said. "It will take a long time for every customer to relax, and in the process, we will have lost opportunities — no doubt about that."

McMullan said he expects new 68040-based models, due out shortly, to keep Sequoia competitive, even though much larger rivals Tandem Computers, Inc. and Stratus Computer, Inc. have both switched almost exclusively to RISC platforms.

Unconcerned about delay

Fred Murray, director of information services at Hughes Supply, Inc., a Sequoia customer in Orlando, Fla., agreed, adding he does not need a RISC system in the near term. "Obviously, we'd like to see that come out, but if it's late 1995 or early 1996, that would be OK for us," Murray said.

Tony Mineo, director of data processing for the city of Lakewood, Colo., said he is also unconcerned about the lack of a RISC offering. That is "more a product they need to get into for marketing" purposes outside the installed base of Sequoia users, he said.

However, analysts said Sequoia's ability to attract new customers and start growing its revenue again would be uncertain without a RISC product line. "If they can't deliver until [late 1995], it's going to be a problem for them," said Stephen Josselyn, an analyst at International Data Corp. in Framingham, Mass.

"They're doing pretty well [financially], but there are still a lot of questions that have to be answered, and the biggest one is the HP relationship," added Casey Stern, an analyst at Starr Securities, Inc. in New York.

Sequoia reported net income of $750,000 on revenue of $10.5 million for its fourth fiscal quarter. The company expects profits each quarter this fiscal year and is looking for "modest" revenue growth in the 5% to 10% range, said McMullan, who took over at Sequoia in late 1992.

To help on the revenue front, Sequoia is trying to expand its ties and work more closely with resellers and software developers, he noted. The company has also set up a new unit that will attempt to license its fault-tolerant technology to other vendors.

HP 3000

CONTINUED FROM PAGE 71

HP users on both sides concur that for transaction processing, the 3000 with its MPE/IX is already a better performer than the HP 9000 with Unix, which was not built as a transaction processing specialist.

For that reason, the 3000, albeit a more expensive machine, is in less need of hardware upgrades. Because the 3000, in addition to its operating system, was designed for transaction processing, it is a more solid performer — but a more closed one — than a souped-up 9000.

Still, users and developers in the 3000 camp took heart that HP is continuing to evolve the venerable line.

Out of print

Above all else, HP is known as a solid engineering company that builds products that work. But one item has apparently been a dog: the Faxo 100 pagelmin. laser printer. The company said, however, it has corrected the problems that were causing printer tech-up...

"It's good news," said Steve Williams, owner of Datastructure, a San Francisco-based HP consultant and database tools vendor. "A couple of years ago we were very concerned that machine would be sunsetted."

And if the 3000 introductions follow the form of June's 9000 flurry, then HP will also cut prices on existing 3000 models.

Smart cuts

Rodger Lindquist, manager of business systems development at Laboratories, Inc. in Hercules, Calif., said it would make sense for HP to introduce bigger and cheaper 3000s because Unix in general is a threat to HP's MPE business, which the company reports is growing at a 5% clip compared with about 40% growth on the Unix side.

Lindquist said Unix vendors such as Sequent Computer Systems, Inc., which sets its prices below HP Unix tags, are taking accounts from traditional 3000 MPE shops.

"Sequent and other vendors come in with multiprocessing Unix boxes that have maybe four or eight 486 processors, and they're competing with HP's uniprocessor machines," Lindquist said.

One item on 3000 users' wish lists is a graphical user interface.

"One thing HP hasn't really done with the 3000 is improve the screen interface," Williams observed. "It's still the old mainframe style. If they came out with a graphical user interface, that would be great."

One item on HP 3000 users' wish lists is a graphical user interface. The current interface is still in the old mainframe style.

Meanwhile, on the 9000 side, users at Interex will be watching for new development and systems management tools from third parties and from HP. Compared with the 3000 market, pickings are slim, users noted.

"One of the things we're looking for is tools, tools, tools," said Jerry Kopecky, manager of MIS operations at IVI Travel, Inc. in Northbrook, Ill.

IVI Travel runs both 9000 and 3000 systems, and Kopecky pointed out that "if I can use common tools that integrate both environments, that would make my life easier." He also said that fewer tools on the 9000 side translate into higher training costs, "which can eat up the savings on cheaper Unix hardware and software."

The 9000 systems management tools he will be looking for will include functions such as job scheduling, security control and librarian and version control.

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BMC Software, Inc. has announced updated versions of three direct-access storage device (DASD) data compression tools that emulate and fully exploit the hardware-based compression to be provided in IBM's Enterprise System/9000 Models 9021 and 9121 mainframes.

According to the Sugar Land, Texas, company, its hardware compression technique, included in Version 2.2 of Data Packer/IMS, Data Packer/OS and Data Packer/VSAM, delivers up to 70% compression without the Escon cabling or software and hardware upgrades hardware compression usually requires.

All three products share in the ability to extend the life of hardware by postponing or eliminating the expense of upgrading DASD.

Version 2.2 of Data Packer/IMS, Data Packer/OS and Data Packer/VSAM is priced by CPU level starting at $16,000, $11,500 and $9,500, respectively, for a perpetual license.

▶ *BMC Software*
(713) 240-8800

Quadrant Software has introduced FastFax/Blue, an IBM Application System/400-based fax server for PCs and fixed-function terminals connected to the AS/400.

The product can be used as a front end to IBM's fax enabler software, Facsimile Support/400, according to the Mansfield, Mass., company.

FastFax/Blue can be used for creating, sending, receiving and controlling fax activity. The product is seamlessly integrated with FastFax/WindowFax, the company's Windows-based driver. FastFax/WindowFax enables Windows users to transmit faxes directly from their PC application through a pop-up window.

Also introduced was FastFax/View, another product that works with FastFax/Blue and enables users to view inbound faxes on an attached PC.

Prices range from $2,495 to $15,495.

▶ *Quadrant Software*
(508) 337-8550

Wall Data, Inc. has introduced Rumba for NetWare Systems 3.2, which adds IBM Application System/400 connectivity to the product's existing mainframe access capabilities.

According to the Redmond, Wash., company, Rumba for NetWare Systems 3.2 is the only Windows workstation connectivity product for both IBM mainframes and AS/400 systems that operates simultaneously in Novell, Inc. NetWare for SAA, NetWare for SNA Gateway (now Microdyne Exos) and Transmission Control Protocol/Internet Protocol environments.

Rumba for NetWare Systems 3.2 can be licensed for one, 10, 25 or 64 workstations per local-area network.

License fees start at $395.

▶ *Wall Data*
(206) 883-4777

Pennant Systems has introduced four printers that can be attached to local-area networks, midrange systems such as IBM's Application System/400 and large systems such as IBM's Enterprise System/9000.

The Norwalk, Conn., company said the printers can increase productivity for users who require high-volume, high-speed printing (up to 150,000 impressions per month) and high-quality output.

The products can produce letter-quality business correspondence and presentations, including graphics, text and images, and can handle jobs such as heavy-duty dot-matrix printing. The introductions range from a 600 char./sec. ASCII dot-matrix printer to a 30 impression/min. electrophotographic printer.

Pricing begins at $2,595.

▶ *Pennant Systems*
(203) 849-6844

Product shorts

XPoint Corp. has introduced FormsXpress 3.2, electronic forms and bar-coding software. Features include spool data mapping and scalable fonts. Cost: Starts at $4,000. XPoint, Norcross, Ga. (404) 446-2764. . . . **XL/Datacomp** has announced a free 60-day trial of Storage Analyzer, an IBM Application System/400-based program that provides a detailed analysis of data residing on direct-access storage devices. Cost: The offer expires Jan. 1, 1994. XL/Datacomp, Hinsdale, Ill. (708) 323-1200.

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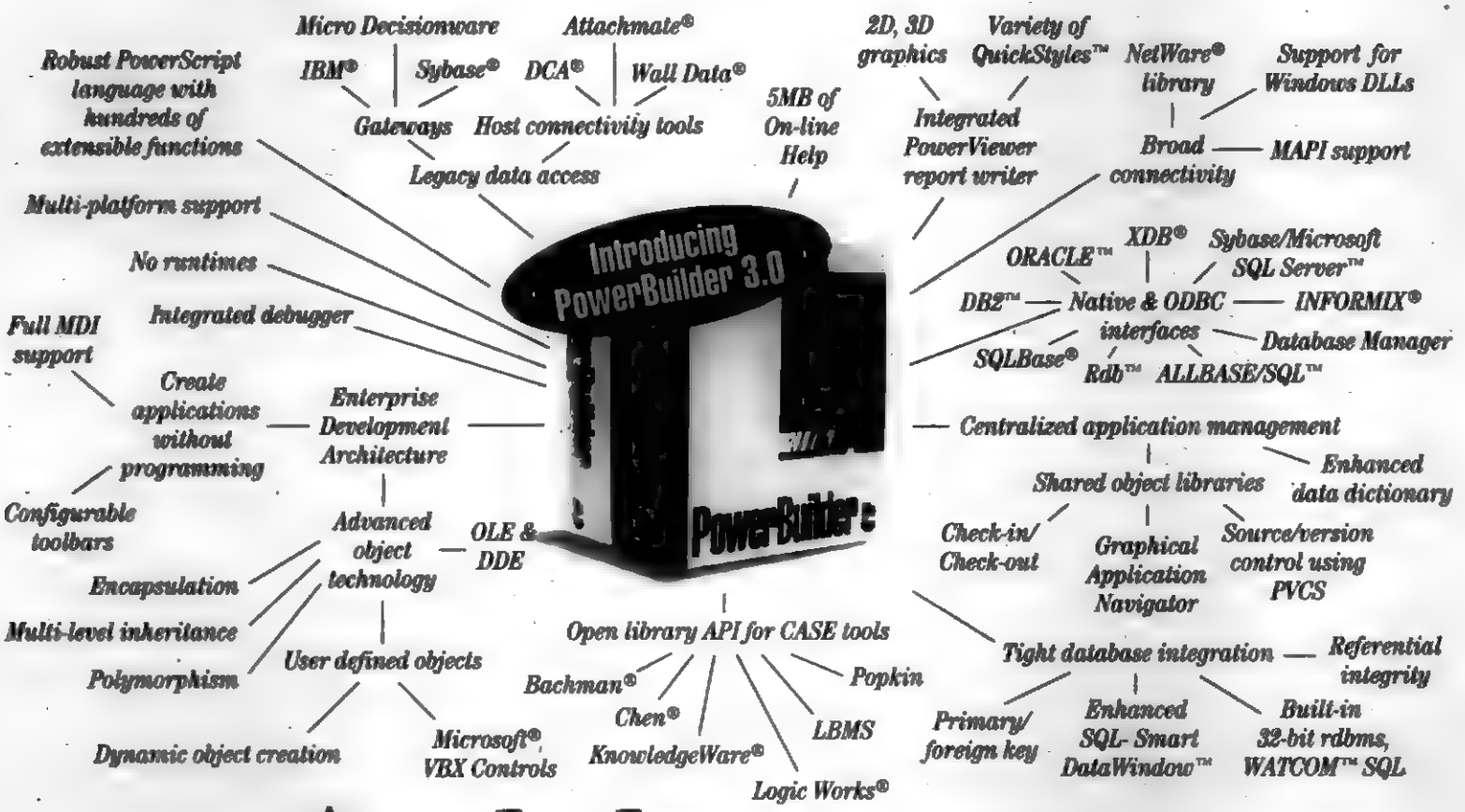

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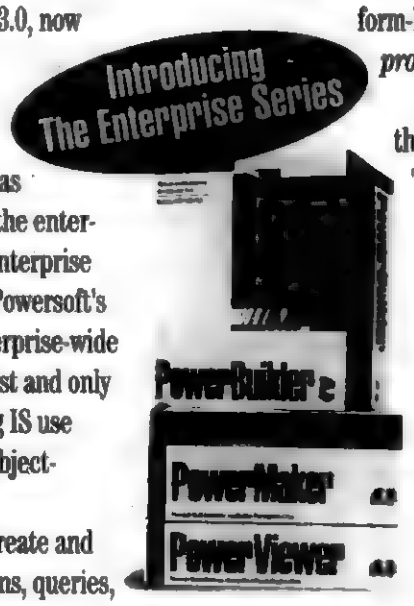

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Portable code develops

Liant tool enables crossover among PC, Mac, other systems

By Melinda-Carol Ballou

Liant Software Corp. recently announced C++/Views 3.0, a tool that will allow users to develop code that is portable across various environments.

The environments include Windows, the Macintosh, IBM's Presentation Manager and the Open Software Foundation's Motif, company officials said.

New with this version is C++/Views Constructor, a visual development tool that generates portable resources such as dialog boxes.

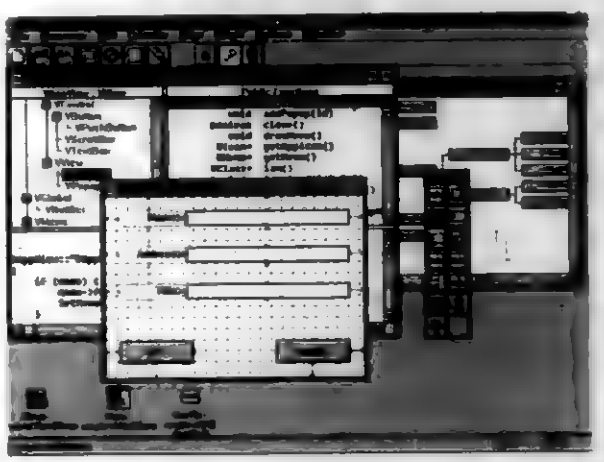
No code rewriting

The resources are called from an application at runtime. The same resource file can then be called from a Windows, Motif, Presentation Manager, Macintosh or DOS application and can offer a look-and-feel that is consistent with the targeted host environment, officials said. This makes it easier for developers to create applications for multiple graphical user interface (GUI) platforms without rewriting code.

"We take the Windows bitmap format and write code for the other systems that will read that [information] into your program and do the porting for you," said Joe DeSantis, vice president of research and development at Liant.

C++/Views Constructor lets developers work visually with the Views class library to create the applications. Users can cut and paste across multiple C++ applications using the tool. An enhanced Browser lets users draw and archive their resources and edit code that calls those resources.

C++/Views offers a class library that is similar to but extends Microsoft Corp.'s Microsoft Foundation Classes and Boriand International, Inc.'s Object Windows Library (OWL). While the



Liant's *C++/Views Constructor lets developers work visually with the Views class library to create the applications*

Microsoft and Borland class libraries primarily target Windows development and presuppose a thorough knowledge of Windows, Liant provides the cross-platform flexibility required by most corporate users.

"Even though Windows may be their most important platform, it's a No. 1 concern not to be locked in," DeSantis said.

Tim Albright, a senior consultant at Ameri-

Portable, *page 90*

When smaller really is better

Using CASE instead of Cobol brings savings

By Thomas Hoffman

The cost savings and productivity gains many user companies experience when downsizing from centralized information systems to distributed architectures are well-documented. But many of these shops do not realize some of the biggest downsizing benefits until they transform their application development approaches.

One vendor that has carved a niche for itself in this market is FourGen Software, Inc., a 10-year-old Seattle-based developer.

FourGen has developed "mainframe-replacement" financial and distributed applications with Unix, fourth-generation language (4GL), SQL and computer-aided software engineering (CASE) software.

Savings over Cobol

Several FourGen users have made substantial time and development cost savings by developing applications using FourGen's CASE tool sets instead of Cobol.

Take, for example, Paging Network, Inc. or PageNet. The $221 million Plano, Texas-based paging services provider has grown at an impressive 35% to 50% clip in each of the past 10 years. But the company's centralized information systems operations and customized financial software applications have held the company back from further expansion.

PageNet, with 60 offices across the U.S., had until recently run its operations on a network of 11 Datapoint Corp. minicomputers that ran customized Cobol financial applications. When the company decided to replace the minis with a suite of 100 Motorola, Inc. reduced instruction set computing servers 18 months ago, a faster, more flexible development environment was required, according to Craig Franklin, PageNet's director of IS and planning.

90 days

PageNet decided on FourGen's Enterprise general ledger, accounts payable and CASE software products. The applications, which use Informix, Inc.'s Online relational database management engine and 4GL, were used to customize eight general ledger and 45 accounts payable applications within 90 days.

Franklin said PageNet paid approximately $500,000 for the Four-

FourGen, *page 86*

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FourGen

CONTINUED FROM PAGE 83

Gen Enterprise general ledger and accounts payable applications and $18,000 for the CASE tools, including consulting services.

Had PageNet built those applications in-house using its Cobol, C and ISAM development environment, it would have taken at least a year and more than $1 million in development costs to complete the project, Franklin said.

"We wanted to buy applications along with an environment that was more productive than what we had with Cobol," Franklin said. "Since using the CASE tools, we've realized that we're two to three times more productive than we had been in our Cobol environment."

For example, PageNet recently developed a help desk tracking system to support its 2,500 users across the U.S. Using the CASE tools, two developers created the system in six weeks.

Franklin said he had considered other development environments, including those from Sybase, Inc. and Oracle Corp. But based on his past experiences with those vendors, and after soliciting input from other users, Franklin opted for FourGen based on price and after-sales support.

"If we went with one of the other bigger names like Oracle, we felt like we would have been lost in the shuffle. FourGen has been heavily involved in many of our projects," Franklin said.

Easy and cheap

FourGen's CASE tools have also proved to be a cost-effective and user-friendly development environment at the National Easter Seal Society based in Chicago. National Easter Seal, which provides support to more than 1 million people with disabilities each year, has a $35 million budget this year. That translates into a slender $125,000 IS budget for 1993, which has placed great demands on the cost-effectiveness of the department's technology projects.

In the past, the National Easter Seal Society Budget Database was a potpourri of independent spreadsheet applications that required weeks of data entry and programming to synthesize data into a cohesive structure. To better streamline the system, the agency brought in FourGen's CASE tool set in February 1992, according to James Sanders, manager of IS at the not-for-profit group.

Within a week of using the CASE tools, two National Easter Seal programmers were able to bring up 12 screens for the budget database. Within a few weeks, the agency had developed 25 screens for its 60 dumb terminal users to access budget information over its Altos Computer Systems Multidrop network.

In addition, the CASE software provided National Easter Seal with simple user interfaces, a plus for an organization with few computer-literate staff members. "CASE provides a standard, simple user interface that makes it very easy for people to enter their data and get their reports," Sanders said.

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CD/9-13

Briefs

CASE for Windows

Microsoft Corp. and Inference Corp. announced a joint agreement that will allow Microsoft to use Inference's computer-aided software engineering-based retrieval technology and engineering services in future versions of Windows. The Inference object-oriented technology will provide the intelligent user assistance component of Windows, according to Microsoft officials. Separately, IBM and Vantive Corp. are also using the Inference retrieval technology for their on-line Help products.

Oracle 7 support

Blyth Software, Inc. in Foster City, Calif., is now shipping support for Oracle Corp.'s Oracle 7 for Blyth's Omnis development tools. Omnis provides client/server connectivity between Macintosh and Windows environments.

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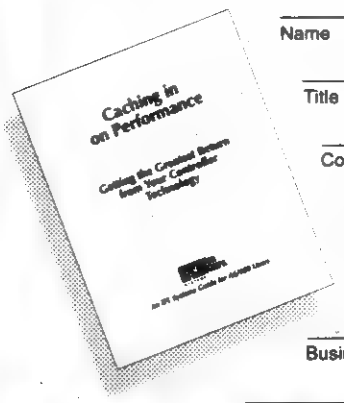

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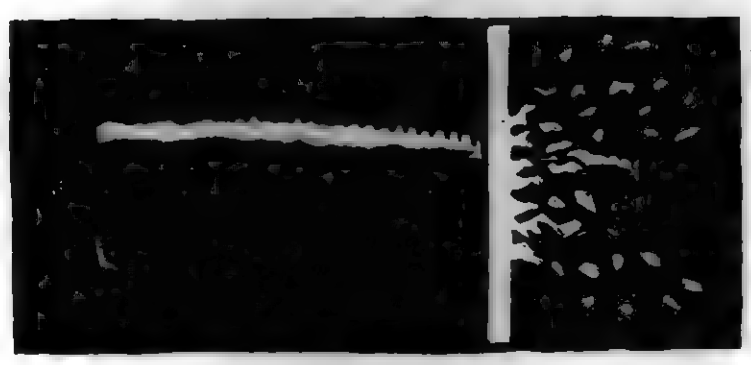

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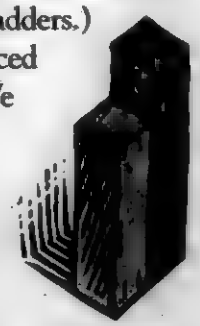

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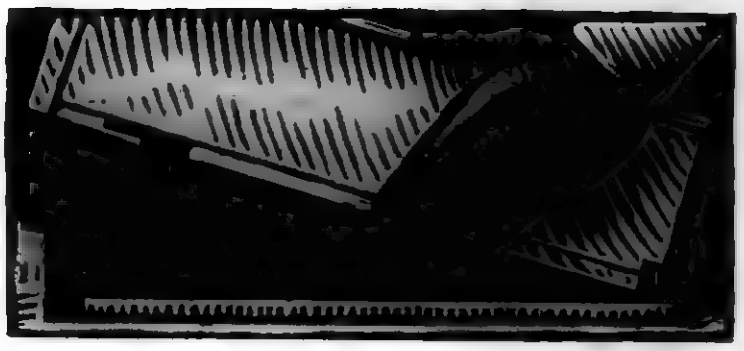

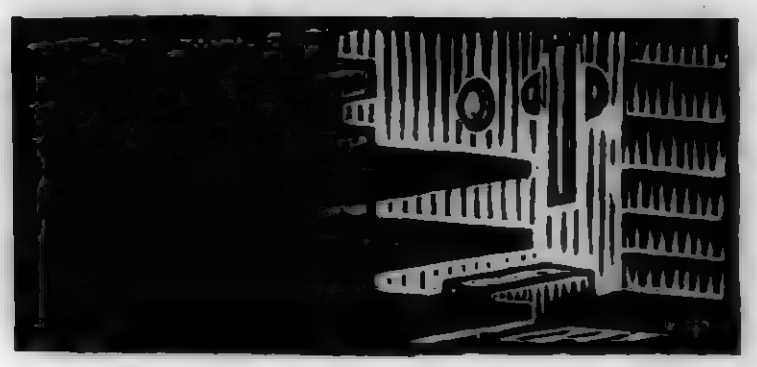

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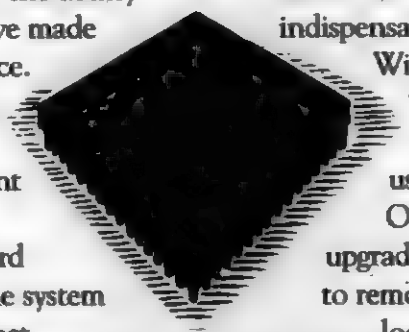

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Developer segments language offerings

By Michael Vizard
CARY, N.C.

Hockware, Inc., a developer of a visual implementation of the Rexx programming language used in IBM mainframe and OS/2 environments, is in the process of delineating its product line into low-end and high-end offerings.

At the low end, Hockware plans to offer a Bronze Edition of its VisPro/Rexx programming environment, a $99 offering that supports OS/2's Presentation Manager interface, the Workplace Shell Utility and the Common User Access user interface standard.

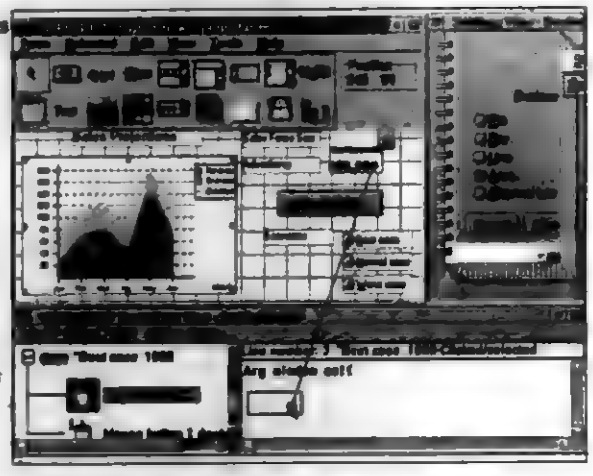
Hockware plans a $300 Gold Edition at the end of the year that will provide more support for IBM's System Object Model and can create entity-relationship diagrams in applications that use IBM's DB2/2 database.

Company President David Hock said VisPro/Rexx is intended to provide the same interactive development environment found in C++ language tools in a visual programming environment.

Patrice Saint-Louis, a systems analyst at The Chase Manhattan Bank NA in Miami, uses VisPro/Rexx for building print statement applications on top of OS/2.

Prior to adopting OS/2 systems, Chase ran its print statement applications on an IBM Application System/400. However, with the availability of Rexx on OS/2, Chase moved those applications to the less expensive OS/2 platform.

"With VisPro, it's a lot easier to add features to those statements now," Saint-Louis said. She also noted that competing tools, such as Visual Rexx from Watcom in Waterloo, Ontario, do not allow developers to distribute free runtime applications. VisPro/Rexx requires 2M bytes of hard disk space.



Hockware's VisPro/Rexx is intended to provide the same interactive development environment found in C++ tools

Now you see it with Magic RAD tool

By Melinda-Carol Ballou

Magic Software Enterprises, Inc. is now shipping Version 5.5 of Magic, the company's Rapid Application Development tool for client/server and host environments. The new release offers improved concurrent multiuser development, embedded SQL, two-phase commit and increased support for relational database management systems.

Magic allows developers to write DOS, Unix, CTOS and VMS applications visually, based on the function of an application. They do not have to write code. Arithmetic or logical expressions can also be done in shorthand, and variable names can be represented by either numbered or lettered lines in a table, analysts said.

With this release, Magic officials are beginning to actively target the lucrative client/server tools market and vendors such as Powersoft Corp. and Gupta Corp. Once the company ships full versions for Microsoft Corp.'s Windows and Windows NT during the first half of next year, however, it will be in a better position to target the Windows development arena.

Multiple developers

The concurrent development features of the release enable Magic to act as an application administrator, coordinating development activities so anyone working on a project is informed about code changes. Multiple developers can check in and check out work at any time.

Gary Rappaport is president of Napco International, a $34 million Minneapolis-based distributor of military parts and a subsidiary of holding company Venturian Corp. He spoke about the time savings involved with the group development support of Magic 5.5.

Napco downsized from an IBM mainframe last year using Magic. The company had a 3.5G-byte database that tracked international trading of parts; it downsized to a Tricord Systems, Inc. PC superserver and a Novell, Inc. local-area network of PCs.

Rappaport's developers started out using Gupta's development tools but switched to Magic after they saw colleagues at another company making a comparable transition more quickly.

Despite the greater programming speed with Magic, team development was cumbersome with the earlier version, he said. Previously, changes made by individual programmers had to be imported separately from the centralized Magic program file. With the new release, developers will be able to work at their own pace and integrate changes "on the fly," he said.

"For a four-person team working together, this is a substantial productivity enhancement, which will probably save three to four hours of work per day for one programmer," he said.

It took his team about a year to move the 150 files from the database and to rebuild from scratch a set of old Cobol programs created during the previous 20 years, Rappaport said.

Time to shift to group development

Davy Bent, manager of field services at Dunkin Donuts, Inc. in Randolph, Mass., said his group is still performing single-user, DOS-based development on 486-based PCs using Magic. But the group programming features will be useful when he gets faster machines and shifts to group development. The two-phase commit and database support interested Bent, who has an Oracle Corp. RDBMS in-house.

The SQL support available with Magic 5.5 includes implicit (built-in) SQL, explicit SQL and SQL Assistor capabilities.

Magic manages all SQL development with its "implicit" SQL feature, so developers do not have to write SQL code and can focus instead on application functionality, officials said.

With the "explicit" SQL support, developers who choose to work directly with SQL can embed SQL statements, which are database-independent, directly into Magic programs. The SQL Statement Assistor minimizes the effort required to write embedded SQL commands by supporting SQL RDBMSs from Oracle and Sybase, Inc. as well as Digital Equipment Corp.'s Rdb.

Magic 5.5 is priced at $2,000.

Portable code

CONTINUED FROM PAGE 83

can Airlines in Fort Worth, Texas, agreed.

"One of the big things for us with Liant is its multiple platform support," he said. "While gigantic corporations like Microsoft and Borland do incredible work, what makes me uncomfortable is [being wedded to] those environments. With Views, you can concentrate on paradigms and less on the specific GUIs."

According to Albright, Liant handled the lower-level Windows calls and abstracted them so his group did not have to go through a steep learning curve for Windows.

"Views is separated from the GUI and presents another layer that you can write to," he said.

Albright added that being able to own the source code — as his group is able to do with Liant — was also key for American Airlines.

Borland will target multiplatform development tools this fall with OWL 2.0.

International Data Corp. analyst Steve McClure said the Liant product handles another problem for developers: geometry management. When geometric constraints are specified in one environment, they will be sized and placed appropriately for the target GUI using C++/Views, he said.

C++/Views for Windows will ship this month; the OS/2, Motif, Macintosh and DOS versions are slated to be available in the fourth quarter. Pricing ranges from $499 for the DOS character version to $1,999 for Unix/Motif.

Microsoft shows groupware templates

By Michael Vizard
REDMOND, WASH.

Microsoft Corp. has put one more piece of its long-term groupware strategy into place. The company used a recent satellite broadcast to showcase 13 modifiable templates to 15,000 developers (see chart).

Created with the help of eight third-party vendors, the $39 templates are intended to provide corporate developers with models for building workgroup applications using Microsoft PC applications and databases.

"The templates take you about 50% to 70% of the way there. They still need to be customized for individual applications," said Hugh Chang, a Microsoft product manager.

Analysts view the templates, which cover a range of applications, as a good deal that few corporate information systems shops will be able to pass up.

"Basically Microsoft is giving these away. A lot of applications span different tools, and it's a major challenge to educate programmers on what these tools can do," said Mike Heylin, an analyst at Creative Strategies International, Inc. in San Francisco. Heylin said the templates would be useful to corporate developers with mainframe backgrounds because they might not be familiar with PC development tools.

Template	Supplier	Location
Budget consolidation, expense report	Micro Modeling Associates, Inc.	New York
Status reporting	Parlan Development, Inc.	Chicago
Remote query	Voice Data Management International, Inc.	New York
Expertise planner	Connect Computer Co.	Eden Prairie, Minn.
Meeting coordinator	Canaan Analytics	Wilmington, Del.
Report consolidation	KPMG Peat Marwick	Washington, D.C.
Help desk travel reservations	ARDAK International, Inc.	Tucson, Ariz.
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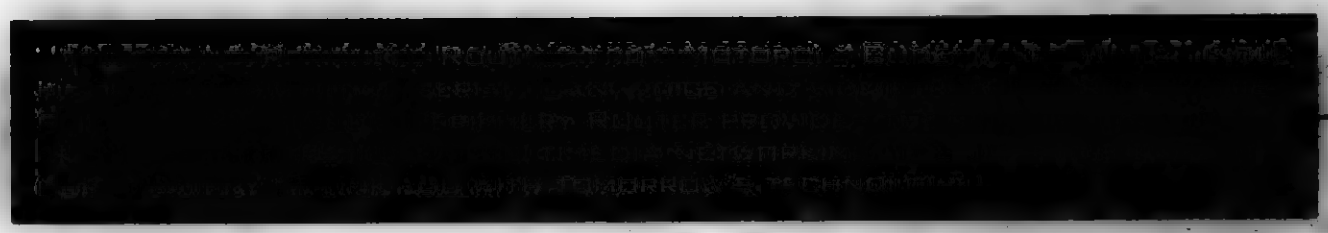

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Beth Gardner

A fruitful investment

There are lots of reasons why software re-engineering is worth the investment of time and effort. Modifying application code in this way decreases complexity, increases quality and better enables future business enhancements.

Re-engineering also simplifies the maintenance of programs and increases the productivity of the programmer. It allows developers to extract specific program parts that will be shared and reused across an enterprise and ported to other platforms or application environments such as client/server environments.

Those are the whys, but what about the hows?

One, two, three

Actually, there are several distinct processes that fall under the general category of re-engineering changes. The first is code restructuring. Restructuring code simplifies complex programs, improves performance and reduces the incidence of errors when changes and enhancements are made.

The introduction of a certain number of errors is inevitable whenever program changes are made. The incidence of errors is two to three times greater, however, when programmers try to enhance unstructured code. In addition, it has been estimated that a programmer can maintain three times as many lines of structured code as unstructured code.

Program modularization is another important aspect of software re-engineering. Once a large application has been restructured, additional gains can be realized by dividing it into smaller units. Modularization is crucial when you want to create reusable, sharable program units to make new development more efficient or improve the maintainability of existing applications.

Think how many date-time routines that an IS shop uses. There may be as few as the number of individual applications or as many as the number of developers at work when the applications were developed. Now think how much easier it would be to handle the century date rollover problem if you could slice the redundant routines from each program and create one reusable subroutine.

Modularization is also invaluable for moving applications off the mainframe and into a client/server environment. Program slicing can split out functions that will run in the new environment.

Language migration also plays a large part in re-engineering. Old Cobol programs are poorly structured, require high investments in maintenance and don't allow programmers to take advantage of new development tools and platforms. OS/VS Cobol applications can't exploit new hardware capabilities and generally compile and execute more slowly than the same application migrated to the latest level of compiler.

Still another aspect of software re-engineering — and one that can yield significant payback in terms of maintenance productivity gains — is data name rationalization and standardization.

This process involves identifying all the various definitions of a particular data element across the application, reconciling all these elements and then updating all occurrences of the element in all the source modules, files, database definitions and screens. The goal is to define something like a part number once, store the common definition in a repository and key all new development and legacy system changes off this definition.

Data standardization, like most software re-engineering activities, requires a substantial investment of time and effort. But the yield is substantial: Maintenance programmer productivity can improve by as much as 30%. Where else can you get that kind of return these days?

Gardner is a senior redevelopment strategist at IBM.

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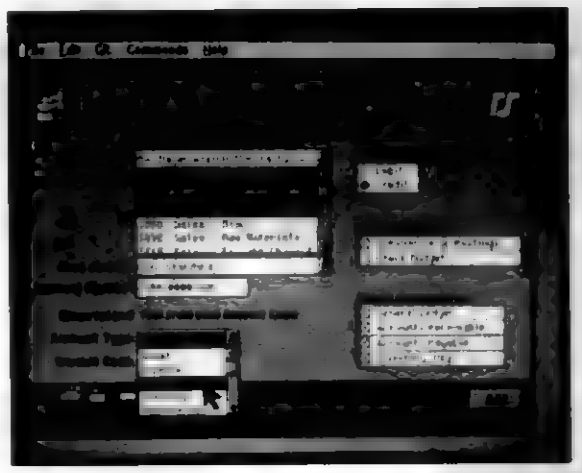

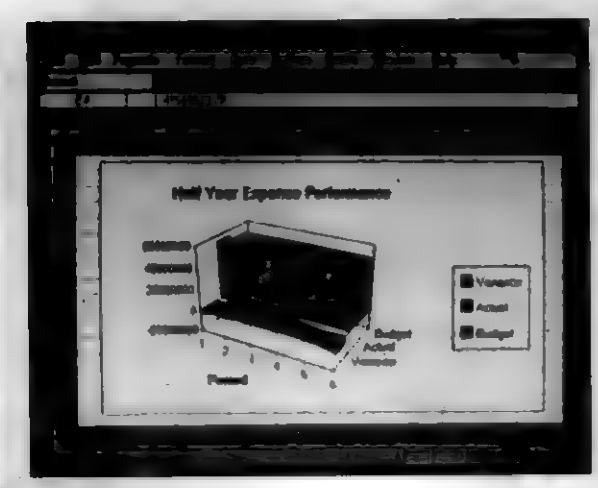

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[redacted]

Must Software International has introduced Executive Nomad, a visual information access and analysis tool that delivers data to users at every level.

The product merges the Norwalk, Conn., firm's Nomad client/server fourth-generation language with Pilot Software, Inc.'s LightShip visual information tool.

Executive Nomad employs an object-oriented interface based on Windows. Data is exposed with image, chart and document objects.

Executive Nomad costs $25,000 for the mainframe server and five workstations. Each additional workstation costs between $595 and $1,295.

▶*Must Software International*
(203) 845-5000

XVT Software, Inc. has announced XVT-PowerObjects, custom controls that complement the Boulder, Colo., company's portable graphical user interface development solutions for C.

PowerObjects in this release include table objects; a tool bar; a status bar; a toggle/picture button object; and rows and columns of cells for storing text. The cells feature horizontal and vertical rules; horizontal and vertical scrolling; column headings; and setable line height, column width and margins.

An XVT-PowerObjects library costs $395 on PCs and $495 on workstations.

▶*XVT Software*
(303) 443-4223

Lucid, Inc. has introduced Energize 2.1, a C and C++ development environment.

Several features have been added to this version of Energize to provide users with greater performance and productivity gains, according to the Menlo Park, Calif., company.

These features include the ability to use precompiled headers, full support of C++ templates and syntax highlighting.

A five-pack of Energize 2.1 costs $16,250, or $3,250 per seat. For a workgroup of 10, the price is $29,500, or $2,950 per user.

▶*Lucid*
(415) 329-8400

Prodea Software Corp. has announced ProdeaSynergy, a graphical application integration tool for designing custom business applications.

ProdeaSynergy automates the flow of information among software products regardless of vendor, how the products communicate or where things are stored, according to the Minneapolis company.

ProdeaSynergy features support of current and future messaging standards and distributed computing that goes beyond the Windows desktop and across local- and wide-area networks to a number of choices.

ProdeaSynergy costs $495 per copy.

▶*Prodea Software*
(612) 942-1000

Product shorts

MingleWood Data Systems, Inc. has announced SQLVOX Version 1.1, a development and runtime environment for the integration of Interactive Voice Response applications with Oracle Corp.'s database. Features include a true client/server-based implementation, an integrated SQLForms-based development environment, comprehensive cursor support and caching capabilities. Cost: $2,500. MingleWood, Los Angeles, Calif. (213) 653-6510.... **UnderWare, Inc.** has announced Track Record, a Windows-based information tracking tool for PC software developers. The product tracks information including feature requests, test cycles, bug reports, testers, releases, schedules and documentation. Cost: An introductory price of $99 per user will change to $159 per user after Dec. 1. UnderWare, Boston, Mass. (617) 267-9743.

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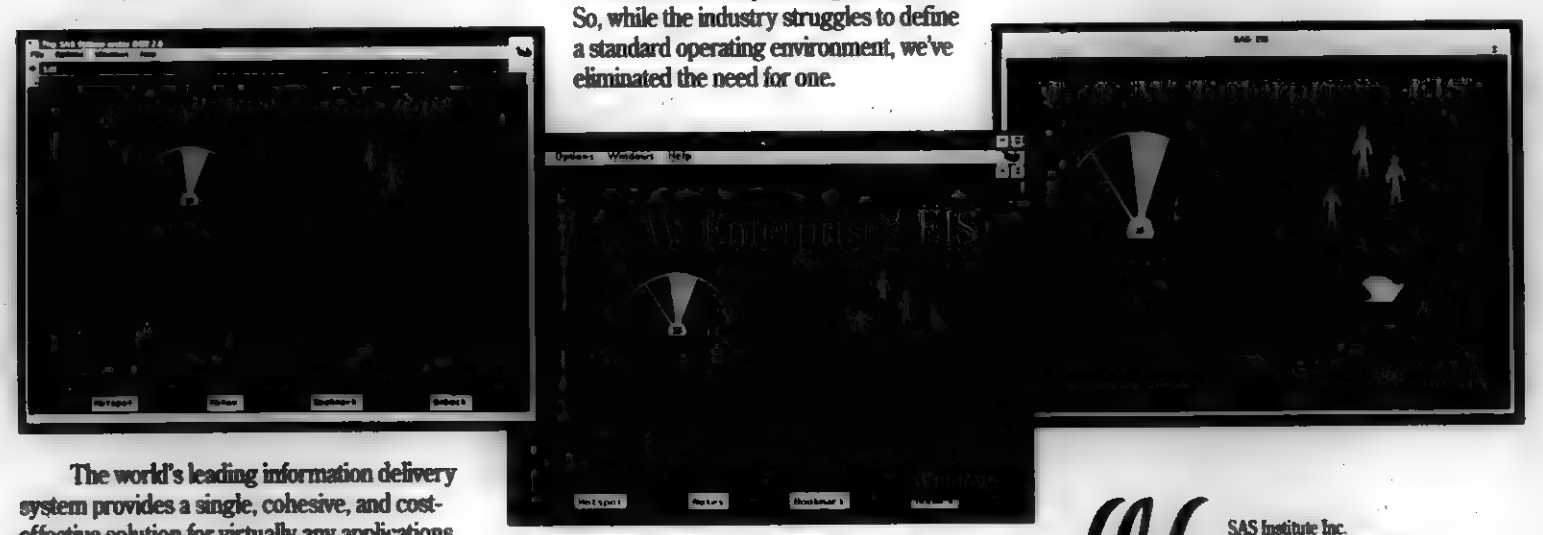

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the HEAT goes on

Continued high pressure from corporate downsizing and demanding business units molds some, crushes others

BY AMY BERMAR AND KATHLEEN ROTENBERG

The continuing crash course in corporate downsizing and re-engineering has left information systems pros both empowered and exhausted.

Computerworld's seventh annual Job Satisfaction Survey of 781 IS managers and professionals reveals that ongoing pressure is both squashing and molding people and careers. Some thrive; others don't survive.

Many IS professionals — despite staggering new work loads, continued stress and more demanding business units — insist they're satisfied with their career choice (see chart).

Even so, employees who had once planned on long-term careers continue to grapple with the consequences of layoffs, cutbacks and stalled upward mobility. Overall satisfaction, although still high, continues to erode, especially at lower levels.

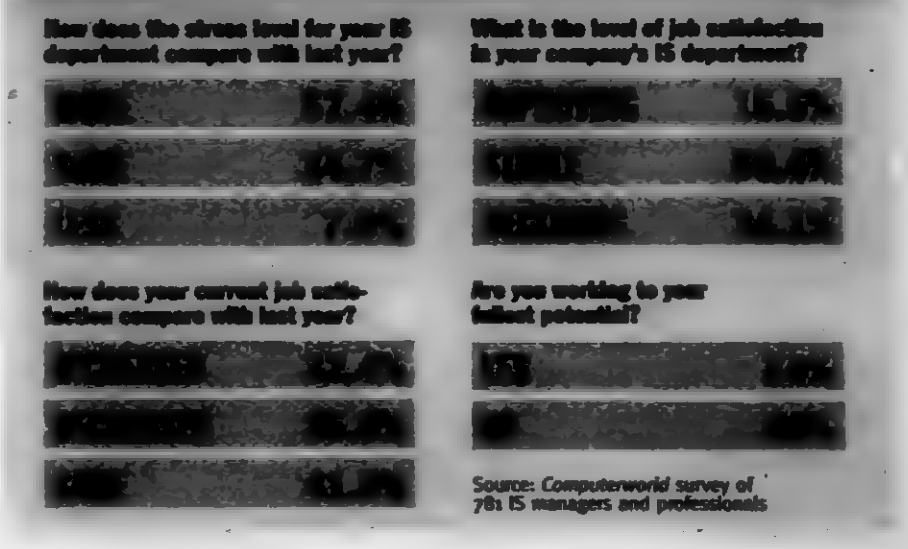
Even more troubling is a continued increase in the number of respondents who believed they were performing below their potential.

Because numbers don't tell the whole story, we've profiled three survey respondents to tell the IS job satisfaction story: an IS executive, a staff analyst and a midlevel manager. ■

SPECIAL REPORT
COMPUTERWORLD SEVENTH ANNUAL JOB SATISFACTION SURVEY 1993

Bermar and Rotenberg at Corporate Ink write about the computer industry. They are based in Newton, Mass.

BEST OF TIMES, WORST OF TIMES



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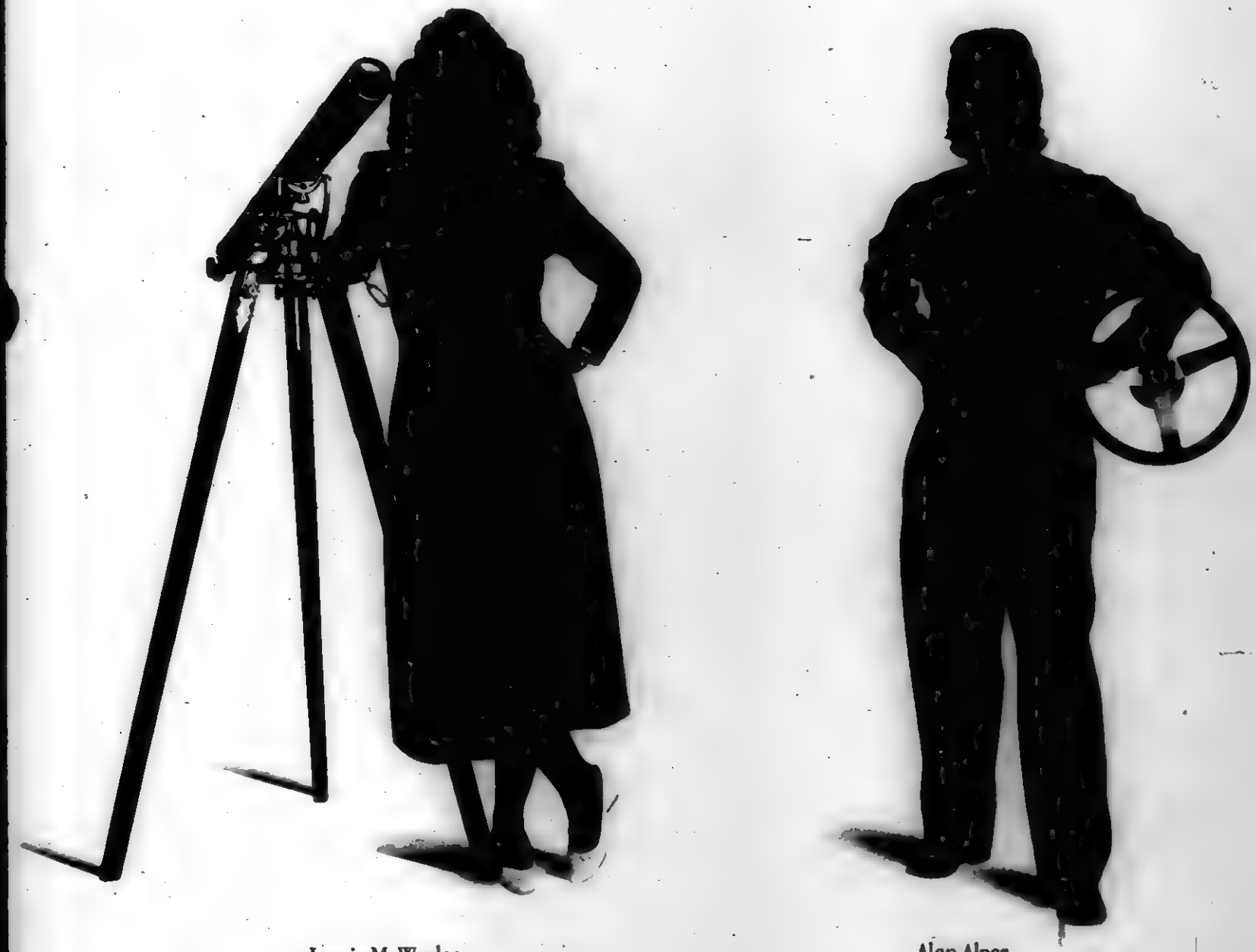

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The Newspaper of IS

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Announcing *Computerworld*'s 2nd Annual Re-engineering Team of the Year Award.

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2. All entries must be signed by the IS executive and one of the business unit executives who sponsored or led the re-engineering team.

3. Include the name, address, phone and fax number of the two entrants, along with two or more references who are familiar with the project and are willing to be interviewed. One reference should be a beneficiary of the project: a customer, supplier or user from the sponsoring business unit.

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The winner will be announced and profiled in an upcoming issue of *Computerworld*. A special Re-engineering Team of the Year trophy will be presented in February at an awards ceremony attended by top IS executives.

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Joseph Maglitta, senior editor/corporate strategies, or Allan E. Alter, senior editor/management, at (800) 343-6474.

Contest is open to all end-user organizations, consulting firms and system integrators. Companies selected for consideration will be contacted by a representative of CW Publishing, Inc. for further details and verification. The winner will be chosen by a panel of *Computerworld* editors.

COMPUTERWORLD
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Bob Nelson

Bowater, Inc.'s Dan Rogers says: 'There's always capability to improve'

Stress way of life for upper executives

As the de facto re-engineering "czar" charged with rolling out more than a half-dozen mission-critical applications this year, Dan Rogers cannot recall when work was more stressful. Or more satisfying.

Rogers, 49, was recruited six years ago for a once-in-a-lifetime opportunity: to redesign how Bowater, Inc., the country's largest maker of newsprint, uses information technology.

As director of information technology, Rogers routinely works 50-hour weeks. But the 31-year industry veteran says his staff is tiring of the intense pressure associated with rolling out eight strategic applications in a single year.

Even so, using the latest technologies has improved morale at the Greenville, S.C., firm, he says. One ongoing project employs client/server computing to migrate diverse systems to a single, integrated architecture based on distributed database technology.

Rogers concurs with the 57% of senior information systems executives who say performance is improving. He also agrees with the 61% of his colleagues who say employees are not working to their potential. "There's always capability to improve," he says.

Turnover has been low in the 135-person IS department, despite corporate cutbacks in response to two prolonged industry downturns. "Raises are becoming more of an issue," Rogers says, noting a dozen other ways in which satisfaction could be improved, including flexible job scheduling, bonuses, training, recognition and opportunities for advancement.

But he hardly expects to eliminate the stress. Launching new projects that promise to reshape how people work is "always a fight," Rogers says. He began six years ago by helping 2,000 employees understand how to, and why they should, use PCs.

Recently, he has focused on convincing employees that re-engineering their jobs is good for everyone. Still, the toughest battles may come next year, when his efforts touch IS departments that don't report directly to him.

"Until now," he says, "I've had control." ■

SENIOR MANAGERS

SATISFACTION: Highest of all groups. One-third reported being "very satisfied" with their work, though levels have dropped since last year. Reasons: Lack of corporate vision, heavier work loads, no management support. Positive factors included more freedom, more decision-making power and exposure to new challenges and projects.

STRESS: Slightly more than last year but less than others polled. More than half said they felt more stress in 1993. Culprits: Heavier work loads (75%) and growing demands from business units (46.7%). One-fifth are working more hours compared with last year.

Staffers not immune to reorg blues

With ITT Hartford Life Cos. facing a reorganization, it's sometimes difficult for staff consultant Bryan Lifsey to look on the bright side of things.

Yet he frequently does. Lifsey relishes the day-to-day contact with other information systems professionals in his immediate group of 150 in the Connecticut-based insurer's information management administration department and conveying requests for new IS projects to an IS steering committee.

IS PROFESSIONALS

SATISFACTION: Poor. Only 18% said they were "very satisfied" with their job — about half the percentage of top-level managers. Most frequently cited reasons: Poor management, layoffs, weak economy, few training opportunities.

STRESS: Down a bit but still edges out middle managers as the most stressed-out group. Some 58.8% experienced more pressure than in 1992, blaming staff cutbacks, concerns about job loss and anxiety about recession.

IS PERFORMANCE: Warning sign: Twice as gloomy as top bosses, almost half said IS satisfaction was declining. And only one quarter said IS performance was improving — half the number of top execs who said so.

BEST MOTIVATOR: Strongest believers that better pay and personal advancement opportunities are key.

MOBILITY: Less desire to change jobs than last year. But one in 10 said they are actively looking for a better post.

Lifsey is also privy to confidential data processing information about pending activities regarding finance and payroll. He says he appreciates the trust and recognition that implies.

Lifsey says he's had ample opportunity to learn new technical skills and believes he is working to his potential. That's relatively unusual: Sixty-six percent of his peers responded that they aren't.

But after 14 years at this company and 20 years in the industry, the uncertainty is taking a toll — Lifsey says he's somewhat less satisfied now than he was last year.

"Restructuring is almost as traumatic as layoffs," says Lifsey, who logs 45 hours weekly and thinks his co-workers are working longer and harder than ever.

"I think people are performing at their fullest potential," he says. "They're putting in more hours and working harder because of the job security issue."

Reorg blues, *page 102*

Reorg blues

CONTINUED FROM PAGE 101

Even so, some 80 people corporatewide have taken early retirement. Another 200 have opted for severance packages.

Morale boosters

More bonuses, salary increases, public recognition of accomplishments and improved opportunities for advancement could help his morale, Lifsey says, and would help his group perform more effectively.

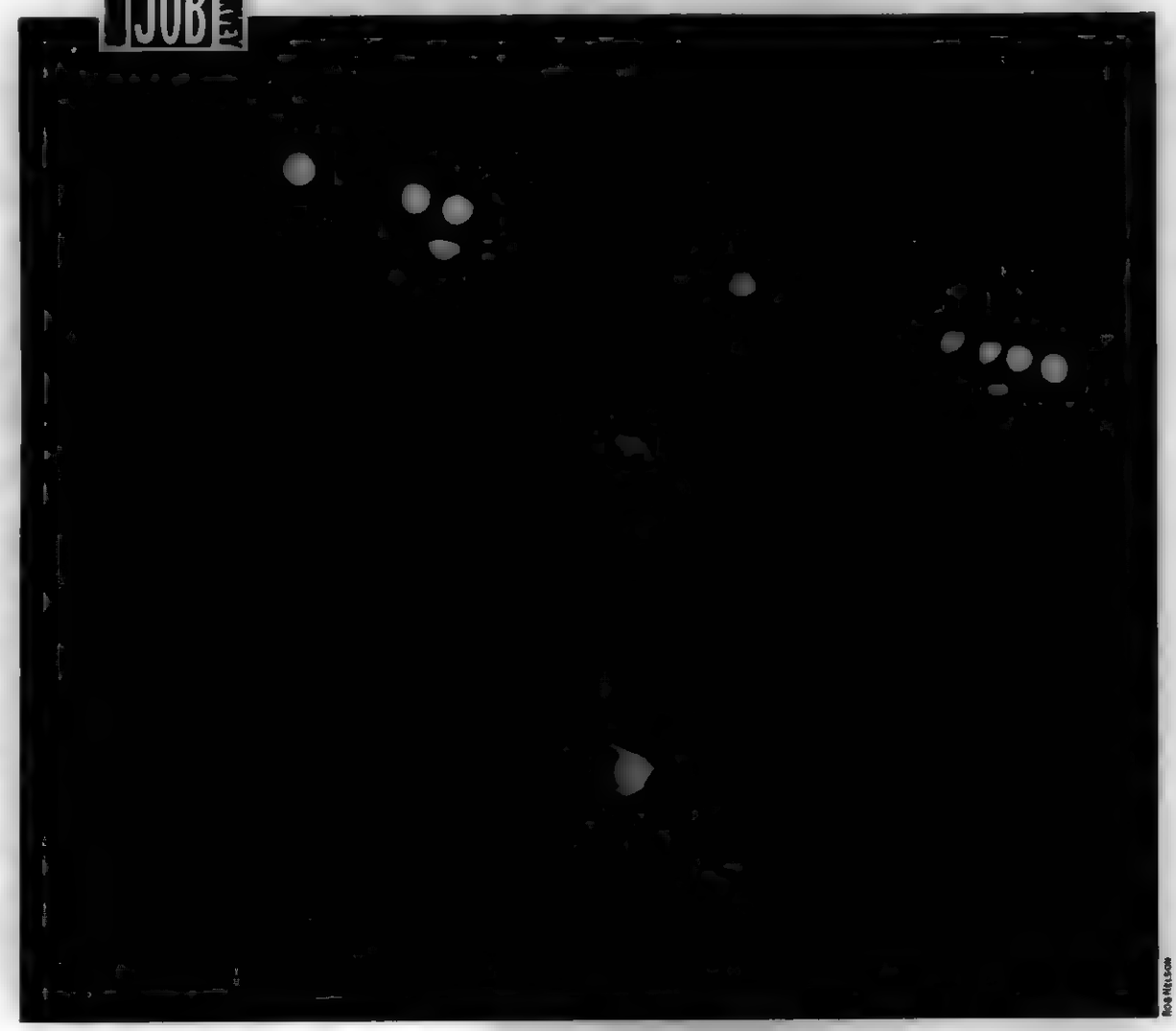
Nearly one-third of the entire survey sample reported leadership problems as a primary source of job dissatisfaction. IS professionals, our survey found, were most likely to leave their current jobs for better career opportunities (63.9%), better pay (51%), less stress (33.2%) and, yes, superiors with better communication skills (26.1%).

But new opportunities may be hard to find after the forthcoming restructuring, which will eliminate many job titles.

How employees will respond is uncertain. Fully 29% of lower-level professionals say they consider a raise the most effective motivator and most influential factor in improving job satisfaction.

According to Lifsey, the company promises that salaries won't be cut. "The jury is still out," he says.

A similar restructuring already occurred at the executive level of the information management group. "They were just happy they had their job," Lifsey adds. ■



Rob Nelson

Middle execs learn skills, gain notice

After back-to-back budget cuts and layoffs that sliced almost one-third from the corporate staff at Steelcase, Inc.'s office furniture factory in Fletcher, N.C., systems manager Anne Smith was less than optimistic about her long-term career prospects.

"I felt pretty dead-ended," said Smith, 36, who has held this position for eight years.

Predictably, middle managers in IS — like many of their colleagues in other disciplines — were more fearful about job loss than IS professionals and top managers were.

Spending cuts crimped development plans. Yet having the opportunity to learn new skills is important to 63% of the midlevel managers surveyed, and according to Smith, her team is eager to move to client/server technology.

Although she says her 12-person staff is technically respected, senior management wonders whether the staff members are too young to handle sizable projects. Minimal raises and scarce opportunity for promotion have simply added to the increased pressures.

Then this past spring, morale began inching upward.

"Things began turning around," Smith says.

The economy improved, making new layoffs less likely. Then a budgeting change shifted hardware purchases to end users, relieving Smith of having to reject requests for new systems. The factory also began working toward ISO 9000 certification.

Improving morale

Most noticeably, Smith's own contributions were publicly recognized when she was asked to join the vice president's strategy-setting team. This highly visible task force extends IS' reach to the entire plant and positions Smith's department as a key contributor in identifying and resolving critical business problems.

Her next step is to extend this satisfaction to her staff. Like most managers, Smith ranks job security, public recognition and enhanced work tools as factors that would help her group work more effectively. For now, she'll strive to keep her team going with frequent informal discussions, staff training and joint tackling of the ever-present backlog of applications.

Smith says members of her staff — all in their 30s — are unusually close. This has become an unexpected source of personal satisfaction.

"I think that's what's kept us hanging in there," she says. ■

MIDLEVEL MANAGERS

SATISFACTION: Widely down from last year and lower than that of top bosses. Only one-fourth said they felt "very satisfied." Most blamed poor leadership and fuzzy direction.

IS PERFORMANCE: Not as good as top bosses believe but this group is more optimistic than IS professionals.

WHAT MOTIVATES: Strongest believers that personal congratulations mean a lot. More money would help, too.

STRESS: Slightly better than last year. Even so, more middle managers (57%) experienced greater stress this year (though less than IS professionals).

MOBILITY: Surprisingly the most inert group. Only 6.9% were actively looking for a new job — half the number of higher and lower levels.

Despite widespread downsizing and cuts, Steelcase, Inc.'s Anne Smith says she feels optimistic

METHODOLOGY

For this survey, *Computerworld* polled 781 information systems managers and professionals selected from our subscriber list.

Surveying took place in June and was coordinated by IDG Research Services in Framingham, Mass.

SEX:
Males: 81.6%, Females: 18.4%.

AGES:
Under 25: 1%, 25-34: 21.5%, 35-44: 40.7%, 45-54: 29.7%, 55-64: 6.9%, 65 and older: 0.3%.

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Executive Track

New York-based **EMI Music Publishing** has promoted **John Murphy** from vice president of information technology to senior vice president of information technology. In this role, Murphy will have worldwide responsibility for information technology at the giant music publishing house. He said he intends to focus on upgrading core business systems worldwide and linking worldwide affiliates and performing rights societies to EMI.

The Chicago Board Options Exchange has promoted **Gerry O'Connell** to first vice president of its systems division. He was previously vice president of systems development. In his new role, O'Connell will oversee all information systems at the exchange and administer a $17 million IS budget. O'Connell replaces **Kruno Huitzingh**.

Capital Data Systems, Inc. in Raleigh, N.C., the information technology services subsidiary of Dover, Del.-based Chesapeake Utilities Corp., has appointed former Memorex Telex Corp. executive **Jim M. O'Reilly** as its president. Capital Data Systems' main business is providing information technology services to the telecommunications and utilities industries. O'Reilly was vice president of Memorex Telex's personal computing division. O'Reilly succeeds **H. Randolph Currin Jr.**, who will remain the company's chief technology officer.

Matthew S. Jacobs has been appointed executive vice president and director of information systems at **Fleet Mortgage Group, Inc.**, an originator and servicer of mortgage loans in Columbia, S.C. In this newly created position, Jacobs will be responsible for managing information systems throughout the group. Prior to this appointment, Jacobs was chief operating officer at Lomas Information Systems in Dallas and most recently was an IS consultant at Lomas Financial Corp., Computer Power, Inc. and Federal Home Loan Mortgage Corp., focusing primarily on strategic planning.

Intelligence File

Liar, liar, IS on fire

Lying to management, as Robert L. Glass sees it, is a "conflagration that threatens to consume our information systems field." Glass detailed the extent of the epidemic in this month's issue of *The Software Practitioner*. The IS people who admitted to lying claimed it's the only way they can function, he said. They insisted they had to "check their ethics at the door."

The effect of these fabricators, Glass insisted, is directly linked to the credibility problems IS departments face.

Is there a solution to all this deception? Glass cited the self-redemption of one wayward soul who fled a job for which lying was the rule for one where the truth "works." "First there is the relief from just getting away. Then there's all the doubt, mistrust and searching for the 'catch.' Then . . . [you] reach the point of acceptance, and understanding replaces all the negatives."

Source: *The Software Practitioner*, Robert L. Glass, September 1993.

Book Review

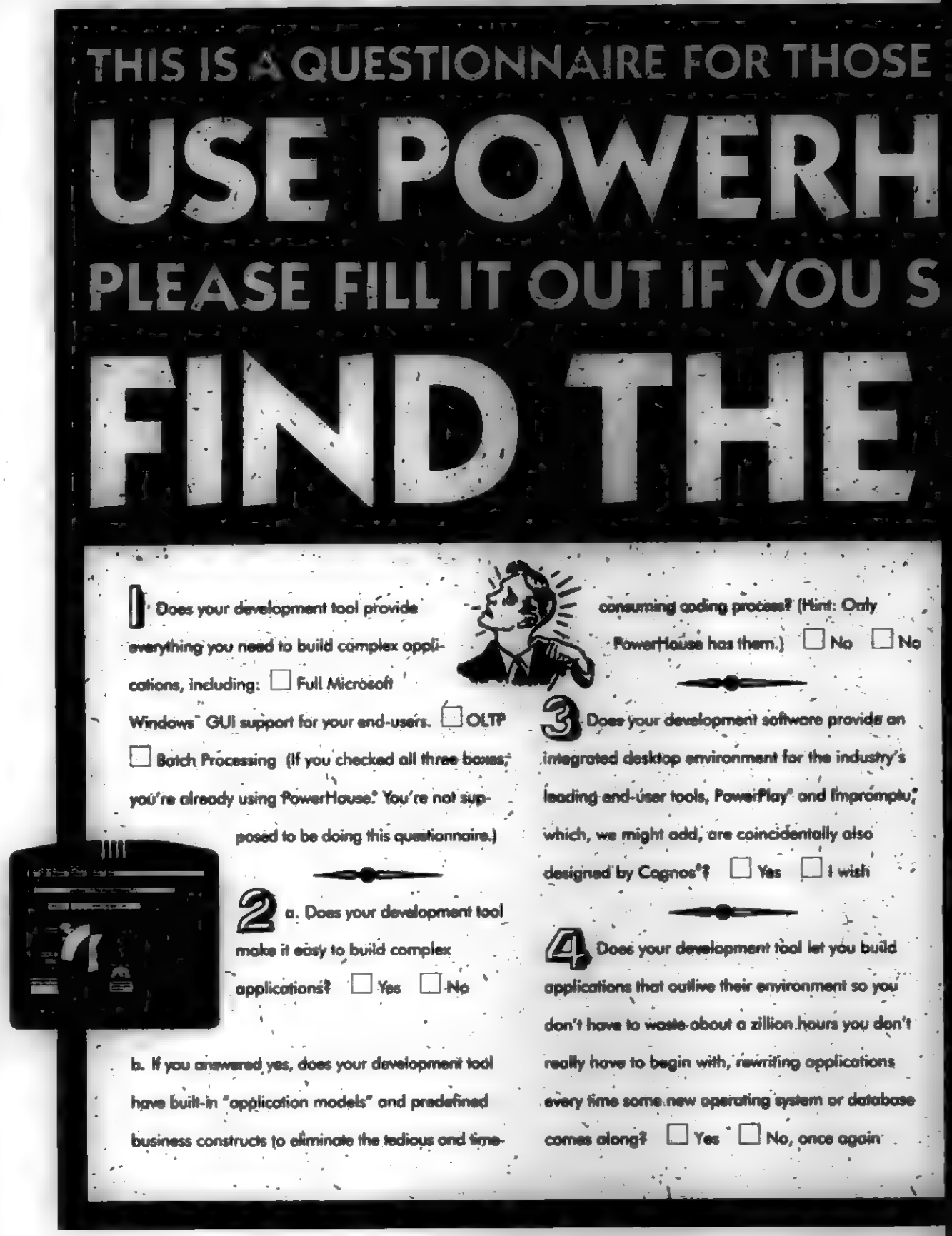
Toyota Production System, Second Edition

By Yasuhiro Monden; Industrial Engineering & Management Press, Norcross, Ga.; $53.95

In 1983, a Japanese professor, Yasuhiro Monden, gave the English-speaking world its first in-depth look at Toyota's revolutionary manufacturing process in his Nikkei Prize-winning book, *Toyota Production System: An Integrated Approach to Just-In-Time*.

A second edition of the book has now been published that describes the changes that have occurred in Toyota's production system, including the introduction of computer-integrated manufacturing technology, expert systems and artificial intelligence to its just-in-time system.

For more information, call the institute's customer service center at (404) 449-0460.



Calendar

SEPT. 26 - OCT. 2

Association of Banyan Users International Hosts Conference and Expo. Ottawa, Sept. 26-29 — Contact: Association of Banyan Users International, Chicago, Ill. (312) 644-6610.

OOPSLA '93: Conference on Object-Oriented Programming Systems Languages and Applications (OOPSLA). Washington, D.C., Sept. 26-Oct. 1 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

IS as a Service Organization. Columbus, Ohio, Sept. 27-28 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

Imaging Expo. New York, Sept. 28-30 — Contact: Comtek International, Wilton, Conn. (203) 834-1122.

OCT. 3 - OCT. 9

The Ninth International Congress on Advances in Nonimpact Printing Technologies/Japan Hardcopy '93. Yokohama, Japan, Oct. 4-8 — Contact: The Society for Imaging Science and Technology, Springfield, Va. (703) 642-9090.

Networld '93. Dallas, Oct. 5-7 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1460.

OCT. 10 - OCT. 16

Design/West. Anaheim, Calif., Oct. 10-12 — Contact: Kari Steidl, Reed Exhibition Cos., Stamford, Conn. (203) 964-0000.

National User Applications Seminar. Atlanta, Oct. 14-15 — Contact: Bellcore TEC, Lisle, Ill. (708) 960-6000.

Hypertext '93. Seattle, Oct. 14-16 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

CAD/CAM, CAE Reseller/Systems Integrator Strategy Workshops '93. Boston, Oct. 15-17 — Contact: Trish Griffin-Silva, Daratech, Inc., Cambridge, Mass. (617) 354-2339.

OCT. 17 - OCT. 23

OS/2 Professional Interchange Conference. Palm Springs, Calif., Oct. 17-20 — Contact: OS/2 Professional, Rockville, Md. (203) 261-6227.

Scan-Tech '93. Philadelphia, Oct. 18-21 — Contact: Scan-Tech '93 Registration, Ventura, Calif. (800) 228-1064, ext. 117.

Advanced Application Development Technology Conference and Exposition. Boston, Oct. 18-22 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3390.

C++ World. Dallas, Oct. 18-22 — Contact: SIGS Conferences, New York, N.Y. (212) 274-0640.

The Object Conference and Exposition (TOOLS). Boston, Oct. 18-22 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-0526.

Used/Refurbished Electronic Capital Assets (URECA). Las Vegas, Oct. 19-21 — Contact: Miller Freeman, Inc., Dallas, Texas (214) 238-3060.

Capacity Management Forum: "Performance of Networked Systems." San Francisco, Oct. 20-22 — Contact: The Institute for Computer Capacity Management, Inc., Phoenix, Ariz. (602) 997-7574.

Information Technology Association of America (ITAA) Management Conference. Seattle, Oct. 24-27 — Contact: ITAA, Arlington, Va. (703) 284-5355.

Common Desktop Environment Developers Conference. San Jose, Calif., Oct. 26-28 — Contact: Uniforum Association, Santa Clara, Calif. (408) 986-8840.

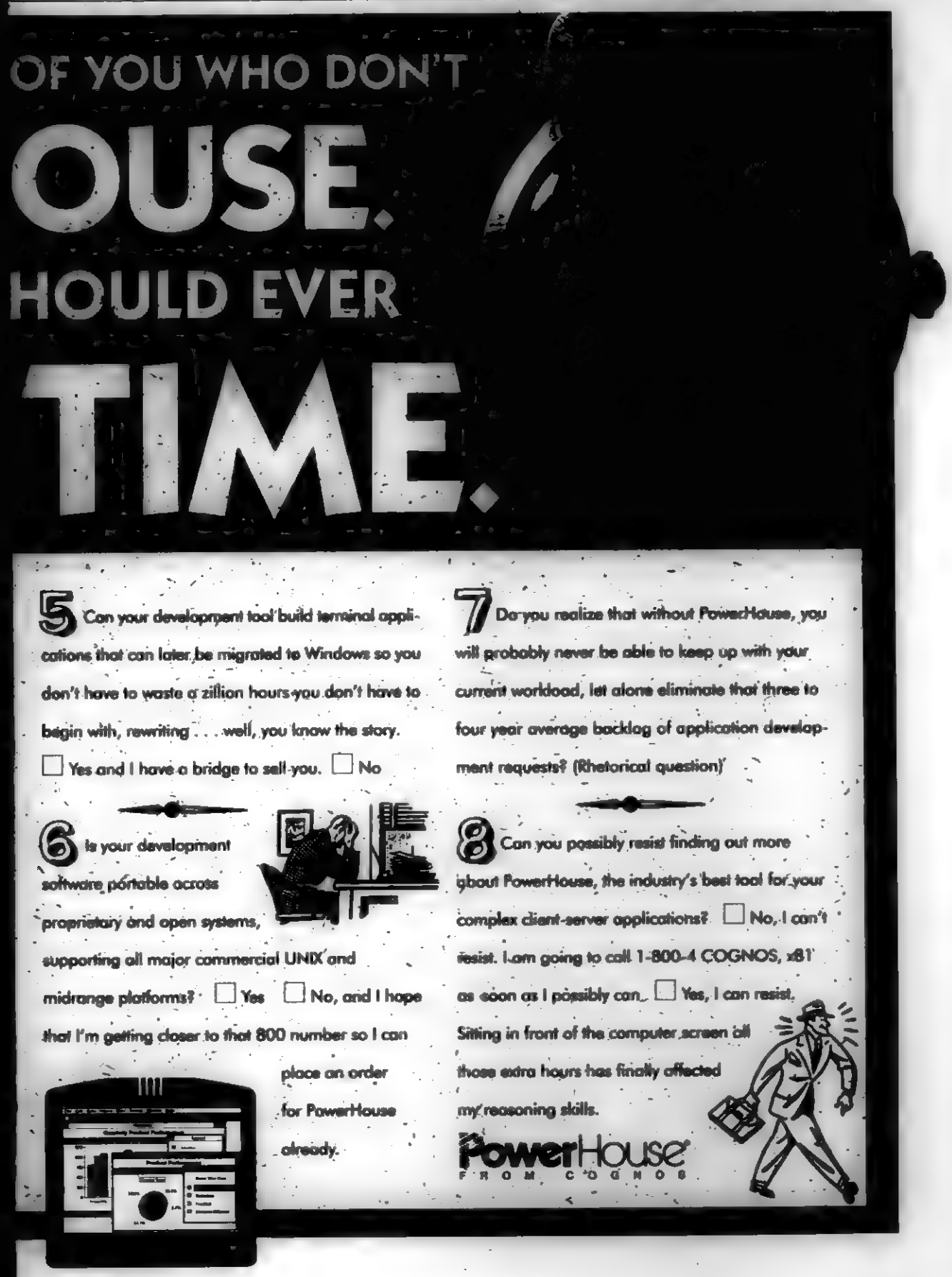
OCT. 31 - NOV. 6

Seventh International Conference on Design for Manufacturability. Orlando, Fla., Oct. 31-Nov. 4 — Contact: Management Roundtable, Boston, Mass. (617) 232-8080.

James Martin World Seminar. Los Angeles, Nov. 1-5 — Contact: Susan Levine, Extended Intelligence, Inc., Chicago, Ill. (312) 346-7080.

NOV. 7 - NOV. 13

1993 Info/Tech. Phoenix, Nov. 7-10 — Contact: DPMA, Park Ridge, Ill. (708) 825-8124.



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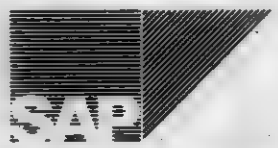

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HELP
Windows is driving me nuts!

By Brien C. Boland

ELLEN WEINSTEIN

Windows might not be ready for prime time networked environments, one IS pro is discovering. Why? There are no robust network management tools and few people expert in enterprise rollouts. Oh, and watch out for the Black Screen of Death. . . .

CORPORATE AMERICA, think twice before installing Windows 3.1 on enterprise networked computers. Believe me, I know what I'm talking about. I've been technical lead of a team that has struggled during the last year with two projects aimed at getting Windows up and running on 130 networked users' machines at my organization, a large international financial institution in Washington, D.C. Currently, we're figuring out how to roll out Windows to about 2,400 other potential users at headquarters, and we don't relish the prospect.

I have a sense my story is not a unique one — that's why I want to tell it. Windows has thrown glitches at us such as the Black Screen of Death (more on that later). It doesn't yet seem to have the management tools common to big systems environments. Perhaps more chilling is the apparent lack of Windows expertise available to help users. We've been trying to hire someone to join our systems integration team to assist us in putting together a hearty Windows configuration, to no avail (see story page 110). And Microsoft hasn't been much help, either.

After a string of sleepless nights and watching my hair turn gray, I've decided the application just isn't ready for the wear and tear of a large networked setup.

Have others reached this conclusion as well? Maybe, considering how we found few organizations that were putting Windows to the test. To help us with organizing and standardizing our approach to a huge Windows rollout, we searched for some kindred company that might share its experiences. The single largest rollout effort we discovered was a gas company in Texas that brought Windows to 300 users.

Sure, there are other companies with more Windows users, but we found that these implementations were done in a spotty, individual and noncentralized fashion.

We have yet to find an organization our size running a similar network with similar applications that has converted its network to Windows from the ground up.

Time and money

At present, we have a projected budget of $300,000 and a time frame of six months to figure out how to get Windows working smoothly in our organization.

"Working smoothly" means fitting Windows neatly in with our Ethernet-based Novell, Inc. NetWare network, which has 40-plus servers spanning three buildings. We run IPX, Transmission Control Protocol/Internet Protocol and NetBIOS. Our users have access, through the network, to an IBM 3090, a Unisys Corp. A17 mainframe, a Digital Equipment Corp. VAX 8800, a Hewlett-Packard Co. HP 3000 and six IBM RISC System/6000s. We have an X.25 gateway, an X.400 gateway and a Novell asynchronous server.

Existing applications include Lotus Development Corp.'s 1-2-3 Version 3.1 for DOS, WordPerfect Corp.'s WordPerfect 5.2 and Borland International, Inc.'s Paradox 3.5.

IBM Personal System/2s make up 80% of our PC hardware; the other 20% comprises Compaq Computer Corp. dual-purpose machines (DPM). These machines are portable computers you connect to the network by inserting them into

Driving me nuts, *page 108*

Boland is lead technical member for the systems integration team at a large international financial institution in Washington, D.C., that is currently planning an organizationwide Windows strategy. He is on assignment from American Technical Resources in Annandale, Va.

Driving me nuts

CONTINUED FROM PAGE 107

a desktop base station.

With downsizing projects planned or in progress (we recently moved an accounting/payroll application off the Unisys mainframe and onto the Novell network), it has become imperative that we have a stable Windows configuration. Users need the features they are accustomed to, and information systems staffs need the kind of management and support oversight we're used to with large systems environments.

Unfortunately, Windows 3.1 out of the box does not provide all the features our users currently have, nor does it provide the tools for centrally managing the environment.

For instance, if Windows were installed on the network, what would happen to our DPM users when they took their machines away from the office? No Windows! Sure, we could install Windows locally for DPM users and on the network for desktop users, but that would result in supporting two configurations, making application distribution and upgrades a nightmare.

The idea of supporting two configurations becomes especially dicey when you consider that neither Microsoft nor third parties offers management tools for the Windows environment that are robust enough.

I found Winlogin, Windows' network-based configuration tool, to be very difficult to use and sparsely documented. Winlogin is supposed to maintain a central database of user configuration files that is accessed whenever a user starts Windows, but it has not always worked as advertised for us. Sure, Hermes — the company's next-generation network systems management facility with remote capabilities — is coming, but a source tells me it is still only in limited beta testing. We can't wait.

Third-party help limited

We've had to turn to third-party products — namely, Automated Design Systems, Inc.'s ADS NetTools, Saber Software Corp.'s LAN Workstation and LANovation's LAN Escort — with mixed results. Each of the three programs we've examined has some nice features, such as those that enable us to change configurations for a user or user group, to add or delete applications for a user or user group and to add or remove a printer from a user printer list.

But each falls short in some important area, including, for us, the ability to handle DPMs and to provide a robust scripting language. We have hundreds of macros written using WordPerfect Office 3.1. If we go to Windows, we need to find a robust scripting language that we can use to replace those.

ADS NetTools and LAN Workstation, for instance, are nearly mature, but they concentrate on network users and do not support our remote Compaq dual-purpose machine users well. Nor do they provide extensive options for arranging user desktops; they allow for subgroups, but that's about it.

LAN Escort, for its part, has solid network management features, but it has no scripting language, keyboard locking, screen blankers or support for remote Compaq users.

Last straw

To top things off, we figured out that the strain Windows puts on our network resources might even call for redesigning our current setup at great time and expense.

Using Network General Corp.'s Sniffer and HP's LAN Analyzer in conjunction with Novell's NetWare STAT NetWare Loadable Module, we got numbers on network utilization, server activity and load/runtimes using Windows.

We also tested loading Windows and running DOS applications, including WordPerfect 5.2, Lotus 4.0 and File Manager, on our workstations. Though our test analysis isn't done, there's one thing we noticed right away: Loading Windows on seven machines at the same time resulted in nearly 100% network utilization. Only seven!

In fact, the energy company in Texas told us that Windows on the network can quickly have a company talking superservers to provide adequate performance. The problem for us is that disk utilization on some of our servers is already dangerously high — about 50% to 80%. If we plan to load more software (Windows) and applications with larger executables (Windows applications are bigger), this could only aggravate the problem.

At this point, if we do end up going with a superserver (average hardware price is $140,000), our costs will skyrocket and our

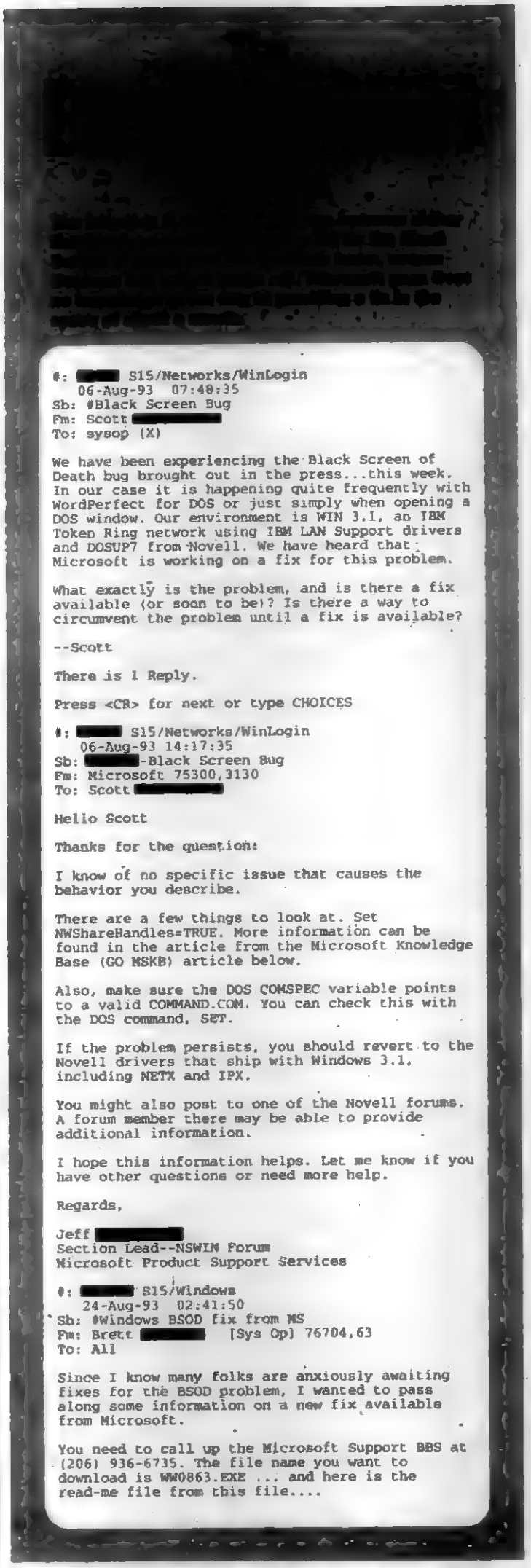
Nuts, *page 110*

EXPERIENCE COUNTS

In our quest to locate other companies that have migrated to Windows, we have researched forums and databases on CompuServe, talked with other Windows experts, asked Microsoft, scoured trade journals and done just about anything else we could think of.

We have been looking for a company with a centrally managed IS department that has conducted a strategic rollout process. Our purpose is to learn from others' experience. We would like answers to questions such as the following:

- What was the cost per workstation? Includes cost of upgrading PC base to run Windows, cost of additional software, cost of upgrading LAN infrastructure, cost of training users and cost of installing software.
- How much user training was required?
- Are you running Windows off the network, and if so, how is it managed?
- How are applications updated and distributed?
- What was the impact on network resources?



```
#: [redacted] S15/Networks/WinLogin
   06-Aug-93  07:48:35
Sb: #Black Screen Bug
Fm: Scott [redacted]
To: sysop (X)

We have been experiencing the Black Screen of
Death bug brought out in the press...this week.
In our case it is happening quite frequently with
WordPerfect for DOS or just simply when opening a
DOS window. Our environment is WIN 3.1, an IBM
Token Ring network using IBM LAN Support drivers
and DOSUP7 from Novell. We have heard that
Microsoft is working on a fix for this problem.

What exactly is the problem, and is there a fix
available (or soon to be)? Is there a way to
circumvent the problem until a fix is available?

--Scott

There is 1 Reply.

Press <CR> for next or type CHOICES

#: [redacted] S15/Networks/WinLogin
   06-Aug-93 14:17:35
Sb: [redacted]-Black Screen Bug
Fm: Microsoft 75300,3130
To: Scott [redacted]

Hello Scott

Thanks for the question:

I know of no specific issue that causes the
behavior you describe.

There are a few things to look at. Set
NWShareHandles=TRUE. More information can be
found in the article from the Microsoft Knowledge
Base (GO MSKB) article below.

Also, make sure the DOS COMSPEC variable points
to a valid COMMAND.COM. You can check this with
the DOS command, SET.

If the problem persists, you should revert to the
Novell drivers that ship with Windows 3.1,
including NETX and IPX.

You might also post to one of the Novell forums.
A forum member there may be able to provide
additional information.

I hope this information helps. Let me know if you
have other questions or need more help.

Regards,

Jeff [redacted]
Section Lead--NSWIN Forum
Microsoft Product Support Services

#: [redacted] S15/Windows
   24-Aug-93  02:41:50
Sb: #Windows BSOD fix from MS
Fm: Brett [redacted]  [Sys Op] 76704,63
To: All

Since I know many folks are anxiously awaiting
fixes for the BSOD problem, I wanted to pass
along some information on a new fix available
from Microsoft.

You need to call up the Microsoft Support BBS at
(206) 936-6735. The file name you want to
download is WW0863.EXE ... and here is the
read-me file from this file....
```

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Nuts

CONTINUED FROM PAGE 108

timetable will double. Before we can even think of superservers, we have to test, test and test again and likely redesign the network.

Ka-boom!

No amount of testing prepared us for the Black Screen of Death, a lovely little problem that locks up the machine, blacks out the screen and hangs the cursor in the upper left-hand corner of the display. This blackout occurs when a user receives a network broadcast message while switching among DOS applications under Windows. Apparently, the problem is a result of Windows' virtualizing network communications. When it receives the message, Windows sends it to the wrong window and *boom!*

According to press accounts, Microsoft has been reluctant to acknowledge this bug's existence. We certainly had trouble getting the company to tell us anything about it when we contacted the SysOp early last month (see correspondence page 109). So we forged ahead, researching CompuServe and other user forums to come up with a fix. We installed the latest open data link interface drivers, tweaked the TimerCriticalSection setting and prevented NETBIOS.EXE from loading, among other things. Microsoft, for its part, offered users its own advice late last month.

At this point, we're not having the problem, but I'm still not sure exactly which part of my fiddling got rid of the Black Screen of Death.

Just as ugly is the DOS Manager error, which first cropped up during design testing for our accounting/payroll downsizing effort. While switching among multiple DOS applications, we would randomly get a Windows error message and have to reboot the machine.

We found that increasing the TimerCriticalSection setting (which instructs Windows to go into a critical section around all timer interrupt code and specifies a timeout period) and switching the network boards from Standard Microsystems Corp. to 3Com Corp. all but got rid of the problem. When we added Novell's open data link interface network driver files, the problem went away. But when my organization standardized on a newer 3Com network-integrated circuit board with our PS/2 Model 90s, guess what came back? Yup, the DOS Manager error.

We have worked with Microsoft technical support on this problem, including ongoing support calls with engineers. I asked them to look at their code and tell me what triggers the problem. It's been more than a year, and no word.

Because of these ills, I discovered the importance of the Novell Novlib forum on CompuServe. From it I download files such as DOSUP7 and WINUP7, which contain network driver files and Windows systems files used for network communications. New WINUP and DOSUP files are published to fix many known bugs. I also accessed WINTIP.TXT, a text document containing common Windows problems and solutions.

To date, Microsoft has only provided reasons for indecision. We continue to forge ahead with Windows 3.1, waiting for the company to provide details on NT, Chicago (Windows 4.0) and Hermes.

So, if you plan to migrate to Windows, beware. The move affects all aspects of your enterprise computing environment, and there is no precedent or easily available expertise to count on. ■

HUNT FOR AN EXPERT

We desperately need one more member of our systems integration team to help us figure out whether Windows can work for us and, if so, help with implementation. But I have not yet been able to locate anyone available who has the kind of knowledge we need. And it's not from lack of trying.

We have had at least five recruiting firms sending us dozens of resumes. I have conducted more than 40 technical interviews. They tend to go like this:

Q: So, you consider yourself a Windows expert?
A: Know it forward and backward. I have installed countless copies and have worked with it since Windows 286.

(At this point I'm saying to myself, "Thank you, God. Please let it be true.")

Q: Great, so do you know what a TimerCriticalSection is?
A: No, can't say I do.

Q: Are you familiar with DOSUP7 and/or WINUP7?
A: No.

Q: So in all your Windows installations in the past, you just used the files straight out of the box?
A: Well, yes.

Thank you very much for your time. We'll be in touch.

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   OTHER PROFESSIONAL MANAGEMENT
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Computer Careers

Getting a foothold in client/server

Advice for client/server job-seekers

BY LEE ANN HANTULA

Hantula is a senior analyst at McCall Consulting Group, Inc. in Atlanta. She has been developing client/server applications for two years.

Q We already have PC LANs for file and print services, but we are starting a client/server project soon. I'm a senior member of the application programming team. How should we approach training?

A Take it step-by-step. Don't cram all your training in at once. Because you already have LAN skills, move to the database. If your company's database is not already relational, learn SQL. Most training programs for client/server tool sets will assume this knowledge. Practice using SQL and start designing your database. It doesn't need to be perfect. The last step will be learning the programming language or tool set.

Q My company is talking about client/server, and I want to be selected for the development team. How can I improve my chances?

A Make it known that you want to do it. Unless you have established a reputation at your company for being a technical trailblazer, you may have to convince them on your own time.

Graphical user interfaces (GUI) are common in client/server, so basic desktop computing literacy is necessary. Learning GUI-based office automation tools is good exposure to GUI principles.

KEEPING up

In the networking arena, an excellent starting point for people with little communications background is *Computer Networks*, by Andrew Tanenbaum, which explains the theoretical underpinnings of almost all LAN and WAN protocols.

If you prefer systems or applications programming, and your background is in Cobol, RPG or a fourth-generation language, consider a programming course in C. Some client/server tools are written in C, and companies are more likely to hire and train former C programmers than Cobol programmers. Also, become familiar with object-oriented principles, but don't make it a top priority.

Finally, learning a relational database is important for application designers. SQL is especially practical. However, if the company wants to hire someone with database administration skills, lobby for a position as backup administrator.

Q I am an AS/400 applications programmer and want to move to client/server. My company doesn't want to switch anytime soon, however. How can I make myself more attractive to other firms?

A Don't discount your Application System/400 skills. I see many AS/400s acting as servers, at least part-time. Most people I know were able to move to client/server without changing jobs. Leverage your knowledge of your company's business, its legacy systems and your working relationships with members of the user community. Good old-fashioned systems design and project management skills never go out of style.

If you decide to change jobs and your target company uses a tool kit such as Powersoft Corp.'s PowerBuilder or Gupta Corp.'s SQLWindows, learning these skills is crucial. Training costs may be prohibitive, however. Also, learn C. One way to get hands-on experience is to volunteer at a nonprofit organization that needs a systems solution.

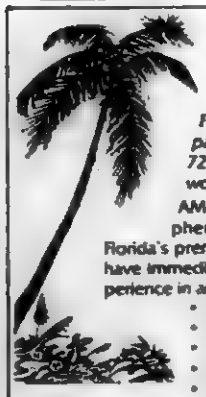
One of my colleagues expanded his SQLWindows knowledge by writing an application to track swimmers in a Georgia Special Olympics event. He learned a new skill and got brownie points for his charitable contribution.

Q What is the most difficult aspect of making the transition from centralized architectures to client/server?

A Any big change requires the willingness to take a risk. Client/server, in particular, takes extra patience because the tools are still immature. Client/server is also characterized by mixtures of different vendors' products, so you can't just turn to one vendor for support.

I find networking the most daunting, and evidently, so do others because network experts are the most in demand of any client/server specialist. Networking is also the most difficult skill to learn on your own.

In my experience, the only people who fail to make the transition are those who panic. Don't be afraid to ask questions. Everyone is still learning. The need for client/server skills is outstripping the supply and will probably do so for at least another year.



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The career road less traveled

ACHIEVER'S PROFILE

By Leslie Goff

JIM HOWELL started his information systems career on an assembly line in the small central Texas town of Temple. Today, he's a key player in the implementation of a wide-area network for the Lower Colorado River Authority (LCRA) in Austin. The real story, however, is how he prepared himself for this position with little formal training.

When the LCRA — a nonprofit, quasi-state agency that manages the resources and conservation of the 600-mile long Lower Colorado River — hired Howell, it was gearing up for a 10-year strategic IS plan. The LCRA was planning to build an Ethernet network linking a mainframe, a Digital Equipment Corp. VAX and more than 900 PCs and servers across 43 counties in central Texas.

Howell was originally brought in for his PC support and local-area network experience. His resume also included self-taught PC programming skills that he sharpened with on-the-side consulting jobs and in-depth knowledge of electronic components and PC hardware.

Now, a senior systems analyst with networkwide responsibility for the rollout of new database applications, Howell says he was attracted to the LCRA because of the opportunity to build a new network.

"Here was a company that had a pretty minimal network. It was like starting with a blank slate. I took a pay cut to come here because there were so many things that leveraged all my prior experience," Howell says.

Howell spent his first 18 months at the LCRA evaluating, specifying, purchasing and installing network hardware and software. He recently began prioritizing and deploying database applications across the myriad functions in the company. He will also manage the LCRA's Enterprise Network Group.

Self-made man

During the past 11 years, Howell has propelled himself to new jobs with skills developed through reading and tinkering but very little formal training. He landed his current position after having taught himself "just enough [Novell, Inc.] NetWare to market myself" while on the job at direct-channel PC vendor CompuAdd.

Even though he had built LANs using Digital's Pathworks LAN operating system, learning NetWare was "like starting from scratch," he says.

"NetWare and Pathworks are completely different — the concepts, the commands, the core components are not alike at all. I think I lied to CompuAdd about how much I knew about NetWare and then went to the bookstore."

For Howell, it has been a self-managed apprenticeship. He learned Basic while working on a printed circuit board assembly line. He taught himself electronics while working at a burglar alarm company and developed PC-based inventory management applications for a small construction company. He improvised when working on his first LAN at a chip manufacturer.

"My perception was that I had to learn everything about hardware, software, networks and internal components, and then it would be time to move into a position where my opinions would mean something," Howell says. "I didn't want to be the guy who always fixed things. I wanted to have upfront responsibility for planning and implementation."

Goff is a free-lance writer in New York.

Lessons learned

We asked a few IS experts to comment on Jim Howell's journey to a senior systems analyst position and add their own suggestions for others facing a similar requirement.

Michael Sinorta, network specialist at Dominick's Finer Foods, Inc. in Northlake, Ill.: "The best education you can get is to pick up a book and read. It's hard work, but it pays."

Steve Wilkes, director of network management at American Greetings Corp. in Cleveland: "He took responsibility for his own development, and you can't do that sitting in front of the TV at night. To succeed in this industry, you have to read nonfiction management books."

Matthew Cain, program director of the Workgroup Computing Strategies Service at Meta Group, Inc. in Westport, Conn.: "It shows that the ability to recognize the value of a technology early on is beneficial. His career has paralleled the PC technology's evolution."

Upwardly mobile

Jim Howell has taken a self-managed apprenticeship approach to his career. Highlighted are responsibilities that he considers have directly contributed to success in his present job.

1992-present
Senior systems analyst
Responsibilities include specification, evaluation and purchasing of network gear; choosing a corporatewide database; deploying departmental database applications; and end-user support in a LAN/WAN environment.

1990-1992
Senior engineering technician
Tested and burned PCs for Digital Equipment Corp. PathWorks and Novell, Inc. NetWare certification; supported NetWare LAN in engineering department.

1987-1990
Technician/senior technician
Installed, supported and maintained 1,000-plus node PathWorks LAN. Maintained engineering production database tracking quality-control parameters.

1986
Moved to Austin, Texas, and took short-term job programming a PC-based inventory control system.

1985-1986
Electronics technician
Taught himself principles of electronics.

1982-1985
Line worker/process engineering assistant
Assembled printed circuit boards; taught himself Basic; wrote small quality-assurance programs.

* Not all responsibilities are listed

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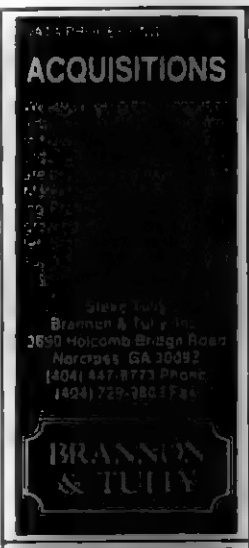

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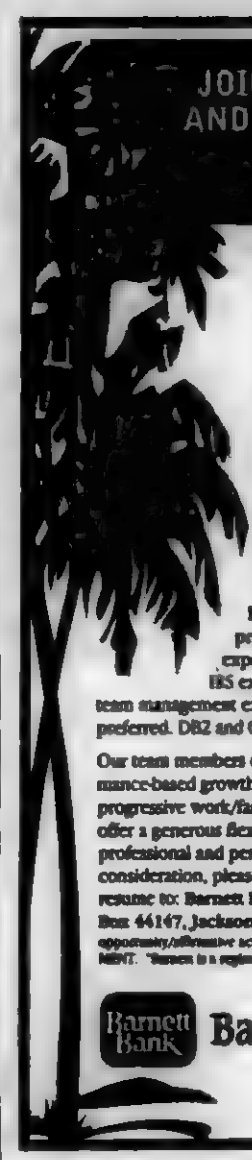

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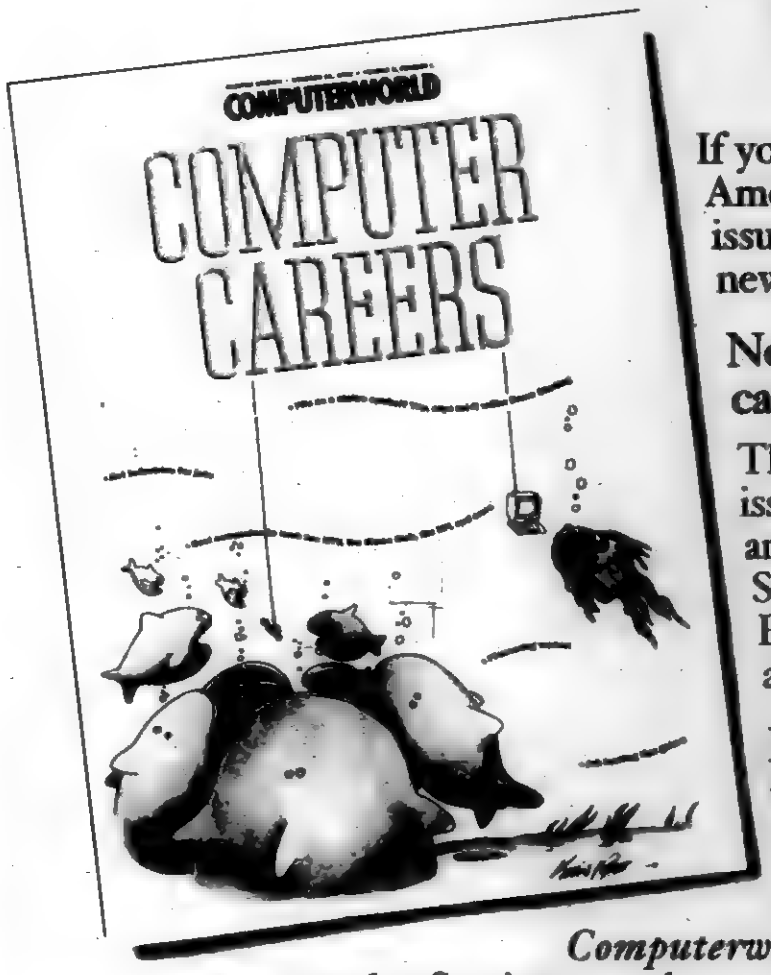

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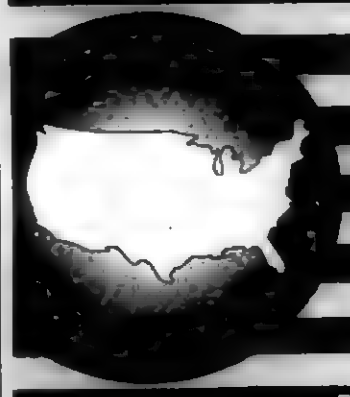

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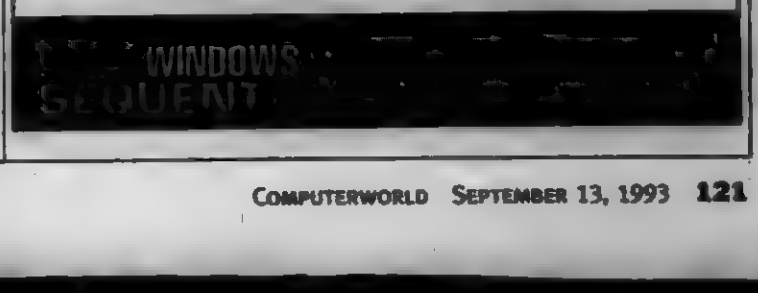

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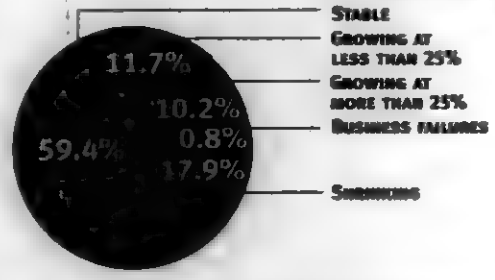

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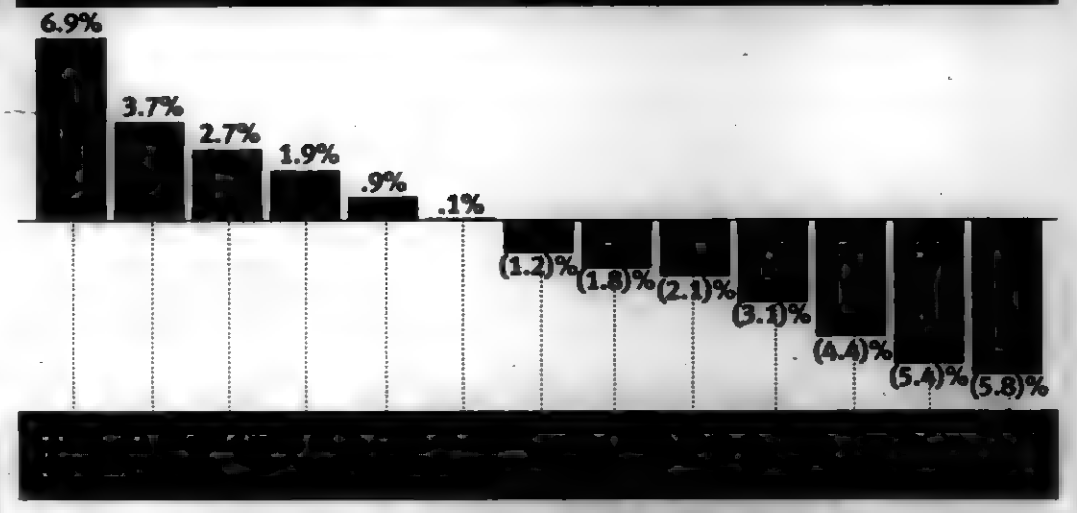

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The following are negotiating questions from information systems buyers. Joe Auer, president of International Computer Negotiations, Inc., a negotiations, consulting and training firm in Winter Park, Fla., is this week's guest adviser.

Master agreement pitfalls

Q IBM has been pushing us to sign its IBM Customer Agreement (ICA). It seems easier to read than other IBM contracts. Should I sign it without negotiating?

A I strongly recommend you get expert advice on this document before signing it. The ICA describes the rights and obligations of IBM and its customers. While it may feel friendlier, many important issues remain to be worked out after the agreement is in place.

The ICA involves a series of documents that can sequentially and subtly increase your legal commitment to IBM. Two such document types are Attachments and Transaction Documents, both of which override provisions of the ICA.

The Attachment's terms come into effect almost automatically when the product or service is either used or paid for (see chart). And when terms conflict in the various documents, the Attachment's terms prevail.

ACCEPTANCE OF ADDITIONAL TERMS

You accept the additional terms in an Attachment or Transaction Document in IBM's Customer Agreement by doing any of the following:

1. Signing the Attachment or Transaction Document.
2. Using the product or service and allowing others to do so.
3. Making any payment for the product or service.

Source: IBM's Customer Agreement contract

This poses problems for companies whose individual departments deal directly with IBM. Someone with no knowledge of the ICA or its Attachments can unknowingly override the original contract terms.

The terms of Transaction Documents also take precedence over those in the ICA. For each product order, IBM provides the appropriate Transaction Document, which confirms the specific details.

Critical issues such as machine quantity and type ordered, price, ship date and warranty are often addressed. If an individual department receives shipment of a product and uses it, the terms and conditions related to that product override previous agreements made with IBM — without the consent of the lawyers who approved the original contract.

Escrow worries

Q I'm in the process of negotiating a software license and have requested a release of the source code, but the vendor is reluctant. What can I do?

A Your best bet is a technology escrow agreement. If it is properly negotiated, an escrow arranges for the source materials to be held in an escrow deposit and released to you under contractually defined conditions. Consider the following when setting one up:

- Negotiate the escrow contract and license agreement at the same time. Once you sign the license agreement, you lose your leverage to negotiate the escrow. The contract should be a three-party arrangement with an independent agent.
- Include a provision stating that an update will be made to the escrow within a specified time after each release.
- Request technical verification rights to make sure the deposit is complete. You will want everything that's necessary for a runtime version of the software.
- Define conditions governing release of the materials. In addition to bankruptcy, this should include the vendor's failure to support the software. The escrow agent should be allowed to deliver materials to you without court instructions.
- Carefully define the escrow deposit's contents. Tell the vendor what you need in the escrow. The deposit should also contain information on licensing third-party software the vendor uses to maintain the software.
- Pay the escrow fees yourself. Also, try to negotiate a reduction in the annual software maintenance fees equal to the escrow's cost. If the vendor pays, make sure the escrow agent will notify you if the vendor defaults.
- Designate someone in your company to monitor communications with the escrow agent at all times.

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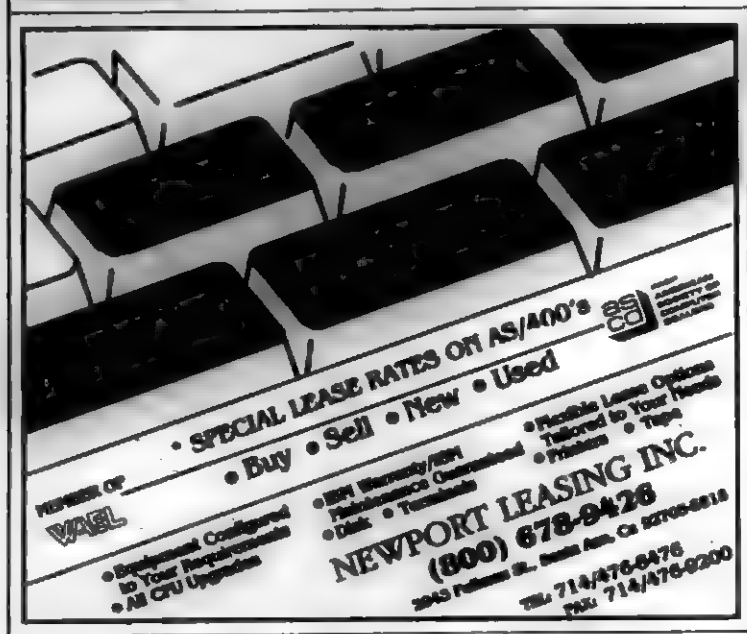

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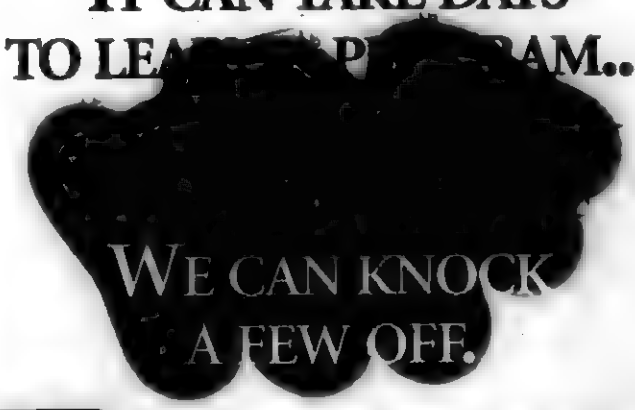

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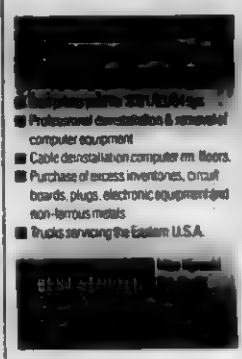

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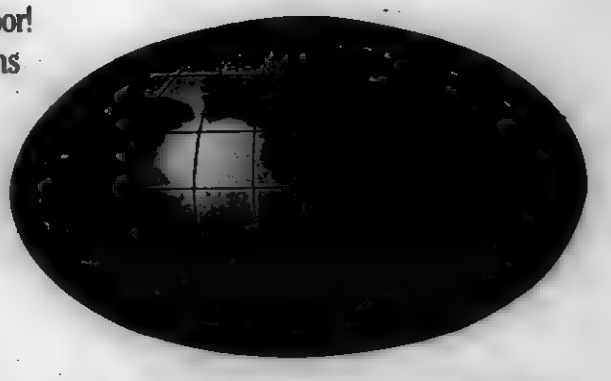

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Intersolv Inc.	19.0
Datapoint Corp.	17.7
Ann Onderdonk	15.3
Fibronix Int'l, Inc.	14.6
Excel Corp.	13.6
Intelligent Electronics	12.9
Walker Interactive Systems	10.4
Gupta Technology	10.2

Dollar

Ericsson Technology	5.38
Lotus Development	3.25
Intel Corp.	3.00
Novell Corp. (O)	3.00
4th Dimension	2.75
Tandy Corp. (N)	2.50
Platinum Software	2.50
Xilinx	2.25

Losers

Percent

Structl. Dynamics Research	-30.6
Borland Int'l, Inc.	-28.3
Parallan Computer(O)	-18.7
Gupta	-12.2
Sequent Comp.	-12.0
MathSoft(L)	-11.9
McAfee Associates	-11.8
Proteon Inc.	-11.6

Dollar

Structl. Dynamics Research	-6.13
DSC Communications(N)	-4.88
Parallan Computer(O)	-4.25
Borland Int'l, Inc.	-3.75
Synoptics Inc.	-3.50
Chipcom Corp.	-3.38
Matsushita Electronics(N)	-3.25
Cisco Systems Inc.	-2.75

Structural Dynamics has fallen, but can it get back up?

That "bop" you heard in the middle of last week was the sound of investors knocking down Structural Dynamics Research Corp. (SDRC).

Structural Dynamics, a Milford, Ohio, vendor of computer-aided design and manufacturing (CAD/CAM) software, shed nearly a third of its market value after announcing that its third-quarter earnings will fall short of Wall Street's expectations. Its shares fell 5¼ to close at 13¾ Wednesday.

Although company officials blamed the earnings shortfall on a slight delay in shipping its new Master Series CAD/CAM software, analysts were not quick to predict a rebound. They said Structural Dynamics faces some significant challenges in the fiercely competitive CAD/CAM market.

"We've been negative on the company for a while," said Thomas Rooney, vice president at Donaldson, Lufkin & Jenrette Securities Corp. According to Rooney, growth of Structural Dynamics' strongest market area has slowed, and the firm's core software code is showing its age despite improvements in the Master Series release.

Fred Wolf, vice president at Adams, Harkness & Hill, also advised avoiding Structural Dynamics stock for now.

To regain its former momentum, the company must expand into other CAD functions and markets. However, it is sandwiched between a hot competitor on the front end, Parametric Technology Corp. (PMTC), and well-established players on the back end, such as Computervision Corp. (CVN).

Computervision's stock is still hanging around the 3 range after its postinitial public offering free fall. However, Rooney said the company should get back on its feet when the European economy turns around. Computervision pulls in about 60% of its revenue overseas.

"Financially, they are very solid since their recapitalization, and they can ride through this European softness with no problem. So it's just a timing issue" as to when the stock will turn upward, Rooney said.

Parametric has largely avoided the stock market tumbles of its competitors and recently hit a 52-week high of 40. Parametric offers a highly intuitive modeling software package, according to Wolf. "If a user is switching from an older CAD system, his first choice is probably going to be Parametric because it's a proven product," he said.

—Derek Slater

Exch	52-Week Range			Sept.10 3PM	Wk Net Change	Wk Pct Change
Communications and Network Services						
OTC	40.00	13.50	3 COM Corp.	25.00	-1.13	-4.3
NYS	88.75	63.38	American Info Techs Corp. (H)	88.75	1.75	2.0
NYS	65.00	60.63	AT&T	60.75	-2.00	-3.2
OTC	4.06	0.75	Artel Communication Corp.	3.13	-0.13	-3.8
OTC	24.50	12.50	Banyan Systems Inc.	19.00	-0.50	-2.6
NYS	64.13	44.50	Bell Atlantic Corp.	64.13	0.25	0.4
NYS	61.13	46.75	Bellsouth Corp. (H)	61.13	1.13	1.9
NYS	14.75	3.63	Bolt, Beranek & Newman	11.25	0.50	4.7
OTC	18.50	9.50	Brooktrout Technology	12.25	0.50	4.3
NYS	119.00	56.63	Cabletron Systems	103.75	-1.63	-1.5
OTC	35.00	6.00	Centigram Communications (H)	31.25	-2.75	-8.1
OTC	55.50	20.25	Chipcom Corp.	46.50	-3.50	-7.0
OTC	59.25	24.00	Cisco Systems Inc.	45.75	-2.63	-5.4
OTC	16.38	5.50	Compression Labs Inc.	14.00	-0.25	-1.8
OTC	36.00	17.00	CrossComm	26.00	2.00	8.3
OTC	4.63	1.50	Data Switch Corp.	2.63	0.00	0.0
NYS	19.88	12.38	Digital Comm. Assoc.	13.63	0.25	1.9
OTC	12.75	3.75	Digital Systems Int'l, Inc.	4.25	-0.38	-8.1
OTC	67.88	8.75	DSC Communications (H)	61.38	-4.88	-7.4
OTC	9.50	4.75	Fibronix Int'l, Inc.	6.88	0.88	14.6
OTC	24.00	8.75	Filenet Corp.	14.00	-0.25	-1.8
OTC	4.38	1.50	Gandalf Technologies Inc.	2.50	-0.13	-4.8
OTC	2.06	0.75	Gateway Communications	0.94	-0.03	-3.2
NYS	15.75	3.25	General Datacomm Inds.	10.50	-1.00	-8.7
ASE	3.75	2.00	Go Video	2.56	-0.19	-6.8
NYS	37.75	32.38	GTE Corp.	37.00	0.38	1.0
NYS	94.75	62.75	ITT Corp.	93.50	1.38	1.5
OTC	29.88	16.81	MCI Communications Corp.	27.88	-1.13	-3.9
OTC	6.50	1.50	Microcom Inc.	2.38	0.00	0.0
OTC	24.25	3.50	Netrix Corp.	5.00	-0.50	-9.1
OTC	19.00	7.00	Network Computing Devices	7.50	-0.25	-3.2
NYS	15.00	5.38	Network Equipment Tech.	8.88	-0.13	-1.4
OTC	20.13	8.00	Network General	12.38	-0.50	-3.9
OTC	15.75	6.88	Network Systems Corp.	8.00	-0.38	-4.5
OTC	73.88	8.19	Newbridge Networks Corp.	66.88	-2.75	-3.9
NYS	46.00	21.38	Northern Telecom Ltd.	27.50	0.50	1.9
OTC	35.25	17.63	Novell Inc.	19.75	0.75	3.9
NYS	95.38	79.00	Nynex Corp. (H)	95.38	3.00	3.2
OTC	30.00	14.50	Octel Communications Corp.	20.50	0.25	1.2
OTC	6.13	3.38	Pemrel Data Comm Networks	4.25	0.00	0.0
OTC	30.50	12.50	Pictrotel Corp.	17.75	0.38	2.2
OTC	15.25	3.63	Proteon Inc.	4.75	-0.63	-11.6
NYS	37.88	17.00	Scientific Atlanta Inc. (H)	37.13	0.50	1.4
NYS	46.00	31.75	Southwestern Bell Corp.	46.00	0.50	1.1
NYS	37.25	22.25	Sprint Corp	36.38	-0.75	-2.0
OTC	27.00	12.50	Standard Microsystems Corp.	18.88	0.13	0.7
OTC	18.50	9.25	Stratacom Inc.	12.75	-0.25	-1.9
OTC	42.75	12.84	Synoptics Communications	24.25	-1.88	-7.0
OTC	6.63	2.88	Telebit Corp.	4.75	-0.13	-2.6
OTC	14.50	2.38	Telematics Int'l Inc. (H)	13.50	-0.38	-2.7
OTC	30.00	15.25	US Robotics (H)	29.75	-0.25	-0.8
NYS	47.75	35.25	US West Inc.	46.75	-0.25	-0.5
OTC	56.00	19.50	Wellfleet Communications	45.00	-2.75	-5.8
OTC	19.50	7.25	Xircom (H)	18.25	-0.50	-2.7
PCs and Workstations						
OTC	5.56	2.50	Advanced Logic Research	3.00	0.00	0.0
OTC	65.25	25.25	Apple Computer Inc.	26.00	0.50	2.0
OTC	24.25	12.75	AST Research Inc.	15.50	0.00	0.0
NYS	9.25	2.50	Commodore Int'l.	3.63	0.00	0.0
NYS	61.75	31.00	Compaq Computer Corp.	57.63	2.25	4.1
OTC	49.88	13.50	Dell Computer Corp.	17.75	-0.25	-1.4
NYS	89.25	50.25	Hewlett Packard Co.	70.38	-2.38	-3.3
NYS	41.00	17.63	Silicon Graphics	39.13	-1.25	-3.1
OTC	41.00	24.00	Sun Microsystems Inc.	27.88	0.38	1.4
NYS	36.25	23.75	Tandy Corp. (N)	36.25	2.50	7.4
OTC	7.00	2.88	Zeos International Ltd.	3.13	0.00	0.0
Large Systems						
ASE	15.13	4.63	Amdahl Corp.	4.94	0.13	2.6
NYS	8.75	3.63	Convex Computer	4.50	0.25	5.9
OTC	6.13	2.25	Cray Computer	3.25	0.13	4.0
NYS	30.88	19.00	Cray Research Inc.	22.75	-0.75	-3.2
NYS	13.88	7.75	Data General Corp.	9.00	-0.25	-2.7
NYS	49.25	30.38	Digital Equipment Corp.	42.75	0.38	0.9
NYS	44.00	28.75	Harris Corp.	40.38	-0.13	-0.3
NYS	88.75	40.63	IBM	43.63	-2.25	-4.9
OTC	25.75	5.50	Kendall Square Research (H)	23.25	-1.50	-6.1
NYS	141.50	83.00	Matsushita Electronics (H)	138.25	-3.25	-2.3
OTC	23.75	8.25	NetFrame	13.00	-0.88	-6.3
OTC	23.50	9.25	Parallan Computer (H)	18.50	-4.25	-18.7
OTC	23.25	6.00	Pyramid Technology	21.25	0.25	1.2
OTC	24.00	11.25	Sequent Computer Sys.	15.25	0.38	2.5
OTC	8.75	1.38	Sequoia Systems Inc.	2.50	-0.25	-9.1
NYS	48.38	20.25	Stratus Computer Inc.	23.63	-1.63	-6.4
NYS	16.88	8.50	Tandem Computers Inc.	10.25	0.38	3.8
OTC	23.50	10.63	TriCord Systems	18.00	-1.25	-6.5
NYS	13.88	7.75	Unisys Corp.	11.50	0.63	5.7
Software						
OTC	37.00	12.63	Adobe Systems Inc.	19.25	-1.50	-7.2
OTC	20.75	10.25	Aldus Corp.	19.00	1.00	5.6
OTC	11.25	5.50	American Software Inc.	7.00	-0.50	-6.7
OTC	28.13	9.50	Ask Computer Systems	11.88	0.63	5.6
OTC	56.75	38.75	Autodesk Inc.	47.25	-1.50	-3.1
OTC	8.75	2.50	Bachman Info. Systems	3.63	-0.13	-3.3
OTC	43.00	28.00	BGS Systems Inc.	30.00	0.00	0.0
OTC	84.13	38.75	BMC Software Inc.	56.63	0.25	0.4
OTC	28.25	18.00	Boole & Babbage	23.50	0.00	0.0
OTC	49.00	14.75	Borland Int'l Inc.	14.75	-3.75	-20.3
OTC	5.00	2.75	CE Software	2.88	-0.38	-11.5
ASE	40.25	11.16	Cheyenne Software Inc.	35.50	-1.50	-4.1
OTC	19.50	8.25	ChipSoft	15.25	1.25	8.9
OTC	8.88	5.63	Cosmos Inc.	8.13	-0.13	-1.5
NYS	32.25	14.50	Computer Associates (H)	30.63	-0.25	-0.8
NYS	13.13	2.75	Computervision Corp.	3.25	0.00	0.0
OTC	34.25	19.25	Compuware Corp	25.00	-2.25	-8.3
OTC	14.75	5.75	Comshare Inc.	10.00	0.25	2.6
OTC	29.75	10.75	Corel Corp.	29.00	0.75	2.7
OTC	15.25	5.00	Easel Corp.	6.50	0.75	13.0
OTC	25.25	12.00	4th Dimension	20.75	2.75	15.3
OTC	19.50	5.25	Frame Technology	7.75	-0.38	-4.6
OTC	17.50	8.38	Group I Software	9.00	-1.00	-10.0
OTC	35.25	14.50	Gupta	15.25	-2.13	-12.2
OTC	10.25	4.50	Hogan Systems Inc.	9.25	-0.13	-1.3
OTC	25.75	11.25	HNPS	16.63	-2.13	-11.3
OTC	41.25	24.00	Information Resources (H)	41.25	2.00	5.1
OTC	27.25	9.63	Informix Corp.	20.25	-2.75	-12.0
OTC	15.00	8.50	Intergraph Corp.	11.13	0.13	1.1
OTC	13.63	6.00	Interleaf Inc.	6.88	0.00	0.0
OTC	18.00	4.75	Intersolv Inc.	8.63	1.38	19.0
OTC	16.00	7.75	Knowledgeware Inc.	10.25	-1.00	-8.9
OTC	54.75	15.50	Legent Corp.	19.13	-0.75	-3.8
OTC	40.13	14.75	Lotus Development	36.75	3.25	9.7
OTC	23.00	4.50	MathSoft (L)	4.63	-0.63	-11.9
OTC	21.25	4.50	McAfee Associates	8.38	-1.13	-11.8
OTC	11.63	2.50	Meca Software	4.75	-0.13	-2.6
OTC	12.00	5.25	Mentor Graphics	9.75	-0.25	-2.5
OTC	46.00	26.25	Micro Focus	29.00	-0.25	-0.9
OTC	13.25	4.38	Microcraft Inc.	6.25	-0.31	-4.8
OTC	98.00	70.38	Microsoft Corp.	77.88	1.63	2.1
OTC	56.88	18.25	Oracle Corp.	51.13	-1.63	-3.1
OTC	40.00	21.50	Parametric Technology	37.75	-1.75	-4.4
OTC	40.50	22.50	Peoplesoft	32.50	-1.75	-5.1
OTC	7.13	3.75	Phoenix Technologies	4.31	-0.06	-1.4
OTC	40.00	22.00	Powersoft	27.75	0.50	1.8
OTC	28.25	11.34	Platinum Software	28.25	2.50	9.7
OTC	25.00	10.75	Platinum Technology	12.00	-0.50	-4.0
OTC	61.50	32.25	Progress Software Corp.	50.25	0.50	1.0
OTC	7.38	2.56	Quarterdeck Office Sys.	2.75	-0.19	-6.4
OTC	32.00	15.75	Rainbow Technologies Inc.	27.50	0.00	0.0
OTC	11.38	4.00	Rasterops	9.88	-0.63	-6.0
OTC	15.25	3.63	Ross Systems	10.75	-0.25	-2.3
OTC	27.75	9.63	Sapiens Intl. Corp. N.V.	27.25	1.00	3.8
OTC	14.50	5.50	Software Publishing Corp.	7.00	-0.25	-3.4
OTC	14.25	2.63	Software Toolworks Inc.	13.75	1.00	7.8
OTC	2.75	0.75	Spinnaker Software	1.56	-0.06	-3.8
OTC	13.75	3.25	State of the Art	12.75	-0.50	-3.8
NYS	24.63	15.00	Sterling Software Inc.	22.63	-0.13	-0.5
OTC	21.63	8.00	Structl. Dynamics Research	13.88	-6.13	-30.6
OTC	77.50	32.75	Sybase Inc.	57.25	-3.50	-5.8
OTC	18.63	5.88	Symantec Corp.	17.00	0.13	0.7
OTC	25.50	10.00	System Software Assoc.	15.50	-2.00	-11.4
OTC	6.38	2.75	Tenzic Corp.	4.00	0.00	0.0
OTC	24.25	11.25	ViewLogic Systems	22.25	0.50	2.3
OTC	23.50	5.50	Walker Interactive Systems	6.63	0.63	10.4
OTC	3.19	1.00	Wordstar	1.13	-0.06	-5.3
Semiconductors						
NYS	32.88	10.63	Advanced Micro Devices	28.50	-0.75	-2.6
NYS	26.50	9.75	Analog Devices Inc. (H)	26.50	0.38	1.4
OTC	35.00	10.50	Atmel Corp.	32.38	-0.38	-1.1
OTC	6.25	2.75	Chips and Technologies	5.50	-0.13	-2.2
OTC	39.75	13.00	Cirrus Logic	36.63	2.00	5.8
NYS	16.75	7.88	Cypress Semiconductor Corp.	14.00	-0.25	-1.8
NYS	19.00	10.38	Dallas Semiconductor	17.38	-0.13	-0.7
OTC	67.25	30.38	Intel Corp.	66.00	3.00	4.8
NYS	19.25	5.38	LSI Logic Corp.	17.75	0.63	3.6
OTC	25.75	11.66	Lattice Semiconductor	24.00	-0.50	-2.0
NYS	56.88	14.38	Micron Technology	56.88	5.25	10.2
NYS	99.13	61.38	Motorola Inc.	93.75	-0.25	-0.3
NYS	20.50	10.13	National Semiconductor	20.50	1.88	10.1
OTC	15.75	6.50	Sierra Semiconductor	7.50	-0.50	-6.3
OTC	51.75	24.75	SynOptys	49.75	0.00	0.0
NYS	84.25	59.00	Texas Instruments	78.75	1.00	1.3
OTC	16.88	6.50	VLSI Technology (H)	16.75	0.50	3.1
OTC	13.25	2.63	Weitek	12.75	0.50	4.1
ASE	9.63	3.63	Western Digital Corp.	5.00	-0.25	-4.8
OTC	46.25	14.50	Xilinx	44.50	2.25	5.3
OTC	33.00	17.16	Zilog Inc.	31.25	-0.75	-2.3
Peripherals and Subsystems						
OTC	48.00	15.75	American Power Conversion	41.75	-2.75	-6.2
OTC	20.16	14.50	Banctec Inc.	18.75	0.00	0.0
OTC	18.00	3.50	Cambex Corp.	4.00	0.00	0.0
ASE	18.38	3.88	Cognitronics Corp.	4.88	-0.38	-7.1
NYS	25.50	9.00	Conner Peripherals	10.38	-0.63	-5.7
OTC	38.50	14.00	Creative Technologies Inc.	19.25	-2.00	-9.4
OTC	50.75	11.00	Data Race Inc.	13.25	-0.25	-1.9
ASE	13.25	4.75	Dataram Corp.	9.13	1.38	17.7
NYS	35.00	4.00	EMC Corp.	32.00	-0.38	-1.2
OTC	10.50	5.38	Emulex Corp.	5.75	-0.13	-2.1
OTC	39.00	13.25	Evans & Sutherland	17.25	-1.00	-5.5
OTC	25.00	7.50	Exabyte	9.63	-0.25	-2.5
OTC	34.00	8.59	Intelligent Info. Systems (H)	32.25	-1.50	-4.4
OTC	8.88	3.38	Iomega Corp.	3.38	-0.13	-3.6
OTC	15.25	5.75	IPL Systems Inc.	8.00	0.00	0.0
OTC	24.00	14.25	Komag Inc.	18.25	-0.25	-1.4
OTC	19.63	4.38	Maxtor Corp.	5.88	-0.13	-2.1
OTC	10.75	5.75	Micropolis Corp.	6.75	-0.50	-6.9
NYS	117.00	97.00	3M Corp	106.38	-1.13	-1.0
OTC	7.75	4.00	Printronix Inc.	7.00	0.00	0.0
NYS	17.25	6.88	QMS Inc.	8.50	0.13	1.5
OTC	17.88	9.50	Quantum Corp.	12.38	-0.25	-2.0
OTC	7.13	3.13	Radius Inc.	4.88	-0.25	-4.9
NYS	16.88	9.13	Recognition Equipment (H)	15.88	-0.38	-2.3
OTC	13.88	3.75	Reton Inc.	4.25	-0.38	-8.1
OTC	22.38	12.00	Seagate Technology	19.25	-0.50	-2.5
NYS	45.00	18.00	Storage Technology	30.13	-0.38	-1.2
NYS	27.88	17.63	Tektronix Inc.	24.00	-0.13	-0.5
NYS	88.88	70.25	Xerox Corp.	72.88	0.38	0.5
Specialty						
OTC*	23.75 *	16.88 *	American Mgmt. Systems	17.38	-0.50	-2.8
NYS	4.75	2.38	Amacomp Inc.	2.88	0.00	0.0
OTC	35.75	17.75	Analysts Int'l.	33.75	-1.50	-4.4
NYS	56.13	44.63	Auto Data Processing	48.88	0.00	0.0
NYS	17.25	13.00	Ceridian Corp.	16.25	-0.38	-2.3
NYS	17.38	13.13	Comdisco Inc.	14.75	0.25	1.7
OTC	11.00	4.50	Computer Horizons (H)	10.50	-0.50	-4.5
NYS	92.25	65.88	Computer Sciences (H)	92.25	0.88	1.0
NYS	9.25	6.00	Computer Task Group	6.75	-0.38	-5.3
NYS	40.50	19.00	CompUSA Inc.	31.88	2.00	6.7
OTC	14.25	7.00	Corporate Software	11.00	0.25	2.3
OTC	12.75	6.63	Egghead Discount Software	7.25	0.13	1.8
NYS	35.88	26.00	General Motors E (EDS)	31.25	-0.63	-2.0
OTC	25.50	10.50	Inacom Corp.	18.75	-1.50	-7.4
OTC	18.63	8.13	Intelligent Electronics	18.63	2.13	12.9
OTC	15.13	7.13	Merisel	14.38	-0.63	-4.2
OTC	24.50	5.75	Microage Inc.	23.00	0.75	3.4
OTC	33.00	18.00	Paychex	31.25	0.00	0.0
NYS	87.25	21.63	Policy Management Sys.	25.25	1.00	4.1
NYS	43.63	20.75	Reynolds and Reynolds	39.88	-1.38	-3.3
OTC	19.00	12.00	SEI Corp. (H)	18.00	-1.00	-5.3
OTC	24.38	17.50	Shared Medical Systems	22.13	0.13	0.6
OTC	12.63	5.75	SNL Systemhouse	9.75	-0.25	-2.5
OTC	30.75	20.00	Software Spectrum Inc.	26.25	0.50	1.9
OTC	40.25	23.75	Sungard Data Systems (H)	40.25	0.00	0.0
NYS	4.38	1.13	Ultimate Corp.	2.88	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

Toolmakers meld

Bachman Information Systems, Inc. in Burlington, Mass., last week said it intends to acquire client/server tool developer **Cooperative Solutions, Inc.** in San Jose, Calif. The deal will be completed by the end of this year, pending approval by Bachman's board of directors, among other things. Both companies have been experiencing some financial distress, industry analysts said, and the acquisition may help both because their application development tool sets are complementary.

Sun, Axil, HEA settle

Sun Microsystems, Inc. has settled a suit it filed in April against **Axil Workstations** and its parent **Hyundai Electronics America.** The suit charged a former Sun employee with misappropriation of Sun trade secrets in the design of certain Axil Scalable Processor Architecture-compatible systems. Among other things, Axil has agreed not to make any more Axilstation 230 or Axil HWS-310 products. It may sell a portion of its old inventory. No financial details were disclosed.

Lotus sells unit

Lotus Development Corp. has sold its **One Source Division** to a new firm owned by the division's management and employees and two venture capital firms: **Information Partners of Boston** and **William Blair Venture Partners of Chicago.** Lotus will retain a minority investment in the new entity. Other terms of the deal were not disclosed.

SHORT TAKES Holders of common **Parallan Computer, Inc.** stock that was subject to lock-up agreements have been released from those agreements.... **Gartner Group, Inc.** has acquired the outstanding stock of **New Science Associates, Inc.** Both market research firms are based in Westport, Conn.

McAfee pushes beyond virus market

CEO steps into chief technologist role as firm readies acquisition strategy

By James Daly
SANTA CLARA, CALIF.

Like Blanche DuBois in *A Streetcar Named Desire,* John McAfee has always relied on the kindness of strangers.

In an era of highly competitive software pricing battles, the 46-year-old founder of McAfee Associates, Inc. has built one of the most successful makers of antivirus software in a highly ironic fashion — by giving the software away.

John McAfee: *'One step at a time. Right now we've got our hands pretty full'*

The company makes its money — about $19.4 million in 1992 at a 70% pretax operating margin — by collecting licensing fees from companies that download its highly regarded file scanning and disinfection software off an electronic bulletin board. The companies like it so much they voluntarily buy a site license.

McAfee typically charges approximately $3,000 for a 100-machine license. The end result is more than 7 million registered machines — out of roughly more that 10 million — running licensed copies of programs such as Scan, Clean, VShield and Sentry.

Despite McAfee's success so far, Wall Street has not exactly embraced the company's stock. It was offered at $16 on its first day of trading last October but had fallen more than 40% to $9 as of late last week.

While other companies mull jumping on the bandwagon, the controversial McAfee, who recently handed the chief executive officer reins to Bill Larson (see story below), is now looking beyond virus technology into a greater realm of software, all of which will, of course, be electronically distributed.

"We have to get over this idea that I have to hand you software in a box," said McAfee, who is still chairman and now chief technology officer. "Software is simply electrons, and if you make it strictly an electronic product, you free it from the things that not only slow down its distribution but make it cost so much to produce."

Avoidable costs?

These "things" include having to encode floppy disks, wrapping and boxing packages and then shipping those boxes. Slowdowns on the user side include the time involved in disseminating those boxes to, and manually upgrading, each node as well as the storage required to house all those packages.

Some analysts said this potential for huge profit-making may push software companies into electronic distribution. "A chance to save a little money can be a very convincing way of getting people to change," said Lenny Siegel, director of the Pacific Studies Center, a Mountain View, Calif., public interest information center.

When antivirus packages can be distributed quickly and updated as often as every 60 days, the continually evolving area of virus control, in particular, benefits a great deal. This is especially important at corporate sites, which typically find upgrading applications to be a big headache.

Price of doing business

Meta Group, Inc. in Westport, Conn., claims that a business with 1,000 PCs will spend approximately $50,000 annually for the distribution of one bug fix, two application upgrades and one operating system upgrade. That estimate is based on labor costs of $40 per hour with an estimate of 20 minutes per PC upgrade.

Acquisition mode

The next phase in the company's expansion process is already under way. Earlier this year, the company signed a letter of intent to acquire shareware database developer Buttonware, Inc. in Bellevue, Wash. The purchase price was not disclosed.

McAfee said he plans to electronically distribute the Button database and all of Buttonware's future products. For the time being, he said, his namesake company will distribute only its own products and those of any acquisition. There is no plan to compete with any software retailers moving into the same market or with any vendors, such as IBM, that distribute some products over electronic bulletin boards.

"One step at a time," McAfee said. "Right now we've got our hands pretty full."

McAfee steps out of the spotlight ... for now

Recent executive shuffling at McAfee Associates has raised a few eyebrows, given the firm's penchant sometimes associated with founder, Chairman and former CEO John McAfee.

The company last month recruited Bill Larson to take over McAfee's CEO post. Larson was vice president of sales and marketing at SunSoft, Inc. McAfee, in turn, was dubbed the firm's first CTO.

The plan is for Larson to sell an expanding product suite as McAfee looks for acquisition candidates while "rolling up my sleeves and getting back into doing what I love — developing new technologies," he said.

That is the official company line, anyway. Some security industry veterans speculated that the move was designed to get McAfee out of the limelight.

The highly public McAfee is about as controversial a fellow as any in the computer security industry. He became well-known nationally during the Michelangelo scare in early 1992 when he predicted that the virus could irretrievably alter data on "anywhere from 50,000 to 5 million" DOS-based PCs worldwide.

McAfee's call was merely a warning flag, but when the number of PCs incurring damage turned out to be lower — an estimated 20,000 to 40,000 PCs worldwide — the long knives were drawn by those who said McAfee made the security software industry look like a pack of Chicken Littles.

McAfee has also come under heavy criticism in recent years for spending more time hyping the virus scare than attending to his products.

"One is still left with the impression that the [Icons] program ... could benefit from more attention to function and less to the promotion of the services of McAfee Associates," wrote author Christopher Pendo in *The Computer Virus Desk Reference.*

That was not the only bump in the road. In February, users of McAfee's Clean utility discovered a bug that could render the hard disk of a user's PC inaccessible.

Several weeks before that, a federal judge in Richmond, Va., ordered the company to stop distributing its Pro-Scan Version 2.31 and Virscan Version 2.33 applications because they were incorrectly identifying some commercially available software packages as virus-infected.

—James Daly

Wysiwyg

From our readers' files: Favorite jokes

Q What do you get when you cross Lee Iacocca with a vampire?

A AUTOEXEC.BAT

Q What did the mountain climber call his hiking boots?

A CTL-ALT-DELETE because they are warm boots.

Donald Dunn
Carmichael, Calif.

From our readers' bookshelves: Favorite books

Atlas Shrugged
By Ayn Rand

The author presents an integrated philosophy that shows what the world could be like if the philosophy were widely practiced. The book illustrates how the failure to practice it has caused the mess we have today.

Software Reliability
By Glen Myers

With scope and depth, this book identifies how our software methods, hardware and software tools influence the production of high-quality software. Tragically, this book is almost totally ignored by the industry in the mad rush to embrace the cost-cutting fad du jour, for example, "open systems."

Mark Wallace
Los Angeles

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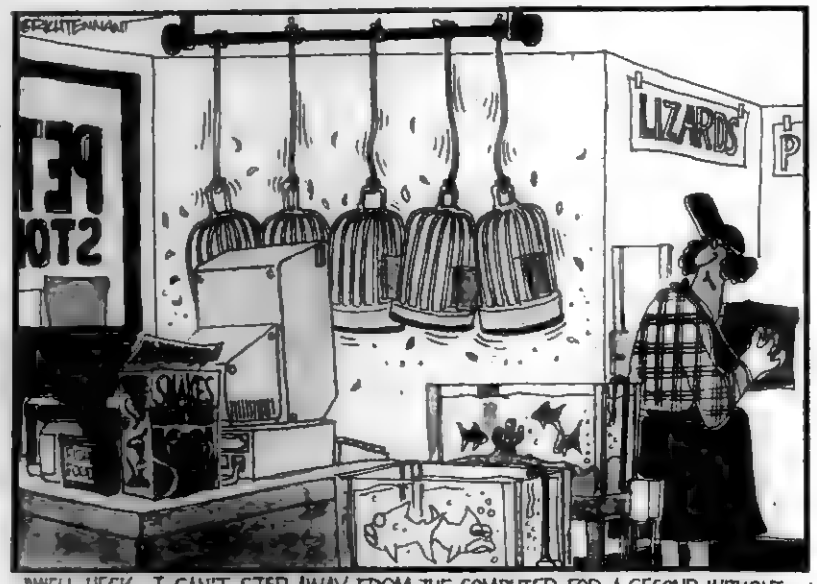
The 5th Wave *by* Rich Tennant



"WELL, HECK—I CAN'T STEP AWAY FROM THE COMPUTER FOR A SECOND WITHOUT YOU BIRDS GETTIN' ALL RUFFLED ABOUT IT."

Inside Lines

Wireless whizzes along

Canadian start-up WI-LAN, Inc. in Calgary, Alberta, plans to drop a 20M bit/sec. wireless LAN bombshell at the Networld '93 Dallas show early next month, a company spokesman said. The speed would nearly quadruple today's airwave-based LANs, which top out at 5.7M bit/sec., and surpass the data transfer rates of today's wired Ethernet and Token Ring LANs. The Ethernet-compatible product is slated to sport built-in encryption and ship early next year.

Parallel views

And at Unix Expo next week, IBM will show off two applications running on its Parallel Server for AIX. The Oracle relational database will be used to show IBM's parallel processing system as a database server. A data modeling package from Quantum Software Development Corp. will highlight the parallel system as a compute server.

Here's the beef

This week, IBM will finally put some product beef into SystemView with the announcement of LAN NetView, a source close to the company confirmed. IBM is rapidly converging the SystemView system and network management architecture with the Distributed Management Environment. LAN NetView, which manages Token Ring and a range of clients, will comply with SystemView's object-oriented data model, GUI and dual SNMP and CMIP support. IBM will also detail how some of its other network management products — NetView/6000, for example — will become more SystemView-compliant.

Crossroads

Like lots of software developers, IBM is wrestling with which version of the Win-32 application programming interface it wants to support on top of OS/2. Right now, IBM is leaning toward supporting the full Win-32 API, but Lois Dimpfel, director of Personal Operating Systems, said IBM may opt to initially support the Win32S kit, which sacrifices some features to support both 16-bit and 32-bit Windows applications. Supporting 32-bit Windows apps on OS/2 will be an easier proposition because the multitasking services that those applications expect to see are already in OS/2, she said.

Paging Rmon

Next week, Network General is expected to deliver on its 6-month-old promise to support the remote monitoring (Rmon) LAN diagnostic and monitoring standard. Look for Novell's distributed Rmon strategy for its NetWare Management System to debut at Networld next month.

Channel changing

ComputerLand Chairman Bill Tauscher last week sold his franchise and Datago distribution organization to Intelligent Electronics, which beat out distributors Merisel and Ingram Micro, according to sources close to the company. Sources said ComputerLand is selling the franchise operations, which are the most profitable part of the company, because investors are tired of waiting for an initial public offering.

The Transaction Processing Council (TPC) has voted to close the loopholes that Oracle slipped through with its controversial "discrete transaction" database benchmark [CW, July 12]. When last we left the storm, Oracle had published extremely high performance ratings using a skimpy, functionally limited version of its database. Standish Group consultants called the benchmark "fraudulent," and Oracle sued. Now the TPC has prohibited vendors from running any so-called benchmark specials that only pump up ratings and don't benefit users in real world situations. Come June 1994, all vendors that have run TPC-A and TPC-B numbers have to stop using them for sales and marketing. Phone, fax or CompuServe News Editor Alan Alper with news tips at (508) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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COMPUTERWORLD

Consortium may loosen OLE's grip on market

By Michael Vizard
SANTA CLARA, CALIF.

Looking to counter the influence of Microsoft Corp. and its Object Linking and Embedding interface, seven leading developers formed a consortium last week that will assume responsibility for developing their object-oriented operating system standards.

Called the Component Integration Laboratories, the so-called mutual benefit association's founders are IBM, Novell, Inc., Apple Computer, Inc., Taligent, Oracle Corp., WordPerfect Corp. and Xerox Corp..

The advantage for information systems managers is twofold. Instead of facing a dizzying array of object standards from a host of vendors, they will most likely have two to choose from: OLE and whatever the consortium comes up with. Two standards of equivalent weight could provide a counterbalance that would ensure that both standards maintain an open posture. The standards will be used for object-oriented development and the creation of compound documents.

The consortium's other primary mission is to "define the plugs" that will ensure that applications built using object technology are compatible with one another, said Jed Harris, the con-

Consortium, *page 8*

Compaq, Novell to team on multiprocessing nets

By Michael Fitzgerald
HOUSTON

■ Officials from Compaq Computer Corp. and Novell, Inc. tomorrow will announce a partnership that will develop a version of NetWare that runs on multiple processors and supports clustering.

The resulting technology should give NetWare users a way to improve the performance of NetWare LANs by adding processors, something they can do with Unix and Microsoft Corp.'s Windows NT.

Ray Noorda, Novell's chairman, president and chief executive officer, hinted at tomorrow's agreement in his Compaq Innovate '93 keynote address last week. He said Compaq and Novell will cooperate in the future on developing multiprocessing NetWare and specialized servers and will more closely coordinate their sales efforts.

Separately, Gary Stimac, Compaq's senior vice president and general manager of the server division, confirmed the announcement. Drew Major, Novell's chief scientist, explained that the forthcoming version of NetWare is an asymmetric approach, but it will run on symmetric multiprocessing boxes or even in clustered configurations.

Major said Novell and Compaq will "focus primarily on asymmetric multiprocessing" development efforts because SMP configurations experience a significant drop-off in performance somewhere between the four- and eight-processor range. Adding processors incurs additional hardware costs for memory and bandwidth. "Client/server is inherently oriented

Compaq, *page 12*

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Novell taps Unix

NetWare link with UnixWare to address distributed gaps

By Elisabeth Horwitt
NEW YORK

Novell, Inc. is expected this week to outline a strategy for dominating the corporate distributed computing market by hitching together its two system software platforms, NetWare and UnixWare.

"The intent will not be to announce fundamental new products, [but to] describe the relationship of Unix System V Release 4, UnixWare and NetWare and [to answer] a whole slew of integration questions around that, plus interfaces," said Bob Davis, vice president of Novell's Unix Systems Group.

Novell will present a dual-platform strategy: UnixWare as the powerful, stable environment corporations need for vertical, mission-critical applications; and NetWare in its customary role of "horizontal" network server, optimized to support global messaging, local- and wide-area connectivity and directory services, said Novell Chief Financial Officer Jim Tolonen at a briefing last month [CW, Aug. 9].

Novell's Ray Noorda: *'It's our job to unify Unix'*

More dramatically, Novell is said to be on the verge of taking the high ground on the openness issue by turning control of the Unix brand name and interface over to standards body X/Open Co. (see story page 14).

Novell is seeking to differentiate UnixWare from other Unix System V Release 4 platforms, and from Microsoft Corp.'s Windows NT. It will do this by integrating UnixWare servers more closely with NetWare. In particular, Kanwal Rekhi, executive vice president of Unix Systems Group, cited the ongoing rollout of NetWare services such as global directory and authentication, Global Message Handling Service and the NetWare Management System.

This integration

Novell, *page 14*

DCE: Ready . . . set . . . go?

By Jean S. Bozman

Early users of the Open Software Foundation's Distributed Computing Environment are finding that the technology requires a commitment to a new method of application development. And many who waited for DCE tool kits to be delivered this year have yet to put DCE applications into production.

Even so, early users said they have high hopes for the nascent technology. They expect client/server systems to benefit from DCE, which ensures consistent file handling and security throughout an enterprise network.

Networks of distributed computers — including Unix-based boxes, PCs and mainframes — will be able to share files and the computational work load as DCE servers match user requests to available system resources.

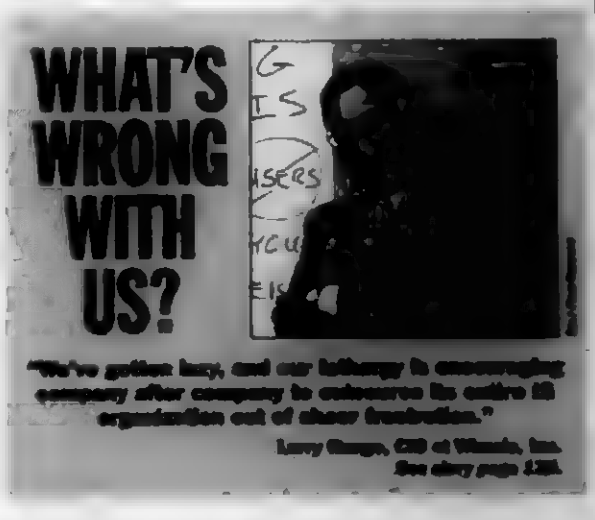
Although production systems built on DCE are still relatively rare, users said many pilot projects are under way at large commercial and technical sites worldwide. Early adopters come from universities, science laboratories and government, but some large companies such as Citicorp and The Boeing Co. also plan to use DCE in next-generation client/server systems.

However, some early users have gotten bogged down in the complexity of DCE source code. In its purest form, DCE requires programmers to learn more than 400 system calls.

And for every user building with DCE code, there are several others waiting and testing for bugs.

"Conceptually, we all like it," said David Truch, a senior technical specialist at BP Exploration Alaska, Inc. in Anchorage. His BP unit has more than 100 Unix systems but plans to wait to develop with DCE. "We have built our own tools and protocols, our own quirky way of

DCE, *page 16*



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■ **Borland** groupware strategy finds considerable support. *Page 8*

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QUOTE

"The Statue-of Liberty kind of manager, who says 'Bring me any computer to take care of,' will have a job in a year. Those who [think] the only 'real' computers are big iron will not." (page 28)

H. William R. Townsend, Air Products and Chemicals, Inc.

UNQUOTE

COMMENTARY

■ **Charles Babcock** says component servers are bringing unprecedented capabilities to the desktop. *Page 6*

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Executive Briefing

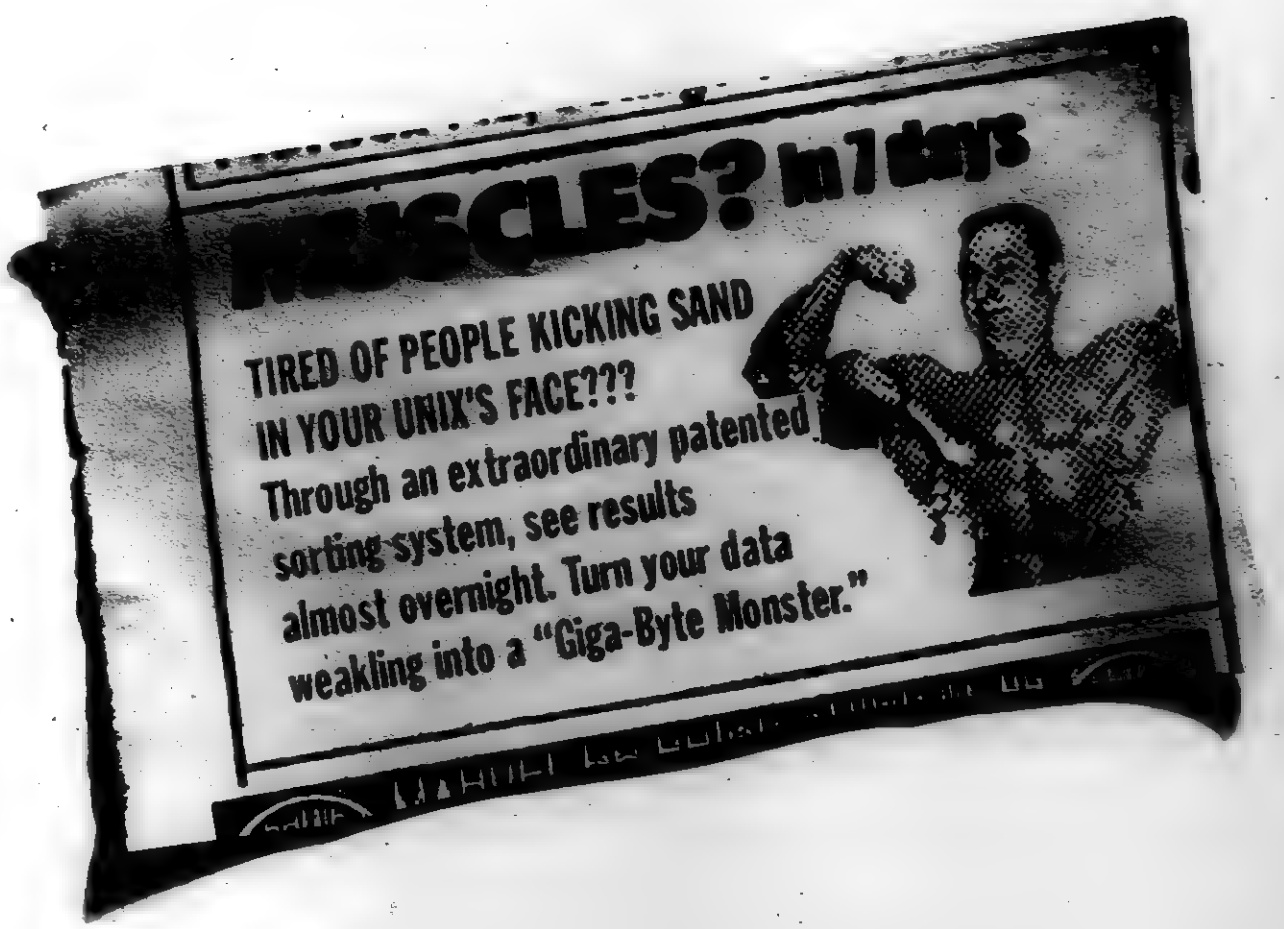
Does vendor unity really serve your best interests? When you're struggling to keep a variety of product and service providers moving in lockstep on your re-engineering project, it assuredly does. That's why Bob Habig, IS chief at **Pepsi-Cola North America**, wouldn't sign up any vendor for his current wide-ranging re-engineering effort unless it would agree to his rule: "We all wear Pepsi uniforms or we don't do business together." *Page 119*

On the other hand, when vendors agree to agree about certain aspects of technology, the outcome isn't necessarily all that advantageous to the customer. In his column this week, John Gantz argues that consortia-backed APIs, like standards, usually come with so many options that conformity means little. And, he says, they're also usually formulated with scant user input. *Page 41.* Unix users might agree. While applauding the recent formation of a coalition to develop common APIs, many are saying that what's really needed is agreement and joint action on critical items such as heavy-duty systems management and security products. *Page 14*

On the whole, no-holds-barred, no-alliance competition often seems to serve the customer best. And there's still a lot of that going on:

Lotus has beefed up its SmartSuite in hopes of beating **Microsoft**'s Office. *Page 44.* **Cyrix** is jumping into competition with **Intel** with the release of three 486DX-class processors, a development that could cut prices. *Page 46.* **Novell** is promising a strategy for uniting UnixWare and NetWare, a development that many see as a direct challenge to **Microsoft**'s Windows NT. *Page 1*

While all of this action, reaction and speculation swirls, some companies are pushing ahead with today's products. **Fiori Plenty**, a retail flower chain, turned a struggling global order fulfillment service, **Teleflora**, into an industry leader with customized telemarketing software and is about to launch a $250,000 WAN project to improve information flow. *Page 83.* **DynCorp**, a highly diversified worldwide professional and technical services firm, jumped off mainframes and into client/server with both feet back in 1990. Now it plans to connect its 11 LANs via a frame-relay WAN from **Sprint**. *Page 84.* And Houston-based **Conoco** has created a virtual bulletin board to link employees at five global sites using **Ingres**' Replicator. *Page 116*



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IBM leans toward recentralization

By Johanna Ambrosio
ARMONK, N.Y.

IBM's move last week to recentralize some key management functions drew cautiously optimistic reviews from customers and analysts, who said it indicates a significant change of direction for the company.

Under the new structure initiated by Chairman Louis V. Gerstner, a committee of 12 senior executives will be charged with overseeing the product plans and cross-business integration activities of IBM's divisions, as well as leveraging manufacturing and other economies of scale companywide.

The individual lines of business will retain responsibility for their financial success or failure.

These changes contrast with the "cut-'em-loose" philosophy of former Chairman John Akers, who encouraged lines of business to be almost fully independent from one another and from corporate management (see chart).

The main goals this time, an IBM spokesman said, are to shorten products' time to market and to improve communications among the divisions to ensure that IBM products work together and are not repetitive.

Key to the success or failure of the new structure, however, will be how much the committee hastens IBM's response to customers' needs. "To the extent they can help reduce expense and eliminate redundancy, that's great. But if they add a level of bureaucracy and complexity that was not there before, that would certainly cost IBM at this stage," said Philip Pasano, an information technology director at Bankers Trust Co. in New York.

Sam Albert, an independent consultant in Scarsdale, N.Y., added, "Gerstner has come to the conclusion that what the customer needs is a total solution and not piece-parts. This committee is a check-and-balance mechanism . . . with a heavier emphasis on the balance than the check."

John Jones, an analyst at Salomon Brothers, Inc. in San Francisco, said he sees the move as an attempt to leverage IBM's strengths as a broad-based supplier. "It is a challenging task, but given where they were three years ago, they know what they don't want."

Not all see the new structure as a plus. "They say the committee will not make operational decisions, but it doesn't look that way. These are the same people who got IBM to where it is today," said Bob Puffer, an analyst at Gartner Group, Inc. in Stamford, Conn.

Divided opinions

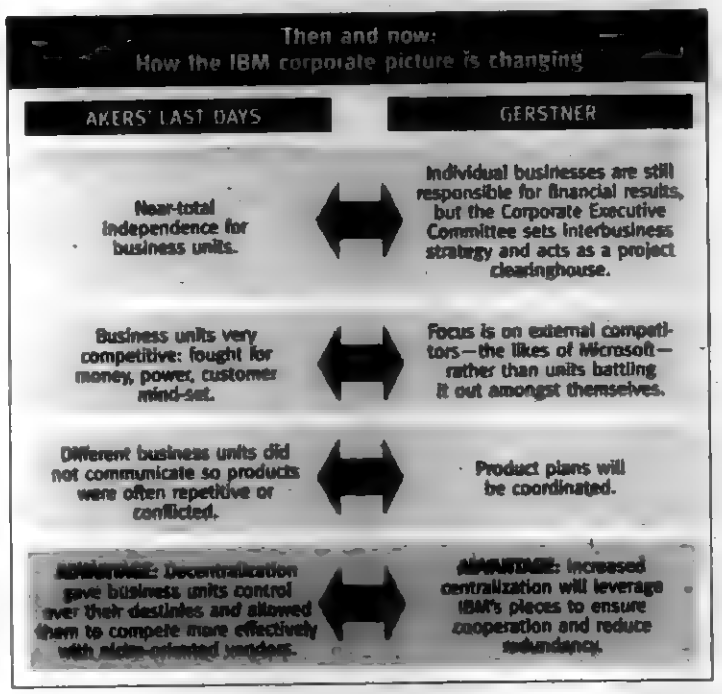
Customers contacted were split on what effect the reorganization will have on them. "We've learned to see how it works out before we come to judgment," said Colin Crook, senior technology officer at Citibank in New York.

Denny Knell, manager of information technologies at Delta Air Lines in Atlanta, said, "At this point, it doesn't sound like it will directly affect me."

Tom Loane, vice president of data processing at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., said the new organization is "one of the best decisions" Gerstner has made. "IBM can be successful if it keeps its act together." On the other hand, he said, "any committee can be a dangerous animal."

Deck shuffling

IBM's Corporate Executive Committee is staffed by Chairman Louis V. Gerstner and 11 others, including chief technology strategist Bernard Puckett; Vice Chairman Paul Rizzo; marketing gurus Ned Lautenbach and Bob LaBant; and product line heads James Cannavino, Ellen Hancock and John Thompson. IBM also announced a worldwide advisory council and an executive reshuffling. Some divisions were also renamed: Programming Systems is now the Software Solutions Division, and Enterprise Systems is now the Large Scale Processors Division.



Client/server nod

The overall theme of last week's IBM reorganization was weighted toward client/server, as four people who had headed individual product units were named group executives overseeing more than one line.

The primary responsibility of these four, however, will be to look to the good of the whole company, not just their own units. Their compensation packages have been altered to reflect that change.

Clients are handled by James Cannavino, who oversees all the PC and workstation businesses; IBM's traditional mainframe and minicomputer servers are the purview of John Thompson; and the networking and software "glue" are the domains of Ellen Hancock, formerly in charge of networking systems. The fourth new group executive is Pat Toole, who had headed corporate operations and now adds semiconductors, printers and storage systems to his roster.

Dave Thomas is now in charge of the AS/400 group, Thompson's old stomping ground. Hancock and Bob LaBant, former head of the U.S. and Canadian marketing groups and also a group executive, will make replacements for their daily duties.

Thompson's elevation came at the expense of Nick Donofrio, head of the company's mainframe unit. Although he retains his title, Donofrio reportedly lost his bid at the group executive slot because his group did not listen to customers fast enough to retool the mainframe in time to stop the revenue slide. "If you had a business whose revenues went from $13 billion in 1990 to $6.5 billion in 1993, would you expect to make it to the top out?" asked John Jones, an analyst at Salomon Brothers.

—Johanna Ambrosio

Big Blue fleshes out SystemView plans

By Elisabeth Horwitt
ARMONK, N.Y.

IBM last week finally put some mainframe-based meat onto the skeletal body of its SystemView network management architecture. In the process, it hopes to bury a growing industry perception that it intends to replace mainframe NetView with the distributed, AIX-based, SNMP-compliant NetView/6000 platform.

This latest raft of announcements clarifies the roles of IBM's three-pronged enterprise network management strategy: OS/2-based LAN NetView and the AIX-based NetView/6000 manage distributed LAN installations via Simple Network Management Protocol (SNMP), while NetView/390 acts as focal point, data warehouse, correlator and central administrator across the various network management domains.

Finally satisfactory

IBM's blueprint found favor with customers. "This [plan] says, 'We finally have our act together, and we now understand that network management systems can either be workstation-based, distributed or centralized,' " said Trav Waltrip, director of telecommunications at The Travelers Corp.

IBM also continued to groom NetView/6000 as an enterprise manager. Last week the AIX-based system gained the ability to monitor SNA networks through a link to NetView/MVS. However, IBM, users and one analyst all agreed that NetView/MVS is not likely to be replaced in a hurry.

"You have to keep in mind that there are between 14,000 and 20,000 licenses of mainframe NetView" managing millions of nodes, said Jill Huntington-Lee, principal at Brandywine Network Associates in Cinnaminson, N.J. And while IBM is continuing to scale up NetView/6000 to handle thousands of nodes, "they'll tell you right away that it has nowhere near the ability to handle the 20,000- or 100,000-node networks mainframe NetView can."

"We run all of our mainframes in darkened data centers, so we need host NetView," Waltrip said. The insurer is looking at deploying NetView/6000 and LAN NetView to manage LANs and to forward statistics to NetView/MVS, where they can be stored cheaply.

IBM is also providing tighter integration between remote systems and NetView/MVS services.

The host system's Resource Object Data Manager will provide a common repository for distributed management systems to store and exchange management statistics, IBM said. The NetView Graphics Monitor Facility will provide a common view across different management domains. And NetView Automated Operations provides a vehicle for initiating responses to network events.

Highlights

- **NetView 2.4** features management of IBM Advanced Peer-to-Peer Networks and cuts installation from days to hours.
- **NetView MultiSystem Manager MVS/ESA:** management hooks to Novell, Inc. NetWare and LAN Network Manager; NetView/6000 to come.
- **NetView/MVS** management of AS/400s.
- **AIX SNA Manager/6000:** NetView/6000 can monitor SNA via NetView/MVS.

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Charles Babcock

A new class of computing

As the appetite for proprietary mainframes wanes, a new source of concentrated processing power is springing up — the component server. These servers, which incorporate an increasing number of mainframe concepts in their design, aren't cheap. But their prices are low relative to mainframes — typically $30,000 to $500,000 — because they are built from off-the-shelf, standardized parts.

Two pioneers in this area are Tricord Systems in Plymouth, Minn., and NetFrame Systems in Milpitas, Calif. Both firms were founded by engineers coming out of supercomputer and mainframe computer design.

Tricord, for example, uses auxiliary 386 processors on a storage subsystem. Mimicking a mainframe design concept, the Intelligent I/O Processor off-loads 90% of the disk I/O processing from the CPU. Two I/O subsystems may be added to a server, offering the option of disk striping with RAID-0 on one subsystem and disk mirroring to a backup set of drives (RAID-1) with the other.

High availability or fault tolerance was typically among the most expensive features when supplied by Tandem or IBM. Tricord and NetFrame, by employing mass-produced hard drives, have added a high-availability feature to their servers without sending prices into no-man's-land. In the event of the failure of a low-cost drive, Tricord's Intelligent I/O Processor automatically switches to the mirrored disk, forestalling a system crash.

But there's more to the direction these servers are taking than just lowering prices. Due to the power of the components from which they are built, Tricord and NetFrame are producing systems that can be easily adapted to today's PC-intensive environments.

With their Intel-based processors, for example, these servers run multiple operating systems, including Novell's NetWare, Banyan's Vines, IBM's OS/2 and Unix. NetFrame is also committed to supporting Microsoft's Windows NT.

NetFrame has designed an intelligent multiprotocol message handling layer between the CPU and storage system. This software layer intercepts calls from the operating system to device drivers, translates them into the proper message format, depending on the devices for which they are intended, and passes the message along to the disk controller.

This layer, dubbed Concerto, "decouples the physical affinity between a device and the operating system. The affinity is a logical rather than a physical connection," said Carl Amdahl, a veteran of the former Magnuson Systems Corp. and Trilogy Ltd.

The addition of Concerto means that many of the differences in 32-bit operating systems are neutralized by the server. A user can run two or more operating systems concurrently on the server, and the subsystem can handle the varying I/O traffic.

In a similar fashion, NetFrame has provided a centralized system for managing multiple NetFrame servers. A manager at a remote location can call up a window from the graphical user interface on each server, drag and drop icons of available peripherals, and in that manner reconfigure it to meet current needs.

In this respect, the NetFrame server has crossed over from the world of PC component server into a new realm, which can't be described as a wanna-be imitator of the mainframe. Rather, it is moving toward a new class of computing, far above an entry-level PC server and adeptly serving the PC users surrounding it.

These firms are giving PC suppliers ideas. Both Compaq and Dell offer servers as an adjunct to their high-volume PC business, and these servers offer parity, error checking, etc.

As Tricord and NetFrame continue to innovate in the field of component servers, the PC firms are likely to follow suit. The result will be a growing body of servers with more and more mainframe characteristics but submainframe prices.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Desktop operating systems

Microsoft's Chicago to provide easier Windows navigation

By Michael Vizard

SANTA CLARA, CALIF.

The forthcoming release of Microsoft Corp.'s next-generation 32-bit, preemptive multitasking implementation of Windows, code-named Chicago, will run comfortably on 80386-based PCs with 4M bytes of memory, according to Doug Henrich, Microsoft group manager for developer relations.

Chicago, which was designed to run on Intel Corp. platforms only, will run a "large subset" of the applications created using the full 32-bit Windows application programming interface, Henrich said at last week's Windows Solution conference.

Microsoft's Steve Ballmer: *Chicago will be an easy adjustment.*

Applications created with the full Win32 kit run on Microsoft's Windows NT operating system, which requires 16M bytes to run effectively. A more limited subset implementation of that kit, called Win32s, allows applications to run on both 32-bit and 16-bit implementations of Windows.

Henrich described the Chicago project as the successor to both Windows 3.1 and Windows for Workgroups. He said it will include built-in networking and a complete redesign of the Windows interface using a document-centric metaphor that will make it easier to navigate through Windows. It will support the Plug and Play initiative [CW, Sept. 13], wireless communications and synchronized updates of files.

Same dog, new tricks

A key component of the redesigned interface will be the merging of the File Manager and Program Manager functions in Windows. "We want everything in Windows to look and interact similarly, as opposed to requiring people to essentially learn different applications for each component of Windows," Henrich said.

Chicago has recently gone into limited beta testing but is not expected to be delivered until 1995. The company may be further along in its delivery schedule, however. Steve Ballmer, vice president of Microsoft's sales and support group, said he expects the product to be delivered by mid-1994.

The next beta release is set for late October or November, Ballmer said, adding that there will be other changes to the interface over and above those made in the first limited release.

"[Chicago] will still employ the desktop metaphor, but when users take a look at it they are probably going to say, 'Hmm, this is a little different look,'" Ballmer said. "But I think it will be an easy adjustment."

Henrich advised developers last week to pay attention to the guidelines Microsoft issues as Windows evolves because some elements may disappear in the next release. "We issue guidelines, but we haven't been [user interface] police for application developers," he said.

In addition to its Chicago project, Henrich said Microsoft will showcase an initial implementation of its Cairo object-oriented operating system this December at its Professional Developers Conference.

Cairo features

Henrich said Cairo, a server operating system that is due in late 1995, will provide transparent access to files and a seamless view of all resources on a network. The completely object-oriented system will include the Object Linking and Embedding interface, the base plumbing in NT, a distributed file system and the ability to run applications on idle processors strewn across a network.

Microsoft's future for client/server operating systems is clearly the Cairo/Chicago combination. Despite Windows 3.1's lavish commercial success on the desktop, the company will not drag its feet in replacing 3.1 with Chicago in client/server environments.

"Chicago will not be held a second longer than it needs to be. When its ready to go, it's gone," Ballmer said.

Ed Scannell contributed to this story.

Windows 4.0: Crowd pleaser?

Microsoft will make a character-based version of DOS 7.0 available, but company officials said Chicago, or Windows 4.0, which combines DOS and Windows functions, will prove much more popular.

Chicago — a 32-bit, multitasking, multithreaded version of Windows that will not require DOS to run — is in beta testing. It is not expected to ship until mid-1994, according to Steve Ballmer, vice president of Microsoft's sales and support group.

"There will be a DOS 7.0 that can be surgically removed [from Chicago] and sold separately for those who want to only run character-based applications," Ballmer said. "I don't think it will be as popular."

Many users and analysts said a character-based DOS 7.0 will be much more popular among users than Ballmer is willing to admit. They said Microsoft may be pushing users too hard and too soon toward Windows.

Sales of character-based DOS 6.0, released last April, have already exceeded 4 million copies, making it one of the company's best-selling products despite mixed reviews.

"There is a lot of industry focus on Windows because that is where the action is. But there is a sizable-based business with DOS. I have to believe that [DOS] is still a very important business to Microsoft," said Ed Iacobucci, chairman of Citrix Systems, Inc. in Coral Springs, Fla.

— *Ed Scannell*

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News Shorts

Windows SNMP standard progresses

NetManage, Inc. and Microsoft Corp. said they have developed a standard application programming interface (API) for developing Simple Network Management Protocol (SNMP) applications in the Windows environment. The standard is said to be the first API for developing applications across multivendor SNMP network management systems as well as the first to incorporate SNMP Version 2. The API has been formally adopted by the Windows SNMP Task Force.

Packard retires as HP chairman

David Packard last week retired as chairman of the board of Hewlett-Packard Co., the $16.4 billion company he co-founded in 1939 with William R. Hewlett. Packard, 81, cited advanced age as the reason for his retirement. He will be succeeded by HP President and Chief Executive Officer Lewis Platt. Packard's retirement was part of a broader shuffle of the HP board. Three other directors also retired.

SIM to honor leading users

The Society for Information Management (SIM) will present its coveted Partners in Leadership Award to JC Penney Co. and Nalco Chemical Co. at SIM's annual conference in Washington, D.C., this week. Dallas-based JC Penney will be cited for a $200 million automated inventory replenishment system that improved inventory handling. Nalco, based in Naperville, Ill., will be honored for deploying notebook PCs and homegrown software in the field to boost sales and customer satisfaction [CW, Sept. 13].

Convex to market tape libraries

Hunting for new revenue sources outside its usual technical supercomputer domain, Convex Computer Corp. plans to start marketing file server systems for commercial customers to use in managing data stored in tape libraries. Convex has added low-end models based on minority investor Hewlett-Packard's workstations to go along with existing file servers built around its own C Series hardware. Prices for the systems, now called the DataSeries line, start at $150,000 for a workstation setup aimed at departments with 10 to 20 users. Convex said it wants to jump into commercial markets to help offset sales declines in its base technical-compute server business.

CRS operators to unite systems

Having announced plans to merge last March, computerized reservation system operators Covia and UK-based Galileo last week formed Galileo International. The new company will consolidate Galileo's Swindon, UK, data center with Covia's Denver facility at the end of this month. The resulting single-image system will serve nearly 30,400 automated travel agencies worldwide.

3Com unites internetwork products

3Com Corp. last week announced Transcend, a software architecture for managing the full gamut of 3Com hubs, bridges, routers and adapters. The product reportedly enables users to define and manage logical workgroups as a single network system, even when some network nodes are on separate hubs.

SHORT TAKES NCR Corp. and Oracle Corp. have announced NCR's LifeKeeper FRS Clusters, fault-resilient software designed to incorporate Oracle's Parallel Server software.... MasterCard International, Inc. and Europay International SA plan to develop a global transaction processing network to support all payment-services products between the companies.

News shorts, *page 16*

Vendors back Borland plan

Apple, MCI, WordPerfect to support groupware framework

By Michael Vizard
NEW YORK

Borland International, Inc. last week announced its groupware strategy to a chorus of support from third-party vendors and information systems organizations alike.

Among the heavyweights pledging varying degrees of support for Borland's Object Exchange (Obex) facility were Apple Computer, Inc., MCI Communications Corp., WordPerfect Corp. and Novell, Inc.

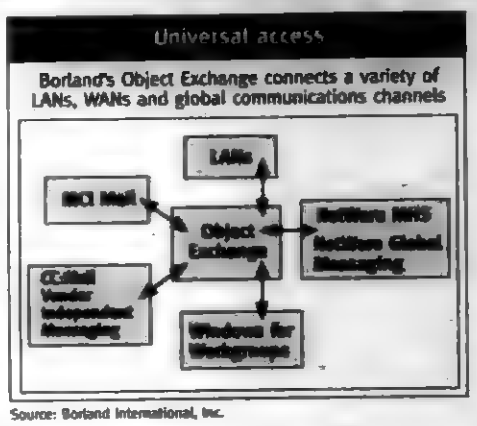
Obex is an object store facility that allows users to selectively share data between their applications without using a specific central server, database, electronic-mail or network protocol. Borland will incorporate Obex into all of its Windows office products.

In addition, Apple plans to use Obex to link its forthcoming PowerShare groupware effort to Windows applications. Also, under an agreement with MCI, support for MCI Mail has been preconfigured in the Workgroup edition of Borland's Quattro Pro spreadsheet.

Similarly, Novell plans to make its Message Handling Service (MHS) compatible with Obex, and WordPerfect will support Obex in its namesake word processor as well as its WordPerfect Office E-mail package.

To showcase the capabilities of Obex, Borland last week demonstrated a SQL query from a Paradox database to both an Oracle Corp. and Sybase, Inc. relational database management system. That data was then transferred into Quattro Pro, a Microsoft Corp. Excel spreadsheet and WordPerfect using a publish-and-subscribe approach. Publish and subscribe allows users to share data without using a central server.

"Borland has tightly linked the object technology with its SQL interface so that you don't feel like you are exiting Paradox to make a SQL query using a separate module," said Dan Robinson, president of Bright Light Consulting, Inc., an independent developer in San Francisco.



Source: Borland International, Inc.

Independent move

To help software developers add support for Obex to their applications, Borland has made available a Workgroup Enabling Kit based on Obex and plans to provide Obex libraries for major applications such as Excel.

The move means Borland will not be dependent on support from Microsoft or Lotus Development Corp. in its bid to push Obex as a standard.

Obex will also become a key component of Borland's suite initiative once WordPerfect delivers Obex in its applications. Borland is expected to deliver an updated version of Borland Office later this year (see story page 44).

General Motors Corp. plans to use Obex to roll up Quattro Pro worksheets and Paradox databases from offices located throughout the U.S., Europe and Mexico, according to Alton Danks, a GM senior systems analyst.

Borland was careful not to position Obex as a direct competitor to Notes and in fact, the products are structured very differently.

Borland Chief Executive Officer Philippe Kahn characterized Notes as simply another transport service for Obex-compliant applications.

"Notes is a heavy-duty infrastructure system that has to be deployed and maintained. If you need that, we'll take advantage of that," Kahn said.

Dharien Rao, a systems analyst at Price Waterhouse in San Francisco, said his firm is looking forward to Borland's promised initiative to support Obex running over Notes. "Having Obex integrated with Notes will be truly great," Rao said.

However, industry analysts said Borland must move quickly if it hopes to make Obex, which has been under development for three years, a standard before rivals can respond.

"It will probably take them until the end of the year to get Obex fully in place. All I can say is they better hurry," said Esther Dyson, editor of the "Release 1.0" newsletter in New York.

Kahn said Borland will ship 1 million copies of Obex-compliant products within a year.

Consortium

CONTINUED FROM PAGE 1

sortium's acting executive manager.

As part of this effort, the consortium plans to deliver a developer's kit in the first quarter of 1994 for Windows, Macintosh and OS/2 systems that will meld into a cohesive development environment the following components: IBM's System Object Model; Apple's Bento object storage format and Open Scripting Architecture language; and the OpenDOC software architecture announced earlier this year by IBM, Novell, Apple, WordPerfect and Borland International, Inc.

OLE, meanwhile, is the cornerstone of Microsoft's plans for developing the Cairo object-oriented operating system.

"When you have a vendor that is as dominant as Microsoft is, it will be hard for {the consortium} to be successful. The market defines what the de facto standards are," said Jonathan Seybold, president of Seybold Seminars in Malibu, Calif.

> The consortium will be incorporated as an independent entity that will provide a certification process for applications by the end of this year.

As evidence of the extent of Microsoft's strength in this arena, he said WordPerfect will deliver a mechanism for transferring data between OpenDOC and OLE as part of the standard.

To counter Microsoft, CIL will stress the multiplatform approach it will take using the technology in OpenDOC.

For example, Microsoft's OLE approach currently supports only the exchange of objects across a single Windows system, and a network-aware implementation of OLE is not expected until Microsoft delivers Cairo in 1996.

In contrast, OpenDOC makes use of IBM's implementation of the Common Object Request Broker Architecture standard, which is the basis of IBM's Distributed System Object Model.

Best of Both Worlds

The HP Windows Client meets user and system administration needs that once seemed worlds apart

The Hewlett-Packard Windows Client is ideal for organizations that want the desktop power of PCs — *plus* the control and convenient system administration that terminals provide.

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Users wary of Oracle support, focus

By Kim S. Nash
REDWOOD SHORES, CALIF.

Oracle Corp. executives will get an earful next week when a crowd of about 8,000 Oracle users are expected to descend on Disney World in Orlando, Fla., for International Oracle User Week. Users last week said concerns range from technical support for development tools to philosophical questions about Oracle's product focus.

Oracle may be juggling too many balls, some observers said. Since signing a pact with US West in June to supply massively parallel databases for the telephone company's foray into interactive television, Oracle Chief Executive Officer Larry Ellison has been touting plans to team up with any and all media carriers.

IOUG
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While Oracle may have the technological prowess to pull it off, some users wondered what is in it for them.

"I'm sure they will make a lot of money off this stuff ... but it better not be at my expense," said Michael Abbey, chairman of Affinity, an advisory group of major Oracle users. He suggested that Oracle hire workers dedicated to interactive TV ventures so as not to take away from existing technical support services or product quality.

The company has not done any significant hiring but recently rearranged resources to focus on multimedia database projects. Chairman Jim Abrahamson is charged with cutting deals with phone companies, while Terry Garnett, senior vice president of marketing, is now responsible for partnering with information providers such as movie companies and news services.

Other users said they were optimistic that any research and development Oracle may do for phone companies will trickle down to core products. Oracle "would be remiss if they didn't translate all that effort — especially in object technology — back to the business user's database engine," said Mark Farnham, database architect at Burlington Coat Factory Warehouse Corp.

In demand

Just to be sure Oracle does not take its eye off the ball, users last week cited several features that they want Oracle to enhance or add to various products:

- Security, tuning and administration features for very large databases of 20G bytes and up.
- Imaging capabilities in Oracle 7.
- Greater flexibility in accounting applications to handle exception situations, such as cutting multiple checks to a single supplier during one pay cycle.

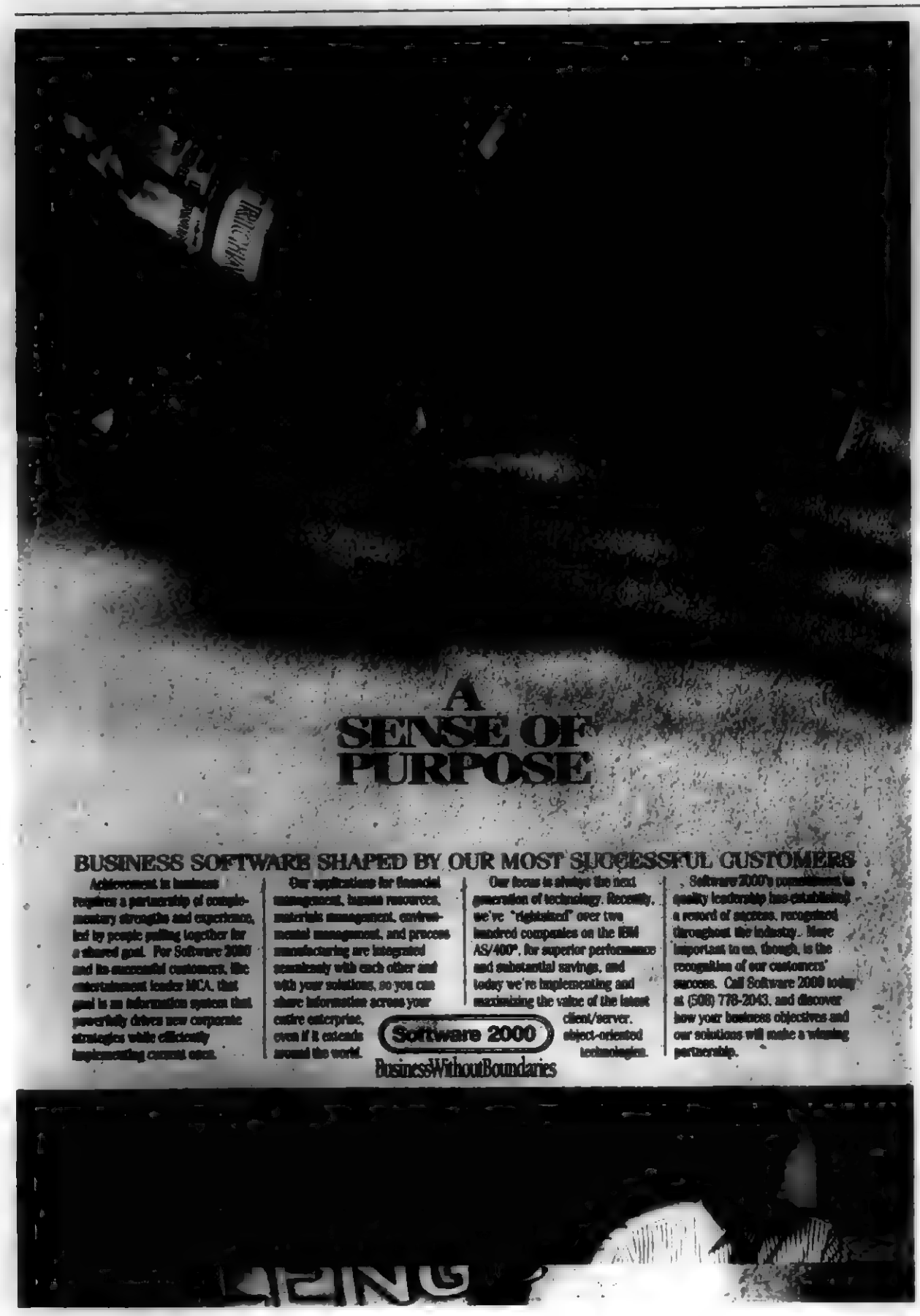
A handful of users also noted the same concern: They want Oracle to state definitively whether it will support its new Cooperative Development Environment (CDE) tools against the Oracle 6 database. CDE products have been tested and certified against only Oracle 7.

"That's part of why we may have to speed up migration from 6 to 7," said Dave Heck, a unit manager at Nationwide Life Insurance. The Columbus, Ohio, insurer wants to use CDE tools for a half-dozen major development and reengineering projects planned for the next 18 months, Heck said.

Meeting tips

What to look to for at Oracle's user conference next week:

- Enhancements to database replication features.
- Demonstrations of interactive TV applications, such as full-motion video and CD-like sound, managed by a massively parallel version of the Oracle database.
- Announcement that key pieces of CDE tools are shipping.
- Blueprints for Oracle's groupware plan, based on improvements to Oracle Office electronic-mail package.



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IBM, Compaq duel over server strategy

By Michael Fitzgerald and Stephen P. Klett Jr.

Recent server announcements by the IBM PC Co. and Compaq Computer Corp. underscore the differences between the Top 2 PC server makers by highlighting the fact that IBM continues to lag in the client/server arena, which should be its birthright.

Compaq, which is No. 1 in the market, rolled out ProLiant, a family of high-end servers with large-system-like functionality. The PC Co., meanwhile, will today release new versions of its Server 85s and 95s designed to pull it ahead of the feature set in Compaq's low-end ProSignia and midlevel SystemPro/XL products.

Compaq CEO *Eckhard Pfeiffer stressed the open nature of the ProLiant line*

In a blow to the PC Co.'s strategy, the company's planned refresh of its 195 and 295 high-end servers, which it intended to deliver as a competitive counter against ProLiant [CW, July 19], will not appear until the first quarter of 1994. Brian Sanborn, product manager for the Server 85 and 95, blamed the missed target date on IBM's delay in readying MP NetWare, a software component that optimizes Novell, Inc.'s NetWare to run on the multiprocessor Server 195 and 295.

"MP NetWare was slated to be ready in July, but it's been pushed back to October, which has impacted our hardware development," Sanborn said.

An overly ambitious release schedule and bugs encountered during compatibility testing have contributed to the delay as well, said David Saxby, manager of server systems at the PC Co. in Boca Raton, Fla.

"It was a very aggressive schedule that assumed a lot of success along the way, and some problems in testing have taken time to correct," Saxby said. "We won't sacrifice the quality of a machine for the sake of meeting a schedule."

In contrast, Compaq's server efforts have sailed smoothly to market. With ProLiant, Compaq has thrown down the gauntlet in front of the PC Co., analysts said; the question is when and if the IBM PC Co. will be ready to rise to the challenge.

Eckhard Pfeiffer, Compaq's chief executive officer, said the ProLiant was an important part of Compaq's effort to surpass IBM in the PC market and stressed that these were open systems.

"We've been a flag carrier of open standards since we were founded," he said.

"Compaq has just introduced boxes that beat the Model 95 on price but are in the performance class of the 295," said Leslie Fiering, an analyst at Gartner Group, Inc. in Stamford, Conn.

She said a strong point in the Compaq announcement is the large-systemlike functionality it offers through a new version of the Insight Manager tool and SmartStart. This offers users a CD-ROM-based installation script that can cut in half the time it takes to install products such as NetWare.

Analysts said the PC Co. continues to retain a solid No. 2 spot in the server market because of its large systems presence, but some wondered if the market will slip away from it because of Compaq's far more aggressive approach.

The PC Co.'s "lack of aggressiveness could start to hurt them," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

Missed opportunity

While many have said IBM could dominate the client/server market because of its experience with support, systems integration and distributed computing, "they forfeited their birthright in the server market when the [Compaq] SystemPro came out and they didn't respond. And they have continued to miss opportunities," Henning said.

"I am impressed with Compaq's new technology and price points," said W. B. Soper, director of information systems at Chevron Canada Ltd. in Vancouver, British Columbia. Soper said he had intended to upgrade to the 295 follow-on but now expects to move to the less expensive Compaq machines.

However, analysts said the PC Co. could come back to pose a real threat to Compaq in the budding arena of client/server hardware. The PC Co. created a separate server brand only two months ago, and for the first time is free to go after IBM's bread-and-butter minicomputers and RISC servers.

Users responded positively to the products the PC Co. did announce, particularly the high-end Server 95 with the option of built-in redundant arrays of inexpensive disks.

The PC Co. said it will release a version of its server management tool, Maximum Availability and Support System/2, for the 85 and 95 lines in January.

Servers square off

	Compaq ProLiant 2000 Model 5/66	IBM PS/2 Server 95 Array 566
Processor	Intel Pentium, 66 MHz	Intel Pentium, 66 MHz
Memory	32M to 512M bytes	16M to 256M bytes
Cache	256K bytes	256K bytes
Controller	Compaq Smart SCSI Array	Fast RAID-5, SCSI-2 streaming
Service	Three-year limited warranty, toll-free support and remote problem troubleshooting	Three-year warranty, toll-free phone support, four-hour response to selected cities at no additional charge

Compaq, Novell team up

CONTINUED FROM PAGE 1

toward multiprocessing, but users don't care if the processors are in one box or multiple machines," Major said.

Users said they were interested in multiprocessing-capable NetWare, though some were displeased that Novell will relegate SMP to second-class status.

"Everything [Major] said [about SMP's drawbacks] is true, but I would prefer he do an SMP version first because in a single box, if you want faster performance, you get it from SMP," said Louis Kahn, chief of computer operations at the Centers for Disease Control and Prevention's Division of Immunization in Atlanta.

More performance

Major pointed to the SMP efforts of companies such as Tandem Computers, Inc. and Sequent Computer Systems, Inc., saying that at a certain point all their extra processors are configured in a loosely coupled (asymmetric) configuration because that is the only way to get extra performance out of additional processors.

While Unix and Windows NT both support SMP, a scalable NetWare will allow users to theoretically gain performance in large-scale multiprocessing systems. However, Major said Novell will continue to push its UnixWare as an SMP offering and will build an SMP NetWare only if customers demand it.

Despite user frowns, analysts said the move by Novell and Compaq makes sense.

"There's a huge, critical mass of users that cannot truly benefit from their applications until they get to plug into incremental performance, such as that you would get from a scalable NetWare," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H.

Client/server

Users want less proprietary CC:Mail

By Lynda Radosevich

Lotus Development Corp.'s expected announcement this week of an X.400-based message server based on Notes will give CC:Mail customers a much-needed migration path to client/server computing. However, customers and observers said they really want to hear that Lotus will become less proprietary about the CC:Mail technology and will improve its delivery record.

The server, to be unveiled at Lotus' annual CC:Mail user conference in San Francisco, will support a new client/server version of CC:Mail, Notes, non-Lotus client software and multiple back-end transports, including Novell, Inc.'s Message Handling Service and X.400, a source said. It is meant to be a "universal" messaging transport along the lines of Hewlett-Packard Co.'s OpenMail, according to the source, however even with the new server, Notes and CC:Mail will continue to use different message stores and directories.

Currently, Notes and CC:Mail have separate methods of transporting messages and documents. "The problem with having two transports is that it requires separate groups to manage them," said Felice Curcelli, a CC:Mail product manager.

Additionally, Lotus will unveil plans for enhancements to the Vendor Independent Messaging (VIM) interface and to its Organizer group calendaring package, according to sources close to the company.

Ed Brill, an electronic-mail administrator at U.S. Robotics, Inc. in Skokie, Ill., said he is looking forward to a client/server version of CC:Mail because it will allow more robust forms and work-flow applications to be created than those now supported by CC:Mail's current flat-file database.

However, the success of Lotus' overall mail strategy depends on Lotus taking a more open approach to CC:Mail, according to both John Dunkle, president of WorkGroup Technologies, Inc., a consultancy in Hampton, N.H., and Rick Kirkland, a senior computing analyst at South Carolina Electric & Gas in Columbia, S.C. Lotus should provide technical manuals, similar to IBM's manuals, that provide detailed information on database structure, transport technology and all aspects of CC:Mail, Kirkland said.

A source within Lotus said that VIM is being enhanced to allow such development.

Delivery dates are another sticking point. "I want to talk to Lotus about their delivery schedules," said Bob Stratton, a technical adviser for Gulf Canada Resources in Calgary, Alberta. "When I come back and tell my user community that Lotus says we will have this, that and the other thing, and it doesn't happen, the users get pretty hostile."

For example, Gulf Canada is in the beta program for the Organizer's group scheduling program but still has not received the beta copy for the Macintosh version.

Also at the conference, Lotus is expected to announce the "Sequoia" updates to the current file-shared CC:Mail, including common features across different CC:Mail client platforms.

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Users want vendors to fill in Unix gaps

By Thomas Hoffman

Users who two weeks ago watched the Unix community rally around a set of common application programming interfaces (API) designed to run applications across a multitude of Unix operating environments have a few other Unix bones to pick [CW, Sept. 6].

Despite giving the common API specification a warm reception, users said they are still anxiously awaiting a similar consensus centered around industrial-strength systems management and security products. They need these capabilities to run mission-critical applications on Unix with the same stability users are accustomed to with their legacy systems.

"Systems management and security are clearly the two issues that need to be addressed up front as we move forward with Unix," said Donna Maria Krasner, manager of technical services at Chesebrough-Ponds USA Co. in Trumbull, Conn.

While several vendors have ushered systems management products into the fray, including Computer Associates International, Inc. and Tivoli Systems, Inc., users are awaiting a comprehensive set of systems management APIs to address multiple Unix environments simultaneously.

Several industry groups have tried to devise their own solutions, including the Object Management Group with Common Object Request Broker Architecture and the Open Software Foundation (OSF) with Distributed Management Environment (DME). But DME, slated for arrival no earlier than the end of 1994, may be superseded by the efforts of the Common Open Systems Environment (COSE), an ad hoc vendor group that is attempting to accelerate commonality among Unix environments.

A COSE working group is reviewing systems management requirements, but its direction is unclear, analysts said. It may adopt systems management interfaces from packages such as CA-Unicenter, the Tivoli Management Environment, IBM's SystemView and Hewlett-Packard Co.'s OpenView. Or the group may integrate the best-of-breed features within packages supported by the OSF, Unix International, Inc. and leading systems management vendors.

Meanwhile, the DME framework has been delayed by shifting objectives and disagreement about specifications among vendors in the OSF's working groups. To boost interest in DME, the OSF released prices for a limited number of DME components at Interop '93 August.

But some said the window of opportunity for DME is closing as products such as OpenView and NetView/6000 vie to be de facto standards.

Other major factors contributing to the systems management dilemma include the variety of technical issues that need to be addressed to develop a de facto systems management protocol and the political infighting occurring among vendors, said David Smith, an analyst at International Data Corp. in Framingham, Mass.

IBM to debut PowerPC boxes

Rollout targets low-end market; performance, speed get kudos

By Ed Scannell and Michael Fitzgerald

IBM this week will roll out its first PowerPC-based systems, which are said to be targeted at the lower end of the workstation market.

The systems will be powered by 66-MHz versions of the 601 PowerPC chip. The base system's configuration consists of 16M bytes of RAM, two Micro Channel Architecture slots and one local bus graphics slot, sources close to IBM said.

Pricing on an entry-level system without a monitor starts at just under $4,500. A configuration with a 19-in. monitor, a 1G-byte drive and three-dimensional graphics capabilities goes for roughly $9,000, the sources confirmed.

The price/performance characteristics of the PowerPC-based systems, according to sources, is impressive.

Test results, reported to analysts recently, show a SPECmark92 rating of 60 for integer performance and 70 for floating point. These results outstrip those of an Intel Corp. Pentium by roughly 30%, analysts noted.

The speed improvements are achieved by a combination of two key advances: the raw processing power of the system, which is said to use nine chips, and what one source described as a "graphics performance breakthrough."

"This stuff (new PowerPC-based systems) should put DEC in some deep yogurt [with Alpha] in terms of performance," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C. "IBM is getting numbers [benchmarks] out of this architecture that makes Crays look like toys."

IBM will also introduce a new version of AIX that slightly improves the speed and performance of DOS and Windows applications over what they can do in their native environments.

Sources said IBM will also show its PowerPC-based notebook, which was developed by Tadpole Technology, Inc. in Austin, Texas.

UNIX EXPO
THE OPEN SYSTEMS SHOW

Novell taps Unix

CONTINUED FROM PAGE 1

will take place in a two to three years, Rekhi added.

By integrating UnixWare with NetWare, Novell should finally be able to stem the rising tide of its major users migrating to some other vendor's Unix/RISC platform when their critical business applications outgrow NetWare, said Paul Bandrowski, manager of advanced technology at Sara Lee Corp. The Chicago company has been experimenting with UnixWare.

Novell's plans for providing UnixWare with NMS support and NetWare 4.01's global directory services means "everyone can share everyone's everything," according to Charles Tilbury, network analyst at the University of Texas M.D. Anderson Cancer Center.

Right now, NetWare integration consists mainly of Novell IPX running on UnixWare clients. What Sara Lee wants is to have UnixWare servers and clients participating fully in Novell's enterprise directory and network management services in a "plug-and-play architecture" that would include both Novell's IPX and TCP/IP as underlying transports, Bandrowski said.

Not worth it

But so far Novell has not added enough value to its Unix system to make it worthwhile to stop using Hewlett-Packard Co. and Sun Microsystems, Inc. RISC/Unix platforms, according to Bandrowski.

UnixWare clients support TCP/IP as an add-on; Novell is expected to announce bundled TCP/IP for UnixWare shortly. And while Novell will continue to support Unix System Laboratories, Inc. OEMs, it hopes to reap major profits by selling packaged UnixWare to end users.

Novell is also rumored to be working with Oracle Corp. on a UnixWare version of the Oracle database with a built-in transaction monitor, which will provide a tightly integrated SQL database environment. This would provide the equivalent of the Sybase, Inc. implementation on NT, which shipped this week.

While UnixWare will go head-to-head with NT and the big Unix players in the application server arena, Novell has by no means abandoned NetWare as an application environment, spokesmen said.

Indeed, several works in progress at Novell are aimed at making NetWare a more robust application platform and will promote application portability across NetWare and UnixWare, according to Michael DeFazio, senior vice president at Unix Systems Group.

Novell may give Unix to X/Open

By Elisabeth Horwitt and Jean S. Bozman
NEW YORK

Reports swirled through the Unix industry last week that Novell, Inc. will bow to pressure from its major Unix OEM customers and turn over its Unix interface specification and brand name to X/Open Co., the UK-based Unix standards body. Novell bought its Unix from AT&T less than a year ago for $320 million.

The move will let Hewlett-Packard Co., Sun Microsystems, Inc. and IBM continue buying Unix from Novell without the fear of Novell making the system proprietary.

The immediate effect of handing the Unix trademark over to X/Open would be price cuts in the major versions of Unix such as Sun's Solaris, IBM's AIX and HP's HP/UX, industry sources said. With royalty-free access to Unix, vendors would no longer have to pay Novell for the right to use the Unix name.

Kanwal Rekhi, executive vice president of Novell's Unix Systems Group, confirmed that the company was working out details of "providing the industry with the use of our brand name" and ensuring a consistent, open Unix interface. Novell wants to "build on the Unix API work" that a number of key Unix vendors announced earlier this month [CW, Sept. 6], Rekhi said.

Novell sees X/Open as a "good company to administer" the Unix brand name and interface; however, whether Novell will make the announcement this week was still up in the air at press time, Rekhi said.

'Trump card'

"This is Novell's trump card to get the fractious computer industry to rally behind Unix and Novell's volume Unix strategy — to wit, UnixWare," said Maureen O'Gara, publisher of the "Unigram-X" weekly newsletter, which first reported the Novell activities last week.

The announcement would put some bite into Novell Chief Executive Officer Ray Noorda's claim last week at the Technologic Partners Conference in San Francisco that the industry's "job is to unify Unix."

If Noorda does indeed turn the Unix brand name and interface specification over to X/Open, that is emphatically "not giving Unix away," stressed Sun CEO Scott McNealy. "We've been talking about this for 11 years: the whole strategy of having open interfaces but proprietary implementations," he said. "Everyone wants to make money on their own implementations of Unix."

DCE: Ready, set...

CONTINUED FROM PAGE 1

moving things around," he said.

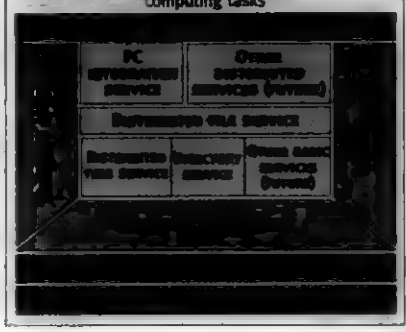
But Truch said he sees many potential uses for DCE because parts of BP Exploration's sprawling operations are all over the globe. "With DCE, you can solve some of the problems relating to the high cost of software licensing at multiple sites and of load-balancing between networked machines," he said.

The slow DCE ramp-up is similar to what happened with the OSF/Motif graphical user interface, OSF President David Tory said. "It wasn't until a year [after release] that the value-added solutions started coming out," Tory said.

That is no consolation to many users, who said they are still looking for independent software houses to provide DCE support for mainframe, minicomputer and PC operating systems before they start any DCE projects.

Close-up: DCE architecture

The OSF/DCE architecture is a series of network services for distributed applications designed to allow many computers to share in the cooperative computing tasks



Others with Unix environments have started DCE development for those platforms only.

"Apple doesn't yet have DCE support, nor is there DCE support for Windows," explained Kenneth Blythe, director of administrative systems at Pennsylvania State University in State College, Pa. "Unless you're working with a Unix machine, you probably can't use DCE yet."

However, IBM is working on MVS and VM support, he said, and has shipped OS/2 support. And Gradient Technologies, Inc. in Marlboro, Mass., is one supplier of desktop PC support for DCE.

But this summer's shipment of DCE tool kits by IBM, Hewlett-Packard Co. and others for Unix systems should boost operational DCE-based applications by 1995, users said. Other tool kits are being shipped by Gradient, Ellery Systems, Inc. in Boulder, Colo., the Open Computing Environment in Cambridge, Mass., and Transarc Corp. in Pittsburgh.

Some users are trying workarounds until DCE becomes a proven technology. Some are turning to relational databases as a stepping-stone to DCE because database engines generate their own database-specific remote procedure calls.

"The database companies do a marvelous job of client/server computing, but they do it in a proprietary format," Blythe said. "If you go for one of them, you've got to stick with them throughout all your applications." He is working with DCE to develop standard applications that can be shared among the Big 10 universities.

Others are waiting for a new project before applying DCE technology. That is because DCE requires a wholesale change in the way computing is done in an enterprise, users said. "You don't use DCE piecemeal," said Steven Jenkins, a software architecture engineer at the Jet Propulsion Laboratories' Deep Space Network in Pasadena, Calif.

For some sites, DCE's promise of uniting a mixed-vendor computing environment is compelling. Citicorp, for example, is evaluating DCE with several server platforms and on-line transaction processor monitors, according to Harriet Schabes, a vice president at Citicorp's corporate technology office in New York.

Mainframe applications will also be integrated into DCE networks, said Ted Hanss, president of the OSF End-User Steering Committee and director of the Center for Information Technology Integration, part of the University of Michigan's information technology division. In many cases, the mainframes will be transformed into servers on open systems networks, he said.

"Everything's a natural extension of the desktop interface," Hanss said, "and you don't have to know where the physical servers are."

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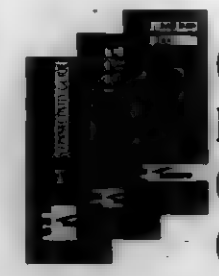

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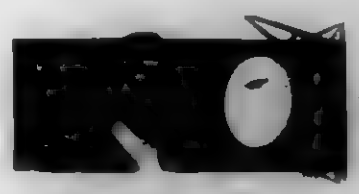

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News Shorts

AST ships Pentium server

AST Research, Inc. last week started shipping its first Pentium-based server. The Premium SE P/60 includes Intel Corp.'s 60-MHz Pentium microprocessor, 16M bytes of RAM expandable to 128M bytes, 256K bytes of Level 2 cache and eight Extended Industry Standard Architecture expansion slots. The server can accommodate up to 8G bytes of optional internal storage. Pricing starts at $5,449.

Sun to finalize WABI

Sun Microsystems, Inc.'s SunSelect business unit said last week it will announce a final version of its Windows Application Binary Interface (WABI) for Windows applications at this week's Unix Expo show in New York. The "golden master" WABI 1.0 release will support Unix systems from IBM, Hewlett-Packard Co., Novell, Inc. and Sun, allowing Windows applications to run on those computers. Vendors will be able to ship the WABI with their Unix software products by year's end, SunSelect said.

Digital to ship Windows NT on Alpha

Digital Equipment Corp. said it plans to start shipping the Alpha AXP version of **Microsoft Corp.'s** Windows NT operating system this week on its DECpc AXP 150 PC. More than 500 Windows NT applications are expected to be available for the Alpha architecture by the end of the year, according to Digital officials.

IBM broadens LAN/host gateway

IBM is shipping an updated gateway between its mainframe-based OfficeVision line of office automation software and LAN-based electronic-mail software. The IBM Mail LAN Gateway/2 adds support for ObjectVision/VM and Professional Office System on the host side and Microsoft's Mail, WordPerfect Corp.'s Office, Da Vinci Systems, Inc. mail products and others on the LAN side.

SQL Server for Windows NT ships

Microsoft and **Sybase, Inc.** started shipping last week a Windows NT version of their jointly developed SQL Server database. Prices range from $845 to $14,995, depending on configuration. IBM OS/2 users can get a special discounted price of $995 for a 10-user system when they trade in OS/2-based versions of SQL Server, according to Microsoft.

SHORT TAKES **Lotus Development Corp.** will officially fulfill its long-standing commitment to deliver Notes on Unix at Unix Expo this week, releasing a version for SCO Unix from The Santa Cruz Operation. Versions for Sun, HP and IBM are expected to follow by the first quarter of 1994. A Unix version of Lotus' Ami Pro word processor will also be announced.... Remote networking vendor **Shiva Corp.** appointed former Lotus executive Frank Ingari as president and chief executive officer. Ingari served two hitches with Lotus, most recently as vice president of marketing. He was also CEO of Ontos, Inc. in Burlington Mass.... **Gateway 2000, Inc.** announced an Intel Pentium-based PC with a Peripheral Component Interconnect local bus, which is said to transfer data up to 15% faster than VESA bus designs. The P5-60 desktop PC comes with a 424M-byte hard drive, 16M bytes of RAM, a CD-ROM drive and a monitor for $3,595.... **Apple Computer, Inc.** is offering a new version of its PowerBook laptop PC through several mass market outlets. The PowerBook 145B is based on a 25-MHz Motorola 68030 chip and offers 4M bytes of RAM and an 80M-byte hard disk for $1,500.

Health care reform sets IT goals

Plan will propose, not mandate, standards

By Mitch Betts
WASHINGTON, D.C.

When Chief Information Officers John Glaser and Larry Grandia testified before the Clinton administration's health care reform task force in March, they recommended that Uncle Sam take a limited, standards-setting role in the reform process rather than becoming technology czar for the health care industry.

As it turns out, President Clinton's reform plan, set to be announced this week, closely follows their advice. The plan relies heavily on the private sector to deploy information technology in the quest for more cost-effective health care.

For example, the Clinton plan focuses on setting data exchange standards rather than mandating a particular information systems architecture. Both Glaser, vice president of information systems at Brigham and Women's Hospital in Boston, and Grandia, CIO at Intermountain Health Care, Inc. in Salt Lake City, argued against broader federal IS mandates.

Database nixed

Early versions of the Clinton plan had called for a nationwide, distributed database of medical records, but that idea was "watered down" out of fear it would be too costly and difficult to quickly implement, according to Alan F. Dowling, national director of health care IS consulting at Ernst & Young in Cleveland. Still, "reading between the lines, there still are some incentives to move in that direction," he said.

"There are a lot of practical problems to overcome, including cost, confidentiality and data standards, before they can mandate it," said Doug O'Boyle, editor of "The National Report on Computers & Health," a Rockville, Md.-based newsletter.

The Clinton plan is expected to contain the following information technology elements:

- A "health security card" for every American, most likely a magnetic-strip card, containing basic administrative data but not a full medical record.
- A new National Health Board that must settle on electronic data interchange standards for electronic claims, payments and remittances within one year of enactment of the reform legislation.
- A still-fuzzy notion of community-based information networks that would allow doctors to exchange clinical data about patients on an ad hoc basis.

For some IS chiefs, the plan is rather anticlimactic. "We're being forced to do these things anyway, due to business and state [regulatory] pressures," Glaser said.

One big question is whether cash-strapped hospitals can afford to build the kind of IS structure envisioned by reformers. Grandia said the federal government should provide financial incentives for IS investments that produce efficiencies but have long-term paybacks.

"The government can't ratchet down our reimbursements and then ask hospitals to invest more," Grandia said.

But Charles J. Singer, a Wakefield, Mass., consultant specializing in health care IS, said it is a competitive necessity for hospitals to aggressively find the money for IS investments. "Why is it they can find $50 million to build a new wing but not $5 million for a new information system?" he asked.

As a general rule, the move toward "managed competition" is triggering profound changes in the health care marketplace, experts said. On the "managed" side, hospitals will have to provide reports of their own cost-effectiveness to federal and state regulators and regional health cooperatives, which will then provide consumers with a "report card" on providers.

On the "competition" side, industry consolidation is expected to accelerate. The survivors will be those hospitals that can use information technology for competitive advantage.

For example, the winners will use their databases of patient information for targeted marketing campaigns, improving customer service and monitoring which services are profitable, said Yvonne Lederer-Antonucci, assistant professor of management at Widener University in Chester, Pa.

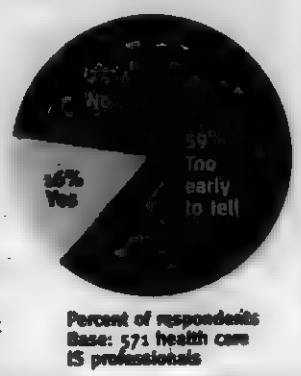
Taking IT's temperature

Clinton's plan helps IT . . .

Q. Will the Clinton reform plan accelerate or inhibit the advancement of information technology in health care?

. . . but can hospitals afford it?

Q. Will Clinton's fiscal policies enable you to afford new spending?



Percent of respondents
Base: 571 health care IS professionals

Source: Hewlett-Packard Co. and Healthcare Information and Management Systems Society, Chicago

Programming error delays Medex payments

Blue Cross/Blue Shield of Massachusetts last week confirmed that a programming snafu in the computer system used to process Medex claims caused a three-month delay in delivering reimbursement checks for medical bills to 3,500 subscribers.

Medex provides the elderly with supplemental health coverage for prescription, hospital and doctor bills that are not covered under Medicare. Subscribers must pay the bills up front and then submit claims to Blue Cross.

Last year, Blue Cross contracted outsourcer Electronic Data Systems Corp. to condense its nearly 40 computer systems into one information systems infrastructure.

An EDS spokeswoman said the error was caused by "typical post-implementation problems," including a holdup in implementing quality control procedures. "We have encountered a few bugs in the transitions, which have resulted in delays in processing a small number of claims, but they have been fixed," the spokeswoman said.

Blue Cross confirmed that the error caused roughly 9,000 claims — all filed by retirees of Polaroid Corp. — to be processed improperly, resulting in no payments. The delinquent payments will be sent out starting today, according to a Blue Cross spokesperson.

—Stephen P. Klett Jr.

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Millipore may take Notes from Beyond(Mail)

By Lynda Radosevich

Lotus Development Corp.'s decision not to offer a runtime version of its Notes groupware application at this time [CW, Sept. 6] has pushed some customers into considering an alternative to the product's high price tag.

For instance, Millipore Corp., a Bedford, Mass.-based filtration equipment manufacturer, uses Notes for electronic mail and to let salespeople access customer information. However, it is looking into a less expensive approach to E-mail for companywide use.

High on the list of contenders is Beyond, Inc.'s mail package, BeyondMail. It features an added facility called Beyond Notes Connection that gives users access to Notes databases, said Kevin Danehy, a senior business systems analyst at Millipore.

"Beyond lets you share and contribute to Notes engines without a Notes license. It's a big money saver," Danehy said.

For example, out of 1,000 users who need access to Notes databases, only 100 might need to create those databases. The other 900 would need just regular E-mail and perhaps occasional access to information in a Notes database. At roughly $350 (street price) per seat for Notes vs. $100 for BeyondMail with the Notes connection, the savings would amount to $225,000, Danehy explained.

List price for BeyondMail with the Notes connection is $140 and $495 for the Notes client user license.

"I hear customers asking for a runtime version of Notes, but Lotus said they have no plans to offer one, so the Beyond Notes Connection fits in there," said Jeff McDonnell, a partner at Northwest NetCom, Inc., a Portland, Ore.-based consulting company. "The main reason is cost. A lot of users are paying for, but not using, Notes development capabilities at people's desktops."

There are 500,000 Notes users in 2,000 companies, according to Lotus.

Get connected

Besides cost, one advantage to the Notes connection is that it permits users to gather only the record that matches criteria in the BeyondMail forms, providing an added level of security for the Notes database, said Arthur Geffen, director of technical services at Veritas Technologies, Inc. in Dallas.

Additionally, users could find the Beyond product a better option for receiving updates while on the road or at home because it sends only the records that the user is interested in, rather than requiring the user to replicate entire databases, as Notes does, Beyond President Chuck Digate said.

To use the Beyond Notes Connection, customers must have a Notes server and BeyondMail. The software allows Beyond users to create forms that look like Notes database forms. Users can query the Notes database for records that match rules-based criteria in the form, and the matching records are sent to their BeyondMail mailboxes. Or users can add to Notes databases using the Beyond form.

However, the software is not meant to replace Notes. Users cannot create Notes databases, scroll through records in the Notes database or receive rich text messages, including image and sound objects, as Notes users can, Digate said.

Also, any of the Notes database links into other Windows-based applications are unavailable to the Beyond Notes users, he added.

Neither product is easy on developers because both Notes and Beyond's forms and rules utilities are complex, highly customizable applications that require significant development time, Geffen said.

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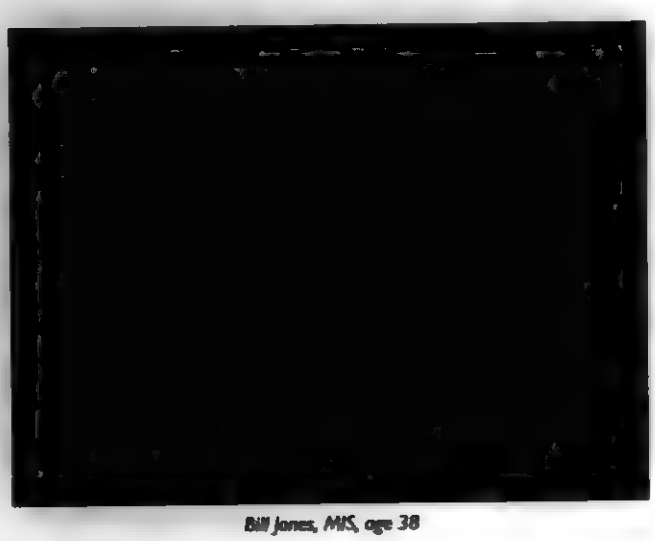

Hair loss *occurs as users complain the system is costing them time, not saving it.*

Bags under eyes *take shape from long hours spent attempting to connect your wireless network and LAN.*

Bill Jones, MIS, age 38

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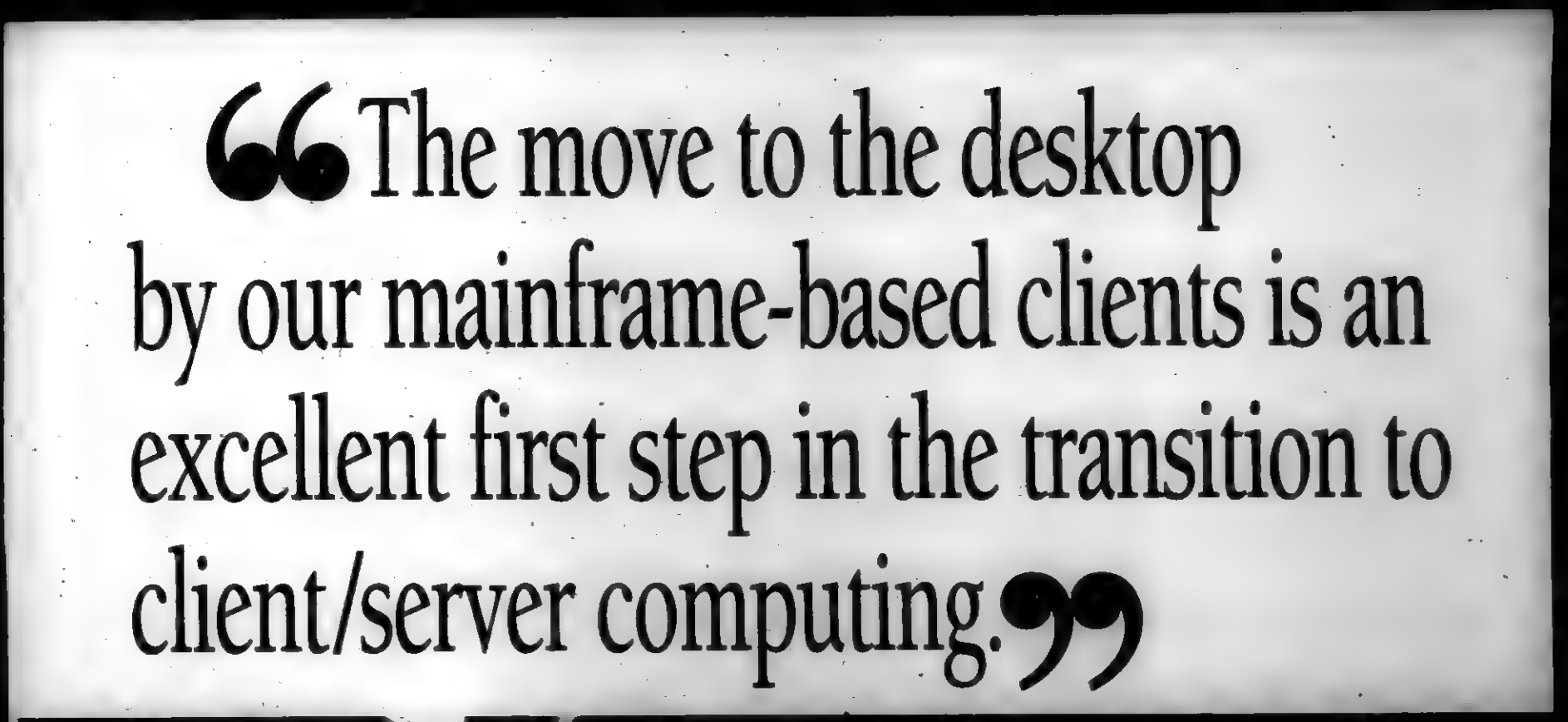

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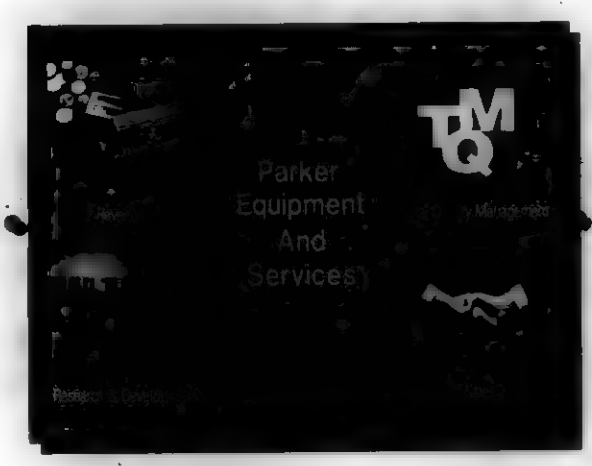

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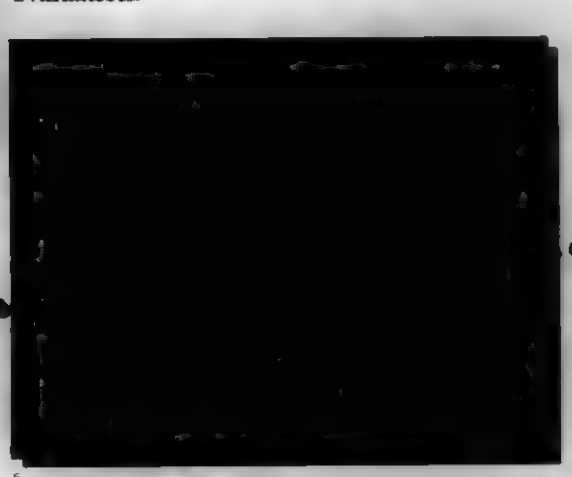

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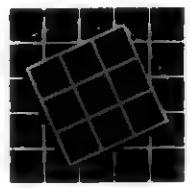
FCC to carve up radio frequencies

By James Daly
WASHINGTON, D.C.

All eyes in the wireless networking community will be on the nation's capital this week: The Federal Communications Commission is expected to detail how it will auction off the precious radio frequencies that lightweight portable machines need before sales can take off.

It's about time.

While vendor commitment and user interest in personal digital assistants (PDA) remain high, the FCC has been criticized for being slow to displace the utilities, railroads and military bodies that have long used these frequencies for microwave communications.



Meanwhile, spectrum allocation activity by regulatory bodies in Europe and Japan has given competitors a head start in the race for wireless data communications markets.

"The usefulness of wireless, lightweight computers depends upon the government reallocating available radio frequencies among new and existing communication services in a timely and efficient manner — two qualities the feds have never been known for," said Chuck Jackson, a principal at Strategic Policy Research, Inc. in Bethesda, Md.

He said the FCC's foot-dragging could prove costly to U.S. companies. Jackson estimated that the decade-long delay in carving off more spectrum for emerging technologies has already cost U.S. firms thousands of jobs and billions of dollars in lost business — for example, for information service providers who would offer the applications and provide the data users would pay to tap into.

That may be changing. Last year, the FCC voted to release 220 MHz of radio spectrum for a gray area it dubs Personal Communication Services (PCS), but it allocated just 20 MHz of radio spectrum for use in wireless networks.

While even an extensive wireless network might sop up only a fraction of that bandwidth, if wireless communications really takes off, the FCC could find wireless vendors banging on its door.

And last week, the FCC conducted a lottery to parcel off the airwaves for use in interactive television. The move had many in the information systems community salivating for a quick repeat of a similar lottery for PCS. But analysts such as Richard Shaffer at the New York-based Technologic Partners consultancy said they do not see that happening before next year at the earliest.

Taking flight

When the FCC auctions off the frequencies needed for PCS, the following technologies could take off:

- Wireless laptops incorporating cellular, LAN and wide-area data transmit/receive capabilities.
- PDAs — handheld machines capable of remote electronic mail, fax or database access.
- Personal phones — cordless flip phones with data screen.

This week the agency is expected to announce how much frequency will be available, how many licenses it will award, the size of the service areas, the number of carriers per service area, the cash requirements for bidding in the auction and other particulars. Once those parameters have been established, the way is cleared for the airwave auctions.

Meanwhile, more than 250 companies have been conducting field trials under experimental licenses issued by the FCC.

Users, too, said they are looking forward to the potential of lightweight wireless devices.

"It's an area with tremendous potential," said Peter Wild, electronic data processing audit manager at Melville Corp., a $10.4 billion retailer in Rye, N.Y. Melville manages more than 8,000 retail stores such as Marshall's and CVS. Wild said wireless PDAs could quickly track goods received or record when deliveries are made.

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Unisys scales price/performance curve

New 2200/500 midrange system hailed as the first of lower-cost CMOS-based mainframes to come

By Thomas Hoffman
BLUE BELL, PA.

Last week's introduction of a CMOS-based mainframe by Unisys Corp. marked the first in a series of planned steps by the vendor to deploy the cost-effective technology across all future high-end hardware.

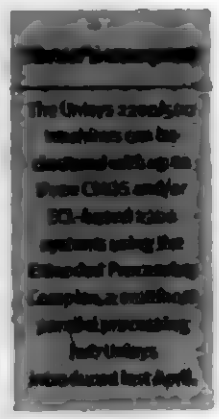
Not unexpectedly, users reacted favorably to the lower-cost models, while several analysts said the new systems have placed Unisys a solid year ahead of offerings expected from IBM and plug-compatible manufacturers.

All future 2200 and Unisys A series mainframes will incorporate CMOS — complementary metal oxide semiconductor — technology, including a 2200/900-class unit scheduled to arrive in the next 12 to 18 months. Moreover, users will not be forced to amend their existing operating systems or applications software, Unisys said.

The move to CMOS is part of an effort by Unisys to stem the flow of its mainframe customers to cheaper distributed computing models.

Those plans were favorably received by several 2200 and A series customers, who said they are looking for any and all cost reductions they can find. "As long as it's cheaper, I'm all for it," said George F. Thomas, senior vice president and director of data processing at the New York Clearing House, an A15 shop.

New York Clearing House's George F. Thomas: *'As long as it's cheaper, I'm all for it'*



The Unisys 2200/500 machines can be clustered with up to three CMOS and/or ECL-based 2200 systems using the Extended Processing Complex, a multihost parallel processing feature Unisys introduced last April.

The Unisys 2200/500 midrange machine, based on CMOS technology, is a more cost-effective on-line transaction processor than standard bipolar emitter-coupled logic (ECL) mainframes, according to analysts.

For example, Unisys executives said early in-house testing results have indicated that the 2200/500 can operate at a cost of less than $10,000 per transaction per second, or at one-fourth the cost of bipolar ECL-based 2200 machines.

Those price/performance levels also compare favorably with estimates for comparable ECL-based IBM ES/9000 machines, which analysts placed in the $40,000 to $80,000 transaction per second range.

Curtis R. Girod, a Unisys vice president, said the vendor plans to test the 2200/500 under the Transaction Processing Council's TPC-C benchmark by early next year. Analysts said IBM has not yet tested its ES/9000 mainframes against the TPC benchmarks.

In addition, the Unisys 2200/500 is equipped with one to four processors that can operate at speeds of 10 MIPS each. It is priced between $350,000 and $1.5 million, or nearly one-tenth the cost of ECL-based 2200 mainframes, according to Frank G. Brandenberg, a corporate vice president at the Unisys Computer Systems Group.

Lower cost lucrative

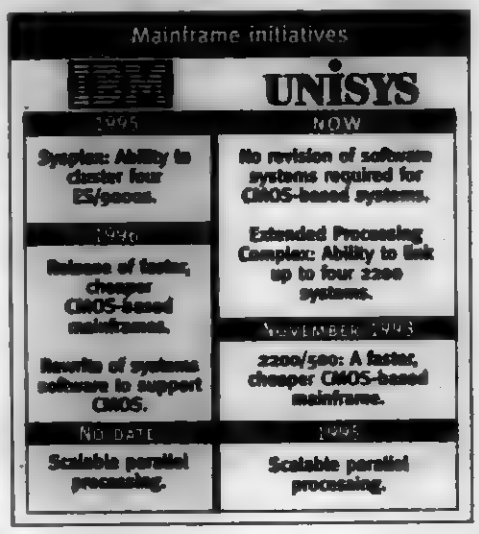
Still, the New York State Department of Social Services, which installed a pair of 2200/9222 mainframes at each of its New York and Albany data centers during the past year, is not quite ready to swap out for the CMOS-based machines. But the lure of implementing cheaper 2200/900 machines has grabbed the attention of David Prager, the project director for computer operations and support at the agency.

"The CMOS 900 class would be very interesting. I'm sure we'll be talking with Unisys when the time is appropriate," Prager said.

Most analysts said IBM and other competitors are still at least 12 months away from delivering comparable systems. "Unisys is farther along the price curve where they need to be than some of the other proprietary companies," noted Jim Johnson, chairman of The Standish Group, a South Yarmouth, Mass.-based transaction processing research firm.

Furthermore, IBM is expected to have a more difficult time wrestling with the technical challenges involved in enabling its MVS and other systems software to operate on a CMOS architecture, according to Wayne Kernochan, director of commercial systems research at Aberdeen Group, a Boston-based market research firm.

"It's going to require an awful lot of work to verify that [MVS] moves over to a CMOS architecture. That's a major, major task," Kernochan said.



Data center operations

Data managers ready for client/server

AFCOM

By Johanna Ambrosio
LAS VEGAS

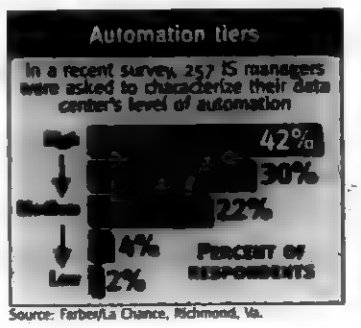
Many of the data center managers at last week's Association for Computer Operations Managers (Afcom) meeting in this winner-take-all kind of town had one thing on their minds: what they stand to lose if they do not learn how to play in the client/server world, and quickly.

The semiannual meeting of Afcom, traditionally attended by the people who handle the care and feeding of the glasshouse mainframe, featured speakers who are increasingly taking on responsibility for Unix-based and other kinds of servers. They urged operations managers to seize the chance to expand the data center's charter by going to their end-user organizations and asking what they might do for users.

"The Statue-of-Liberty kind of manager, who says 'Bring me any computer to take care of,' will have a job in a year. Those who are convinced that the only 'real' computers are big iron will not," said H. William R. Townsend, manager of computing services operations at Air Products and Chemicals, Inc.

Townsend's group, based in the company's main data center in Allentown, Pa., handles backup, disaster recovery, planning and other services for some 60 LAN servers, about half of which are physically located in the data center.

"Client/server is the No. 1 topic on members' minds," said Len Eckhaus, Afcom president. "It's really up in the air about who's responsible for servers, and we'll see a lot of experimentation as companies try to see what works for them."



Source: Farber/La Chance, Richmond, Va.

In many cases, end-user groups are approaching the data center staff because they are weary of administering the LAN in their department, or it has become too large and complex for them to do so. But data center staffs, in turn, have to go through a mighty learning curve in regard to Unix, PCs and the need to straighten out some issues such as what happens when the server goes down and who is responsible for what.

At the same time, data center staffs are still struggling with a more traditional job: automating procedures such as troubleshooting or bringing the host machine back after a crash. Even though most companies with mainframes have started this process, many have hit roadblocks because they are forced to adopt a piecemeal approach. Either they lack the people or management buy-in to implement the tools correctly or they lack the money to buy software or expertise.

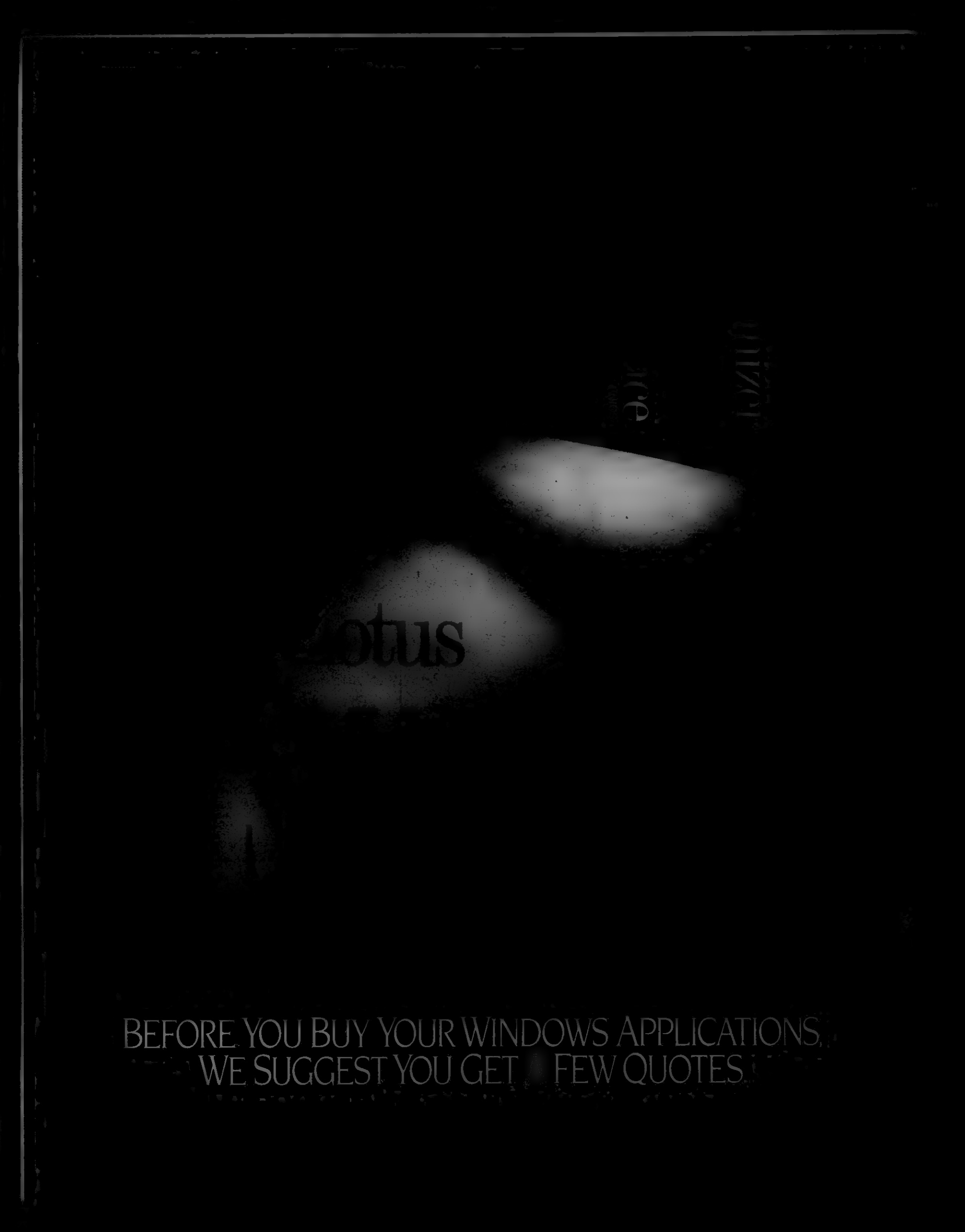
A typical example is a Northeast insurance company, whose operations manager said, "We've done a lot of automation projects, but we have five separate sets of people working on this problem [separately]. We're so big, we have no idea where it belongs." He said he is trying to get management to stop buying products and commit three or four people to a team so they can straighten it all out.

Time to refocus

That is exactly the tack taken by Westpac Banking Corp. in Sydney, Australia. A couple of years ago, the bank — one of the country's largest — revamped its whole approach to data center automation. "We needed to reassess what we were doing," said Stephen Moller, manager of operations automation. "We had a lot of products, which we had modified beyond belief — to the point where the vendors would no longer support us. We lost sight of where we were going."

Where before it had focused on product development, the bank instead started looking at its processes to see where things were breaking down. In addition to switching over to more off-the-shelf solutions, the company implemented a cross-functional team approach to automation throughout the bank.

The results have been good so far, Moller said, and include better communications among the data center staff, a two-hour increase in the batch window each day and 800 hours of manual work eliminated per week.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Thousands of DOS users who wouldn't move to Windows™ for Microsoft® Excel are jumping for Lotus® 1-2-3® Release 4. As are many who already use Windows.

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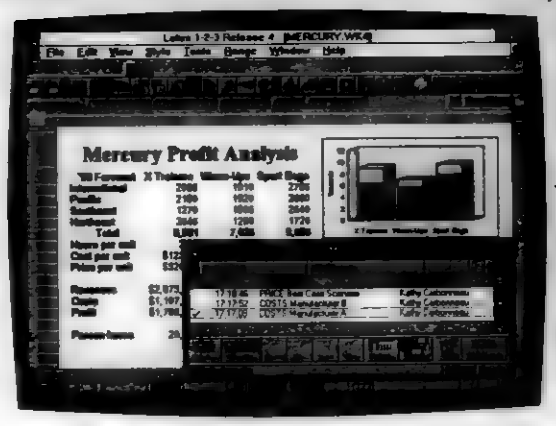
The new 1-2-3 is the first spreadsheet designed to help people work the way they want to work. Which is often together.

A raft of powerful new usability features makes 1-2-3 easy to learn and a pleasure to use. These include a context-sensitive user interface. A Live Status Bar. In-Cell™ Editing. One-step charting. A completely new graphical



interface for database queries. And Worksheet Tabs for 3D spreadsheets that make labeling and manipulating the work much easier.

The close integration of 1-2-3 with other Lotus Windows desktop applications lets you easily transfer 1-2-3 information, formats and processes to other applications where you need them. But it's the Version Manager, and other Working Together® features, that turn the 1-2-3 spreadsheet into a potent workgroup tool by letting people share and track information in new ways.

See for yourself. Visit your Lotus Authorized Reseller or call **1-800-TRADEUP, ext. 9079*** to upgrade for just $119 direct from Lotus. Or ask for a free demo disk. But first, turn the page and let's talk word processors.

Lotus
Working Together®

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Windows Spreadsheet Ratings

"1-2-3 Release 4 ..... **7.8**"
"Excel Release 4.0 ..... **6.9**"
"Quattro Pro Release 1.0 ..... **6.5**"
InfoWorld 10/92, 8/93

"The SmartIcons in 1-2-3 for Windows are smarter and Lotus's approach to swapping different tool-bars in and out beats Excel's and Quattro Pro's."
PC/Computing 6/93

"1-2-3 LEAPFROGS EXCEL AND QUATTRO"

"Lotus's version manager blows away similar features in Excel and Quattro Pro."
Walter S. Mossberg
Wall Street Journal 7/29/93

–PC World 6/93

"Users who often collaborate on developing and refining worksheet data...will find Release 4 indispensable."
PC Week 5/3/93

"1-2-3 for Windows has always had more powerful database features than Excel or Quattro Pro and now these features are also easier to use."
BYTE 6/93

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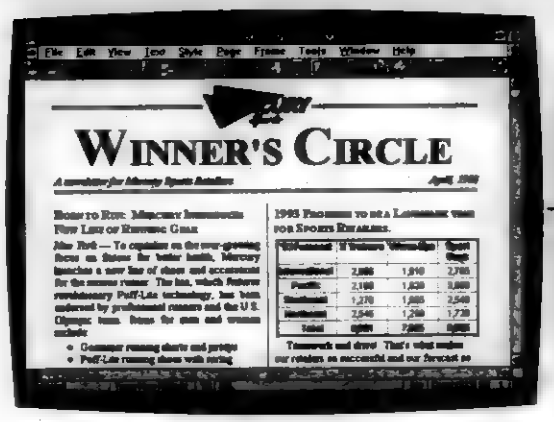
Software reviewers and industry experts have convincingly and consistently chosen Lotus® Ami Pro® as the best word processor over both Microsoft® Word and WordPerfect® for Windows.™

Again, in the August, 1993 *PC/Computing Face-Off*, Ami Pro soundly beat Word, and swept both DOS and Windows versions of WordPerfect in 8 out of 8 categories.

If you're in the least nervous about leaving WordPerfect, or think Word is the easiest way to face Windows, Ami Pro will feel like a breath of fresh air. Because no one comes close to Ami Pro for making even the most complex documents fast and easy. Using customizable, editable SmartIcons®



that give you one-click access to most tasks, and a SwitchKit that takes any trauma out of leaving WordPerfect, you'll understand why new Ami Pro users rarely bother to open the manual.

Then consider the advantages of Ami Pro's tight integration with 1-2-3® and the other Lotus applications. With Ami Pro, you can not only exchange data, charts and functions with the other applications in a click, you can easily create hot links between applications.

Enough words. Visit your Lotus Authorized Reseller or call **1-800-TRADEUP, ext. 9079*** to order. Or ask for your free, full featured working model. Meanwhile, how happy are you with your presentation graphics software?

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"AMI PRO 3.0 TAKES THE LEAD OVER MICROSOFT WORD AS THE WINDOWS WORD PROCESSOR TO BEAT"

"Ami Pro 3.0 comes close to being perfect...It stands above Word and WordPerfect in both its function and in its speed."
Home Office Computing 1/93

"You can learn to use Ami Pro, the Lotus word processing program for Windows, in about a day. Put the manual in a drawer as a first step."
Forbes 2/1/93

"Usability, features, and performance – Ami Pro is the overall winner."
PC/Computing 8/93

"Users moving to Windows from DOS can fearlessly choose the latest Ami Pro version."
PCWorld 3/93

– *InfoWorld* 9/28/92

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Year after year, Lotus® Freelance Graphics® has dominated both Harvard Graphics® and PowerPoint® in industry awards. This year, Freelance Graphics 2.01 has again set new standards, winning top ratings from InfoWorld, PC/Computing, BYTE and Windows Sources.

Historically, building professional looking presentations, even with the best software, has been time-consuming work. But with Freelance Graphics 2.01, it's so simple and so fast that people are now punching out charts for small presentations and even for hand-outs used at informal meetings.

One click is all it takes to access some of the

most powerful features in Freelance Graphics, like more than 65 SmartMaster™ design sets, 500 symbols and 100 chart styles. And when you're done, you can turn four-color overheads into black and white hand-outs with just one click.

The integration of Freelance Graphics with other Lotus applications is so complete that if you bring your 1-2-3® data into a Freelance presentation, and you later change a number in your 1-2-3 spreadsheet, it will be instantly reflected on the Freelance chart.

For your own live presentation, visit your Lotus Authorized Reseller. Or call **1-800-TRADEUP, ext. 9079*** for a free, full featured working model. By the way, have you ever used a database?

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"Creating a presentation of even (100 slides) is absurdly easy--and much easier in many ways than with competing products..."
PC Week 2/15/93

"Freelance is as close to presentation perfection as you'll find on any shelf."
Windows User 8/93

"FREELANCE SCORED AN AWESOME 98.9 OUT OF A POSSIBLE 100... POWERPOINT 3.0 SCORED 83.6, HARVARD GRAPHICS 2.0 SCORED 80.4"

– *PC / Computing* 9/93

"Lotus Freelance Graphics
★★★★★
Microsoft PowerPoint
★★★"
Software Digest 7/93

"(Freelance Graphics) outclasses the competition in features and ease of use."
InfoWorld 6/21/93

"The users in this study were more productive, more effective, and more satisfied with Freelance Graphics than PowerPoint...PowerPoint users took 64% more time to complete their presentations."
Usability Sciences Corp. 3/93

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Award-winning Lotus® Approach™ defines a whole new database category: the full powered client/server relational database for the general business PC user. No longer do you have to be a programmer, or think like one, to experience the everyday advantages of a relational database.

Now you, yes you, can build and use your own databases as easily as you build and use your own spreadsheets. For sales reporting, invoicing, project management, customer tracking, mailmerge or hundreds of other uses. Now PC users can enjoy easy, one-click, high-performance access to company data stored in all the major formats (including dBASE,® Paradox,® FoxPro,® Oracle® SQL, SQL Server and DB2®) across all popular networks.

If you've never worked with a Windows™ database, or if you bought Paradox or Access™ only to find they were unworkable, Approach will change everything. An independent study found that Approach users are up-to-speed and producing real results in two hours.**

And because Approach is designed to share with other Lotus Windows applications, using Approach databases to mailmerge with Ami Pro,® to share data with 1-2-3® spreadsheets, or to simply report on data is something anyone can do.

What a difference a database makes. Visit your Lotus Authorized Reseller or call **1-800-TRADEUP, ext. 9079.*** Or get the whole suite and save a few hundred bucks.

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"...Approach offers much easier-to-use database-creation tools for individual users, and easier access to big-time databases than either Microsoft Access or Paradox/Windows...Approach is a big, big winner."

PC Week 6/28/93

"APPROACH... IS BOTH PRODUCTIVE AND HIGHLY USABLE. ACCESS WILL BE TOO OVERWHELMING FOR END-USERS..."

– *InfoWorld* 1/17/93

"...Approach 2.0 is one of the few (software) packages...for which it's truly possible to never open the manuals."

Windows Magazine 12/92

"Best Buy Approach is the simplest and most straightforward relational database."

PC World 6/93

"The most usable Windows relational database ever."

PC/Computing 8/93

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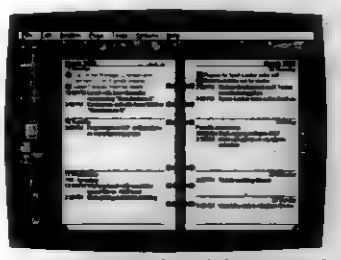
The new Lotus® SmartSuite™ 2.1 is the most complete desktop solution for Windows™ users. It brings together 1-2-3® Release 4, Ami Pro® Release 3.01, Freelance Graphics® Release 2.01, Approach™ 2.1 and Organizer™ 1.1 at an irresistible price (upgrade for just $299***). But it's much more than a deal on an all-star collection of Windows applications.

The applications in SmartSuite 2.1 are closely integrated, sharing a consistent appearance and behavior. This reduces the time it takes for a user to learn each application. For example, the three most used applications in SmartSuite share 26 common SmartIcons® (in Microsoft® Office, they share 3).

Far beyond anything possible with Microsoft Office, Lotus's integration also simplifies the process of switching between applications, sharing information across applications and using functions from one application while working within another.

For example, you can easily edit 1-2-3 charts from within Freelance Graphics. Or use Freelance, or 1-2-3 functions within Ami Pro. All work easily with the Approach database. And all support industry standards, so they'll work with offerings from other vendors as well. This makes working in each application, and the entire Windows platform, easier and more productive than ever before.

SmartSuite is also designed for working in groups in ways Microsoft Office can't. All applications are network ready and mail-enabled with ccMail.™ The results of Working Together® are easily manageable through 1-2-3's Version Manager. And each application features additional enhancements for full integration with Lotus Notes.***



Lotus SmartSuite also includes a personal information manager, the award-winning Lotus Organizer.

Unlike Office users, SmartSuite users can call a single toll-free number for support.

For the whole story, visit your Lotus Authorized Reseller. Until 12/31/93, you can upgrade from any Lotus or competitive product to SmartSuite 2.1 for just $299.*** Or for a SmartSuite demo disk, call **1-800-TRADEUP, ext. 9079.**

Lotus
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"LOTUS SMARTSUITE REDEFINES HOW APPLICATIONS SHOULD WORK TOGETHER."

"Lotus now has a top rated product in each of a half a dozen categories... Moreover, Lotus products have come to share a great deal of genuine integration..."
*Soft*Letter* 5/21/93

"When you buy...SmartSuite, the pieces really work together!...The point: There's more to a suite than cramming four boxes into a suitcase and cutting the price."
PC/Computing 8/93

—*PC Letter* 6/7/93

"The level of integration in the SmartSuite makes complicated, cross-application tasks easier for users and lets them take full advantage of...the Windows environment."
Dataquest 6/15/93

*In Canada, call **1-800-GO-LOTUS**. **Consult your Lotus Representative for more information on how to incorporate Lotus Notes and ccMail into your communication strategy. ***$299 direct from Lotus. Offer expires 12/31/93. Qualifying competitive products are Microsoft Excel, Borland Quattro® Pro (not including SE), Microsoft Word, WordPerfect, Wordstar,® DisplayWrite,® Microsoft PowerPoint, Harvard Graphics, Corel Draw, WordPerfect Presentation, Aldus® Persuasion. Qualifying Lotus products include 1-2-3 (excluding 1-2-3 for Home), Symphony,® Ami Pro, Freelance Graphics, ccMail and Graphwriter.® Lotus Notes, Symphony and Graphwriter are registered trademarks and SmartSuite and Lotus Organizer are trademarks of Lotus Development Corporation. ccMail is a trademark of ccMail, Inc., a wholly owned subsidiary of Lotus Development Corporation. Quattro is a registered trademark of Borland International, Inc. Wordstar is a registered trademark of Wordstar International, Inc. DisplayWrite is a registered trademark of International Business Machines Corp. Aldus is a registered trademark of Aldus Corporation.

Starting over

Apart from Ebenezer Scrooge and a few people in supermarket tabloid articles, none of us gets the chance to preview our own death and return to tell the tale. However, Wang Labs, which hopes to emerge from Chapter 11 bankruptcy protection this week, has done the business equivalent during the last 18 months and is returning as a smaller, wiser and more focused company.

Wang President Joe Tucci winced last week when I used the term "miracle of Chapter 11" during a visit to Wang's Lowell, Mass., headquarters. But bankruptcy really can be a miracle worker, considering that last summer Wang was staring down a black hole. Collapsing under the weight of a half-billion dollars in debt, 10-year leases on unused buildings, a shareholder revolt and mass customer defection, Wang's survival prospects looked dim.

But the Wang that emerges from bankruptcy this week will have a nearly spotless balance sheet, buttressed by $150 million in cash. Its debt/equity ratio is down from 90% to 1%. The company walked away from many of its lease obligations and turned creditors into shareholders. It plans a public offering in the fall, and the Wang family will no longer call the shots.

The reborn Wang sees itself as a software firm targeting the imaging and office work-flow markets. It will continue to support and even enhance its VS series of minicomputers while moving those customers smoothly onto something else until it brings its line of imaging and work-flow software up to speed. And like everyone else in the industry, Wang plans to be a network integration firm.

But whether this self-proclaimed "billion-dollar start-up" can make a go of it as a software company is questionable. Certainly, Wang has the financial wherewithal to move ahead and its products are world-class. But some of the luster has worn off the imaging market in the past year as high expectations were not met. Wang is also counting on service dollars from its installed base for nearly half its revenue next year. With many Wang users running, not walking, away from the VS platform, that figure is sure to decline pretty quickly.

Will office software, which will constitute only about $100 million in Wang sales this year, be there to make up the difference? Maybe, but in an industry in which you can still count the number of billion-dollar software firms on one hand, that's a stretch.

Wang's got a chance to start over, which few computer companies ever do. The important thing during the next six months is to make a splashy return, keep existing customers happy and show some growth. I don't doubt Wang can take care of the first two items on that agenda. I hope its business plan is on the mark to handle the third.

Paul Gillin, *Editor*

Ramsey's ghost: An optical illusion?

You have caused me to write to you about your editorial "Ramsey's ghost" [CW, Aug. 30]. You are doing well in the stirring-up trouble department. To disagree with you is my purpose in this letter.

To compare that action as a simile for the Justice Department action on Microsoft is in poor taste. You tainted Ramsey Clark, the Democratic Party, the Republican Party, the Federal Trade Commission (FTC), the Clinton administration, the Bush administration and others with character assassination.

Since you do not perceive the point of law, I suggest that you interview your lawyer on the topic of antitrust and deceptive trade practice laws. Then I suggest you review past actions by the accused. See if you can find suspect actions that might justify action.

You should not compare past legal actions without stating the root causes. In your article you did cite a base motive as the cause for the IBM investigation. You suggested the same base motive for the Microsoft investigation while expounding on the deadlock at the FTC. Since you did not state the alleged causes for the Microsoft investigation, you unjustly painted Microsoft as a victim.

William L. Hartzell
Garland, Texas

In regard to your Aug. 30 editorial, one question that keeps plaguing me: Why aren't you working for *The National Enquirer*?

The time has come to get your head out of your GOP and take a good look at reality. In the past six months, there has been a rash of articles and editorials written on just what went wrong for IBM. However, the thought that IBM's current problems could ever be attributed to Ramsey Clark and the Democrats is the most ludicrous of all.

You and I seem to recall the '70s differently; I don't remember IBM as being a great and innovative company, just a large and dominating one. What you want to call IBM's "bunker-mentality" was viewed by many as IBM's elitist attitude.

IBM's current problems are a result of its underestimating the intelligence and needs of its consumers. Your inability to recognize this is understandable in light of the fact that you seem to have the same failing.

Michael McFarlin
Newfane, Vt.

Your excellent editorial on Microsoft was very good. However, don't you think that the expression "deja vu all over again" has been overused too many times?

When it was originally used for the first time, it was an amusing phrase which was funny, since it's repetitious in its redundancy. Don't you think that enough is enough is enough?

P.S. This letter was written using a RAID disk array.

Gary McGath
Penacook, N.H.

Your editorial on the forthcoming Microsoft/Justice Department investigation implied that the 11-year IBM/Justice Department suit was a waste of time and effort. Nothing could be further from the truth.

Within six months of the suit, IBM unbundled its software products, except for operating systems. In 1979, the company unbundled its operating systems software.

During the period of the suit, IBM was careful not to preannounce hardware and software products and kept its pricing competitive.

The suit encouraged the EEC suit of the early 1980s, which resulted in IBM agreeing to disclose all hardware and software interfaces at time of first delivery.

Without that suit we might not have a wide choice of operating systems, a competitive hardware and software environment or the ability to have open systems.

Martin A. Goetz
President
Goetz Associates
Teaneck, N.J.

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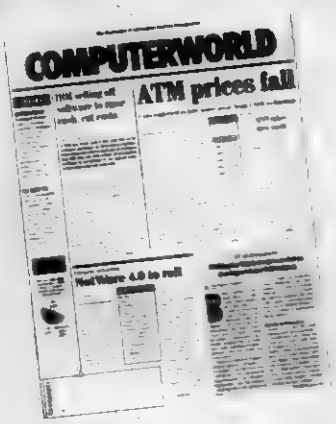

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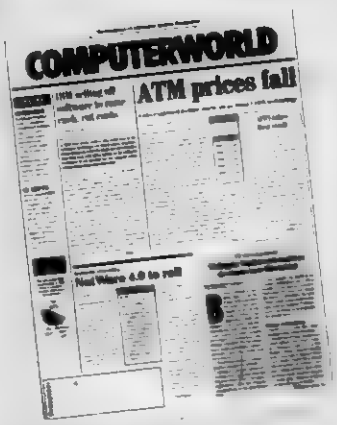

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Tidal wave approaching

Jerrold M. Grochow

You thought we already had a crisis in software maintenance? You ain't seen nothin' yet.

For the past decade, we have been trying to deal with the maintenance of software in a relatively stable, technologically contained environment. By and large, applications used the same technology: They ran as monolithic systems on large machines accessed by text terminals over a single type of network. (Of course, there were many manufacturers, but you typically used only one.)

If you were writing business applications, you wrote them in Cobol. Programmers followed fairly well-understood methods and standards. And the development staff all worked for the same organization — the central IS department.

Now consider the kind of environment taking shape around us today. Application development methods are in turmoil. We are being asked to develop applications that use many different operating systems and user interface protocols and that connect over many types of networks. We are rushing headlong into distributed processing, where some parts of an application run on one computer and some on another (possibly incompatible) computer.

Because we are being told to use the right programming language for each job, we often have multiple languages in simultaneous use.

Tool vendors are popping up everywhere with development environments that promise amazing levels of productivity improvement but that often use proprietary languages. And now application developers are scattered all over the organization as end-user departments seek more direct control over their applications.

Where will all this lead?

If we don't do something soon, it will lead to total chaos in software maintenance over the next five years.

Here's a nightmare to consider: It's 1998. End-user departments have decided that the maintenance of the applications they have been creating is really the responsibility of central IS. So suddenly it's your job to enhance systems that were built using some of those very productive but also very proprietary code generators that were so popular a few years back. Unfortunately the vendors of these tools no longer exist so you can't expect any help from them as you struggle to get the resulting systems to work with new types of user workstation environments, such as Microsoft's follow-up to Windows NT.

I don't believe for a moment that the "new" languages are "self-documenting" or that there will be so few lines of code in each procedure that everyone will be able to figure out what its original developer intended to do. Nor do I believe that object technology will, in and of itself, make systems so modular that making changes will be as simple as switching one object class method for another.

Our only hope is the rapid institutionalization of common architectures and standards across the organization. That isn't something we've been very successful at, but that has to change and change quickly. We really don't have a choice about keeping things in control this time. This time, we have to make it work.

Grochow is chief technology officer and director of the American Management Systems' Center for Advanced Technologies.

The false promise of APIs

FIRE WATCH *by* John Gantz

We are awash in application programming interfaces, consortia to develop them and false hopes about what they will do for us. There are API groups for everything these days, from E-mail, messaging and calendaring to network middleware and wireless communications. Trouble is, consortia-backed APIs don't really help anyone except the participating vendors.

APIs may have the cachet of openness, but they are really instruments to advance proprietary interests. By developing these interfaces jointly or jumping on existing bandwagons, vendors may cut development costs and increase their universe of prospects, but they aren't going to solve user compatibility and portability problems any time soon.

Since the industry now consists of Microsoft and all others, we generally see two competing sets of APIs for just about any computing function you can imagine — Microsoft's and those offered in opposition by a consortium.

The Unix vendors, for instance, began work earlier this year on a common set of APIs that, at least theoretically, will allow applications (with recompile) to run on different Unix platforms. Six of the major Unix vendors led the charge spurred on by visions of Windows NT marching through their developer bases. Now 75 are on board. The group is known as the Common Open Software Environment (COSE) coalition, and already there are 1,170 specific APIs in the COSE spec.

> Committee-developed APIs come with enough options for implementation as to contradict the idea of a standard.

Another good example is Common Object Request Broker Architecture (Corba), a specification developed by the Object Management Group that will compete with Microsoft's Object Linking and Embedding (OLE) technology. There are already two anti-Microsoft camps developing OLE-like APIs based on Corba.

Now, I ask you ... do you really think that all 75 of those Unix vendors will adopt the same subset of those 1,170 APIs in the COSE suite and do it in the same way? Do you honestly believe your programs will be able to run on any Unix operating system with a simple recompile? (And *is* there such a thing as a simple recompile?) And how much would you be willing to bet that those two camps of OLE competitors will offer interoperable APIs? Let's face it: It's tough enough for a single vendor to have its own products adhere to a single set of common APIs.

My beefs with committee-developed or bandwagon APIs are the same as my beefs with other standards. They are usually developed out of a political process with minimal input from users. They are generally completed long after the market has found another solution. They come with enough options for implementation as to contradict the idea of a standard. There is always a hidden cost to convert. And there is no assurance of forward compatibility.

APIs free us from writing programs to specific operating systems or hardware specs but not from writing to thousands of APIs, each with multiple options for implementation. There is only one Windows NT, but there are three different programming APIs for it (Win32, Win32s and Win32c). Writing to the Novell NetWare 286 API didn't mean applications would run on NetWare 386.

As long as vendors compete, consortia-developed APIs will be designed to the lowest common denominator: They'll offer enough commonality to compete with the market leader, but not much more.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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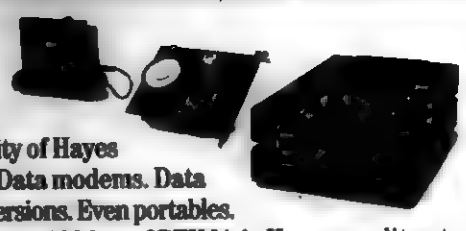

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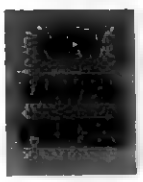

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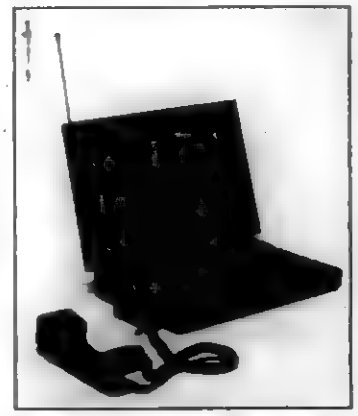
Notebook computers

IBM ThinkPad 750s late but welcomed

By Michael Fitzgerald
NEW YORK

The IBM PC Co.'s new ThinkPad 750 family of notebooks offers a complete redesign. The result is a product that weighs significantly less than most, promises dramatically longer battery life and has features such as multimedia support, extensive communications options and easy upgradability. But the 750 carries the burden of its predecessors, which were well-received but suffered availability problems.

"We've hit a home run with this one," said Bruce Claflin, president of PC Co. Americas, and observers appeared to agree. Claflin compared this rating to his rating the popular ThinkPad 700 as a "double."



New ThinkPad 750 *will provide a cellular communications option*

Still, a promising big hitter offers only potential if it cannot deliver, and PC Co. officials seemed to concede the company may remain in the minor leagues in terms of meeting demand.

"We do not expect to catch up to our demand in the fourth quarter," said Michael Coleman, the PC Co.'s vice president of brand management and marketing. However, he insisted the company would produce more ThinkPads this quarter than last, which may help reduce supply problems.

Also, the Model 750C, a unit outfitted with what IBM describes as a high-quality, passive-matrix color screen, has a late November ship date. IBM said the 750C is a way to siphon demand from its hard-to-get active-matrix color ThinkPads.

Shipping or not, the new 750 line has enough features to make competitors sit up and take notice, analysts said.

"It's hot, and I think it'll force the other vendors to address its features," said Randal Giusto, an analyst at market research firm WorkGroup Technologies, Inc. in Hampton, N.H.

The ThinkPad's sophisticated array of multimedia features includes a built-in 16-bit stereo audio subsystem, which has a speaker and I/O jacks. Also, Mwave, an analog-to-digital converter chip from IBM and Texas Instruments, Inc., resides on the motherboard. These features will allow users to run television images online or do full-motion video.

Needed extras

While analysts such as Jeffrey Henning at BIS Strategic Decisions in Norwell, Mass., said these features would appeal "to a distinct minority of notebook users," at the same time it could not hurt the PC Co. to add the extra technology since it has kept pricing aggressive.

And users whose sales forces give many presentations said the multimedia capabilities are attractive.

"Under the right circumstances, [multimedia] is something we'd like to do," said Ron Edwards, director of sales operations at Nike, Inc. in Beaverton, Ore. Edwards stressed he has not seen the new ThinkPads but would like to give Nike sales representatives the ability to put 30- to 60-sec. full-motion videoclips into sales presentations through Microsoft Corp.'s PowerPoint or Asymetrix Corp.'s Compel application.

Victor Mutnick, vice president of corporate information systems at New York Life Insurance Co., said the ThinkPad's multimedia capabilities mean that the big insurer will start looking into developing multimedia applications.

"We do find [multimedia] interesting, but it's probably a year or two ahead of us, and we don't see investing in hardware now when you know there'll be something better then, probably from IBM," Mutnick said.

The ThinkPad's design also appears to give it a step up on the competition. The keyboard flips up to allow users to easily upgrade the hard disk and change the battery. It also lets users remove the floppy drive, either to lower the traveling weight or to add in some optional modules such as a wireless modem or, in the first quarter of next year, a cellular digital packet data wireless modem or TV Tuner module.

Users doubtful

Some users questioned whether the PC Co. was actually serious about upgradability, given the entirely new form factor and design of the ThinkPad 750.

"I'm a little annoyed on the 750 because it is a completely different form factor, which I think means they've forgotten about upgradability," Mutnick said.

PC Co. officials said that while hard drives from older models will not fit into the newer ones, the company will at the same time build versions of the 340M-byte hard drive for its 700 and 720 products and will also build versions of the wireless modems and other module add-ons for its older products.

Your choice

The 5.5-pound ThinkPad Model 750 costs $3,199 with a 170M-byte hard drive and $3,749 with a 340M-byte hard drive. The 6.2-pound Model 750CS costs $3,899 and $4,449, respectively, for the same configurations. The 6.4-pound Model 750C costs $4,699 and $5,249, while the pen and keyboard Model 750P costs $3,799 and $4,299.

Lower-cost Digital Alpha AXP awaits vendor support

By Craig Stedman
MAYNARD, MASS.

Following the recent introduction of a lower-cost Alpha AXP microprocessor, Digital Equipment Corp. said it hopes in the next six to nine months to start enticing any major PC vendors besides itself and business partner Ing. C. Olivetti & Co. to commit to building Alpha-based systems.

Kevin Fielding, senior product marketing manager for the DECchip product line, noted that Digital is talking most seriously at this point with second- and third-tier vendors. These companies "are in danger of going out of business" because they face fierce competition in the market for X86-based PCs and need to find alternate revenue sources, he said.

Fielding would not comment specifically on any negotiations but cited Northgate Computer Systems, Inc. and Everex Systems, Inc. as examples of the type of vendor that Digital might be able to snag in the short term. The cream of the PC crop — companies such as IBM, Compaq Computer Corp. and Dell Computer Corp. — are maintaining a wait-and-see attitude toward Alpha, he added.

Digital needs support from other vendors to help ship the 4 million to 5 million chips it said are needed per year to fund its Alpha investments, analysts said. A lot, therefore, is riding on the new DECchip 21066, which is targeted at PCs that run Microsoft Corp.'s Windows NT and cost as low as $2,500 (CW, Sept. 6).

"It's very critical for them to get this chip out and have it be successful," said Linley Gwennap, senior editor of the "Microprocessor Report," a newsletter in Sebastopol, Calif. Digital needs increased volume to attract not only other hardware makers but also software vendors, he added.

Thus far, Digital has signed up several small PC vendors in addition to its own PC unit and Olivetti, in which Digital is a minority investor. Included is Carrera Computers, Inc., a Laguna Hills, Calif., vendor that recently started shipping a deskside PC based on the original DECchip 21064 device.

Guiding hand

A potential drawback to getting more companies to join the fold is that lower-tier suppliers pressed by the PC price wars "don't have a lot of design resources" available for an Alpha project, Fielding noted. As a result, Digital will sell Alpha-based motherboards or provide sample board designs as a "development guideline," he said.

The 21066, which runs at clock speeds up to 166 MHz and uses 21 watts of power, is scheduled to go into volume production in the first quarter of 1994. Due out late next year, meanwhile, is a 21066 derivative that will be targeted for use in portable machines running Windows NT, Fielding said.

That device should require less than 2½ watts of power on a continuous basis, according to Fielding. He said, though, that Digital does not expect much of an NT portable market to develop for at least the next few years.

Larry Stiefvater, research principal at the Kraft General Foods Research Technology Center in Glenview, Ill., said Kraft's technology demonstration workers, who travel regularly, might benefit from an Alpha-based portable. But most users do not need that much power, he added.

Double or nothing

Digital also plans to release a faster version of its flagship DECchip 21064 microprocessor before the end of the year. Kevin Fielding, a manager for the DECchip devices, said clock speed should be 50% faster than the first version of the 21064, which would put it up in the 300-MHz range. Performance is supposed to get an even bigger boost: The size of the dual memory caches on the 21064 will double to 16K bytes each, Fielding added.

Software suite wars

Lotus takes offensive against Microsoft

By Michael Vizard

After virtually ceding the PC software suite market to its archrival for the past two years, Lotus Development Corp. is putting the finishing touches on a makeover of its SmartSuite offering. The changes are intended to give Lotus enough muscle to compete for the first time with Microsoft Corp., which owned an estimated 77% of the suite market last year.

The latest Lotus move consists of adding a version of the Approach database, which Lotus acquired earlier this year, to SmartSuite. At the same time, Lotus is dropping the CC:Mail client software from the suite, which essentially allows the company to add Approach without raising the price, and enhancing the integration of its 1-2-3 spreadsheet.

The arrival of this version of SmartSuite will give Lotus an offering that for the first time does not imitate Microsoft Office. A $795 SmartSuite package will consist of Approach, Ami Pro, 1-2-3 Release 4.0, Freelance Graphics and the Organizer personal information manager.

In contrast, a $750 Microsoft Office package includes the Excel spreadsheet, Word word processor, PowerPoint presentation graphics and a client license for Microsoft Mail. Microsoft also has a $950 version of Office that includes the Access relational database.

Until the arrival of 1-2-3 Release 4.0 earlier this year, Lotus' ability to compete in the suite market had been hamstrung by a poor Windows implementation of its flagship software package. Last week, Lotus moved to supplement 1-2-3 with an upgrade that adds support for Lotus' Application Exchange Field facility, which is an implementation of Version 1.0 of Microsoft's Object Linking and Embedding (OLE) interface for Windows.

Complementing this move is the addition of Approach, which has been updated to support the SmartIcons included in all Lotus applications. The database strategies, alongwith their respective electronic-mail efforts, differentiate the two companies' suite offerings.

Lotus' Approach was designed to be an easy-to-learn database without a programming language for end users who, Lotus said, typically do not need to develop applications.

Microsoft countered that Access, which includes Visual Basic as its programming language, provides an end-user tool that can scale upward as needs increase. "The trick is to provide an easy-to-use database that can scale upward," said Hank Vigil, Microsoft director of marketing for applications.

For example, Advanced Communications Technology Corp. in Minneapolis opted to replace Approach with Access three months into a development project, said John Cavanaugh, a senior vice president at the telecommunications consulting company.

Cavanaugh said his firm found that the query facilities in Approach were too limited for its needs.

He also said that while Approach is definitely easier to use than Access, the Microsoft database has more to offer. In addition, Microsoft is expected to deliver an easier-to-use Version 2.0 of Access later this year.

On the E-mail front, Lotus said its research has found that the people who purchase E-mail are not the ones who purchase PC applications.

But Vigil said E-mail will be an important part of Microsoft's still unfolding groupware strategy, which justifies continuing to put Microsoft Mail client software in the suite.

For Lotus to compete in the suite arena against Microsoft, which has sold more than 2 million suite licenses worldwide to date, it will have to focus heavily on getting 1-2-3 for DOS customers to adopt the entire Lotus suite.

For example, Holland America Line-Westours, Inc. in Seattle is looking at moving from 1-2-3 for DOS and Professional Write from Software Publishing Corp. to SmartSuite.

Scott Brady, data resource manager, said the potential move to SmartSuite is being driven by economics and the firm's reliance on 1-2-3. He said Lotus has a more flexible licensing structure that supports concurrent users.

What a feeling

In general, industry analysts credit Lotus with having an edge over Microsoft in terms of providing a well-integrated suite offering because all Lotus applications support OLE 1.0 and share a common code basis that allows them to have the same look and feel.

"With SmartSuite 2.0, it just feels right," said A. J. Dennis, an industry analyst at International Data Corp. in Framingham, Mass.

The challenge for Lotus will be whether it can leverage that advantage as corporate shops move from DOS to Windows before Microsoft delivers Microsoft Office 4.01 this fall. That version will add OLE 2.0, a common macro language and intelligent agents to the suite.

In fact, Lotus has been moving too slowly for some customers. K. C. Madden, a business decision-support consultant at Kraft General Foods, a subsidiary of Phillip-Morris Corp. in Hawthorne, N.Y., reported that his division is eschewing 1-2-3 in favor of Microsoft Office.

"We made the decision before 1-2-3 Release 4.0 came out. We're going to stick by our decision because the vendors keep leapfrogging each other. Microsoft has a new generation of applications. We may look at it again in two years," Madden said.

Suite-talking

Users expressed concerns about quality degradation and compatibility with other software when shopping for packaged productivity tools

Top-rated considerations

	Concerns		Purchase influencers
1	Perceived loss of "best of breed" products	1	Compatibility with existing software
2	Ending up with unneeded products	2	Cost
3	Loss of flexibility/ limited to one vendor	3	Features
4	Hardware choice	4	Maintenance and support policies

Source: International Data Corp. Framingham, Mass.

Playing its trump card

One of the cards Lotus has yet to fully play is the integration of its applications with its Notes groupware environment.

With the last release of SmartSuite, all Lotus applications can use a common implementation of Version 1.0 of Microsoft's OLE facility to communicate with Notes. But Lotus has not yet moved to bundle Notes into a suite offering, which would simplify the purchase process and provide a price break to sites that standardize on Lotus applications and Notes.

A. J. Dennis, an industry analyst at International Data Corp., suggested that Lotus bundle Notes client software with SmartSuite and then raise the price of the Notes server edition to make up for lost revenue. By doing so, Lotus would introduce customers to Notes on a wide-scale basis while providing a suite offering that rivals could not duplicate, Dennis said.

"Lotus has the potential to use SmartSuite to hook users into Notes," said Krystyna Filistowicz, an industry analyst at Dataquest, Inc. in San Jose, Calif.

Lotus has indicated that it intends to offer a SmartSuite edition that includes Notes but has given no time frame for that move.

Will Reynolds, Lotus development manager for SmartSuite, said Lotus maintains an edge over rival applications in a Notes environment because it builds applications with Notes integration in mind. Lotus is also expected to further leverage Notes by delivering a document management system for Notes later this year.

—Michael Vizard

Banding together

While Microsoft and Lotus have been playing up the integration benefits of low-cost application suites, industry rivals that do not possess the same breadth of software have been banding together to deal with users' growing interest in suites.

A case in point is Borland International, Inc.'s move to market Borland Office, which combines Borland's Quattro Pro spreadsheet, its Paradox database and WordPerfect Corp.'s WordPerfect word processor into a single offering.

But for Borland and WordPerfect to be successful, users said they will have to prove their software offers substantial benefits over the individual components that Microsoft and Lotus have included in their suites.

For example, WordPerfect is about to ship Version 6.0 of its namesake word processor for Windows. WordPerfect users said they are confident the company's plans to support Version 2.0 of Microsoft's OLE will provide sufficient integration capabilities.

"We've looked at WordPerfect's integration plans. I think the suite integration issue is a lot of marketing," said Harris Televitz, director of technology at Skadden, Arps, Slate, Meagher & Flom in New York.

"For us, suites will be provided by two vendors [Borland and WordPerfect] under one umbrella," added Rock Bianco, vice president of information systems at Garber Travel Services in Boston.

Enticing WordPerfect users to its SmartSuite offering may prove challenging for Lotus. Thus far, its Ami Pro software has only a 10% market share, and WordPerfect has just shipped a new release. Microsoft, meanwhile, has the top-selling word processor for Windows.

However, Lotus should be able to gain market share against WordPerfect by leveraging suite sales, said Krystyna Filistowicz, an industry analyst at Dataquest, Inc.

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Cyrix competes with Intel in 486DX class

By Michael Fitzgerald
RICHARDSON, TEXAS

Intel Corp. today is expected to gain companionship in the market for its high-margin 1486DX2 clock doubler, which could result in lower prices. Cyrix Corp. is scheduled to release three 486DX-class processors, including one that competes with Intel's 25/50-MHz DX2.

In other news, Cyrix landed its biggest customer to date, with the announcement by Zenith Data Systems Corp. of three new notebooks based on Cyrix's 33-MHz 486SLC part. The Z-Star 433VL family, which is priced starting at $1,399 for monochrome and $2,399 for passive-matrix color, is aimed at the low end of the market. Cyrix officials said Hewlett-Packard Co. will use the SLC part in its OmniBook subnotebook, although HP would not comment on that claim or Intel's own claim that HP will use its SLC.

Cyrix officials said they do not expect to put more than 100,000 486DX units on the market this year, so it will not outship Advanced Micro Devices, Inc. in the 486 market, or approach Intel's multiple 7-figure unit volume. However, analysts said the Cyrix chip could still impact Intel's DX2 pricing. "The large majority of Intel's profits come from the DX2, so if somebody nips at its costs, Intel will probably have to drop prices," said Kimball Brown, an analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif.

An official at one systems vendor, who asked not be identified, said, "Anything that lets us go to Intel and plead competition can only help us."

Cyrix has added an 8K-byte cache to its DX2 and tweaked the instruction set so it will run certain instructions more quickly than Intel's chips, though Cyrix officials said they were unsure of the performance gains users might achieve.

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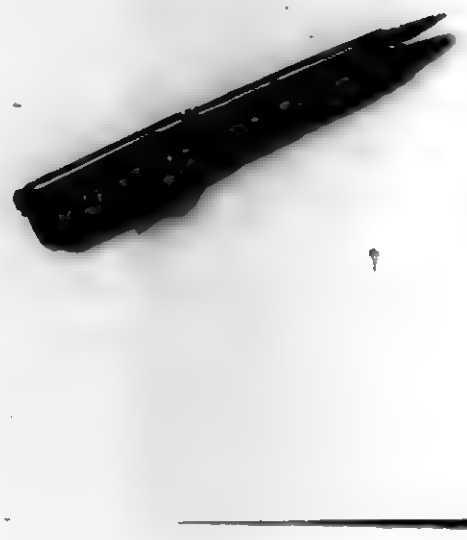

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Utilities shakeout gains momentum

By James Daly
CUPERTINO, CALIF.

Symantec Corp.'s purchase of Fifth Generation Systems, Inc. begins the consolidation of the competitive utilities field, which was sparked last March when Microsoft Corp. introduced the refreshed DOS 6.0 operating system featuring a passel of new utilities.

Symantec officials said they will acquire the Baton Rouge, La., utilities software maker in a stock swap worth about $44 million. The move is subject to government and shareholder approval and is slated to be completed within 30 days.

The companies said the acquisition will give them the chance to focus on the distributed computing market. "The stand-alone utilities market is not a growth market anymore," said Ellen Taylor, general manager at Symantec's Peter Norton Computing Group. "The real opportunities lie on the networks."

That realization was sharpened after the introduction of DOS 6.0. Many in the field said they felt that Microsoft's inclusion of utilities such as compression into DOS 6.0 could force producers of other utility products out of the market.

Fifth Generation President Barry L. Bellue said this spring that the DOS 6.0 utility additions caused a 35% drop in sales of utility applications among all manufacturers in a recent quarter.

In addition, Stac Electronics, Inc. already faces tough financial straits and has laid off nearly 20% of its work force.

Nine-year-old Fifth Generation develops utilities for DOS, Windows, OS/2, Unix, Macintosh and Novell, Inc. NetWare operating platforms. Its products include the FastBack backup utility and the Untouchable antivirus software.

Taylor would not comment on specifics. Bellue, however, will stay on report to Symantec President Gordon E. Eubanks Jr. while Fifth Generation is absorbed into the Peter Norton Computing Group.

Taylor noted that the two companies will focus much of their energy on delivering network-based utilities.

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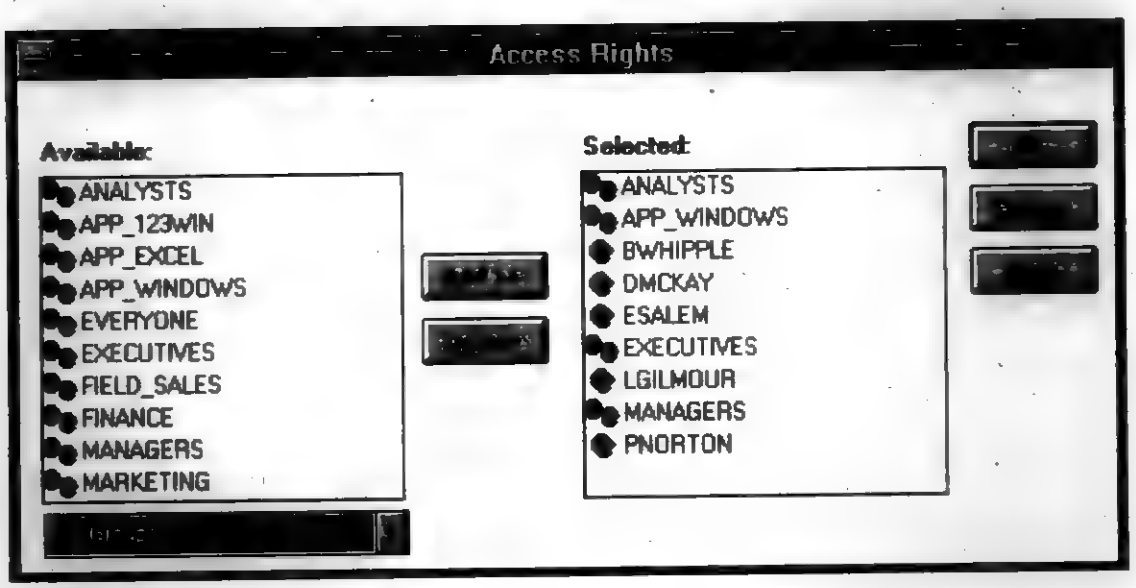

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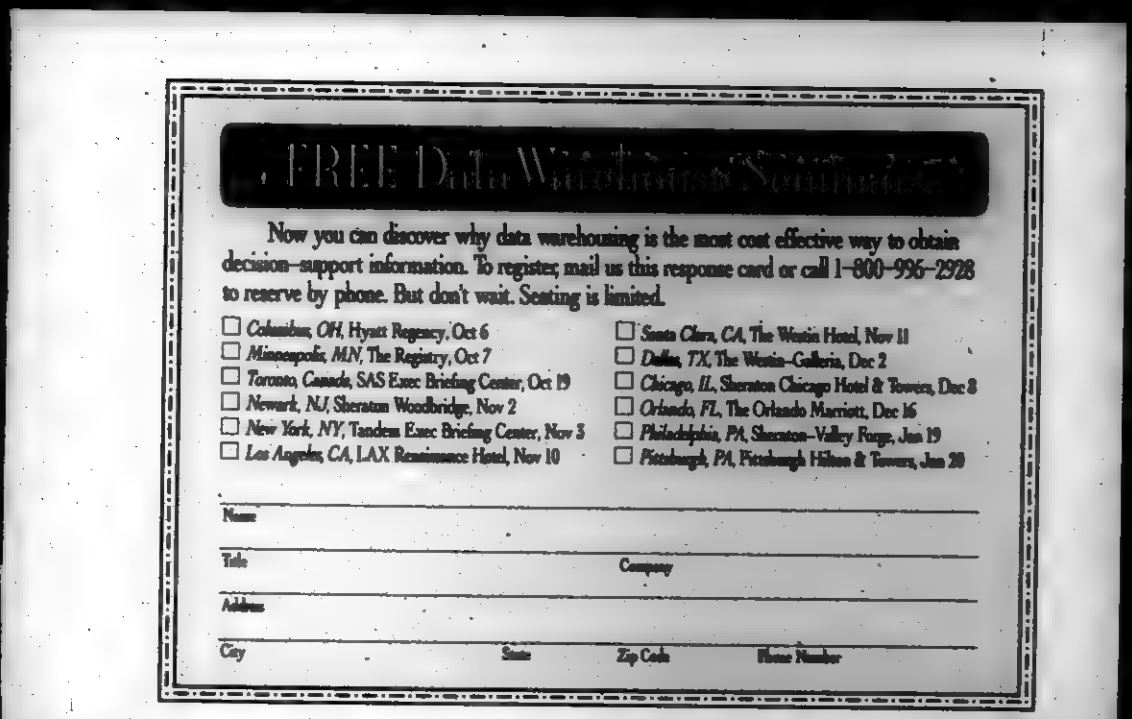
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Frame lures word processing users

By Michael Vizard
SAN JOSE, CALIF.

Looking to shore up its ongoing campaign to entice word processing users to move over to an integrated desktop publishing package, Frame Technology Corp. last week released Version 4.0 of its FrameMaker software.

For the past two years, Frame Technology has been positioning FrameMaker, which bundles a word processor with a desktop publishing software package, as an offering that already provides the desktop publishing features suppliers of word processing packages have been gradually adding to their wares.

In the new release, the company said, it has enhanced FrameMaker with 100 new or updated features, including an improved automated page layout facility and more easily defined hypertext links.

Also included is a facility that provides a detailed comparison of two versions of a document and an application programming interface that allows customers to link custom applications with FrameMaker.

"FrameMaker gives us the ease of use of a word processor and the technical strengths of a document publishing package," said Francois Belanger, director of electronic publishing at GDC et Associs in Montreal, which translates textbooks from English into French.

In contrast, he said word processing packages are not robust enough to handle large documents, while high-end document publishing packages take up too much space on desktop systems.

According to Belanger, the most significant features in FrameMaker are an underlying programming language that allows him to save file descriptions, the ability to change portions of a document and then have that document automatically reformatted and an indexing and table of contents facility that is automatically linked to specific areas of text.

FrameMaker runs on Windows, Macintosh and Unix platforms. Pricing starts at $895.

Briefs

A Watermark decision

Document imaging vendor Watermark Software, Inc. has entered into a distribution agreement with Law Cypress, which will immediately begin selling Watermark's Discovery Edition product. The Discovery Edition is a Windows-based application that embeds document image objects into any Object Linking and Embedding-compliant Windows application. The two firms also plan to educate and train value-added resellers about Watermark's product line and develop bundled programs.

CDS to sell Acer prods

Control Data Systems, Inc. has signed a one-year agreement to sell Acer America Corp.'s PCs and network servers as part of its systems integration business.

Battery charge

AER Energy Resources, Inc. last week licensed Westinghouse Electric Corp.'s cathode technology, which AER Energy hopes to use to build longer-running rechargeable batteries for portable notebook and pen computers.

Jeppesen goes electronic

Jeppesen Sanderson, a subsidiary of The Times Mirror Co. that publishes navigation charts for the airline industry, has adopted the DynaText electronic delivery system from Electronic Book Technologies, Inc.

SHORT TAKES NCR Corp. said it would sell its PCs through direct mail.... Corel Corp. has launched its fifth annual $1 million CorelDraw World Design Contest

Client servers, giant servers and mainframes alike will all accommodate a data warehouse, given the right software. That's where Bill Inmon comes in.

Bill created PRISM Warehouse Manager,™ a data warehouse automation tool that's proving indispensable to high-level decision makers. Now he's taken Warehouse Manager one step further, making it fully compatible with IBM, HP, DEC, NCR and most other servers running Oracle, Sybase, DB2 and RedBrick databases.

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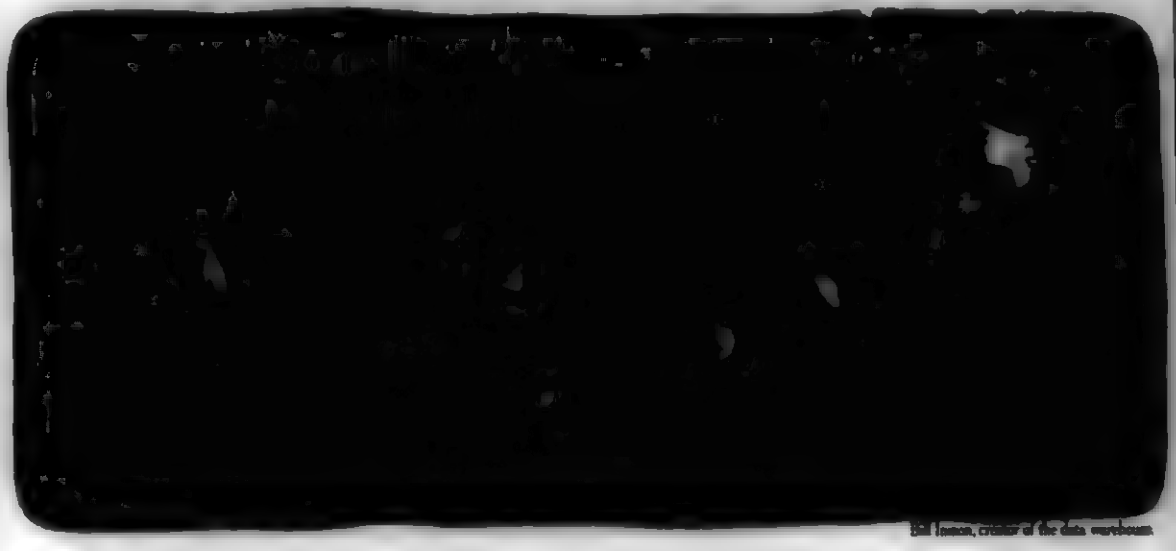
And only PRISM offers 20 Inmon Generic Data Models™—named after Bill, of course—for specific corporate functions and industries. These templates determine how information



Bill Inmon, creator of the data warehouse

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Carole Patton

Killer apps a rare breed

The PC world is bulging with Windows apps that aspire to be "killers," but only a handful are destined for greatness.

One of those few that seem marked for success is Replica from Farallon Computing, Inc. in Alameda, Calif. Replica creates a TrueType document, including all fonts. The idea here is solid. You create one file (an RPL file) and send it. Then, whether the recipient has a Macintosh or a PC, he can open this file with a reader, view it and print it. It's a universal format that circumvents one of today's biggest problems: distribution.

Replica costs $79. The reader software is provided free to any and all recipients requiring it, which gives the product a big leg up on Adobe's Acrobat, which charges $50 for its Viewer software ($19 for volume orders).

Another of Replica's appealing features is that there's no learning curve. If you can print from Windows, you already know how to use Replica. Like the current crop of fax software, Farallon has set up Replica's interface to look like another printer driver. In fact, you create a Replica document without even starting the program. You use it from your word processor by going to the printer setup.

The only "gotcha" is that Farallon decided to use its own printer technology rather than Windows drivers. As a result, the print quality isn't quite as good and documents can change depending on the fonts chosen.

Another promising new product is E-Mail Connection from Connect Software, a division of the Redmond, Wash.-based contract programming firm Adonis, which was started by a group of ex-Microsoft programmers. They wrote this product because they were frustrated with the technical mumbo jumbo users needed to access E-mail services.

E-Mail Connection has a very simple setup. Users walk through, telling the program where they live (it knows what CompuServe access phone numbers are needed) and the speed of their modem (it sets the baud rate). However, if you think E-Mail Connection is a communications program, you're wrong. Actually, this is a smart front end for something every Windows user already has on his desktop: Windows Terminal.

E-Mail Connection has a built-in database for storing messages and folders you can name. Best of all, the rules for routing information are built-in. This means you can send an Internet message from a service such as CompuServe without having to remember a long, esoteric address. No other communications program does that.

A couple of cautions: This product is not a front end for CompuServe like TapCis is, and it doesn't handle message threads. Also, there is no way to import address lists. But for $99 (street price), this program is a breakthrough.

Finally, there is one product that raises the question of whether star quality is enough. Ecco, a personal information manager (PIM) from Arabesque Software, Inc. in Bellevue, Wash., is an excellent package that may have missed its big moment. What Arabesque did with Ecco is clever. It combined two ways of looking at information — a spreadsheet view and a database view — and created a PIM that also includes an outliner. The product is still selling for the introductory price of $99.

The only problem is that corporate purchasers tend to be heavily networked, and network vendors are building PIMs right into their E-mail. Lotus' CC:Mail just added The Organizer, a very nice PIM. WordPerfect Office already has a great little to-do list and a calendar built-in and seamlessly integrated. And Microsoft has Scheduler, which could be interesting with a little work.

My guess is that stand-alone PIMs will sell to the corporate market only if they include special-interest extras such as time and billing or contact management.

Patton is president of the Mendham Technology Group in Mendham, N.J., which produces Client/Server Summits for corporate strategists. Her MCI Mail address is 401-4869.

CHOOSING THE WORLD'S BIGGEST DATABASE COMPANY MAY SEEM SAFE.

Symantec Corp. has introduced Version 4.0 of its Q&A for Windows database software.

According to the Cupertino, Calif., company, the product features a fully integrated word processor, a familiar spreadsheet view and a built-in personal assistant called "Do Anything Very Easily."

Q&A for Windows allows users to create graphical forms of their data and is fully interoperable with Q&A for DOS.

An IBM PC or a 100%-compatible PC running Windows 3.1 or higher in enhanced mode is required.

Q&A for Windows costs $249.95.

▶ *Symantec*
(408) 253-9600

Claris Corp. has announced FileMaker Pro 2.1 for Windows and Macintosh, an end-user, cross-platform database.

Expanded peer-to-peer networking support and productivity enhancements have been included in the offering.

FileMaker Pro 2.1 supports the standard NetBIOS application programming interface and is compatible with Novell, Inc.'s NetWare, Microsoft Corp.'s Windows for Workgroups and LAN Manager, Banyan System, Inc.'s Vines and Artisoft, Inc.'s LANtastic networks.

According to the Santa Clara, Calif.-based company, support is provided for Novell's MacIPX, a tool that offers streamlined peer-to-peer integration between FileMaker Pro 2.1 Windows and Macintosh users without needing any special configuration of server-based data files and applications.

FileMaker Pro 2.1 for Windows costs $129 through January 1994. FileMaker Pro 2.1 for Macintosh costs $399.

▶ *Claris*
(408) 987-7000

Pacific Crest Technologies, Inc. has introduced CardGrabber, a business card scanner system designed for Windows-based PCs.

The product unites a compact scanner with an address book for Windows software that organizes, files, stores, retrieves and prints business card images and data.

By using optical character recognition, images from a business card are converted into computer text and stored.

According to the Newport Beach, Calif., company, built-in artificial intelligence software searches for data such as company name, address and telephone and fax numbers and automatically puts the information into the corresponding database field.

CardGrabber costs $395.

▶ *Pacific Crest Technologies*
(714) 261-6444

Kensington Microware Ltd. has introduced Expert Mouse 4.0, a programmable trackball for IBM PCs, PS/2s and compatible computers.

According to the San Mateo, Calif., firm, the product features advances in software that include slow cursor technology, programmable mouse commands, custom acceleration and application sets.

Expert Mouse 4.0 is available in a serial version for $149.95 and a bus version (includes serial card) for $179.95.

▶ *Kensington Microware*
(415) 572-2700

Product shorts

Cardinal Technologies, Inc. has introduced the Cardinal Sensory System I and the Cardinal Sensory System II multimedia kits. The products feature Cardinal's Digital Sound Pro 16 Soundcards, double-speed CD-ROM drives for faster data access and Windows/DOS multimedia presentation software. Cost: System I is $599; System II is $699. Cardinal Technologies, Lancaster, Pa. (717) 293-3000.

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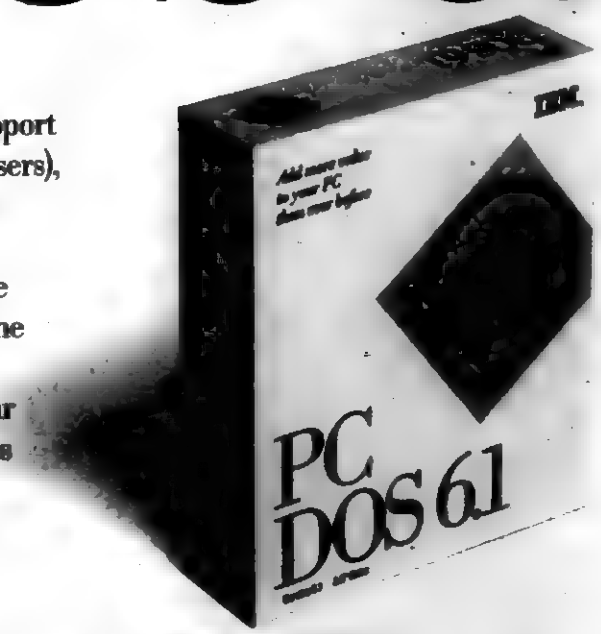
It's got utilities you don't get with MS-DOS. For instance, you get a Program Scheduler for any program or DOS command, and a new editor that allows you to edit files at the same time.

It's got features you don't get with MS-DOS. Such as support for PCMCIA Card Services (i.e., hot plugability for portable users), and the industry's leading Pen support for DOS.

And there's one more reason that goes beyond the software—PC DOS 6.1 is backed by superior service and support, including a 24-hour helpline you can actually reach. What's more, the first 60 days of support are free.

So if you haven't got PC DOS 6.1, get it from your local software dealer. Or call 1 800 342-6672.

Features and Functions	PC DOS 6.1	MS-DOS 6
Backup—Tape support; High-speed floppy disk support	x	
	x	
Approximate number of viruses that can be detected	>1,400	800
Automated system configuration optimizer	x	
PCMCIA II support	x	
Enhanced editor	x	
Program scheduler	x	



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David Coursey

Charges will limit NT trials

Microsoft's new paid support programs should have them cheering in Provo. That's because support for a single $495 (list) copy of Windows NT costs $7,500 per year or $150 per call. Which is a real kick in the teeth for those who'd like to do some tire-kicking of the Mother of All Operating Systems.

Of course, the support cost is the same whether you're using vanilla Windows NT or the $1,495 NT Advanced Server and whether you have one or 100 copies. Still, at a time when Microsoft ought to be calling its NT customers weekly just to spread good karma among the masses, this isn't a smart move. Anything that makes NT less attractive than NetWare is a case of Microsoft shooting itself in the foot.

Microsoft counters that Novell also charges $150 a call for support, but this overlooks all those Certified NetWare Engineers who have been trained over the years to make low or no-cost NetWare support fairly easy to come by.

Under pressure, Microsoft's original plan — to include 30 days of free installation support with copies of NT purchased before the end of the year — has been extended until next June. But that still isn't enough to help NT become a real competitor for NetWare, Unix and other network server architectures.

This is just a first level of fault-finding. Microsoft has created a support plan of almost biblical complexity (which befits the size of its

Coursey, *page 64*

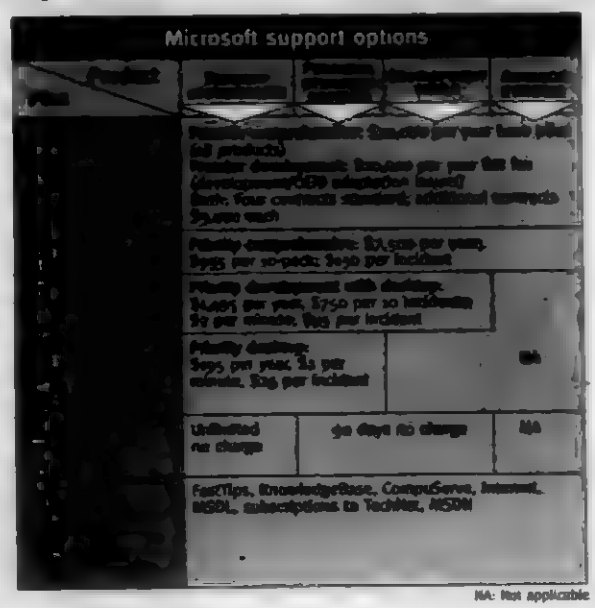
Support plan well-received

By Ed Scannell

Corporate information systems managers interviewed seemed to welcome Microsoft Corp.'s recently announced tiered technical support program, saying it offers more flexibility for users of products including Windows NT.

The Microsoft Support Network program, scheduled to go into effect Oct. 1, is the company's attempt to get away from the one-size-fits-all approach of previous support programs, according to some IS managers.

It is a necessary evolution, in their opinion, if the company is to entrench NT as a standard for the development of mission-critical client/server-based applications.



Three levels

The program has three categories of support, with Premier Support — the highest level — aimed at Fortune 1,000 accounts and third-party developers.

Premier Support promises personalized technical support and 24-hours-a-day, seven-days-a-week priority access to Microsoft technicians.

Each corporate account is assigned a technical account manager who has detailed knowledge of that account's technical needs.

"We like this agreement because we are writing mission-critical applications that will run on PC networks," said Rob Hassell, general manager of MIS at Freightliner Corp. in Portland, Ore.

"What I think is unique about this program is I have a name to call who knows our suite of software and what we are doing. I don't know of any other program that has that," Hassell said.

There are two versions of Premier Support: Comprehensive Support, which assists Fortune 1,000, education and government accounts in system administration and in-house development; and Premier Development Support, which focuses more on commercial developers and OEM adaptation issues.

Both programs carry a base fee of $20,000 per year, which could go higher depending on the number of systems an account has.

The programs' price tags do not appear to be a deterrent to the IS managers interviewed.

"When you look at what we are paying for software and support across the board, $20,000 is a bargain. For us it is not even an issue," Hassell said.

"Pricing on their previous support was in the same ballpark. We need to investigate more the impact of what we must pay above the base charge of $20,000," said Scott Russell, a senior technical consultant at Georgia Pacific Corp. in Atlanta.

While Microsoft is charging for support at the highest levels of the program, company officials said they do not see support as a major profit center.

"We are not looking at this to be a profit center. In other words, we are not expecting to make back what it actually costs to run the business," said Deborah Willingham, Microsoft's general manager of product support services.

"We are focused on doing repeat business with customers with software products, not added services," Willingham said.

Spreading its wings

Microsoft will extend the program's reach through about 2,500 third parties called Solution Providers as well as through a new group located in Authorized Support Centers (ASC).

The ASCs will offer multivendor support, consulting services and advisory and diagnostic assistance. "Microsoft can't be the sole answer to people's support problems with so many customers mixing and matching third-party hardware and software," Willingham said.

"It also gives us more time to become a better friend to the channel," she added.

In addition to Premier Support, the Microsoft Support Network offers Standard Support, which gives desktop application users free telephone support from 6 a.m. to 6 p.m. Monday through Friday.

Users with personal operating systems, such as DOS 5.0, 6.0, Windows and Windows for Workgroups, get 90 days of no-charge telephone support.

Microsoft's Priority Support allows users of desktop applications and personal operating systems to choose among payment options. Users can pay $195 a year for unlimited priority access to technicians, $25 per incident using a credit card or $2 a minute over a 900 number with a $25 per incident cap.

Through June 1994, NT users will receive 30 days of free support.

Token Ring vendors change with the times

By Lynda Radosevich

Token Ring equipment vendors are aiming to split the market into two distinct segments, one for client workstations and one for servers. For instance, in June, IBM introduced separate versions of its LANStreamer Token Ring line targeted specifically for client or server workstations.

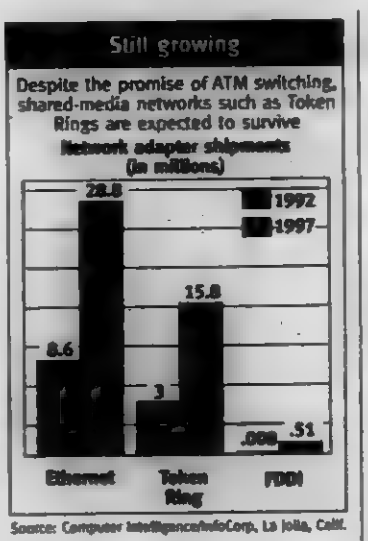
Now, Madge Networks, Inc. is delivering its Token Ring adapter line optimized and priced for client workstations.

The idea is to provide users with a higher-cost, higher-performance adapter suitable for servers running multitasking operating systems such as OS/2 and Microsoft Corp.'s Windows NT; and a lower-cost, lower-performance version suitable for client computers running single-tasking operating systems including DOS and Windows.

The Madge client adapter, called 16/4 ISA Client Ringnode, is a $560 card that has a programmed I/O method for transferring data between the adapter card and the host system.

"A lot of the tie-up on the network is the communication between the card and the node. Programmed I/O is increasing the speed between the card and the node," said Stan Schatt, director of LAN research at Computer Intelligence/InfoCorp in La Jolla,

Token Ring, *page 73*



Coursey

CONTINUED FROM PAGE 53

product line), and there's lots to pick on. But while Redmond's plan has problems, the Fortune 500 won't encounter them as quickly as smaller businesses.

If you're a big customer, a $20,000 check sent to Redmond each year will get you all the support you need, provided all that support can be delivered to only four of your employees. Each additional contact is $3,000. That money buys round-the-clock, year-round access to someone who is supposed to know how to solve the thorniest of Microsoft-related problems. If you can afford that, stop reading because it's the simplest of Microsoft's support options.

If you're on the other end of the scale, unlimited free support is available for desktop applications via phone (actually, it's a toll call) or various on-line or fax-back services. Purchasers of desktop operating systems and development tools get 90 days of free support, limited or not to installation questions, depending on who you talk to.

If you're the lucky buyer of an advanced system like a mail server or even the remote dial-up software that picks up your mail from the server, you'll pay from the moment the software is installed or whenever you decide to call, whichever is first. Windows NT is an advanced system, although I've already talked about the free "promotional support" Microsoft has decided to offer as an enticement.

If they want more service than Microsoft is willing to give, desktop application and personal operating system customers can sign up for a $195 annual support contract. The investment will get you 24-hour-a-day and weekend access over a toll-free line. Other options are $25 per incident on an 800 number or $2 per minute via a 900 number. (OEM versions of Microsoft apps and operating systems will continue to be supported by the OEMs.)

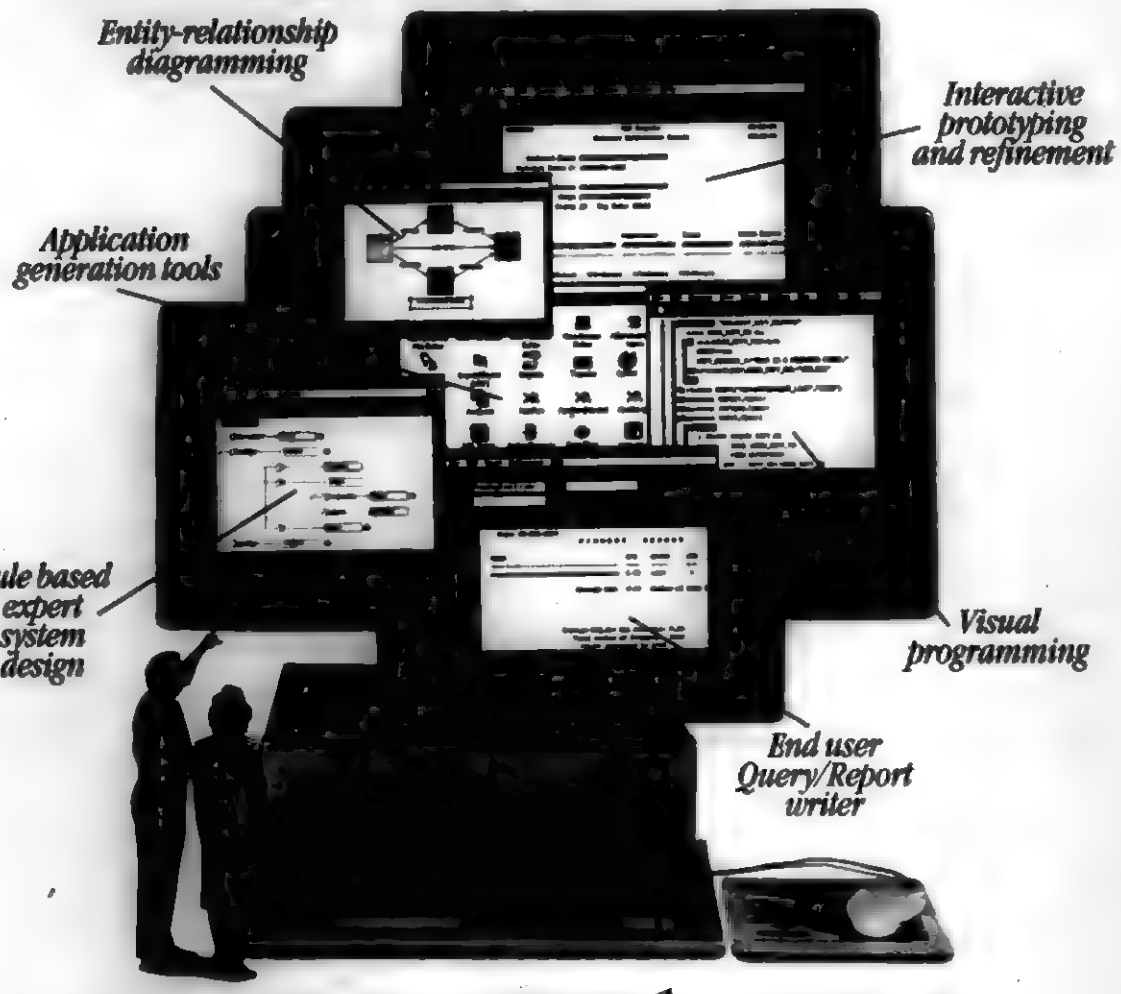
Developer support after the first 90 days is much like that for applications, except it costs a lot more — $1,495 a year, $95 an incident or $2 a minute. This includes all the development tools, with the exception of the forthcoming Visual Basic for Applications (different from the standard Visual Basic) and Microsoft's databases, Access and FoxBase, both of which are conveniently considered applications.

Considering Microsoft's roots as two guys with Basic, I would have expected some special support deal to help beginners learn to program.

Microsoft does deserve credit, though, for its willingness to get out in front on the issue of unbundling support from software. Over the next six months or so, you can expect all the major publishers to weigh in with paid support plans of their own. And shortly thereafter a wave of price cuts will probably come as software companies seek to use these programs for competitive advantage. If possible, customers should watch and wait until things shake out early next year.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4480.

"Wow, that's what I call pushing the boundaries..."



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Motorola releases modular servers

TEMPE, ARIZ.

The Motorola Computer Group last week announced a family of systems and servers designed to provide snap-together modularity and expandability.

The company, based here, said the Series 900 computers allow a user to reconfigure or expand a system in minutes without tools or the need to change internal cabling, wiring or jumpers.

Based on the Motorola MC88110 Symmetric Superscalar RISC computer microprocessor, the Series 900 machines are intended for use as servers or as multiuser Unix systems supporting as many as 1,000 users.

The computers are sold in stackable modules that are plugged together to achieve various configurations.

Pricing for the CPU modules start at $4,200 for a 33-MHz CPU, while the VME bus-based expansion modules start at $1,600.

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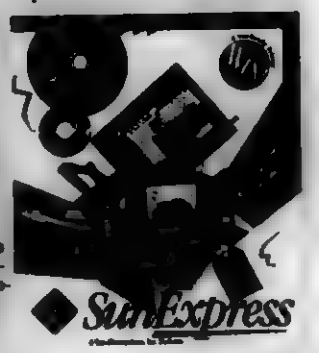

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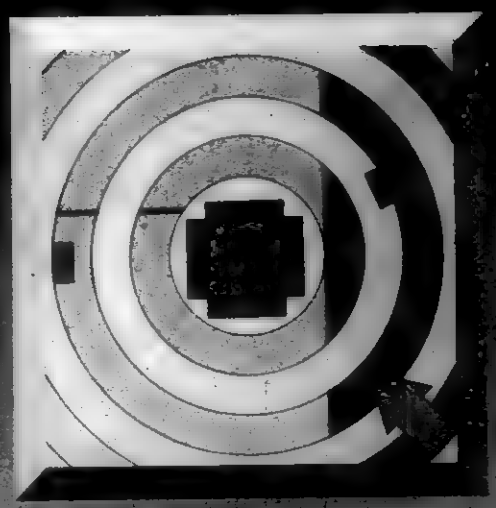


PowerPC:

The New Generation of Computing

"Eventually, the PowerPC will be an all-encompassing processor family. This family will be scalable to everything from embedded controllers in automobiles, to printers, to graphics coprocessors, to personal digital assistants to desktops, to supercomputers."

This White Paper was written by Jim Lardear, analyst, workstations, at Datapro Information Services Group, Delran, NJ. Datapro is a provider of objective and analytical information on computer, communications and office technology products and markets.

Introduction

During the late 1970s and early 1980s, the defining characteristic of the embryonic personal computer market was chaos. The market was populated by a host of proprietary fiefdoms and hindered by the lack of a unified direction. Several competing 8-bit microprocessors, including Motorola's 6800, Zilog's Z80, and Intel's 8080, were vying for leadership. The operating system market was less turbulent, with Digital Research's 8-bit CP/M sitting, at least momentarily, on top of the heap.

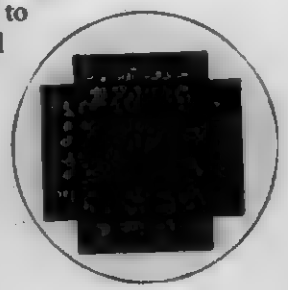
At that time, the market, in need of a catalyst, had failed to reach its full potential and PCs were considered little more than novelties. Then, everything changed. Into the void rode IBM. On August 12, 1981, IBM introduced its Personal Computer and brought the credibility of a corporate icon to a desktop computer market that was primed for explosive growth.

By virtue of IBM's strong reputation and presence in the corporate marketplace, the IBM PC became an instant de facto standard. In the process, IBM crowned Intel and Microsoft heirs apparent by basing its PC on the 8088 8-bit processor and the MS-DOS operating system.

With IBM's announcement that its PC architecture would be opened for development to third-party hardware and software vendors, the market rallied around a single hardware (8088) and software (MS-DOS) standard. This spawned the development of an aggressive clone market and the evolution of microcomputing as we know it today.

In the years since Intel's 8088 was thrust into this position of prominence, die (chip) sizes and prices decreased, while overall performance dramatically increased. As a result, the average consumer and price-sensitive corporate buyer can now access a wealth of floating-point and integer performance with inexpensive desktop and portable computers.

Today, the battle for control of the desktop is being waged primarily in two processor camps. On one side, there is the PowerPC from Motorola, IBM and Apple. On the other side, there is the Pentium from Intel. Both sides are feverishly working to generate the ground swell of support necessary for their platform to control the market now, and into the next century. That market will undoubtedly evolve to include other high-tech products that are currently in their early stages of development.



As Motorola, Intel and a host of rival RISC vendors take turns trying to pull the sword from the stone, there is an important caveat to consider. Leaders are crowned by the people — only in this case, they vote with dollars instead of ballots.

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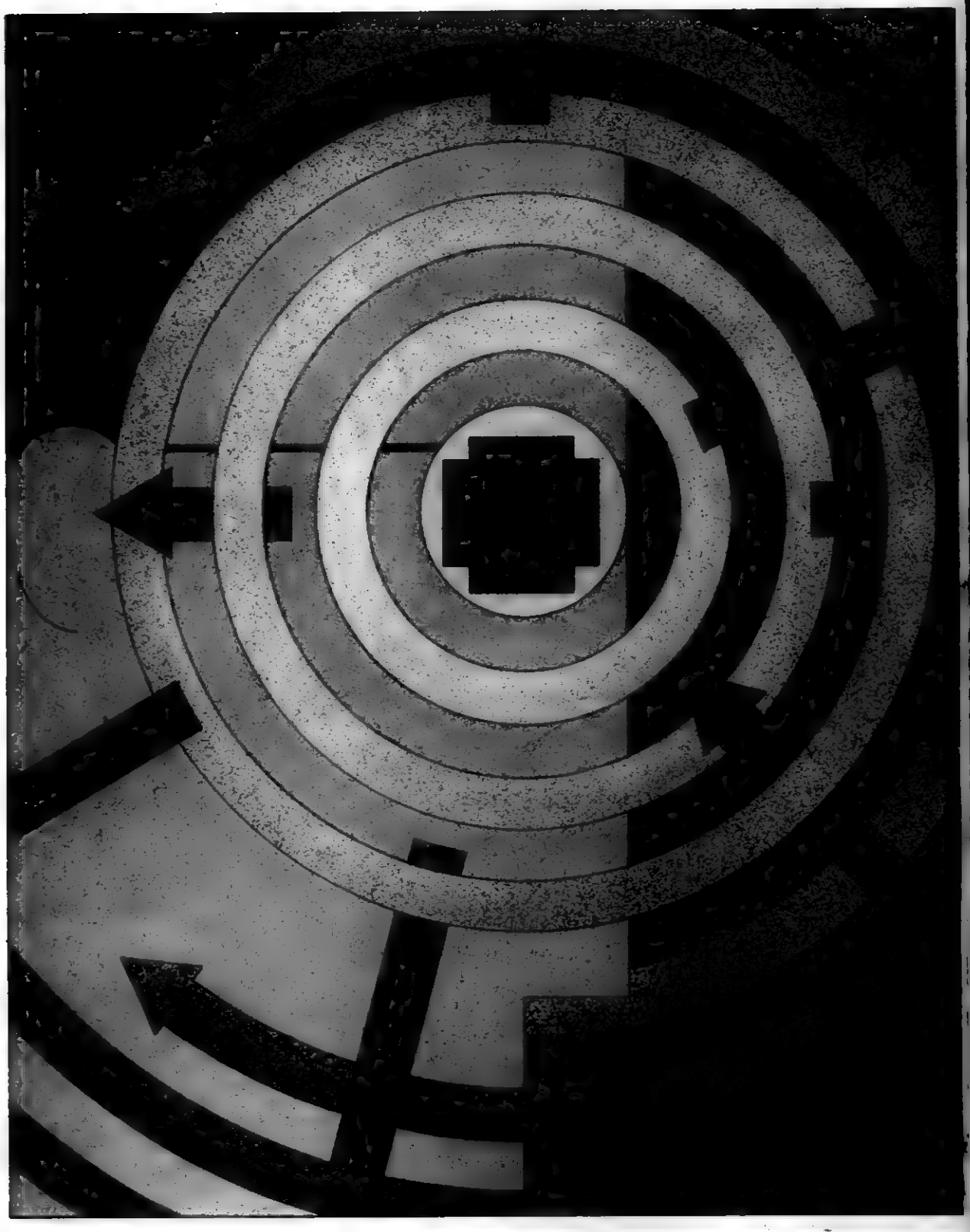


PowerPC: The New Generation of Computing

An epic American business battle is about to be joined. Its corporate combatants are inalterably opposed; there can be no retreat, no accommodation. They may both survive, but one will likely emerge triumphant and the other vanquished. It seems ironic that such a gargantuan battle is to be waged for control of the market for miniature microprocessors.

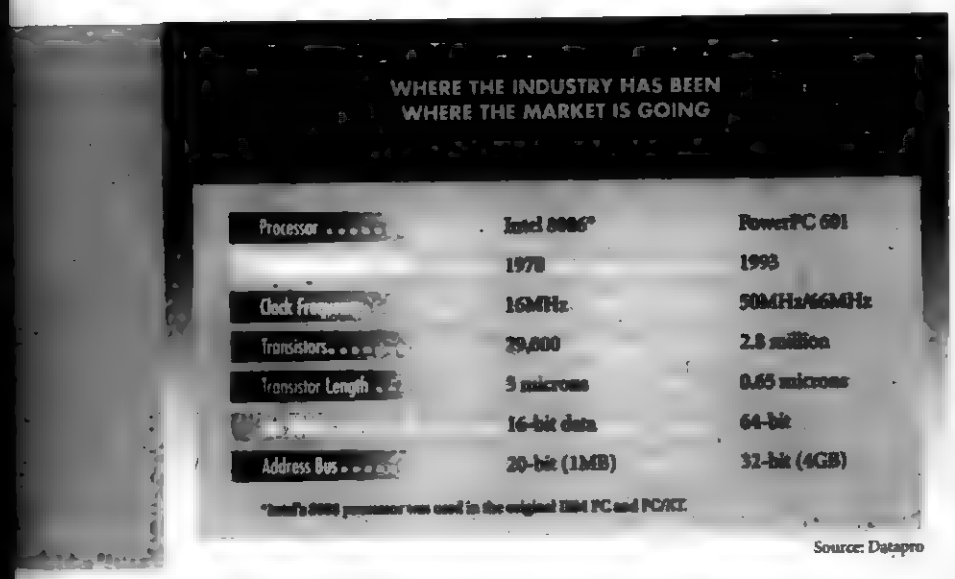
Motorola, IBM and Apple have aligned themselves behind the PowerPC. Intel will meet their thrust with the Pentium. PowerPC versus Pentium. Strength versus strength and no holds barred. Only the market, the great mitigator, can step between them.

This impending confrontation is a direct result of the market pressures and trends of the 1990s. Foremost among those trends are downsizing, compatibility, the graying of lines between PCs and workstations, and new 32-bit operating systems. Victory — in the form of processor market share — hinges on each vendor's unique ability to address user requirements in these key areas.

Downsizing from mainframe and midrange hosts forces systems in the lower end of the market to pick up the processing

slack. Since PowerPC, Pentium and other Reduced Instruction Set Computing (RISC) processors offer enough raw compute power to handle this task, the server market is sure to be hotly contested.

Historically, RISC vendors focused on the high-margin, low-volume technical and scientific markets. Until recently, they paid little attention to the commercial desktops dominated by Complex Instruction Set Computing (CISC) processors.



Source: Datapro

RISC vendors are aggressively pursuing the under-$5,000 desktop with workstations masquerading as PCs.

The high-volume commercial market is very attractive to RISC vendors who are now aggressively pursuing the under-$5,000 desktop with workstations masquerading as PCs. Their road to success is blocked by high-performance PCs from the incumbent CISC vendors and their decade of dominance over RISC processors. To compete in this commodity market, RISC vendors must rely on high volumes — not high mark-ups — to turn a profit.

Of all the 32-bit operating systems on the desktop today, RISC vendors see Windows NT as their best chance to wrest mainstream desktop market share away from Intel. The two leading PC manufacturers, Apple and IBM, have other operating systems and plans based on PowerPC. No matter which operating system eventually dominates the market, it will require increasingly faster processors to fully exploit it. Here, the PowerPC has a large advantage: processor-intensive applications such as graphics, multimedia and CAD/CAM currently running on CISC-based PCs will show the most improvement through its use.

For the most part, users are unwilling to move to a new environment at the risk of losing their existing investment in software, hardware, and training. Migration, as opposed to merely upgrading, is a complex, demanding process that can take lots of years and lots of aggravation. Today, Pentium is viewed as an upgrade — advantage Pentium — while the PowerPC is perceived as a migration. But within the year, this will cease to be an issue, and a significant Intel advantage will be checked.

No doubt, with PowerPC shipments initiated, the playing field with Intel will begin to level. Although currently available, the Pentium does not have the optimized software necessary for users to realize any performance benefits, and Intel expects to ship only about 100,000 of the chips in 1993. As a result, the Pentium will not have much of a lead by the time the first PowerPC systems hit the market in the third quarter of 1993.

THE PowerPC ALLIANCE

In October 1991, three distinct and diverse companies with similar visions for the future formed an alliance to develop an open computing platform based on the PowerPC architecture. The Motorola, Apple and IBM alliance came together rather quickly at the Somerset Design Center in Austin, Texas. The center, which employs more than 300 engineers — mostly from Motorola and IBM — is aptly named because Somerset is the county in England where King Arthur's knights planned their strategies at the round table.

Motorola brings its manufacturing expertise to the table, and it will shoulder much of the marketing and manufacturing responsibilities in addition to the design. The firm will manufacture three members of the PowerPC family — the 603, 604, and 620 — at its new MOS11 submicron fabrication facility located close to Somerset.

Apple supplies strong third-party software support and, more importantly, its easy-to-use operating environment. IBM contributes advanced processor design, network connectivity technologies, third-party support and, despite its recent setbacks, the overall momentum of an industry leader.

IBM also recently formed the Power Personal Systems Division to exclusively sell PowerPC-based systems. These systems compete directly with IBM's own Intel-based sys-

tems, including ThinkPad notebooks, ValuePoints and PS/2s. The formation of this new division allows IBM to concentrate on either the PowerPC or Pentium without mixing support for the two.

THE PowerPC MICROPROCESSOR ARCHITECTURE

The PowerPC 601's aggressive development schedule was completed successfully due largely to the fact that it was based on IBM's predecessor single-chip POWER (Performance Optimization With Enhanced RISC) processor technology. The POWER architecture, in various implementations, currently drives IBM's RISC System/6000 POWERstation and POWERserver family as well as a similar line of systems from Bull HN. The name "PowerPC" reflects this heritage.

The most obvious difference between the superscaler PowerPC and its forbearer is the fact that it offers a more scaled-back instruction set. A superscaler architecture enables a processor to execute more than one instruction in parallel per clock cycle. Engineers from Motorola, IBM and Apple enhanced the POWER architecture to better meet the combined low-cost and high-performance goals of the alliance.

The alliance is also developing the PowerPC 601, 604 and 620 to include multiprocessing support missing from IBM's original POWER architecture. Both SunSoft's Solaris 2.0 and Windows NT are optimized for multiprocessing.

The programming model and instruction op-code assignments remain fully POWER compatible. Any missing features can still be trapped and emulated to support existing POWER binaries. This is an important consideration, since the PowerPC will be able to access over 4,000 IBM AIX applications upon its release.

The PowerPC's floating-point unit is supported directly in the instruction set architecture, resulting in a more tightly integrated system with improved floating-point performance. This is a significant improvement since the high-end graphics applications of the technical workstation market and other emerging applications, such as handwriting and voice recognition, require strong floating-point performance.

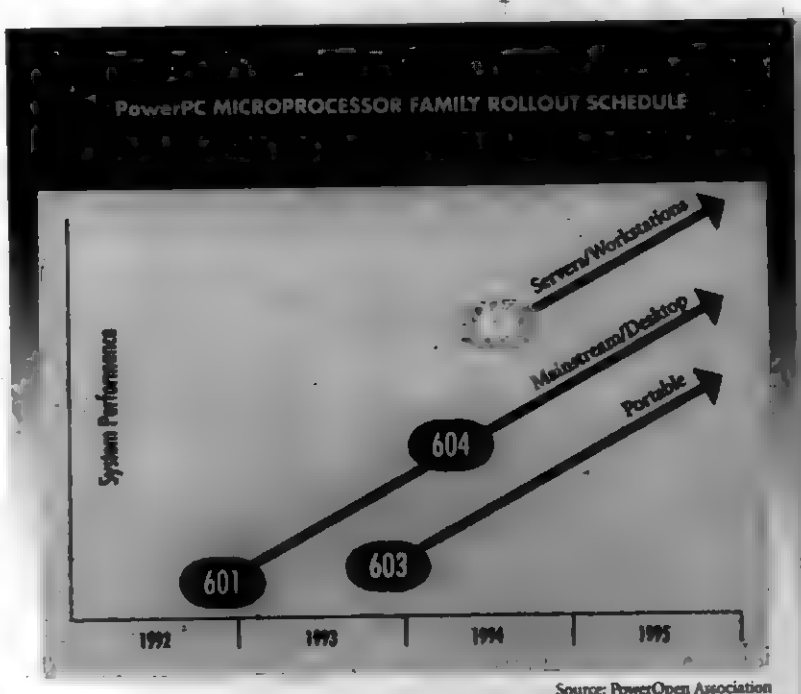
In keeping with the utilization of existing technologies, the PowerPC 601 bus interface unit (BIU) incorporates much of the technology used by Motorola's 88110 processor. The BIU currently supports a 32-bit address bus and a 64-bit data bus in the PowerPC 601.

The extension to 64 bits is new to the POWER architecture. The PowerPC architecture will offer a full 64-bit processor in the PowerPC 620. All PowerPC versions, including the 620, will provide backwards compatibility to existing PowerPC-compatible 32-bit software applications.

Because they are so advanced, members of the PowerPC family are faster than the buses that support them. However, an on-chip clock divider provides easy interfacing to standard buses. Those buses include ISA, EISA and MCA. MCA and EISA run at just under 32MHz, while the PowerPC 601 runs at either 50MHz or 66MHz. Other key system components such as 32-bit operating systems with graphical user interfaces, multimedia, high-end graphics, networking and SCSI-2 disk drives are also handicapped by the slower bus speeds.

The PowerPC will be able to access over 4,000 IBM AIX applications upon its release.

Because a system is only as fast as its slowest component, the PowerPC is designed to be bus-independent. It supports all industry-standard bus designs, including Intel's emerg-



Source: PowerOpen Association

Simultaneous development work is being conducted on the 603, 604 and 620 microprocessors.

ing Peripheral Chip Interconnect (PCI) local bus. Since the local bus connects directly to the processor, it will speed up networking applications, graphics accelerators and hard disk controllers. Support for PCI will not only speed up important subsystems, it will also help to keep the PowerPC in step with Intel on the desktop.

The PowerPC family will be scalable to everything from embedded controllers in automobiles to personal digital assistants.

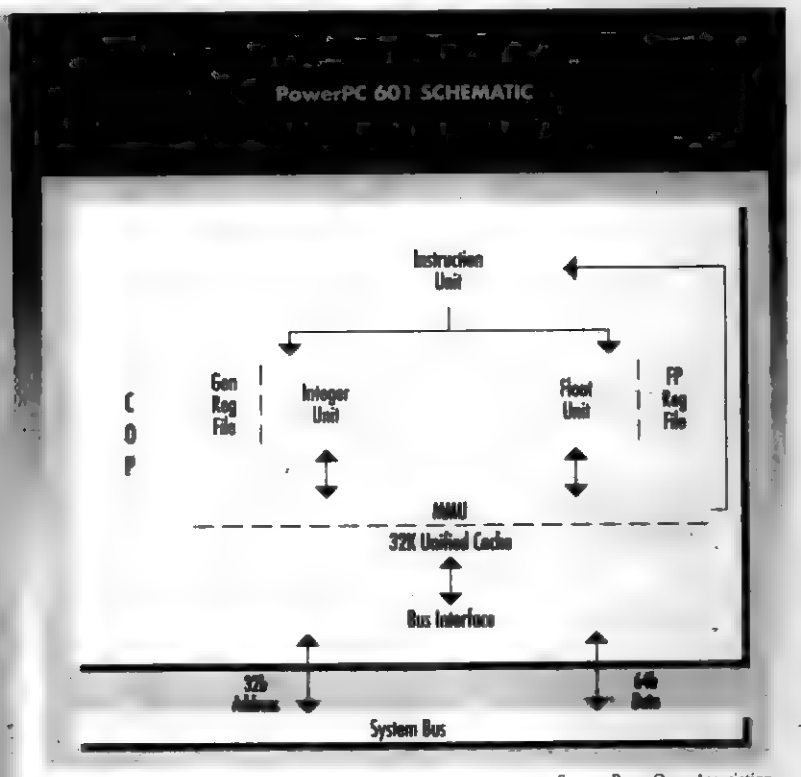
ALL IN THE PowerPC FAMILY

In April 1993, Motorola's RISC Microprocessor Division began sample shipments of the first member of its PowerPC family, the 601. While the PowerPC 601 is being sampled by Motorola and IBM, the Somerset design center is working simultaneously on the 603, 604, and 620, all of which are targeted at specific market segments and will be available within the next 18 months.

Eventually, the PowerPC will be an all-encompassing processor family. This family will be scalable to everything from embedded controllers in automobiles, to printers, to graphics coprocessors, to personal digital assistants (PDAs) to desktops, to supercomputers.

The PowerPC 601

Although the superscaler PowerPC 601 is specifically optimized for use in low-range to medium-range desktop systems, it also supports high-end symmetric multiprocessing features. It is available with clock rates of either 50MHz or 66MHz, and includes a 32K byte on-chip cache.



Source: PowerOpen Association

The PowerPC 601 offers 50MHz and 66MHz speeds.

The PowerPC 603

The next product family to be introduced will be the PowerPC 603. This chip will carry a lower price tag, while maintaining similar performance levels to those of the PowerPC 601. Particular 603 strengths include low power consumption and a power-down mode, as it is targeted for use in notebooks and low-cost desktops.

The PowerPC 603 will also offer innovative power management features to further distance itself from the competition in battery-powered markets.

Intel's Pentium is too large, uses too much power, and runs too hot to offer any challenge to the PowerPC 603 in this market.

The PowerPC 604

The PowerPC 604 is designed for high-performance PCs, workstations and servers, and graphics-intensive applications. It will compete against Intel's P6, This processor also supports symmetric multiprocessing and will offer two to three times the performance of the PowerPC 601.

The PowerPC 620

The PowerPC 620 will be a full 64-bit high-end processor for both uniprocessor and multiprocessor workstations, servers and supercomputers. Performance is its major design emphasis. As a result it will offer four to six times the performance of the PowerPC 601. Projected performance figures from Motorola put the PowerPC 620 in the 200 to 400 SPECmark range. IBM will introduce AS/400s based on the PowerPC 620 sometime in 1995.

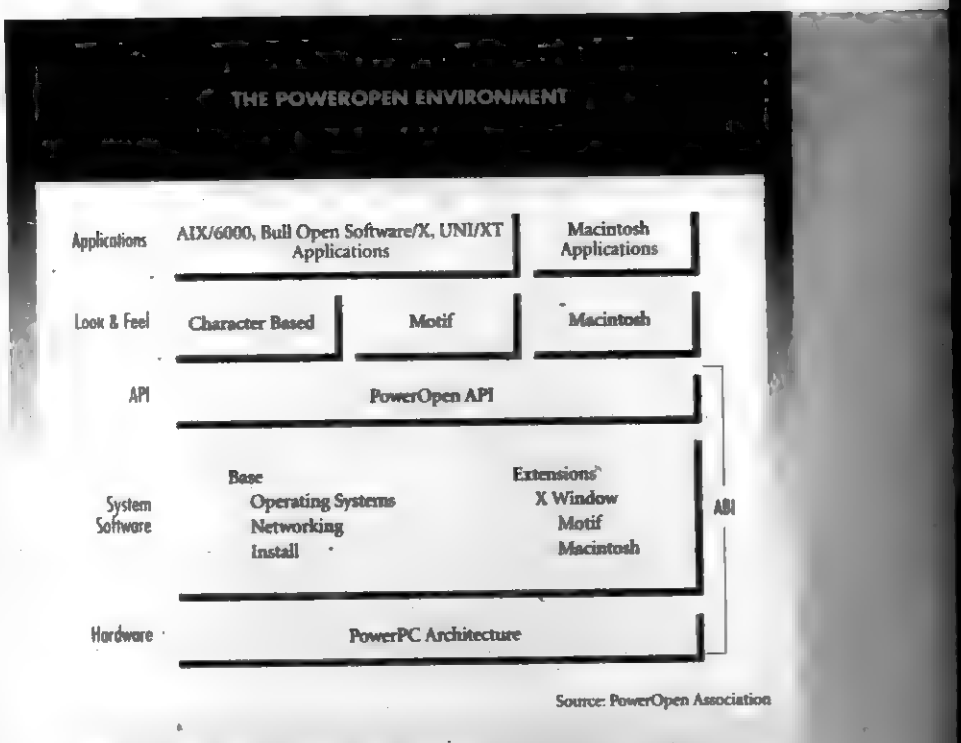
THE PowerPC 601 VERSUS INTEL'S PENTIUM

The battle lines have been drawn. The troika of Motorola, IBM and Apple has chosen to take the fight to the extremely lucrative desktop market dominated by Intel's processors. Once representing two separate

ends of the desktop computing spectrum, RISC and CISC vendors are now competing head to head. Since the traditional technical RISC market does not offer the high volumes long enjoyed by Intel in the commercial market, this move is simply a matter of survival for makers of RISC-based systems.

PowerPC 601-based machines will not be the first RISC systems to specifically target this end of the market. Sun Microsystems' SPARCclassic and Digital's DEC 3000 Model 300L AXP are already fishing in the waters below $5,000. Other vendors such as Hewlett-Packard are currently designing low-cost RISC-based workstations. All major RISC players realize the importance of hitting the lowest possible price points with the most feature-rich systems.

Designing competitive systems is not the problem. The problem is winning market share from the firmly entrenched Intel and getting ISVs to port their applications to these systems.



The PowerOpen environment consists of the combination of any binary-compatible PowerOpen multi-user, multi-tasking UNIX operating system and any PowerPC-based platform.

PENTIUM

Intel's Pentium, formally announced in March 1993, with actual system announcements in May of 1993, will be used primarily in servers and high-end microcomputers — at least until its price starts to fall and next-generation operating systems such as Microsoft's Windows NT, IBM's OS/2 and NeXT's NeXTstep gain in popularity.

Most of the first Pentium models hitting the streets will be based on existing systems and have Pentiums added via daughter or processor cards. The first Pentium-optimized systems will be from vendors such as ALR, Compaq, Hewlett-Packard, IBM and NCR — vendors who are technologically capable of designing systems that fully exploit the Pentium's potential and minimize its flaws.

Pentium is available in clock speeds of either 60MHz or 66MHz. The 66MHz version delivers performance levels of 112 MIPS, 64.5 SPECint92, and 56.9 SPECfp92. Pentium includes 3.1 million transistors and an integrated floating-point processor to deliver three to 10 times the performance of a 33MHz i486. And it is fully compatible with the existing library of Intel x86 software.

The major strengths behind Intel's Pentium are, paradoxically, both momentum and inertia. Momentum is a strength because users have been consistently moving from 8080 to i286, i286 to i386, and then i386 to i486 throughout their computing lives. The next rung on the performance ladder is the step from i486-based systems to those powered by the Pentium. And one day the Pentium will yield to the P6 and P7.

Inertia is a strength because Intel's x86 is the premier processor architecture in the mainstream computing market, with over 50,000 supported DOS/Windows software titles and an installed base of over one hundred million PCs. The commercial market has wholeheartedly embraced the Intel/DOS/Windows computing platform, and is likely to remain inert in that posture. Also, users are unwilling to risk their heavy investments in software for moves to emerging platforms.

However, this inertia will be less of an issue during upcoming months as Windows NT gains in popularity. Windows NT will be available on both Intel and RISC platforms, giving users access to a broader selection of processors while allowing them to remain in the comfortable Windows environment.

The first Pentium-optimized systems will be from vendors such as ALR, Compaq, Hewlett-Packard, IBM and NCR.

Superscaler Design

Both the PowerPC and Pentium

PowerPC Brokers Union of Rivals

A marriage of rivals that seemed destined for divorce court is, instead, moving harmoniously toward actual product fruition.

In May 1993, Apple Computer showed off a Macintosh based on the 66MHz PowerPC 601. Shipments of PowerPC-based Macintosh systems tentatively slated for January, 1994 — the 10th anniversary of the Macintosh — were postponed until March. Although disappointing, the delay will not prevent systems from shipping during the first half of 1994, as promised by Apple.

The eventual release of PowerPC-based Macintosh systems will herald a new dawn for Apple, as it begins its publicly committed transition from CISC-based to more powerful RISC-based computers.

Apple Chairman John Scully predicts there will be shipments of over 1 million PowerPC-based Macintosh systems in 1994. More realistic figures come in at about half that number. Either way, the numbers still compare quite favorably with an estimated 250,000 shipments of Intel Pentium-based systems for the same period.

Apple has not made any announcements regarding the use of the Motorola 68060 and upcoming models. This is consistent with Apple's transition from the 680X0 architecture to a Macintosh line based only on the RISC architecture.

By mid-1994, Apple could be offering a complete line of notebooks, entry-level desktops, and high-end multiprocessing RISC-based systems. But 680X0-based systems will continue to be the base system for the next several years during the RISC conversion.

The PowerPC's performance is enhanced by the larger 32K byte unified on-chip cache and 64-bit data bus, compared with only 4K byte data and 4K byte instruction cache, and 32-bit data bus on the 68040. Both processors also include the added benefits of an integrated floating-point unit.

The PowerPC will run Apple's System 7 operating system and existing Macintosh software in emulation. On the down side, performance gains for PowerPC-based systems running traditional Macintosh software in emulation mode will be negligible.

PowerPC systems will need to run native mode software if they are to provide any real-world performance increases over existing 68040-based systems. Performance gains are also necessary to justify the purchase of a PowerPC-based system. Consequently, the Macintosh operating system will be gradually converted to native PowerPC code. This will allow RISC-based Macintosh systems to get faster as Apple releases new system software.

Two other operating systems — PowerOpen's version of UNIX and Taligent's object-oriented offering — have also emerged from the Apple-IBM alliance. With three operating systems to choose from, users will be able to meet the requirements of a variety of applications.

Despite the general animosity created by their competitive GUI offerings and the spate of courtroom battles, Apple and Microsoft are co-dependent. Apple needs native applications to realize the full potential of the PowerPC. Toward that end, Microsoft is expected to release native versions of Word and Excel to coincide with the first-half 1994 release of PowerPC-based Macs.

For Microsoft it all boils down to the bottom line. During 1992, analysts estimated that Microsoft earned upwards of $270 million dollars in revenue on worldwide sales of Macintosh software.

As if the picture was not bright enough, Sun Microsystems' SunSoft subsidiary announced a version of its UNIX-based Solaris operating system for use on Apple's PowerPC-based Macs.

The endorsement from RISC-workstation leader Sun is significant for many reasons. First, it levels the playing field against Intel's i486 and Pentium since SunSoft has already released a version of Solaris for use on this platform. Second, and most importantly, Solaris, via SunSelect's Windows Applications Binary Interface (WABI) technology, will provide access to the massive Microsoft Windows applications library.

Apple's success will hinge both on maintaining compatibility with the existing installed Macintosh base of 4.5 million and the availability of PowerPC-optimized software. Apple already has the support of a number of leading software developers who offer versions of existing applications for PowerPC-based Macintosh systems.

Ever since
Apple, IBM and
Motorola
formed their
alliance,
people have
expected
something big.

Well, it's not so big, but it's amazingly powerful.

	Intel Pentium™	PowerPC 601™
Frequency (MHz)	66	66
SPECint92	64.5	>60
SPECfp92	56.9	>80
Power (watts)	10	8
Die size (mm²)	262	120

Introducing the PowerPC™ family of microprocessors from Motorola.

How powerful is our first tangible result of the Apple®, IBM®, Motorola alliance? Unlike any other microprocessor, PowerPC Microprocessors have the power to change the course of computing.

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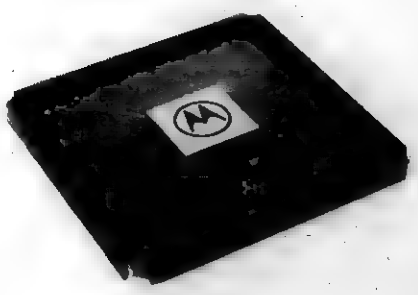

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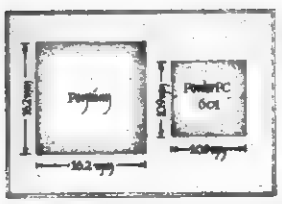


being developed for pen-based and object-oriented computing. In fact, PowerPC Microprocessors will play a pivotal role in the imminent convergence of computing, communications and lifestyle products.

To take a closer look at the future of computing, call Motorola today at 1-800-845-MOTO. We'll be happy to provide you with more information, including our free PowerPC Information Pack.

And we'll show you the microprocessors that are changing the course of computing.

The PowerPC Microprocessors from Motorola.

PowerPC Microprocessors. *Changing the course of computing. For the better.*

MOTOROLA

Pentium as announced by Intel, and Motorola's announced projected performance of the 66MHz version of the MPC601. Thermal comparison is based upon preliminary Intel specification for the 66MHz Pentium, and the performance of samples of the 66MHz version of the MPC601.

are based on superscaler architectures. The PowerPC 601 has three pipelined execution units capable of issuing and retiring three 32-bit instructions per clock cycle. These instructions include one integer, one floating-point, and a branch processing unit which can be either integer or floating-point.

Pentium's floating-point processor, a redesigned version of that found in the i486, is still much slower than the PowerPC 601's.

Each of Pentium's two instruction pipelines includes an arithmetic logic unit, address-generation circuitry and data-cache interface. The Pentium's dual pipelines can only process two integer or one floating-point instruction per clock cycle. This two-to-three difference in instructions per clock cycle represents a definite performance advantage for the PowerPC 601.

Performance Enhancement Through On-Chip Cache

Although both the PowerPC and Pentium include an on-chip cache, the Pentium's 8K byte data and 8K byte instruction cache is only half of that offered by the PowerPC 601's 32K byte, eight-way, set-associative, physically-addressed unified cache. On-chip cache memory acts as a buffer for instructions and data that can be accessed at high speeds to avoid loading another segment from the slower main memory. A larger cache translates into a smaller wait state, which improves overall processor performance.

Floating-Point Performance

The Pentium's floating-point processor, a redesigned version of that found in the i486, is still much slower than the PowerPC 601's. Its eight-stage pipeline can execute only one floating-point operation per clock cycle. The Pentium's 56.9 SPECfp92 is almost 40% slower than the 81 SPECint92 found on the PowerPC 601.

Strong floating-point performance is critical to both traditional technical applications and emerging technologies such as real-time video processing and voice and handwriting recognition.

Manufacturing and Chip Design

Two of the most important issues concerning microprocessor price/performance are chip technology and the manufacturing process. The PowerPC 601 utilizes a smaller die size and a reduced number of transistors to lower costs and help undercut Pentium's pricing structure. The PowerPC 601's die size is 118.81 squared millimeters, while the Pentium's is a relatively mammoth 262.44 squared millimeters.

Since the PowerPC is half the size of the Pentium, it maintains roughly a two-to-one manufacturing advantage. This disparity helps to keep costs down and allows the PowerPC to be priced at about half that of the Pentium.

The PowerPC is based on a .65 micron complementary metal oxide semiconductor (CMOS) technology, while Intel's Pentium uses .8 micron BiCMOS (a combination of bipolar logic and CMOS) technology. The PowerPC 601 has four levels of metal wiring compared with three on the Pentium. The difference in technology favors Motorola's PowerPC for a number of reasons:

The Heat Is On

With heat dissipation at 15 to 16 watts, Intel is having problems with the 66MHz Pentium's operating temperatures. This does not even take into account the heat generated by neighboring high-speed electronics such as video cards and disk drives. Heat sinks and dedicated fans provide a workable solution, but in the Pentium's targeted role as a server, it might not be enough. Server functions tend to be more processor-intensive and mission-critical than those of typical desktop applications.

As a result, 66MHz Pentiums might not ship in 1993, and some systems previously marketed as Pentium upgradable may not be. Vendors must now verify that systems will actually accommodate the Pentium. Reliability concerns raised by

COMPARING THE PowerPC WITH PENTIUM

	[illegible] PowerPC 601	[illegible] Pentium
Clock Rate	[illegible]Hz	66MHz
SPECint92	60	64.5
SPECfp92	81	56.9
Transistors	2.8 million	3.1 million
Die Size (mm)	10.9 x 10.9	14.6 x 17.6
Heat Dissipation	8.5 watts	16 watts
Volume Price (Qty. 1,000)	$450	[illegible]

Source: Datapro

Smaller die size, lower heat dissipation and less than half the price make the PowerPC a powerful alternative to Intel's Pentium.

the chip running too hot will undoubtedly delay the Pentium's implementation. However, Intel will soon find a solution to this problem.

Price/Performance

Motorola is aggressively pricing the PowerPC 601 to undercut the Pentium. At about half the size of the Pentium, the 66MHz PowerPC 601 is priced at $450 ($374 in quantities of 20,000), which translates into about 12.77 SPECint92 and 17.23 SPECfp92 per dollar. By way of contrast, the 66MHz Pentium is priced at $965 in quantities of 1,000 and offers only a meager 8.10 SPECint92 and 7.11 SPECfp92 per dollar.

These figures give Motorola and the PowerPC a significant price/performance advantage. Clearly, if the quest for supremacy boiled down to only price/performance, the PowerPC would be the runaway winner.

No other RISC vendor is offering these levels of performance at this price point. But in many environments, this might not be enough. Companies cannot change their technological direction in midstream. They usually continue to stick with their commitments to previously installed technologies.

Competitive Summary

In general, Pentium's impact will be minimal during the remainder of 1993. Its price will be too high, and its supplies too low for it to grab a big competitive lead. Most microcomputer buyers will find that Intel's i486 processor family can still meet their price/performance requirements. This is especially true since most of the available Pentium systems will not be "new" Pentium-optimized designs.

Availability of the PowerPC 601 is expected as early as September 1993 with RISC System/6000 Powerstation 220s from IBM. Apple will follow shortly thereafter with PowerPC-based Macs in early 1994 (see sidebar). Pentium's early lead will shrink as IBM and Apple boost the PowerPC.

Intel shipped over 32 million CISC processors during 1992, while RISC vendors shipped only 500,000 chips. This fact, coupled with Pentium's access to millions of installed users, and a vast, albeit unoptimized, library of software, is critical to winning "mind share" on desktop processors.

But the PowerPC also has competitive advantages. One is its support of new 32-bit operating systems, such as Windows NT, OS/2 and Solaris. Another is its access to the vast Windows application base via Insignia Solutions' SoftPC.

The manufacturing and chip design technology definitely favor the PowerPC in terms of price/performance. Motorola will push this advantage further with the addition of the 603, 604, and 620 in 1994. The battle is just beginning.

METAMORPHOSIS OF COMPUTING

The digital revolution will meld computers, communications and consumer technologies into products destined to become an indispensable part of everyday life.

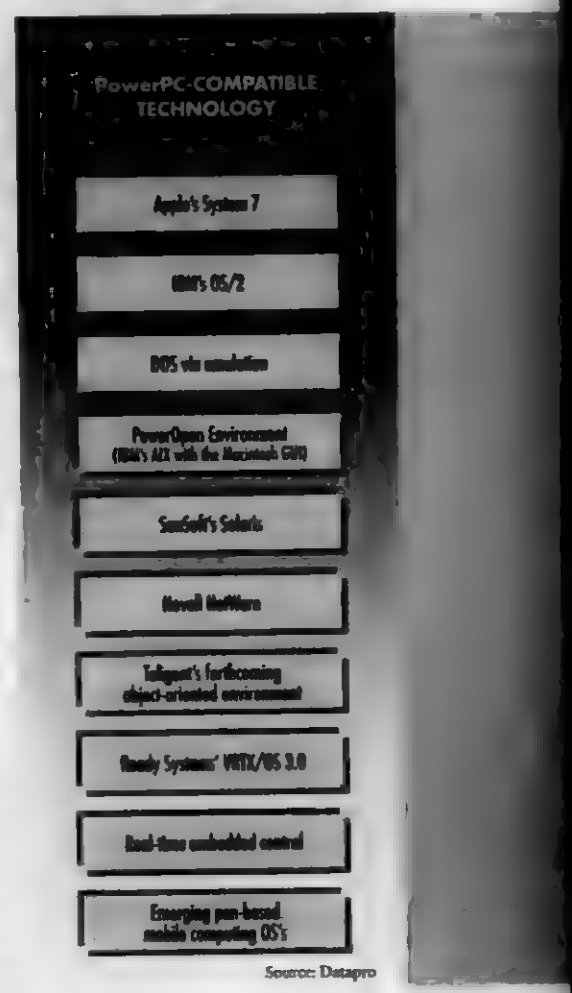
Elements of this technology already exist. Other elements, such as application-specific software, faster buses, broader bandwidths and the necessary peripherals, are on their way.

Motorola and the PowerPC family will play an increasingly important role in this revolution, especially in the merging of computer and communications technologies. As smaller, more powerful computers are integrated with cellular communications technology, the concept of the mobile office will become an efficient and workable solution.

SUMMARY

Intel, the computing world's crowned king, has ruled the market for the past decade. But now Motorola's PowerPC is at the royal drawbridge. One day soon, systems based on both PowerPC and Pentium will be shipping and battling head to head. A few other RISC vendors will also join the fray. In this heated environment, the competition for market dominance will be intense. Price/performance leadership will be measured in months or even weeks, not years.

The PowerPC architecture and PowerOpen software are in the technological vanguard. Unlike Intel, which ruled by default, the PowerPC will be popularly elected by a grass roots movement of users, ISVs, and OEMs. It will then lead computing into its next millennium. ■



Source: Datapro

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The New Generation of Computing

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LOWELL, MASS

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Storage format made more open

By Stephen P. Klett Jr.
RESEARCH TRIANGLE PARK, N.C.

Users have been slow to accept hierarchical storage management (HSM) technology because of its proprietary nature. Alphatronix, Inc. last week unveiled an "open" HSM system called Emissary/HSM aimed at reversing this trend and winning cautious users' hearts and wallets.

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Emissary also uses the host machine's native storage device driver rather than a proprietary third-party driver. As a result, Ritchie said, data can be accessed without the Emissary software, removable media are portable to third-party drives, the system works with any backup software, and it can be installed without reformatting the network's hard drives.

HSM systems automatically migrate files from network hard drives to optical libraries and then tape libraries, using parameters set by the systems administrator. Files that are accessed infrequently — up to 80% of files on the network, according to analysts — are moved to more cost-effective storage media, freeing expensive hard disk space for more frequently used data. Migrated files are automatically and transparently restored to the hard disk when needed.

While the initial release of Emissary/HSM is not a true HSM system because it does not support tape libraries, it is the first system on the market to use a nonproprietary data format. Tape support is slated for the fourth quarter, Ritchie said. Currently, Emissary supports only magnetic and optical storage media.

Industry analysts said Emissary is an attractive, viable alternative to proprietary systems that will help speed industry acceptance of HSM technology.

"Emissary/HSM's open architecture will allow companies to start using hierarchical storage without redesigning their whole backup process," said Michael Peterson, president of Peripheral Strategies, Inc., a market research firm in Santa Barbara, Calif.

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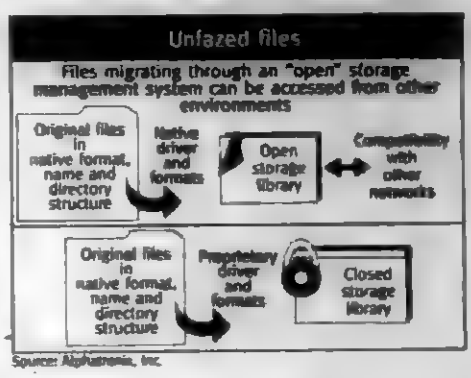

Source: Alphatronix, Inc.

Emissary/HSM is available now starting at $4,800 for 20G bytes of secondary storage. The purchase of a $1,200 unlimited client license is also required.

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Token Ring

CONTINUED FROM PAGE 53

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Sales still growing

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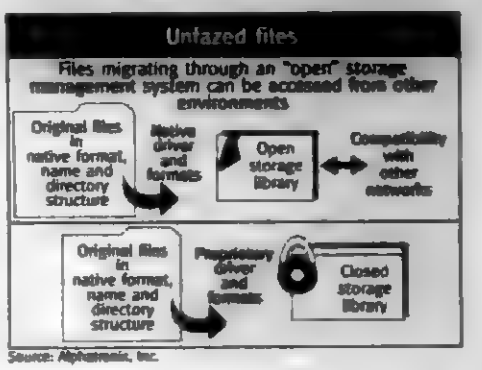

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Unisys seeks consistency with client/server unit

By Thomas Hoffman
SAN JOSE, CALIF.

Unisys Corp. recently laid out its strategy for the client/server business unit it created as part of its corporate restructuring last month.

Unisys executives and analysts said the unit should provide customers with a more cohesive approach to dealing with the vendor for its range of U6000 Unix servers, CTOS workstations, PW2 Advantage and Advantage Plus PCs and the related software and services Unisys provides to support Microsoft Corp.'s Windows NT operating system.

The Unisys Client/Server Systems business unit will operate like an independent company but will be able to draw on Unisys' corporate services and technologies to satisfy customer needs.

The unit will be headed up by Donald E. Coleman, who was president and managing director of Ventana Corp., a Tucson, Ariz.-based electronic meeting software developer, before he joined Unisys last March.

"If you're looking at us from the outside, two attributes will change," Coleman said. In the past, Unisys maintained separate divisions that focused on specific products, such as the U6000 servers. For each division, there was also a standalone, product-oriented research and development team, manufacturing and marketing groups and geographically based sales organizations.

Those once product-oriented divisions will now work together as a unified team of 2,500 staffers, Coleman said, starting with a marketing approach aimed at satisfying Unisys' four primary lines of business: financial services, telecommunications, airlines and the public sector. Those sectors provided the vendor with 80% of its $8.4 billion in revenue last year.

In 1992, Unisys' client/server hardware, software and services revenues totaled $1.5 billion, Coleman said. He estimated those revenues would approach the $2 billion mark for 1993.

Coordinated products

Unisys' "client/server approach is coordinated now," noted Rich Schreiber, president of ATB Associates, a Wellesley, Mass.-based consultancy. Schreiber said the strategy will enable Unisys to deliver to its customers a set of "solutions" rather than a set of products.

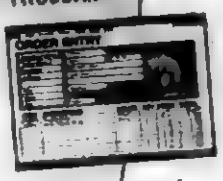
Schreiber said customers should benefit from the new unit by its more consistent set of products and services. Services are becoming increasingly important for user shops as they wade through their initial client/server efforts, Schreiber said.

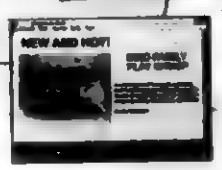
"The reality is that if you're going to be putting in a new distributed system, unless it is a pilot, the requirement for the level of end-user sophistication generally begins to spiral upward more than most organizations are budgeted or staffed for," Schreiber said.

RemoteWare and the SEMINAR Charlie missed

AT THE VERY MOMENT AN EXPERT WAS EXPLAINING THE COST- AND SANITY-SAVING BENEFITS OF REMOTEWARE-CREATED AUTOMATED WORKFLOW SYSTEMS TO A ROOMFUL OF HIS FELLOW CLIENT/SERVER AFICIONADOS, Charlie was sitting

in a tiny center seat, in coach, staring blankly at a fly nimbly exploring the OXYGEN PANEL above him. It had come down to a scheduling conflict. One more FREE product seminar, half-day, inevitably bad deli sandwiches... potato chips that had gotten too close to the kosher dills and gone soggy. Or this junket to clean up yet another set of branch communication difficulties in Opelika, St. Louis, and San Antone. So the picture of this fly on the ceiling RUBBING ITS FRONT LEGS TOGETHER with an ominous delight didn't have the significance for him it might have had he seen that MEANWHILE, BACK AT THE SEMINAR THE REMOTEWARE FOLKS WERE SPINNING COLORFUL TALES OF SUCCESSFULLY-IMPLEMENTED FIELD COMMUNICATIONS SYSTEMS, HOLDING CHARLIE'S TECHNO-PEERS FROM COMPETING COMPANIES CAPTIVE WITH THE PROMISE OF THOUSANDS OF FULLY-AUTOMATED, EASY-TO-MANAGE AND UNATTENDED DIAL-UP COMM SESSIONS, AND RIVETING ACCOUNTS OF REAL COMPANIES WITH HUNDREDS OF MOBILE CORPORATE LAPTOPS AND REMOTE BRANCH OFFICES USING CENTRALLY-CREATED AND MANAGED ELECTRONIC FORMS, DOCUMENTS, AND REPORTS, ALL LINKED TO CENTRAL SYSTEMS AND DATABASES, AND ALL NEATLY SUPPORTED BY INTEGRAL ELECTRONIC SOFTWARE DISTRIBUTION CAPABILITIES!





So these were the things Charlie was missing: solutions to the very problems that had made this one more night away from home a necessity. That, and what actually turned out to be a delicious RemoteWare lunch of pasta salad, FRENCH BAGUETTES with prosciutto and mozzarella, and fresh strawberries.

But what did he know? He was headed to lunch with the fellas in San Antone. For bad deli sandwiches. And SOGGY CHIPS.

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Briefs

Support from IBM

IBM recently said it will boost the level of system integration and support it supplies to value-added resellers of its RS/6000 Unix systems. The IBM RISC System/6000 Express Support program provides 800-number technical support, custom configuration of systems and on-line access to IBM's product and support databases. The program will begin Oct. 1, IBM said.

Porting to Unix

Palindrome Corp. and Lachman Technology, Inc. announced plans to port Palindrome's Network Archivist automated backup software to Unix platforms. The initial release is to be for Sun Microsystems, Inc.'s Solaris in mid-1994.

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Epoch Systems in Westboro, Mass., has announced EpochServ 6.0, a family of integrated client/server data management software products that were designed for backup, file migration and volume management.

Key enhancements to the product line include the ability of files to span optical volumes, support for multilevel staging and expanded peripheral support.

Epoch officials claim the products are open, modular and portable. There are three integrated software products: EpochServ, client/server management software that includes three modules to implement a complete enterprisewide data management solution on a single platform; EpochBackup, software that automatically backs up and restores client files located throughout the enterprise in heterogeneous environments to an EpochServ-based system; and EpochMigration, software that provides automated, enterprisewide migration of client files located in heterogeneous environments to an EpochServ-based system, according to the firm.

Pricing ranges between $20,000 and $60,000.

▶ *Epoch Systems*
(508) 836-4300

Advanced Archival Products, Inc. and **Cygnet Systems, Inc.** have announced the availability of the Amass optical-disc jukebox file system for the Cygnet Series 1800 expandable, 12-in. optical jukebox family.

According to Advanced Archival in Greenwood Village, Colo., Amass is the only direct-access jukebox file system to provide a single-device, single-file system view of all models of the Cygnet Series 1800 family.

The series offers integrated functions such as high-speed, on-line index and magnetic disk caching. It also features a reliability rating of 425,000 mean exchanges between failures, and its storage capacity ranges from 162.4G bytes to 1.4T bytes.

Prices start at $25,000.

▶ *Advanced Archival Products*
(303) 792-9700

Tangent Computer, Inc. has announced NetRun, a line of high-performance network workstations.

The systems are said to offer 50% greater network performance than competitive units with typical Novell, Inc. NE2000 network interface cards, according to the Burlingame, Calif., company.

The NetRun line provides a 32-bit interface with VL bus graphics acceleration. Two models are available, the VL NetRun and the Universal NetRun. Both come equipped standard with 4M bytes of RAM, a 40-MHz Intel Corp. 1486 CPU, 16550 high-speed communications circuitry, a 32-bit VL bus disk interface, a 120M-byte, 19-msec hard drive, a 16-bit Parallel Tasking Ethernet interface, a 1.44M-byte floppy and a 14-in. color monitor. DOS 6.0 and Windows 3.1 are preinstalled.

The VL bus version is called the VL NetRun and costs $1,895. The Universal bus NetRun supports VL bus, XT/AT bus and most Extended Industry Standard Architecture bus expansion cards; it has a base price of $2,195.

▶ *Tangent Computer*
(415) 342-9388

Unisys Corp. has announced two entry-level Unix departmental servers for commercial users looking for network-ready systems.

According to the Blue Bell, Pa., company, the servers increase performance while helping users manage the transition from Intel Corp.'s 1486 to Pentium technology.

The U6000/300 system employs a 60-MHz Pentium processor and was designed for high-performance server applications. The U6000/100 uses a 66-MHz 1486 DX2 processor; it is field-upgradable with a Pentium processor module to become a U6000/300.

The servers offer a range of key features, including redundancy and data integrity. These features enable the products to be used in distributed applications and transaction processing environments.

The U6000/300 is priced from $12,750. The U6000/100 is priced from $8,800.

▶ *Unisys*
(215) 986-4011

Hadax Electronics has announced its LAN Access Unit (LAU).

According to the Ridgefield Park, N.J., company, connecting one or two analyzers to the LAU enables the analyzers to access up to eight LANs for testing.

Two LANs can be tested at the same time because both analyzers can operate simultaneously. The need for dedicated analyzers for each LAN and the act of physically moving test equipment among the LANs is eliminated.

The L210 Ethernet LAU is available in an eight-port model, offering connector options for either DB15 for AUI or keyed RJ-45 for 10Base-T. The L200 Token Ring LAU is available in an eight-port model, and its connector options are data connectors, RJ-45 or DB9 connectors. The product is 2¾ inches high and fits in a standard 19-in. rack.

The L210 for Ethernet and the L200 for Token Ring each cost $1,395.

▶ *Hadax Electronics*
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Retailer swings its partners to EDI

By Lynda Radosevich
MINNEAPOLIS

This summer Target Stores, Inc.'s purchasing department kicked the paper habit: It managed to get 100% of its trading-partner transactions onto electronic data interchange (EDI) systems.

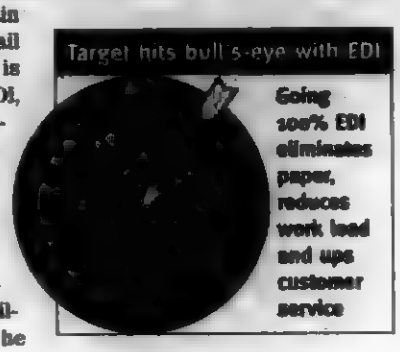
Unlike retail competitors Kmart Corp. and Wal-Mart Stores, Inc., which mandated in 1990 that all their trading partners move to the electronic exchange of business documents, Target waited for EDI systems to mature and its partners to naturally evolve to the technology.

This meant that as of last January, almost 86% of Target's purchase volume had migrated to EDI. At that point, "it didn't make sense to have a paper system in place," said Jane Lucas, director of total quality and quick response for Target.

The company then set a June deadline to go 100% EDI, which Lucas characterized as now being "almost as pervasive as the telephone."

However, while EDI is common in the retail industry, systems that include every trading partner are rare.

"About 95% of the trading partners of the Top 15 retailers are on EDI," said Torrey Byles, EDI/electronic commerce program director for Input, a consulting company in Mountain View, Calif. "In retail and distribution, it is de rigueur to have EDI, especially in discount retailing, because price is the competitive differentiator."



And saving money by eliminating paperwork helps retailers cut prices, he explained.

But in most retail companies, the last 5% of trading partners, which typically represents a "trivial amount of their business," does not make it onto the big retailer's EDI systems, Byles said.

In Target's case, the non-EDI trading partners represented only 14% of business purchases but accounted for more than half the retailer's 2,700 suppliers.

Lucas said one key component to getting them to use EDI was complying with Voluntary Interindustry Communications standards, a subsegment of the ANSI X.12 EDI standard aimed at the retail, apparel and textile industries. X.12 standards provide the syntax for business electronic transactions such as purchase orders.

Even so, there was a crunch at the end of the conversion process. Though Target had announced last New Year's Day that it wanted to go paperless by June, as of May about 700 business partners still straggled behind on paper systems. The biggest conversion challenge, then, was having Target specialists set up all those companies' profiles in one month.

However, the benefits, including an unquantified reduced work load, increased accuracy and speedier processing, far outweighed one uncomfortable month, Lucas said.

Internally, Target uses Gentran software from Sterling Software, Inc. in Dublin, Ohio, to translate incoming documents into a form used by the company's order-processing systems.

Trading partners have the option of exchanging documents with Target using a value-added network (VAN) — either General Electric Information Services in Rockland, Md., or Sterling Software's Ordernet. Smaller partners can also use TargetDirect, a mailbox service provided by Target so they do not have to pay for VAN services.

Life in the EDI world is becoming less cumbersome for smaller businesses, Byles said.

This is because newer EDI software makes it easier to tie EDI information to PC-based spreadsheets and database applications using Windows, according to Byles.

New, improved SNMP still has a way to go, but products emerge

By Elisabeth Horwitt

The networking industry's movement to embrace Simple Network Management Protocol (SNMP) Version 2 has so far been more of an amble than a rush. However, at least two vendors, Sun Microsystems, Inc.'s SunConnect division and The Wollongong Group, Inc., have promised that their enterprise network management platforms will support the emerging standard by year's end.

Once in product form, the enhanced version will provide major advantages over the original version of SNMP, among them: the ability to secure management systems and tasks against unauthorized access, more efficient gathering of bulk files from managed stations and interaction among different network management systems (see chart).

Unfortunately, the first SNMP 2-compatible platforms will make use of the above features in a limited fashion until managed network devices also support the standard.

Sun expects the industry to rally around SNMP Version 2 within the next six months, said Joe Matibag, senior product manager. Initially two Sun partners, Nynex Allink and Isicad, Inc., have committed to support SNMP 2 with their products, which they are integrating with SunNet Manager Version 2.2. Cisco Systems, Inc. and Banyan Systems, Inc. are rumored to be readying SNMP 2 announcements.

Allink provides a network management platform; Isicad offers software for trouble ticketing and problem management.

However, Sun's SunNet Manager 2.2, scheduled for release next month, only supports two major SNMP 2 features: bulk retrieval and security.

Sun makes plans

Sun will roll out full support of SNMP 2, along with other major standards such as the Common Object Request Broker Architecture and Common Management Information Protocol, with its upcoming distributed management platform, Sun spokesmen indicated.

Meanwhile, SunNet Manager 2.2 will offer other advantages over its predecessors, including the ability to pinpoint problems across links between routers and other internetworking devices.

SunNet Manager 2.2 will be available in October on Solaris 2.x at a suggested retail price of $3,995.

Wollongong, meanwhile, is claiming full SNMP Version 2 compatibility for its PathWay Management Station 3.1. The Palo Alto, Calif., vendor is replacing a proprietary management information base with SNMP 2's manager-to-manager protocol so distributed management nodes can communicate with one another, according to Joe Hielscher, director of product marketing.

Once the major vendors support SNMP 2, Wollongong's management nodes will potentially be able to communicate with other vendors' nodes. Then users will be able to set up multivendor domain management systems, each specializing in a different type of application or network and to share information as needed.

First, however, the industry needs to do further standardization work, particularly in the area of defining how various network objects are managed, industry analysts said.

Meanwhile, Wollongong has used SNMP 2 to beef up the interaction among its distributed management nodes, Hielscher said. For example:

- The get-bulk feature will allow PathWay Management Station Nodes to exchange large amounts of data more efficiently.
- The security feature will allow users to guard interactions between distributed nodes against unauthorized intrusions.

In addition, the new version of the product can correlate, filter and acknowledge alarms from routers to prevent alarm broadcast storms, Wollongong said. It also features a distributed rule-based expert system and report generator that enables users to customize reporting functions.

When network hardware and networked system vendors implement the new version of the standard, the system will be able to extend security and get-bulk features out to managed devices as well, Hielscher said.

PathWay Management Station 3.1 runs on Sun's SunOS and Solaris, Novell, Inc.'s UnixWare, Digital Equipment Corp.'s Ultrix and Motorola, Inc.'s Unix System V Release 4-based operating system. It supports Motif/X Window System-based interfaces for applications and is available 90 days after receipt of order at a list price of $10,000.

New and improved!

The major enhancements of SNMP Version 2 compared with Version 1

1	A 10-times-or-better speed and efficiency improvement in bulk data retrievals.
2	Trilevel security, configurable by the network administrator.
3	Improved support for communications among different vendors' network management stations. For example, the management systems now have a standard way to negotiate which stations will handle which services.
4	Improved "set" capability, the function of a manager's workstation to write to a remote management station.
5	An SNMP shift from "TCP/IP-centric" to "protocol-neutral."

Source: SNMP Research, Inc.

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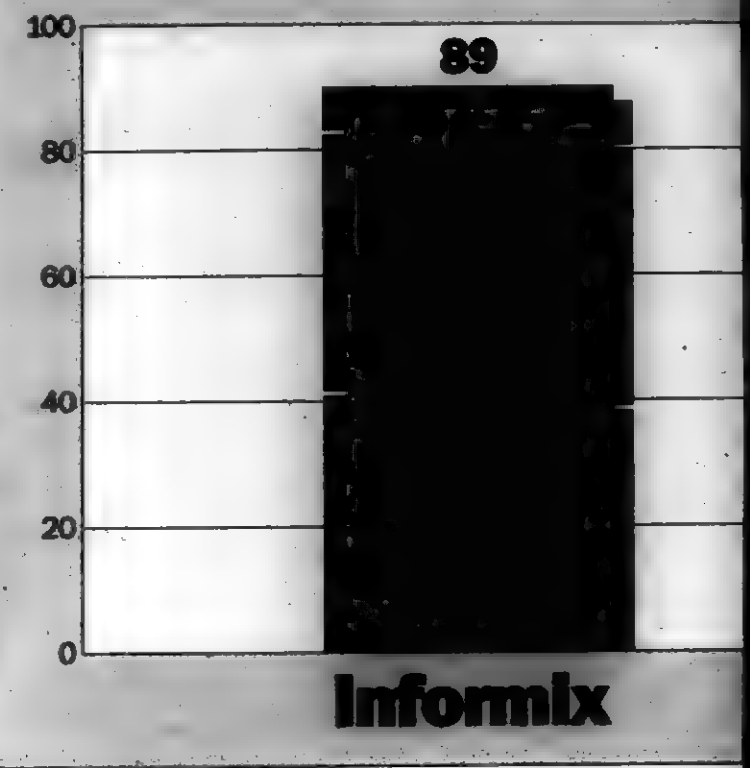
- Sun Microsystems
- Texas Instruments
- Unisys

*UNIX TPC-audited benchmarks published by hardware manufacturers as of 9/1/93.



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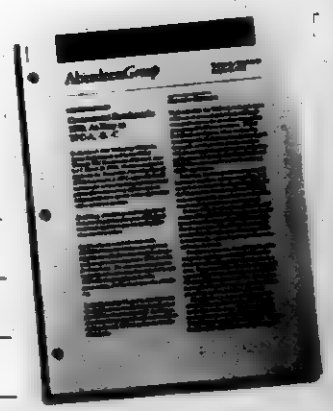

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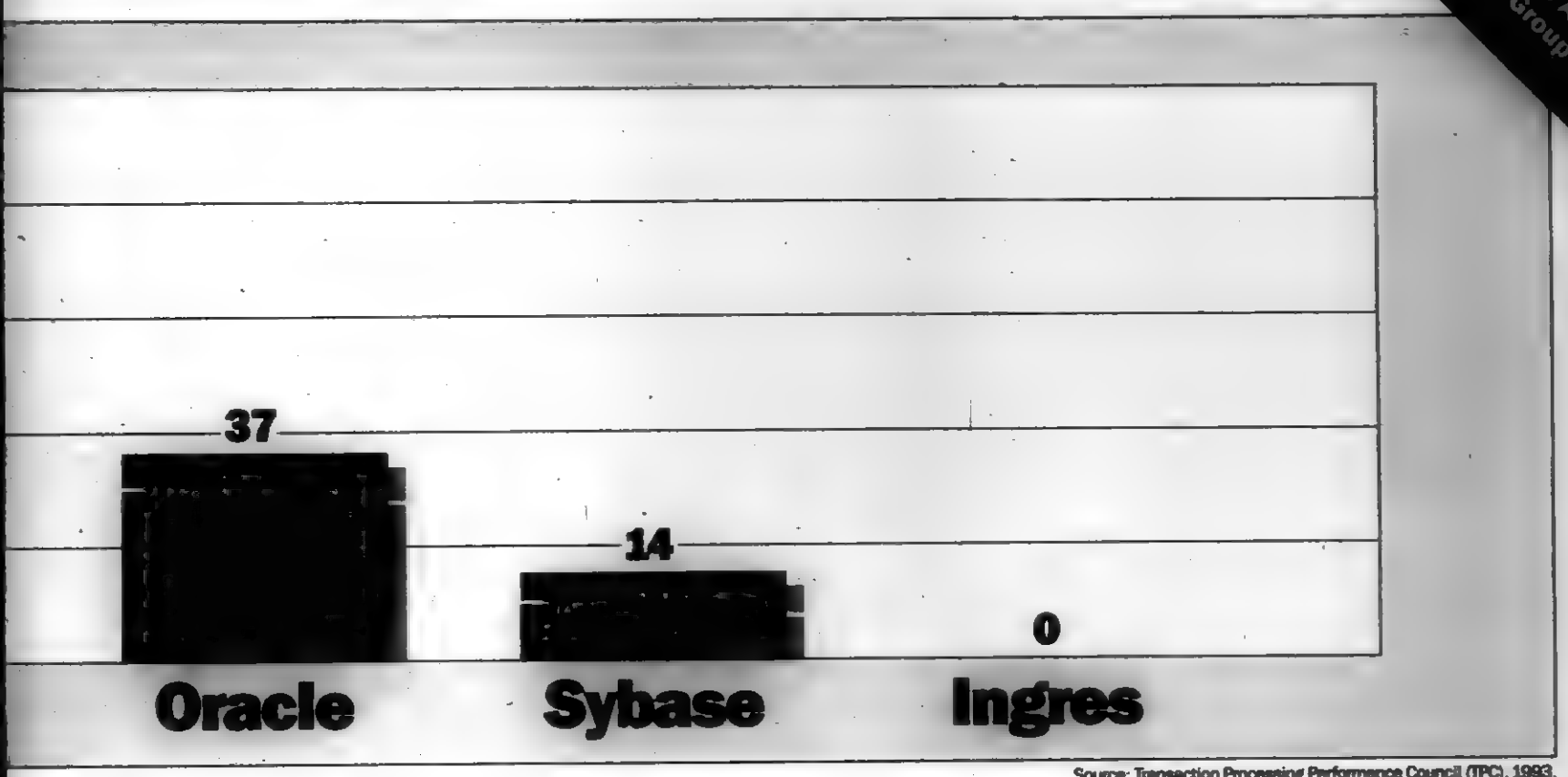

Source: Transaction Processing Performance Council (TPC), 1993.

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Package promises to back up LAN data on mainframe

By Jean S. Bozman
RANCHO CORDOVA, CALIF.

Sterling Software, Inc. said last week it has begun shipping an enterprisewide client/server storage management system code-named Galil, which was announced nearly a year ago [CW, Oct. 26, 1992]. The software was designed to back up data on corporatewide LANs and to ship the data to mainframes.

Now called SAMS:Expert, the LAN-based software allows users to fill out a software menu that identifies files for enterprise backup and storage. A companion product, SAMS:Vantage, supports central-site reporting and data recovery on IBM/MVS mainframes.

Still missing from the client/server package is SAMS:Control, which has middleware that supports LAN backup on the mainframe. SAMS:Expert and SAMS:Vantage are in Release 1.0, which has limited data security and support for network backbones. SAMS:Control is due to ship in 1994, Sterling said.

The Sterling product package addresses an important information systems challenge — enterprisewide data management — but faces competition from established LAN backup packages, said Patrick McBride, a program director at market research firm Meta Group, Inc.'s service and systems management strategies group in Westport, Conn.

The first release supports Novell, Inc. NetWare LANs. But Sterling plans to ship Release 2.0 in March 1994, said Bob Brown, director of product marketing at Sterling's Storage Management Division. Release 2.0 will support TCP/IP and IBM's LU6.2 protocol, as well as Banyan Systems, Inc.'s Vines LANs, IBM's LAN Server and Microsoft Corp.'s LAN Manager network operating systems.

SAMS:Expert is priced at $2,995 for the LAN Server and at $250 for 10 PC users. SAMS:Vantage for the mainframe is priced at $35,000 for a mid-size IBM mainframe.

Inmac offers catalog globally

By Gary H. Anthes
SANTA CLARA, CALIF.

Inmac Corp., a direct marketer of computer products, has published an international catalog of networking products and services that stretch beyond equipment offerings to full-scale network design. It will be translated into several languages, marking the $300 million company's entry into non-U.S. markets.

Inmac's networking offerings include services such as network planning, installation, integration and maintenance. These services will be provided on behalf of Inmac by Memorex Telex Corp.

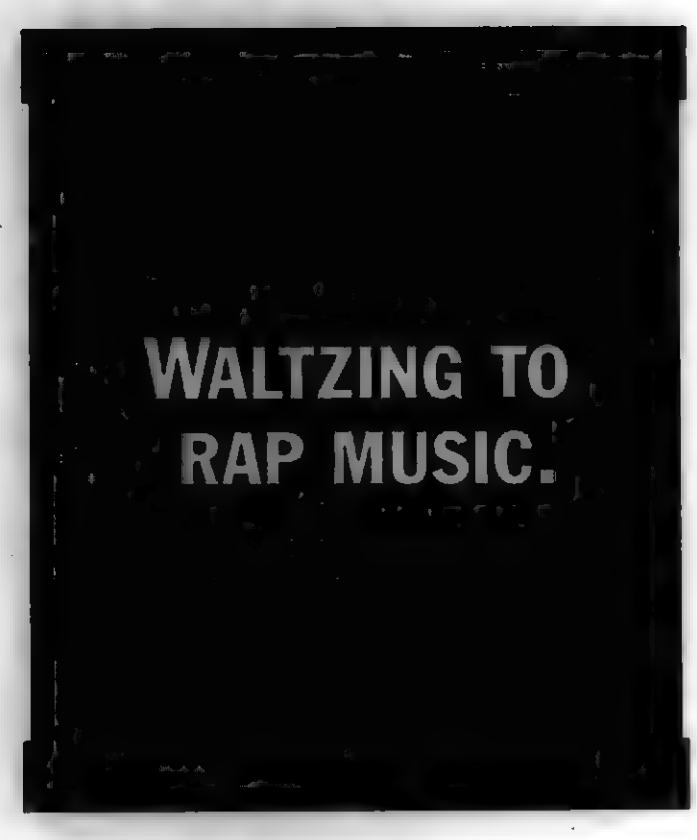
"The catalog serves the primary market of customers who do not have any kind of LAN installation — and we can take them soup to nuts including pulling the wire if they need that — and the aftermarket, where customers need incremental components," said Jeff Heimbuck, Inmac president.

The catalog lists 3,000 items from modem cables to complete network systems, including hardware, software, test equipment, power backups and the like. It includes mainstream U.S. products as well as products unique to European markets, Heimbuck said.

One of a kind

Heimbuck noted that Inmac is unique in its combination of broad geographical reach and vendor-independence. Most multivendor LAN value-added resellers operate in local markets only, he said.

"If you want to get something going across the U.S., you have to deal with a single vendor like Novell or IBM or 3Com, and you're stuck with whoever they're partnered with," he said.



Start-up rolls out enterprise net product

Arkhon Technologies, Inc. in Cerritos, Calif., said it intends to go up against the big guys with an enterprise network and systems management platform.

An eight-person start-up, the company is planning to roll out next year a kitchen sink-type of product that will manage networks, networked systems and applications, as well as security, validation and encryption functions.

It will also perform these functions:

- Consolidation and correlation of information from the leading network management systems.
- Expert system technology to automatically zero in on and take care of common network problems based on rules derived from discussions with human experts.
- Neural network technology, which allows automated systems to learn from network events and gain experience in solving common problems.
- Distributed domain managers that will cooperate using the Common Object Request Broker Architecture.

The product will support industry standards such as the Open Software Foundation's Distributed Management Environment and Distributed Computing Environment, as well as SNMP, the company said.

Florist's revamped system blooms with new WAN link

By Thomas Hoffman
WESTBURY, N.Y.

In 1984 the owner of Flora Plenty, a retail floral chain in New York, purchased Dallas-based 800-Flowers, a struggling global floral service that was losing more than $400,000 per month.

Since then, James McCann and his brother Chris, the company's vice president of operations, have leveraged a mix of marketing entrepreneurism and information technology to return the now $50 million organization to profitability.

The company's next information technology project is to swap out an IBM AS/400 at one call center in favor of an NCR Corp. Unix-based server to allow portability of telemarketing applications between the firm's two primary telecenter locations. The intersite connectivity medium will be a fractional T1 link, slated to go live in December.

Chris McCann (left), *vice president of operations, discusses operational plans with James McCann, president of 800-Flowers*

The goal of the $250,000 hardware/software wide-area network project is to provide tighter communication ties between the company's two 800-Flowers call centers, one in Worcester, Mass., and one here, where the company moved its headquarters in 1987.

The WAN project is also expected to help consolidate the processing of all sales information on an NCR 3550 server in Westbury in time for the holiday order rush.

"By having all these processes done in one facility, we anticipate better control of our data and better service to our customers," Chris McCann said.

Separate order processing

In the past, each telecenter handled inbound sales orders, outplacement of orders to networked florists and customer satisfaction ratings separately. This posed a problem because the Worcester telecenter processed its sales information using an AS/400 and the Westbury facility used an NCR 3550 server.

Application software had to be reconfigured for the AS/400 environment — a time-consuming and costly endeavor — and the two telecenters were not able to communicate well with each other.

To better integrate these facilities, the company plans to replace Worcester's AS/400 with an NCR 3450 server early next month.

According to McCann, Unix has some other advantages over the AS/400. "Because we ramp up our order processing by a magnitude of 10 during the holidays, it's easier to process orders with dumb terminals linked to Unix hosts than with PCs linked to the AS/400," he said.

Also, for telemarketing representatives, "it's easier to call up Help screens and different windows under Unix," McCann said.

Screen prompts

800-Flowers customized its telemarketing software three years ago so an order screen would prompt a telemarketer to ask the customer a full range of sales questions, make suggestions for floral arrangements in different price ranges and provide information about various packages offered for birthdays and other special occasions.

Those types of capabilities have helped 800-Flowers vault to the top of the industry, according to Frances Porterfield, publisher of *Florist's Review*, a monthly floral industry magazine in Topeka, Kan.

Although Florist Transworld Delivery Association — better known as FTD — and other players have entered the 800-market during the past 12 to 18 months, 800-Flowers' technical and marketing savvy has placed it well ahead of its competitors, Porterfield said.

For example, she said the 800-Flowers customized telemarketing software appears to be more user-friendly and covers a wider range of customer needs than what the competition has developed.

Once the NCR 3450 is installed in Worcester, the file server will be linked via Ethernet over a 384K bit/sec. fractional T1 connection to the company's private-branch exchange and NCR 3550 in Westbury. This will allow the company to more quickly and easily download sales information to Westbury. Also, both telecenters can now share a common database.

Once the WAN is installed, orders taken by the Worcester telecenter will continue to be processed on an IBM 3090. From there, they will be downloaded to the NCR 3450 and transmitted to the NCR 3550 in Westbury, where the sales will be processed and finalized.

TYPING WITH BOXING GLOVES.

MOVING MISSION-CRITICAL APPLICATIONS TO CLIENT/SERVER.

Firm to go virtual with frame relay

By Gary H. Anthes
RESTON, VA.

When DynCorp calls itself a "diversified" professional and technical services firm, it is not kidding.

The billion-dollar company's 21,000 employees at 198 worldwide sites work at a broad array of jobs: baggage handling at airports, medical research at the National Cancer Institute, the operation of the Strategic Petroleum Reserve along the Gulf Coast and others.

And now DynCorp has a highly distributed computing and communications infrastructure that supports that geographical and functional diversity.

When DynCorp downsized in 1990, it did not just set in motion a gradual move to client/server computing with the idea of postponing the inevitable upgrade to the next mainframe. In 10 months, the company set up LANs at 11 major sites, moved all applications off two IBM mainframes and sent the machines out the door — one to a scrap dealer.

The company even had an "unplugging party" on the day the machines were removed. People involved in the process drank champagne and toasted a new era in information systems.

DynCorp hired or appointed LAN administrators at each of the 11 sites but still reduced its IS staff from 66 to 22 people. The $3.5 million up-front investment cut the $4 million annual IS budget in half. The alternative to client/server — a move to a distributed, complex instruction set computing mainframe system — would have boosted outlays by 25% to 50%.

Butch Fernstrom, *MIS director: The WAN will blend geographically diverse pockets of expertise*

Now DynCorp is taking another big step to bring its information systems more in line with the way it does business. It is tying together its LANs through a frame-relay wide-area network provided by Sprint Corp.

"The WAN provides the communication medium for ... a virtual corporation," said Butch Fernstrom, MIS director.

According to Fernstrom, this is because the U.S. network will allow standardization and wider deployment of the company's electronic-mail system and will allow the implementation of groupware, work-flow automation, videoconferencing and other modern practices.

In particular, he said, it will make it easier to form far-flung teams of experts to collaborate on large, complex proposals, which for the government can run to thousands of pages and may be won or lost on bid differences of less than 1%.

"Big companies like us have a lot of expertise, but the pockets of expertise are hard to tap into," Fernstrom said.

Paul Lombardi, *president of DynCorp's Government Services Group: 'If you can't communicate, you can't operate'*

Easier to update

He said frame relay was less costly than the older point-to-point private line network approach and that frame-relay technology's software-defined circuits made it easier to alter network topology as connectivity requirements changed.

Currently, "we are at the mercy of faxes and overnight mail," said Paul V. Lombardi, president of DynCorp's Government Services Group. "Federal Express has got us by the neck."

Lombardi declined to predict how much of the company's $18 million annual travel budget and $1 million in overnight delivery outlays might be saved by the network. But he did say cost savings were not the major objective of either the move to client/server or the move to the WAN. He said the moves were vital to the firm's success as a business.

Efficiency gains

"If you can't communicate, you can't operate. This will lead to a significant improvement in efficiency," Lombardi said.

He said the WAN will enable DynCorp to set up a companywide marketing management information system that will, for example, easily convey sales leads unearthed in one part of the country to interested parties elsewhere.

DynCorp has six sites on the WAN now. Novell, Inc. LANs connect to the Sprint frame-relay network via Wellfleet Communications, Inc. routers. Two more sites will be added during the next year, Fernstrom said. Other sites will dial in to the WAN.

He said it costs $6,000 per facility — mostly for the routers — to set up the WAN and will cost $150,000 a year to operate the network. The operations costs mostly represent fees to Sprint, according to Fernstrom.

Single station shows bird's-eye view of vast net

By Jean S. Bozman
CHICAGO

From a lone computer console, Stone Container Corp. can survey the sprawling network that supports its $5.5 billion paper-and-corrugated container manufacturing empire.

The company achieves this through network alert-unifying software it runs on a Sun Microsystems, Inc. workstation.

Boole & Babbage, Inc.'s Command/Post software allows the Sun workstation to display all major nodes in the company's enterprise network, according to information systems staff members at Stone. These include an IBM 3090 Model 200 E at corporate headquarters, approximately 50 IBM AS/400s and 60 Hewlett-Packard Co. HP 3000s scattered across the U.S. and Canada.

Each computer has been wired to send a network alert to the central-site console in the event of an operational failure or an environmental disaster. The benefit of seeing all computers from one spot is that end users experience less downtime and outages are reported quickly, according to Rich Antonini, manager of computer resources.

Four Sun IPC workstations, used by data center operators here, display the same information shown on the console screen. Routine restarts are handled automatically, although operators can also intervene.

The sweep of the information on-screen is wide, but IS managers here would like to improve the depth of information represented by each network alert. Detail is missing today because the wide variety of systems — gained through corporate acquisitions of smaller companies — do not interoperate. Instead, they report up to the IBM mainframe, seven AS/400s and a large HP 3000 at headquarters.

Better integration

The goal is to have a fully integrated system console; currently, operators have to log on to remote systems to access performance data, Antonini explained.

Stone aims to improve the situation in two ways: by interfacing more of the system-specific performance monitors into the central network console and by gradually migrating to open systems, including Unix servers, to improve interoperability and application portability.

Antonini said he expects Boole & Babbage to forge more links between its Command/Post system and system-specific performance analysis tools. For example, Stone's AS/400s run a monitoring tool from Help Systems, Inc. in Minnetonka, Minn., he said. Novell, Inc. LANs run another monitoring tool from Ungermann-Bass, Inc. in Santa Clara, Calif.

Antonini, who acquired Command/Post two years ago, said he expects Boole & Babbage to carry out much of the integration with other vendors' monitors.

"Boole is not going to go out and make automation tools live on every [type of] platform, but it will add hooks or connections to other vendors' products," he predicted.

As it is, Stone's 12-person operations staff has to be versatile when it comes to operating systems and languages, IS managers said. Operators trying to resolve a problem with a remote computer can open a window on the Boole & Babbage console to log on to the remote system.

Operations manager Jim Ullery said Stone's integrated console is just one step toward a long-range goal of building a network based on open systems standards. "We are going to be implementing a network strategy to try to get any-to-any connectivity," he said. The goal would be to allow "anybody in this office to log on [to the remote system] from their workstation."

Open systems hopes

Open systems will also bring greater flexibility to application development, he said. "We're trying to get vendor independence so we can have portable program expertise," Ullery explained. "We're hoping to achieve a universal development environment where it doesn't matter what computing platform we're on."

Today, programmers specialize in machine-specific languages for the AS/400 and HP 3000 machines, he said.

Given the small size of Stone's operations staff, the console did not reduce the need for operators since it was installed in 1991. But it did improve overall efficiency, reducing the number of terminals on operators' desks and supporting preventive maintenance, Antonini said.

"We were able to catch errors that might have gone unnoticed," he said. "I expect we will become even more proactive as we use more of the system tools from Boole and other vendors."

ON SITE

Stone Container Corp.
Chicago

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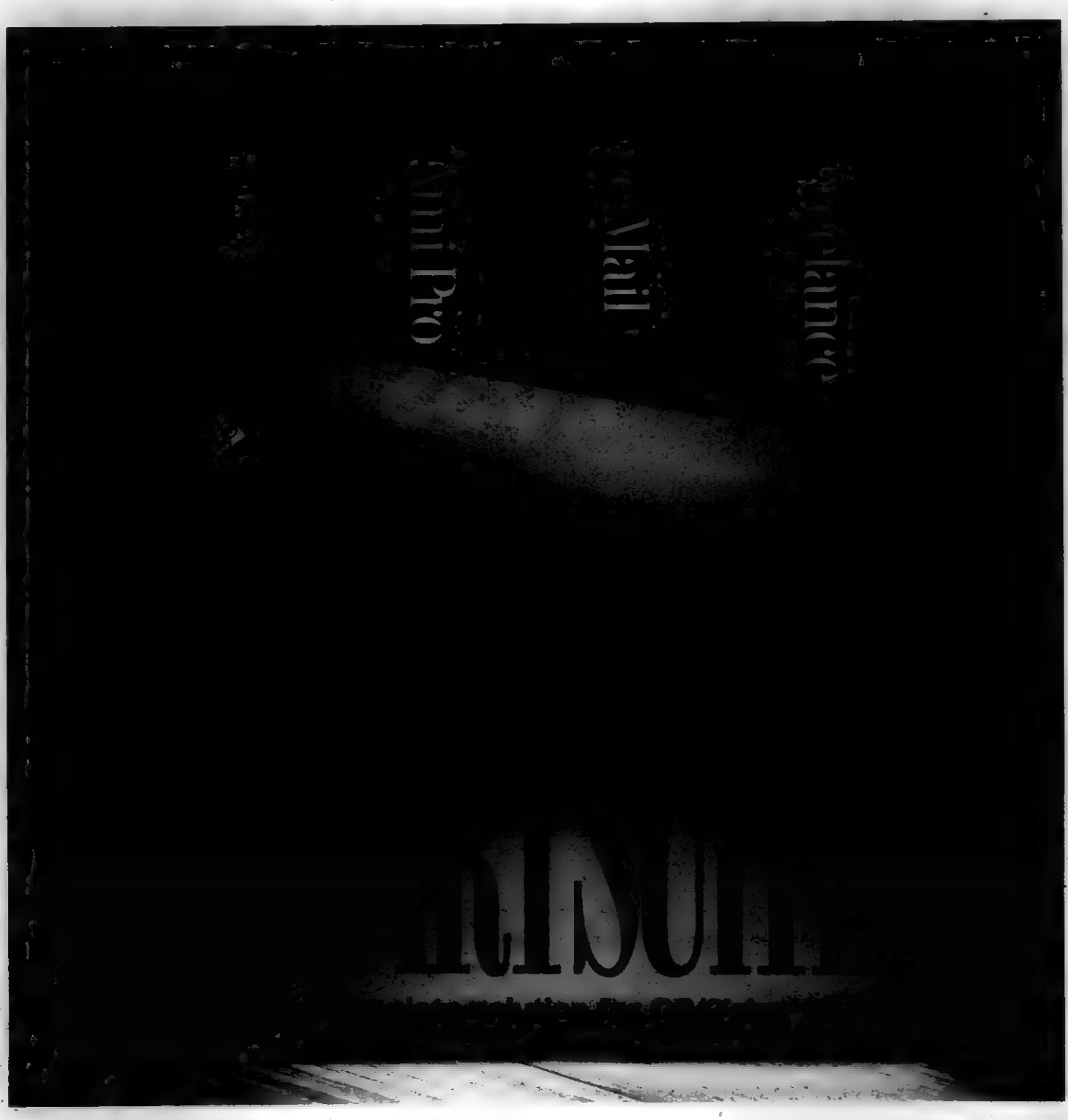

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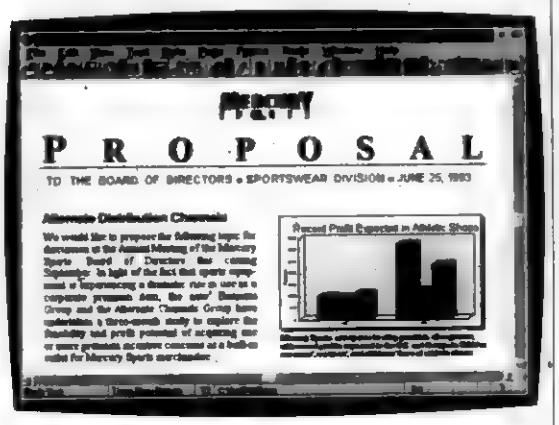

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Banks guard against electronic crimes

By Mitch Betts
WASHINGTON, D.C.

These days bank robbers are more likely to target financial networks with names such as Fedwire, Swift and Chips than break into a bank vault. Consequently, most major banks now carry insurance policies for electronic crimes, according to the American Bankers Association.

An annual survey of 376 banks indicated that better than 90% of medium-size and large banks have insurance policies that cover crimes involving computer systems or electronic funds transfer (EFT) networks.

The vast majority get the electronic crime coverage via a rider that supplements their basic "financial institution bond" coverage for criminal acts.

However, a handful of the banks surveyed (8%) carry a separate insurance policy specifically for electronic crimes, the Washington, D.C.-based trade association reported.

"While electronic payment systems offer speed, cost efficiency and convenience, they have replaced the bank vault as a target for criminal violations," according to the association's report on bank insurance.

Smaller community banks were less likely to have insurance for high-tech crimes.

For example, coverage for computer viruses and telephone toll fraud is growing in popularity among the larger banks but has little acceptance among small community banks, the survey found.

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A2EBWC

Briefs

Bellcore to open ATM lab

Bellcore, the research and technical services arm of the regional Bell telephone companies, plans to open an Asynchronous Transfer Mode (ATM) interoperability laboratory at its Red Bank, N.J., facility at the end of the month. The purpose of the installation is to spur deployment of mixed-vendor ATM networks. Customers who are interested in ATM can subscribe to a newsletter that tracks the interoperability progress of participating vendors.

Cisco tests switch

Meanwhile, Cisco Systems, Inc. said it has successfully tested its high-end Cisco 7000 router with five vendors' ATM switches: Fore Systems, Inc., GTE Corp., NEC Corp., Newbridge Networks Corp. and TRW, Inc.

Intel picks Fourth Wave

Intel Corp. has licensed Fourth Wave Technologies, Inc.'s wireless messaging software with plans to incorporate it into its LANDesk Manager network monitoring system. The idea is to allow companies to notify LAN administrators of network conditions by alphanumeric pagers.

Remote, mobile user help

IBM and Shiva Corp. in Burlington, Mass., said they will jointly develop remote networking technology to allow mobile and remote users of IBM computers to access data and communicate with corporate offices as though they were on the corporate internetwork.

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Digital Communications Associates, Inc. has announced Remote LAN Node Version 2.0, client/server remote-access software.

Remote LAN Node Version 2.0 features a new modular architecture plus enhancements such as Token Ring support, Simple Network Management Protocol, an application programming interface (API) and a Windows client interface.

A Remote LAN Node API is included that enables system administrators to write programs that integrate Remote LAN Node client functionality within their end-user application. According to the Alpharetta, Ga., company, Remote LAN Node Version 2.0 supports challenge handshake authentication protocol, enhanced data encryption, connection time restrictions and password aging.

Remote LAN Node Version 2.0 provides an authentication services model that enables organizations to add multiple servers and communicate with one another to verify password information and user identification.

Remote LAN Node Version 2.0 Ethernet prices begin at $795. Remote LAN Node Version 2.0 Token Ring prices start at $995.

▶ *Digital Communications Associates*
(404) 442-4000

BlueLine Software, Inc. and **MultiStream Systems, Inc.** have introduced Hypertape — a multivendor, multiprotocol, automated network backup and recovery software package. The product was developed by MultiStream.

According to Minneapolis-based BlueLine, Hypertape provides automatic, unattended backup of workstations, departmental servers and enterprise servers.

The product can copy data transparently from local disks to tape, optical and other magnetic storage media. Throughout the enterprise, Hypertape enables organizations to centrally manage backup and recovery procedures. Hypertape is used with a variety of Unix implementations.

Hypertape consists of three components: Control Node, Backup Node and Service Node. Supported network protocols such as Digital Equipment Corp.'s DECnet or TCP/IP can be used as a path between nodes.

A permanent license for Hypertape starts at $35,000 for a three-node configuration.

▶ *BlueLine Software*
(612) 542-1072

Frye Computer Systems, Inc. has announced Version 1.5 of The Frye Utilities for Networks-NetWare Early Warning System, its network monitoring product.

According to the Boston firm, this version offers the addition of file monitoring, multiple server configurations, automatic baselining, scheduled monitoring, print queue monitoring, more response and security options, automatic logging of all messages to screen and log files.

The Frye Utilities for Networks-NetWare Early Warning System Version 1.5 costs $495.

▶ *Frye Computer Systems*
(617) 451-5400

Motorola/UDS has introduced BitRUNR, a family of high-performance, multiprotocol, dial-up internetworking routers.

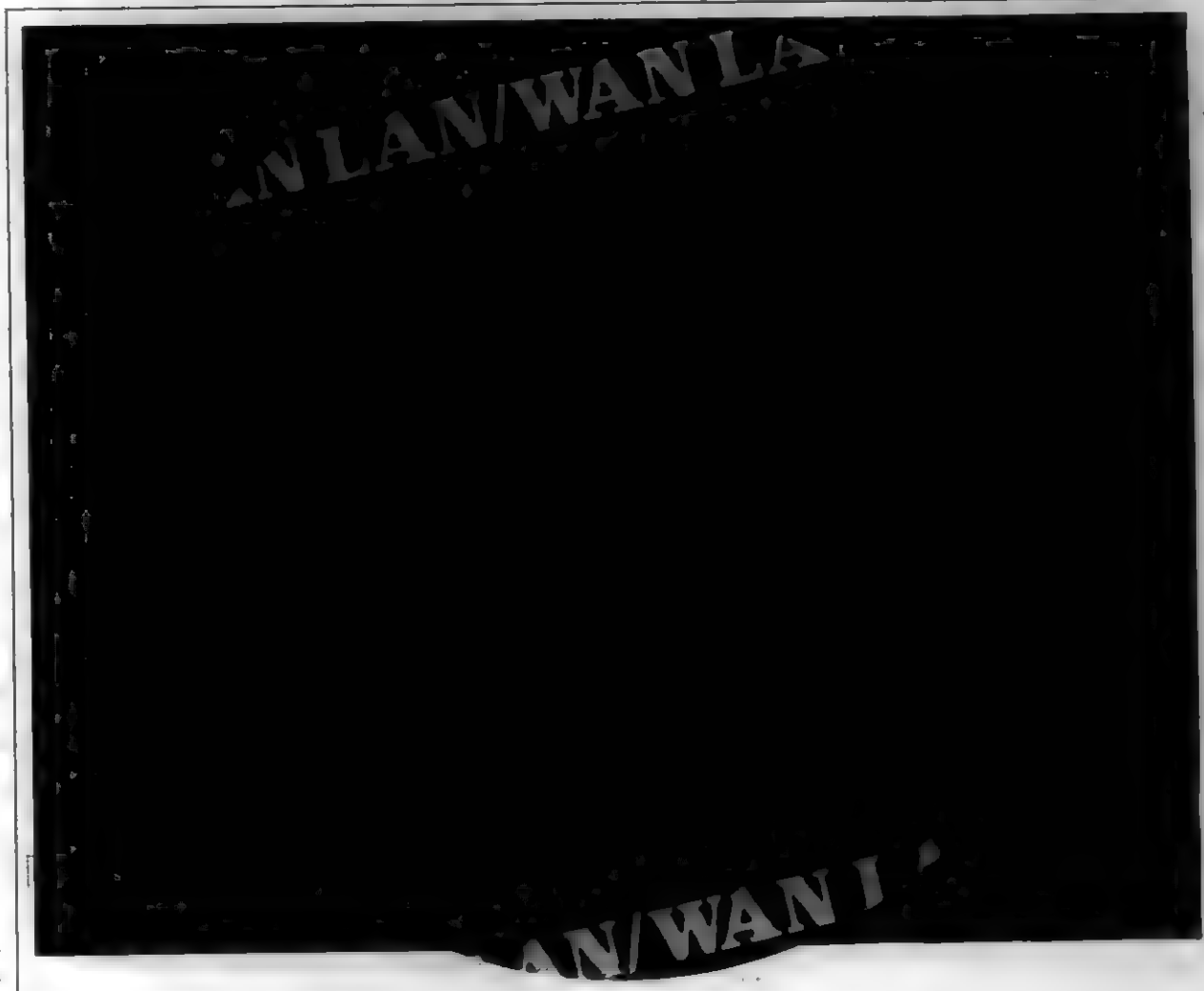
According to the Hunstville, Ala., company, the BitRUNR Turbo CS and the BitRUNR XP are two of the industry's first dial-up routers to simultaneously support TCP/IP, Novell, Inc.'s NetWare IPX and Apple Computer, Inc.'s AppleTalk protocols for network access and high-speed wide-area network connections.

Designed for central site applications, the Turbo CS is expandable from four to 26 asynchronous ports, up to three T1/E1 synchronous ports and up to six 128K bit/sec. WAN connections. Both products include connectivity options for both Token Ring and Ethernet networks.

BitRUNR XP was created for remote offices or small central site networks. A basic configuration of the unit provides three asynchronous WAN ports and one Ethernet card. BitRUNR can be expanded to accommodate up to 19 WAN connections.

Pricing begins at $2,495.

▶ *Motorola/UDS*
(205) 430-8000



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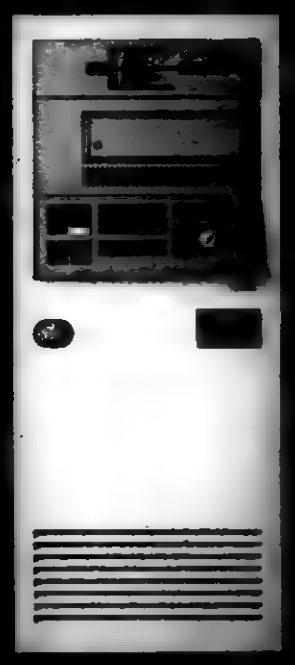

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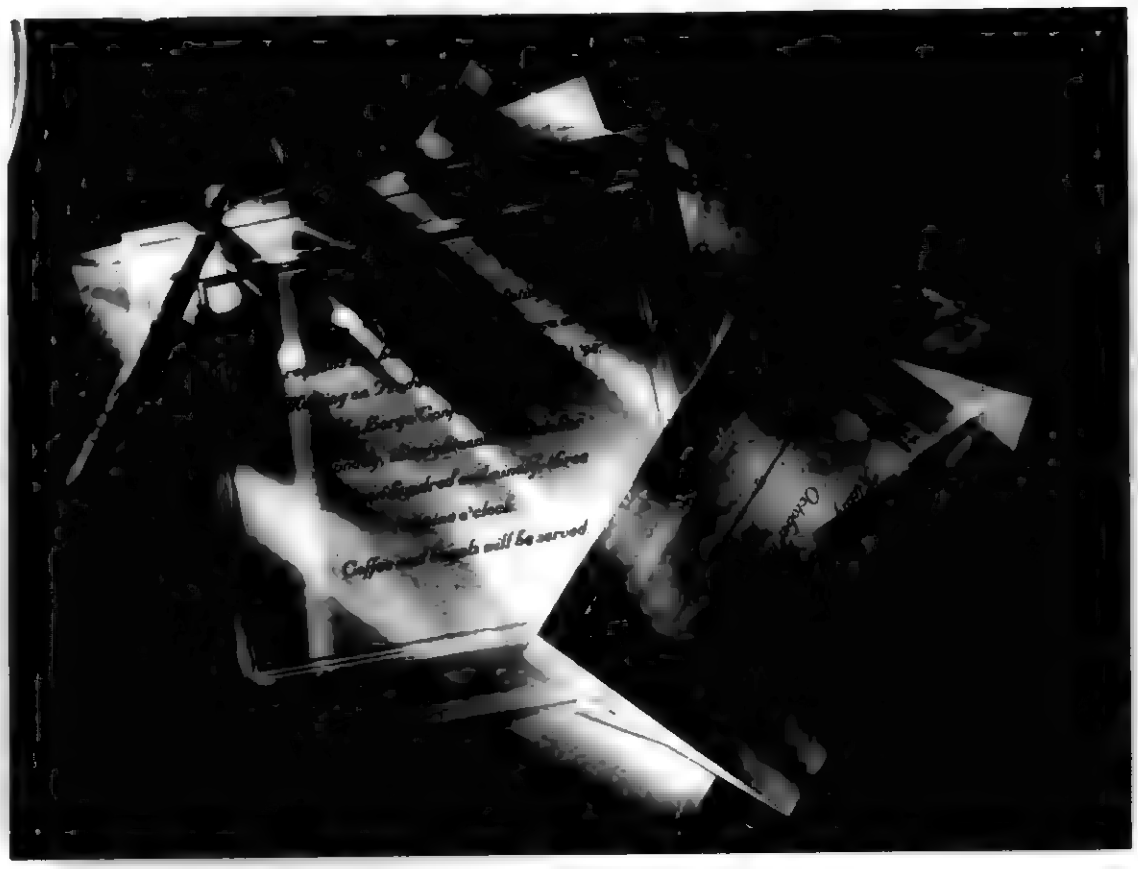

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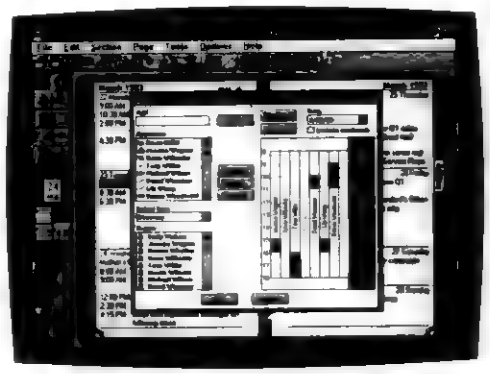

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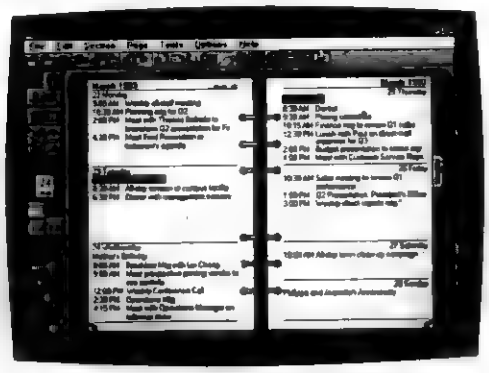

With an on-screen calendar, a to-do list, an address book, a note pad and an anniversary reminder built into one package, Organizer is a powerful personal tool that's fun to use.

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Piece of profit pie key to Perot deal

By Mark Halper
PARIS

When the information systems chief at Europcar International found his shop choking on costs, he decided it was time for the drastic Heimlich maneuver.

To administer the jolt, he hired Perot Systems Corp. and embraced a client/server outsourcing agreement based on a radical concept that may breathe life into other IS partnerships of the '90s: revenue sharing.

Robert Verasdonck, director of IS at Europcar, recalled that before the Perot contract was signed in January 1991, "We were getting more and more strangled. We were looking at 20% growth of IT costs and 14% revenue growth."

So Europcar and Perot worked out a 10-year deal that calls for the rental car company — Europe's largest — to pay Perot a percentage of Europcar revenue after the second year. Payments are fee-based through December.

Perot and its subcontractors are burning the midnight oil trying to transfer operations by that time from Europcar's old, hierarchical systems to a distributed environment built largely on NCR Corp. Unix computers. Perot is also responsible for operating Europcar's mainframes in the meantime.

ON SITE

Europcar International
Paris

Challenge: To replace outdated, incompatible systems in varied nations while keeping IS costs low.

Strategy: Outsourcing agreement with Perot Systems under which Perot will carry out the system replacement for a share of Europcar's increased revenue.

Status: After delays, several new systems now on-line and others expected by year's end.

Piece of the pie

While Verasdonck declined to disclose Perot's exact revenue share, he said it is less than half of the 6.8% of revenue that Europcar's information technology operation has been spending.

The price thus provides Perot's guarantee that Europcar will improve its information technology machinery by one of the most commonly applied yardsticks: costs as a percentage of revenue.

But the incentives built into the price model go beyond cost cutting. The revenue side of the equation gives Perot greater motivation to develop

Europcar, *page 101*

IBM's 'no-price tags' policy no problem for customers

By Johanna Ambrosio

Customers say IBM's no-price tags policy for its new mainframes has pretty much meant business as usual. The policy has not played out along the lines that some had feared when the company abolished prices for its newest big machines in February.

Back then, some had questioned IBM's policy of each mainframe being essentially special ordered, with prices negotiated depending on what the customer wanted for the total package — including service and support — and how much business the customer did with IBM each year. Some users' biggest gripe was they would not know what a "good" deal was if there was no basic price from which to start negotiating.

But that has not happened, and instead, the large customer base has felt very little, if any, impact. "It hasn't been an overly big deal," said Larry Bacon, senior vice president at The Travelers Corp. in Hartford, Conn. "We never knew what the price really was anyway. So what's new?"

John Wood, vice president for computing and communications at the Royal Bank of Canada, agreed. "The list price is an incidental number. It's really no different than it's ever been," Wood said.

Where there's a will, there's a price

IBM's official stance notwithstanding, users have lots of sources for pricing information. Within a few weeks of the February announcement, analysts from International Data Corp., Gartner Group, Inc. and Meta Group, Inc. started providing their best estimates as to what the machines are selling for. Gartner Group's current price, according to analyst Jim Cassell, is $62,500 per million instructions per second (MIPS).

Craig Goldman, chief information officer at The Chase Manhattan Bank NA in New York, said the bank "has always found ways to get what we believe is good price/performance, including purchasing non-IBM products."

Customers such as The Travelers' Larry Bacon *said they have noticed little change with IBM's 'no-price tags' policy. 'We never knew what the price really was anyway. So what's new?'*

Even with no price tags, customers said, the fundamentals still apply. Included among the tried-and-true negotiating tactics used by many of IBM's largest accounts are the following:

- Looking at the per-MIPS prices of used equipment.
- Demanding that all competing players provide one, and only one, bid rather than getting into a protracted price war.

IBM, *page 103*

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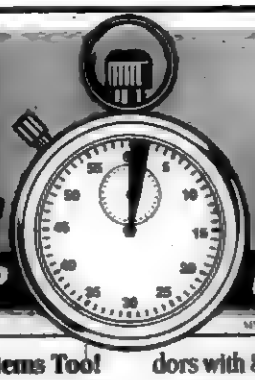

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IBM to allow AS/400 clustering

By Craig Stedman

IBM's Application Business Systems unit plans next year to add clustering capabilities to the AS/400 that executives said would push the midrange computer line's raw performance up into the rarified air occupied by the high end of the company's ES/9000 mainframes.

John Thompson, senior vice president and general manager of Application Business Systems, said at a recent press conference that pilot installations of AS/400s clustered via the Fibre Channel interconnect are scheduled at customer sites for the first quarter of 1994. He did not specify when general availability is expected.

The AS/400 architecture allows clusters of up to 32 systems, but an unspecified smaller number will be supported at first, Thompson said. He noted that maximum AS/400 throughput, now about one-third the performance of a high-end, air-cooled ES/9000, should increase by three or four times once clustering is available.

Marc Cohn, senior vice president of information systems at Enterprise Rent A Car Co. in St. Louis, said Application Business Systems officials talked in early briefings on the clustering concept about linking six to 10 machines out of the chute. However, that was not presented as a definite plan, he added.

The first clusters may not support a single system image, under which they would look like one large machine, Cohn said. Instead, IBM appears to be planning to set them up as client/server-style platforms where one AS/400 would act as a server for others; the single image concept would be added in a later release.

Nevertheless, observers said the clustering capabilities should provide an upgrade path for large AS/400 shops and increase the line's appeal as a downsizing platform for mainframe users. Clustered AS/400s "will attract a great number of people using traditional mainframes," said David Andrews, managing partner of ADM Consulting, Inc. in Cheshire, Conn.

Cohn said he expects clustering to be an "extraordinarily valuable" way to support larger transaction loads. Enterprise Rent A Car has 10 AS/400s.

DDM too slow

AS/400 machines can already be linked in an ad hoc fashion through IBM's Distributed Data Management (DDM) software, which finds files on remote systems and treats them as if they were stored locally, Cohn said. But performance is "intolerably slow" with DDM, he added.

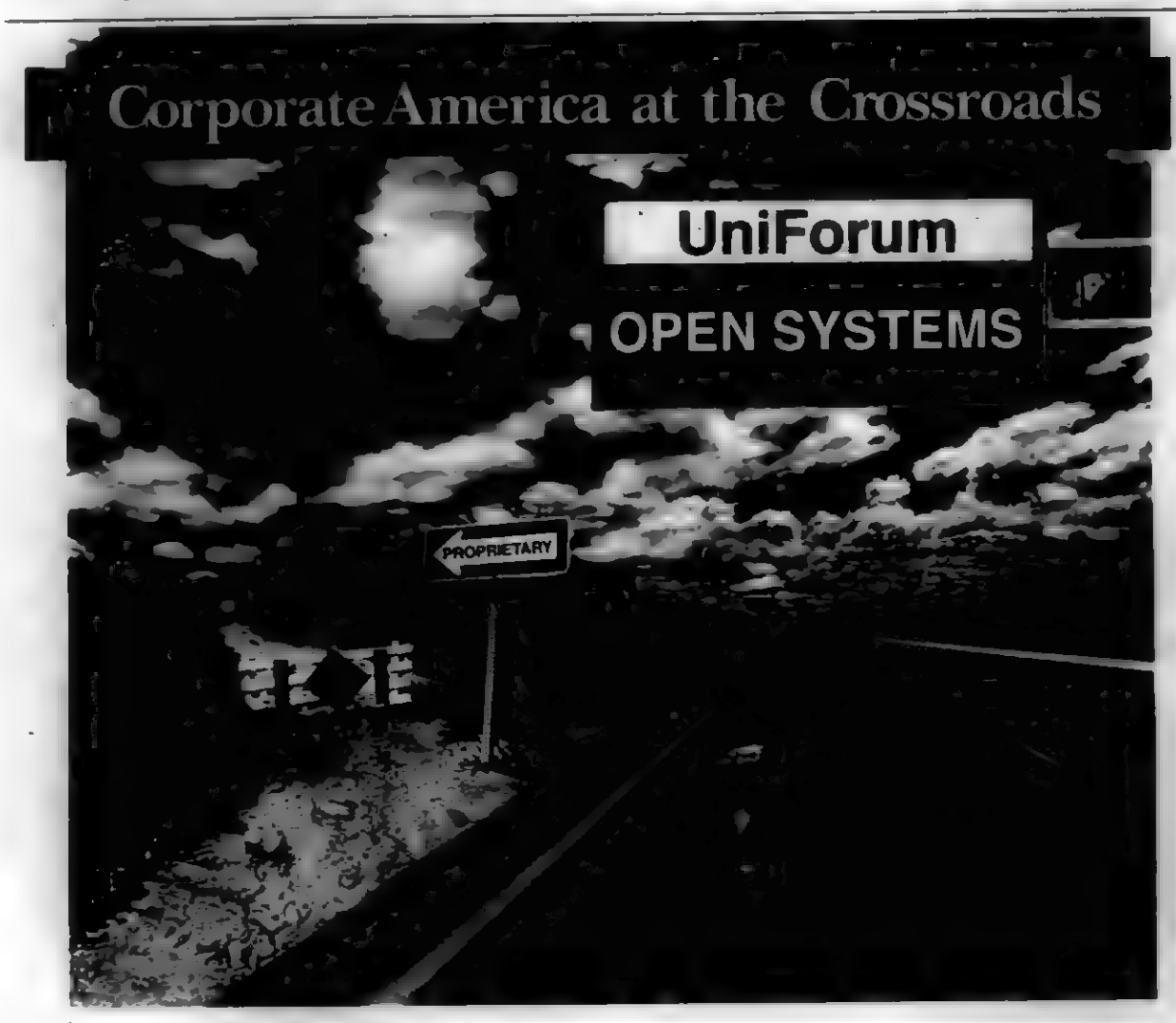
"You can look at 20-second response times, which are totally unacceptable in a point-of-sale application," Cohn said. Implementing DDM also is a time-consuming process, and the development tools for creating DDM-based applications "aren't very good," he noted.

Scott Plumer, technical support project manager at Gannett Co.'s data center in Silver Spring, Md., said the high-availability features that are possible in a clustered system would be useful. The clustering approach also sounds more beneficial than just building larger multiprocessors, he added.

However, the AS/400's storage capacity and I/O throughput would have to be increased to make it a true mainframe-class system, Plumer noted. "They have some serious things besides [processing] power that they need to fix before they can even be considered" as an equivalent to a mainframe, he said.

Downsizing from mainframes currently accounts for 600 to 700 AS/400 system sales a year, Thompson said. However, that business is coming primarily from users of IBM's older 4300 series mainframes "who wouldn't tend to go to an ES/9000 anyway," he added.

Application Business Systems is not looking to steal away much business from the ES/9000 line with the clustering plan, Thompson insisted. "I don't ever expect to be able to do real large-scale computing" with the AS/400, he said.



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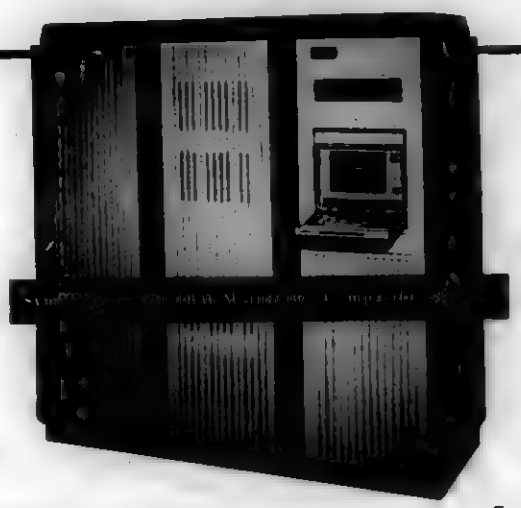

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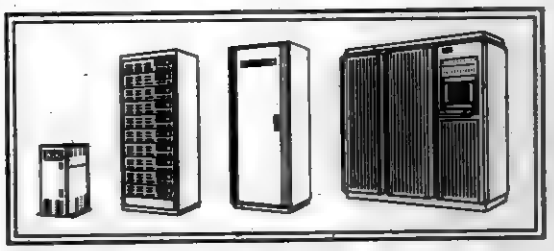

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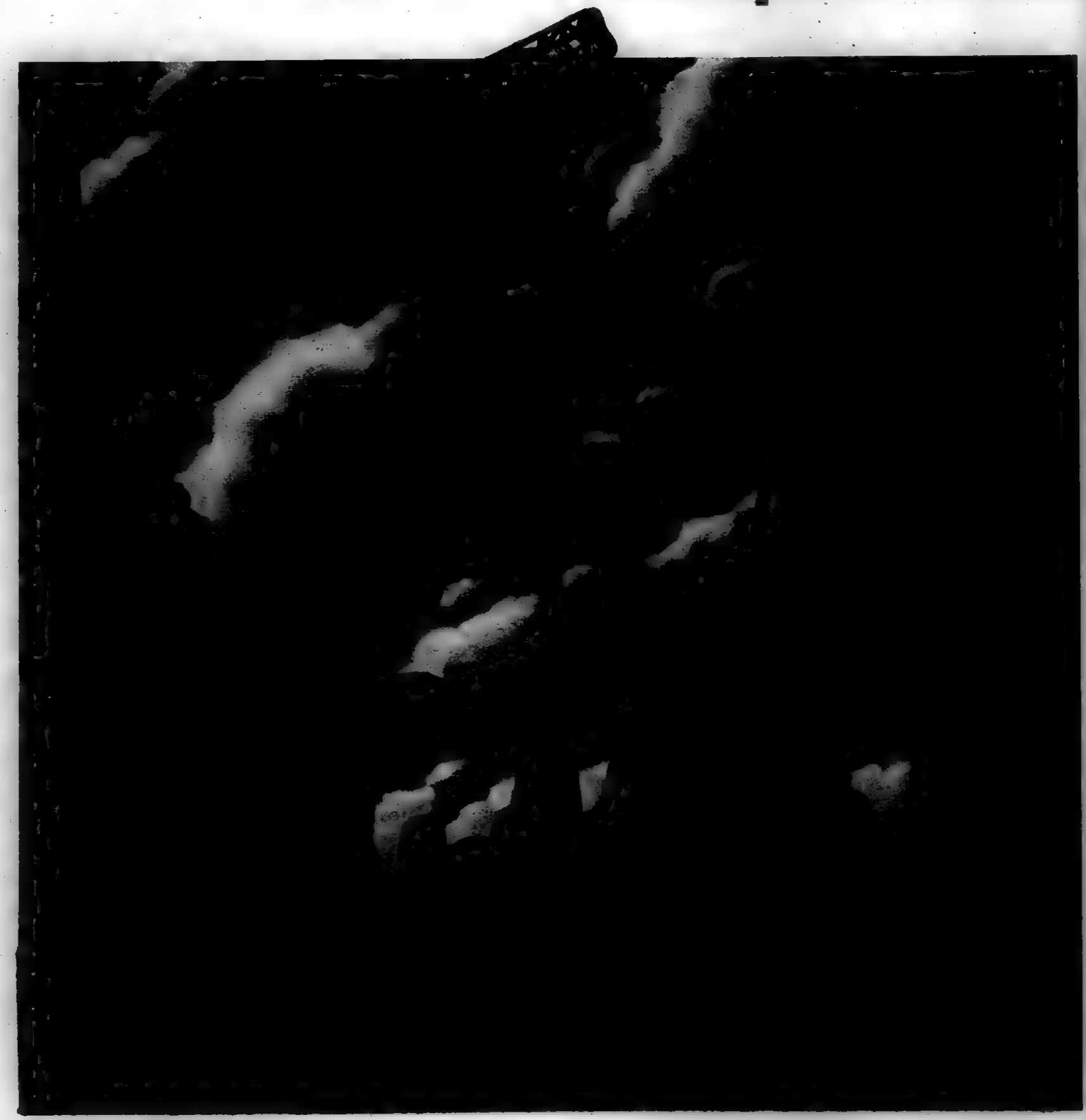

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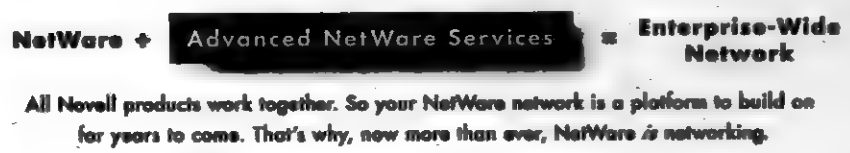

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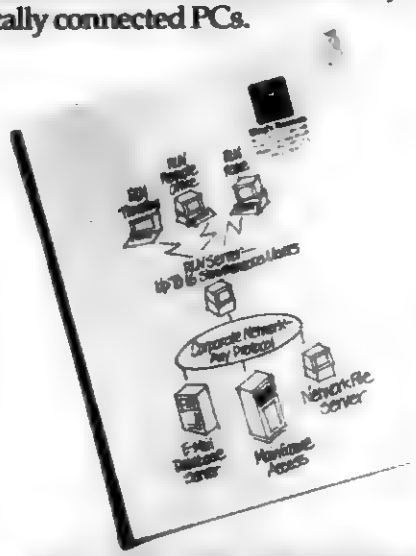

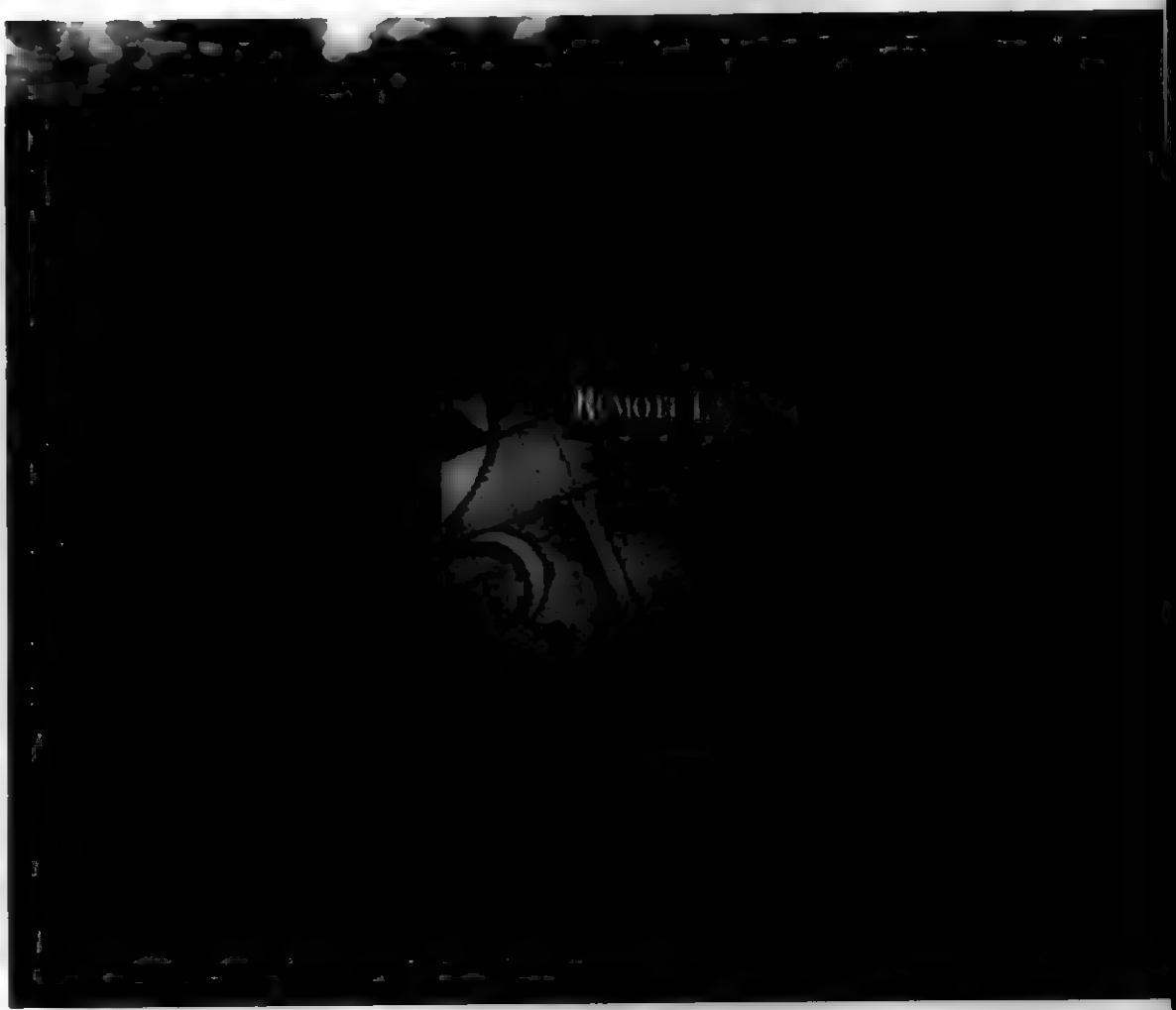

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The report went on to say, "Our winner, DCA's RLN, stood out for its capability to handle multiple communications protocols," commenting that "it won hands-down on flexibility, allowing our remote users to connect to both IPX and IP servers in the same call."

All in all, the report concluded, if you're looking for versatility, "None of the other units we tested came close."

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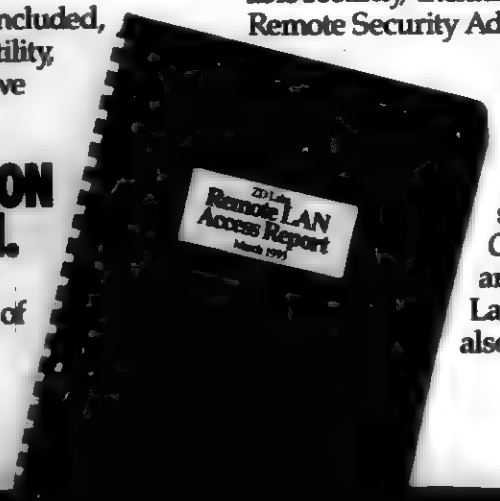

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Supercomputers sound storm alert

Advanced warning model pinpoints severe weather systems

Unravel technology

By Ellis Booker

As the summer's devastating Midwestern floods proved time and again, weather forecasts are valued not only for their accuracy but also for their timeliness.

Almost nowhere is advance warning more important than in the case of severe weather, when a pinpoint prediction can mean the difference between life and death.

Warning extension

The University of Oklahoma recently pushed the science of forecasting severe storms to new heights with the aid of a Cray Research, Inc. supercomputer at the Pittsburgh Supercomputing Center. The collaboration resulted in a computer model — the Advanced Regional Prediction System (ARPS) — that greatly extends the amount of warning Oklahoma weather-watchers can give.

The model could stretch the 30 minutes of warning given today to four or five hours, according to its creators at the University of Oklahoma's Center for Analysis and Prediction of Storms.

In addition, ARPS should be able to identify individual storms and their potential for spawning tornadoes.

Unique application

Powerful computers are no strangers to weather forecasting, of course. However, the amount of computer horsepower devoted to the Oklahoma project was unique.

During a trial at the height of the storm season in May, forecasters at the National Weather Service's Experimental Forecast Facility in Norman, Okla., transmitted local weather data across the Internet to a Cray C90 supercomputer in Pittsburgh.

The results, calculated on four of the C90's 16 processors over a 45-minute period, were available by 1 p.m. each day, in time for the afternoon forecast.

A high point in the test was the model's successful prediction of the general characteristics and motion of the severe storms that swept through Oklahoma on Mother's Day weekend, May 8 and 9.

According to researchers, the test was also the first time such a complex, supercomputer-based storm model was made part of an "operational" weather forecast.

A full-scale ARPS trial is slated for next year.

In a numerically modeled supercell storm, *the white shows the cloud water field and the yellow contours on the ground show the pour of rain-cooled air spreading out beneath the storm*

Predicting the worst

A computer model that successfully re-created an observed 1992 undersea earthquake and subsequent tidal wave, or tsunami, off the coast of Nicaragua has been applied to the Northern California coastline.

It suggests that this area, too, might be vulnerable.

"We're still working on a model to predict precisely the tsunami's height and the coastline area [involved]," said Kenji Satake, an assistant professor at the University of Michigan's Department of Geological Sciences.

The analysis does not seek to predict where these catastrophic waves will occur but rather simulates the effects of such waves against different shorelines.

Researchers wrote in the July 23 issue of *Science* magazine that the area near Cape Mendocino should be on the watch for tidal waves, which could lash the coastline for as long as eight hours.

Tsunamis, generated by geological shocks, travel at speeds of approximately 500 mph in the deep ocean and grow rapidly when they reach shallow waters. The April 1992 quake off the shore of Nicaragua resulted in 40-foot waves.

—Ellis Booker

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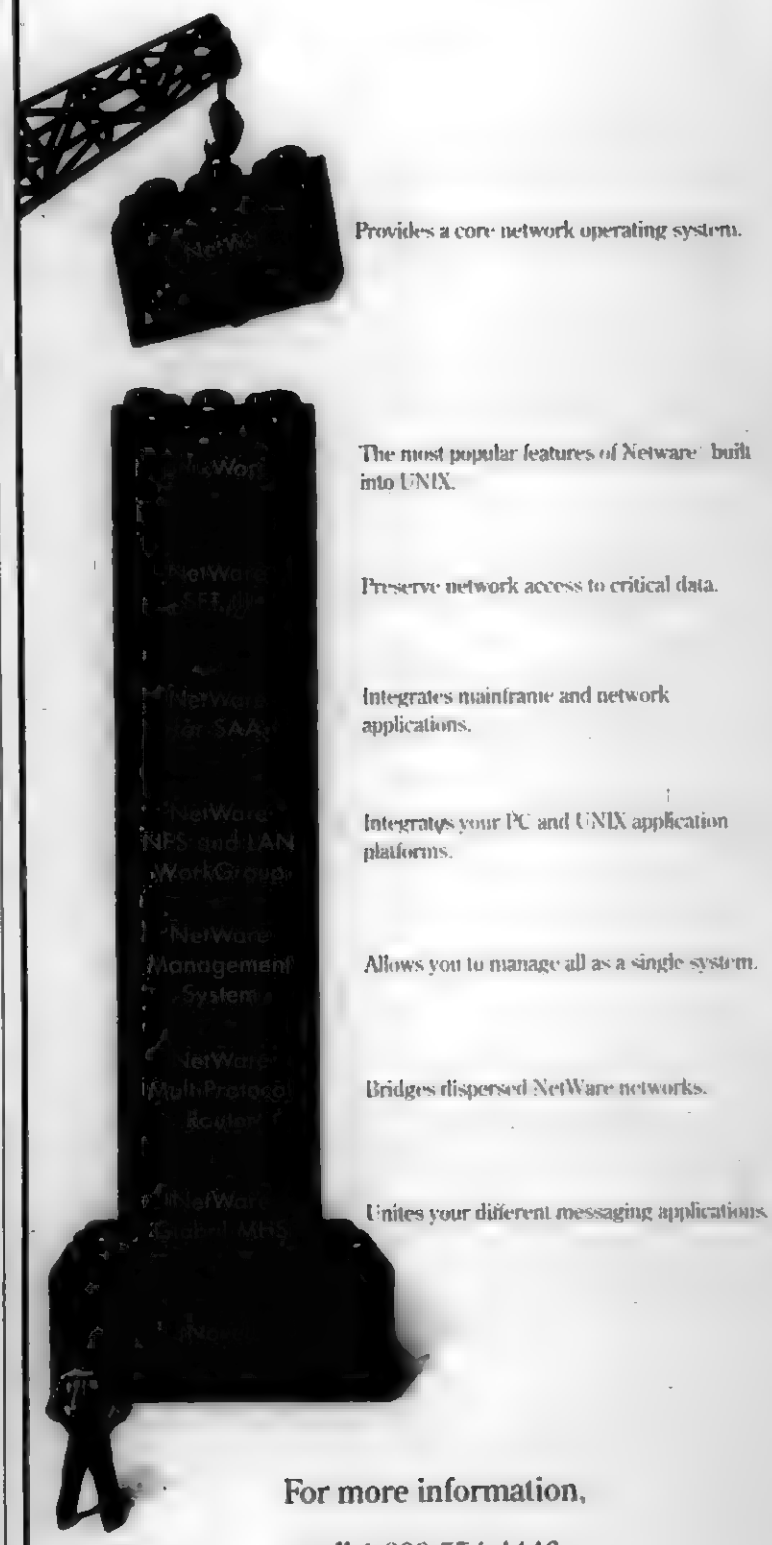

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LBMS

Europcar

CONTINED FROM PAGE 93

and apply technology that will make Europcar a livelier business.

More money coming into the Europcar coffers means more money for Perot. Verasdonck estimates the value of the deal at around $500 million, but that figure stands to rise or fall with the fortunes of Europcar's business.

Europcar's Robert Verasdonck: *Europcar desperately needs the overhaul that Perot is bringing*

According to Verasdonck, the revenue aspect of the deal will benefit Europcar more than the cost-saving side. While the company expects annual cost reductions of about $5 million, it anticipates revenue gains of "five to 10 times that," Verasdonck said.

The IS director acknowledged that Europcar desperately needs the technology overhaul that Perot is bringing. Europcar has been running some 55 different systems across Europe and other international sites, and many of the applications do not talk to one another effectively.

Verasdonck explained that Europcar's strength has been servicing customers traveling within countries, while the incompatible systems have left support of international travelers as a weak spot.

How is it all going as Perot and Europcar approach the two-year cutover point?

Perot is dismantling a system in which two IBM mainframes in Paris house several programs accessed by a multitude of country systems, each running their own databases.

The mainframe operations are being moved to two NCR 3600 boxes and a half-dozen NCR 3550s housing a huge Oracle Corp. Oracle 7 database.

Perot and subcontractors are developing and installing numerous applications under the umbrella program known as Greenway.

Greenway's software elements include reservations, sales and marketing, Oracle financials, fleet management, yield management, decision support, reporting, control and cost-optimization programs, all drawing from massive databases housed and backed up on the NCR boxes.

Perot is also developing hooks to other computerized reservation systems, some of which it has already completed.

After recovering from an early stumble that pushed some deadlines back by two months [CW, March 1], the project is now on schedule, Verasdonck said.

As evidence, he noted that Europcar's reservation system went live in May, meaning the company is now using the NCR-based platform for the daily routine of booking cars for customers.

The maiden voyage for counter systems — the computers that process rentals when customers arrive to pick up their cars — was launched on time in July, when two sites went live in Germany.

Since then, Perot has also turned on counter systems at six locations in Amsterdam and is preparing for a rapid rollout that would entail switching 1,000 sites to the new counter system by Dec. 6.

An Oracle financial system is up and running in the Netherlands, and it is scheduled to come online in Belgium and the UK later this month, with installations to follow in most of the rest of Europe by the end of this year. The company's fleet control system went live in early July, although it is only useful to the sites where the counter systems are live, Verasdonck said.

The yield management system is also live but will take a year to serve its purpose because it needs historical data to perform its function: helping Europcar determine what rates work best so that cars are not sitting idle.

Potholes

Even the smallest client/server conversions seldom go off without a hitch, so it is not surprising that Perot Systems' massive Europcar project has incurred setbacks.

Among the surprises along the way, Europcar discovered that the memory management was faulty on the Oracle 7 database. Europcar Director of IS Robert Verasdonck said Oracle supplied patches late last month, and he is confident the program will provide sufficient response times.

A couple of problems stemmed from outside factors.

For one, Germany's public phone company, Deutsche Bundespost, has fallen behind in installing phone lines that would connect various locations in Germany both intra- and internationally.

Another delay came from Europcar's U.S. marketing partner, National Car Rental System, Inc., which balked at co-funding a project in which National's outsourcer, Electronic Data Systems Corp., and Perot were to have linked the two companies' systems. Verasdonck said National only recently committed funds, and work began about a year after the intended start date.

The Perot Europcar project got off to a rocky start almost two years ago when changes in development tools and business plans for accommodating Europcar affiliates pushed back deadlines [CW, March 1]. — *Mark Halper*

Briefs

IBM appointments

IBM recently named Lutz E. Hahne to be IBM vice president and general manager, Application Solutions. Hahne will report to Patrick A. Toole, IBM senior vice president, manufacturing and development. Hahne replaces M. Bernard Puckett, who in June was named IBM senior vice president, corporate strategy and development. Application Solutions is responsible for developing software and hardware for specific industries.

FileNet gains

Document imaging pioneer FileNet Corp. in Costa Mesa, Calif., announced it has made a record number of customer shipments in the second quarter, signing up nine new U.S. and 14 new international accounts.

Monsanto safety initiative

Monsanto Co. has installed a document imaging system from FileNet at one of its chemical plants as part of a project to support the federal government's process safety management guidelines and ISO 9000 quality initiatives. Monsanto is looking at a range of other applications and may eventually develop an enterprisewide imaging system, FileNet said.

CA user group meeting

The Information User Association (IUA), a Computer Associates International, Inc. user group, will hold its first annual practitioner's workshop on Oct. 19 in Memphis. The workshop is intended to enable users to share experiences in working with various CA software products.

Mortgage processing

Western Bank has purchased NCR Corp.'s Document Management System to facilitate its mortgage loan processing.

Disaster recovery moves

IBM is transferring operations of its disaster recovery center in Franklin Lakes, N.J., to Sterling Forest, N.Y. The new disaster recovery center was scheduled to open last week.

IBM's Business Recovery Services (BRS) hot-site unit for the AS/400 added capabilities allowing AS/400 users whose computers have been knocked out of service to recover their data from remote system consoles that can be located on-site rather than at an IBM facility. The AS/400 Remote Support Option is being included in the overall monthly cost of the BRS service, which ranges up to the $100,000 level. BRS, which is part of IBM's Integrated Systems Solutions Corp. subsidiary, also now supports the high-end AS/400 F95.

Library license

Concentric Data Systems, Inc. has licensed Q+E Software's Q+E Database Library software for use as the base technology in a new SQL version of Concentric's R&R Report Writer data access and reporting tool for Windows PCs. Q+E's other licensees include Microsoft Corp., Computer Associates and Lotus Development Corp.

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[redacted]

Software

Platinum Technology, Inc. has announced Platinum Package/It, a conversion, maintenance and analysis tool.

According to the Oakbrook Terrace, Ill.-based company, Package/It was designed for database administrators who want to save resources by consolidating their database request modules into packages.

Automated conversion and ongoing package maintenance facilities include an unconversion option for database administrators who want a packaged "unpackaged." In addition, the product can perform after-conversion analysis of package use and misuse and load module analysis.

Prices for Platinum's Package/It range from $15,180 to $103,150, depending on CPU size.

▶ *Platinum Technology*
(708) 620-5000

Mitchem Technologies, Inc. has introduced The Allocation Control Center (ACC) and The Space Recovery System (SRS).

The products are fully compatible with all IBM MVS systems, including MVS/ESA and MVS/XA.

According to the Madison, Ga.-based company, ACC and SRS provide an affordable way to manage data set allocation and eliminate space abends. ACC is a full-featured allocation control package, offering enhanced volume selection, direct-access storage device and tape pooling and extensive user-defined messaging facilities.

Out-of-space conditions resulting in B37, D37 and E37 abends and VSAM errors are removed by SRS.

Pricing begins at $4,500 for ACC and $8,500 for SRS.

▶ *Mitchem Technologies*
(706) 342-7600

Hardware

Xerox Corp. has introduced the Xerox 4890 HighLight Color Laser Printing System, a product that can operate up to 92 pages per minute.

The 4890 offers an enhanced electronic subsystem with increased input options, an expanded color palette, color job queue management facility and 300 dot/in. resolution.

According to the Stamford, Conn., company, the 4890 was designed for monthly print volumes of up to 2 million pages.

An on-line configuration of the Xerox 4890 costs $232,500.

▶ *Xerox Corp.*
(203) 968-3000

IBM policy

CONTINUED FROM PAGE 93

•Where possible, sharing information about recent deals among users.

However, Cassell cautioned, "you have to keep very close track of the deals, so customers don't have misleading expectations."

What one user pays for a single machine may actually be higher per-MIPS than, say, a huge account that buys four mainframes with the promise to upgrade in 18 months, Cassell said.

Still, there's no doubt the bargaining process has changed irrevocably, with IBM's no-prices policy playing very little role in that change.

"In a sense, it almost becomes IBM's responsibility to justify a price," said Frank Bereznay, manager of technical services at the Auto Club of Southern California in Costa Mesa, which buys most of its gear on the used market.

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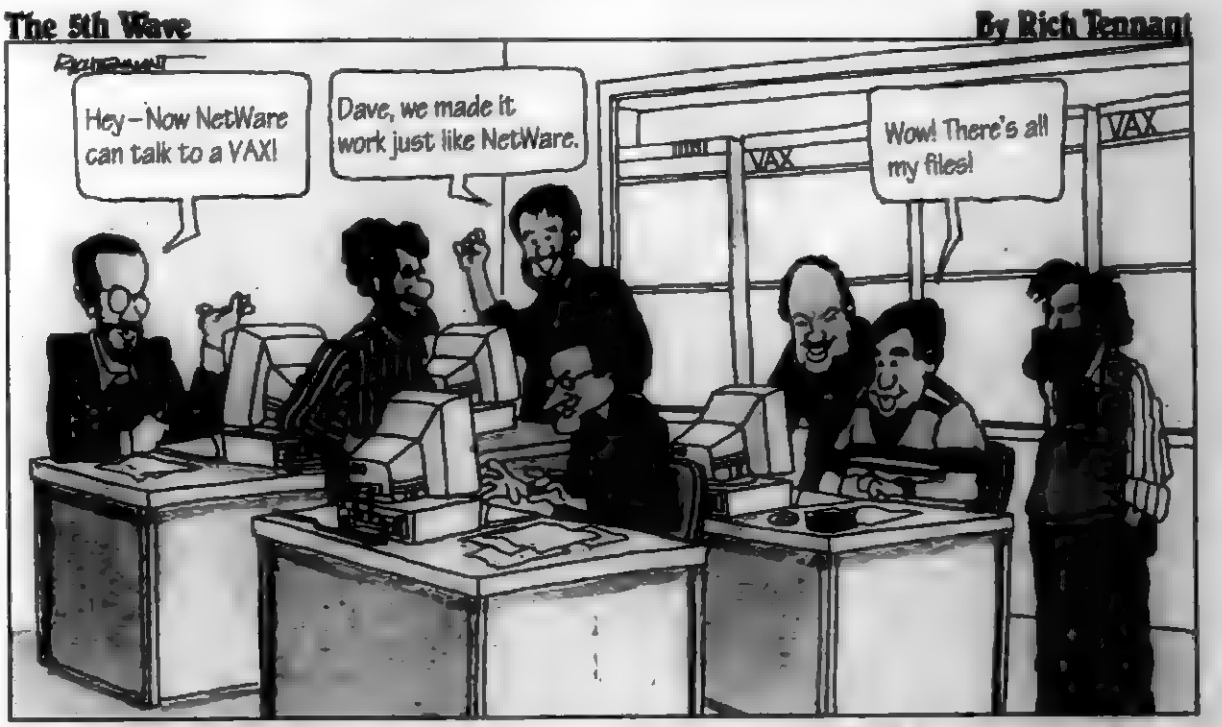
The 5th Wave By Rich Tennant



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Development tools

Death of runtime fees promises price flexibility

By Melinda-Carol Ballou

As some tools vendors eliminate runtime licensing fees, users can expect to see a gradual shift toward less expensive and more flexible licensing practices that reflect the need to distribute applications, analysts said.

Neuron Data, Inc., for instance, announced earlier this month that it is eliminating its runtime licensing fees, a move that users have enthusiastically embraced. And Progress Software Corp. will announce pricing this month for Version 7.0 of the Progress 4GL, which will no longer have runtime fees.

Some industry analysts said these moves are part of a broader trend toward higher-end development tools, following the lead of lower-end tools providers such as Powersoft, Inc., which announced it was eliminating its runtime fees earlier this year [CW, June 14]. However, others warned it will take time for additional vendors to adapt their pricing structures and that users will feel the cost elsewhere, such as in increased costs for support and services.

Heading out?

Runtime license fees may be a thing of the past if price restructuring continues

Cognos	yes	25% development fee	–	$470,000*
Neuron	no	–	–	–
Progress	no**	–	–	–
TI	yes***	–	$16,000	$16,000
Uniface	yes	10% development fee	$2,500	$30,000

*available shortly in spring **ready for OS/2 client/server ***as of June this month

High fees

Development licenses allow developers to create applications, but in order to deploy or "run" those applications, many tools vendors charge fees for runtime licenses that can range from 10% to 25% of the price of a developer's license. Although volume discounts are available, these costs can mount considerably for those who deploy their applications across an enterprise network of hundreds or even thousands of machines.

The Aerospace and Defense Sector of Hughes Aircraft Co. in Fullerton, Calif., will be able to save a significant amount of money on deployment when Neuron Data eliminates its runtime fees, said Pat Wright, a systems engineer there.

"We do a lot of development for the military, and they are looking for ways to save money," he said. "They are trying to cut costs wherever they can, and they don't tend to [need only] one of a particular system — they want many. Especially if they like it, they may want another 300,000 [copies]."

Looking for lower prices

Even if a tool offers significantly better functionality, information systems managers who are up against a budget wall have to at least consider the lower-priced options, according to Don De Palma, an analyst at Forrester Research, Inc., a Cambridge, Mass., consulting firm.

"PC software has set the pricing pace, with desktop software in the $49 to $2,000 price range, and users now have the perception that software should cost less regardless of where it is. Users just don't want to pay runtimes, and the price deflation in the market is going to affect everyone," De Palma said. He added that at a minimum, sales cycles are being extended to include the lower-end vendors.

"Let's say you have Powersoft at one quarter the price with 75% of the functionality — anyone will stop to think twice about that proposition," he said.

On the other hand, users are likely to pay the fees if it saves them development costs.

"It would be wonderful [not to have to pay] the runtime fees because we pay an awful lot for around 150 runtime licenses," said Carro Meacham, a director at Johnson & Johnson who uses Progress 4GL. "But I would rather pay runtimes than double the cost of my development and maintenance [by using a less functional tool] — that would cripple me."

In any case, users are likely to feel the hit elsewhere. With Progress' new pricing structure, for instance, runtime prices are

Runtime, *page 108*

Database makers jump on replication

By Kim S. Nash
ALAMEDA, CALIF.

Data replication is the latest hot button for database vendors. The ASK Group, Inc. last week announced a replicator designed to duplicate and synchronize databases spread out in remote user sites. Oracle Corp., meanwhile, plans to demonstrate enhancements to its replication features next week at its annual user conference.

Taken with Sybase, Inc.'s product announcement in June [CW, June 7], one might think that users cannot wait to get their hands on this kind of technology. Truth is, while there are early adopters for whom database replication soothes a contorted client/server muscle, most database users do not need the technology right now, observers said.

"Replication techniques are good, but we don't need them for most applications," said Bill Menger, a database consultant at Conoco, Inc., an oil company in Houston. Looking broadly at the range of applications Conoco runs, replication is suitable for a specialized handful of systems, Menger said.

For example, Conoco's bulletin board-style system replicates oil drilling and processing data on ASK's Ingres databases for approximately 250 users at five sites worldwide (see story page 116). "There's no need to do similar things with many of our systems, though," Menger said, referring to applications such as accounting and manufacturing.

Nevertheless, replication is sure to become more of an issue as client/server systems grow. So, too, will the subtleties of various replication methods become more important, said Mike Heylin, an analyst at Creative Strategies Research International in San Jose, Calif.

"You'll want to know exactly how your database is going to be replicating data in order to create

Data replication, *page 116*

Sidebar

Ingres/Replicator is in beta testing at no sites and is priced at 35% of the cost of an Ingres database until January. After that, prices will be adjusted, said The ASK Group's Russ Donovan. Translation: Prices are going up, so if you want to buy, now's the time.

Product: Ingres/Replicator. Ship date: December. Product: Oracle enhancements. Ship date: Not available, but will be part of Oracle 7 database. Product: Sybase Replication Server. Ship date: December.

Gupta links with CASE tools

By Kim S. Nash
SAN FRANCISCO

It's no Middle East peace accord, but client/server development companies are shaking hands with computer-aided software engineering (CASE) rivals. Gupta Corp. is the latest in a series of toolmakers to plan links between their application generation products and the front-end analysis and design offerings of old-line CASE makers.

Gupta's CASE links are part of a five-step plan called Tools Integrated into the Enterprise (TIE), announced this month at the company's annual developers' conference here.

"Generation tools [from] Gupta and Powersoft lack analysis and design capabilities that old-line CASE provides," said Aaron Zornes, an analyst at Meta Group, Inc. in Burlingame, Calif. "No one can get by alone nowadays."

TIE is a coherent effort to get Gupta tools talking to as many third-party development products as possible, said Umang Gupta, chairman and chief executive officer. He stressed that bridges between Gupta database and graphical development tools are one part of TIE. Also on the agenda are several other methods for bridging Gupta's SQLBase database, SQLWindows fourth-generation language and TeamWindows project management program with popular databases and CASE tools.

Other TIE components include the following:

- Open Database Connectivity, Integrated Database Application Programming Interface and other links to relational databases.
- Class libraries connecting SQLWindows to information sources, such as bar code scanners, networking gear and Microsoft Corp.'s Visual Basic development kit.
- Interfaces to scripting languages in future operating systems such as IBM and Apple Computer, Inc.'s Taligent and Novell, Inc.'s AppWare.
- Custom links requested by users.

Work has begun on each of these initiatives, Gupta said. The company built several class libraries into SQLWindows 4.0, which shipped in April. The company is also "working hard" with Novell on connections to the networking company's AppWare application development environment for building distributed systems.

Forming a team

Rival Powersoft Corp. has also announced partnerships during the past few months with three of the same CASE vendors enlisted by Gupta: Bachman Information Systems, Inc., LBMS, Inc. and Intersolv, Inc.

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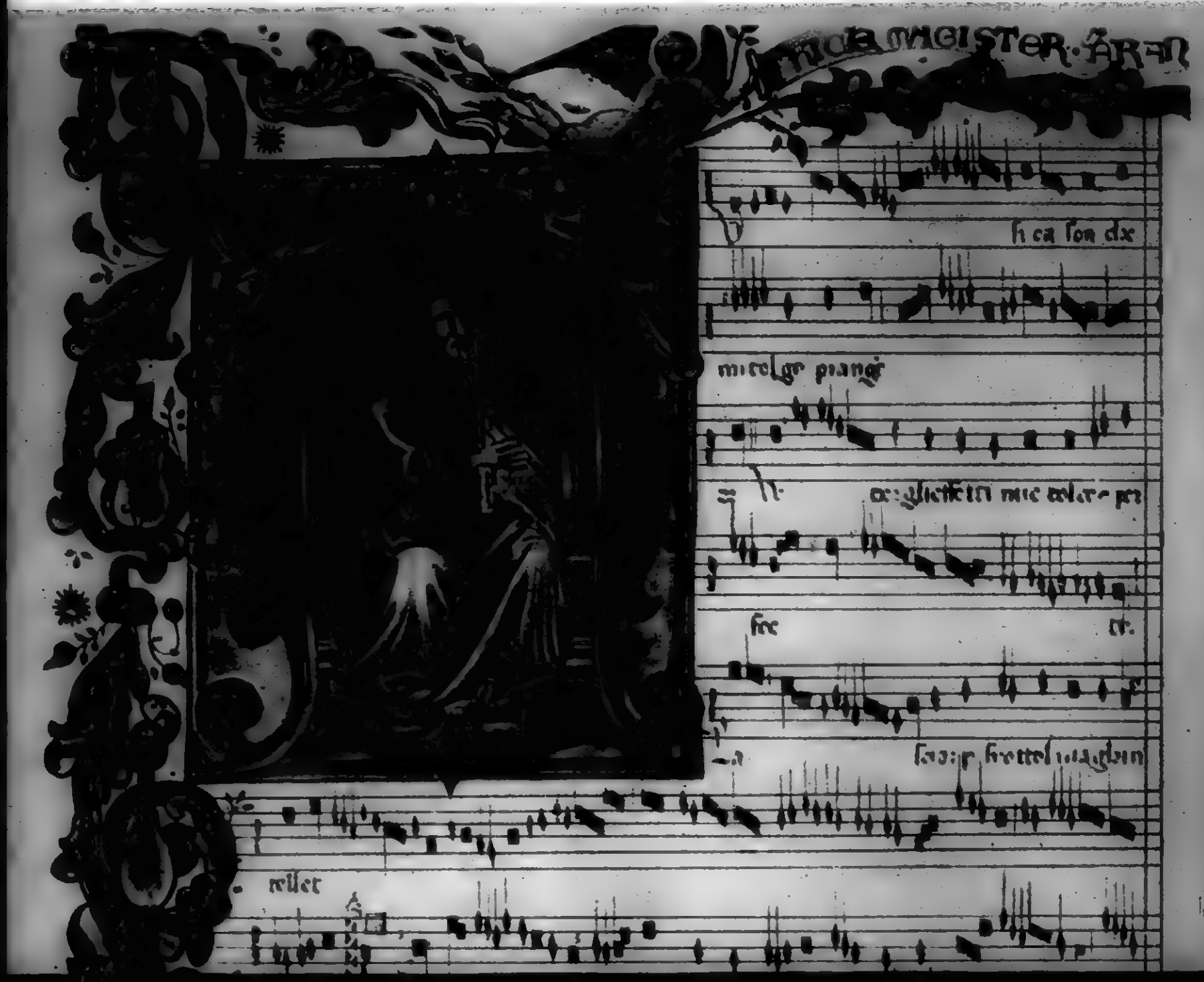

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Windows-to-DOS tools get boost

By Melinda-Carol Ballou
MORRISTOWN, N.J.

Wingate Technologies, a division of Mitech Corp., is now shipping a low-level tool set that will allow users to integrate DOS programs with Windows 3.1 services and applications directly from DOS, company officials said.

The set, also called Wingate, includes a virtual device driver that offers bidirectional pipelines to facilitate communication among multiple DOS and Windows applications, they said. The device driver provides a global memory buffer for Windows and DOS programs.

Users who communicate between DOS and Windows applications usually create their own message-based information-passing schemes that require the overhead of putting information into a file and then reading it. The direct access to data through the global memory with Wingate avoids an I/O bottleneck, according to Wingate officials.

Also available with Wingate are application programming interfaces to 36 Windows functions and support for a range of 16-bit or 32-bit class libraries and a series of Windows routines. These include WGClip for accessing the Windows clipboard from DOS, WGSpawn for launching Windows applications from DOS, WGKill for terminating those applications and WGDDE for sending data and Dynamic Data Exchange commands from DOS to Windows servers.

Corporate sites with a range of DOS applications seeking to bring in Windows said they need a seamless link between the two operating environments.

"In a nutshell, the issue is that we have DOS systems that are too large to rewrite," said Wally Bockholdt, manager of information technology at Aetna Life & Casualty Co. in Windsor, Conn. "We are looking to use Windows as an umbrella and we want to fit our DOS [applications] beneath Windows, but we need to have the applications talk to each other without a lot of hassles. We need a very seamless DOS-to-Windows transport which is fast and not apparent to the user."

Aetna is evaluating the Wingate tools. Industry analysts said the Wingate product may be useful as an interim tool until Microsoft ships Chicago, its next-generation operating system.

"There's no doubt that if you have a DOS-to-Windows problem today, Wingate sure looks like it beats rolling your own code. But over the long term, Microsoft's stated direction is to make this [connection] nearly transparent with Chicago," said Peter Kastner, a vice president at Aberdeen Group, a Boston consulting firm.

He added, however, that developers and independent software vendors confused about their long-term Windows migration strategy and whether or not to use Win32, Win32s or Win32c, "might want to spend $300 on Wingate to see how they can put a Windows face on their existing code" with minimal effort.

The Wingate developer's tool kit costs $295. Wingate offers libraries for C, C++, Pascal, Basic, and Microsoft Corp.'s Visual Basic, Visual C++ and Foxpro, among other languages.

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COMPUTERWORLD

Runtime fees

CONTINUED FROM PAGE 105

eliminated, but the tiered, user-based pricing the company is now introducing will make the shift a "wash" for some users and may cost others more, company officials said.

Other analysts said the real push for a change in licensing structures is unlikely to come on the Unix side unless and until Microsoft Corp.'s Windows NT begins competing against Unix, and vendors such as Boriand International, Inc. and Microsoft begin competing in this space.

"In the third-party 4GL market, there's no dominant player who can cause the prices to go drastically down and control the market," said Rich Finkelstein, president of Performance Computing, a market research firm in Chicago. He added that Sybase, Inc. and Oracle Corp. tend to keep their prices high but could force the third-party market prices down if they chose to do so.

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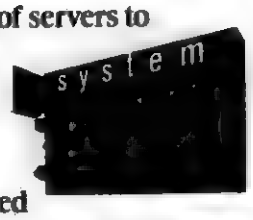

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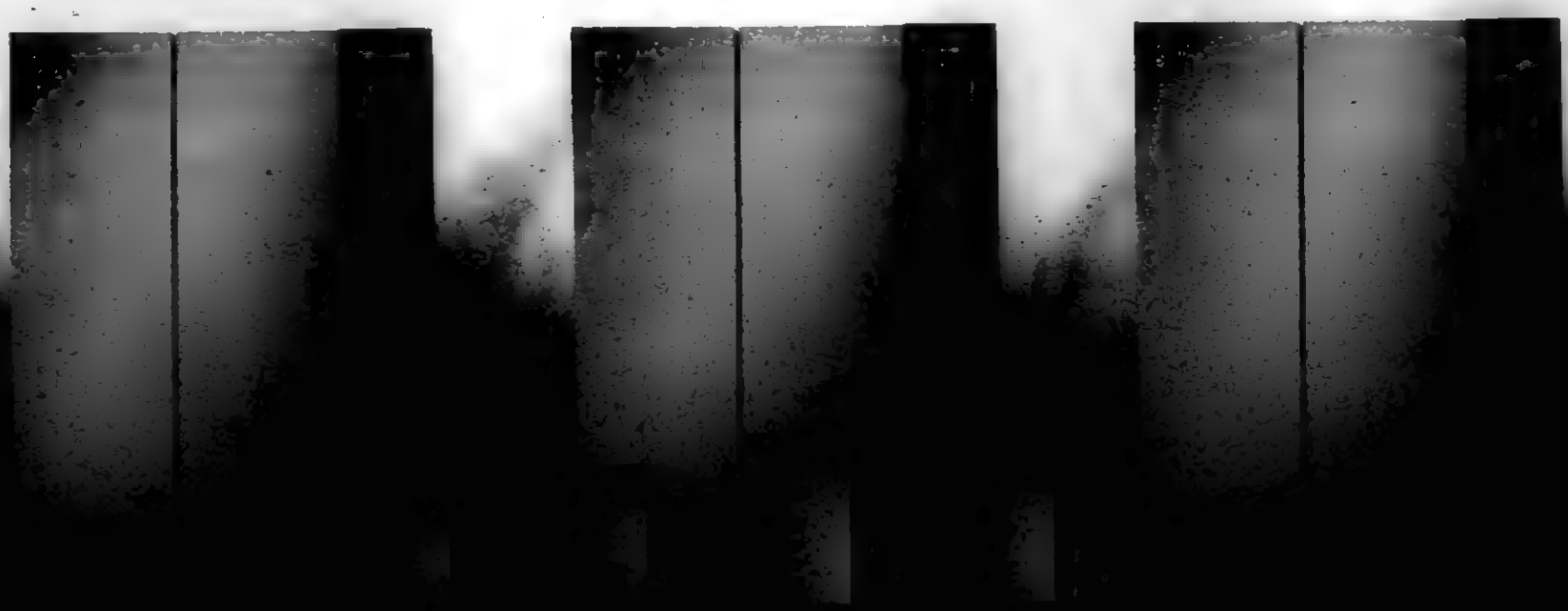

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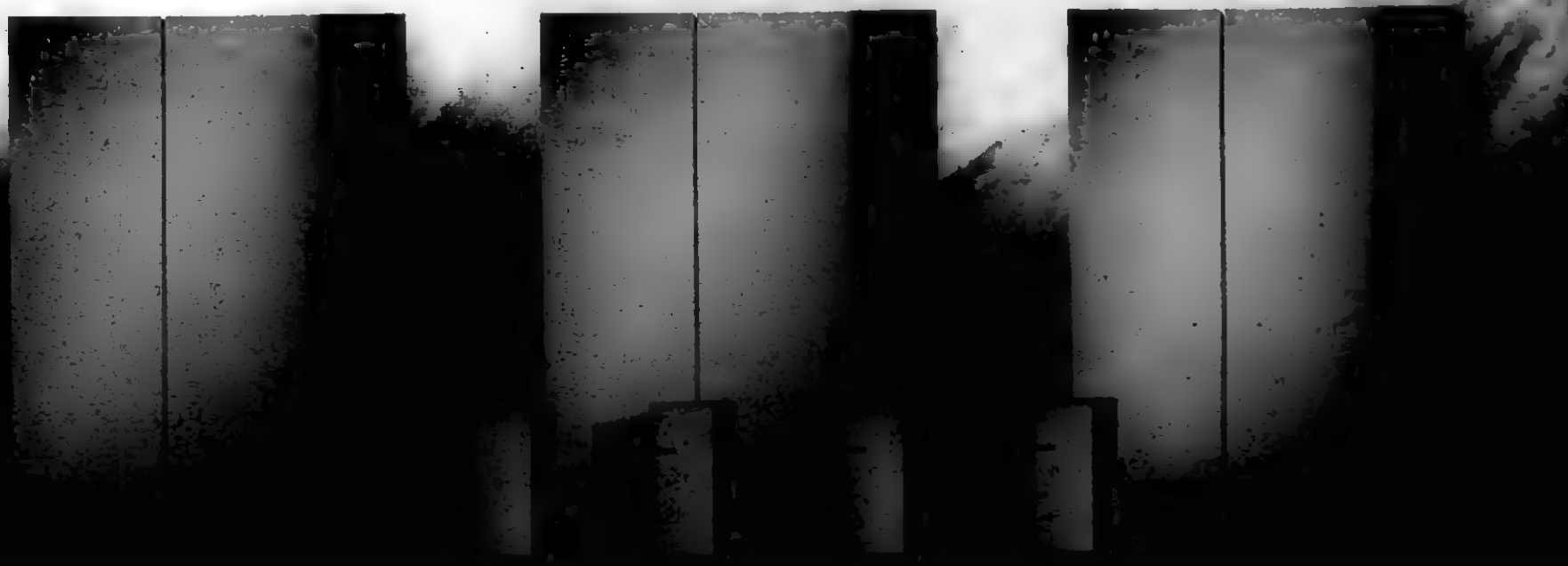

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Scott H. Koehler

How to handle objects

Many companies are diving into object-oriented development. Unfortunately, as is the case with any new and radically different development approach, a certain percentage of those efforts will crash and burn. In the interest of minimizing the casualties, I'd like to describe a successful project I worked on at a large insurance company, starting in June 1991.

The system being built was a business application that models and processes the company's insurance products. This system was one part of a larger initiative, but it was a critical part that could have thrown off the effort.

What the company did to contribute to that success was approach object technology in a limited and controlled way appropriate to the political climate and the circumstances of the project. It did not jump in with both feet, declaring, "We're doing objects now," but confined the work with objects to a well-bounded application.

Although other areas later suffered from not being objectified (my assessement), limiting the exposure was proper given staffing restrictions and the need to limit risk as well as the unexplored state of object-oriented programming at the time. (In 1991, there weren't a lot of companies working with it, particularly outside the GUI arena.)

The feasibility of working with objects was tested repeatedly, before any real work began. A paper-based design was produced and evaluated. When this showed promise, a C++ prototype of a portion of the application was built to determine if the unconventional design was indeed "codable." Once the first two tests were passed, the object approach became the preferred solution, and a traditional effort that had also been proceeding in parallel was discontinued.

The project was placed in an application group, rather than an advanced technology group. Initially, a small number of people were involved, including some of the best people in the company.

These decisions were appropriate in that the personnel were bright and willing to learn new techniques and at least one member had a vision of the end product and the experience to get there. The single significant mistake was that some individuals were required to participate involuntarily.

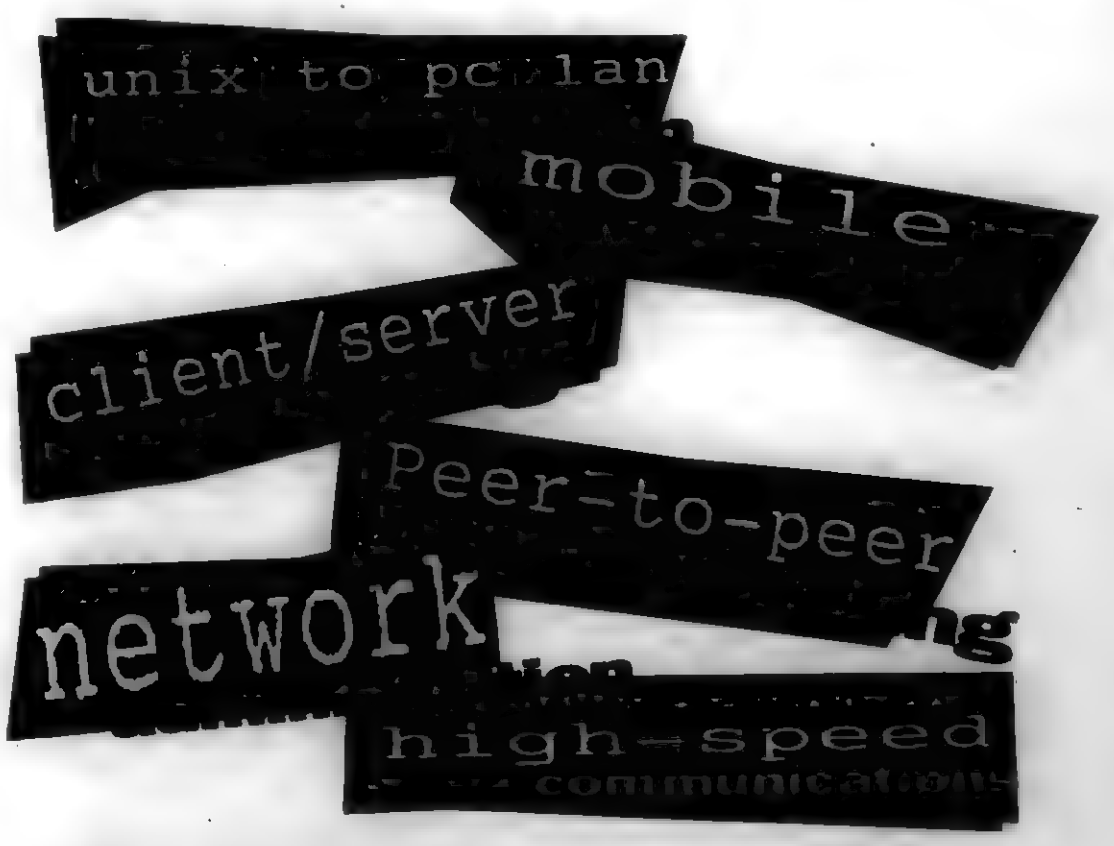
The project was not complicated by rigid methodologies, CASE tools, advanced development environments and/or object-oriented databases. Instead, the focus was on the "core" object technology: namely, C++ business objects, their behavior, attributes and their interactions. This approach eliminated many potential time-wasters on a project where timely completion was a necessity.

Much time was spent "selling" the technology throughout the company. This was critical because to say there were skeptics would be an understatement. As an outsider, I was amazed at the extent to which thinking could be influenced by company culture. When one's understanding of the business is based on Cobol modules that have existed over the years, seeing alternative solutions is difficult.

Development followed an incremental and iterative model. Construction sometimes actually outpaced the analysis and design. Management was not particularly pleased with this result because it made it difficult to track completed phases on a project plan. In retrospect, our method of monitoring progress and conveying status could have been better, although I would argue that this more dynamic method reflects the natural way to develop software.

Although the road was not without bumps and shocks, the resulting design has proved to be resilient and extensible to newly introduced products.

Koehler is the principal at Koehler Consulting in Holliston, Mass.



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Data replication

CONTINUED FROM PAGE 105

the most efficient replication scenario," Heylin said. "It's tough to understand all the varieties," he added.

Users would need to know whether they could replicate portions of a table to two different sites. If not, then two separate tables would have to be created and maintained, Heylin said.

Ingres and Oracle approach replication in decidedly different manners, he said. First of all, Ingres/Replicator is a separate product from the database. Oracle plans to enhance replication features within its Oracle 7 database.

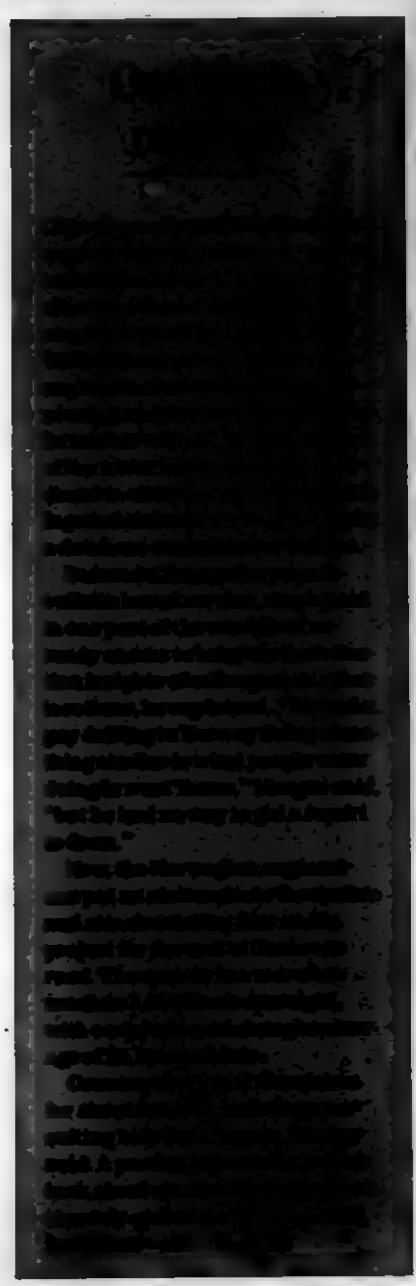
Next, Ingres replicates information down to the row and column level, with the ability to copy and synchronize different parts of the same table to different locations. Currently, Oracle replicates and disperses data by taking a picture or snapshot of an entire database, then sending it out at set intervals. Two-phase commit is the mechanism for regulating which sites get updated snapshots and when. Two-phase commit requires that each set of sender and receiver sites on the replication schedule electronically agrees to the data transfer.

That means networks have to be up. If Receiver A cannot commit to Sender B's signal for some reason — because of a malfunctioning network, for example — then replication scheduled for sites C, D, E and so on is held up.

Replication using the Ingres product is done on a transaction basis: Ingres/Replicator will move through a replication "to do" list, item by item, until each one is done. If network troubles prevent a connection from happening, the product puts that item aside and continues down the list, completing all the transactions it can. Replication at all locations is not waylaid by a lost connection at one, according to Russ Donovan, director of Ingres product marketing.

Transaction-based features that Oracle expects to show users next week veer away from two-phase commit functionality. The approach is a "hybrid" that includes an extension of the Oracle Cooperative Server's ability to process distributed queries, said David Knight, senior marketing manager for Oracle servers.

Generally, Oracle's changes step closer to the method Ingres employs, according to a source familiar with Oracle's plans. That way Oracle replication will no longer be restricted by unpredictable networks, the source said. Oracle declined to comment.



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Aetech, Inc. has announced IntegrAda for Windows.

The product provides Ada programmers with the ability to write Windows-based applications using Ada. IntegrAda for Windows combines Aetech's proprietary Ada language-sensitive tools with Windows interface features.

The product offers tools that include interactive error correction, point and click code generation, colored source code, the ability to cut and paste from standard Ada or Windows libraries and complete control over the editor, libraries, compiler (DOS or Windows), binder and linker, according to the Carlsbad, Calif., company.

Standard features include automatic indentation, "block commenting," real-time error detection and automatic capitalization to a chosen standard.

IntegrAda for Windows costs $495.

▶ *Aetech*
(619) 431-7714

CASE Methods Development Corp. has announced Synergy 2.1, a graphical user interface (GUI) computer-aided software engineering (CASE) management and control application.

Synergy 2.1 is a client/server-based product designed for both OS/2 and Windows environments. Synergy 2.1 was created for organizations that are looking for a vehicle to address their full development life cycles, according to the Richardson, Texas, company.

The product comes equipped with CASE/Framework, a comprehensive Information Engineering Methodology that covers a variety of development paths, including information strategy planning through production, and alternate paths for rapid application development, client/server development, maintenance and purchase product integration.

Other features include an integrated interface to a user's project management system, intuitive GUI and direct access to CASE tools such as KnowledgeWare, Inc.'s Application Development Workbench and Information Engineering Workbench and Texas Instruments, Inc.'s Information Engineering Facility.

Synergy 2.1 costs $42,000 for five users.

▶ *Case Methods Development*
(214) 644-8173

Product shorts

Rational has introduced Rational Apex, its Ada software engineering environment designed for Sun Microsystems, Inc.'s SPARC workstations. The product features program browsing, editing, debugging, compilation along with team-oriented configuration management and architectural support. Cost: $21,000 per license. Rational, Santa Clara, Calif. (408) 496-3600. . . . **Ideas, Inc.** has announced D-Make, a software development tool designed to reduce the total compilation time of Ada programs. D-Make provides integrated source file management and reporting tools that enable users to organize Ada source files into projects, generate static analysis reports on projects and monitor and log compilation results. Cost: ranges from $1,195 to $1,495. Ideas, Columbia, Md. (410) 312-2000. . . . **National Instruments** has introduced its LabWindows/C for Virtual Instrumentation, scientific and engineering software for developing instrumentation applications using the ANSI C programming language under Sun Microsystems Computer Corp.'s Solaris for SPARCstations and Windows. The product contains all of the necessary tools required to construct C-compatible test, measurement and control applications using Windows on a PC or X Window System on a Unix-based SPARCstation. Cost: $1,995. National Instruments, Austin, Texas (512) 794-0100.

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Don't FENCE me in

Despite vendors' best pitches, one-stop shopping for re-engineering and client/server services isn't making CIOs hoot yet

BY MARK MEHLER

SHERRINA VALERIA

The one-stop shop is the Holy Grail of information systems, the chief information officer's ticket to fast, painless re-engineering and, ultimately, Easy Street.

"Who wouldn't want to bring in a single, qualified vendor to do everything?" asks Bob Habig, vice president of IS at Pepsi-Cola North America. "It's easier, you have only one voice. It eliminates the need for all coordination and logistics and collaborative concerns. Conceptually, it's a CIO's dream."

Mel Bergstein, vice chairman of systems integration at Technology Solutions Co. (TSC) in Chicago, adds, "Buyers love one-stop shopping. It's the ultimate realization of their goal of building continuous, long-term partnerships with their software and service providers."

Smart vendors know it's an appealing fantasy, especially as more organizations race ahead with business process re-engineering, downsizing projects and client/server conversions. Many continue to take active steps toward making single-sourcing for services a reality (see chart page 120).

But there's a big problem. Despite the fervent desires of both CIOs and vendors, one-stop shopping for computer services appears to be dead on arrival.

Matthew Bender & Co. CIO Ed Diamond is cautious about using a single vendor: "You can always find new areas for improvement."

A dozen CIOs interviewed by *Computerworld* are all but unanimous in rejecting the notion that any single vendor can be best-of-breed in every discipline.

Instead, IS executives say they would much rather experience the headaches of dealing with multiple vendors than risk getting second-rate service.

Indeed, only one CIO could recall a single example of a one-stop approach to re-engineering, undoubtedly this season's most in-demand service.

Keith Kebel, vice president of information management for the $6 billion Pharmaceutical Group of Bristol-Myers

One-stop shopping, *page 120*

Mehler is a free-lance writer based in Jackson Heights, N.Y.

One-stop shop

CONTINUED FROM PAGE 119

Squibb Co., says he sought integrated services to help the drug company re-engineer to compete better in a harsh new regulatory environment.

Computer Sciences Corp. (CSC), Price Waterhouse and McKinsey & Co. all pitched their total re-engineering capabilities, but Kebel wasn't buying.

Bristol-Myers Squibb wound up choosing McKinsey to do a strategic evaluation of the business, Price Waterhouse to do some consulting on manufacturing work flows, CSC to do some sales/marketing automation work and American Management Systems, Inc. to build a managed care information system.

"Each would have loved to be our sole source," Kebel says. "But I don't believe that any of them is good enough across the full spectrum of our [re-engineering activities] to handle the whole job."

Ed Diamond, vice president and CIO at Matthew Bender & Co., a legal publisher, says he too believes in fostering close relationships with vendors. But he also doesn't buy into the one-stop shop idea for a minute.

Bender, a division of Times-Mirror Co., brought in front-end strategist Booz, Allen & Hamilton, Inc. for a process overview. The consultancy studied every internal business process.

When it came time to select a vendor to design and implement a technical plan to support those recommendations, Booz, naturally, was among the bidders. But after evaluating at least four potential vendors — Booz, Andersen Consulting, Deloitte & Touche and TSC — Bender went with TSC.

"I thought a number of them could have probably done the systems integration portion," Diamond says, "but what we didn't want was to relinquish control."

Having TSC and Booz in at different stages, he said, provided a system of checks and balances. "Specifically, TSC, while not critiquing Booz's strategy work, came in with its own insights into the re-engineering process and found potential areas of cost saving that Booz had overlooked."

For example, Diamond says, TSC was able to pinpoint a few problem spots within the order fulfillment process where handoffs (elapsed time) could be eliminated, or at least reduced.

"You can always find new areas for improvement," Diamond says.

CIO pitfalls

While IS executives report success in adopting this "best-of-breed" approach to re-engineering, they also acknowledge the problems.

Chief among them is managing a web of ongoing vendor alliances to make sure customers get what they pay for.

Fred Forman, executive vice president of Arlington, Va.-based American Management Systems, suggests that customers not wander into the project management minefield without three critical elements — an IS department capable of coordinating many activities in parallel, a strong business mission statement and an equally solid statement of architectural standards that jibes with the business goals.

Forman and several of his counterparts further advocate several steps, including forming a senior management steering committee and a "team leaders" committee.

"If someone tells you a task is 30% complete, you have no way of knowing if they are making that number up," says Forman, citing an all-too-familiar complaint. "Typically, in a systems integration job, the first 90% is easy. But that last 10% can take forever ... there has to be a concrete way of measuring progress."

"There's no magic to it," says Bristol-Myers Squibb's Kebel, whose company has established a joint vendor/client committee that meets monthly. "It's a matter of paying attention to what's happening all around you."

Culture vultures

Nevertheless, IS managers warn that personnel issues in managing multiple vendors can torpedo even the best-laid organizational plans.

Specifically, how do you get fierce competitors like Andersen, IBM and EDS to sit in the same room, let alone cooperate and share ideas?

"Other industries, like aerospace, do very well forming consortia to sell to customers," says Doug Brockway, a partner at Nolan, Norton & Co. "A few years ago, we did a bid jointly with Peat Marwick and EDS on a job at Apple where we did the strategic architecture piece. But outside of that, we haven't seen this kind of cooperation taking place in the [information technology] consulting industry."

Habig, who is spearheading a far-reaching re-engineering program at Pepsi-Cola, has devoted considerable time to solving this problem.

"By nature, our vendors are a witches' brew," he says, rattling off a roster that includes IBM, Andersen, TSC, CSC Index, Inc. and CSC Partners and NCR Corp.

"We had to make it very clear to each of them before signing any agreement that we expected them to operationalize their client-first rhetoric. The philosophy going in has to be, "We all wear Pepsi uniforms or we don't do business together."

Some intervendor relationships are more important than others, Habig says. For example, Andersen, brought in to do some pilot re-engineering work, has not had to interact much with other consultants such as CSC Index.

But CSC Partners and TSC, both of which are deep in coding, risk assessment and other ground-lev-

One-stop shopping, *page 122*

What you should do

•**Form a steering committee.** Include senior management and representatives from user, information systems and vendor constituencies. Chaired by the chief information officer, the committee should meet at least four or five times a year. Its mission is to ensure that overall business and IS goals mesh and that users gradually assume ownership of the re-engineered process. The group should also keep rough tabs on the project's progress.

•**Create 10- to 12-person "team leaders" committees.** These should meet at least weekly to chart daily progress of each individual re-engineering project.

Again, be sure to include users, IS staffers and vendors. Monitoring should focus on deliverables such as screen designs and database records design, not tasks. Groups should also ensure that the project team has sufficient PC and local-area network support.

•**Convene a joint vendor/client steering committee** that meets monthly, tracks costs and schedules against deliverables.

Software not so simple

As enticing as the possibility of one-stop shopping is on the services end, it's doubly so on the software side.

Larry Gunther, CIO of Gillette Co.'s North Atlantic Group, says he'd love to solve, once and for all, the problem of integrating disparate vendor applications and databases — a problem that is particularly acute in the open systems, client/server realm.

However, while Gunther says he does not envision any re-engineer ever achieving cross-disciplinary best-of-breed status, he holds out some hope that a single software vendor might one day come through with a suite of best-of-breed applications that could meet, say, his entire manufacturing/distribution requirement (manufacturing resource planning, inventory, capacity planning, purchasing, production planning, etc.).

"Right now, we're beginning to see [some progress on this score] in Europe, but you've still got a problem in interfacing with multiple databases. The interfaces add complexity, and the only solutions [to data redundancy] are batch-oriented, which means for a period of time, you're not running in sync."

Bill Lodge, a project manager at Turner Corp., a construction management firm, holds out no hope for any such development in the software industry.

"No one single source is ever going to be best for every application," he says. "Excel might be the best spreadsheet, Notes, the best groupware, Word the best word processing package.... Every vendor does one thing well."

Lodge, for his part, asks for no more than software that is compliant with Messaging Application Programming Interface, Vendor-Independent Messaging and other standards.

"After that, we could care less," he says. "We want to build our own off-the-shelf applications that work together as a suite."

As for suite software in general, a widely held view is offered by Computer Associates International, Inc. Executive Vice President Sanjay Kumar.

"Suite software is a marketing concept, that's all. Instead of having three application products, a company takes five and packages it in a suite. It means nothing," he says.

—Mark Mehler

What vendors are doing

Nearly everyone in the industry is trying to beef up their array of services to tempt organizations tackling re-engineering, client/server and other hot projects. Here's a quick rundown of major tactics:

•**Large integrators** such as Electronic Data Systems Corp. and Andersen Consulting have been selling themselves for years as total solutions providers, offering a range of services from strategic consulting to applications software to functional outsourcing. They will continue to do so.

•**Big hardware and software vendors** have begun emphasizing software suites they claim will provide soup-to-nuts process re-engineering capability.

High interest in re-engineering among the Fortune 1,000 is a big motivator. Vendors aim to combine numerous consulting and technical disciplines into a seamless package. That's why IBM, Unisys Corp., Digital Equipment Corp. and others are making huge investments in consulting.

Add to this growing list Oracle Corp., Microsoft Corp. and Lotus Development Corp., all angling for a piece of re-engineering action through their own fledgling consulting practices.

•**Leading strategists**, including CSC Index, Inc., Coopers & Lybrand, McKinsey & Co. and Bain & Co., have been scrambling to beef up their technical skills via internal development, acquisitions or strategic alliances.

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One-stop shopping

CONTINUED FROM PAGE 120

el implementation tasks, must work together as interchangeable parts of a task-oriented, skills-based team. Habig reports things are working out wonderfully.

Other CIOs argue that the best way of keeping a lid on cultural clashes is to designate one vendor as prime contractor, responsible for keeping everybody else in line and interfacing with the client.

Harvey Shrednick, senior vice president of IS at Corning, Inc., is a proponent of this approach. "You've got to have one face to speak to," he says. "Otherwise, it gets unwieldy."

Extra tips

A couple of additional tips on managing multiple re-engineering consultants include the following:

- Keep close tabs on scope changes in every ongoing project. Forman says it is wise to count "function points" (a metric for measuring the size of the system by tracking inputs, files, etc.).

"This is a lot easier than filling in change orders constantly and spending 80% of your time negotiating those changes with the customer," he says.

- Draw up contracts that steer away from a fixed-price mentality and emphasize risk/reward sharing. Call them "bonus pools" or "incentive clauses."
- Another example of a mutually rewarding financial incentive: joint software development deals that permit both parties to share in future revenue streams when the product is marketed commercially.
- Finally, while re-engineering presents executives with the biggest project management challenges, some CIOs say they are just as reluctant to depend on a single vendor for more routine integration or outsourcing engagements. Gerry Hogue, who manages Air Canada's financial services operations, says the airline farms out IS functions but avoids putting "all our eggs in one basket."

Air Canada has already selected Andersen Consulting to handle its revenue accounting operation but is looking at EDS, among others, to run its data centers, Hogue says.

"Even within the [relatively small world] of outsourcing," he adds, "one company can be best at applications development, another at operations. The one thing I'm most concerned about is giving any vendor an opportunity to hold a gun to our head." ■

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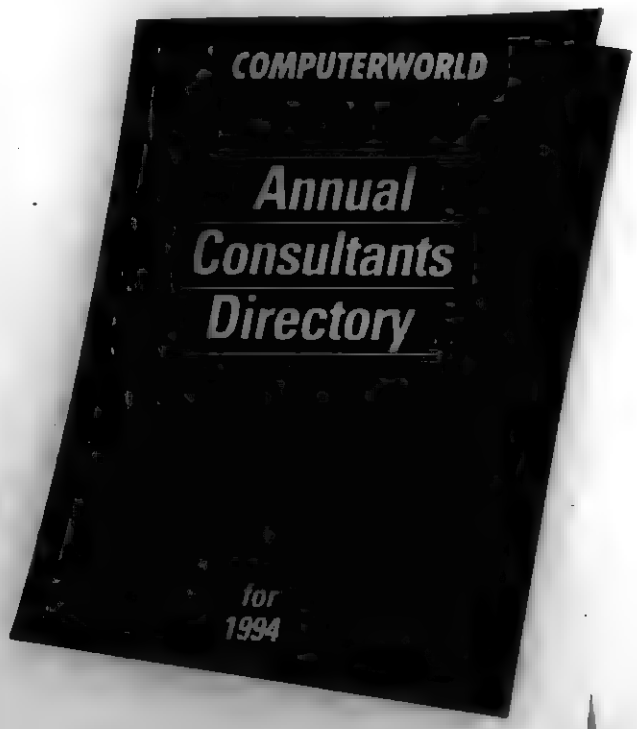

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The Ninth International Congress on Advances in Nonimpact Printing Technologies/Japan Hardcopy '93. Yokohama, Japan, Oct. 4-8 — Contact: The Society for Imaging Science and Technology, Springfield, Va. (703) 642-9090.

Networld '93. Dallas, Oct. 5-7 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

The College of Healthcare Information Management Executives (CHIME) Fall CIO Forum: "Critical Issues for CIOs." Longboat Key, Fla., Oct. 7-9 — Contact: Gail Arnett, CHIME, Ann Arbor, Mich. (313) 665-0000.

OCT. 10 - OCT. 16

Design/West. Anaheim, Calif., Oct. 10-12 — Contact: Karl Steidl, Reed Exhibition Cos., Stamford, Conn. (203) 964-0000.

RisCON '93. Chicago, Oct. 10-13 — Contact: National Retail Federation, Carrollton, Texas (800) 222-8734.

CLASS '93 (Client/Server Applications and Systems Solutions). New York, Oct. 12-15 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

Fourth Annual Computer Publishing and Marketing Conference '93. San Francisco, Oct. 14 — Contact: Computer Publishing and Marketing Conference, Stamford, Conn. (800) 927-5007.

National User Applications Seminar. Atlanta, Oct. 14-15 — Contact: Bellcore TEC, Lisle, Ill. (708) 960-6000.

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   31. Programming Management, Software Developers
   41. Engineering, Scientific, R&D, Tech. Mgt.
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   13. Treasurer, Controller, Financial Officer

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   60. Government - State/Federal/Local
   65. Communications Systems/Public Utilities/Transportation
   70. Mining/Construction/Petroleum/Refining/Agriculture
   80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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   23. Dir./Mgr. Sys. Development, Sys. Architecture
   31. Programming Management, Software Developers
   41. Engineering, Scientific, R&D, Tech. Mgt.
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the HARDEST sell

ALL EYES ARE ON SALES/MARKETING DEPARTMENTS AS THE NEXT RE-ENGINEERING TARGET. UNFORTUNATELY, TODAY'S SOFTWARE OFFERINGS CAN ONLY DO SO MUCH TO HELP.

DID YOU KNOW... . . . that the average sales rep spends nine to 11 minutes per day on paperwork for each account? In one week, that can add up to a full day's work. *According to InfoMarketing Systems Corp., Tampa, Fla.*

. . . that the average sales call now costs more than $200, triple that in 1975? *According to Information Systems Marketing, Inc., Washington, D.C.*

. . . that CEOs name "sales and marketing" as their top concern for re-engineering business processes? *According to this year's respondents to the* Computerworld Premier 100.

No wonder most Fortune 1,000 companies today have either embarked on or are seriously considering a sales force automation system.

BY MARY BRANDEL

But there's something else you should know: People are spending $7,500 to $15,000 per salesperson to initially develop a sales force automation system and then $2,500 to $3,500 per salesperson per year for ongoing maintenance and support, according to Peter Perera of The Perera Group, a sales and marketing consulting firm in Boston. These costs include hardware, software, communications links, maintenance, loading and converting data, telecommunications, lost productivity during start-up and ongoing training and support.

That adds up to a multimillion-dollar project for most large and medium-size firms. Obviously, we're not just talking about a scheduler, some word processing functions and a way to keep track of account histories.

With streamlined staffs, shrinking budgets and fierce competition, most companies are redefining how they target and keep customers, and that often means expanding the role of sales.

Take Sensormatic Corp. in Deerfield Beach, Fla., which manufactures electronic security devices. Its sales reps will eventually be using custom-designed PC-based electronic entry tools to monitor customers' changing internal and external demographics. They look for clues of budget growth — added doors, exits, cash registers and phone systems — that indicate a need for more Sensormatic products. They record these findings in a database that is then accessed by the marketing group.

"That's the role of the sales rep in the 1990s and beyond," says Van Mayros, president of InfoMarketing Systems Corp. in Tampa, Fla., who helped Sensormatic develop its system. "We want to arm them with tools and technologies to easily identify the range of opportunity that exists at a prospect."

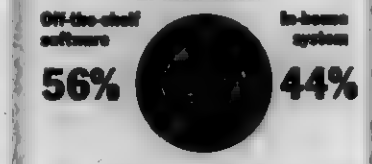
The most important part, then, of a sales force automation system is its ability to increase revenue, not just count it, Mayros says.

Pfizer Corp. in New York has a similar attitude. "We don't want analytical reps out there in the field," says Kevin Butler, manager of field operations at the company. "We want people reps. But the human person in the loop doesn't do an effective job of targeting prospects." Pfizer was finding that salespeople were very good at maintaining relationships with long-standing customers but were less adept at securing new business.

The hardest sell, *page 127*

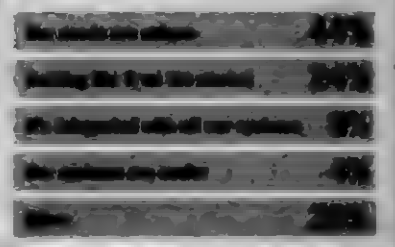
many report in-house development

Sales force automation software users report the following kinds installed at their sites:



Response base: 50 users

Why do you develop your own?



■ THE ULTIMATE SALES AUTOMATION SYSTEM. Page 127.

■ BEST-SELLER ACT SCORES HIGH IN BUYERS' SCORECARD. Page 130.

■ PRIMUS LINK SPOTLIGHTS USERS OF BROCK ACTIVITY MANAGER. Page 132.

3 STEPS in the right direction

BY MARY BRANDEL

Off-the-shelf packages can't "do it all." But many people (56% of the respondents to our Buyers' Scorecard survey) use this software as a base from which to build or as the first installed component of a larger strategic project.

What's important, then, is to be able to twist the package into a shape that supports your company's unique sales procedures. Here are three areas that deserve most of your attention:

ABILITY TO CUSTOMIZE

Whether you do it yourself, work with the vendor or hire a consultant, the harsh reality is that you will have to customize. "Most software gives you the core 80%: recording calls, electronic mail, sending and receiving reports, lists of customers and basic customer targeting," says Kevin Butler, manager of field operations at Pfizer Corp. in New York. "But the last 20% is where you have to come up with your own ideas to get a sustainable competitive advantage."

Realizing this, some software firms leave a lot of room for customization, says Van Mayros, an independent consultant in Tampa, Fla. "Take National Management Systems," he says. "It's a typical software platform but with unlimited free-form fields that the client puts in." Another approach is to provide a tool kit, such as that provided by Brock Control Systems, Inc.

What it comes down to, says Peter Perera, an independent consultant in Boston, is the extent to which you can or cannot change the data model without programming or changing the source code. For instance, Contact Software International, Inc.'s Act data model is based on "contact name"; if you have more than one contact per site, Act would store them as separate records. It's a rigid data model. With a product such as Sales Technologies, Inc.'s Snap, the data model is based on an account. That means you can attach multiple contact names and many other related, user-definable files of information. The data model is more complex and so provides more room for change and adaptability to more sophisticated data needs.

Perera's advice is to look for a product that breaks the application into two parts. This way, the functionality of the applications is separate from the database definition so you can change the database definition without touching the mechanics of the application, which Perera strongly advises against.

Another way to increase flexibility is to look for adherence to technical standards, says Barton Goldenberg, president of Information Systems Marketing, Inc. in Washington, D.C. This includes the use of the C++ programming language, graphical user interface standards such as Windows, relational database standards such as SQL and network standards such as Ethernet and X.25.

Some users say they prefer to hand the customization duty to the vendor. That's the case at Ciba-Geigy Pigments in Newport, Del. The firm was using some basic scheduling, E-mail, file transfer and report distribution modules from Envoy Systems Corp., but only as the first phase in a project to forge a close link between salespeople, technical and service laboratories and marketing.

Envoy was part of the core team that developed specifications, and "in the end was the hands that built the system," says Bob Yetto, an information services consultant at the company. Now, salespeople (who act more as consultants than as order takers) can send customer queries as "action items" directly to lab technicians. The technicians complete the assignment — determining how a product runs under certain conditions, for instance — and the results are sent to the originator's database.

Down the road, Ciba-Geigy plans to add a competitive database. But no changes to the original system will be in the firm's domain, as the source code belongs to Envoy. That's fine with Yetto, "as it fits with the company's direction."

If you choose a third party to customize your system, there are some cautionary measures you should take. For one, users say, be as exact as you can when specifying features and functionality. Otherwise, costs can run amok as each change is labeled "an enhancement instead of a bug fix," according to one user.

DATABASE SHARING

To many, the ultimate sales force system would allow marketing, customer service, telemarketing, field salespeople and corporate executives to work with the same database so that all groups are in sync. This requires the product database to have synchronization and multifunctionality.

Database synchronization

The idea behind database synchronization is for all parties to work with the same information, no matter how many changes occur to it. The customer service agent on a LAN may update a record by changing the customer's phone number or adding a note; the field salesperson may add or edit some other piece of information on the same customer. Somehow, users must get one another's changes without overwriting one another's database. "In order to do that, you need some mechanism that will synchronize — merge or consolidate — the information above and beyond the more straightforward approach of import/export," Perera says.

Unfortunately, few of the vendors do this very well yet. Most are working on data synchronization, and there are at least 16 vendors that can provide it to some extent (see chart page 127).

Multifunctional databases

It's also critical for different user groups to get their own view of the database. For example, Goldenberg says, "a salesperson's window into the application is driven by concerns like time, contact and account management, calendaring and scheduling. When they turn on the system, that's what they want to see."

If customer service turns on the same system, he says, they want the same database files, but they want insight into customer complaints with a particular product so they can be proactive about responding. In marketing, "the windows might look into market intelligence, competitive activity or marketplace trends," he adds. Executives will want to see financial performance and regional, people, revenue and market comparisons.

It is unlikely that any single sales force package will provide the desired interfaces right out of the box. But if the database is separate from the application, it is fairly simple to modify the interface and present each kind of user with the right window.

SOFTWARE THAT MATCHES YOUR BUSINESS PROCESSES

If the above sounds too good to be true, that's because it probably is. There are very few (and possibly no) exceptions to the rule that no product can perform all business functions equally well. Most are strongest in one or two areas — say, telemarketing or field sales. It's best to narrow down the most important business functions and make sure the vendor can support those really well, Perera says.

It's also a good idea to select a vendor with a good balance of technical expertise and sales/marketing know-how. "It's a real cowboy industry," Goldenberg says, noting that the average age of vendors is five to six years old, with the oldest vendors being only 10 to 12 years old. "The most successful vendors are those whose sole mission is to develop and sell sales/marketing software applications."

Some business functions have just never made it into software: Sales reps at eyewear vendor Bausch & Lomb in Rochester, N.Y., for instance, follow a typical method for expense reimbursement: They cut a check themselves and send it along with an expense report for management approval. When Bausch & Lomb went looking for a sales force automation package, they found that few supported that method, says Jonathan Witmer, project leader at the company.

Instead, Bausch & Lomb developed its own communications system and report forms. Off-the-shelf modules such as a pure contact management package will eventually be plugged in.

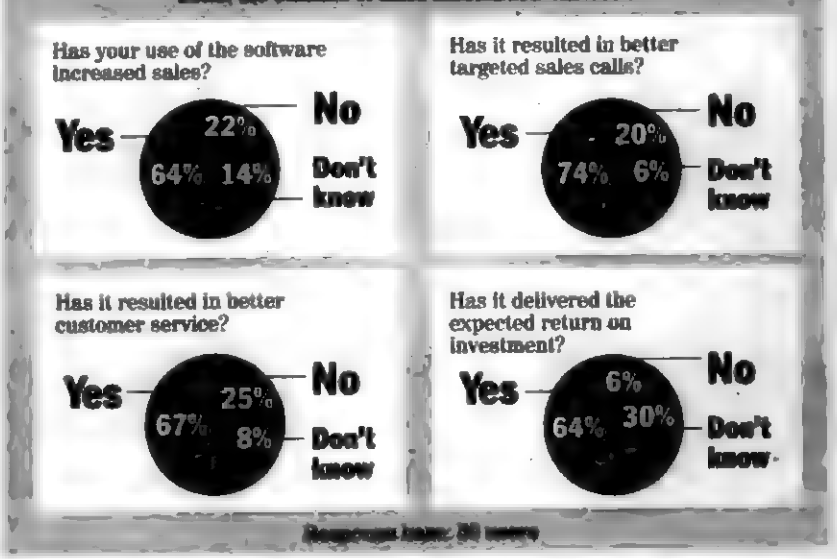
A final caution from those who have been through the sales force automation development process: Business methods and principles are susceptible to change. A user at a large pharmaceutical firm says his company chose in-house development for its sales force of close to 1,000 because the changes in the health care industry have rendered most packages obsolete. "The shift toward managed long-term care is making fundamental changes in the way pharmaceutical companies sell," he says.

Changes are more likely given the time span over which projects are implemented. Whether you buy a shrink-wrapped solution or build from scratch, make sure your system adapts well to change. ■

Assistant editor Derek Slater contributed to this story.

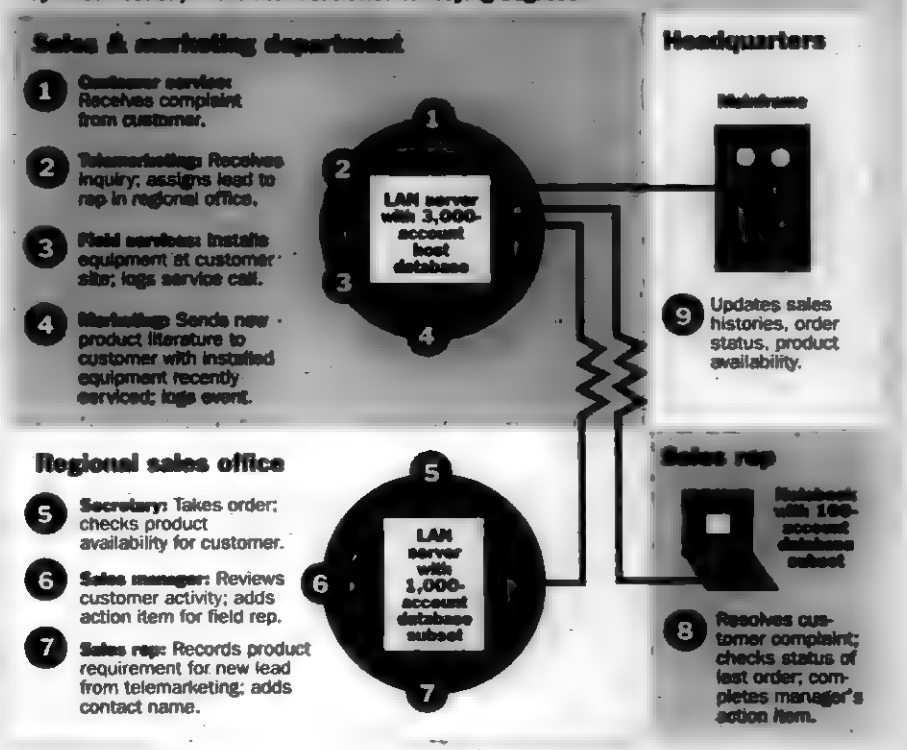
side effects

Users of contact management software were asked about the benefits of sales automation software.



the ultimate sales force system

would allow geographically dispersed users to make and then exchange changes to information with other users of the same database. This requires "database synchronization," which vendors offer to varying degrees.



Source: The Petera Group, Boston

The following software vendors claim database synchronization beyond a conventional import/export facility. Note that each provides a different level of synchronization capabilities:

- Appintec Corp.'s Telemagic, Oakland, Calif.
- Brock Control Systems, Inc.'s Brock Activity Manager, Atlanta
- Contact Software International's Act, Carrollton, Texas
- Cornet, Inc.'s Corscan, Springfield, Va.
- Data System Support's SIRS, Orange, Calif.
- Delta Business Systems, Inc.'s Profits, Lanham, Md.
- GE Information Services, Engelwood, Colo.
- HWA International, Inc.'s ASIS, Memphis
- Lotus Development Corp.'s Notes, Cambridge, Mass.
- Market Power, Inc.'s Matrix, Nevada City, Calif.
- National Management Systems Ltd.'s Sales Manager's Workstation Builder, Vienna, Va.
- Richmond Technologies & Software, Inc.'s Maximizer, Burnaby, British Colombia
- SalesKit Software Corp., St. Louis
- Sales Technology, Inc.'s Snap, Manchester, N.H.
- Saratoga System's SPS, Campbell, Calif.
- Software of the Future, Inc.'s MarketForce Plus, Grand Prairie, Texas

The hardest sell

CONTINUED FROM PAGE 125

Because the company has been working with a pharmaceutical-specific system from Dendrite Systems, Inc. for five years, Pfizer has decided to customize the system further to provide a facility for prospect targeting.

"We at headquarters will feed parameters into the system — product emphasis, third-party information — and the computer will sift through it and figure out who the rep should be calling on," Butler says. "Our vision is for the computer to tell the rep who to call on, in what order, what marketing messages should be given to that particular customer. The rep would be an executor, not a planner."

Importance of integration

The most important part, then, of today's sales force automation systems is the tie-in of salespeople with one another and with key members of other departments. "The hot trend," says Barton Goldenberg, president of Information Systems Marketing, "is software that offers integrated functionality between sales representatives, sales management, customer service personnel, marketing personnel and executive personnel, thereby breaking down the traditional power kingdoms notable within sales and marketing functions."

Goldenberg describes a common scenario for people buying off-the-shelf packages: "Too often, a company goes out and buys a particular package for, say, contact management. Somewhere along the way, a customer complains about a service. The salesperson doesn't know how to log the complaint because the package doesn't do customer service. After five such occurrences, the company might end up buying a customer service package.

"Then, the customer says, 'Your competition was in here yesterday offering a 30% price reduction.' Suddenly, there's a whole new type of competition out in the marketplace, but the person who has the customer service package doesn't know what to do with that information. So the company buys a marketing automation system.

"By this time, none of [the systems] are compatible. One uses Oracle, one uses its own database, one uses Informix. One is Windows-based, one is DOS-based. The company is left with no ability to share information across departments."

Not a good situation. But guess what? Of the 600 or so packages on the market today, there's not one that you can pop in to start running a strategic sales force automation system. Most vendors have by now caught on to the selling point of sales/marketing/customer service integration. But, most experts say, the majority of products simply supply a very basic functionality, leaving the other strategic part, the part that has to be customized, up to you.

"The nature of the off-the-shelf software is very crude," Mayros says. "Even some of the largest vendors ... simply deliver me-too products that don't help salespeople."

It's little wonder, then, that 44% of people who responded to the Buyers' Scorecard said they have built their own systems (see page 130). "The products we looked at had limited corporate value," says Carlton Shufflebarger, project manager at the U.S. Postal Service, which developed its own system based on an Oracle Corp. database. Not that the off-the-shelf products didn't have merit: "Act [from Contact Software International, Inc.] is a leading-edge, state-of-the-art contact manager," Shufflebarger says. "It's got a lot of nice calendars, word processing, scheduling, which means a lot to the salesperson. But when you're looking at a multimillion-dollar investment, the payback wasn't there to justify it."

But building from scratch can be a time-consuming and inevitably very expensive endeavor that many companies won't want to attempt.

Goldenberg's solution is for vendors to change how they build products. In addition to being a consultant, Goldenberg is working with a related company that is responsible for a customizable product. It starts with a database platform and allows customers to build their system modularly, adding components such as customer service on an as-needed basis.

A little less than half of the companies that install sales force automation systems do accept the base functionality of a carefully chosen off-the-shelf package and build in their own functionality from there. The secret, of course, is selecting one that makes customizing possible, cost-effective and quick. ■

SOFTWARE TIERS

It's a sloppy process to categorize the 650-plus software packages that call themselves "sales automation software." Nonetheless, here's a rough idea of how to look at the market.

LEVEL 1

Contact management software that offers the basic call reporting, note history and word processing functions.

Most of the sales and marketing software packages fall into this category. These packages tend to do "one" business function very well and usually have predefined features, files, screens and processing routines. Because they often use proprietary database management systems or are written in their own language, they can be difficult to integrate with other systems.

The complexity and functionality of these packages vary considerably. A growing number offer some sort of customizability, from the ability to change fields in a screen to the ability to create new screens.

Sample packages: Action Plus Software's Action Plus; Contact Software International, Inc.'s Act; Richmond Technology & Software, Inc.'s Maximizer; and SaleMaker Corp.'s SaleMaker.

Cost: $250 to $500 per user. Customization and training cost extra.

LEVEL 2

Off-the-shelf software "systems" that interact with relational databases to allow more flexibility and use of more information.

This category usually runs on more than one operating system, as well as on many types of hardware. The packages are often targeted at companies with medium-size to large sales forces and support remote data uploading and downloading. Because of demand, many of today's Level 1 contact managers are upgrading to position themselves in this category, which is becoming increasingly Windows-based.

Functionality varies widely at this level. All the packages tend to be very good at the basics, such as customer name, tracking one or more contacts within that company and keeping a running log with those contacts. When it comes to more advanced things such as cross-referencing information (for instance, all customers you haven't spoken with in the past six months that live in Cincinnati), the packages vary widely. Other "added" functionality includes executive reporting and links to external sources of data.

Sample packages: Advanced Concepts, Inc.'s SalesCTRL2; The August Group's Frontline; Brock Control Systems, Inc.'s Brock Activity Manager; Data Code, Inc.'s Project Management System; Data Systems Support's SIRS; and Elan Software Corp.'s Goldmine.

Cost: $1,500 to $30,000. Customization and training may be extra.

LEVEL 3

Software that is available in prewritten but still highly customizable database-independent modules.

With these packages, the database is like a foundation to which you can add sales, marketing, customer service or executive application modules as you need them. Some of these packages offer an extensive DBMS tool kit that allows you to modify screens, fields, reports and Help menus or build your own modules without changing the source code.

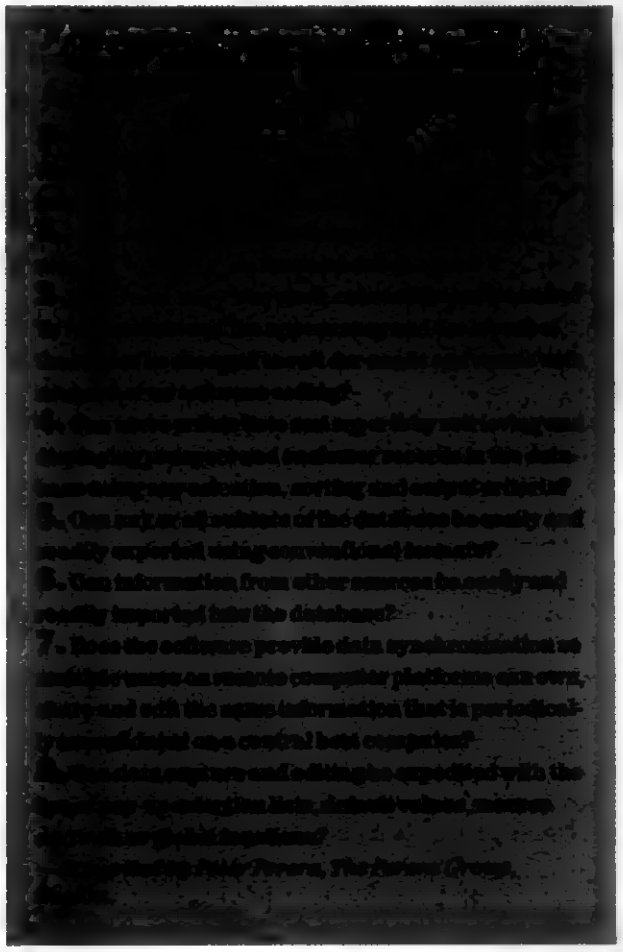
Prewritten modules include functions such as account management, contact management, contract management, expense reports, business opportunities, market intelligence, telemarketing, lead tracking and customer service monitoring.

There are actually very few of these packages available, but this is where much of the market is headed, so we'll see more vendors coming out with products in the near future.

Sample packages: Information Marketing Association, Inc.'s Telemar; Information Systems Marketing, Inc.'s Homerun; National Management Systems' Sales Manager Workstation; and SalesBook Systems' SalesBook and SalesLink.

Cost: $1,500 to $2,500 per user, with a predefined amount of customization and training included. ■

Burton Goldenberg is president of Information Systems Marketing, Inc. in Washington, D.C.



Payback is difficult to quantify

BY DEREK SLATER

There's one thing you can count on with a sales force automation project: It will cost you big bucks. Most implementors talk in terms of millions of dollars, with time investments stated in years.

That makes up-front cost justification tricky — if it is possible at all. "I have my doubts that anyone can quantify return on investment," says Kevin Butler, manager of field operations at Pfizer Corp.

Just the same, Pfizer did conduct a pilot for its international sales automation strategy to compare performance of users and nonusers. "We're going to be spending close to $20 million over time, so we want to be damn sure of the outcome," says Gary Schmid, associate director of field force planning in the international pharmaceutical area.

Others who have implemented sales systems report a broad range of benefits and paybacks — some concrete, some intangible.

■ Better customer service

Benefits aren't always what you expect them to be. That's what Ciba-Geigy Pigments found when its lower-revenue customers stopped falling off the roster. Bob Yetto, information services consultant at the company, had expected increased productivity and higher profits but not a solution to the attrition problem.

But because sales representatives were freed up to spend more time — and more effective time — on each account, they were better able to satisfy and hang on to those clients.

"The increase in time spent on each account wasn't as much as we anticipated — maybe 15% to 20% more. But the value of that time is much greater, more directed and effective," Yetto says.

■ Reduced cost of making a sale

Voice system vendor Executone Information Systems, Inc. is one company that calculated an exact return on investment. Based on a pilot, Executone found it could slash the average cost per sale to less than one-third of its original cost via a lead-qualification system.

Prior to installing its system, salespeople made an average of 11 calls to qualify a lead and turn it into a sale.

At $250 per call — a conservative estimate, based on previous in-house surveys — that put the cost per sale at $2,750.

The lead-qualification system analyzes marketing surveys conducted by telemarketing to determine appropriate sales leads.

■ Staying alive

In highly competitive industries, it's less a matter of cost-justifying a sales system and more a matter of survival.

"We *had* to do this to maintain a level of competitiveness in terms of managing information," says a sales force automation manager at another large pharmaceutical company. "Timeliness is a key in our industry, and we were using a very cumbersome paper system." ■

Contact dominates with Act

BUYERS' SATISFACTION SCORECARD

By Kevin Burden

Contact Software International, Inc.'s Act is the best-selling contact management software package in the very popular sales force automation category (see story next page).

With over 92% market share, Act's installed base has risen on the wave of low-end sales force package sales, which grew 79% in 1992 to $31 million, according to International Data Corp.

Contact Software doubled its revenue in 1992, selling $11 million worth of Act DOS and Windows versions. A Macintosh version, released late last year, further bolstered Act's position.

A varied Act

Developed in C, Act runs on Novell, Inc. LANs with a minimum of 2M bytes of RAM for its Windows version. File formats compatible with dBase are provided, alongwith Dynamic Data Exchange links to Microsoft Corp.'s Word for Windows, Lotus Development Corp.'s Ami Pro and WordPerfect. Corp.'s WordPerfect for Windows. The software costs $395 for a single user and $1,295 for five users.

Forty-six percent surveyed use Act primarily for Windows for contact management. Sales force management was the second most popular application.

So what do users like best about Act? They said they find it easy to use and like its performance in primary contact management functions such as tracking client contacts and building profiles.

Overall score

72

These functions are performed through extensive predefined fields comprising data files of up to 4,000 contacts. Linked to other screens, the contact profiles also provide historical information about each client.

Act is more than a contact manager, however. It also supports functions for account and sales force management.

Users found these functions to be less impressive but still above average. Features include activity history, an order entry template and custom sales reports. Sales management features range from reporting and tracking to activity reporting.

The bottom line of a package of this sort is the bottom line. Sixty-six percent of the respondents claimed that using the package has helped them to increase the number of sales calls made, followed by 64% who have shown an increase in actual sales.

User names were obtained from non-vendor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results.

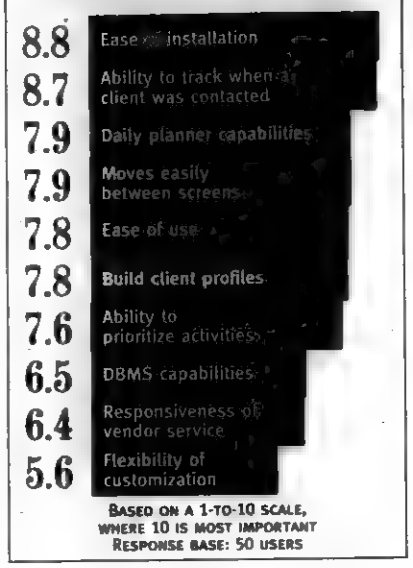
Fifty users of the market-leading software packages were contacted and rated Act in 18 different categories which were all factored into the final score.

For a complete methodology of Buyers' Satisfaction Scorecard, contact Michael Sullivan-Trainor at *Computerworld*, (800) 343-6474, ext. 229, 375 Cochituate Road, Framingham, Mass., 01701. ■

Would you purchase this product again?

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.
RESPONSE BASE: 50 USERS

Contact Software's Act



BASED ON A 1-TO-10 SCALE, WHERE 10 IS MOST IMPORTANT
RESPONSE BASE: 50 USERS

Ease of use, database control high on users' lists

By Michael Sullivan-Trainor

Users of contact management software ask two things of their packages: simplicity in managing client lists and activities and the ability to customize according to their needs.

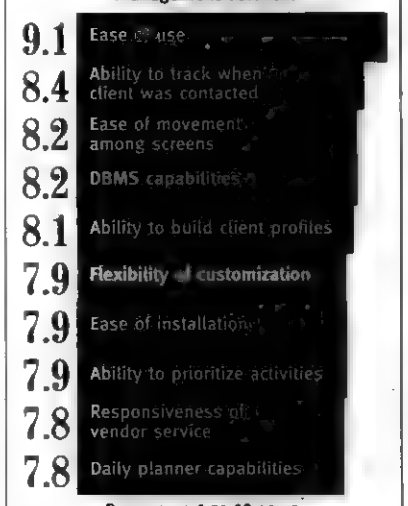
These low-tier applications are far less complex than the highly integrated, high-cost, host-based systems. For this reason, this is where many companies first test the waters of automation. Their simple but effective operations and the recent surge of notebook computer sales have made contact management packages the most prevalent type of off-the-shelf sales force automation software.

While Contact Software International, Inc.'s Act leads the market, other contact management packages include Chang Laboratories, Inc.'s CAT4 and Sherrer Resources' Sales Ally. Contact management is also a major component of multimodule packages such as Brock Control Systems, Inc.'s Brock Activity Manager and Sales Technologies, Inc.'s Snap.

Key components of contact management include constructing profiles and tracking client backgrounds; providing histories of clients; the ability to manipulate the screens and databases; and the ability to link client information to other features, such as a daily planner. ■

Top priorities

The 10 most important aspects of contact management software

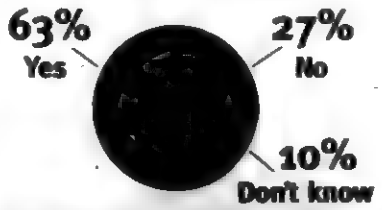


BASED ON A 1-TO-10 SCALE, WHERE 10 IS MOST IMPORTANT
RESPONSE BASE: 50 USERS

Many uses . . . many users

Although contact management software is ideally suited for the sales force . . .

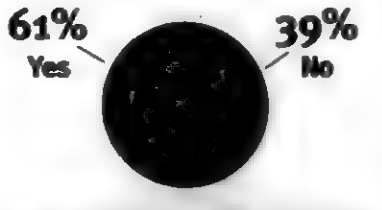
Is the package being used for a large sales force effort?



. . . and the idea to implement usually comes from the sales department . . .

Who initiated the decision to implement?

Are salespeople the sole users of the software?



. . . the application's diverse feature components make it useful for many different departments.

Who are the other employees who use it?

MULTIPLE RESPONSES ALLOWED

Brock Activity Manager:
Easy to customize, power-hungry

Brock Activity Manager

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ Brock Control Systems, Inc.'s Brock Activity Manager is strong in ease of use, but users cautioned that the package is expensive.

Few sales force automation packages span the multiple functions and multiple platforms necessary to provide an enterprisewide sales management system. Brock Control Systems' Brock Activity Manager (BAM) is one of the few that succeeds at this difficult feat.

BAM runs on a variety of Unix platforms and provides a comprehensive set of modules to address everything from account and sales force management to telemarketing.

Users in this Firing Line run BAM to manage their customer databases, track complaints, provide customer service, perform telemarketing and make collections. They have anywhere from 16 to 44 users working on the system. Their platforms include The Santa Cruz Operation's Unix running on a Compaq Computer Corp. 486 server, with DOS 386-based laptops in the field; AIX running on a Bull DPX, with PCs and dumb terminals; and Sun Microsystems, Inc.'s SunOS running on a Sun server, with 386-based laptops.

All evaluators were using BAM Version 7.0 or greater. They had three months' to three years' experience with the product. The companies involved were three manufacturers and one transportation firm.

The format for this Firing Line was developed with the assistance of Howard Rubin Associates and Technology Investment Strategies Corp.

Ease of use

Dealing with a range of user experiences, the evaluators gave BAM strong ratings in this category, except one user who struggled with hardware and configuration problems.

Manufacturer 1: "We've had internal problems with bugs and hardware problems. On our laptops we found we couldn't run both our demo applications and our sales force software. We had a number of problems with the synchronization routines. Switching between Windows and DOS makes the system a little clumsy to use for phone work. It's been a battle."

One of the main issues for the manufacturer was an initial attempt to run BAM on a Digital Equipment Corp. VMS-based VAX. In addition to technical problems, Brock had too few VAX accounts to provide sufficient VMS support, the user said. The firm ended up switching to Unix with an associated change in hardware.

By contrast, the only complaints from other users were the need to provide a hot key to switch between BAM and in-house systems and that the number of features made it a little

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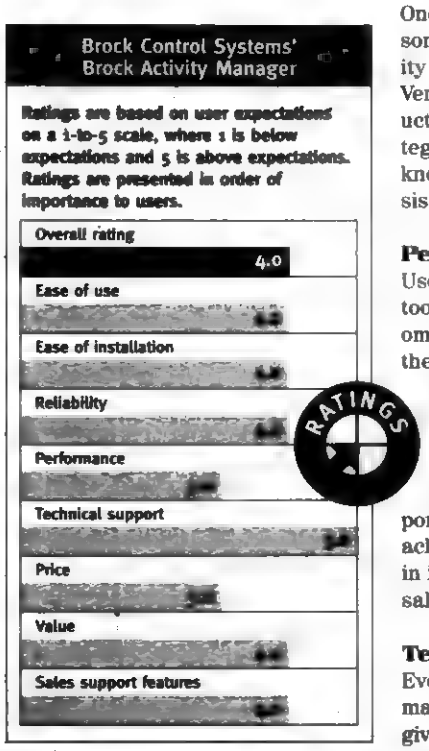
more difficult to manage than a single module package.

Ease of installation

The VMS problem also colored Manufacturer 1's view of installation, but he agreed with other users that the Unix installation went smoothly.

Transportation: "It took us about 250 man-hours and the bulk of that was interfacing with our existing system."



Reliability

One user found runtime errors in some of the utilities of the Field Activity Manager (FAM) portion of BAM Version 7.4 that would bomb the product. Training was also needed for integrating FAM with Unix. Lack of knowledge caused some data inconsistencies, Manufacturer 3 said.

Performance

Users found 386SX-based hardware too slow for BAM. Brock's initial recommendation of that platform caused them to purchase 386-based laptops that need to be upgraded before running the latest version of BAM, Version 8.0, which requires a 486-based system.

On the other hand, the transportation user was pleased with achieving subsecond response time in integrating BAM with his in-house sales systems.

Technical support

Even the VMS user gave this area top marks. "They bent over backward to give us what we needed," he said.

Price and value

Users were satisfied with the price and value. The transportation user said his company budgeted $150,000 for in-house development and was able to obtain BAM for $103,000.

The company also exceeded its projected 25% productivity improvement estimate. It is gaining 30% to 35% productivity improvement, plus added functionality.

Manufacturer 3 said his company did not anticipate the high cost of maintenance and upgrading due to lack of experience with large software applications.

Sales support features

Users found many features that were very useful and others that were of no help. Included among the most useful were the FAM package, prospect tracking with notation and the ability to synchronize data on different systems.

Least useful were FAM's appointment scheduler and call queues for calling campaigns. ■

Brock responds

The following are Brock Control Systems' responses to issues raised in this evaluation:

▶**Ease of Use:** Brock made a decision to stop offering new releases on VMS when Informix Software Corp. announced that Informix 2.1 would be its last release supporting VMS and that it was discontinuing support of that platform.

Brock is still providing hot-line support to remaining VMS customers but has encouraged those VMS customers to move to Ultrix.

The last Brock release supporting VMS is Release 7.A.

▶**Laptop performance:** Especially in a Windows environment, Brock recommends a minimum laptop configuration of a 486DX, 12M to 16M bytes of RAM, a 160M-byte hard disk, a mouse and an IBM Video Graphics Array monitor.

▶**New version:** BAM has been available for both Windows as well as Novell, Inc. LANs since April 1.

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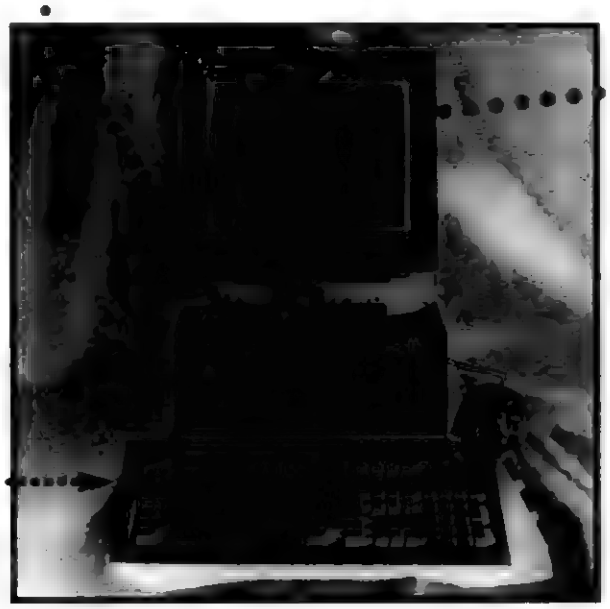

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Hard disk ☐170MB ☐240MB ☐340MB ☐440MB

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Hard disk ☐170MB ☐240MB ☐340MB ☐440MB ☐540MB SCSI-2*

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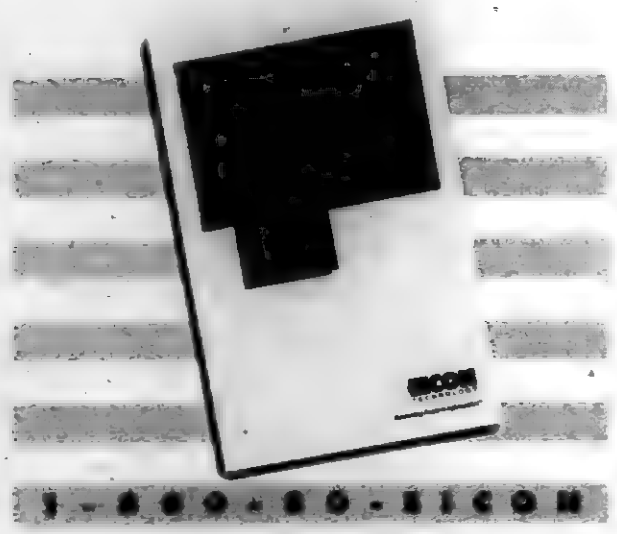

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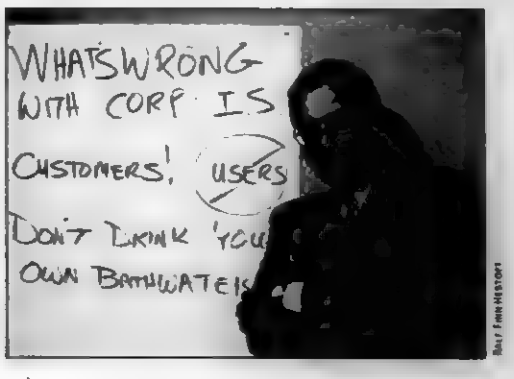

BY LARRY RUNGE

RECIPE FOR A POOR SYSTEMS GROUP: A NARROW PERSPECTIVE, SLAVISH DEVOTION TO MEANINGLESS MEASURES AND THINKING LIKE A MONOPOLY

These aren't the good old days for information systems. Take, for example, the national retailer that outsourced its entire IS department to Electronic Data Systems Corp., or the large Chicago bank that outsourced its IS group to IBM. Or there's the story a friend of mine at an outplacement company told me about two chief information officers who lost their jobs — because their CEOs couldn't understand what they were talking about!

We, as the chief information overseers in our companies, have to take this bloodletting to heart. It's time for a little introspection. It's time to find out what we are doing wrong.

Here's what I think:

Runge is CIO at Wheels, Inc., a fleet leasing and services company in Des Plaines, Ill.

WE THINK IN TERMS OF "USER," NOT "CUSTOMER." A user is someone who ignores Nancy Reagan's plea to "Just say no" to drugs and says "Yes!" instead.

Customers, on the other hand, are a different breed. All they ask is that we do our job well and efficiently. Then, in return, they pay our mortgages, buy our groceries, help send our kids to college and give us money to buy that boat or stereo we've always wanted.

Frankly, if our customers are willing to pay for the good life we enjoy in return for a bit of programming, then they deserve our respect and our best efforts to get them what they want, when they want it.

WE DON'T BASE OUR MEASUREMENT AND REWARD SYSTEM EXTERNALLY, ON THE CUSTOMER. Most of our measurements are focused internally, on things such as schedules, lines of

Narrow perspective, *page 140*

COUNTERPOINT

WHAT'S RIGHT WITH US?

"All we talked about in the '70s and beyond — the fact that we should become less of the technician and more of the businessperson — has come to pass. When I meet with my peers these days, I notice they have really taken past criticism to heart and have become darn good businesspeople who happen to know a lot about technology."

Dick Lester
Vice president, information services
Associated Grocers, Inc.
Seattle

Narrow perspective

CONTINUED FROM PAGE 139

code and so forth. These measures ignore the customer completely. We are drinking our own bathwater.

Admittedly, many corporations force this type of thing on the IS group, but we need to do all we can to change that thinking. For example, I know of a situation in which a financial services company — the leader in its marketplace — began re-engineering an ordering system crucial to its business. The system handled about $1.2 billion worth of orders per year.

IS figured out a budget and set schedules. But the budget and schedules were cast in concrete, without regard to the customer. The project ran into difficulties, of course.

The head of systems was in a quandary because she had a window to hit, and if she missed it, she would have to delay implementation for several months — at a cost of $200,000 for a six-month period — until the peak ordering season passed. And she could kiss off her incentive bonus because meeting the schedule was one of the areas in which she would be measured.

Yet the head of systems and everyone else in her organization knew the new system wasn't ready to go in.

So what happened? She shoehorned the system into production, of course. The result was an error-ridden and failure-prone system that takes twice the time and twice the people to process an order, compared with the old system. Clients dropped like flies.

Did the head of systems make the right decision? From the perspective of her bonus and the mortgage payments on her house, yes. From the perspective of the measurements her company had imposed on her, yes. From the perspective of the customers, a definite no.

Our measurements and rewards have to be based on meeting the customer's needs. Anything else will be counterproductive to our goal of serving the customer.

WE DON'T THINK OF A QUALITY PRODUCT AS A CUSTOMER'S RIGHT. Our customers have a right to a quality product. Unfortunately, quality is often the last thing our profession considers or measures. We tend to give more weight to schedules than to quality, yet what good is it to deliver something on time if it doesn't work?

I hate to say this, but many of us have a double standard: one we apply to our own performance and one we apply to everyone else's. The attitude is, "Toss it over the transom; if it has problems, they'll find them and send it back."

Excuse my bluntness, but only a fool would want his customers to serve as his quality control department. There's no faster way to put ourselves out of business.

This situation brings to mind my first brand-new car. It was so riddled with problems, I had to get it fixed again and again, even after the warranty expired. I'm on my eighth car since those unhappy days, and not one of them has come from the manufacturer who did such a shoddy job on that first car. Frankly, I'll never buy a car from those turkeys again.

We in corporate IS have had it easy. We've had a monopoly. Our users haven't had any choice but to buy our products, regardless of how shoddy or poorly supported they were.

This is no longer the case. There is an entire outsourcing industry more than willing to do a better job for our customers than we can if they only get the chance. If we demand that our customers serve as our quality control department, the outsourcers will get their chance.

WE ARE NOT REALISTIC ABOUT ESTIMATES AND SCHEDULES. Let's face it, software estimates are just that — estimates. Unfortunately, systems folks have a tendency to ignore this uncertainty when presenting schedule and budget estimates to upper management. Part of this is because of a tendency toward excess optimism on the part of the systems organization; part of it is because of the decided lack of enthusiasm that business leaders exhibit for "hedged" or "qualified" estimates.

The inaccuracy of the estimating process and the reluctance of the system organization to admit it aren't the only problems. What complicates things further is that many senior managers believe software estimates are a self-fulfilling prophecy. Regardless of how large the estimates, we will require all of the available time to do the job. Give us six more months to do the job and we'll take six more to do it.

Building a system is not the same as putting new sod in the front of company headquarters. We must estimate accurately and then make sure the business leaders understand that predicting software schedules and budgets is not unlike predicting the weather. It's not that the bear dances well but that it dances at all.

WE DON'T ALWAYS PROVIDE THE BEST POSSIBLE PRODUCT AT THE BEST POSSIBLE PRICE. This again goes back to the fact that corporate IS, as an industry, has been able to depend too long on having a captive market for our products. We've gotten lazy, and our lethargy is encouraging company after company to outsource its entire IS organization out of sheer frustration.

While working at NASA on the shuttle program in the early 1960s, I decided I would write a few computer games, get rich and spend the rest of my life sitting on a Galveston beach drinking Mai Tais. It was then that I learned an invaluable lesson: In an open market, it's not enough just to have a product. You have to have a product that's better than everyone else's. Otherwise, your customer will buy the competitor's product and not yours.

That is not a lesson well-learned in the corporate IS world. Here, it doesn't matter what the customer wants. He has to take whatever we give him, and he has to wait until we get around to delivering it. And if it doesn't fit his needs? Well, sorry, but the budget has already been spent and you're just plain out of luck.

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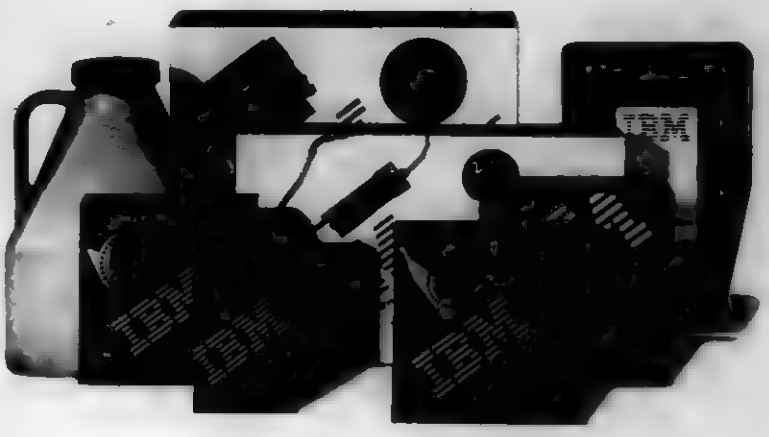

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is SELF-STUDY right FOR YOU?

Students using computer-based training and other self-paced methods are happy with the results but often need additional hands-on experience

grading THE resources

By Alice Bredin

SELF-STUDY packages appear to offer it all. They're inexpensive, flexible and comprehensive. But do they really teach what's necessary when it comes to heady technologies such as networking?

The verdict from trainers and students is while self-study packages — books or computer-based training — are comprehensive, they often require supplemental classes and hands-on experience.

"[Self-study] is a good introduction and refresher," says Ellen Hersh, training and education analyst at International Data Corp., a Framingham, Mass., market research firm. "But it doesn't have human interaction to bounce ideas around and to ask questions of."

Even so, many information systems departments are using self-paced training as a first step in teaching a technology. Dale Jenkins, a technical training coordinator at Advanced Technology Services, Inc. in Peoria, Ill., prepared 40 of his field service engineers for Novell, Inc.'s Certified NetWare Administrator test this way.

"No one comes out of the self-paced training with any knowledge gaps. However, classes are good reinforcement," Jenkins says. For instance, students can see firsthand how to set up privileges, establish security levels and investigate connections such as Ethernet, "which they can't get otherwise," he adds.

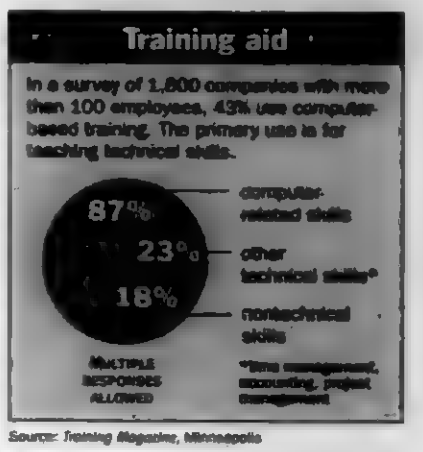
One student, Jose Colon, a senior customer service engineer at Olivetti North America, Inc. in Spokane, Wash., recently spent three days completing the first part of a Novell computer-based training program designed to teach NetWare v3.11. He has yet to start the second half, which simulates hands-on work, but he says he has learned the basics. "It didn't gloss over any details, but I still need to learn how NetWare actually works and makes things operate," he explains.

Classes and hands-on experience expose students to situations not always covered in self-paced programs, including unusual error messages in system setup and how to change variables, says John Merlino, a training account manager at East Coast Network Training Services in Lincoln, R.I. Computer-based training "is limited to a certain amount of information because of time and cost limitations on making [programs]."

Paul Thomas, president of Blue Whale Technologies in Bay Point, Calif., agrees. By actually working on NetWare, Thomas, who is preparing for the Certified NetWare Engineer test, has picked up details on what error messages to expect and how to work out quirks that are difficult to learn and remember. However, the levels of understanding beneath NetWare's surface still elude him. "All of the information is probably in the books, but it's 50 pounds of books," Thomas says.

Bredin is a free-lance writer in New York.

Formal training not required



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WINDOW SERVICE

Throw out traditional troubleshooting and support methods. Windows has its own, and they're very different from single-tasking environments.

By Jeff McGroary

IF YOUR COMPANY is moving from DOS to Windows as its standard desktop environment, be forewarned. Your troubleshooting duties just got harder. Most support technicians will tell you that Windows is more difficult to support than single-tasking environments, especially in the detection of software problems.

Unfortunately, previous DOS support experience is of little help. Where DOS is static and single-task-oriented, Windows is dynamic and supports limited multitasking. Where DOS is a character-based operating system, Windows supports a graphical user interface.

Of these differences, it is critical to understand the multitasking concept and its implications for configuring system hardware and software troubleshooting.

The following three areas should concern new Windows troubleshooters the most. If you have a PC capable of running Windows, you might even consider purchasing a copy of Windows to get a feel for the environment.

TROUBLE-SHOOTING SOFTWARE

Diagnosing software problems on a Windows workstation is undoubtedly the most difficult skill to hone. If a DOS workstation locks up, the error most likely occurred in the single DOS application. With Windows, it could be in any of the applications running at the time.

First, you must develop the ability to isolate the problem application and determine whether it is a software error or a hardware problem in disguise. You'd be wise to get to know the utilities that address this issue. Microsoft Corp.'s Dr. Watson, for instance, when added to a workstation's Windows Startup group, will look for and trace the events leading up to any errors.

However, Dr. Watson does not always uncover the exact source of the problem. In this case, try one of my favorite tools —Bounds Checker for Windows from NuMega Technologies, Inc. in Nashua N.H. Once a problem has been isolated to an application, Bounds Checker tracks every move of the application and reports the precise location of the error.

WORK-STATION TUNING

The single-tasking DOS environment requires little system tuning. To optimize a Windows workstation's performance, however, you must tune the Windows software to take full advantage of any given hardware configuration.

A support technician must be intimately familiar with WIN.INI (Windows initialization) and SYSTEM.INI (system initialization) files. Each contain switches and settings used to tune the Windows environment for a particular machine. Although these ASCII text files share a common format, they have different purposes, including the following:

- WIN.INI is primarily used to record user preferences. Most changes made via the Windows Control Panel, such as a user's choice of system colors, are stored here.

Applications also use WIN.INI to store information. If your Windows environment or individual applications are erratic, it is often a sign of a corrupted WIN.INI file.

- SYSTEM.INI contains hardware-related information. For example, the SYSTEM.INI file identifies the video, mouse and network drivers used for a given configuration. It does not change as frequently as the WIN.INI file and is most often updated by the Windows Setup program.

Problems with the video display, mouse operation and network connections can often be traced to incorrect SYSTEM.INI settings. To determine how a specific application makes use of both of these files, check its documentation.

HARD-WARE SPECS

The performance and smooth operation of a Windows workstation is much more dependent on its hardware configuration than is a DOS machine. A good Windows support technician must configure the workstation to meet all processing requirements.

Under DOS, this task is relatively simple. You determine the requirements of the most demanding application and provide enough random-access memory and disk space to handle it.

With Windows, however, any combination of applications may be running at any given time. Determining the optimum hardware configuration under Windows usually requires performance benchmarking on several hardware configurations.

Although the hardware components for a Windows workstation will essentially be the same for a PC running DOS, there will be more of them. DOS-based PCs with 1M to 2M bytes of RAM will be replaced or upgraded with PCs outfitted with at least 4M bytes of RAM.

Disk drive requirements will also increase. A 70M-byte hard drive is probably sufficient for a DOS PC, but Windows workstations require capacities of 170M bytes or higher. A mouse will also become standard equipment.

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McGroary is a software developer and president of The Aristos Co., a graphical software development firm in West Hartford, Conn.

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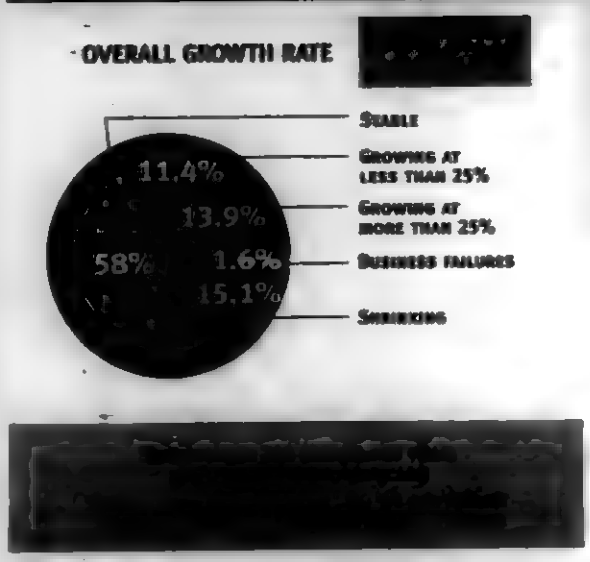

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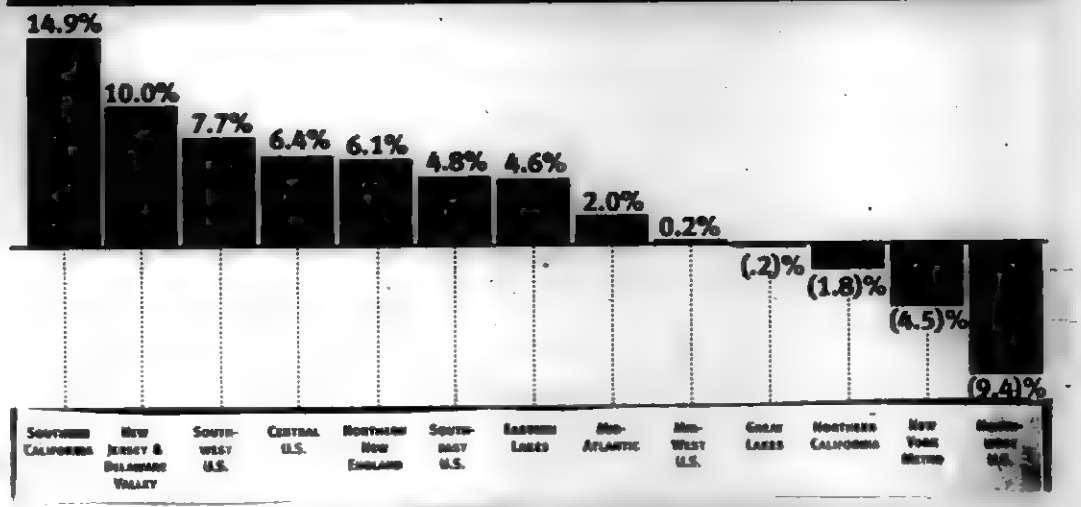

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To be considered for this position, respond by resume to the address below:

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Required Qualifications:
- Master's degree preferred, bachelor's degree required.
- Demonstrated strong oral and written communications skills.
- Substantial knowledge of microcomputer software (operating systems and applications) and hardware.

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- Experience working with IBM-compatible mainframes.
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Applications must include a letter of interest which addresses the position's requirements and desirable qualifications, a current resume, and the name, address and telephone number of three professional references. To assure consideration, applications should be received by October 8, 1993. Application screening will begin October 11, 1993 and continue until the position is filled. Applications should be addressed to: Mr. Roy Gallup, Director of Computing and Telecommunications Services, Emporia State University, Campus Box 4018, 1200 Commercial Street, Emporia, KS 66801-5087.

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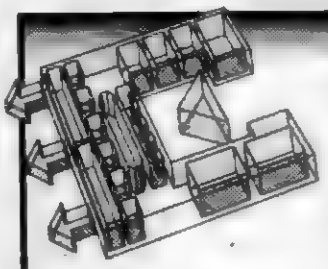

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A safer route to client/server

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By Alan Radding

WHEN IT COMES TO client/server computing, low cost and low risk are highly relative terms. Client/server is never simple and easy. It's a different approach to application design and development that involves new tools and technologies and requires substantial retraining. Still, the following strategies allow you to wet your feet without betting the company or taking the risk of bringing your career to a crashing halt.

Relational database

⊕ **Best choice if planning to expand client/server efforts**

⊖ **Most risk; requires commitment to a data architecture**

"We recommend companies get into client/server through database products like Informix and Oracle," says Tom Nolle, president of CIMI Corp., a technology consulting company in Voorhees, N.J. Nolle advises his clients to standardize on one of the leading server-based databases and install a gateway to the host for the purpose of accessing host data.

This model, he says, offers the most general utility when you are ready to expand your initial client/server effort.

Jens Pedersen, vice president of information systems at Great-West Life & Annuity Insurance Co. in Englewood, Colo., had this strategy in mind when his company standardized on Oracle Corp.'s database and tools running on a Sun Microsystems, Inc. platform four years ago. He conceived a small-scale client/server computing project as a way to begin moving applications off the mainframe.

"We were looking for a low-cost implementation compared to our mainframe," Pedersen recalls. However, the effort quickly snowballed when a major application involving 200 workstations suddenly came along.

To avoid getting in over your head, focus initial efforts on small decision-support applications using snapshots and extracts of host databases. "People decide to access production databases, and that just increases the problems," says Lynn Berg, program director of mid-range computing strategies at Gartner Group, Inc. in Stamford, Conn.

Front-end tools that straddle both client/server and traditional development

⊕ **Least risk; easiest to implement**

⊖ **Least gains; expansion is limited**

"You can get your feet wet with tools like Microsoft's Visual Basic," advises Judith Hurwitz, president of Hurwitz Consulting in Newton, Mass. This approach allows the company's developers to experiment with client/server technology and gain experience on a small scale using familiar technology.

"There are a lot of tools if you want to get started on the client side. Even advanced spreadsheets from Borland and Lotus have direct SQL access capabilities," Berg notes. With this approach, an initial low-risk foray into client/server computing might involve little more than a Lotus Development Corp. 1-2-3 application with a generic data access add-on tool to access a remote database.

The danger with the tool-based approach, however, is scalability. "You might build one application but then have trouble expanding it," Nolle says. By focusing on the client side of client/server computing, companies may fail to implement a robust back-end database architecture.

Off-the-shelf client/server-enabled software

⊕ **Eliminates research investment in nonstrategic applications**

⊖ **Limited product selection; retraining still required**

"Off-the-shelf products are a way to jump-start client/server development," says David Klimetz, manager of financial control systems at Federal Express Corp. in Memphis. Federal Express opted for Dun & Bradstreet Software Services, Inc.'s financial software enabled for client/server computing. Fixed Assets was chosen as the first application, he explains, "because it was a low-risk way to start." The application involved only a few users and a limited amount of daily activity.

Similarly, Associated Grocers, Inc. in Seattle turned to Lawson Software's financial software "as part of our strategy to get to client/server computing," reports Richard Lester, vice president of information services. Although the company is painstakingly developing most of its client/server applications from scratch, the availability of Unix-based, client/ server-enabled core financial software saves a lot of work. "Everything we do now is client/server, but we never want to write a general ledger or payroll application from scratch," he says.

Unfortunately, the product selection is limited to a few core applications, and you still have to standardize on your database architecture or "you'll end up with a hodgepodge of different databases," Nolle warns. Off-the-shelf software also doesn't eliminate what many believe to be the biggest cost in client/server development retraining. "You still have to retrain everybody because you are going to have to modify and support the off-the-shelf application," Klimetz says.

If you want the benefits of client/server computing, sooner or later you will have to take the plunge. The best way to reduce the risk is to go slow.

Client/server computing isn't an all-or-nothing proposition. You can add client/server applications to your existing application portfolio, learn as you go and gain the experience to tackle the big, mission-critical production jobs. At that point, it won't be such a high-risk undertaking.

Radding is a free-lance writer in Newton, Mass.

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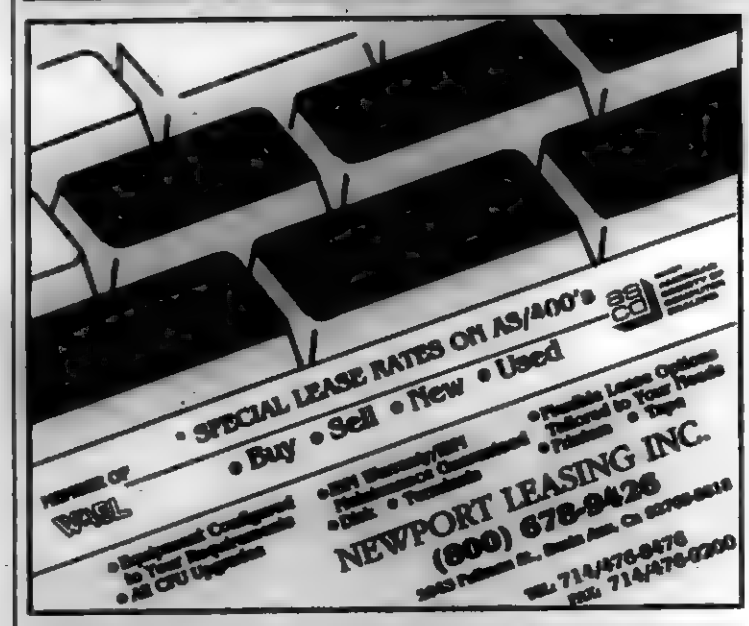

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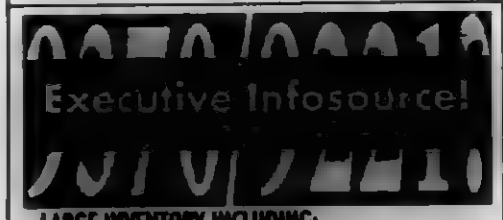

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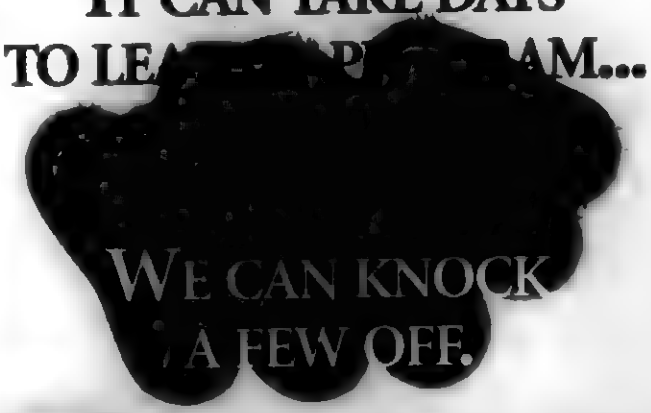

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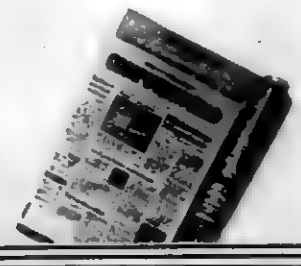

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Gainers

Percent

Cray Computer	30.0
Netframe	36.9
Microcom Inc.	26.3
General Datacomm Inds.	15.5
Standard Microsystems Corp	13.9
MathSoft(L)	12.5
Adobe Corp.(L)	12.4
Telematics Int'l Inc.	11.1

Dollar

Cincom Corp.	3.50
Netframe	3.50
Standard Microsystems Corp	3.63
3 COM Corp	2.25
Atmel Corp.	1.88
Platinum Software(H)	1.75
General Datacomm Inds.	1.63
EMC Corp.	1.63

Losers

Percent

Intelligent Info. Systems	-19.4
State of the Art	-17.6
Adobe Systems Inc.	-13.8
Cheyenne Software Inc.	-12.0
BGS Systems Inc.	-11.7
Chips and Technologies	-11.4
Group I Software	-11.1
Tandem Corp.(L)	-10.1

Dollar

Intelligent Info. Systems	-6.25
Digital Equipment Corp.	-4.25
Cheyenne Software Inc.	-4.25
Progress Software Corp.	-3.63
Synopsys	-3.63
BGS Systems Inc.	-3.50
American Power Conversion	-3.00
Newbridge Networks Corp.	-2.88

Analysts debate storage rivals

EMC Corp.'s (EMC) stock has burned up the track this year on the strength of the company's Symmetrix mainframe disk arrays and Harmonix arrays for the AS/400. Storage Technology Corp.'s (STK) stock, on the other hand, has floundered as big-iron shops await its Iceberg product. The company's massive mainframe disk array, announced in January 1992, is more than a year late. StorageTek installed a test system in its own facilities this summer. Iceberg is expected to ship early next year.

Joseph Payne
Senior vice president, Kemper Securities, Inc.

EMC has been on a product cycle run with the Symmetrix 5500 [mainframe disk array]. The question is, is it going [into sites] displacing IBM 3990s, or is it going in as a supplemental high-volume application, which is only about 10% of the market? Is what they're doing quickly filling their available marketplace? I haven't found any massive displacement of 3990s.

My next question is, what is the product life cycle of the 5500, [and] when in 1994 are other products going to be featuring continuous operation? Iceberg is an 18-wheeler if you're going to be moving massive amounts of data. It will be self-tuning, self-optimizing and more than fault-tolerant.

This quarter will be a rough quarter for StorageTek, but they have something new coming in every segment of the storage hierarchy. I like the breadth of their product line. (Editor's note: StorageTek fleshed out its line in May when it acquired Amperif Corp., which makes RAID-5 mainframe subsystems priced lower than Iceberg.)

William Miller
Research analyst, Rutherford Brown Catherwood, Inc.

This quarter EMC has a possibility of earning 35 cents per share. That's knocking the cover off the ball. As long as earnings momentum continues, the stock will move up.

Long term, I'm concerned about their market. Not the 5500 product cycle because that isn't a static product, but EMC's bread is buttered in the mainframe market, and mainframes clearly aren't doing well. Their AS/400 product is doing well, and that's a much more competitive market.

I think Iceberg's continuous operation is almost a moot point. There have been such quantum advances in densities and mean time between failure that you don't have to mirror everything anymore. You can mirror just the mission-critical data and have a much more inexpensive solution.

— Derek Slater

Exch	52-Week Range			Sept.17 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						
OTC	40.00	13.50	3 COM Corp.	27.25	2.25	9.0
NYS	91.13	63.38	American Info Techs Corp. (H)	89.63	0.88	1.0
NYS	65.00	40.63	AT&T	59.38	-1.38	-2.3
OTC	4.06	0.75	Artel Communication Corp.	3.31	0.19	6.0
OTC	24.50	12.50	Banyan Systems Inc.	18.50	-0.50	-2.6
NYS	64.88	44.50	Bell Atlantic Corp. (H)	64.38	0.25	0.4
NYS	62.63	46.75	Bellsouth Corp. (H)	61.63	0.50	0.8
NYS	14.75	3.63	Bolt, Beranek & Newman	10.50	-0.75	-6.7
OTC	18.50	9.50	Brooktrout Technology	12.00	-0.25	-2.0
NYS	119.00	56.63	Cabletron Systems	102.88	-0.88	-0.8
OTC	35.00	8.63	Certigram Communications	30.75	-0.50	-1.6
OTC	55.50	20.25	Cmpcom Corp.	50.00	3.50	7.5
OTC	59.25	24.00	Cisco Systems Inc.	46.25	0.50	1.1
OTC	16.38	5.50	Compression Labs Inc	13.75	-0.25	-1.8
OTC	36.00	17.00	CrossComm	27.50	1.50	5.8
OTC	4.63	1.63	Data Switch Corp.	2.50	-0.13	-4.8
NYS	19.88	12.38	Digital Comm. Assoc.	13.63	0.00	0.0
OTC	12.75	3.75	Digital Systems Int'l Inc.	4.00	-0.25	-5.9
OTC	67.88	9.38	DSC Communications	59.50	-1.88	-3.1
OTC	9.50	4.75	Fibronix Int'l Inc.	6.50	-0.38	-5.5
OTC	24.00	8.75	Frenet Corp.	13.00	-1.00	-7.1
OTC	4.38	1.50	Gandalf Technologies Inc.	2.31	-0.19	-7.5
OTC	2.06	0.75	Gateway Communications	0.88	-0.06	-6.7
NYS	15.75	3.25	General Datacomm Inds.	12.13	1.63	15.5
ASE	3.75	2.00	Go Video	2.44	-0.13	-4.9
NYS	38.00	32.38	GTE Corp.	38.00	1.00	2.7
NYS	94.75	67.75	ITT Corp.	92.63	-0.88	-0.9
OTC	29.88	16.81	MCI Communications Corp.	28.38	0.50	1.8
OTC	6.50	1.50	Microcom Inc.	3.00	0.63	26.3
OTC	24.25	3.50	Netrix Corp.	4.75	-0.25	-5.0
OTC	19.00	6.75	Network Computing Devices (L)	7.00	-0.50	-6.7
NYS	15.00	5.38	Network Equipment Tech.	8.00	-0.88	-9.9
OTC	20.13	8.00	Network General	12.25	-0.13	-1.0
OTC	15.75	6.88	Network Systems Corp.	7.75	-0.25	-3.1
OTC	73.88	8.94	Newbridge Networks Corp.	64.00	-2.88	-4.3
NYS	46.00	21.38	Northern Telecom Ltd.	25.50	-2.00	-7.3
OTC	35.25	17.63	Novell Inc.	19.13	-0.63	-3.2
NYS	48.75	39.50	Wyse Corp. (L)	48.75	1.06	2.2
OTC	30.00	14.50	Octel Communications Corp.	21.00	0.50	2.4
OTC	6.13	3.38	Pearl Data Comm Networks	4.38	0.13	2.9
OTC	30.50	12.50	Picturetel Corp.	17.50	-0.25	-1.4
OTC	11.50	3.63	Proteon Inc.	5.00	0.25	5.3
NYS	37.88	17.00	Scientific Atlanta Inc.	35.63	-1.50	-4.0
NYS	47.00	31.75	Southwestern Bell Corp. (H)	44.00	2.00	4.3
NYS	37.38	22.25	Sprint Corp. (H)	35.75	-0.63	-1.7
OTC	27.00	12.50	Standard Microsystems Corp.	21.50	2.63	13.9
OTC	18.50	9.25	Stratacom Inc.	13.00	0.25	2.0
OTC	42.75	12.84	Synoptics Communications	25.50	0.75	3.0
OTC	6.63	2.88	Telebit Corp.	5.13	0.38	7.9
OTC	15.00	2.38	Telematics Int'l Inc.	15.00	1.50	11.1
OTC	32.75	15.25	US Robotics (H)	28.75	-1.00	-3.4
NYS	48.13	35.25	US West Inc.	48.13	1.38	2.9
OTC	56.00	19.50	Wellfleet Communications	46.00	1.00	2.2
OTC	19.50	7.25	Xircom	17.00	-1.25	-6.8
Personal Workstations						
OTC	5.56	2.50	Advanced Logic Research	2.88	-0.13	-4.2
OTC	85.25	24.00	Apple Computer Inc. (L)	25.50	-0.50	-1.9
OTC	24.25	12.75	AST Research Inc.	15.50	0.00	0.0
NYS	9.25	2.50	Commodore Int'l	2.25	-0.38	-10.3
NYS	61.75	31.00	Compaq Computer Corp.	57.50	-0.13	-0.2
OTC	49.88	13.50	Dell Computer Corp.	17.25	-0.50	-2.8
NYS	89.25	50.25	Hewlett Packard Co.	67.88	-2.50	-3.6
NYS	41.00	17.63	Silicon Graphics	38.63	-0.50	-1.3
OTC	41.00	24.00	Sun Microsystems Inc.	25.63	-2.25	-8.1
NYS	36.38	24.63	Tandy Corp. (H)	35.88	-0.38	-1.0
OTC	7.00	2.88	Zeos International Ltd.	3.19	0.06	2.0
Large Systems						
ASE	9.63	4.50	Amdahl Corp. (L)	5.50	0.56	11.4
NYS	8.75	3.63	Convex Computer	4.63	0.13	2.8
OTC	6.13	2.25	Cray Computer	4.25	1.00	30.8
NYS	30.88	19.00	Cray Research Inc.	23.38	0.63	2.7
NYS	13.88	7.75	Data General Corp.	8.63	0.38	4.2
NYS	49.25	30.38	Digital Equipment Corp.	38.50	-4.25	-9.9
NYS	44.00	28.75	Harris Corp.	40.63	0.25	0.6
NYS	84.63	40.63	IBM	43.00	-0.63	-1.4
OTC	25.75	5.50	Kendall Square Research	20.75	-2.50	-10.8
NYS	141.50	83.00	Matsushita Electronics	136.00	-2.25	-1.6
OTC	23.75	8.25	NetFrame	16.50	3.50	26.9
OTC	23.50	9.25	Parallan Computer	19.50	1.00	5.4
OTC	23.25	6.00	Pyramid Technology	20.88	-0.38	-1.8
OTC	24.00	11.25	Sequent Computer Sys.	15.00	-0.25	-1.6
OTC	8.38	1.38	Sequoia Systems Inc.	2.38	-0.13	-5.0
NYS	46.75	20.25	Stratus Computer Inc.	24.00	0.38	1.6
NYS	16.88	8.50	Tandem Computers Inc.	9.75	-0.50	-4.9
OTC	23.50	10.63	TriCord Systems	19.25	1.25	6.9
NYS	13.88	7.75	Unisys Corp.	11.50	0.00	0.0
Software						
OTC	37.00	12.63	Adobe Systems Inc.	16.75	-2.50	-13.0
OTC	20.75	10.25	Alous Corp.	18.75	-0.25	-1.3
OTC	11.25	5.50	American Software Inc.	7.38	0.38	5.4
OTC	28.13	9.50	Ase Computer Systems	11.00	-0.88	-7.4
OTC	56.75	38.75	Autodesk Inc.	48.25	1.00	2.1
OTC	8.50	2.50	Bachman Info. Systems	3.38	-0.25	-6.9
OTC	43.00	26.50	BGS Systems Inc.	26.50	-3.50	-11.7
OTC	84.13	38.75	BMC Software Inc.	54.75	-1.88	-3.3
OTC	28.25	18.00	Boole & Babbage	24.00	0.50	2.1
OTC	42.00	13.88	Borland Int'l Inc. (L)	13.88	-0.88	-5.9
OTC	5.00	2.75	CE Software	2.88	0.00	0.0
ASE	40.25	11.16	Cheyenne Software Inc	31.25	-4.25	-12.0
OTC	19.50	8.25	ChipSoft	15.00	-0.25	-1.6
OTC	8.88	5.63	Cognos Inc.	7.63	-0.50	-6.2
NYS	32.25	14.50	Computer Associates	30.13	-0.50	-1.6
NYS	10.88	2.75	Computervision Corp.	3.13	-0.13	-3.8
OTC	34.25	19.25	Compuware Corp.	24.25	0.75	3.0
OTC	14.75	5.75	Comshare Inc.	9.13	-0.88	-8.8
OTC	30.38	10.75	Corel Corp.	30.38	1.38	4.7
OTC	15.25	5.00	Easel Corp.	6.50	0.00	0.0
OTC	25.25	12.00	4th Dimension	21.75	1.00	4.8
OTC	19.25	5.25	Frame Technology	7.63	-0.13	-1.6
OTC	17.50	8.00	Group I Software	8.00	-1.00	-11.1
OTC	35.25	14.50	Gupta	15.25	0.00	0.0
OTC	10.25	4.50	Hogan Systems Inc.	10.25	1.00	10.8
OTC	25.75	11.25	IMRS	18.00	1.38	8.3
OTC	44.75	24.75	Information Resources (H)	41.50	0.25	0.6
OTC	27.25	9.63	Informix Corp.	18.75	-1.50	-7.4
OTC	14.75	8.50	Intergraph Corp.	10.63	-0.50	-4.5
OTC	13.63	6.00	Interleaf Inc.	6.50	-0.38	-5.5
OTC	17.75	4.75	Intersolv Inc.	8.13	-0.50	-5.8
OTC	16.00	7.75	Knowledgeware Inc.	10.13	-0.13	-1.2
OTC	54.75	15.50	Logint Corp.	19.13	0.00	0.0
OTC	48.13	14.75	Lotus Development	38.25	1.50	4.1
OTC	23.00	4.25	MathSoft (L)	5.25	0.63	13.5
OTC	23.25	4.50	McAfee Associates	8.25	-0.13	-1.5
OTC	11.63	2.50	Meca Software	4.88	0.13	2.6
OTC	12.00	5.25	Menton Graphics	9.63	-0.13	-1.3
OTC	46.00	26.25	Micro Focus	26.50	-2.50	-8.6
OTC	13.25	4.38	Microgate Inc.	6.75	0.50	8.0
OTC	98.00	70.38	Microsoft Corp.	76.50	-1.38	-1.8
OTC	56.88	18.25	Oracle Corp.	52.63	1.50	2.9
OTC	40.00	21.50	Parametric Technology	36.75	-1.00	-2.6
OTC	40.50	22.50	Peoplesoft	32.25	-0.25	-0.8
OTC	7.13	3.75	Phoenix Technologies	4.19	-0.13	-2.9
OTC	40.00	22.00	Powersoft	27.75	0.00	0.0
OTC	30.25	11.34	Platinum Software (H)	30.00	1.75	6.2
OTC	25.00	10.75	Platinum Technology	11.13	-0.88	-7.3
OTC	61.50	32.25	Progress Software Corp.	46.63	-3.63	-7.2
OTC	7.38	2.56	Quarterdeck Office Sys.	2.81	0.06	2.3
OTC	32.00	15.75	Rainbow Technologies Inc.	26.13	-1.38	-5.0
OTC	11.38	4.00	Rasterops	10.25	0.38	3.8
OTC	15.25	3.63	Ross Systems	11.00	0.25	2.3
OTC	28.75	9.63	Sapiens Intl. Corp. N.V. (H)	27.63	0.38	1.4
OTC	14.50	5.50	Software Publishing Corp.	6.50	-0.50	-7.1
OTC	14.25	2.63	Software Toolworks Inc.	13.25	-0.50	-3.6
OTC	2.75	0.75	Spinnaker Software	1.56	0.00	0.0
OTC	13.75	3.25	State of the Art	10.50	-2.25	-17.6
NYS	24.63	15.00	Sterling Software Inc.	27.00	-0.63	-2.8
OTC	21.63	8.00	Struct. Dynamics Research	14.88	1.00	7.2
OTC	77.50	32.75	Sybase Inc.	55.50	-1.75	3.1
OTC	18.63	5.88	Symantec Corp.	18.13	1.13	6.6
OTC	29.50	10.00	System Software Assoc.	14.63	-0.88	-5.6
OTC	6.38	2.75	Timeic Corp.	6.00	0.00	0.0
OTC	34.25	11.25	ViewLogic Systems	21.13	-1.13	-5.3
OTC	23.50	5.50	Walker Interactive Systems	6.75	0.13	1.9
OTC	3.19	1.00	Woodstar	1.19	0.06	5.6
Semiconductors						
NYS	32.88	10.63	Advanced Micro Devices	29.38	0.88	3.1
NYS	26.88	9.75	Analog Devices Inc. (H)	25.00	-1.50	-5.7
OTC	35.00	10.50	Atmel Corp.	34.25	1.88	5.8
OTC	6.25	2.75	Chips and Technologies	4.88	-0.63	-11.4
OTC	39.75	13.00	Cirrus Logic	27.13	0.50	1.9
NYS	36.75	7.88	Cypress Semiconductor Corp.	13.50	-1.50	-10.7
NYS	19.00	10.38	Dallas Semiconductor	16.88	-0.50	-2.9
OTC	67.25	30.38	Intel Corp	64.75	-1.25	-1.9
NYS	19.25	5.38	LSI Logic Corp.	17.50	-0.25	-1.4
OTC	25.75	11.66	Lattice Semiconductor	23.25	-0.75	-3.1
NYS	58.25	36.38	Micron Technology (H)	58.25	1.38	2.4
NYS	99.13	41.38	Motorola Inc.	92.13	-1.63	-1.7
NYS	20.88	10.13	National Semiconductor (H)	19.88	-0.63	-3.0
OTC	15.75	6.50	Sierra Semiconductor	7.25	-0.25	-3.3
OTC	51.75	25.50	SynOpsys	46.13	-3.63	-7.3
NYS	84.25	39.00	Texas Instruments	76.13	-2.63	-3.3
OTC	17.38	6.50	VLSI Technology (H)	17.13	0.38	2.2
OTC	13.25	2.63	Weitek	12.75	0.00	0.0
ASE	9.63	3.63	Western Digital Corp.	4.88	-0.13	-2.5
OTC	46.25	14.50	Xilinx	44.25	-0.25	-0.6
OTC	33.25	18.00	Zilog Inc. (H)	32.50	1.25	4.0
Peripherals and Subsystems						
OTC	48.00	15.75	American Power Conversion	38.75	-3.00	-7.2
OTC	20.38	15.50	Benetec Inc.	19.25	0.50	2.7
OTC	18.00	3.50	Cambex Corp.	4.00	0.00	0.0
ASE	18.38	3.88	Cognitronics Corp.	4.38	-0.50	-10.3
NYS	23.50	9.00	Conner Peripherals	10.00	-0.38	-3.6
OTC	38.50	14.00	Creative Technologies Inc.	19.13	-0.13	-0.6
OTC	30.75	11.00	Data Race Inc.	12.75	-0.50	-3.8
ASE	13.25	4.75	Databram Corp.	8.63	-0.50	-5.5
NYS	35.00	6.00	EMC Corp.	33.63	1.63	5.1
OTC	10.50	5.25	Emulex Corp. (L)	6.25	0.50	8.7
OTC	19.00	13.25	Evans & Sutherland	16.75	-0.50	-2.9
OTC	24.25	7.50	Exabyte	9.38	-0.25	-2.6
OTC	34.00	9.13	Intelligent Info. Systems	26.00	-6.25	-19.4
OTC	8.88	3.00	Iomega Corp. (L)	3.00	-0.38	-11.1
OTC	15.25	5.75	IPL Systems Inc.	7.25	-0.75	-9.4
OTC	24.00	14.25	Komag Inc.	16.25	2.00	11.0
OTC	19.63	4.38	Maxtor Corp.	5.88	0.00	0.0
OTC	10.38	5.75	Micropolis Corp.	6.25	-0.50	-7.4
NYS	117.00	97.00	3M Corp	107.75	1.38	1.3
OTC	7.75	4.00	Pinnacle Inc.	7.13	0.13	1.8
NYS	17.25	6.88	QMS Inc.	7.88	-0.63	-7.4
OTC	17.88	9.50	Quantum Corp.	11.38	-1.00	-8.1
OTC	7.13	3.13	Radius Inc.	4.63	-0.25	-5.1
NYS	16.88	9.13	Recognition Equipment	15.63	-0.25	-1.6
OTC	13.88	3.75	Reason Inc.	4.25	0.00	0.0
OTC	22.38	12.00	Seagate Technology	17.63	-1.63	-8.4
NYS	45.00	18.00	Storage Technology	27.50	-2.63	-8.7
NYS	27.88	17.63	Tektronix Inc.	24.13	0.13	0.5
NYS	86.88	70.25	Xerox Corp.	71.75	-1.13	-1.5
Services						
OTC	23.75	14.88	*American Mgmt. Systems	16.13	-1.25	-7.2
NYS	4.75	2.38	Amacomp Inc.	2.88	0.00	0.0
OTC	35.75	17.75	Analysts Int'l	32.75	0.00	0.0
NYS	56.13	44.63	Auto Data Processing	49.13	0.25	0.5
NYS	17.50	13.00	Cerdian Corp. (H)	17.38	1.13	6.9
NYS	17.38	13.13	Comdisco Inc.	16.13	1.38	9.3
OTC	11.00	4.50	Computer Horizons	11.00	0.50	4.8
NYS	92.38	65.88	Computer Sciences (H)	90.00	-2.25	-2.4
NYS	9.25	6.00	Computer Task Group	7.00	0.25	3.7
NYS	40.50	19.00	CompUSA Inc.	30.75	-1.13	-3.5
OTC	14.25	7.00	Corporate Software	11.25	0.25	2.3
OTC	12.75	6.63	Egghead Discount Software	7.13	-0.13	-1.7
NYS	35.88	26.00	General Motors E (EDS)	32.00	0.75	2.4
OTC	25.50	10.50	Inacom Corp.	17.63	-1.13	-6.0
OTC	19.50	8.13	Intelligent Electronics (H)	19.50	0.88	4.7
OTC	19.13	7.13	Medisi	13.88	-0.50	-3.5
OTC	24.50	5.75	Microdyne Inc.	21.50	-1.50	-6.5
OTC	33.00	19.00	Paychex	32.00	0.75	2.4
NYS	37.25	21.63	Policy Management Sys.	25.13	-0.13	-0.5
NYS	43.63	20.75	Reynolds and Reynolds	38.38	1.50	3.8
OTC	19.00	12.00	SEI Corp.	18.00	0.00	0.0
OTC	24.38	17.50	Shared Medical Systems	21.88	-0.25	-1.1
OTC	12.63	9.75	SHL Systemhouse	9.75	0.00	0.0
OTC	30.75	20.00	Software Spectrum Inc.	25.25	-1.00	-3.8
OTC	40.75	23.75	Sungard Data Systems (H)	39.25	-1.00	-2.5
NYS	4.38	1.13	Ultimate Corp.	2.75	-0.13	-4.9

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

Televideo posts loss

For its third fiscal quarter ended July 30, **Televideo Systems, Inc.** has recorded a net loss of $431,000, or 1 cent per share, on net sales of $3.4 million. This compares with a loss of $94,000, or less than 1 cent per share, on net sales of $4.7 million for the similar period a year ago. The company blamed this on its exit from the computer systems business.

Investors sue Apple

Apple Computer, Inc. picked up another shareholder suit last week — its sixth since July — charging company officials with taking advantage of insider information to sell stock before the price dropped significantly in July.

Micropolis cuts force

Micropolis Corp. last week cut about 14% — 205 workers — from its work force and said it expects to further reduce its manufacturing staff. Due to a combination of costs associated with the cuts and lower-than-expected sales, the company expects to post a larger net loss for the quarter ending Sept. 24 than it had previously anticipated. It blamed "overcapacity conditions" and an "intensely competitive" marketplace.

Sun Data parts sold

SunGard Recovery Services, Inc. acquired the disaster recovery business of **Sun Data, Inc.** Separately, Sun Data said it sold a 90% stake in the company to Eric Prockow, formerly chief financial officer and vice president of operations. He was named chairman and chief executive officer. Details of the transactions were not disclosed.

Stratus buys firm

Stratus Computer, Inc. signed an agreement to buy **Shared Financial Systems, Inc.**, a Dallas vendor of financial, retail and health care applications, for $15 million.

Export guides hinder U.S. encryption trade

U.S. software vendors say federal export controls giving foreign market leg up

By James Daly
WASHINGTON, D.C.

U.S. software companies building data encryption packages are losing an estimated millions of dollars each year because of strict and outdated federal export control guidelines, according to a recent study by the Software Publishers Association (SPA) in Washington, D.C.

"We are going to be closed out of the [foreign] market and lose sales of noncontrolled software and maybe even hardware and services because we can't provide the total package the customer wants," said Lee Mercer, corporate export manager at Digital Equipment Corp.

At the root of the problem is a type of package that uses mathematical formulas or algorithms — sometimes called keys — to scramble data, making it hard for unauthorized recipients to read. The federal government puts strict control on the export of such packages, fearing they may prevent U.S. security agencies from intercepting foreign communications.

Vendor insecurity

Vendors say federal regulations have inhibited them from putting security features into their products. They fear being prevented from exporting the features or not affording the laborious export approval process. The rules allow a watered-down version of DES to be exported, but many manufacturers cannot support two versions of their encryption packages. And many foreign customers demand to have their products protected by the use of DES or its equivalent.

Brisk overseas business

But the SPA's study found that such encryption packages are flourishing overseas. Earlier this month, in testimony before the National Institute of Standards and Technology's Computer Systems Security and Privacy Advisory Board, the SPA's Douglas Miller said at least 215 foreign hardware and software products from manufacturers in at least 20 foreign countries now encrypt text, files and data. He added that 84 of those products use the Data Encryption Standard (DES), an algorithm used by the federal government that is believed to be unbreakable.

Miller also identified 33 foreign encryption software kits that employ DES. The kits are installed by inserting a floppy disk, thus allowing DES capabilities to be programmed into various applications. In contrast, he identified 283 encryption products from U.S. firms, 148 of which employ DES.

While DES or DES-strength encryption is legal in the U.S., federal regulations prohibit its commercial export in most circumstances. But DES software is available worldwide via Internet, said the SPA's general counsel Ilene Rosenthal. "Current export regulations are not effective in preventing the export of DES encryption technology," she said.

It's a no-win situation for U.S. software makers, according to the SPA. "Export restrictions simply prevent U.S. companies from generating foreign revenue and creating new jobs," said SPA executive director Ken Wasch.

Senior correspondent Gary H. Anthes contributed to this report.

Pace picks up in tech mergers; client/server hot

By Derek Slater
FORT LEE, N.J.

Information technology companies continued to partner up at record rates in the first half of the year, according to a Broadview Associates study, which revealed a 30% rise in merger and acquisition activity.

A total of 296 deals, worth $12.6 billion, were completed, compared with 227 transactions totaling $9 billion in the comparable period in 1992.

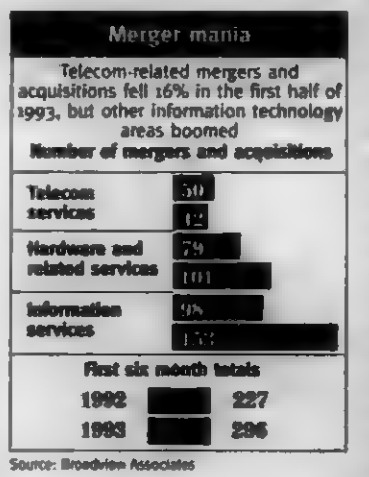
Peter Stoneberg, managing director at Broadview Associates, said the largest number of deals were in the services and software sector. Client/server software companies were hot targets, as were PC application software developers.

Telecommunications deals, while less numerous than software transactions, were more capital-intensive and accounted for a whopping 60% of the dollar total in the six-month period.

Among the pacesetters was networking giant Novell, Inc., which snapped up four acquisitions in six months, engulfing Unix System Laboratories, Inc., video-on-NetWare start-up Fluent, Inc. and development tool vendors Serius Corp. and Software Transformation, Inc.

OpenVision Technologies, Inc., a well-heeled distributed systems management start-up, also bought four entire companies during the same period, along with two divisions and Control Data Systems, Inc.'s Aria storage management product suite. One-year-old OpenVision is based in Pleasanton, Calif.

"Megadeals" worth $100 million or more included Sterling Software, Inc.'s $156 million buyout of Systems Center, Inc. and AST Research, Inc.'s purchase of Tandy Corp.'s Grid subsidiary. Most of the transactions in the half-year, however, were valued at less than $10 million.



Source: Broadview Associates

No end in sight

Don't expect the dance to end soon.

For example, Bachman Information Systems, Inc. has announced it will acquire Cooperative Solutions [CW, Sept. 13]. Novell is expected to keep shopping [CW, June 14], as is Symantec Corp., which announced plans to buy Fifth Generation Systems, Inc.

Stoneberg said he also expects internetworking companies to start pairing up. "Up until now, there have been pretty distinct lines between hubs and routers, but now they are getting into each other's territory," Stoneberg said.

Broadview's report also noted that tax law changes should help fuel the fire. Goodwill that is usually booked in asset acquisitions is now tax-deductible, meaning that an acquired company can make a more positive immediate contribution to after-tax earnings. Lower capital gains taxes also contribute to a healthy mergers and acquisitions environment, according to Broadview's report.

"The biggest thing that could slow things down would be a major correction in the stock market," Stoneberg said. The high prices of technology issues have made stock a preferred currency for acquisitions, he said.

One factor driving the merger momentum is the surprising speed with which downsizing has taken root. "It's a time to market issue," Stoneberg said. "Client/server has accelerated beyond what anyone expected, and to get a market position the big firms are having to buy smaller, innovative companies" rather than develop products from scratch.

On the PC application front, Stoneberg noted that distribution channels are becoming more defined, making it difficult for smaller vendors to break in. New companies are pushing to hook up with more established players in order to gain access to precious shelf space.

Wysiwyg

It had to happen

Computer Athlete, Inc. in Dublin, Ohio, is promoting PC software that works with any exercise equipment. According to the company, the equipment is attached to a PC, creating an arcade-style game that enables a person's motions to correspond to those of a video athlete. You score points by dodging hazards and passing menacing characters.

Did you know?

They've started calling the Minneapolis/St. Paul area "the heart of the silicon tundra."

Eat my (Silicon) dust

They take their technology seriously in Silicon Valley. On the way to a user group conference recently, one of our reporters saw a shiny black BMW speeding down the highway. Its vanity plate read:

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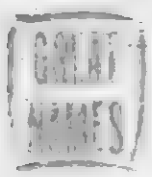
Thar she blows!

Consultants, analysts and public relations people are often characterized as being, ahem, a bit long-winded and fond of doubletalk. Therefore, the following list of great names seems rather appropriate:



- John Boring, president of SQL Designs, a consultancy.
- Wyndi Ballard, director of public relations, Software Marketing Corp.
- Robert Puffer, analyst, Gartner Group, Inc.
- Dick Hackmeister, Hackmeister Advertising and Public Relations.

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The 5th Wave *by* Rich Tennant

Inside Lines

True Blue?

The IBM Consulting Group appears to be holding firm to its pledge to provide its customers with non-IBM equipment when required. This week the White Plains, N.Y.-based consulting firm will announce plans to conduct a client/server project for a major database vendor with non-IBM hardware.

First in line

In the next month or two, Banyan Systems and Cisco Systems should be the first major network system vendors to announce support for Simple Network Management Protocol (SNMP) Version 2.0, according to Jeff Case, who co-developed SNMP Versions 1.0 and 2.0. Such support will give users something to manage with the new SNMP Version 2.0-based platforms recently announced by Sun and Wellfleet.

Potential bedfellows?

Are we close to seeing Oracle sign a joint development pact with Lotus for an expanded Notes-style groupware product [CW, Sept. 6]? Several database analysts think so. The database maker plans to announce "a major alliance" at the International Oracle User Week conference next week in Orlando, Fla., a spokeswoman acknowledged. One Wall Street analyst said the duo has been "talking for months" about a groupware collaboration. An Oracle executive acknowledged the talks but would neither confirm nor deny an impending partnership.

Manufacturing plant: Will sell or lease

Sources say IBM is getting very close to peddling off its Kingston, N.Y., manufacturing plant. The facility, which is closing as part of IBM's ongoing consolidation efforts, is in the process of being folded into Big Blue's Poughkeepsie, N.Y., operations. The Federal Aviation Administration was rumored to be interested in transferring 975 of its Jamaica, N.Y., employees to the Kingston site, but FAA officials have denied interest. The latest prospective tenant? NBC Corp.

'Gussied-up' nuptials

Legent and Hewlett-Packard will this week announce an alliance that will marry Legent's glass house expertise with HP's distributed computing capabilities in suite of performance monitors. Legent will integrate HP's Vantage Point/Open distributed performance management software into Legent's Paradigm product for distributed environments. Vantage Point is a full-blown Paramount product for distributed environments. Vantage Point is a full-blown Paramount product for distributed environments. Vantage Point is a full-blown Paramount

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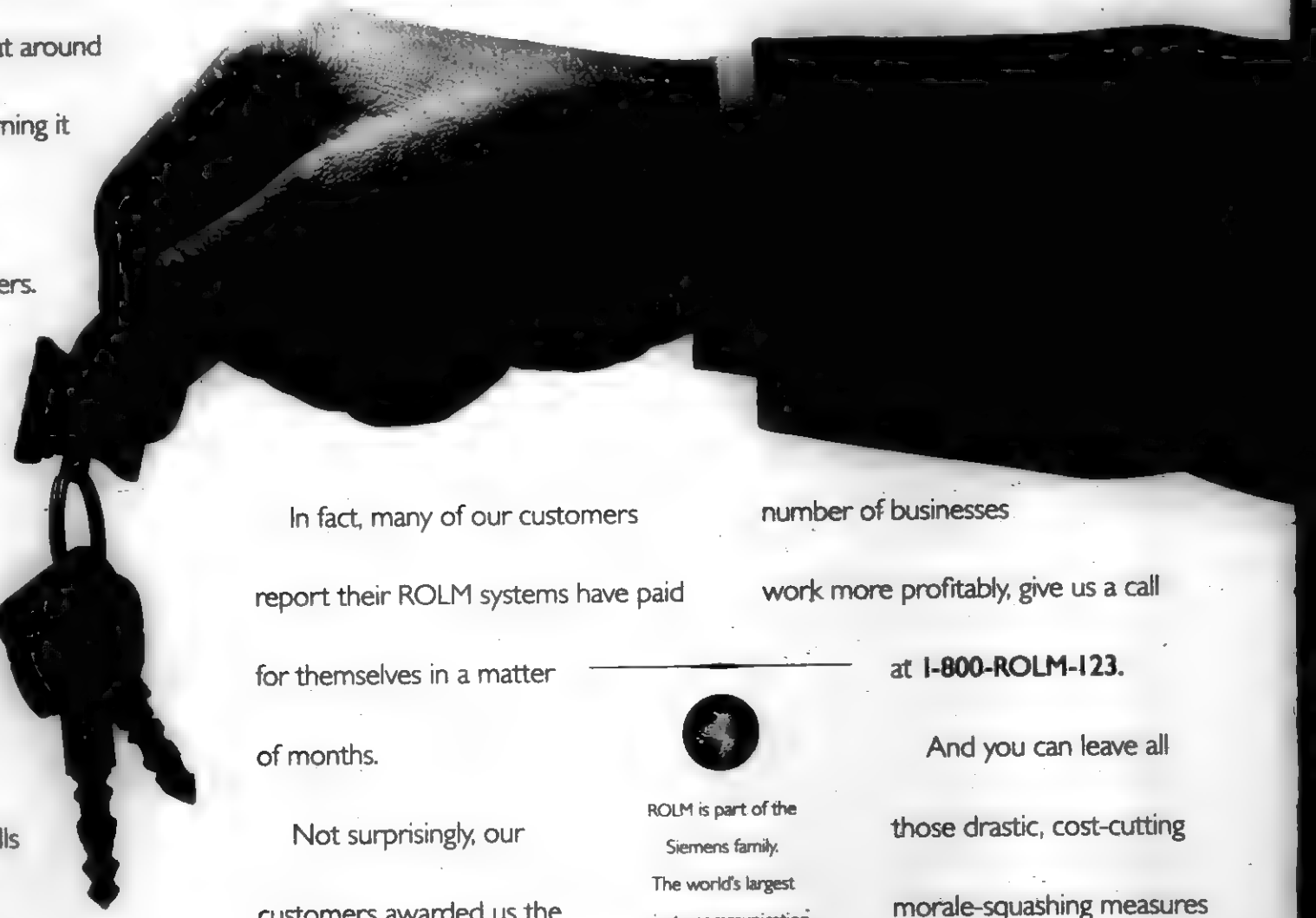
Then there are the infinitely more interesting stories of enormous revenue gains. West Capital Financial Services, for example, pulled in a colossal 357% of their previous year's revenues.



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COMPUTERWORLD

Microsoft pumps client/server

Advanced Server price slashed in bold bid to win NetWare users

By Elisabeth Horwitt
REDMOND, WASH.

Microsoft Corp.'s decision to give away its Windows NT Advanced Server client software will help entice first-time corporate buyers to choose NT over Novell, Inc.'s NetWare as their primary client/server platform, observers said last week.

Less clear, however, is whether bargain-basement prices will help Advanced Server carve a significant slice out of Novell's 68% to 70% share of the overall network operating system installed base.

Furthermore, pricing will be only one consideration — and possibly a minor one — for companies choosing a network operating system, according to one user, several analysts and, of course, Novell.

"Irrespective of dollar amounts, NetWare does outperform Advanced Server in file and print services, although not as an application server," said Louis Kahn, chief of network operations at the National Immunization Program in Atlanta.

Added John Donovan, a senior analyst at WorkGroup Technologies, Inc. in Hampton, N.H.: "Considerations like durability and reliability, administration and management tools are all tremendously important [to users], and Novell is very far ahead of NT on those scores."

Microsoft announced last week that client networking software

Microsoft, *page 10*

Wellfleet adds IBM flavor to router recipe

By Joanie M. Wexler
DANVERS, MASS.

Wellfleet Communications, Inc. last week gave users a premature peek into the next version of its router software, an IBM internetworking-oriented upgrade that finally unites old and new Wellfleet platforms.

The software, due out in November, includes a list of IBM protocol support and network management enhancements aimed at the heart of user internetworking challenges today: force-fitting IBM host traffic onto LAN internetworks.

The new release will also bring the long-touted benefits of Wellfleet's 18-month-old Backbone Node family, such as software fault tolerance, to users of its older VME-based line, according to documents circulating at the Wellfleet user group meeting here last week. The VME-based routers are installed at the majority of Wellfleet accounts today.

Release 7.6 represents the first box on the market to support Data Link Switching, the IBM-originated but now industry-driven standard scheme for merging SNA traffic onto distributed internetworks.

For IBM-heavy shops, Data Link Switching "addresses a legacy environment that now requires a whole extra support structure,"

Wellfleet, *page 12*

PC price war

Rivals may squeeze Intel

By Michael Fitzgerald

Intel Corp. is staring straight at a pincerlike move that could force it to lower its prices and shift its Pentium strategy in 1994.

Surrounding Intel are the PowerPC initiative from IBM, Apple Computer, Inc, and Motorola, Inc. and Cyrix Corp.'s coming M1 chip design, which that company plans to detail at the Microprocessor Forum on Oct. 18.

The first PowerPC systems started shipping last week. The various PowerPC partners have the potential to ship well over 1 million systems next year, according to analyst estimates. That could make PowerPC a solid volume competitor to Pentium, which analysts expect will ship in the 2 million to 3 million unit range in 1994.

Staying on schedule

Moreover, the PowerPC alliance remains on schedule for the second part of the project, the 603 chip. Sources said the partners will announce at the Microprocessor Forum that they have developed the first implementation of the chip.

Intel also will face pressure from Cyrix. Like the Pentium, the M1 features a superscalar design. But unlike the Pentium, it does not

Intel, *page 7*

CITY LIMITS

Reinventing government? Local-level IS chiefs such as the city of Phoenix's Vivienne Dacey are trying, but empty coffers and regulations are blocking their efforts.

See In Depth, page 132

UNIX EXPO

- NetWare gets Unix spin; X/Open doesn't get USL code — yet. *Page 14*
- First PowerPCs arrive. *Page 16*
- Notes on Unix? *Page 18*

Desktop application development

Windows 4.0, OLE 2.0 to test developer mettle

By Michael Vizard and Ed Scannell
REDMOND, WASH.

As Microsoft Corp. begins its transition to Windows 4.0 and Version 2.0 of its Object Linking and Embedding interface, the coming year is likely to be remembered as one of the most trying times for Windows developers.

Microsoft currently plans what amounts to a redesign of the Windows graphical user interface in Windows 4.0, known as Chicago. It will also deploy an object-oriented programming environment in the guise of OLE 2.0.

Windows 4.0 simplifies the task of sharing application data by allowing users to drag icons across the screen.

The prospect of a redesigned Windows interface, which will steadily evolve throughout its upcoming beta cycle, presents developers with a significant challenge as they march through their own development projects.

For example, a developer planning to deploy an application in 1994 is currently working with the Windows 3.1 interface. But a developer at a rival company may opt to start working with the user interface in Windows 4.0 early next year. Doing so would give the second developer a nicer-looking, native Windows 4.0 application as early as six months after the first developer delivered a Windows 3.1 application.

"Microsoft is saying that Windows 3.1 up-

Windows development, *page 6*

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■ **The Society for Information Management works with vendors to define terms in software licensing debate.** *Page 6*

■ **Oracle forges partnerships with traditional mainframe utilities makers to provide customers with mainframe-caliber systems management tools.** *Page 6*

■ **IBM will soon unveil software to manage distributed LAN Server systems via either host or OS/2-based NetView.** *Page 10*

■ **HP pledges (again) to fix its archaic order-fulfillment system and reconsiders porting its HP 3000 database to the Unix platform.** *Page 12*

■ **Novell tightens links between UnixWare and NetWare, including expansion of a certification program to include UnixWare.** *Page 14*

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■ **It can be a long way from concept to product, as is clear from a catch-up look at some of the leading-edge technologies we've covered during the past three years.** *Page 32*

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■ **3Com announces a set of applications for managing its network products.** *Page 67*

Ed Trainor at Southern California Gas *says you can buy a lot of contractor for the cost of a full employee compensation package.* **Page 113**

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■ **NCR establishes a dedicated software division and adds fault-resilient software to support server clustering.** *Page 79*

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■ **Contract programmers aren't just extra labor for peak work loads. Some companies find that temporary hires can help train staffs in new technologies.** *Page 113*

IN DEPTH

■ **Information systems groups in local government battle both cost cuts and bureaucratic red tape.** *Page 132*

INTEGRATION STRATEGIES

■ **Integration projects aren't something you can just hand off. Even if you find a great integrator, which takes some effort, you still have to manage the process all the way.** *Page 121*

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■ **If you know one version of Unix, learning another version is not a big stretch.** *Page 140*

MARKETPLACE

■ **A former consultant discloses shortcuts and billing games that hired advisers sometimes play.** *Page 149*

COMPUTER INDUSTRY

■ **It's survival of the fittest in the internetworking market.** *Page 157*

COMMENTARY

■ **IBM researchers may have discovered a way to exponentially increase disk drive capacity without upping power drain, according to Charles Babcock.** *Page 6*

■ **Client/server looks wonderfully easy when you consider only the client side, Paul Gillin says. Most of the complex parts are found on the other side of the slash mark.** *Page 36*

■ **Information technology could be used to simplify the way we do business, Michael Schrage writes. But too often, we're using it to manage unnecessary complexity.** *Page 37*

Integration Strategies: *Michelle Wells at KFC says systems integrators need up-close exposure to your business.* **Page 121**

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Executive Briefing

Better management through consistency is an idea that a couple of networking product vendors are saluting this week. Wellfleet's new router software release will cater to mixed IBM/LAN shops and unites features across its older and current platforms. *Page 1.* **In the meantime, 3Com has announced a set of applications that will unify the management of its large variety of hubs, routers and network adapters.** *Page 67*

Champing at the bit for multimedia capability? Developments on several fronts will soon give you more to work with. HP is scrapping its line of X Window System terminals in favor of a new multimedia-capable line called Envizex. *Page 53.* Oracle is road-testing massively parallel databases capable of manipulating video and sound in tests of interative TV applications by Bell Atlantic and US West. Pieces of this product line, dubbed Media Server, are expected to ship to developers in January. *Page 85.* And disk drive maker Micropolis has introduced the first magnetic drives designed for digital audio/video applications. *Page 44*

Some potential customers are worried about the sizable hardware commitment that Microsoft's SQL Server for Windows NT might require. *Page 49.* This issue spells opportunity for Netpower, a start-up funded by Silicon Graphics, Stanford University and venture capitalists. Netpower will announce today that it is shipping a RISC-based server for Windows NT, and it will market client and server versions together with Microsoft. *Page 61*

Nothing is going to make client/server as safe or easy as the marketing hype would have you believe (*Page 36*), but some alliances are at least bringing some familiar utilities and mainframe capabilities into this rough territory. Oracle has provided APIs for its database to Legent, BMC and five other large-system specialists in systems management tools. *Page 6.* Legent has also allied with HP to produce an integrated suite of tools spanning mainframe and Unix client/server environments for performance and resource management. And in another combination move designed to allay concerns about merging legacy systems with open or distributed platforms, Sun and Amdahl have announced plans to collaborate. *Page 24*

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What's to come

Near term (expected by year's end, in rough order of delivery):
- Organizer for Macintosh: overdue Macintosh version of group-scheduling software.
- CC:Mail for Macintosh 2.1: fixes problems such as slow response and lack of spell checking.
- CC:Mail Remote for DOS 3.5: includes wireless support and message previewing.
- CC:Mail for Unix 1.1: client software for Solaris 2.x and OSF/Motif Windows Managers.
- CC:Mail Link to MHS 2.0: updated gateway to Novell's MHS.
- Automatic Directory Exchange (ADE) 2.0: will synchronize CC:Mail post office directories and allow multiple iterations of the same user name.
- Admin. 3.0: administration tools for ADE includes a free set of administration utilities.

Midterm (three to six months out):
- Windows Mobile 2.0: remote version of CC:Mail for Windows multiple location profiles, wireless drivers.
- Organizer Scheduling for DOS: interoperable with Windows and Macintosh versions.
- Organizer connection to IBM Professional Office Systems or OV/VM: partnership between Attachmate Corp. and Lotus to allow searching for free time and exchange of meeting notices across mainframes and LANs.

Long term (yet to all materialize):
- Sequoia Post Office: overdue update to traditional CC:Mail post office that does not require users to take the server down to reclaim disk space.
- New Sequoia routers and gateways: includes a DOS version of the LCS.
- CC:Mail Post Office Edition clients: offers unified set of features across platforms.
- LCS: multitasking X.400/SMTP-based server that will route mail traffic to CC:Mail or Notes directories and will support non-Lotus mail clients.
- Client/Server CC:Mail: CC:Mail for LCS.

Lotus overhauls CC:Mail

Plans to meet user demands for management, migration

By Lynda Radosevich
SAN FRANCISCO

Lotus Development Corp.'s blueprint for modernizing CC:Mail signals that it has recognized the most urgent needs of CC:Mail customers: management and administration features and a method to migrate to client/server platforms.

Officially unveiled at the annual CC:Mail user conference here last week, parts of the Lotus strategy, however, are long on intention and short on details. This is leading some customers and analysts to question whether Lotus can follow through on its promises in a timely manner, something with which the company often has difficulty (see story page 16).

For instance, Lotus executives echoed users' complaints by conceding that CC:Mail needs better wide-area management administration. The company also committed to providing those management features, but it did not define how or when it would be done.

"The good news is they articulated a strategy that makes sense because it gives us a growth path," said Larry Quinlan, manager of LAN services at CC:Mail user site Deloitte & Touche in Nashville.

Highlights of the CC:Mail game plan included an upcoming messaging server called the Lotus Communications Server (LCS). Based on Notes technology, it will use native X.400 and Simple Mail Transport Protocol (SMTP) transports and support the X.500 directory protocol [CW, Sept. 20]. It will operate on Microsoft Corp.'s Windows NT, Unix and OS/2 and will function as a Novell, Inc. NetWare Loadable Module. By supporting various application programming interfaces, the server will work not only with Notes and CC:Mail clients but also with archrival Microsoft's Mail.

"Lotus is making major changes in terms of 'openness,'" said David Marshak, an analyst at the Patricia Seybold Office Computing Group, a consultancy in Boston.

Doing so may allow Lotus to hold off a challenge from Microsoft, which is developing an X.400-based Enterprise Messaging Server (EMS) that runs only on Windows NT. For customers that do not want to be forced into using NT but are accustomed to Microsoft's Mail interface, the Lotus server could provide back-end services, Marshak said.

May miss the mark

But Lotus officials were unable to predict how parts of the server would be done. This led industry analyst David Ferris, editor of the San Francisco-based newsletter "Ferris E-mail Analyzer," to conclude that Lotus is not very far along in its development process.

Lotus' timing could be critical. Microsoft has indicated that EMS will ship in the first half of 1994. While Microsoft's plans may not affect some current CC:Mail customers, they could sway users who are just beginning to migrate from mainframe systems or who are beginning to reevaluate their electronic-mail strategies.

GE Capital Fleet Service in Eden Prairie, Minn., is one of those companies. A CC:Mail site for two years with 1,300 users, the car-leasing company will begin in two weeks to reexamine the major E-mail systems, said Terry Sovil, a project manager in office automation.

Lotus also reiterated that it is developing an updated post office, called Sequoia, for traditional CC:Mail. Also, the company said it will develop new client software to work with Sequoia.

For Notes/CC:Mail integration, Lotus will deliver a client/server version of CC:Mail that will use the Notes directory store and LCS for transport. Eventually, this version and Notes will share the same interface, Lotus officials said.

Lotus is also working on a stand-alone forms package for early 1994 delivery that will operate across Notes and CC:Mail and will allow access to information in the Notes database.

All we want from Lotus is. . . .

Customers of CC:Mail at last week's user group conference differed on what capabilities they want Lotus to deliver first, but enthusiasm for an updated new directory was high.

For example, Joe Klehe, a networking engineer at Syntex, Inc., a pharmaceutical company in Palo Alto, Calif., said directory synchronization among CC:Mail post offices is his top priority.

The current release of Lotus' Automatic Directory Exchange (ADE) sends updates from one post office to another but does not verify that post offices are "in sync." This leads to creeping directory corruption, Klehe said.

The upcoming ADE Version 2.0 appears to address this limitation, but in the meantime, Syntex has created a homegrown synchronization program that does the job.

Other users were more interested in seeing CC:Mail connections to outside systems improved.

Gregory Kandl, chief of the information planning and requirements branch at a large government organization based in Chicago, said he is indifferent to Lotus' messaging server announcement. What he really needs are X.400 and SMTP gateways to exchange mail with outside organizations, he said.

For Terry Sovil, an office automation manger at GE Capital Fleet Service in Eden Prairie, Minn., electronic forms based on Notes or CC:Mail is his top priority. That is because the company is striving to "go paperless" as part of a broader move to client/server computing, he said. —*Lynda Radosevich*

Medical center in tune with Clinton reform

By Joanie M. Wexler
BOSTON

■When the Clinton administration's health care reform plan hit the streets last week, at least one medical services provider was already on route to overhauling its patient care delivery system via new information technologies.

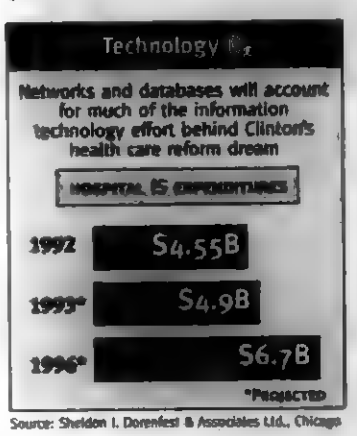
New England Medical Center here is revamping its business, a monumental task that includes redefining its relationship with insurance carriers and instigating a network-centric approach to treating patients.

The goal is to leverage emerging technologies as an incentive for the facility to streamline operations and conserve costs while boosting the quality of care, said Bill Montgomery, vice president and chief information officer.

The center believes it will be "more efficient for us to get information from videoconferencing or digital imaging" while still providing quality care, Montgomery said.

But the multiyear plan stretches beyond the efficiencies associated with automation. The center is banking on the power of networks to allow physicians the freedom to provide what they deem appropriate treatment independent of what they will be reimbursed for.

The idea is to discard the current insurance system of being reimbursed for "doing things to people," and instead contract with an insurer for a certain number of dollars to handle a given patient case in whatever method a physician sees fit, including network-oriented home care. The center would eat the cost if not successful and thus be incented to provide quality care.



Source: Sheldon I. Dorenfest & Associates Ltd., Chicago

New England Medical's agenda, which is in step with an aspect of the Clinton plan that encourages using the information superhighway [CW, Sept. 20] to bring hospitals, doctors, patients and insurers together, depends on new-generation networking technologies such as Integrated Services Digital Network (ISDN), T3 (45M bit/sec.) leased lines and Asynchronous Transfer Mode (ATM).

Trials under way include a joint effort with IBM in which outpatients' family members provide real-time data about patient status through a PC that acts like a remote hospital LAN node. They communicate through the PC over ISDN or dial-up lines via modems.

Interhospital trials with T3 lines and ATM are helping the center assess the benefits of interphysician discussions about treatments.

What the center is doing addresses the key issues medical facilities need to address in order to survive: how to decrease costs and re-engineer delivery systems, said health care information systems consultant Charles Singer, president of Charles J. Singer & Co. in Wakefield, Mass.

A picture is worth a ~~thousand~~ 25,000 lines of code.

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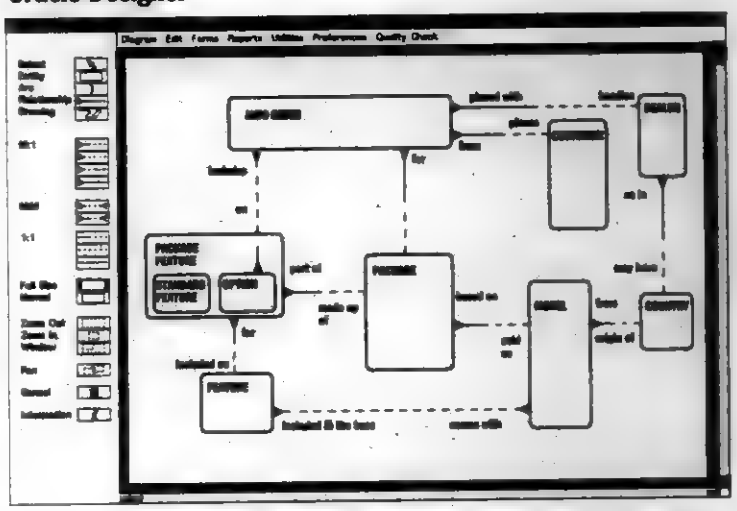

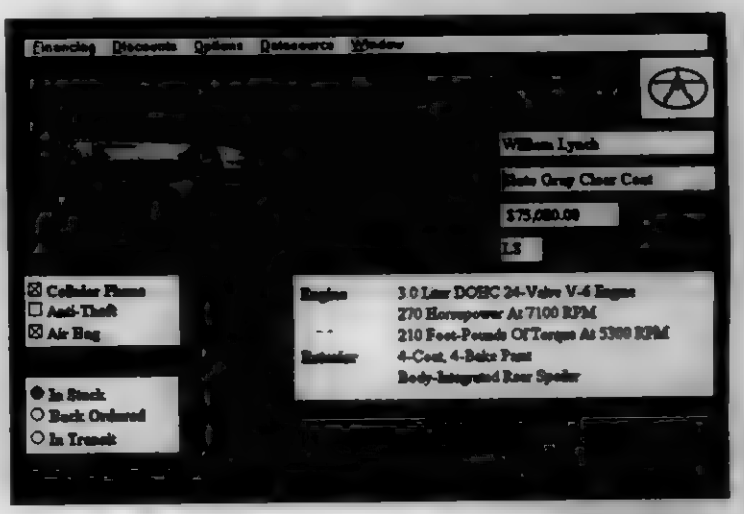

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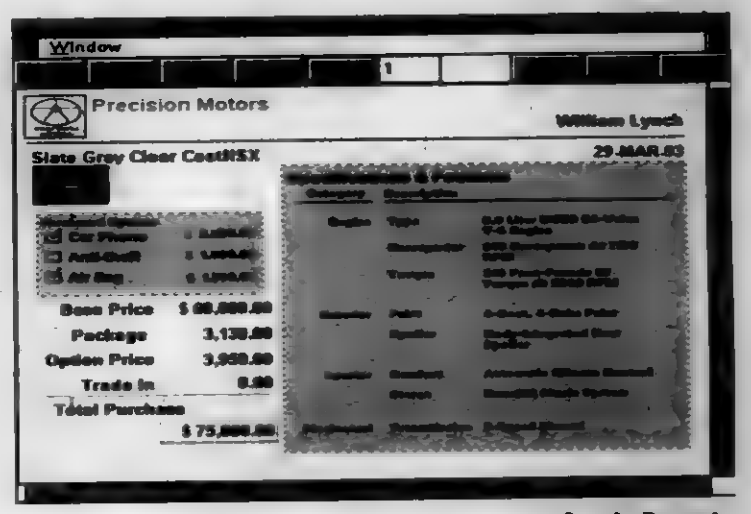

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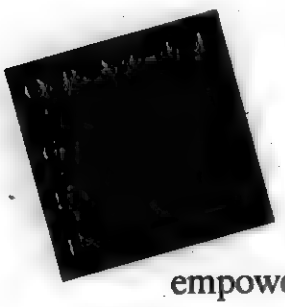

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10 billion bits per square inch?

IBM researchers in San Jose, Calif., have seized on a commonly known phenomenon, giant magnetoresistance, and are finding a way to apply it that could multiply disk drive capacity fiftyfold and supply a boon to low-power mobile computing (see story page 32).

Competitors are shaking their heads in disbelief that any such gains will materialize before the year 2000. "I think talk about giant magnetoresistance is speculation. It's seven to eight years away," says Charles Christ, vice president of Digital Equipment Corp.'s Storage Business unit. But IBM is talking about giant magnetoresistance drives within three years.

I understand skeptics who say IBM is desperate for good news, but they should remember that IBM has been a leader in storage for 26 years. After visiting its Advanced Storage and Retrieval facility, I would say IBM is going to make good on its claims. If it does, drive capacity will not only increase dramatically, but drive sizes will continue to shrink. Giant magnetoresistance encourages further miniaturization.

An IBM breakthrough promises mega storage on small, low-power disk drives.

Charles Babcock

Today's hard drives are based on induction, where a magnetic field representing a bit induces a tiny electrical current as it passes under the drive head. The force of the field depends on the spinning disk's speed, and supplying power to the disk motor is a drain on a battery-powered laptop.

Drive heads based on plain vanilla magnetoresistance, which have been on the market only a short while, function by registering a change in the resistance to electricity in a conductor when it is exposed to a magnetic field. Resistance typically increases 4% to 6% maximum (or 1% in the small scale of a drive head).

It has been known for some time that this effect can be magnified under special circumstances, increasing resistance by 40% to 60%. Generating this kind of giant magnetoresistance in the past has required magnetic fields 1,000 to 2,000 times stronger than those used on a hard disk and temperatures of minus 450 degrees Fahrenheit, not exactly optimum conditions for the desktop.

What IBM engineer Todd Hylton and three associates have done is find a way to create giant magnetoresistance with materials and conditions that mimic those in use today.

Because giant magnetoresistance yields a pronounced effect from a small magnetic field, future drives based on it will allow the bit size to shrink further and the disk spin to slow, reducing power consumption. All forms of hard drives would benefit, but portable computing would be one of the largest beneficiaries.

The IBM team attacked the problem by sandwiching a layer of nonmagnetic silver between two ultrathin layers of nickel/iron. The nickel/iron layers naturally aligned their magnetic poles in opposite directions, similar to the way refrigerator magnets repel each other unless they are brought together at opposite poles.

When the metals were annealed, or heated briefly, at 572 degrees, the silver was found to penetrate the neighboring layers of nickel/iron, reducing the strength of their antiparallel alignment.

When the baked sandwich was then exposed to a magnetic field, the force was sufficient to cause the poles in the nickel/iron to realign in parallel, creating the giant magnetoresistance effect. To their surprise, the IBM engineers had found a way to partially "decouple," in Hylton's words, the strength of the magnetic alignment and allow very small magnetic fields to trigger giant magnetoresistant signals. "A 100M-byte drive may one day be the size of a computer chip," Hylton suggests, and IBM claims it will achieve 10 billion bits (1.25G bytes) to the square inch on drives before the end of the decade.

My guess is Hylton is talking with such confidence because IBM has already taken this technology beyond the laboratory stage.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Oracle eyes systems management

By Kim S. Nash

REDWOOD SHORES, CALIF.

Oracle Corp. database users might have mainframe-caliber systems management tools, such as backup and restore and capacity planning utilities, in hand by mid-1994.

Oracle announced last week that it will give Legent Corp., BMC Software, Inc. and five other mainframe and high-end Unix systems management makers application programming interfaces (API) for the Oracle database (see chart). Those vendors said they intend to use the APIs to build links between their management utilities and Oracle databases.

Oracle users cannot wait.

A lack of powerful, stable utilities for Unix has been one downsizing holdup for companies such as Telephone and Data Systems, said Jim Gillespie, database analyst at the Madison, Wis., utility.

Mainframers "are used to security, administration and monitoring tools that haven't yet appeared in the Unix world. That's part of what keeps us on the mainframe," said Gillespie, who is also head of an IBM MVS special interest group within the International Oracle Users Group.

Other users said they were happy about Oracle's intentions but questioned whether mainframe-style products are appropriate for a Unix setting. "The problem is that most of these mainframe companies still think mainframe," said Sylvia Vargas, head of the Puget Sound Oracle user group. If Legent and others simply port existing tools to other platforms, "that's not solving the problem at all," Vargas said.

Utilities appropriate for centralized computing will overlook sets of problems found in distributed database systems, some users said.

For example, setting up parameters authorizing which users can log on to which systems is simpler in a centralized mainframe configuration than for a network of 10 distributed databases running on various hardware platforms, said Paul Song, chairman of the Northwest Oracle user group.

As it stands now, the Oracle database lacks certain management facilities such as thorough self-monitoring in a client/server setup, according to Brad Howie, senior associate at Cornerstone Computer Associates, Inc., a consulting group specializing in Oracle technology in Vancouver, British Columbia.

Tools at your disposal

Mainframe and high-end Unix software makers plan to build links — via an Oracle API — between big iron systems management tools and Oracle databases for use in client/server setups

SAMPLING OF TOOLS

BMC Software	Systems optimizers, backup and recovery
EcoSystems	Configuration management, capacity planning
Epoch Systems	Backup and recovery, storage management
Legato Systems	Network backup and recovery
Legent	Performance analysis, storage management, network monitoring
Open Vision	Performance analysis
Patrol Software	Capacity planning, backup and recovery

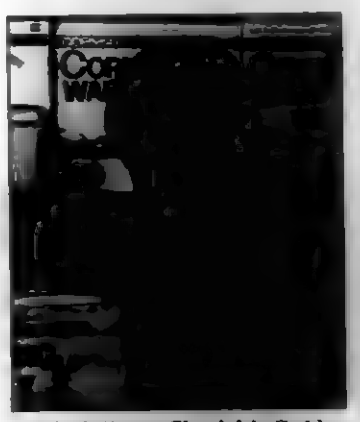
SIM tries to define licensing terms

By Mitch Betts

WASHINGTON, D.C.

The Society for Information Management (SIM) forged ahead last week with its mission to make software contracts more customer-friendly by starting to define such slippery concepts as user-based pricing and enterprisewide licensing.

At a summit meeting with software vendors here, both sides agreed to draft standard terminology to prevent misunderstandings and then develop detailed licensing guidelines for the industry. Harvey Shrednick, senior vice president for information services at Corning, Inc., said the guidelines may be ready by April 1994.



Corning's Harvey Shrednick: *Guidelines may be ready by April 1994*

The goal is to eliminate what users consider unfair software fees and still allow vendors to make a profit [CW, April 26]. The dialogue for reaching a middle ground began last week, but both sides discovered the need to clarify the terms of the debate.

For example, SIM's April position paper urged vendors to move from machine-based pricing to more flexible schemes, such as pricing based on the number of users on a system. But vendors asked how to count the users.

"What if three people use one terminal on different shifts? Should access by remote [or casual] users mean an additional fee? If one person puts software on their office PC, laptop and home PC, how many users is that?" asked Ellen Ray, assistant general counsel at Dun & Bradstreet Software in Atlanta.

Likewise, Ray said, questions exist about how to define the "enterprise" for enterprisewide licensing: "Does that include international offices? Do updates get distributed to all sites across the globe or just the headquarters?"

During the next six months, SIM's Software Licensing Task Force will try to hammer out an agreement on those details and other issues, said Shrednick, who is SIM's vice president for communications.

Information systems chiefs had their own set of concerns, especially about upgrade fees and transfer fees. "If the user moves the software to a more efficient machine — and the software doesn't have any more features or users — why should you pay $200,000 more?" Shrednick asked.

Rivals press Intel

CONTINUED FROM PAGE 1

require 486 code to be recompiled for top performance. Sources said Cyrix claims that a 66-MHz chip based on the M1 design will run most 486 code 30% to 50% faster than today's 66-MHz Pentium.

Cyrix declined to comment on possible performance numbers.

The double whammy of PowerPC and the M1 means that "things are getting much more interesting" for Intel in the market, said Linley Gwennap, editor in chief of the "Microprocessor Report" in Sebastopol, Calif. But Gwennap said the multiple 486 clone efforts are of more immediate concern to Intel and will have a bigger near-term impact on users.

IBM has already beaten Intel to market with a clock-tripling 486 clone, and analysts said Cyrix and Advanced Micro Devices, Inc. will likely bring similar chips to market in 1994. With competitors keeping pace with Intel's coming DX3 [CW, July 19], Intel may find its current cash cows threatened before Pentium ships in high enough volumes to replace them as profit-generators.

The pressure is on

"Intel is going to start to get squeezed [in the 486 market]. I think 486 prices will be dropping rapidly in 1994, which will be the most significant thing to 90% of the users out there," Gwennap said.

"We expect to see 486 pricing drop due to competition and the new [DX3s]," said Jim McDonnell, marketing manager at Hewlett-Packard Co. in Sunnyvale, Calif. However, he said HP does not expect dramatic price cuts until the second half of 1994. Some analysts suggested that sharp reductions in 486 pricing could lead to systems priced less than $1,000.

Users trying to decide whether to buy 486 workstations now or wait for Pentium pricing to drop may opt for the 486 with the price cuts.

"With the software requirements we see on the horizon, we'll probably need to move beyond the 486, but if prices drop, we can buy the higher-level 486s," said Abraham Chait, a team lead at Pacific Gas & Electric Co. in San Francisco.

Because its competitors appear unlikely to ship chips until the second half of 1994, Intel has time to react, analysts said. The chip maker plans to shift Pentium production to a new process known as 0.6 micron, which will let it bring out higher-performance Pentiums.

Those Pentium parts, code-named P54C, should match the M1's expected performance levels, though this will still mark the first time Intel has not been a generation ahead of the cloners.

Seeking to nip PowerPC in the bud, Intel plans a frontal assault on its target market: Macintosh users. Intel will start advertising in major Macintosh user publications in October to persuade those users to move to Intel platforms.

"They see a chance to get this market in a transition time," said Tom Thornhill, an analyst at Montgomery Securities in San Francisco.

Also in Intel's favor: Several sources said the Cyrix M1 chips will not be pin- and socket-compatible with Intel's chips, which may create design and software compatibility issues.

Bruce Burkhardt, director of strategic marketing at Cyrix, declined to comment on whether it would opt to match Intel's design. "Let me propose that the 486 and the Pentium are not socket-compatible. If Intel doesn't have to be compatible why should anybody else be compatible?"

In the oven

Looking to drive up its volumes, Intel has a multiprocessing surprise coming late in the second quarter of next year, according to OEM hardware sources who asked not to be identified.

Intel is working on chip sets that will allow systems makers to build servers that support more than two processors on the same motherboard, the sources said.

Intel's C5C8 chip set supports only two processors; Intel is discussing ways to implement five and six Pentium processors on a single motherboard.

—Michael Fitzgerald

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IOPLB1	3380-K	39825	365	38	3225			7574	48	2051	0.243	48	416		5	48		
	--AFTER-CPK-->		365	3	3225			7574	1	7574	0.000	48	416	5242	15	67	3.9	0
IOPLB5	3380-K	39825	458	49	38650	615	57	1175	82	130	0.619	660	160	4422	15	61		
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Windows, OLE

CONTINUED FROM PAGE 1

plications will run on Windows 4.0. But an application written for 4.0 is going to look a lot nicer," noted Don Baarns, president of the Baarns Consulting Group, Inc. in Sylmar, Calif.

Microsoft is expected to deliver tools that will enable developers to convert Windows 3.1 applications to comply with the Windows 4.0 interface. But when the tools will arrive and how robust they will be has developers concerned.

"It's definitely something we're looking at. In the back of our heads, we're asking ourselves, 'Are we wasting our time right now?'" said Michael Abele, vice president of programming services at Varitec Corp. in Birmingham, Mich.

Meanwhile, the few developers that already offer a true drag-and-drop interface with their Windows-based products — something Microsoft will introduce for the first time with Windows 4.0 — will have another interface problem.

This drag-and-drop protocol will be a key technology behind the Windows 4.0 document metaphor. For instance, it will allow users to easily share data across Windows applications that have live links by dragging icons across the screen, as opposed to cutting and pasting data between discrete applications.

One developer dealing with this issue is Keyfile Corp., maker of a work-flow application. It is considering delivery of two different shrink-wrapped versions: one package with Keyfile objects integrated onto the Chicago desktop and another with Keyfile objects on top of Keyfile's existing desktop metaphor, said Kim Shah, vice president of marketing.

Meanwhile, developers continue to wrestle with the concepts Microsoft is presenting in OLE 2.0, which comprises more than 400 interfaces. The problem facing developers is that while there will be a base level implementation of OLE 2.0, each software developer is essentially free to implement any subset of the OLE 2.0 specification they choose.

Consequently, one application may call for a service from another that does not support it. This means users are going to see applications that are better integrated with applications from the same vendor (because they will all support the same interfaces) than with applications from vendors that might not implement the same subset of OLE 2.0 interfaces.

Unix partners
In addition to working on OLE 2.0 for Windows, Microsoft is also joining forces with several Unix systems vendors to port OLE 2.0 to Unix, according to Kraig Brockschmidt, a Microsoft systems engineer.

As a result, OLE 2.0 might actually serve to encourage users to purchase software from a single vendor.

"It's a big problem. Microsoft is going to have to refine the OLE 2.0 standards" to ensure true compatibility across applications, said Daniel Grant, president of Tangent International Computer Consultants, Inc. in New York.

How to be objective

Developers not only face the problem of which interfaces to write to but also the testing of applications they produce.

"The problem is not just writing to all these interfaces but in finding a way to objectively test them. Without that, a lot of this [development] will be pretty useless," said Vadim Yasinovsky, president of Clear Software, Inc.

A lobbying effort is under way among some developers to set up a laboratory where developers can test their applications against a defined set of parameters. Microsoft officials said they will not provide such a facility themselves, but they would back the idea of an independent laboratory.

The lack of a testing and certification program is important because it could stall OLE 2.0's momentum if the OpenDoc alliance — led by IBM and Apple Computer, Inc. — follows through on a promise to set up a similar program and facility late this year or early next year.

Another problem some developers see is that OLE 2.0 cannot support the transfer of OLE files over networks. Microsoft officials have acknowledged that users will not be able to move or delete OLE files over networks until the company ships Cairo sometime in early 1995.

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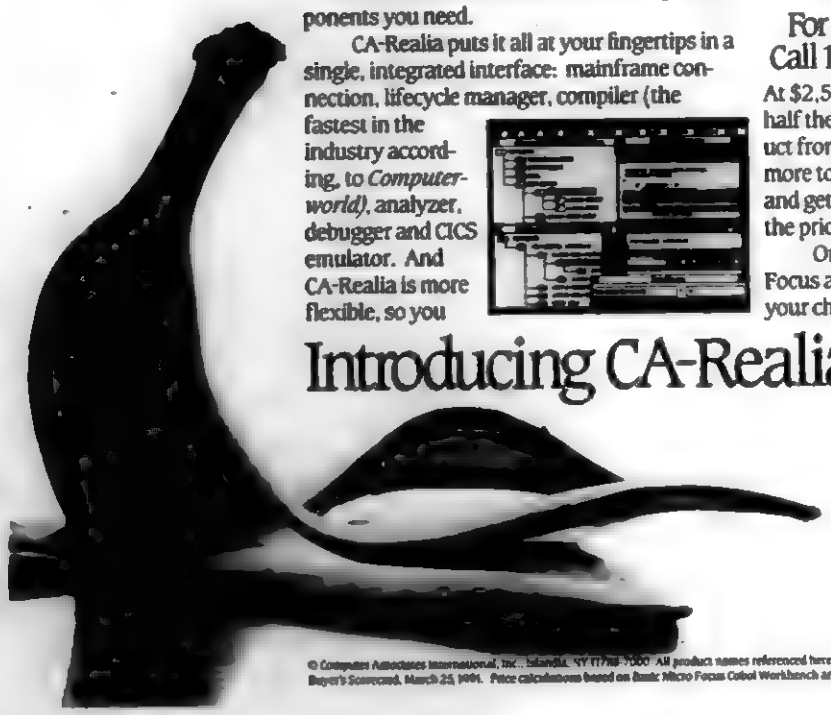

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News Shorts

Too many standards?

Efforts to expand emerging "fast Ethernet" technology to Token Ring networks heated up last week when **IBM** and **Hewlett-Packard Co.** said they will jointly promote a standard called 100VG-AnyLAN. The idea with the higher-speed versions of existing LANs is to breathe more life into today's LAN investments in advance of higher-bandwidth switching technologies. While IBM and HP said they will submit technology to the IEEE 802.12 committee, formed recently to develop one of two existing versions of fast Ethernet, a similar Ethernet/Token Ring effort from **Proteon, Inc.** announced in August will be taken up by the 802.5 Token Ring standards body.

Microsoft to integrate PCMCIA software

SystemSoft Corp. has signed a deal that lets **Microsoft Corp.** integrate its PCMCIA software into future operating systems. When coupled with this type of software, an operating system gains more reliability and higher performance. The SystemSoft PCMCIA software, called CardSoft, is made up of driver files that automatically load when a PC powers up. Through the agreement, Microsoft hopes to speed user acceptance of PCMCIA and also help move its Plug and Play initiative for Windows.

IBM lab director switches gears

Guy Harrison, formerly head of **IBM**'s Poughkeepsie, N.Y., laboratory where the MVS operating system lives, has moved to the Personal Software Products Group in Austin, Texas, to take charge of development for Workplace OS. That is the code name given to IBM's graphical user interface that will straddle OS/2, DOS and Unix platforms. Harrison made the move to ensure the software will reflect the bulletproof nature of MVS, an IBM spokesman said.

Computerland to sell distribution unit

In a move that some have suggested signals the end of the reseller channel as it has been, **Computerland Corp.** agreed to sell its franchise and distribution division to **Merisel, Inc.** for as much as $110 million. Merisel would gain Computerland's profitable franchise division, its Datago distribution arm and the rights to the Computerland name. Computerland retains its company-owned stores and its service arm, and, with a $60 million up-front cash payment, will end its status as a "thinly capitalized" company.

UPS Canada goes cellular

United Parcel Service, Inc. activated Canada's first nationwide cellular data transfer network last week, designed to provide UPS customers with the ability to receive immediate information on the status of their packages. UPS created the cellular system in a strategic alliance with **Mobility Canada**, a corporation formed by BCE Mobile Communications and Bell Mobility Cellular.

SHORT TAKES Kenneth Thome, vice president of information systems at **General Mills, Inc.** in Minneapolis, was promoted to senior vice president of financial operations, replacing Tom Nelson, who retired. . . . **The Ultimate Corp.** in East Hanover, N.J., has changed its name to **Allerion, Inc.** and will focus on re-engineering consulting and other services. . . . **Motorola, Inc.**'s Paging and Wireless Data Group said it would develop a wireless handheld computer that uses **Microsoft**'s At Work software. . . . **Storage Technology Corp.** said its third-quarter results will be "below expectations" and that it will take a onetime charge of $80 million for restructuring.

News shorts, *page 16*

LAN Server plans hopeful but far off

By Elisabeth Horwitt
AUSTIN, TEXAS

IBM is grooming its OS/2 LAN Server for the global network services environment that corporate users are increasingly demanding and rival network operating system companies are already providing.

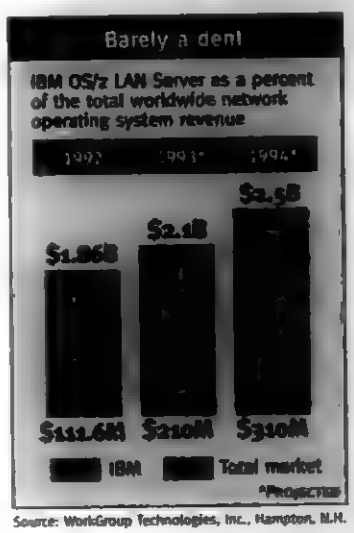
The first major step in this direction will come in a few weeks when IBM unveils LAN NetView, a package providing management of distributed LAN Server systems and various clients via either host or OS/2-based NetView, according to Art Olbert, director of IBM's Personal System Group.

Like Novell, Inc.'s NetWare Management System (NMS), LAN NetView will manage devices via Simple Network Management Protocol, Olbert said.

And like distributed NMS, which Novell is expected to announce Oct. 4, LAN NetView can distribute management of local network systems out to LAN Servers, which can then send key information to LAN NetView, or host NetView, according to Olbert.

The ability to manage distributed LAN Server networks from host NetView is a key capability, users said. The Automobile Club of Southern California, for example, has a "very demanding environment" consisting of LAN Server and diskless PCs, said Steve Nees, supervisor of office systems at the automobile club. "We want to manage that environment remotely from NetView over our existing SNA network. LAN NetView sounds very useful."

Unfortunately, other key enterprise LAN Server services, such as the Open Software Foundation's Distributed Computing Environment-based global naming, directory and security, are still in the pre-Alpha stage, Olbert said.



Source: WorkGroup Technologies, Inc., Hampton, N.H.

Tardy delivery of such services could hurt IBM in the crucial market window of 1994, when Banyan Systems, Inc., Microsoft Corp. and IBM will be competing for those shops that are still defining their client/server strategies, analysts said. Prospects of prying Novell loose from its huge installed base appear slim.

"IBM is trying to gain recognition that it is a player [in the client/server market], that it hasn't disappeared and that it has some advanced products coming out," said Lee Doyle, director of LAN Research at International Data Corp., a research firm in Framingham, Mass.

But future growth for the IBM OS/2-based network operating system will depend on the timely delivery of the above cited services on a par with Novell's and Banyan's offerings, he added.

Indeed, strong enterprisewide naming services and wide-area connectivity were main reasons why Vines and not LAN Server became the primary platform for New York agencies in the past couple of years, said Sam Blumenstyk, director of LAN consulting for the city's Computer and Data Communications Services Agency.

Microsoft

CONTINUED FROM PAGE 1

for the MS-DOS and OS/2 operating systems will be available at no additional charge to all its networking customers, including users of LAN Manager, Windows NT and Advanced Server. Previously, customers had to pay $179 per five-user copy of Microsoft's NT client software.

The price break really makes a difference for large corporate customers, which will be able to save $35,024 for 1,000 users on Advanced Server installations as a result. Companies can now buy an unlimited-user version of NT Advanced Server for an introductory price of $1,495, which will jump to $2,995 in March, Microsoft said.

Novell does not charge for client software; however, its NetWare pricing structure is tiered according to the number of users that a given server can support. A 1,000-user version of NetWare 4.01 is priced at $47,995.

Microsoft's new pricing will certainly weigh in as a factor in how widely the National Immunization Program eventually decides to implement NT Advanced Server, Kahn said. However, it will probably not make a big difference in the program's commitment to NetWare, he added. "We already have the financial investment in Novell."

A more fair cost comparison would be one between Advanced Server and UnixWare, Novell's Unix-based application server, Novell spokesman William Donohoo said. "NT does not compare with NetWare 4.01" because the former lacks key network services such as global directory and authentication, he said. The server edition of UnixWare is priced at $1,299 for an unlimited number of users.

Could reach 10%

If Microsoft's pricing structure is successful, Advanced Server market share could climb to 10% next year out of a total worldwide network operating system market of $1.8 billion, said Bob Flanagan, a senior analyst at WorkGroup Technologies. This year's market totals $1.5 billion, he added.

While Novell is "always looking at its pricing," the vendor has perceived no user unrest about NetWare's current pricing structure, Donohoo said. However, Novell is likely to respond either with price changes or legal action, such as a charge of anticompetitive pricing against Microsoft, if NT Advanced Server starts cutting into its revenue next year, Flanagan said.

NT redirector

Claiming that Novell was taking too long to deliver a jointly developed NetWare redirector for Windows NT, Microsoft has come up with its own redirector.

Novell has for some time offered a prerelease version of the redirector on Internet and CompuServe. However, the release is missing key pieces such as IPX support for Winsockets, DOS and Windows virtual clients on NT and support of the NetWare 4.01 global directory, a spokesman conceded.

Directory and Winsockets support will appear in the general-release version slated for delivery early next year; however, DOS support may come later.

Microsoft's version will provide full NT client support as well as Token Ring support, which Novell's release lacks, a Microsoft spokesman said. Microsoft plans to release a beta version of its redirector within 30 days.

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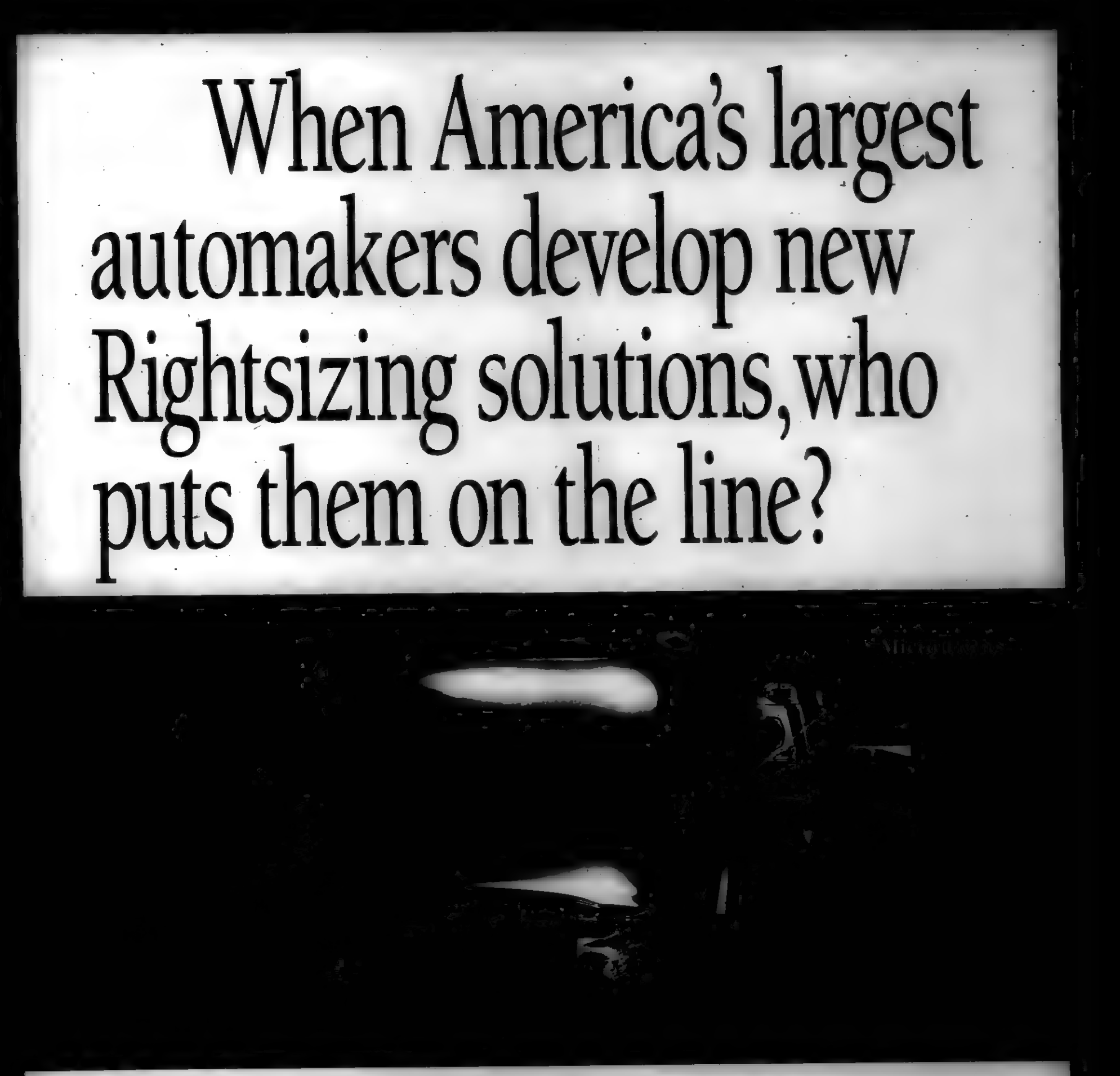

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HP users still stung by order processing, support snafus

Company says remedies on way

By Mark Halper
SAN FRANCISCO

Hewlett-Packard Co. may indeed have replaced Digital Equipment Corp. as the country's second-largest computer vendor, but it has done so despite a couple of lingering internal nemeses.

At a user conference resonant with mea culpas from Chairman Lewis Platt and other HP executives last week, HP conceded that overhauling its archaic order fulfillment system has proved more difficult than expected.

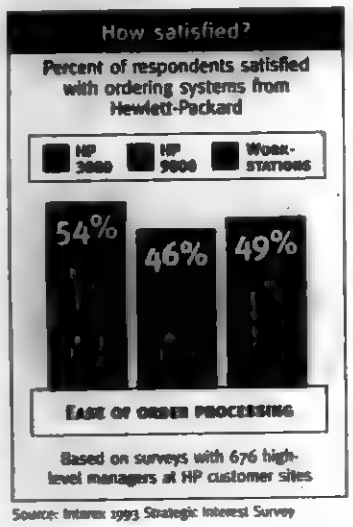
"One of my Top 3 goals is to fix order fulfillment," Platt told an audience at his keynote address at Interex, The International Association of Hewlett-Packard Computer Users meeting.

Revising last year's prognosis of improving the system by this time, Dick Love, vice president of order fulfillment and manufacturing, said, "We're expecting to see acceptable performance within the next few months, industry parity within a year and a leadership position within two to three years."

Furthermore, HP executives acknowledged, the company's sales response effort is lagging. Manuel Diaz, worldwide computer sales and marketing general manager, cautioned that users cannot expect the type of attention they received prior to HP's work force reductions.

That point is already apparent to some HP users. During an open microphone session, James Ouellette, director of management and information systems at Connecticut Attorneys Title Insurance Co. in Rocky Hill, Conn., described his HP sales support as "a nightmare. We went from seven salespeople to not seeing [any] for two years."

Although HP promised at last year's Interex conference to make significant order fulfillment strides by the time of this year's meeting, Platt issued a bleak progress report. "We're just now getting a handle on how hard this is," he said.



Source: Interex 1993 Strategic Interest Survey

And as the challenge daunts them, the issue haunts them. Users have been complaining that HP's creaky order fulfillment system slows down delivery as well as price quotes beyond acceptable levels [CW, March 29].

According to survey results Interex issued last week, users gave order processing low marks (see chart). In contrast, users gave hardware satisfaction ratings ranging from 96% to 100% and software satisfaction ratings of 83% to 99%.

Earlier this year, Platt reassigned Love to devote full-time attention to the problem. "The competition can turn around a quotation faster than we can," Love said. "Our time is days. We'd like to see it in hours or seconds."

Chuck Piercey, Interex executive director, explained that HP runs a mishmash of order fulfillment operations designed to support separate businesses within HP that now sell to mutual customers more than in the past.

One of the keys to the forthcoming system is an electronic quotation and components configuration program under development called Conquest. Beta versions of Conquest, co-developed with Trilogy Development Group are installed on HP 9000s at about 10 sites worldwide.

Invisible reps

Meanwhile, HP customers are still smarting from sales support cutbacks. Some customers were switched to phone sales, and many have complained that they never see their representatives and that they have trouble reaching them.

This problem has cost HP some customers [CW, April 12]. Lawrence Simonsen, MIS manager at Springville, Utah, valve maker Valtek, Inc., announced at the open mike session that this Interex conference would be his last because his firm is switching to NCR Corp. equipment. Simonsen faulted HP salespeople for failing to meet with Valtek's chief financial officer.

Diaz said the company is working to provide a higher level of sales support but cautioned that because of economic conditions, "it will not be the same level of service as in '91 — no one can do that."

Prepared to change its mind

[redacted] an eye toward staving off possible customer defections, Hewlett-Packard Co. last week outlined ways if they want its proprietary IMAGEN, database portage to the Unix-based HP 9000.

HP posed the question — one of several in a survey the company hoped to unveil at Interex (see story at left) — just one year after it told customers that such a move would require a large software effort and that the system's performance would be substandard, according to Bob Sorvik, HP's minicomputer chief.

Supporters said HP, luckily or [illegible], in the meantime [illegible] who migrate to Unix may choose platforms other than the HP 9000 Unix line, which runs HP-UX.

Image/DDL, [illegible] for MPE-IX (see story page 85), said if a user migrating to Unix could easily load existing database applications onto HP-UX, he would be more inclined to stick with HP rather than find another Unix vendor.

Sorvik claimed that HP does not have a definition problem. He cited a Gartner Group report that said 67% of HP-3000 users have [illegible] running their mission-critical systems.

The report, however, said "by the autumn of the computer industry, general users have to have the mind-set of 'Beyond Unix, [illegible]'"

HP already offers an HP-UX database, Allbase, and markets it to those people managers who don't [illegible] with third-party vendors.

Robert Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco, suggested that because [illegible] sensitivity may explain why HP took a low-profile position [illegible] with another database choice, Oracle. HDS's DBE will soon run on the HP 9000. The move comes a little over a year after HDS said it would make DBE available on HP 9000s. — *Mark Halper*

Wellfleet

CONTINUED FROM PAGE 1

said Al Candela, vice president of data planning at Chemical Banking Corp. in New York.

Since the bank has about 20,000 IBM terminals, "this means more than a little to us," he said. Today, on the LAN side of the house, Chemical runs a source-route bridged Token Ring internetwork and has "tremendous problems with broadcast storms," an infamous issue with the technology.

Candela said he anticipates that after some heavy prototyping, Data Link Switching could usurp the bank's source-route bridging infrastructure.

Meanwhile, the heightened status of the VME-based boxes is "a good thing: capital G, capital T," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co. in Newark, N.J., which uses the older line.

"In Release 7.6, we'll finally get all the goodies that the Backbone Node people have always taken for granted," he said.

Scoggin is particularly motivated by the software fault tolerance achieved by Wellfleet's design of distributing protocol stacks, management and other processes out to individual LAN modules rather than centralizing the function in a potential single point of failure.

One reason is that Delmarva has just completed its LAN internetwork. "All our customer service is now totally dependent on our routed backbone," he said.

Other Wellfleet Release 7.6 highlights include the following:

•The ability to manage Wellfleet routers from IBM's LAN Network Manager and thus from NetView. Candela said this allows his SNA-oriented information systems staff a view of the router network.

•Incorporation of Madge Networks, Inc.'s Fastmac Plus technology, which Wellfleet said will double its Token Ring internetworking performance.

•Schemes that reduce broadcasts in source-route bridging networks.

•Backward porting of such Backbone Node features as the standard Point-to-Point Protocol for router interoperability across wide-area networks and support of Banyan Systems, Inc.'s Vines IP traffic.

Vines support is important to Scoggin, who currently encapsulates Vines in Internet Protocol (IP) packets across the wide area via a function in his Banyan servers that "eats a lot of horsepower. We'll eliminate that."

Also, having one set of source code for all platforms means that customers using both Wellfleet product lines will gain interoperability between both environments with these and all other functions.

•An Asynchronous Transfer Mode (ATM) Data Exchange Interface, which defines how local ATM cells are placed on a wide-area leased line.

•Enhanced traffic prioritization and more flexible dynamic load-sharing schemes that allow bandwidth to expand and contract upon user request to accommodate different types of traffic.

•Support for AppleTalk protocols over frame relay and Switched Multimegabit Data Service WANs.

The new release is "so comprehensive, my first reaction is, 'why didn't you call it Release 8.0?'" said Michael Howard, president of Infonetics Research, Inc., a consultancy in San Jose, Calif. There is such a bulk of improvements, he said, Wellfleet "might have missed a chance here, positioning-wise."

First to market

Wellfleet's Release 7.6 represents the first box on the market to support Data Link Switching, the emerging industry-standard scheme for merging SNA traffic onto distributed internetworks.

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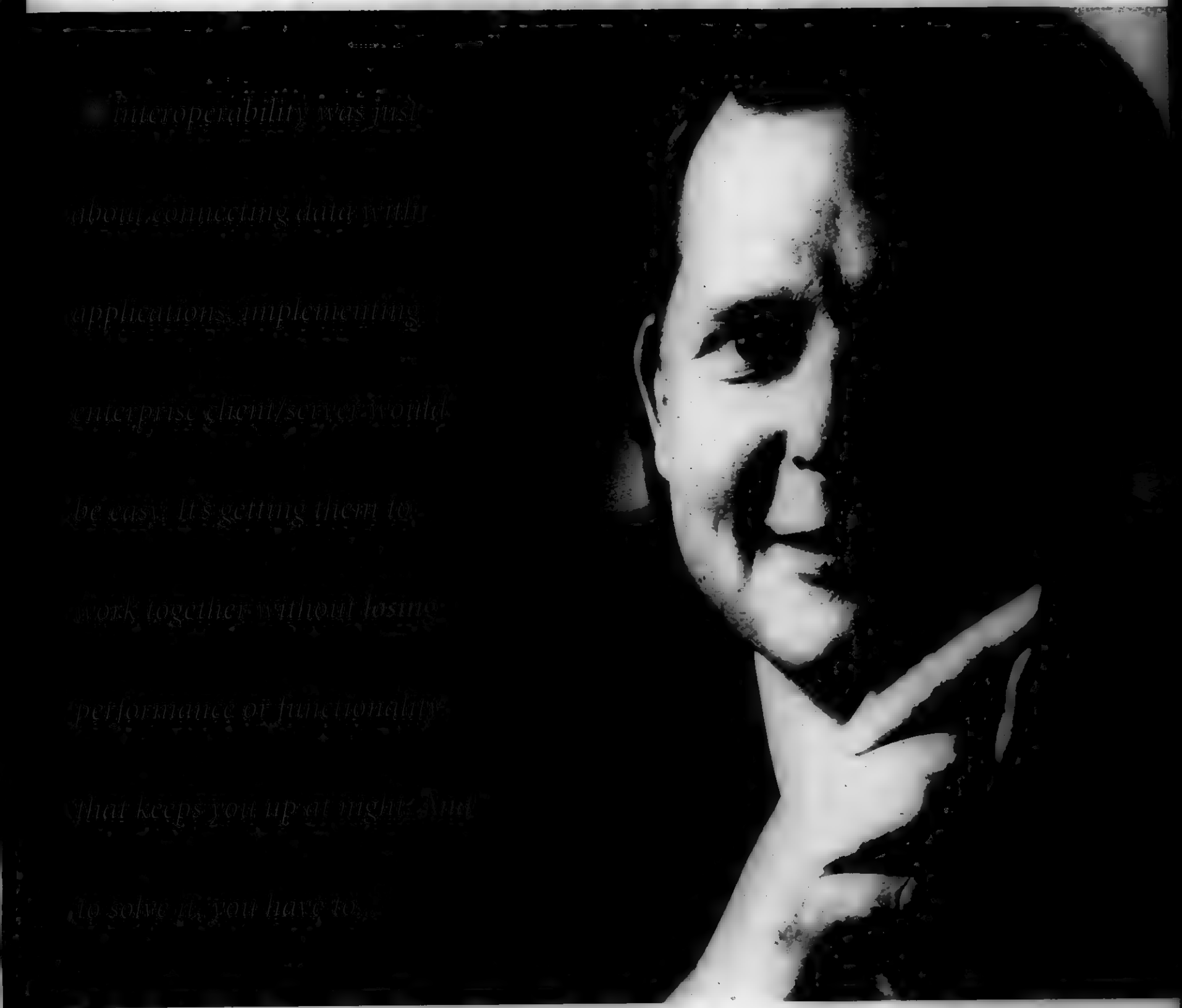

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Novell to move UnixWare to fore

By Elizabeth Horwitt
NEW YORK

■ Novell, Inc. detailed plans last week for moving UnixWare onto the front burner of users' client/server strategies, saying it will provide tighter integration with NetWare global services. The company also promised to provide OEMs with UnixWare in binary and source code form starting in the fourth quarter.

In addition, Novell announced a UnixWare-compatible certification program and expanded its Certified NetWare Engineer program to include UnixWare.

The idea is to make UnixWare and NetWare into an integrated "matched pair." NetWare will be the network services platform and will support applications in smaller sites that do not want UnixWare. Meanwhile, UnixWare will act as the scalable robust server for mission-critical corporate applications, said Kanwal Rekhi, executive vice president of Novell's Unix Systems Group.

Novell's decision to bundle NetWare services and updates into the UnixWare source code free of charge will be a costly but probably effective way for the company to jump-start its Unix system into the volume-shipped, shrink-wrapped desktop and server markets, said Bob Gill, a director at Gartner Group, Inc., a Stamford, Conn., research firm.

The integration of NetWare and UnixWare in source code form "will speed our time to market and let us concentrate on adding value," a Data General Corp. spokesman said.

The source code will conform with X/Open Co. standards and a common Unix application programming interface (API) that will allow Unix applications to run over multiple Unix variants. A 75-vendor consortium agreed to support the API by mid-1994 [CW, Sept. 6].

In addition, Novell's support of X/Open and its expected future move of turning the UnixWare brand name and interface over to the standards body [CW, Sept. 20] should reassure OEMs, independent software vendors and users alike that the system is a true open standard and not a proprietary Trojan horse that will put them under Novell's control, analysts and vendors said.

Novell Chief Executive Officer and President Raymond Noorda confirmed last week that Novell is working toward this but would not provide a time frame.

Rollout specifics

Through a product rollout slated to start in mid-1994, Novell will provide the following:

- A utility that maps between UnixWare and NetWare directories, enabling users to access both types of servers transparently across the enterprise.
- NetWare Management System services for UnixWare.
- Software licensing administration and centralized software distribution across both platforms.
- Extension of AppWare, Novell's multiclient/server application development environment, to UnixWare clients and eventually to UnixWare servers.
- Integration of the two platforms via Network File System and TCP/IP.

Still missing was a firm Novell commitment to Distributed Computing Environment (DCE), the Open Software Foundation's standard for distributed Unix-based computing.

"DCE is still not in high demand," said Michael DeFazio, a Unix Systems Group vice president. "As it evolves, we'll support it in UnixWare and NetWare, primarily through third-party partners."

Novell's focus for integrating UnixWare and NetWare will not be DCE but TCP/IP and NetWare services, DeFazio said.

Unix trademark switch on hold

By Jean Bozman
NEW YORK

It was a near miss.

Despite high expectations throughout the Unix community that Novell, Inc. would announce its decision to turn over Unix System V Release 4 source code to X/Open Co., the Orem, Utah, networking giant stopped short of doing so at last week's Unix Expo.

Indeed, Robert Davis, vice president of marketing at Novell's Unix Systems Group, alluded to political wrangling as he described the last-minute talks with key Unix players to reach agreement on the trademarking move: "In an effort to move this thing forward, to make it happen by Unix Expo, we ran out of time."

Deal was real

Novell's discussions were for real, vendors affirmed. "They are looking to take the name outside," said Ron Bell, chief technology officer at Data General Corp., one of the System V Release 4 licensees.

In fact, Novell came so close to striking an accord that several Unix vendors said they arrived at Unix Expo with press releases of support in hand and were surprised when the trademarking move did not materialize.

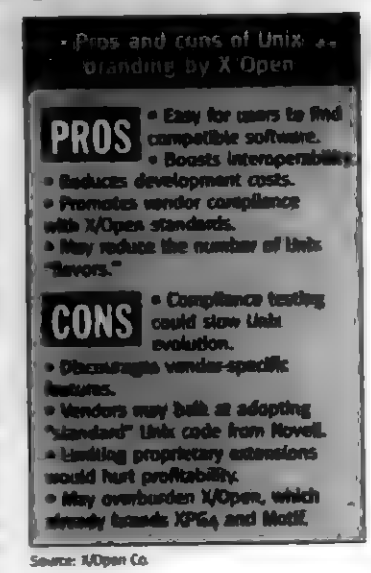
Users were also disappointed because a "branding" of standard Unix could cut application development costs and improve application portability among hardware platforms. But some said they are already satisfied with a wide-ranging Sept. 1 agreement among Unix vendors to support a set of more than 1,100 common application programming interfaces (API) certified by X/Open.

The talks started in July, when Novell acquired Unix System Laboratories, Inc. (USL), which owned System V Release 4. Davis still expects an agreement, but he would not say when it would be reached.

Instead of making the expected announcement, Novell officials used the show to make clear their intention to work with an industry body such as X/Open to handle Unix compatibility and trademarking [CW, Sept. 20] but provided few details.

Fine-tuning first

Davis said the company "absolutely believes that a single interface of Unix is important," while Novell officials hinted that the company would rather provide a "finished" version of Unix, such as Novell's UnixWare, for branding, than hand over only the Unix System V Release 4 source code.



Source: X/Open Co.

Analysts predicted that vendors such as Sun Microsystems, Inc. or IBM — which supply the Solaris and AIX operating systems, respectively — would probably balk if Novell tries to brand its UnixWare implementation of System V Release 4 as an industry standard.

Sun Chief Executive Officer Scott McNealy said he would endorse a Novell move to brand its Unix interfaces through X/Open. But he asserted Sun's right to make building or buying decisions about finished Unix implementations such as UnixWare.

"Unfortunately, what Noorda did was buy the [USL] brand name because he didn't have a lot of implementation horsepower. I would like to see the USL team create some compelling technology for an open interface and allow us to make a buy decision," McNealy said.

HP offers full Corba implementation, finally

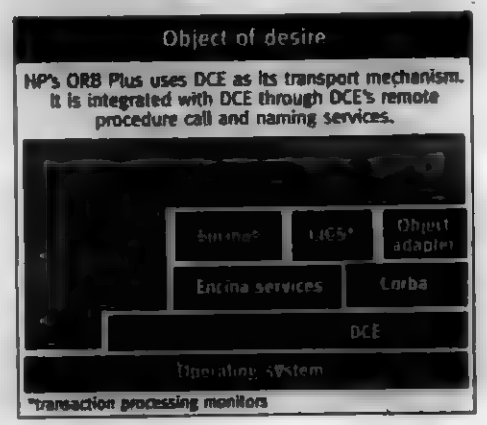
By Melinda-Carol Ballou
NEW YORK

Hewlett-Packard Co. last week unveiled an implementation of the Object Management Group (OMG)'s Common Object Request Broker Architecture (Corba) that uses the Distributed Computing Environment (DCE) from the Open Software Foundation as its transport mechanism.

Corba includes a language for describing application interfaces as well as dynamic and static application programming interfaces for accessing objects across the network. It acts as a kind of object traffic cop, offering directions to enable software existing on a network to communicate with software elsewhere.

Although HP was one of the first to contribute to the Corba specification, it is one of the last to ship a full implementation of the standard.

HP's ORB Plus includes its Distributed Object Management Facility (DOMF), object services, development and administrative tools and sample applications. HP is now combining DOMF with IBM's Distributed Systems Object Model to allow developers to create applications that are scalable, interoperable and portable across HP and IBM platforms. Both companies will comply with an interoperability standard for Corba that the OMG will establish in the first half of 1994.



HP users said they were enthusiastic about the release of ORB Plus, which is now beginning to ship to users via an early release program and will be generally available with a developer's kit in the first half of 1994.

The University of California at Davis (USC) is hoping to use the technology to create network-based multimedia applications, according to Turnando Fuad, a computer resource manager at USC's Center for Image Processing and Integrated Computing.

Fuad said he is interested in the links to DCE as a way to connect ORB Plus applications with DCE-compliant platforms.

Pricing for the ORB Plus developer's kit will be made available when the product ships.

Reporter's Notebook

The Common Open Systems Environment (COSE), an ad hoc vendor group attempting to accelerate commonality among Unix environments, held its first systems management subgroup meeting last week to begin reviewing requirements for Unix systems. It is still unclear whether COSE will adopt systems management interfaces from a slew of vendor packages or support the best-of-breed features within packages supported by the **Open Software Foundation** (OSF), **Unix International** and other leading systems management vendors. Sources said COSE may make an announcement by late November.

In the meantime, **Computer Associates** will submit to COSE APIs from its CA-Unicenter for Unix systems management package by mid-October, according to Alfred H. Novissimo, CA's vice president of research and development. Novissimo and other executives close to COSE said they were unsure when the group planned to decide on the systems management format.

Tivoli Systems in Austin, Texas, last week extended support for its Tivoli Management Environment framework to **IBM**'s RS/6000 and **SunSoft**'s Solaris 2.3 and unwrapped Tivoli 1.6. The upgrades will ship in December. Tivoli 1.6 will support new print management and E-mail management applications.

SunSoft last week introduced Solaris 2.3, its fourth release of Solaris 2.X since the operating system was first announced in June 1992. Solaris 2.3 will reportedly feature better support of Network File System (NFS) networking applications, as well as support for the Sun XIL imaging library for multimedia applications and the Wabi interface for Windows-based software running under the X Window System. Solaris for clients is priced at $795; server versions are priced from $1,995.

Unify announced Unify Vision, a cross-platform, object-oriented graphical tool for creating client/server applications targeting a range of RDBMSs. Its SmartView architecture acts as an intelligent interface to the specific databases and allows developers to build complex applications on Windows-based PCs or Unix workstations.

NCR unveiled 3534 XLA X-Station, which includes NCR Telnet 3270 local terminal emulation software to connect to IBM mainframes. The 3534 succeeds NCR's 3533 X-Station and also features a standard 25-MHz RISC processor upgradable to a 33-MHz turboprocessor. It will ship in the fourth quarter with prices starting at $4,195.

Micro Focus and **Transare** said they have integrated the former's Cobol wrappers with the latter's Encina on-line transaction processor (OLTP) product. This will let Cobol programmers use Encina to create distributed transaction processing applications for Unix. Micro Focus said it will work with **Sybase** to develop an interface for linking Cobol applications with Sybase's SQL Server. Micro Focus also announced its transaction system for Solaris, an OLTP system that supports CICS and non-CICS applications. In addition, **IBM** will start shipping in December Micro Focus tools for Cobol development on AIX platforms along with IBM's Workbench tools.

In other news, the OSF has released the first "snapshot" of its OSF/1 Release 1.3 source code and said it will submit its Unix System V Release 4-compatible Calvin test suite to the X/Open Co. . . . **Tandem** replaced **Mips Technologies**' R3000 RISC chips in its Integrity line of fault-tolerant Unix computers with R4000 RISC processors. **Tandem** also agreed to resell **Silicon Graphics** Unix computers. . . . **Sun** officially announced its SPARCcluster 1 NFS file server, which is a cluster of up to four SPARCserver 10 systems (CW, Sept. 13). . . . **Sapiens International** announced its own Sapiens Vision for HP/UX, an object-oriented tool for rapid development of client/server applications originally developed by **Smartstar**. Sapiens completed its merger with Smartstar in July.

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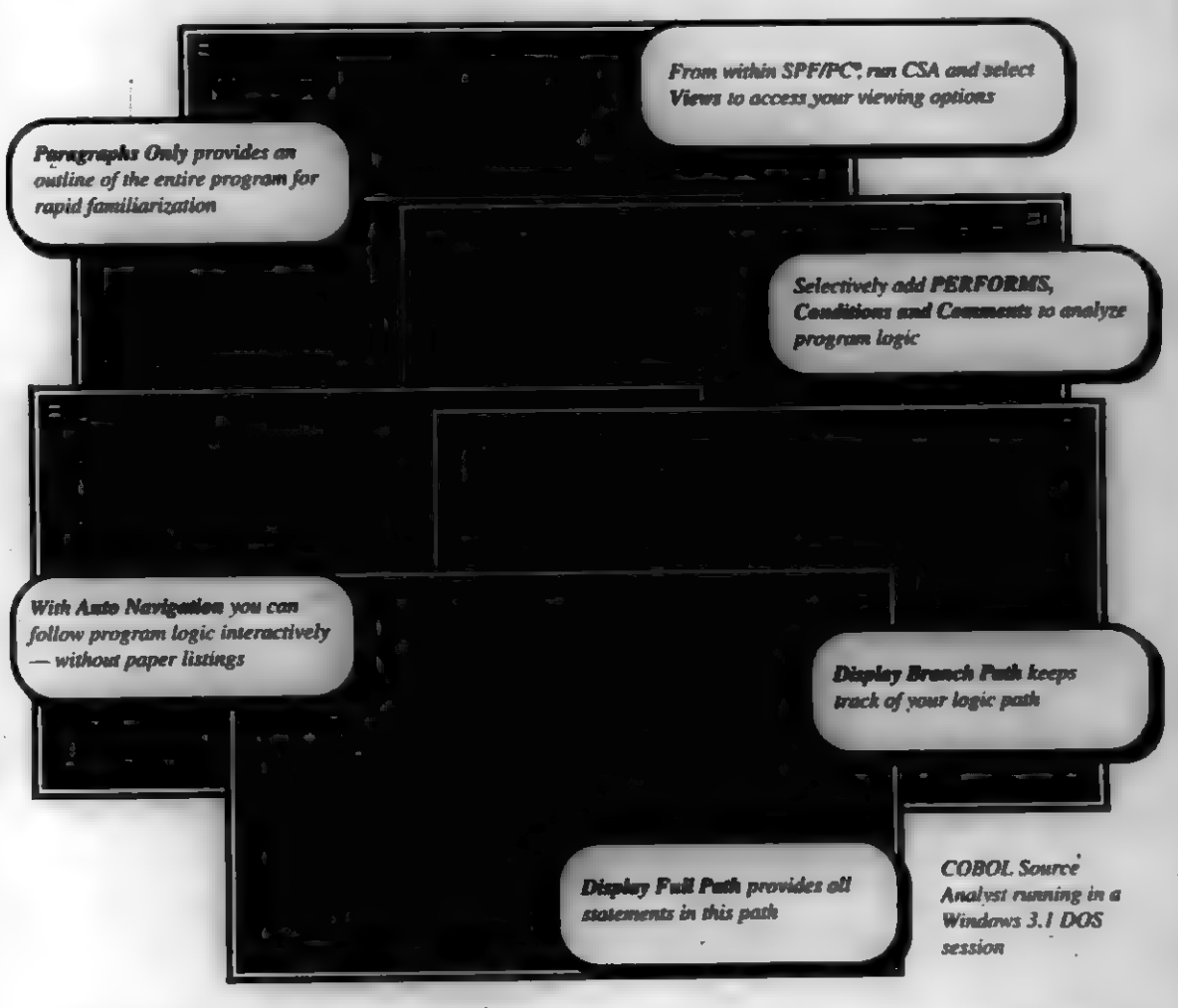

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News Shorts

Massively parallel machine to debut

Next week in Washington, D.C., **Cray Research, Inc.**, will unveil its long-awaited massively parallel processor system, the T3D. Cray declined to provide details about the T3D that is based on Digital Equipment Corp.'s Alpha chip. Analysts said they believe the T3D will eventually scale from tens to at least 1,024 processors. T3D's pricing is expected to start in the single-digit millions; the high-end machine will be priced between $25 million and $30 million.

Health reform eyes electronic Rx

President Clinton last week sketched out his plans for health care reform, which include an emphasis on reducing paperwork and developing data interchange standards for electronic billing [CW, Sept. 20]. A proposed National Health Board would develop standards for electronic billing and for a nationwide information network that would collect data on the quality and cost of health care. However, sources said Clinton advisers were unable to decide on a patient identification numbering scheme [CW, Aug. 9].

WordPerfect outlines Unix, other plans

As expected, **WordPerfect Corp.** last week announced WordPerfect Office for Unix running on **Sun Microsystems, Inc.**'s Solaris 1.0. Other Unix versions are due out in the first quarter. WordPerfect also said it plans to run its namesake word processing package on RS/6000 systems based on the PowerPC architecture. Finally, WordPerfect announced a promotion deal with **Borland International, Inc.** under which WordPerfect will bundle Borland's Quattro Pro 5.0 WorkGroup edition with WordPerfect 6.0 of Windows for $525 through December.

Routers to work with Novell NMS

Stonybrook Services in Bohemia, N.Y., last week announced Router Manager for Wellfleet, software said to manage **Wellfleet Communications, Inc.** routers from **Novell, Inc.**'s NetWare Management System (NMS). The first release will be a Windows-based snap-in application that allows users to view Wellfleet routers as icons and launch Wellfleet's management application from the NMS graphical user interface. The three companies are working on tighter integration with NMS in the future. Router Manager for Wellfleet is shipping now for $1,995.

Borland gives support new twist

Seeking to make itself more attractive to information systems departments, **Borland** this week will unveil its Borland Advantage program. The service and support plan differentiates Borland from its rivals by factoring an average usage estimate into site licenses and also by factoring in the installed base of Borland software. The firm will also launch Borland Assist, a standard program available to users for free. It has two other paid support programs that offer varying levels of service.

SHORT TAKES As expected, the **IBM PC Co.** last week announced new PS/2 Server 85s and 95s. The servers use a design called SynchroStream, which moves data at full bandwidth to each subsystem to circumvent the major throughput bottlenecks.... **Micrografx, Inc.** last week named Gordon M. Tucker president and chief executive officer. Tucker was most recently vice president of strategic development at PepsiCo, Inc.'s **KFC Corp.** subsidiary.... **Adobe Systems, Inc.** last week announced a $11.4 million profit on sales of $78.8 million for its third quarter, ended Aug. 27.... IBM last week announced FlowMark, an OS/2 object-oriented work-flow package.

IBM shows PowerPC systems

By Jean S. Bozman
NEW YORK

IBM has used its PowerPC and Power2 RISC chips in a sweeping renewal of its nearly 4-year-old RS/6000 line of Unix workstations and servers announced last week.

The unveiling of three desktop workstations and a server based on the IBM/Motorola, Inc. PowerPC 601 chip at Unix Expo marked the beginning of IBM's use of that high-performance technology (see chart).

The three high-end servers based on IBM's Power2 chip reportedly provide more than twice the performance of the first generation of Power RISC chips.

IBM also announced an X Window System terminal, a new version of the AIX 3.2 operating system and availability of the high-end SP1 Powerparallel Unix processor, announced in February.

AIX 3.2.5 supports the Visual System Manager distributed systems management tool and a new X.500-compatible global directory. It includes C, C++, Fortran and Cobol tool kits for building Unix applications.

More aggressive?

Despite all the upgrades, some users said IBM is still not pushing open systems aggressively. "But I expect that to change," said David Trevino, computer technology director at the Instituto Tecnologico de Monterrey in Monterrey, Mexico, "because the solutions are more competitive, and you can get better value for your money."

Industry analysts said IBM's PowerPC-based systems will put Intel Corp. on notice that IBM intends to make a comeback in the high-volume PC and workstation markets. IBM officials said the 601-based systems run almost twice as fast as Intel's 66-MHz 1486 PCs and have about the same performance as Pentium-based systems.

IBM's Power Personal Systems division will come out with low-cost PC implementations of the PowerPC chip in the first half of 1994, said Bill Filip, president of IBM's Advanced Workstations and Systems division in Somers, N.Y.; this should apply further pressure to Intel-based systems. Workplace OS, the first operating system written to take full advantage of the PowerPC, is due out in the first half of 1994.

The RS/6000 systems' broad power range is intended to address a wide variety of applications, said Tom Jarosh, director of advanced workstations at IBM's Advanced Workstations and Systems division. Low-end PowerPC models may take the place of inexpensive PCs or terminals, he said, while midrange and high-end models will be departmental and corporate file servers.

But a modular version of the AIX operating system called Scalable AIX, which would, for example, cut system overhead in half for AIX Lite laptops [CW, Aug. 30], may not be added until 1994, he said.

Even so, some IBM RS/6000 users said they are waiting for low-end and laptop PowerPC/AIX models to add mobility to the line of desktop and deskside machines.

"We plan to put maps on laptops with a [geographic information system] for people who work out in the field," said Martin Bartel, a senior engineer at Northeast Utilities, a group of five New England utility firms. The Berlin, Conn., site where Bartel works has nine RS/6000s, he said.

However, Tadpole Technology, Inc. in Austin, Texas, which built the AIX laptop around a PowerPC 601 chip for IBM, demonstrated a working model complete with a rubber mouse used in IBM's ThinkPad portable.

The portable system, scheduled to ship in the first half of 1994 and priced close to $10,000, was running a 50-MHz version of the 601 chip under AIX 3.2.5. It had 16M bytes of RAM expandable to 64M bytes, a 210M-byte hard drive and VGA color display using thin film transistor technology. The system also supports PCMCIA cards.

Senior editor Ed Scannell contributed to this report.

Chip off the old block

SAMPLING OF IBM RS/6000S BASED ON THE POWERPC CHIP

Desktop Workstations	Processor	Memory	Storage	Price	Ships
Powerstation 25T	PowerPC 66 MHz	16M bytes	540M bytes	$9,395	10/15/93
Powerstation/ Powerserver 250	PowerPC 66 MHz	16M bytes	2G bytes	$5,445	10/15/93
Servers					
Powerstation/ Powerserver 580	Power2 55 MHz	64M bytes	2G bytes	$68,450	10/22/93

Lotus unveils Unix for Solaris 1.0

By Michael Vizard
NEW YORK

■ Lotus Development Corp. teased Unix Expo show-goers last week with a glimpse of its Unix implementation for Notes when it officially introduced a forthcoming Notes for Solaris 1.0 system from Sun Microsystems, Inc.

Due in the fourth quarter, the Notes implementation for Sun systems is aimed at integrating Sun's installed base with the Notes environment. Lotus will not catch up to Solaris 2.0 until it ships a compatible version of Notes next year.

Lotus' schedule for other Unix implementations, which are targeted at systems from The Santa Cruz Operation, Hewlett-Packard Co. and IBM, has slipped into the first quarter of 1994.

"I'm not surprised. Lotus is notorious with its delivery timetables. I take them all with a grain of salt," said Norman Weizer, president of Weizer Associates, a consultancy in Lexington, Mass. Lotus has been talking publicly about a Unix implementation of Notes for about 18 months.

The arrival of Notes will be welcome news for sites that use Unix as their primary platform. "Right now, a lot of people have OS/2 systems that are used to just run Notes," said Antonio Parham, a Lotus product manager. "They'd like to put all their applications on the same server."

According to Parham, Notes on a SPARC platform will give users access to a RISC platform that supports more physical memory and better I/O performance to run Notes. However, Solaris 1.0 does not support symmetric multiprocessing, which would allow Notes sites to begin consolidating servers by running multiple Notes databases on the same system.

Symmetric multiprocessing will be supported on IBM's AIX, HP's HP/UX, Solaris 2.0 and Microsoft Corp.'s Windows NT platforms in 1994, according to George Gilbert, a Lotus marketing manager.

Meanwhile, Lotus said it plans to launch Notes as a NetWare Loadable Module at Networld Dallas '93 next week.

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❑ October 12
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Dallas, TX
❑ October 13
Detroit, MI
❑ October 19
❑ February 1
Houston, TX
❑ February 3
Tampa, FL
❑ January 27
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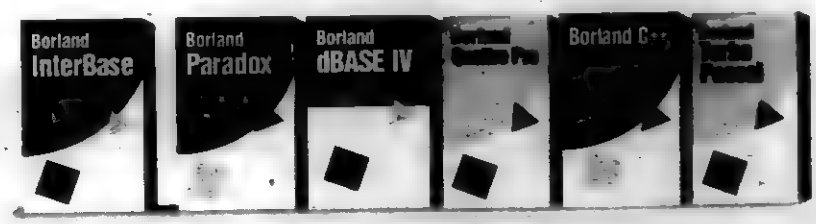

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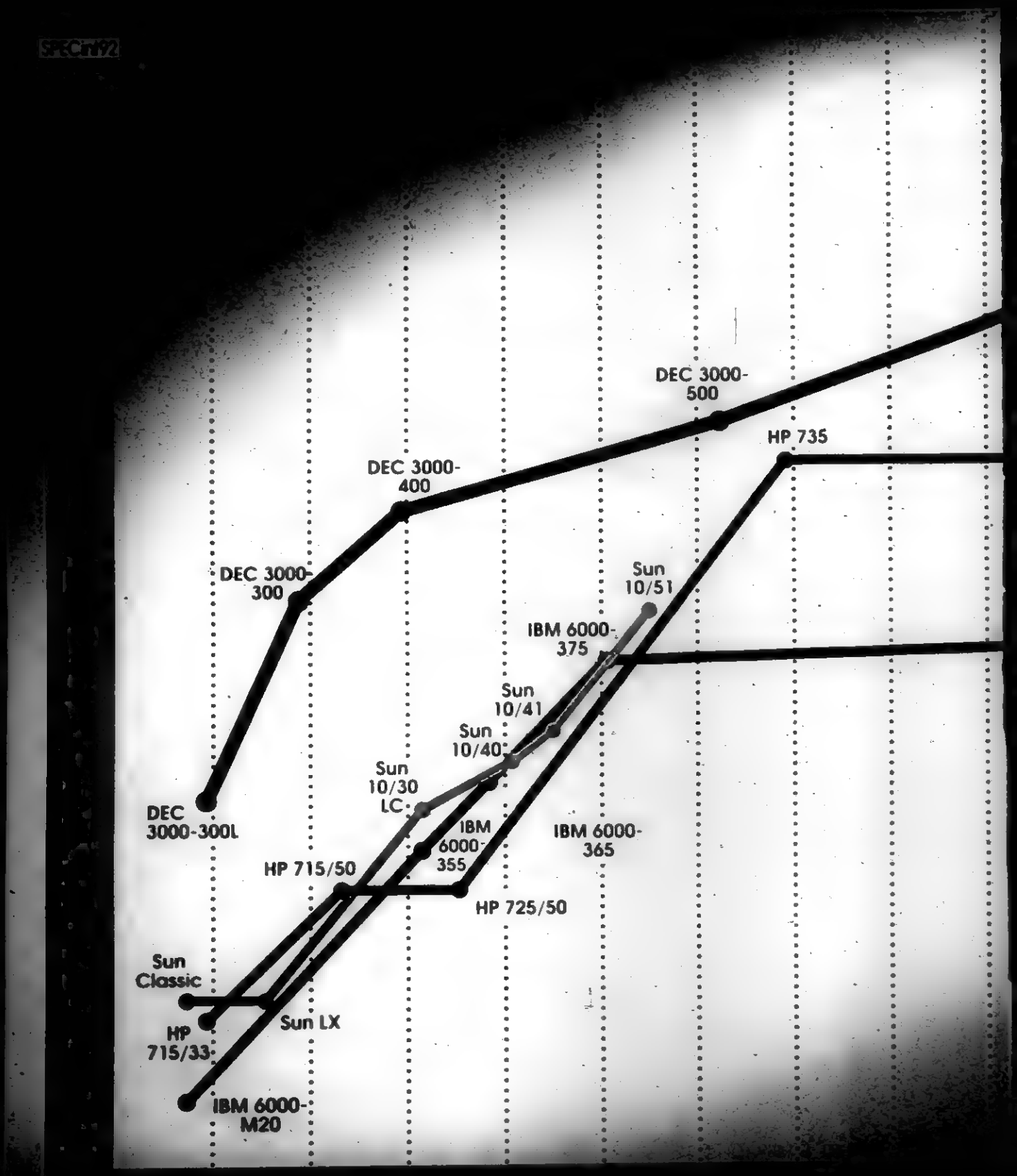

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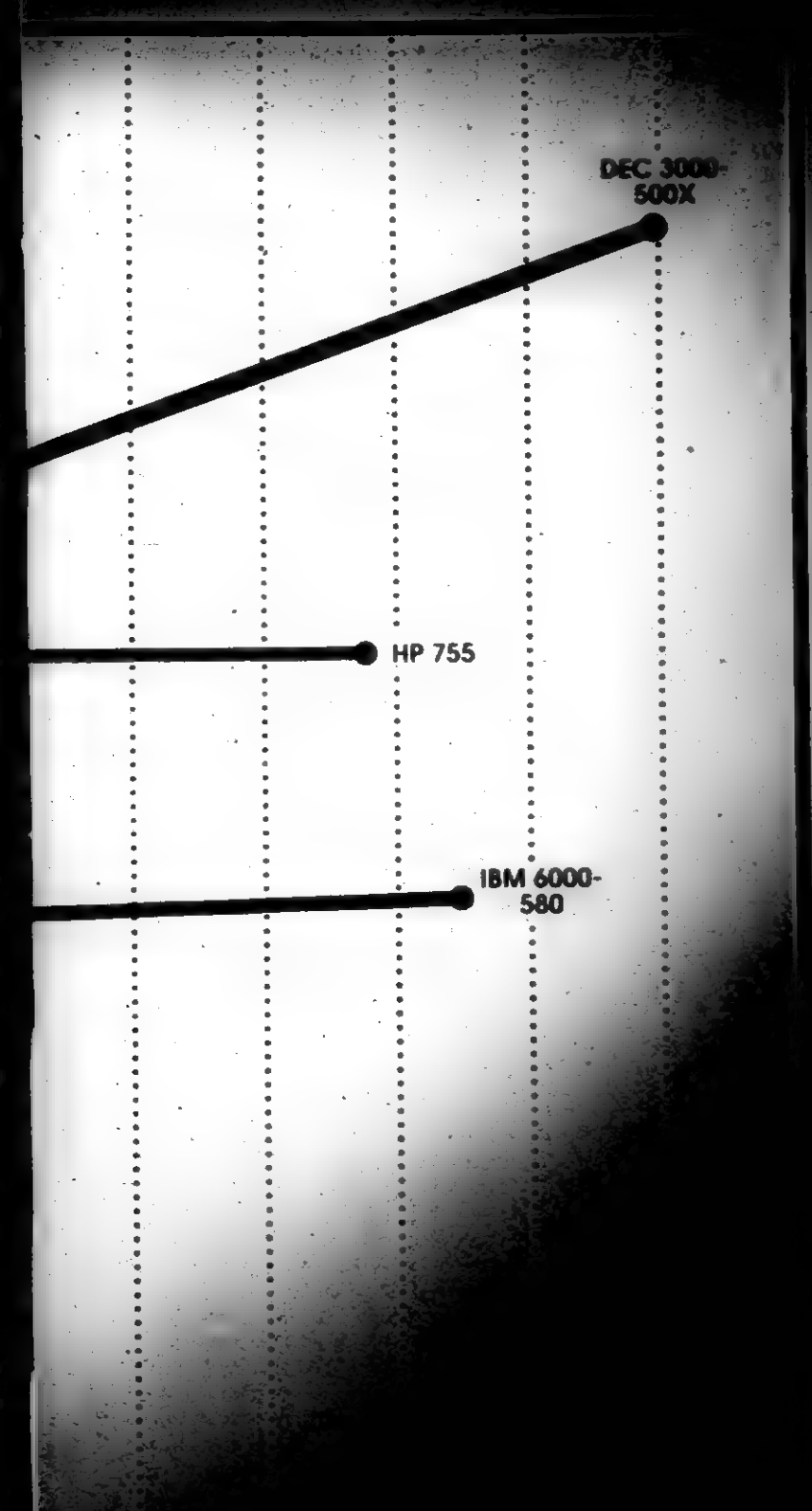


digital

MasterCard, Europay team up on network

By Thomas Hoffman
NEW YORK

MasterCard International, Inc. and Europay International S.A. have joined forces to develop a single, Unix-based global transaction processing network for their 24,000-member financial firms.

When the $90 million project is completed by late 1995, the network is expected to operate up to 10 times faster and more reliably than the IBM Series/1 minicomputer-based networks the payment services providers currently use.

MasterCard executives said the project, which will replace 350 Series/1s with Intel Corp. I486-based Unix servers, will also eliminate European gateways and Series/1 maintenance on both sides of the network. This is expected to reduce information technology overhead for both partners, including an estimated $100 million in cost savings for MasterCard during the next seven years.

The network is expected to deliver all payment services products for both MasterCard and Europay, which together process more than 3.7 billion transactions per year for more than 10.8 million merchants. MasterCard is shelling out $65 million for the project, while Europay is contributing $25 million.

"A move to leading-edge technology, such as the one MasterCard is implementing, will have a positive effect on card issuers," said Lou Iannaccone, a vice president of systems at The Chase Manhattan Bank NA's Direct Response Division, a MasterCard member.

The network, called Programme Global, will be built by combining MasterCard's Project Omni with Europay's Columbus project, according to Philip P. Verdi, executive vice president of electronic services at MasterCard. Both Project Omni, which started in 1990, and the Columbus project were launched to provide process innovations targeted for their respective payment services businesses, including equipment enhancements and state-of-the-art fraud-detection systems.

MasterCard's Philip P. Verdi: *Reformatting of data will no longer be necessary*

According to Verdi, there will be no changes made to MasterCard's global peer-to-peer packet-switching network, called BankNet, which includes fiber-optic connections through Bolt Beranek and Newman, Inc. switching nodes in 14 locations around the world.

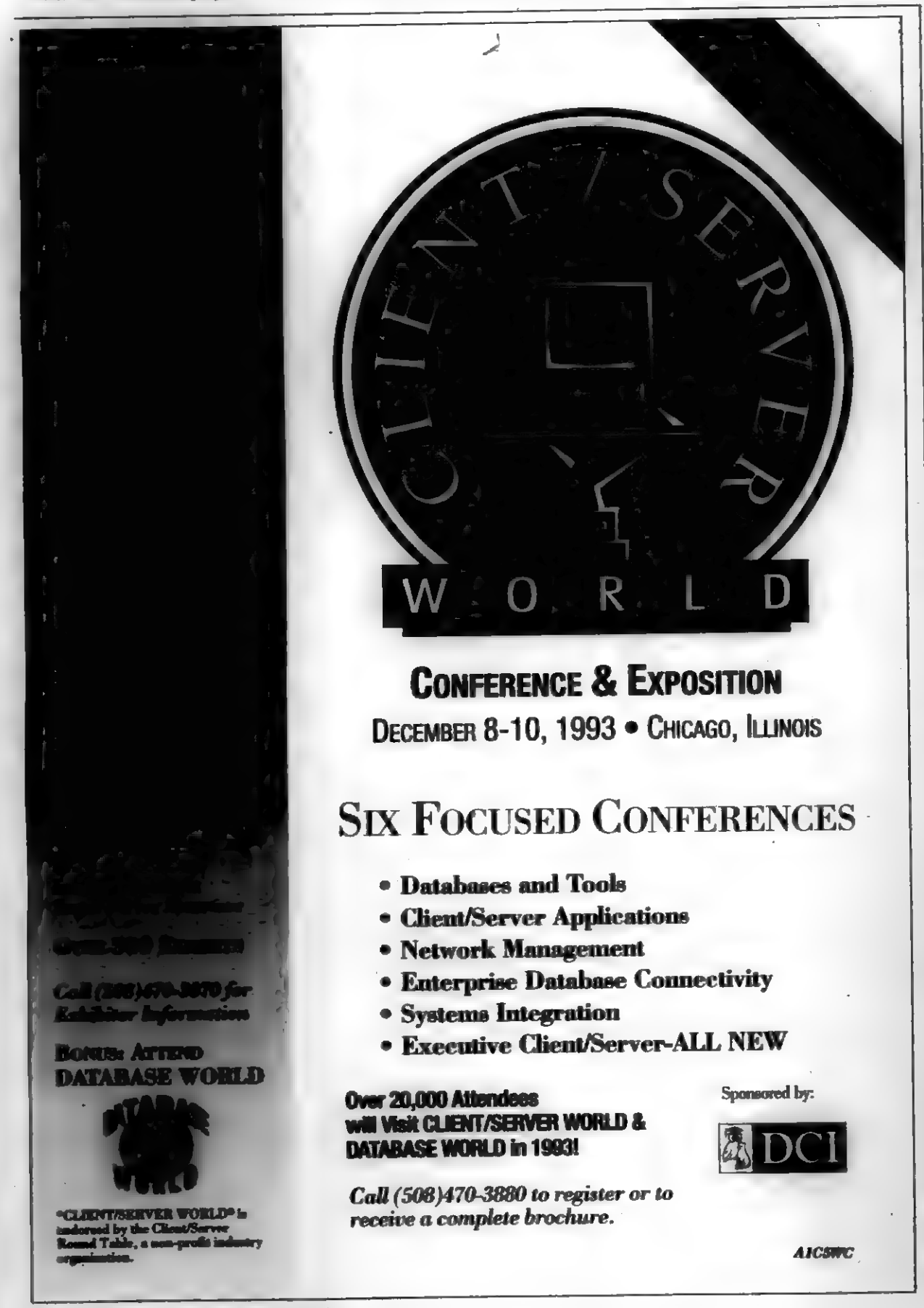
More flexibility

"We're going to satellite processing in many parts of the world where terrestrial lines aren't very good, such as the Middle East, Africa and parts of South America. So if you lay that on top of applications we're redoing for authorization for settlement and clearing processes, the Unix environment gives us a lot more flexibility in moving things around [vs. the Series/1]," Verdi said.

For example, when MasterCard's European partners needed to transmit credit-card transactions to a cluster of IBM, Amdahl Corp. and Hitachi Data Systems Corp. mainframes at MasterCard's St. Louis data center via Series/1-to-Series/1 connections, the data would have had to be reformatted from European communications standards to conform with U.S. networking standards. Because Unix standards have virtually become universal, reformatting of data will no longer be necessary, Verdi said.

The X86-based Unix servers will likely be more cost-effective for MasterCard. For example, Verdi said MasterCard member firms that use 10 to 12 Series/1 front-end processors will be able to replace those with two Intel-based servers once installations begin early next year.

MasterCard and Europay are now evaluating numerous Unix vendors, though Verdi said his company is leaning toward a mix of IBM PS/2 and NCR Corp. System 3000 servers.



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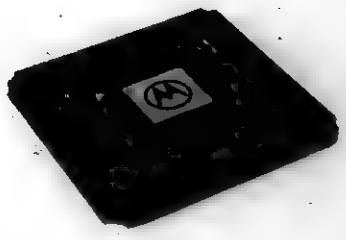

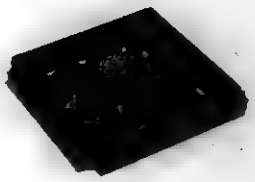

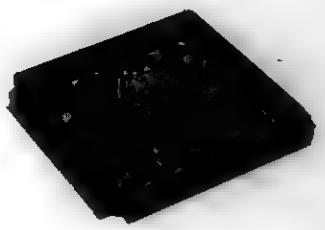

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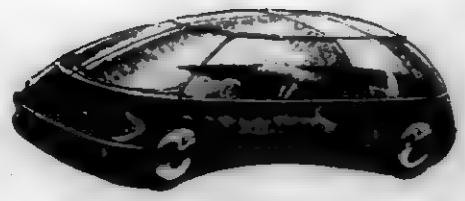

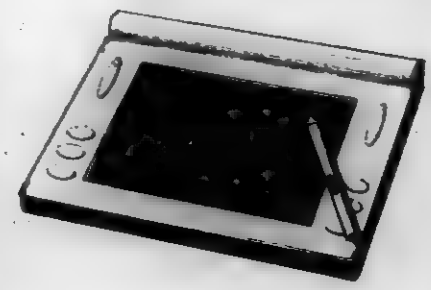

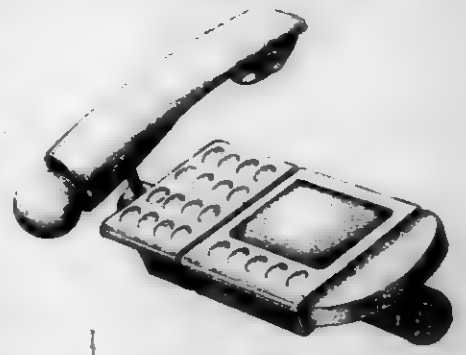

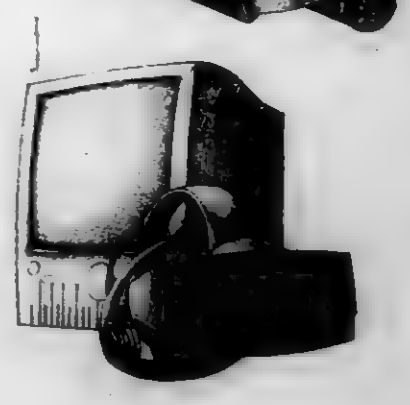

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MOTOROLA

Legent, HP to link host, Unix worlds

By Gary H. Anthes

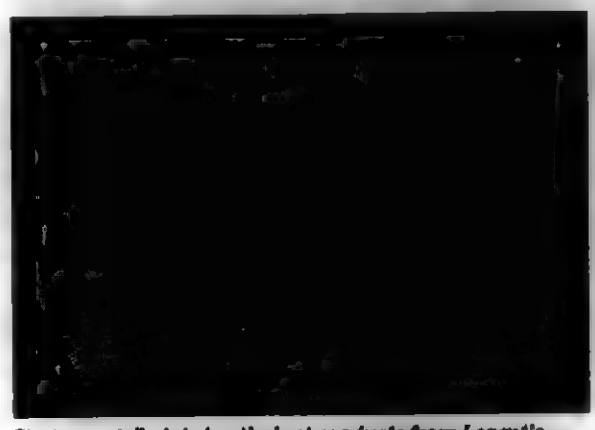
Legent Corp. and Hewlett-Packard Co. last week allied in an effort to produce an integrated suite of tools spanning mainframe and Unix client/server environments for performance and resource management.

Much like another alliance announced last week between Sun Microsystems, Inc. and Amdahl Corp. (see story below), the partnership seeks to address users' concerns about merging legacy systems with newer open or distributed platforms. IBM, meanwhile, is also addressing this issue but will go it alone.

HP and Legent said, and users agreed, that the integrated product suite will make it easier to manage large, diverse distributed computing environments. "Customers are demanding interoperable solutions, and they are demanding that systems management tools span the enterprise," said Phil Carrai, product marketing vice president at Legent.

The companies said they will take "best-of-breed" products from Legent's mainframe tool box and HP's distributed systems management offerings and knit them into a spectrum of capabilities that will allow users to transparently manage system resources across dissimilar operating systems using just one workstation.

The plan extends a concept already embodied in Legent's Paramount, a product for downloading to a PC and displaying and analyzing the output of multiple mainframe performance monitors [CW, May 31]. It also moves Legent into the world of client/server.



Strategy entails *joining the best products from Legent's mainframe tools and HP's systems management offerings*

Just what they want

That is just what Legent and HP customer Mead Data Central, Inc. in Dayton, Ohio, is looking for. Mead, which provides the Nexis and Lexis information services, is moving its in-house applications from MVS mainframes to Unix-based client/server environments. Mead is likely to move its financial/administrative applications and Nexis and Lexis to a combination of HP, NCR Corp. and Sun Microsystems, Inc. Unix platforms, said Daniel Hursh, staff systems engineer.

Hursh said if Legent and HP had not made this move, Mead would have had to build its own bridges between the product lines. "This really brings together two of our key vendors for systems management," he said. "This is exactly what we were waiting for them to say."

Legent will begin selling HP's Unix-based performance and resource management products early next year. In the second half of the year, it will introduce integrated MVS/Unix applications under HP OpenView using Legent's Paramount architecture for performance, capacity and information systems financial management and reporting on Windows and the Open Software Foundation's Motif platforms.

The performance suite will include Legent's MVS, LAN, database and SNA performance products and HP's PerfView, as well as other Unix performance products such as HP GlancePlus. The capacity and financial applications will combine the companies' MVS and Unix offerings, including Legent's MICS and HP's Performance Collection Software products.

The resulting applications will integrate into HP's OpenView network management system and move later to IBM's NetView/6000 and possibly to Sun's NetManager.

Future deliveries from Legent/HP alliance

December 1993: Interfaces will be demonstrated between Legent's MICS products for capacity planning and accounting and HP's Performance Collection Software.

First quarter 1994: Legent will begin selling HP's Unix-based performance and resource management products.

First half of 1994: Legent will introduce a MICS/Unix data integration application that will let users integrate HP Performance Collection Software Unix metrics data through Legent's MICS historical repository.

Second half of 1994: Legent will unveil under the mainframe-based Paramount umbrella MVS/Unix performance, capacity, accounting and reporting applications on OSF/Motif and Windows platforms.

First half of 1995: The Paramount suite of tools will debut on Unix platforms.

Help on the way

Legent offered these scenarios for how its integrated products could help users:

- A Unix server takes data from DB2 on an MVS mainframe and passes it to client workstations. A performance problem in DB2 is detected by Legent's Insight for DB2 performance monitor, which sends an alert to Legent's Paramount. Paramount passes the information on to HP's PerfView performance monitor, which notifies users.
- A company wants to downsize an application from a mainframe to client/server and to look at questions of capacity, performance and user cost across the network. Without integrated management tools, each piece would be examined separately.
- An IS manager wants to look at enterprise-wide systems performance across all operating systems. With the new Legent/HP offerings, the manager will be able to write one query to transparently access data distributed across the enterprise.

Sun, Amdahl team on open systems boxes

By Jean S. Bozman

NEW YORK

Sun Microsystems, Inc. and Amdahl Corp. used Unix Expo last week to announce plans to jointly sell Sun's Unix servers and infuse Amdahl's commercial information systems expertise into Sun's Solaris operating system.

The two are teaming up to counter IBM's broad reach in Unix systems and legacy mainframe applications.

The alliance will also address the need to tie large data centers with proprietary mainframes into growing open systems networks, as will moves by IBM and the partnership between Legent Corp. and Hewlett-Packard Co. (see story above).

Sun expects to gain from Amdahl's expertise in managing heterogeneous systems, including IBM MVS systems and Unix mainframes, analysts said. Amdahl will continue to sell its UTS mainframes.

How it breaks down

HARDWARE

Sun and Amdahl: Both sell Sun SPARCserver 1000 and SPARCenter 2000 Unix servers.

Sun: Sells RS/6000s and PowerPC-based Unix machines.

SOFTWARE

Sun and Amdahl: Work to enhance Sun's Solaris operating system with the reliability and performance features of UTS mainframe Unix variant.

IBM: Uses standard AIX 3.2 operating system; plans to ship scalable AIX in 1994.

SERVICE

Sun and Amdahl: Will spell each other on service and support.

IBM: Provides its own support and service.

INTEGRATION OF LEGACY SYSTEMS

Amdahl: UTS runs on large IBM-compatible mainframes. Huron will support re-engineering of MVS mainframe applications for use on open systems; it already runs on Sun workstations.

IBM: Tool kits for developers help downsize Cobol and Fortran applications on IBM hosts. New C++ tool kits help to build new open systems applications.

Real interoperability, rather than promises of such, is what users are looking for, according to one New York programmer who works at a mixed-vendor shop that includes HP and Sun machines. "If there were true interoperability, you could flip machines in and out and not worry too much about the software. It's like cars: If someone comes out with more horsepower, you can buy that one."

Huron to the rescue

Another issue is the need for industrial-strength Unix applications. Sun users will be able to use Amdahl's Huron environment, now sold by Amdahl and its Antares venture with Electronic Data Systems Corp., to re-engineer legacy applications for use on Unix servers.

Amdahl Chief Executive Officer Joseph Zemke said Huron has already been ported to Sun's SPARC workstations. IBM, meanwhile, said last week it is providing new tool kits for C, C++, Fortran and Cobol so users can rewrite mainframe applications for RS/6000s.

Users who may have held off on open systems and re-engineering of open systems may like the Sun/Amdahl alliance, analysts said. "I think that what Amdahl represents to Sun is a large-scale commercial Unix platform," said Judith Hurwitz, a development tools consultant in Newton, Mass.

"It's a venture that gives Sun a method to get out of the technical workstation 'box' the industry has made for them," said Donald Haback, executive vice president at D. H. Brown Associates, Inc. in Port Chester, N.Y. "By adding Amdahl's strengths to Solaris, you give the Solaris operating system more commercial viability."

Analysts speculated that Sun and Amdahl may have been motivated to cooperate because Amdahl plans to build future systems around Sun-designed SPARC RISC processors. Both firms use chips made by Fujitsu Ltd.

Sun and Fujitsu have also had a long-standing partnership. Earlier this year, Sun, Fujitsu and ICL agreed to standardize on compatible Unix versions.

The Sun/Amdahl alliance is open-ended, beginning with the cross-selling of Sun's SPARCserver 1000 and SPARCcenter 2000 and the development of Solaris software with enhanced reliability and performance.

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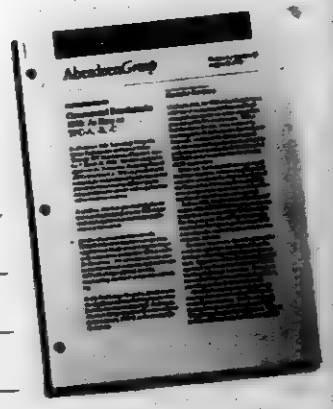

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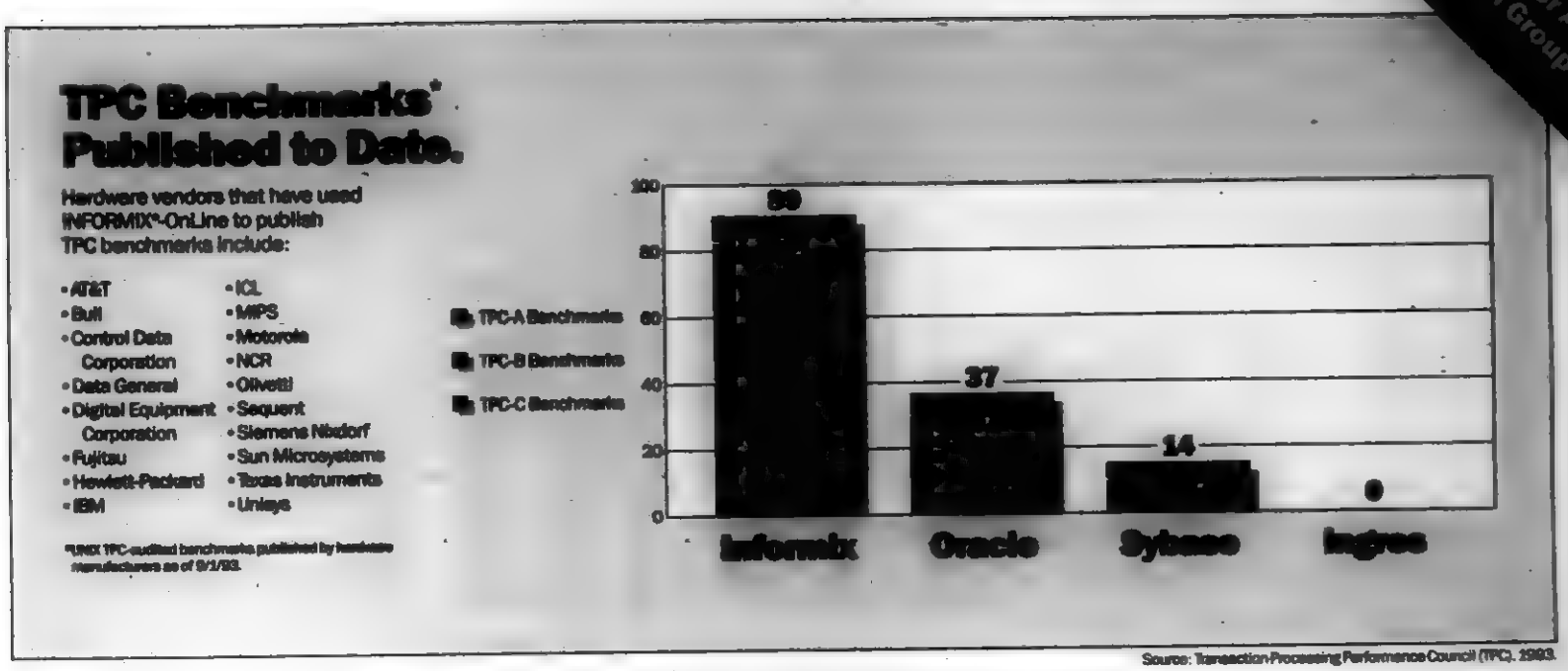

Source: Transaction Processing Performance Council (TPC), 1993.

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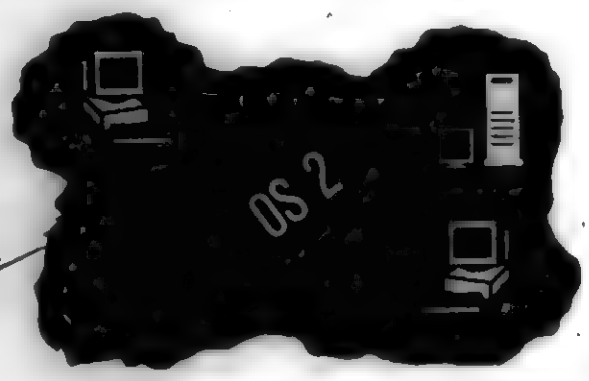
▲ *All this monkeying around with NT raises lots of questions. OS/2 has the answers.*



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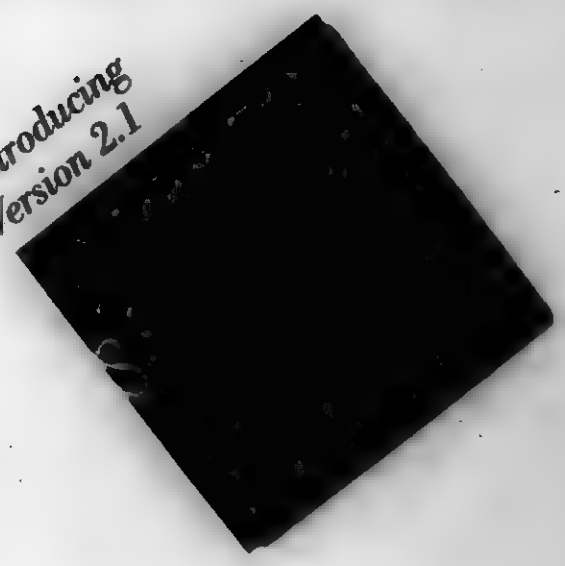

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Domain/DACS,™ AlertView,™ Foundation Manager™), and more. **Fact:** The NT strategy is still Not There, and neither are native client/server applications.

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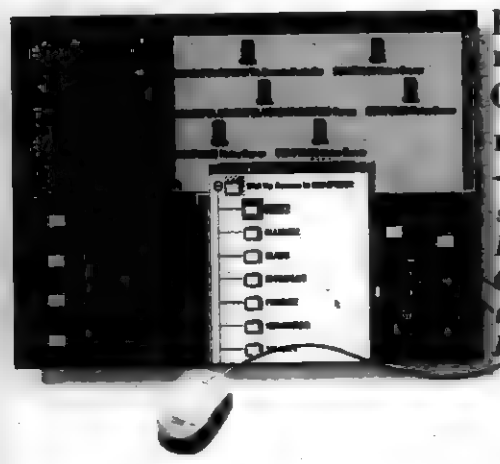

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Digital outsources IS control to itself

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp.'s professional services organization is now running the company's data processing operations as a prelude to trying to increase Digital's relatively small presence in the outsourcing market.

Digital plans to focus mainly on network outsourcing, an area in which analysts said the company has a good reputation. However, they added that it has not yet shed its image as a product vendor first and foremost. Meanwhile, some existing Digital outsourcing customers were critical of the company's bureaucracy.

Data center reduction

Internally, the number of Digital's data centers will be reduced sharply following the shift of data processing responsibility from the finance department to Digital Consulting, said Gresham Brebach Jr., vice president of that business unit. He said he expects to cut the roster of about 200 data centers by two-thirds or more.

However, Brebach said the main reason control of the information systems group changed hands was to buy the consulting unit some fast credibility as an outsourcer while also giving it direct control of the IS facilities and workers it uses on outsourcing contracts.

Previously, analysts noted, Digital Consulting had to negotiate individual subcontractor deals with Digital's local IS managers to get space for outsourcing work. It was a time-consuming process, and the cost of facilities, power and personnel varied.

Brebach acknowledged that previous outsourcing contracts had been handled largely on a local basis. "We want to manage that more centrally now," he said.

Paul Johnston, an analyst at International Data Corp. (IDC) in Framingham, Mass., said Digital Consulting is "behind the curve in running [data processing]," compared with other outsourcing vendors, and was held back as a result. "They need to be able to show that they have the infrastructure in place to manage these contracts," Johnston said.

The lack of data processing control also created a perception problem with potential outsourcing customers, Brebach noted. "The first question you get is, 'Do you run your own data processing?' And if the answer is no, you don't get very far."

Following leaders

Digital's outsourcing sales remain small compared with market leaders such as Electronic Data Systems Corp., IBM and Computer Sciences Corp. (see chart).

"They are a factor in their installed base, but when you look at competitive situations, Digital is not up there competing with the Big 3," said Julie Schwartz, a Dataquest, Inc. analyst based in Framingham, Mass.

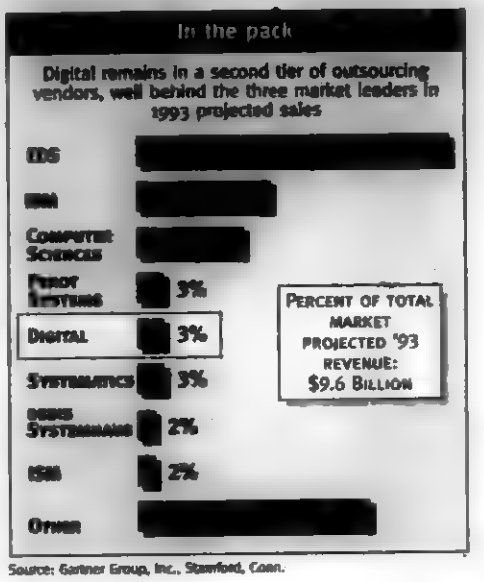
"Most companies don't even know we're in that business," conceded Brebach, who joined Digital last April after leaving McKinsey & Co.

However, Brebach said he wants Digital Consulting to become more of a factor in outsourcing by mid-1994, still focusing on network outsourcing rather than the traditional glass house data centers.

Digital Consulting's Gresham Brebach Jr.: *Unit wants to gain fast credibility as an outsourcer*

Cutting the fat

Gresham Brebach Jr., vice president of Digital Consulting, said Digital has "overly decentralized data processing" and needs to reduce the number of its data centers to cut costs. Brebach, who is now in charge of the company's information systems, declined to comment on how much money he hopes to save in the consolidation process. He noted that Digital's internal IS head count — including the number of workers devoted to outsourcing — will be reduced by an undetermined amount as Digital Consulting takes "the fat out of the current system." The shedding of data centers will take "several years" to complete, he added.



Source: Gartner Group, Inc., Stamford, Conn.

Rita Terdiman, an analyst at Gartner Group, Inc., a consulting firm based in Stamford, Conn., said Digital earns good marks as a network services provider, despite not having pushed outsourcing "as much as they could have." Terdiman and other analysts noted, however, that Digital has yet to shed its product vendor image. "Their biggest hurdle is that users still view them as a technology company, not a services company," said Mike Melenovsky, an analyst at IDC.

Digital is "good at making hardware and running a data center, and it has lived up to that," said Rod Sikes, vice president of information technology at AMC Entertainment, Inc., a movie theater chain based in Kansas City, Mo., that outsourced its VAX data center and network to Digital last October.

Bureaucracy blues

However, Sikes said he does "get frustrated with their bureaucracy." Digital responds slowly when AMC tries to buy PCs and other products for the operations it still runs internally, and it has not been made clear whether he should deal with the outsourcing unit or with Digital's local sales office for such purchases. "I just try to play both ends and see if I get an answer."

Santo Crisafulli, director of global operations at Foreign Exchange Transaction Systems, Inc., a Citicorp subsidiary in Long Island City, N.Y., has had an outsourcing contract with Digital since 1989. He agreed things "don't always run as smoothly as they should" because of bureaucracy.

Crisafulli said he had no complaints about the quality of Digital's outsourcing work, however, and said the bureaucratic problems have not been beyond expectations. "I'd like to say everything has been perfect, but that would be a lie," he said. "But the bumps haven't been too big, and we've been able in short order to manage through them."

Source: Digital Equipment Corp.

Help wanted

Digital has taken its search for a chief information officer inside the company after failing to entice prospects from outside, following its transfer of data processing responsibilities to the Digital Consulting unit.

"It's not that there aren't good people out there," said Gresham Brebach Jr., vice president of Digital Consulting. "It's just that some people want to control the whole nine yards, and they're not going to be able to do that here because we're running the data centers."

The CIO's main role at Digital will be to manage the development of the company's applications, Brebach said. Some outsiders viewed that as "a step down" from their current duties, he added.

Another sticking point: The CIO will report to William Hurd, Digital's chief financial officer, because financial applications are "obviously an integral part" of the position, Brebach said. He acknowledged that a CIO would typically report to a company's president or chief executive officer, "but in this situation, because of the nature of the job, [working for the CFO] is the way it should be."

Digital recently offered the job to an employee in Europe, Brebach said, but he declined to identify the individual. The firm previously had separate CIOs responsible for Europe, Asia and the U.S., but now wants the new CIO to centralize global application development.

—Craig Stedman

Same idea, different company

Digital's hand off of data processing responsibilities to its professional services organization mirrors a similar move last year by IBM, which has been shifting control of data center operations to its Integrated Systems Solutions Corp. (ISSC) outsourcing subsidiary.

Data centers that support IBM's marketing and sales and manufacturing and distribution operations are all being put under the control of ISSC [CW, March 15].

IBM has also been consolidating its data centers in conjunction with the internal outsourcing move.

Controlling internal data processing has virtually become a requirement for outsourcers, said J. P. Richard, an analyst at Input, a Vienna, Va., market research firm. "Most of the substantial vendors run their parents' shops," including market leader EDS with General Motors Corp., according to Richard.

A holdout is Unisys Corp., which, like Digital, is trying to improve its place in the outsourcing pecking order. Unisys' own MIS department remains separate from its outsourcing operation, a company spokesman said.

—Craig Stedman

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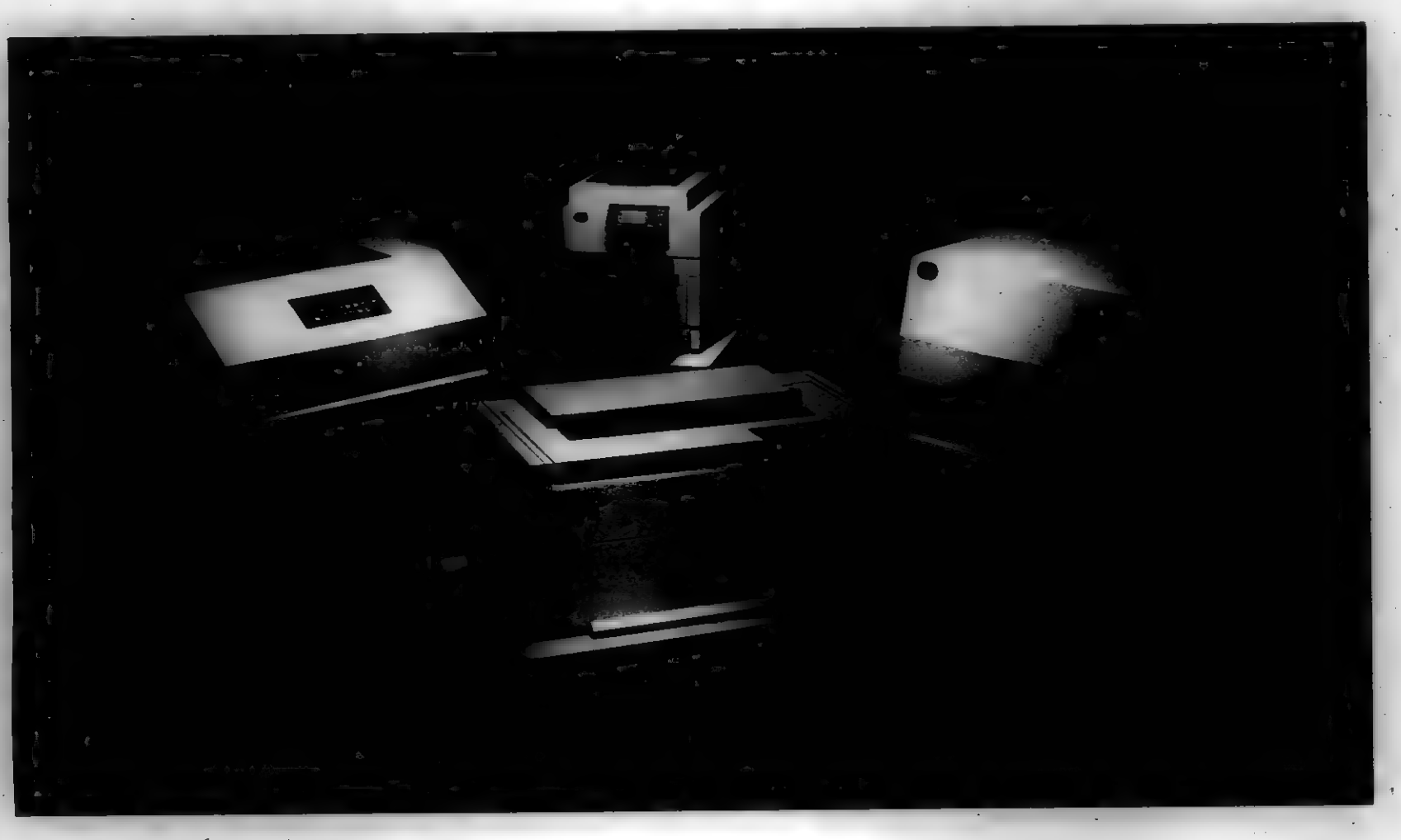

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Tech Talk

Call home

Ameritech Corp. earlier this month said it would test a voice-activated dialing service that would let consumers operate a telephone without pressing a single button. The Chicago phone company will use a patented voice-dialing system from Texas Instruments, Inc.'s Telecom Systems Unit in Austin, Texas, and fault-tolerant Unix servers from Tandem Computers, Inc. in Cupertino, Calif. Ameritech's future voice-dialing option, which could be commercially available as early as next year, will provide a personal voice directory for each household member, with a total of 70 voice-activated names per household.

Mass storage

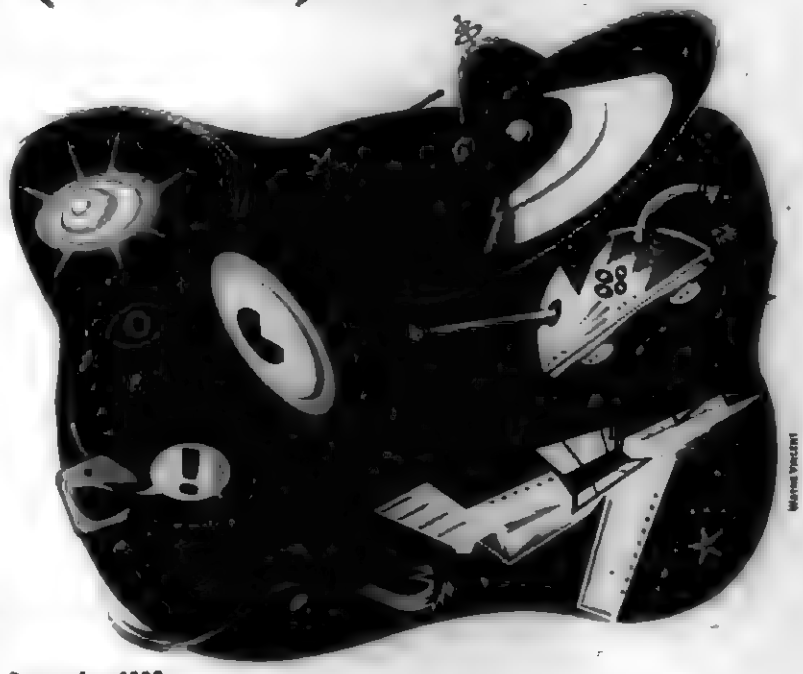
Last month, IBM Adstar scientists reported they had discovered a way to store up to 10 billion bits of information per square inch of computer disk surface, or a density 30 times greater than current disks. The feat is accomplished by a variation on the so-called "magnetoresistance" effect, whereby the materials in the disk drive's read head change their electrical resistance in the presence of a magnetic field. Adstar scientists were able to produce a "giant magnetoresistance" effect, resulting in a signal five times stronger than current methods. Because of the stronger signal, disk drive heads produced with materials exhibiting the effect should be able to detect magnetic spots that are much smaller and more densely packed than those in current systems, according to IBM. The prototype head has yet to be developed.

T-byte Rex

E-Systems in Dallas announced a commercial patent — its first — for its massive data storage technology, which stores from 5T to 10,000T bytes. E-Systems' commercial-products unit, Emass, is already selling massive data storage systems based on the technology.

Looking (back) forward

By Ellis Booker



Technology breakthroughs rarely change the world overnight. Sometimes a heralded advance never achieves its promise; it can be derailed by unseen difficulties or superseded by other approaches.

In any event, a look back to update the fortunes of some "advanced technologies" is a useful exercise. The following are updates on stories that appeared on this page during the past three years:

September 1993: Optical

A "proof-of-concept" fully optical computer, developed and shown by the University of Colorado six months ago, has given researchers there plenty to work on.

"We've reached a plateau level on the experiment and are going back to the theoretical work to understand and extend the techniques," said Harry Jordan, a professor of electrical and computer engineering and one of the development leaders at the university's Optoelectronic Computing Systems Center (OCSC).

The OCSC demonstration was the first of its kind to use light pulses to both calculate and store data elements conveyed along three miles of spooled glass fiber. Each "bit" is carried as a 12-foot light pulse. An earlier system shown by AT&T Bell Laboratories had used an external electronic computer for program control.

Still ahead for the experiment is a multiplex trail, whereby two virtual machines run simultaneously on the same hardware. "Every other pulse will belong to one of the two virtual machines," Jordan explained. Other related projects at OCSC include the development of a high-speed graphics processor that uses light waves in "free space" and the creation of an optical switch to interconnect high-speed computers.

The fully optical computer has been a dream of computer scientists for decades. Theoretically, doing away with physical media (wires and silicon chips) would dramatically increase a computer's speed.

A light-based computer that dispensed with optical fiber to carry the light beams could feature a virtually limitless number of interconnections in free space — the ultimate architecture for a massively parallel system.

September 1992: Speech recognition/translation

After the successful January demonstration of Janus, an English/German/Japanese speech recognition/translation system, researchers at Carnegie Mellon University's Center for Machine Translation are now at work on a more general-purpose, two-person translation system.

Unlike the 400-word Janus, developed to register attendees at an international conference, the two-person system will use an unconstrained vocabulary and allow users to speak more naturally, according to Arthur McNair, a research programmer in neural network speech at Carnegie Mellon.

"Our biggest change is working on spontaneous speech, allowing people to say things like 'ummm' and 'ah' and restart their sentences," McNair said.

The "task" of the new system will be to schedule an appointment, translating sentences such as, "Can we meet next Tuesday at 10 a.m.?" and "No, I have a meeting then" into English, German and Japanese. Eventually, Spanish will be added to the mix.

A public demonstration of the system is a year or two away.

September 1991: Eye-tracking

Despite high hopes two years ago, eye-tracking systems have yet to crack the commercial marketplace to become "the ultimate" computer interface.

The gear is still important to military and research users, however. And affordable, PC-based systems that have come on the market in the past two years are proving a godsend for some disabled persons [CW, Aug. 30].

"There aren't any big markets yet," acknowledged Rikki Razadan, president of Iscan, Inc. in Cambridge, Mass., a vendor that was profiled two years ago. Nevertheless, Razadan said, "There's no question that this technology will show up on user desktops." Immediate future uses include videogame applications.

A year-and-a-half ago, Iscan introduced its Eye-Slaved Pointer system, a tabletop eye-track setup for the disabled. The $15,000, PC-based system comes with software that enables its user to dial a telephone, do word processing and access message boards.

The technology in the PC-based system is based on Iscan's $50,000 to $60,000 military and research products.

September 1990: Project Athena

Back in September 1990, Athena was still an experiment at MIT. By the next July, however, the Unix-based, campuswide computing environment, had been officially merged into the university's information systems group.

Today, Athena is the primary academic electronic resource at MIT and supports some 14,000 students and faculty members. Other changes since 1990 include ports to vendor-specific Unix operating systems, such as Digital Equipment Corp.'s Ultrix and IBM's AIX, and a trend toward using third-party software packages.

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IDC Insight

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IDC has developed a better method of evaluating costs of computing. Price/performance numbers based on hardware benchmarks are often extremely poor predictors of the actual computing costs users will face. This is especially true in situations where customers are distributing very-complex workloads across an enterprise.

Hardware price-performance benchmarks such as TPC-A provide solid, base-level comparisons in specialized environments. They don't reflect the complexity of most users' business needs and processing workloads. Therefore, they have limited value in making realistic buying decisions.

The IBM AS/400, sometimes mistaken as a premium-priced product, emerges as the lowest cost-to-use system in complex, networked, enterprise-wide processing environments

To help IS management better predict the true cost of computing, International Data Corporation (IDC) developed a "cost-to-use" model. This model is intended to more-accurately measure and compare the full costs of using four types of leading midrange systems in networked, enterprise-wide applications. The systems in the study were: IBM AS/400, DEC VAX VMS, HP UX, and NetWare LANs.

Contradicts Price-Performance Notions

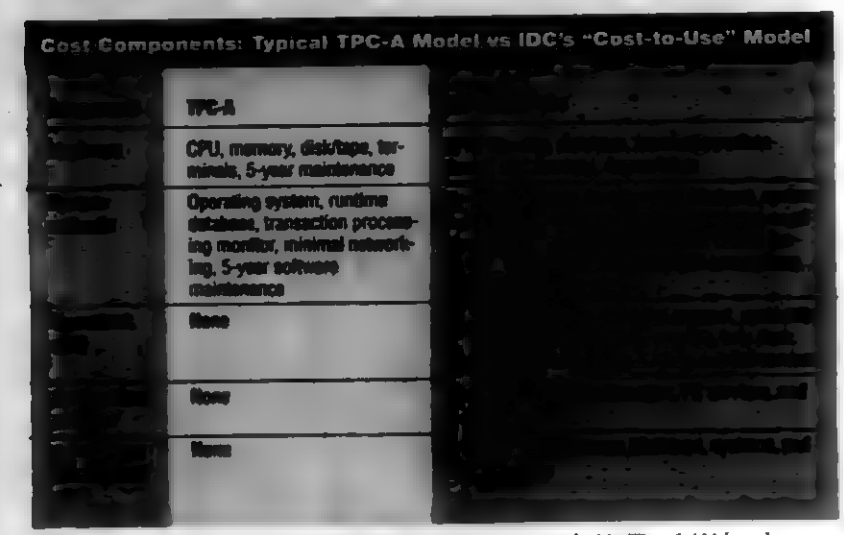
IDC studied more than 150 commercial computer installations in the United States. We interviewed more than 30 customers who have installed networked-enterprise systems to assess the full range of computing costs in complex, enterprise-wide environments. The model IDC developed from this research includes hardware, system software, application software, development-staff and operations-staff costs, and all overhead costs associated with remote-systems management performed by a central site over a five-year period.

IDC believes the results of this study provide IS professionals with the best information available on the costs of processing in the most-complex type of computing environment, the networked enterprise. While we doubt that the results of the study will come as a major surprise to those who have fully considered the issues, our data contradicts notions based simply on hardware price/performance figures.

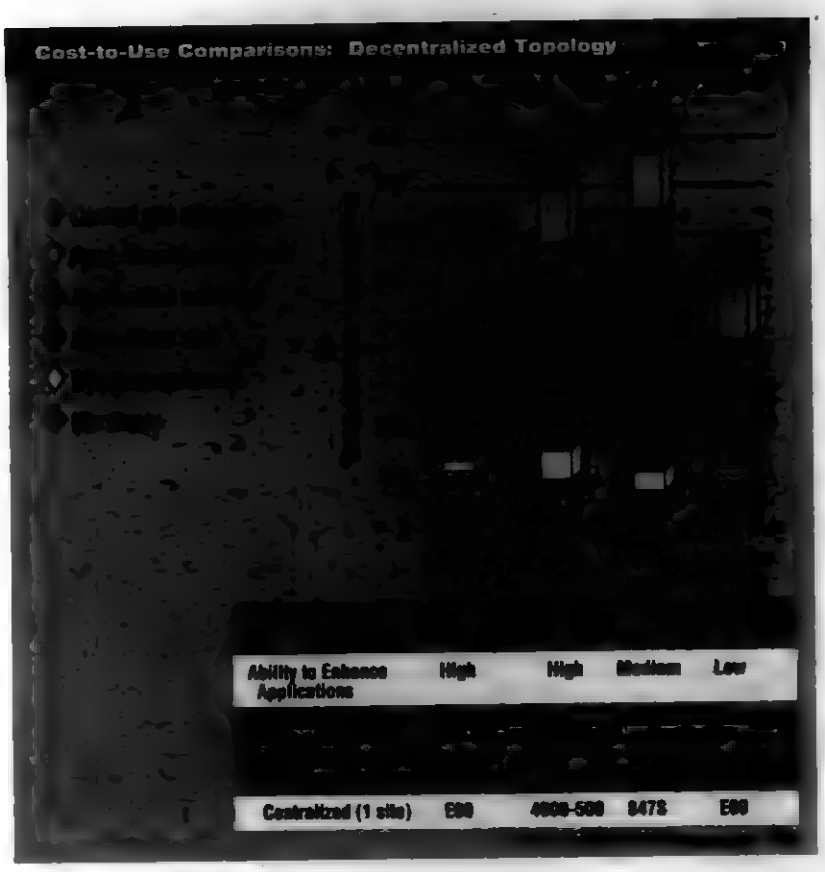
Options

Four major options appear to be available to PC LAN users.

1. Do nothing, and continue to live with existing distributed or decentralized topologies and functionality as they currently exist.
2. Wait for LAN vendors to deliver the needed functionality.
3. Add to operations staff, even though this will increase costs out of proportion to the increase in benefits.
4. Implement currently available technologies that provide the advanced functionality not yet available on LANs. While this may result in higher up-front costs, the IDC Cost-to-Use model indicates that this is the most-effective choice.



* *Minicomputer-based topology included 60% PCs, 40% terminals. NetWare LAN-based topology included 100% PCs. Source: International Data Corporation, 1993.*



Staffing costs dominate

For example, consider the following:

- Integrated systems-management software services (a series of coordinated tools for administering local and remote systems) are a major differentiator for users because staffing expenditures dominate overall cost in the networked enterprise.

  In a distributed topology, operations-systems staffs for IBM AS/400 and DEC VAX systems cost $36 per workstation per month, roughly a tenth of the cost of a LAN-based system. In a decentralized topology, as opposed to distributed, the reverse is true — LANs had the lowest costs for operations staff at $244 per workstation per month. However, IDC believes these staffing costs are likely to rise during the next two years as the LAN-based applications mature and require reworking.
- Users — even IT professionals — generally lack experience with networked enterprise topologies. The logistics of distributing new software, software updates, physical and electronic support services, and hardware in a networked enterprise are viewed as a major barrier to success. As a result, few users are taking full advantage of the possible benefits of complex, distributed processing.
- The application set on LANs tends to be less-sophisticated than those on minicomputers. Development resources available for minicom-

valuating Networked Enterprises

cation Business Systems

puters often are considerably more sophisticated that those available for LANs. In response to rapid changes in business environments, we believe that many LAN-based applications in networked enterprises will require significant reworking in the 1993-1995 time frame as the environments move from support roles (i.e. file, print, and electronic mail servers) to full-fledged production applications (OLTP, database, accounting, and data analysis) computers.

- The IBM AS/400, sometimes mistaken as a premium-priced product, emerges as the lowest cost-to-use system in complex, networked, enterprise-wide processing environments.

The IT industry is currently investing heavily in distributed computing — and rightly so. Distributing processing power while retaining overall cohesiveness is an outstanding strategy for achieving the most-pressing objectives facing IT professionals today: organizational effectiveness, better return on IT investments, increased productivity, and more-rapid exploitation of new technologies.

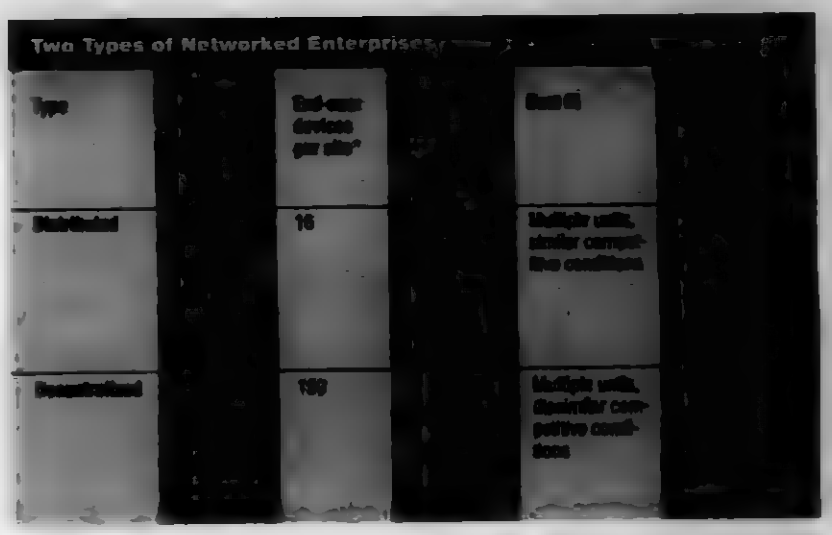
However, distributed processing is associated with significant complexity and uncertainty. Making the right decision requires higher quality, more-relevant information.

Conclusions

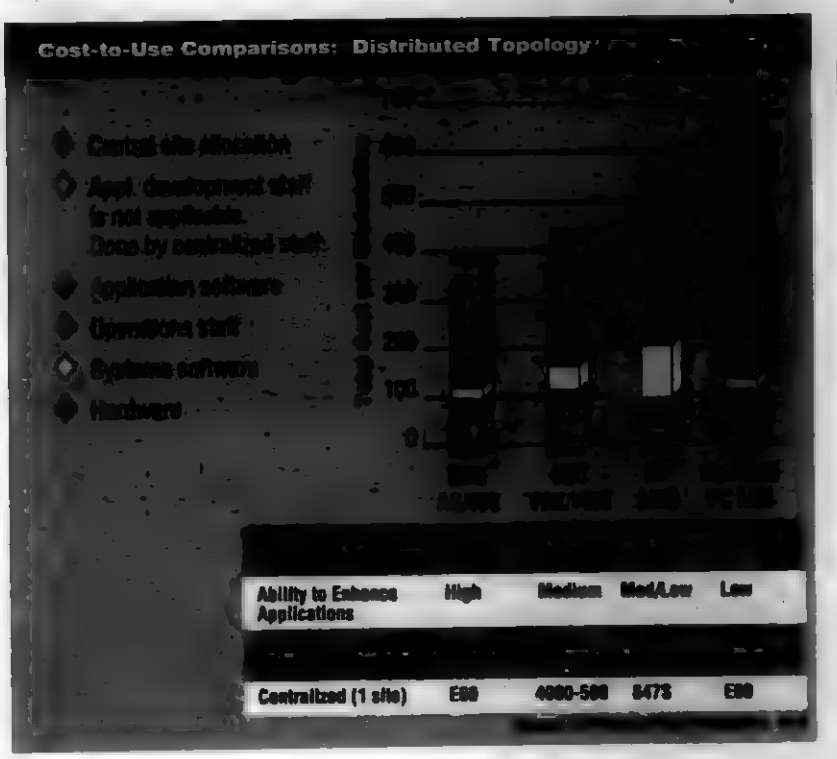
The information technology market is a very-complex place to shop. An expanding variety of hardware, software, and communications technologies, most associated with individual functional capabilities — that offer unique benefits — is being marketed by IT vendors to prospective and current customers. IT professionals demand better sources, quality and types of information to help them make the right decisions when planning purchases in this market.

Popular benchmark metrics such as TPC-A are specialized indicators of application performance (e.g. OLTP). As systems topologies get more complex, the appropriateness of this benchmark decreases dramatically. But TPC-C and the forthcoming TPC-D and TPC-E benchmarks will provide significant advances.

Users are exploring more-complex topologies as they attempt to support more-complex business strategies.



** Site size and end-user populations based on survey data. These qualities are used as the basis for all distributed and ecentralized analysis Source: International Data Corporation, 1993.*



The distributed enterprise and the decentralized enterprise, although more complex relative to traditional host-based, fully centralized configurations, are especially attractive to many companies. Comprehending options in these more complex setting, however, requires special costing tools.

IDC applied its Cost-to-Use model to help users better understand trade-offs between alternatives. From our research, the following conclusions emerged:

- Overall costs-to-use in networked enterprise are very dependent on staffing levels. Superior systems-software services allows users to minimize staffing levels at remote sites without also minimizing IT support and responsiveness.
- IBM's AS/400 and Digital's VAX VMS systems, largely because of their advanced system-software capabilities, are more attractive alternatives to LANs in sophisticated, networked OLTP enterprises. Moreover, our research indicates that IBM's AS/400's cost to use is superior even to Digital's VAX VMS offerings.
- The Hewlett Packard 9000 offers excellent pricing at the hardware level. It is being positioned to attack costs of complex topologies and staffing issues. Its vulnerabilities are in applications software and system software in distributed topologies. In decentralized topologies, HP displays a lack of sophistication in system- and network-management tools relative to IBM and DEC.
- As customers gain more experience with complex, networked enterprise topologies, they will (1) become more familiar with the logistics and politics of choosing, implementing and managing complex topologies, and (2) they will deploy these complex topologies more often.

Although we feel that the functionality of UNIX and LAN alternatives will increase over time, customers looking to take advantage of the benefits of networked enterprise topologies should strongly consider more integrated alternatives.

- Many users with LAN-based, decentralized enterprise topologies will be forced to chose between continued reliance on aging, less-sophisticated applications — and the potential competitive disadvantages implied by that choice — or greater staffing costs to rework and maintain their code base. We feel that they will have to choose more staff, despite the added costs, if they retain these topologies.

For a copy of the complete report, "Cost-to-Use of Midrange and PC LAN Systems in the Networked Enterprise," call 1-800-765-0119.

Valley of dearth

At a gathering of SAS Institute users at the company's Cary, N.C., campus last week, the talk was all about client/server. At one point, a SAS saleswoman pointedly asked me, "What is it about the press and client/server? Our customers get all whipped up over this stuff from reading trade journals, and then we have to go in there and tell them how difficult moving to client/server really is."

To quote *Saturday Night Live*'s Mr. Bill: "Oh, nooooo!" I certainly hope we're not guilty of contributing to any happy talk over this most difficult of technology challenges.

But the woman has a point. Users are being sold a bill of goods on client/server, not just by members of the press but by a clutch of consultants, newsletter publishers, market researchers and vendors — *lots* of vendors — whose shortsighted view of client/server's complexity stops roughly at the user's credenza.

Too much attention has been focused on short-term hardware savings and not enough on the cost of people and lack of features. Yes, client/server does let you replace expensive, proprietary computers with cheap, mass-produced ones. But that's about all that's cheap about it. Users on the western front of the client/server wars report the headaches and support costs imposed by unreliable networks, toy operating systems and nonexistent system management tools more than offset the cheaper chips.

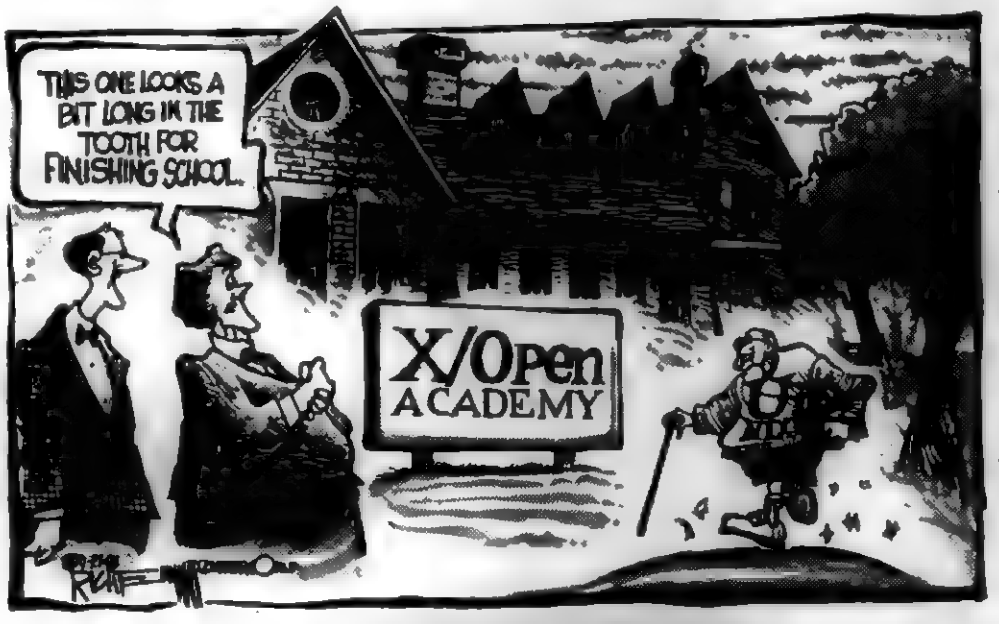
The tough nut about client/server development isn't the client; it's the server. While lots of impressive client/server management and utility products currently exist in press release form, I have yet to meet a user who'll say that these technologies can hold a candle to what's been available on a VAX or a 370 for years. How can they? A distributed network with six potential points of failure is a lot tougher to manage than a host/terminal network with two. As Xerox PARC alumnus Butler Lampson once said, "A distributed system is one in which I can't get my work done because a computer has failed that I've never even heard of." Complexity is the nature of the beast, and we'll just have to live with that.

Ditto for database management, security, backup and recovery, program development and more. Those are boring issues relative to the merits of Visual Basic or SQL Windows, but they're the issues stubbing the toes of IS organizations around the country right now.

That said, why should IS organizations continue to charge ahead into this valley of dearth? Because client/server makes so much sense for business reasons. Flexibility is what client/server is all about. While the short-term costs of a client/server project will almost certainly be higher than a mainframe approach, the long-term savings from greatly reduced training, support and infrastructure upgrade costs will more than make up the difference.

Sorry if we or any of our brethren have made this stuff sound easy. It isn't. But it is the future. Of that there can be no doubt.

Paul Gillin, *Editor*



Notes price is fair, but rework model

Recently I was quoted advocating that Lotus release a much cheaper runtime version of Notes to increase market penetration [CW, Aug. 16]. I want to point out that I think that Notes is worth every penny Lotus charges, and that, given the vast resources Lotus has spent developing it, the price it charges is more than fair.

However, Notes, like the telephone, E-mail or fax machine, increases in value proportionately to the number of users, and I fear it will lose a chance to become the de facto standard by using an economic model that works better for refrigerators than for software. I still believe it would be better for companies to have pricing that encourages them to install Notes on every desktop as soon as possible.

Carolyn Coughlin Weissberg
Genencor International
San Francisco

Frustrating curve

It's understandable why Tim Lynch states that object-oriented technology is easy to grasp in "Object orientation isn't salvation" [CW, Sept. 6]: He hasn't grasped it. Open your eyes to the millions of lines of C code being written in C++, to the unused copies of SmallTalk, to the data flow diagrams being drawn with OOA notation, and you'll see a steep learning curve and many frustrated developers. Object technology *is* more complex and *is* different, and to pooh-pooh the learning curve is to negate the honest efforts of thousands of professionals exploring and applying this new technology.

Reading a book, taking a class and playing around with a visual development tool doesn't qualify you to estimate the effort required to grasp object technology. Please, until you've climbed the mountain, don't tell others how short and flat it is.

G.K. Khalsa
San Diego

Got it; get it?

Your article on the Newton Toolkit [CW, Aug. 23] omitted a key fact that probably led readers to an erroneous conclusion.

The article states that the Newton Toolkit is "scheduled for imminent release." While this is correct relative to the production version, Apple has been distributing the Newton Toolkit beta version since the first week of August. I acquired one on Aug. 5.

T.R. Unkefer
LTV Steel Co.
Cleveland

Try out a new spin

In "Where's CASE when we need it?" [CW, Aug. 23], John Gantz points out a major weakness of most visual development tools: maintenance. I find little to argue with about this. The problem is that each element must interact, creating an invisible cascade effect whenever a major design change is required.

I disagree with Gantz's final conclusion that applications developed with these tools will "crash and burn" two years later. He might have just been making a philosophical point, but it seems more likely he missed the paradigm bus. By applying a different spin to the application life cycle we can turn a maintenance weakness into another advantage!

When a prototype *is* the application, there is never any need for major refinement or maintenance.

But what are we doing instead of maintenance? Why, all the stuff we gave lip service to but never had time for: developing an enterprise data model, documentation, user support, training, business needs analysis, strategic planning, evaluating products, developing marginal needs systems, building test suites....

I have seen the future and it was a *visual* experience.

Jack William Bell
Computer analyst/programmer
Lacey, Wash.

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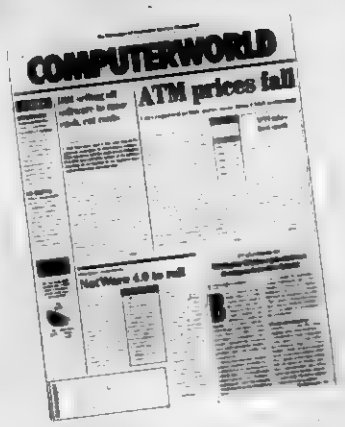

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The toppling of an American icon

Joanne Kelleher

Remember that phrase, "Nobody ever got fired for buying IBM?" Sure you do. You probably even used it, although you're too smart to admit it now. These days people *do* get fired for buying in the reflexive, no-questions-asked way that gave rise to the motto.

What became of all the true-blue IS executives who followed IBM down one dead end too many isn't much explored in Paul Carroll's book, "Big Blues: The Unmaking of IBM." But those dead ends are, as are the organizational flaws that helped to topple a once seemingly unbeatable competitor.

Carroll, a *Wall Street Journal* reporter who covered the IBM beat, calls what happened to IBM "a sort of Greek tragedy," and that image certainly fits. But so does another that's not quite so classical: Picture a winter night in the North Atlantic and a massive ship, reported to be "unsinkable," ploughing confidently through icy waters. One of the worst mistakes any company can make is believing its own PR, but IBM believed it with a vengeance.

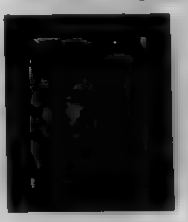
IBM was convinced the market would always wait to see what it had to offer, even after missing multiple opportunities and receiving clear signals that customers were more interested in price tags than initials. It also insisted that it knew the best way to write software — scattering pieces of a project to a half dozen or so overstaffed teams around the world, virtually ensuring the resulting product would be both late *and* poorly focused.

Every once in a while, a particularly strong personality or unusual set of circumstances would allow a skunk-works operation thrive long enough to pull together an excellent product. But then, even if marketing resistance or political infighting didn't kill it off and the product actually succeeded, it was chalked up as an anomaly, and it was business as usual the next time around.

There aren't many out-and-out villains in this saga, at least of the human variety. The real villain was a system of management that was allowed to thrive for so long it took on life and power of its own. Anyone who wonders, for example, why John Akers didn't move faster, should read the section detailing negotiations to sell the Lexington, Ky., printer division. Akers had to personally intervene more than once to save that deal, and even then, the system, which gave everyone veto power, nearly killed it in the 11th hour.

That was one action regarding one division. Consider the size and scope of the changes required to remake IBM for the times, and then try the math on how long it would have taken without the shock of that $5 billion loss.

There were so many chances for different endings, so many "if onlys" along the way that it's hard not to label what happened willful self-destruction. If only IBM had grabbed the exclusive marketing rights to 1-2-3 that Mitch Kapor offered. If only Bill Lowe negotiated a better deal with Bill Gates in 1985. If only IBM had backed some of its own key research instead of letting others take the risks and the rewards.



This is, as Carroll says, a very sad story.

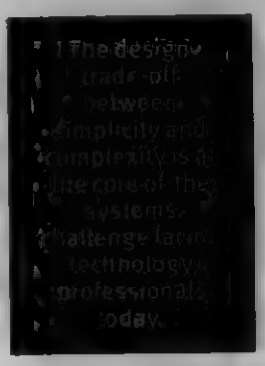
Kelleher is *Computerworld*'s features editor.

No frills, fewer tangles

COUNTER INFORMATION *by* Michael Schrage

With growing disbelief, I watched a Delta gate agent key in the details of my (completely standard) upgrade. *Click*... *click*... *click*... I lost count somewhere after the 35th keystroke. *Click*... *click*... *click*... It was painful.

Less than a week later, I flew Southwest Airlines for the first time. No upgrades, no boarding passes, no *click*... *click*... *click*. Instead, you're handed an ugly, numbered and color-coded piece of plastic in the shape of California in the order you arrive at the gate, and you board accordingly. Southwest CEO Herb Kelleher swears no-frills ticketing saves his airline millions, is environmentally correct and lets him turn his planes around in half the time it takes American Airlines to do the same. That means more flights per plane per day. That, of course, means more money. For the moment, Southwest is making money. Most U.S. airlines are not.



Sure, Southwest uses computers. Who doesn't? But compared with a Delta, United, TWA or, especially American Airlines, Southwest is an unabashed technological moron. That's not by accident; that's by design.

Southwest's design priority is to create and manage simplicity. Delta's priority is managing complexity. The distinction is crucial. There's a world of difference between viewing computers as a medium to create simplicity and viewing them as the best way to soak up more complexity. Keeping things simple poses a radically different design challenge than trying to manage complexity. Simplicity architectures just don't look like complexity architectures. Think of it as the difference between designing RISC and CISC processors.

This design trade-off between simplicity/complexity is at the core of the systems challenge facing technology professionals today. Does "working smarter" in the 1990s mean making tasks inherently simpler and easier? Or does it mean giving individuals and enterprises the computational tools to better manage increased complexity?

Corporate America is split on this issue. General Electric's Jack Welch vehemently argues that most businesses are too complicated. KISS — Keep It Simple, Stupid — is GE's credo. To Welch, it's clear that complexity is the sworn enemy of cost-effectiveness. In contrast, business gurus from Drucker to Senge to McKinsey & Co. maintain that organizations can't avoid complexity; they have to have the courage, creativity and consistency to manage it. Amoebas don't eat sharks. It takes complex systems to solve complex problems and exploit complex opportunities.

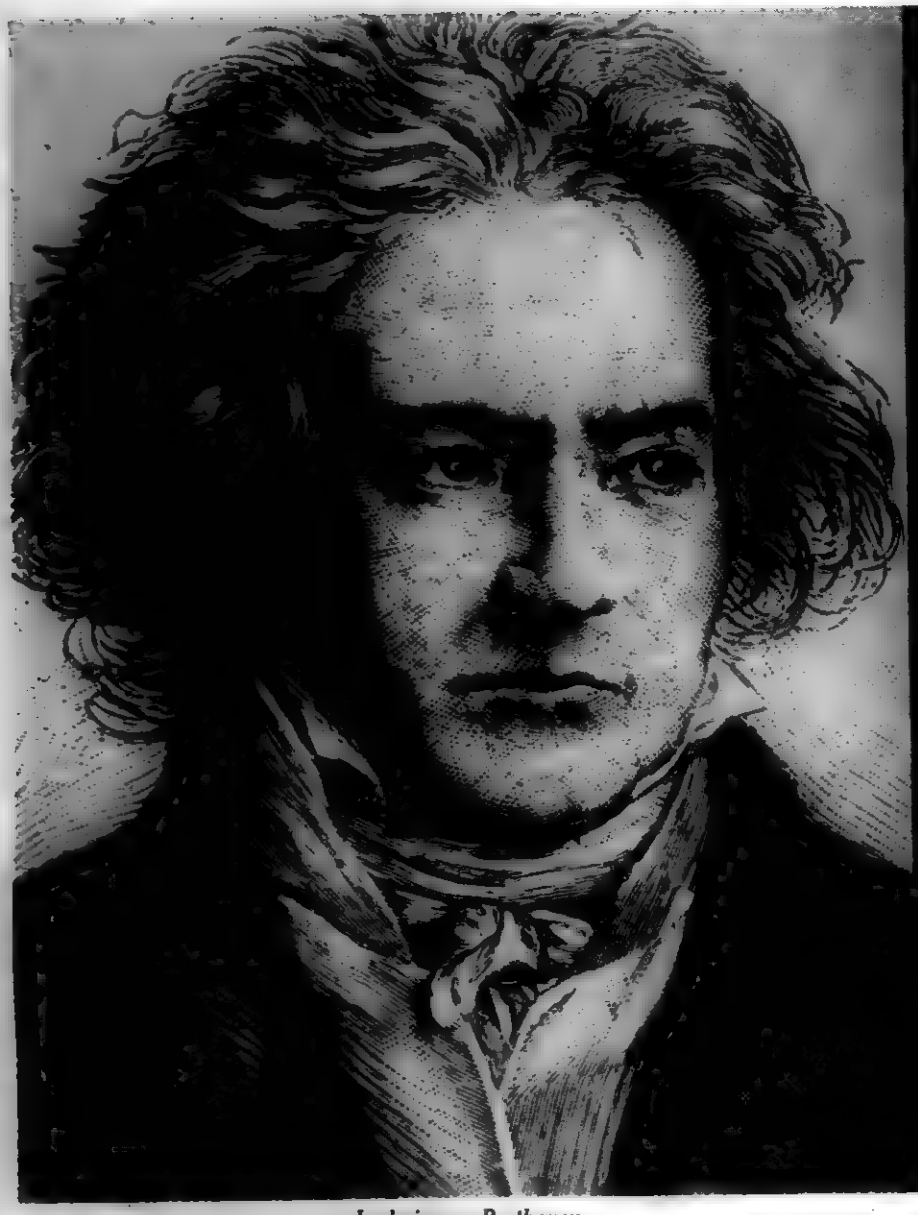
For the most part, software designers have opted to design for complexity. Graphical user interfaces are used to prettify access to complex lumps of data. Query languages and neat data structures artfully conceal complexity. We rarely focus on the underlying complexity because we're getting so much better at cheating with the interfaces. Often, we use software to mirror external complexity because we can, rather than because we should. That often leads to diminishing returns.

There's an awful lot of hoopla today about "re-engineering" corporations and their systems. That would be encouraging if removing excess complexity were part of what's driving the movement. It isn't, though. Re-engineering is all about cutting costs. We're just so conditioned to the idea that value comes from additional functionality, that most organizations honestly believe they can't afford to stay simple in an increasingly complex world.

The sad truth is that most CIOs have gotten into the fixes they're in by promising to tame complexity. Perhaps they'd be better off if they emulated Southwest and used technology as a bridge to The New Simplicity.

Schrage is a fellow at the MIT Sloan School Center for Coordination Science and the MIT Media Lab. His Internet address is schrage@media-lab.media.mit.edu.

Imagine they're software.



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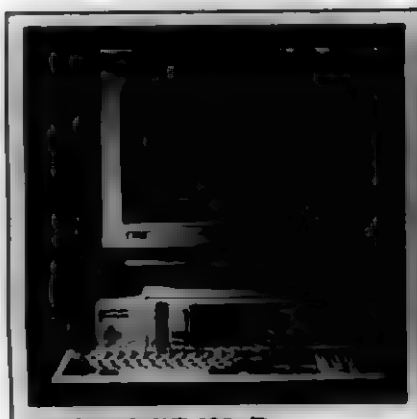

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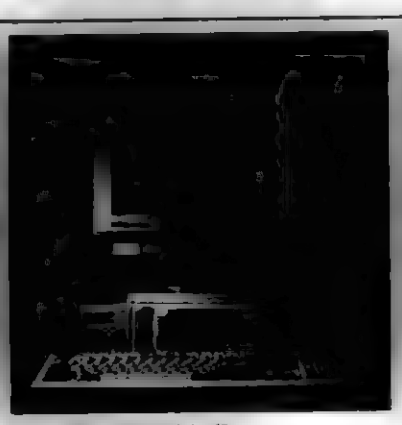

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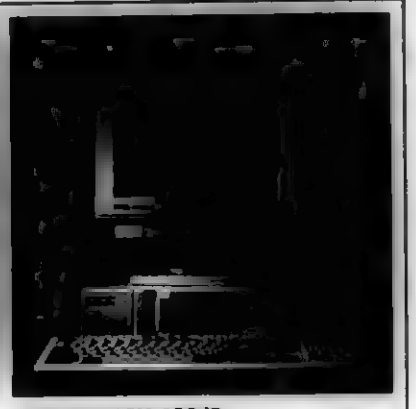

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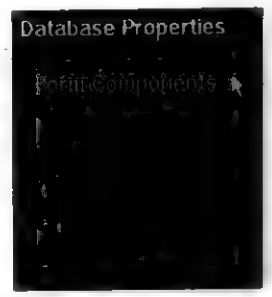

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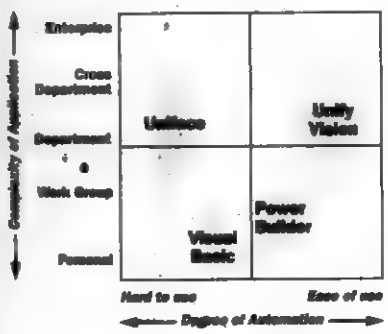

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Compaq hopes combo portable strikes chord

By Michael Fitzgerald
HOUSTON

Compaq Computer Corp. is counting on its recently released Concerto pen and keyboard portable PC as the company treads into new territory.

Besides allowing a pen and keyboard to be used in concert, Concerto represents many firsts for the company. It is Compaq's first effort with pen input, the first Compaq product to support the PCMCIA standard and the first effort to bundle Compaq-specific software with a portable.

Trying to avoid the stigma of pen computing and comparisons with Grid Systems Corp.'s Convertible, Compaq is billing Concerto as a notebook that happens to have pen capabilities. It does, in fact, look like a pen-based system with an attachable keyboard.

"I consider it a convertible because it combines pen and keyboard," said John Fell, PC LAN specialist for sales systems at the Moore Business Forms and Systems Division of Toronto's Moore Corp.

Fell said he currently has 30 Grid Convertibles in the field and is testing Concerto as a 486-based replacement for those systems.

Eye-catching setup

Whatever it is, Concerto will at least draw some looks. Its detachable keyboard sits at a desktop-like 10 degree angle when in notebook format. A handle attached to the screen props up the display and allows for easy adjustment of the display angle.

The pen, besides acting like a pen, also replaces the mouse.

Compaq's Concerto

Processor: 25-MHz or 33-MHz 486SX.
Weight: 6½ pounds, 5.2 without the keyboard.
Hard file: 120M-byte or 200M-byte.
Slots: One Type III PCMCIA; pen interface.
Battery life: Three to four hours.
Bundled software: Windows for Pen Computing, Ink Development's NoteTaker, Slate's PenPower for Excel.
Base price: $2,499.

Fell said the pen is a plus for his users. "For our sales automation project, we need the flexibility of having full keyboard capability but want to use the pen for some situations," Fell said.

Late entry

Compaq's use of the PCMCIA standard brings the company in line with portable computing's major players. Compaq has attempted to make up for its tardiness in implementing the standard by building in a utility that posts information on whatever PCMCIA card is in use.

The utility will turn off power to the power-hungry cards when they are not in use. A Compaq official said this could save as much as 30% of the battery life.

Included with Concerto is DOS 6.0, as well as Microsoft Corp.'s Windows for Pen Computing, Ink Development Corp.'s NoteTaker memo program and Slate Corp.'s PenPower for Excel, a new utility that makes Microsoft's Excel spreadsheet program work exclusively with the pen. The Ink and Slate products were developed with some input from Compaq. The products will sell on retail shelves and for the first year Compaq will be the only hardware vendor that can bundle them.

While Compaq bills Concerto as a notebook, Compaq executives were quick to say that future products in its flagship LTE Lite notebook line will not have the same feature set as Concerto.

Separately, Compaq cut prices on its LTE Lite family by up to 18%. A base model LTE Lite 4/25 now costs $2,199 with a 120M-byte hard drive.

Quattro Pro for Windows excels despite learning challenges

By Garry Ray

It is hard to imagine that a full-featured, competitive spreadsheet could be had for a paltry $50. But Borland International, Inc. in Scotts Valley, Calif., has pulled it off once again with Quattro Pro 5.0 for Windows.

PRODUCT test QUATTRO PRO

The company, which rose to acclaim a decade ago with its dirt cheap Pascal compilers, is known for stuffing tons of features into low-cost packages. Witness its series of under-$100 databases, Pascal and C++ compilers, debuggers and other technically advanced software tools. With all that technical backing, it should come as no surprise that Quattro Pro 5.0 includes the same polished advancements as other Borland products. But polished does not necessarily mean perfect, and some design issues in Quattro Pro 5.0 could stand improvement.

Feature-rich

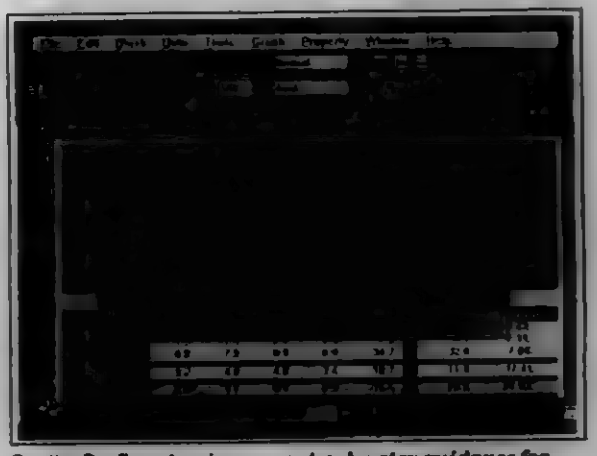
On the plus side, Quattro Pro 5.0 is a power-packed Windows spreadsheet that includes just about every conceivable analytic and presentation feature users might want. Of course, the spreadsheet includes the standard array of @ functions (more than 360, according to Quattro Pro documentation) and macro commands, along with the standard font, styling and presentation capabilities conferred by Windows. However, these obligatory spreadsheet features are bolstered by additions such as data modeling tools similar to Lotus Development Corp.'s Improv; "experts" that automate activities such as charting and spreadsheet consolidation; and on-line, interactive tutorials.

A $495.95 version of the spreadsheet (dubbed the Workgroup Edition) permits data sharing through LANs and telecommunications networks.

With all these new features, Quattro Pro for Windows presents a formidable learning challenge even to experienced spreadsheet users. Some of this is eased with a series of on-line, interactive lessons called SpeedTutors that are targeted at new spreadsheet users. But with topics such as "Entering numbers" and "Moving a block," these are far too basic to cover the complex questions experienced users might ask. There is no similar coverage for the sophisticated data modeling tool, the scenario manager or for most complex spreadsheet questions.

Another learning aid is the set of Quattro Pro Experts, which provide step-by-step guidance for creating graphics, building scenarios, consolidating worksheets, compiling formulas and building statistical analyses. The Experts ask a series of questions and ultimately produce the desired result. These will be of use to both novice and advanced users.

Like all contemporary spreadsheets, the Quattro Pro feature list is extensive. Matching its primary competitors — Lotus' 1-2-3 for Windows and Microsoft Corp.'s Excel — Quattro Pro also includes a graphical draw layer with a complement of drawing tools, drag-and-drop of selected spreadsheet blocks, automatic block formatting and an automatic chart building feature.



Quattro Pro Experts *give users step-by-step guidance for creating graphics and performing other functions*

On-line Inspector

Block and cell operations are augmented by Borland's Object Inspector, which is invoked with the right mouse button. The Object Inspector provides access to a variety of operations according to the type of object being examined.

For example, the Object Inspector presents a pull-down menu to allow formatting, charting or editing operations if a block of cells is "inspected." If a notebook tab is selected, the Object Inspector will provide a menu of changes that can be made to notebook characteristics such as protection, spreadsheet grids and default numeric formats.

Those who customize spreadsheets for others will appreciate the array of tools to create menus, macros and custom SpeedBars (Borland's equivalent of Lotus' 1-2-3 SmartIcons). The macro creation tool allows keystroke capture and editing, and macros can be linked to spreadsheet "buttons" for point-and-click macro execution.

While it is difficult to criticize any product that delivers the range of features and functions found in Quattro Pro for Windows, users might be surprised by the number of "hidden" features they must unearth to use the spreadsheet to its fullest potential.

For example, we were becoming concerned about the time needed to "grab" a selected block for movement to another section of the spreadsheet. It was only in a passing reference in the documentation that we discovered that "delay time" can be adjusted using one of the Object Inspectors.

In operation, Quattro Pro 5.0 was rela-

Quattro Pro, *page 42*

Macintosh users get ready for Unix

By James Daly

It is never too early to plan for what is coming around the next technological bend, and for a lot of Apple Computer, Inc. Macintosh users these days that means Unix.

By the middle of next year, the Apple/IBM technological alliance will unveil one of its bedrock technologies: PowerOpen, a next-generation Unix. Though it sometimes gets lost in all the noise about Taligent and PowerPC, PowerOpen will likely be just as important.

Many users reportedly hope the Macintosh's traditional ease of use will make it easy for users to embrace Unix. Although Unix offers tremendous flexibility to skilled practitioners, its technical intricacies have scared potential users.

"The complexity of Unix can be quite daunting," said Robert Keim, director of information, management and system technology at the College of Business at Arizona State University in Tempe.

Unix difficulties

Apple has had a Unix offering since 1989, when it introduced A/UX. The problem with A/UX, however, is that like most Unix versions it is not immediately intuitive. Thus, its user base has mostly been limited to the scientific and academic user communities.

By weeding out those technical challenges — and adding many more applications to the existing A/UX software base — PowerOpen could help change those demographics, initiating a rapid growth of Unix in corporate Macintosh shops. The MacIS user group even plans a special session to discuss PowerOpen at its November conference in Orlando, Fla. Some users said they also plan to develop training classes during the next few months to acclimate users to Unix.

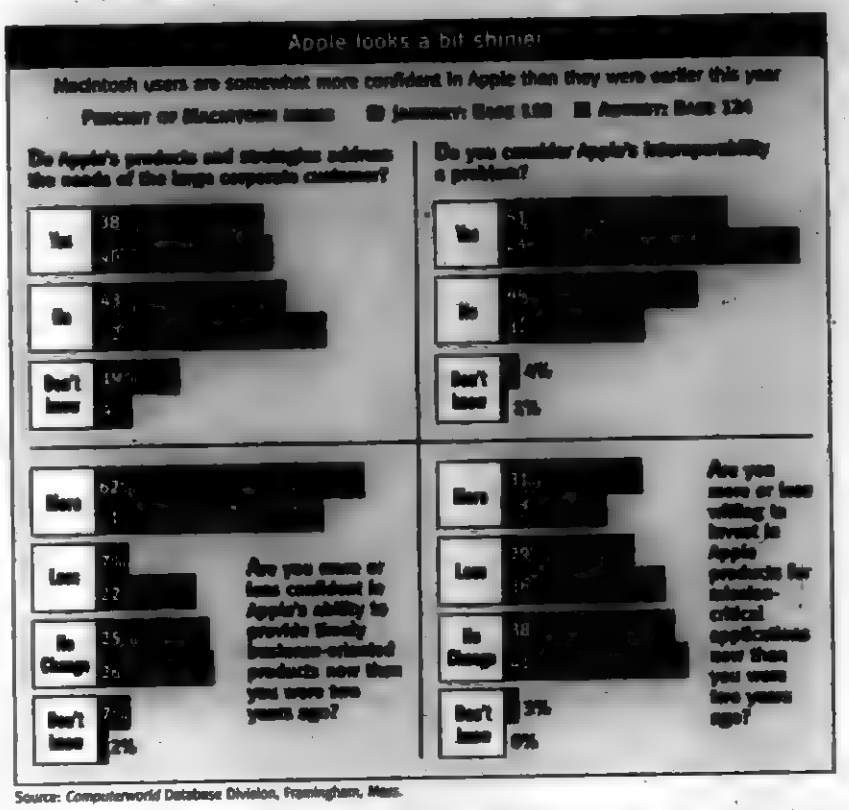
"We have high hopes for PowerOpen," said James Yip, who supervises more than 3,000 Macintoshes as a manager of technical services at Ernst & Young in Toronto. Yip said his organization brought in 30 Apple Workgroup Server 95s early this month, giving many users their first taste of Unix. "If [PowerOpen] works, it will insulate users from the complexity of Unix, while still giving [them] access to its power," Yip said.

PowerOpen will be based on IBM AIX 4.1 but will also encompass elements of A/UX. Users will need a machine running a PowerPC chip to take advantage of PowerOpen. Apple and IBM officials have also promised backward compatibility for A/UX and AIX applications.

PowerOpen is enjoying wide support in the industry, with more than 100 players such as Thomson SA, Bull HN Information Systems, Inc. and Harris Corp. committed to shipping PowerOpen-compliant systems.

PowerOpen will also ship with a widespread application base: More than 12,000 existing AIX applications and thousands more A/UX applications will reportedly run on the platform.

The PowerOpen specification is still under development and should be completed by the first quarter of next year, according to Pat Ricuitis, vice president of marketing at the PowerOpen Association in Burlington, Mass. Full availability of PowerOpen is expected by next June.



Source: Computerworld Database Division, Framingham, Mass.

What's next

Apple also has other irons in the Unix fire. At its developer's conference in May, Apple announced that it is cooperating with IBM, Sun Microsystems, Inc., Hewlett-Packard Co. and Unix System Laboratories, Inc. to put the Macintosh user interface on machines running Unix. The payoff would be that programs written for the Macintosh would be able to run, unchanged, on Unix workstations.

Specifics were hazy: No time frame was announced, nor were Apple officials certain whether users would require two sets of tools to build front-end services for Macintosh and Unix applications.

Some analysts said this approach could backfire, particularly with companies that have many Unix machines in place.

"It's a strategy that could actually blow up in Apple's face if it's not careful," said Tim Harmon, program director for desktop computing strategies at Meta Group, Inc. in Westport, Conn. "Why pay for a Macintosh when you can get a much cheaper Unix box with a Mac interface?"

Harmon said that while a Macintosh designed for Unix might cost $2,000 or more, a Brand X workstation could undercut that price by $500 or more.

Still, many users said they think Unix is going to be a big part of the Macintosh's future. "You have to look out three to six years," Keim said. "And I think you'll see that PowerOpen will be a key part of many corporate Mac shops."

Quattro Pro

CONTINUED FROM PAGE 41

tively speedy and on par with 1-2-3 Release 4.0 for Windows. But users might bristle at the nearly 16M bytes of disk space required for program installation. Granted, that space delivers a lot of features. But users are advised to run Quattro Pro using the Windows SmartDrive disk cache because on our system the program was constantly swapping program modules to and from the disk.

The flip side of Borland's vaunted object-oriented technology is that you will need plenty of hardware resources to use it to its fullest.

In all, Quattro Pro 5.0 for Windows delivers the sort of features and performance for which Borland is recognized. Certainly, there are more than enough features to keep Quattro Pro in the spreadsheet competition with Lotus and Microsoft. But as always, this new version of Quattro Pro also offers enough enhancements and added features to prove that Borland still knows how to up the ante.

Compaq tries for bite of Newton pie

By Michael Fitzgerald

HOUSTON

Compaq Computer Corp. said it would use a little help from its friends to build its answer to Apple Computer, Inc.'s Newton personal digital assistant.

Accordingly, Compaq, Microsoft Corp., Intel Corp. and VLSI Technology, Inc. have announced a cooperative effort to develop Mobile Companion, a new handheld device that will use a new operating system from Microsoft and a new chip set co-designed by Intel and VLSI. The firms have not, however, committed to when the handheld device will be delivered.

The partnership will take a significantly different tack from Newton, one analyst said. Newton "is for taking down new data and transferring it to the desktop, while Mobile Companion is a way to manipulate data already on desktops and LANs," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Microsoft's operating system is At Work for Mobile Companions. Code-named WinPad, it was recently licensed by Toshiba Corp. and also ties in to Microsoft's strategy for putting the Windows interface on office equipment.

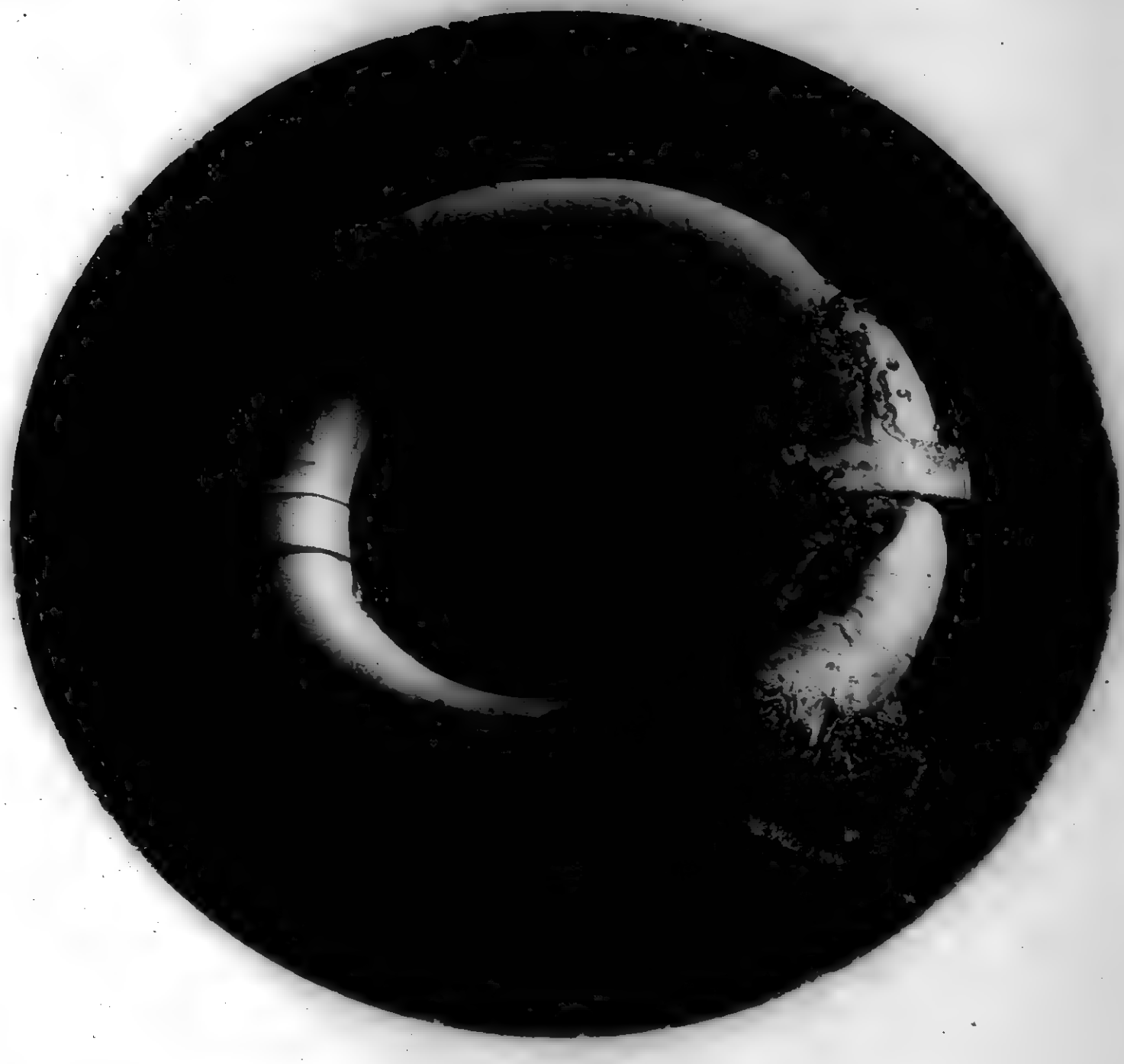
At Work will maintain compatibility with Windows through a subset of the Windows application programming interface, but it will be different from Windows, said Steve Ballmer, Microsoft's senior vice president of sales. For instance, "the current user interface with overlapping windows is probably not appropriate" for At Work, Ballmer said.

Also, while At Work can communicate with current Windows applications, it will not be able to run them, he added. The operating system will be burned into read-only memory to cut down on battery use and eliminate the need for drives to store it.

Microsoft is scheduled to deliver a preliminary software developer's kit this week at its developer's conference, according to Bjorn Hovstadius, group product manager of handheld systems at Microsoft.

The Intel/VLSI chip effort came to light last week when the companies unveiled the Polar chip set, a version of Intel's 80386SL with more functionality integrated on-board the chip.

Compaq did not say when it would ship its Mobile Companion, nor was it clear whether Compaq would be the first to ship one. Officials from the four firms said they were attempting to create momentum behind a standard that would make it easier to build and bring these types of devices to market.



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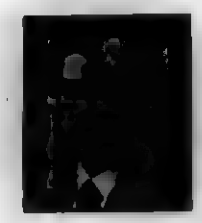
W. D. Riley

Where are my color notebooks?!



It's time for the big computer manufacturers to put up or shut up, and they can start with color notebooks.

It's been about a year since the active-matrix color notebook computer was introduced, and I suspect the only way you can get one involves a disembodied voice whispering "psst" from an alley.

Product introductions used to be simple from the buyer's point of view. Someone invented something, produced it, advertised it and sold it. This system worked pretty well, but stand by, because it seems the computer industry, already known for its "guess your shipping date" attitude, has a few changes in mind. Apparently, vendors think the way the process should work is that you invent something, advertise it, preselI it and then scramble around for enough parts to put a few together. Sadly, computer buyers are sitting on their hands and simply accepting this egregious behavior when they ought to be protesting loudly and switching computer companies.

There can be no finer example of this nonsense than IBM and Compaq and the color notebook fiasco. Forget the minor ProLinea shortage, a foreseeable mistake that probably sent many Compaq customers screaming into the night. And forget the yearly shortages that plague our industry, jack up prices (big surprise) and slow down deliveries.

This time it's personal.

As simple as this problem seems, it is apparently beyond the control of these two companies. While Compaq and IBM supposedly produce their own notebooks, they rely on outside sources for the most critical part of the box — the color monitor.

Wildly anticipated

While the creation of the 486 notebook wasn't exactly a feat of engineering derring-do, the active-matrix monitor was pretty heady stuff. For the first time since the beginning of the computer revolution, the portable computer user would have a fast machine *and* a great monitor. Early reports had it looking better than the equivalent full-size VGA monitor, and while that may be stretching the facts a little, it was much better than anything that had preceded it.

To the mobile user, it was the dream desktop replacement. All Compaq and IBM had to do was get the thing to market. The rest would have taken care of itself.

But somehow these wise and powerful companies didn't see the shortage coming. If the facts are any witness, no one had the foresight to ask the people making the monitor one simple question: "Just how many of these things can you guys make?"

Disasters such as factories burning down aside, this kind of thing is just inexcusable. I have my own problems. As a corporate buyer, I base long-range decisions on incoming equipment. Projects are defined, people are shifted and software is ordered on the assumption that the equipment will arrive on time. Furthermore, I have clients who have waited patiently for months now, and I have to tell them there are still no color portables in sight.

This fumble, following the ProLinea shortage from Compaq and IBM's inability to deliver its ValuePoint products, will cause me to take a closer look at Dell, Gateway and other manufacturers with more foresight.

Somebody should have seen this one coming.

Riley is microcomputer support manager at the City of Hope National Medical Center in Duarte, Calif.

Conner broadens storage strategy

By Stephen P. Klett Jr.

Conner Peripherals, Inc. in San Jose, Calif., recently unveiled a marketing strategy and product set aimed at bringing the company back into the black after a series of quarterly losses.

Conner's "Storage Solutions Initiative" targets four markets and customer classes: entry, value, performance and portable. New and refreshed products range from disk drives to hierarchical storage management systems with capacities and price points specific to each segment. These products will gradually phase out Conner's current product set.

"Right now we have too much supply for our current demand," said Chief Executive Officer Finis Conner. "Couple this with the transition occurring from low-capacity to high-capacity drives and the PC price wars and you have all the condiments for a tough situation. This strategy marks an attempt to rid ourselves of products that are stuck in price free falls."

Beyond disk drives

The initiative is an extension of Conner's announcement in June 1992 that it would extend its business to become more than a disk drive manufacturer. The move into the tape and software markets was fueled by its December acquisition of Archive Corp.

"If you are just in any one of these markets — given the present level of competition — you end up selling your product by the pound," said George Rea, executive vice president at Conner's Storage Systems Group. "It's a deadly strategy to continue selling along one product line."

This appears to be the case for Conner, which posted losses of $22.5 million and $58.8 million for the first and second quarters, respectively, and has projected a loss for the third quarter as well.

CEO Finis Conner: *Strategy is an attempt to get rid of products stuck in price free falls*

Analysts said the initiative shows that Conner — once the fastest growing disk drive manufacturer in the U.S. — has realized that its heyday in the disk drive market has ended and that it has to find other avenues for growth.

"They're in a tough hole to get out of," said Phil Devin, a senior industry analyst at Dataquest, Inc. in San Jose, Calif. Devin said he believed Conner had chosen the proper path to return to profitability but added it would be a slow climb. "They have all the resources in place, but the question remains as to how soon they can deliver the new products in quantity."

Conner acknowledged that the company can no longer count on growth in disk drives sales and that tape now represents Conner's largest market opportunity for the future. While Conner said only 5% of PCs shipped last year had a tape drive added after market, he expects this to jump to 20% during the next couple of years and believes this initiative positions Conner to take advantage of this growth.

The new strategy "helps us turn things around quicker for our customers," said Felix Lomangino, principal at Computer Partners, a disaster avoidance and recovery company in Mobile, Ala. "It solves the logistic problem of having to figure out who's got what where."

Lomangino said he believed Conner's strategy to focus on the tape market was sound. "We've seen demand for tape products really escalate, which is driven by hard drive media. It's very hard to back up 500M-byte drives on floppies; people are very open to tape for backup and recovery solutions."

Burstless data transfer optimal for audio/video

By Ellis Booker

Hoping to satisfy the rising interest in multimedia, disk drive maker Micropolis Corp. in Chatsworth, Calif., last week introduced a line of what analysts said are the first magnetic drives designed specifically for digital audio/video applications.

The 3½-in. 2200 AV Series drives, which offer storage of 1.05G and 1.76G bytes, have been optimized to deliver data in long, sequential blocks.

Standard drives transfer data in bursts, which, while suitable for data processing applications, can cause trouble for digital video applications that require a minimum sustained data transfer rate of about 3M byte/sec.

Micropolis uses the latest SCSI technology to achieve a maximum sustained and uninterupted data rate of 2.9M byte/sec.

Micropolis claimed that its new drives will save users the expense of extra hardware, software and RAM cache buffers, which today compensate for delays in transferring digital video streams off magnetic media. "We believe getting the tools right is half the battle," said David Guo, Micropolis marketing manager.

In the lead

Bob Katzive, vice president of Disk/Trend, Inc., a research firm in Mountain View, Calif., noted that some optical disc drive makers have attempted similar firmware changes to their products. "But I believe Micropolis is the first with a complete effort for a magnetic drive," he said.

Katzive said he is not sure, however, whether other makers of high-capacity drives will follow Micropolis' lead.

The 2200 AV Series 1.76G-byte drive will cost 2,440; the 1.05G-byte version is priced at $1,642. Both drives will be available next month.

Briefs

Apple success

Apple Computer, Inc. Chairman John Sculley said Apple's Newton MessagePad has sold 10,000 units in its first month of availability, despite reports of power problems and handwriting recognition difficulties. Full national availability of the MessagePad, however, only began earlier this month.

Database deal

Software Publishing Corp. in Santa Clara, Calif., recently dropped prices on its Superbase 2.0 Windows relational database management system. Current Superbase users can upgrade to Release 2.0 for $99, which is priced the same as Lotus Development Corp.'s Approach database. Single-user pricing for Superbase is $495, reduced from $795. A single license for Lotus' Approach is $395.

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- BIMECHO - CICS Screen Duplication and Demonstration Facility
- BIM-EDIT - DOS/VSE and OS/MVS On-line Program Editor System
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- BIM-ICCF - Access to CICS transactions from within ICCF
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- BIM-LMON - VSE Phase Load Monitor
- BIMMONTR - DOS/VSE System Status, Performance, & POWER Queue Display
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- BIM-RECOV - CICS VSAM Recovery
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Software

The Pendulum Group, Inc. has announced Version 2.0 of the Auto-Might Professional, an automatic event processor and keyboard macro package that permits users to schedule programs to run automatically when a computer is unattended.

Version 2.0 consists of two memory-resident utilities, a keyboard macro utility called AutoKey and an event processor, according to the Englewood, Colo., company. The utilities can be used together or independently.

Features include an expanded keystroke field, a "record mode" that memorizes keystrokes to be used in events or as hot keys, security options, larger event files, additional network compatibility, DOS 6.0 compatibility and easy-installation procedures.

Auto-Might Professional costs $169.

▶ *The Pendulum Group*
(303) 781-0575

Agfa, the imaging division of **Miles, Inc.**, has introduced Version 1.1 of its FotoTune Color Management Software.

Enhanced color capabilities for Macintosh and PC platforms are provided in this version.

According to the Wilmington, Mass., company, FotoTune 1.1 Color Management Software delivers color consistency across a range of devices, including monitors, scanners and printers. Features for the product include a Tag Image File Format importer and scan plug-in module, calibrator software, compatibility with Apple Computer, Inc.'s Apple Colorsync and new color tags.

FotoTune 1.1 costs $795.

▶ *Agfa*
(508) 658-5600

Hardware

Quantum Corp. has announced the Go-Drive GLS series of 2½-in. hard disk drives for subnotebooks and standard-size, advanced notebook computers.

According to the Milpitas, Calif.-based company, the drives offer capacities ranging from 85M to 256M bytes, a selection of drive heights from 12½mm to 19mm and a variety of features designed to boost drive reliability and ruggedness.

Single unit pricing for the Go-Drive GLS series 85M-, 127M-, 170M- and 256M-byte drives is $250, $300, $350 and $425, respectively.

▶ *Quantum*
(408) 894-4000

Identity Systems Technology, Inc. has announced Identity, a 486SLC-based notebook computer that features a 500M-byte Maxtor Corp. hard disk with an access speed of 8 milliseconds, according to the Richardson, Texas-based company.

Identity's features and options include a Cyrix 486SLC/33-MHz microprocessor, a built-in 3½-in., 1.44M-byte high-density floppy disk drive, a socket for optional math coprocessor chip, 80-column by 25-line text resolution, two nine-pin serial ports and one parallel port.

Identity costs $2,995 in a configuration with 4M bytes of RAM, MS-DOS 5.0, Windows 3.1 and MS-Works.

▶ *Identity Systems Technology*
(214) 235-3330

Logisys, Inc. has introduced the VAR 486SLC/33-MHz Dual Scan Color and the VAR 486SLC/33-MHz Active Color, high-performance flexible notebooks.

The models are based on the Cyrix 486SLC/33-MHz chip, and they come with 4M bytes of RAM, a 200M-byte hard disk and built-in coprocessor, according to the Anaheim, Calif.-based company.

MS-DOS is preinstalled, and each model weighs 6.6 pounds. Options for both models include a second RS-232 serial port, trackball, fax/modem and Ethernet 10Base-T.

The VAR 486SLC/33-MHz Dual Scan Color and the VAR 486SLC/33-MHz Active Color cost $2,350 and $3,299, respectively.

▶ *Logisys*
(714) 693-1888

Dolch Computer Systems has announced the Rack-300 series of ruggedized, 14-slot, rack-mount PC platforms.

According to the Milpitas, Calif., company, the use of onboard parallel and serial ports, SCSI connections and integrated drive electronics reduce the need for plug-in boards. The systems deliver up to 27½MIPS, Dolch said.

Pricing for the Rack-300 systems begins at $2,900.

▶ *Dolch Computer Systems*
(408) 957-6575

Product shorts

Delrina Corp. has announced updated Windows and Macintosh versions of The Far Side Daily Planner and Calendar Publisher, an electronic theme-based daily planner with a year's supply of animations and cartoons. The Far Side Daily Planner and Calendar Publisher features an address book, file importing and exporting, and sorting, searching and printing capabilities. Integration with Delrina's WinFax Pro is provided. Cost: $59.95. Delrina, Toronto (416) 441-3676.... **ATI Technologies, Inc.** has introduced Graphics Ultra Pro VLB, a VESA local bus graphics card that employs ATI's mach32 graphics controller. The card can display high-resolution graphics up to 1,280 pixels by 1,024 pixels at 74 MHz and up to 16.7 million colors at 800 pixels by 600 pixels. Cost: $499. ATI, Toronto (416) 882-2600.... **Timeworks, Inc.** has introduced Timeworks Translate It, a series of whole-document, bidirectional, foreign language translation programs for DOS-compatible computers. Available in three versions — English to/from Spanish, English to/from French and English to/from German — the product can translate entire documents at once with full-sentence, idiomatic accuracy. Cost: $99.95. Timeworks, Northbrook, Ill. (708) 559-1300.

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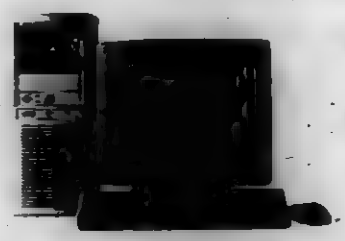

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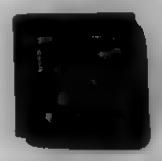

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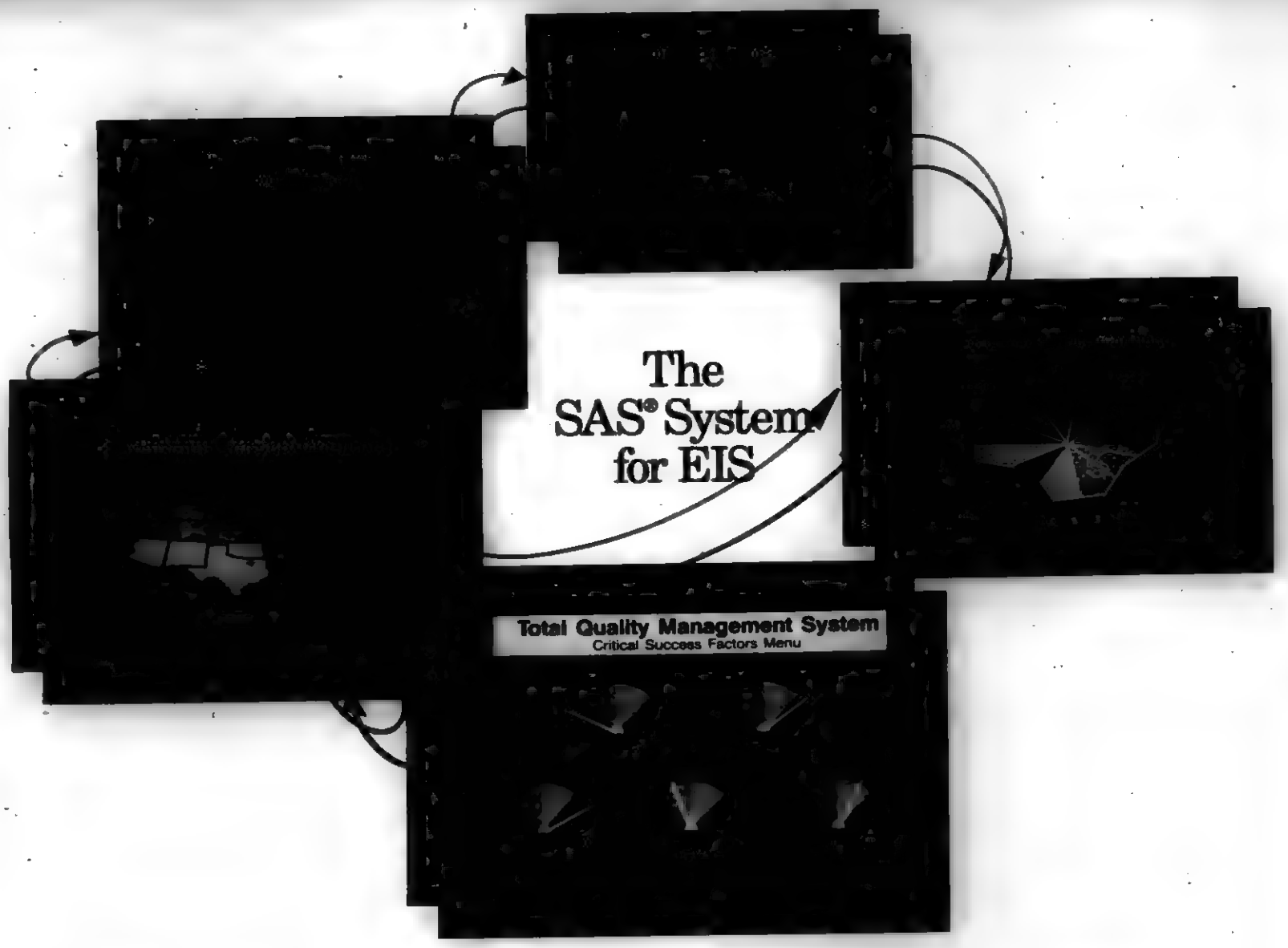

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SQL Server users: Happy but hesitant

By Kim S. Nash
REDMOND, WASH.

Early users commended Microsoft Corp.'s SQL Server for Windows NT database but said that a single adequate product does not make client/server computing a viable scheme.

Initial pilots of NT and its accompanying database left several users saying they were basically happy. However, rollout of satisfactory test bed applications to the enterprise level depends on several factors, both within and beyond Microsoft's purview, users said.

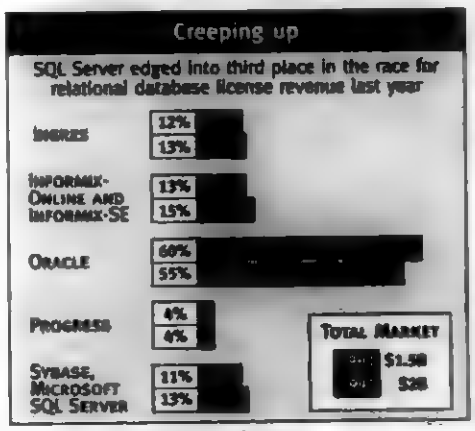
For example, compatible and affordable hardware is a sticking point for Chevron Canada Ltd. Windows NT "needs a pretty big chunk of hardware to perform," said Bill Soper, manager of information services. For pilots done so far, the oil company has run NT on 486-based machines with 32M bytes of RAM.

The Vancouver, British Columbia-based firm plans to move a 60-user order entry system used in its wholesale unit from IBM's OS/2 to Windows NT. However, the switch may be in a holding pattern until IBM certifies its Model 295 multiprocessing servers to run NT, which is expected by the first quarter of 1994.

For future NT-based systems, Soper is considering servers from Compaq Computer Corp. instead. Chevron plans to move several mainframe-based applications to NT — not Unix and not OS/2.

The company chose Windows NT because it wanted a foundation for client/server computing that is as vital to the vendor as it is to Chevron, Soper said.

"It's obvious that NT is Microsoft's key product moving forward. They can't afford to let this fail," he said. "So we'd be left behind if we didn't go [from OS/2] to NT."



Source: Montgomery Securities, San Francisco

For its part, Microsoft contends that SQL Server for OS/2 is in no danger. "The product will keep pace [technologically] with the NT version," said Gary Voth, SQL Server product manager.

NT's sheer newness put off other Microsoft users. "I would never start with a new Microsoft product. They're notorious for putting out buggy systems," said Howard Roth, head of information systems at Gymboree Corp., a children's clothier in Burlingame, Calif.

Roth cited early and ongoing problems with Windows 3.1, such as unexplained error messages and system crashes. Gymboree runs Sybase, Inc.'s Unix version of SQL Server.

Patiently waiting

On the other hand, Goodwin's & Sons plans to bet the business on NT — but not yet. The grocery chain awaits results of a carefully contained, 10-user pilot at its flagship store in Crestline, Calif., owner Martin Goodwin said.

Goodwin and a Microsoft-recommended third-party consultant built an integrated sales and accounting system using Microsoft's Access and Visual Basic. Neither of Goodwin's existing point-of-sale (POS) system suppliers — IBM and NCR Corp. — offered such an integrated application. Because Goodwin's already used several Microsoft products, including Visual Basic, Word and Excel, the company opted to continue down the Microsoft lane by buying NT and SQL Server, Goodwin said.

The NT-based system collects data from checkout stands, such as fast-selling items and the ratio of cash to check to credit-card sales, and integrates that information with the

SQL Server, *page 53*

On the agenda

Chevron Canada plans to move several mainframe applications and one OS/2-based system to Windows NT. It will start with a 60-user order entry application when IBM certifies Model 295 superservers for Microsoft's NT operating system, which IBM promised for first-quarter 1994.

Goodwin's & Sons is testing an NT-based POS system at a 10-user flagship store. The homegrown NT application will replace an IBM and NCR POS setup that lacked integration with the grocer's accounting software. Checkout stands are equipped with 486-based 66-MHz PCs.

EIS vendors adopt SQL to push client/server

By Michael Vizard

■ Four major suppliers of executive information systems (EIS) are adding SQL interfaces to their offerings as part of a drive to accelerate the replacement of mainframe-based EISs with client/server software.

Vendors adding support for SQL include Pilot Software, Inc. in Boston, Information Resources, Inc. in Waltham, Mass., Planning Sciences, Inc. in Littleton, Colo., and Comshare, Inc. in Ann Arbor, Mich.

According to International Data Corp. in Framingham, Mass., Comshare has a 50% share of the EIS market, compared with 15% for Pilot and 10% for Information Resources.

The addition of SQL interfaces to these products is intended to give users the ability to directly browse and read data stored in a SQL database, as opposed to requiring database administrators to replicate data into a separate database that must be maintained and updated.

"Right now we do a lot of extracts and downloads of data into spreadsheet files and text files. In the future, we'd like to be able to let people go directly against the data locked in the SQL databases," said John Doucette, vice president of information systems at Bay State Gas Co. in Westboro, Mass.

In the short term, Bay State Gas will probably use the SQL interface to give users read access to data stored on its mainframes from within Pilot's LightShip offering. But over time, Doucette said, he expects that Bay State Gas will be able to eliminate its need for a mainframe altogether.

More than one option

Pilot has two products with SQL front ends. One is its traditional Command Center Plus mainframe-based system, which runs on IBM mainframes and Unix systems from IBM and Hewlett-Packard Co. The second offering is the LightShip series, which includes a set of analysis tools for Windows systems that are linked to the LightShip server database.

Users can apply the Windows tools against data downloaded to the LightShip server or use the tools directly against data stored in as many as 20 SQL databases using either native drivers from Pilot or drivers from Q+E Software, Inc. in Cary, N.C.

Meanwhile, Comshare is also moving to improve SQL access by adding support for 21 SQL drivers. To do so, Comshare is using software from Q+E Software in its Commander EIS product line.

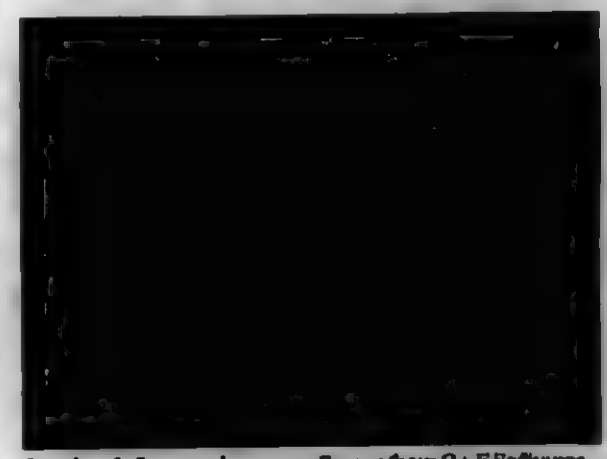
Unlike Pilot, the Comshare client/server product is based essentially on the same code base as the company's mainframe software.

Comshare has also added an implementation of its multidimensional spreadsheet module to its EIS, aimed at profit and loss analysis.

Similarly, Information Resources has added SQL support to its EIS package in addition to support for Windows, Windows NT and Open Software Foundation Motif clients. However, the SQL interface from Information Resources supports only the SQL Server database from Sybase, Inc. and Microsoft Corp., and that interface will not be available until the fourth quarter.

Meanwhile, Planning Sciences expects to add support for SQL drivers from Q+E this October.

Gentium, a new EIS offering from Planning Sciences due out in November, will use object technology to allow users to reformat data without the aid of information systems professionals, according to Bill Hopkins, vice president of marketing at Planning Sciences.


Comshare's Commander uses software from Q+E Software

Gentium is based on an object file system that allows the company to add data access modules by encapsulating them into an object that is then linked to the Gentium database. Users can then define data as a set of objects that can be easily shared with other Gentium users.

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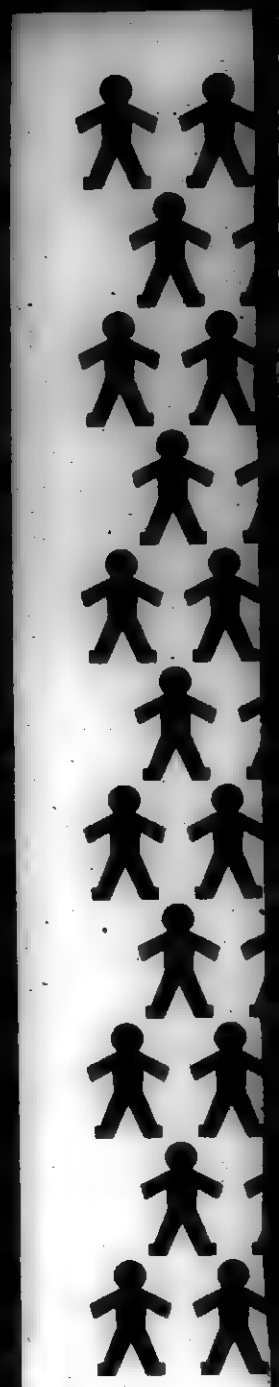

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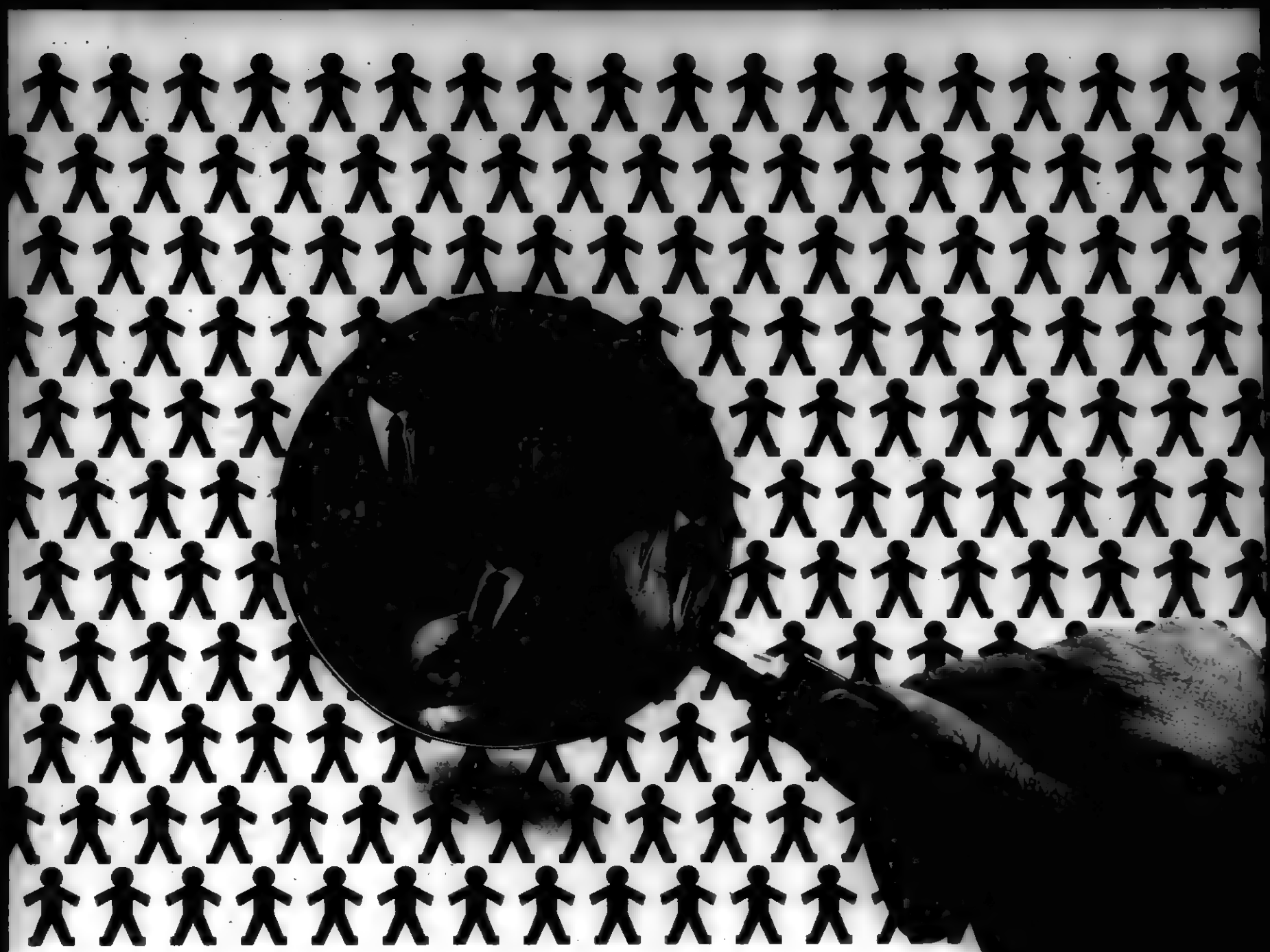

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HP replaces X terminal line

By Jean S. Bozman
CHELMSFORD, MASS.

Hewlett-Packard Co. last week announced that it is replacing its entire 4-year-old line of X Window System terminals with a multimedia-capable line called Envizex.

The move, which analysts said is intended to boost HP's 20% market share, was accompanied by the announcement of two 75-MHz HP 9000 Model 700 Unix workstations and two 100-MHz Unix workstations for industrial applications. HP, which is second to Network Computing Devices, Inc. in Mountain View, Calif., in global X terminal shipments, is already ahead of Unix workstation rivals IBM and Sun Microsystems, Inc. (see chart).

Market divisions

Percent of 1992 U.S. X station shipments

Total: 97,970

Source: International Data Corp., Framingham, Mass.

Now HP plans to convince information systems managers that they can reduce the cost of Unix computing by buying X terminals and workstations in a volume package deal, analysts said.

"They're moving to provide all of the user interface facilities that you get with a workstation at the X terminal level," explained Andrew Allison, an independent consultant based in Carmel, Calif.

Eileen O'Brien, an analyst at International Data Corp. in Framingham, Mass., said HP shipped 193,000 X terminals last year but will ship nearly 300,000 in 1993.

The Envizex X terminals will range from $1,995 for a 14-in. color terminal to $5,595 for a high-performance 19-in. color unit. They support shared whiteboard, audio and scanning features, and they can be linked to X servers from IBM, HP, Sun and The Santa Cruz Operation.

New editions

At the same time, HP is adding 75-MHz versions of the HP 9000 Model 700, Model 715 and Model 725 workstations, as well as two 100-MHz Unix workstations for industrial uses, the Model 745I and Model 747I.

The Model 715/75 is priced at $15,395 for an entry-level configuration with 32M bytes of memory and a 525M-byte disk drive. The entry-level Model 725/75 is priced from $18,395, HP said.

The industrial Models 745I and 747I are priced at $22,890 and $26,490, respectively. Upgrades from installed 33-MHz Model 715 units to the 75-MHz version will cost users $10,500, while upgrades from the 50-MHz Model 715 or Model 725 to the 75-MHz version are priced at $6,500.

Groupware initiatives differ widely in style

By Michael Vizard

As the groupware phenomenon continues to evolve, the different tacks vendors are taking to address the growing demand for collaborative computing are beginning to emerge.

The dominant offering in this sector continues to be Notes from Lotus Development Corp. But Borland International, Inc. is promoting its recently unveiled Object Exchange (Obex) technology [CW, Sept. 20].

Notes allows Windows and Macintosh clients to access applications and documents stored in an object database running on OS/2, Unix or Windows servers.

Notes is generally recognized by users as particularly good at providing a foundation for the bidirectional communications needed to create interactive discussions. Lotus extends this metaphor to include tools for building tracking and process-oriented applications.

Open access to data

In contrast, Borland's Obex allows any application to share data by posting it in a separate object store that users can then subscribe to over any electronic-mail or network protocol. Essentially, Obex provides an application-independent mechanism for storing data that can then be inserted into other applications.

As such, it provides an unstructured method for dealing with data that is typically stored in structured documents such as databases and spreadsheets. In contrast, Notes provides a structured environment for documents that typically consist of unstructured data.

In general, Borland concedes that Notes is a good environment for electronic discussions but maintains that Obex is more useful for letting applications share data more cost-effectively. This is because Obex does not require users to adopt a specific database running on a server, as Notes does.

Lotus, however, stresses that the move to document-centric computing requires an object database that provides system services to manage and track access to documents.

OLE added

Meanwhile, Microsoft Corp. has said it is retooling Windows with a document-oriented interface and is adding system services — starting with its Object Linking and Embedding (OLE) interface — that were designed to ease data sharing and document tracking.

However, OLE currently works only on individual Windows systems. A network-aware version of OLE is not expected until the arrival of Microsoft's Cairo object-oriented operating system in 1995.

SQL Server users: Happy but hesitant

CONTINUED FROM PAGE 49

grocery chain's inventory and bookkeeping systems. The application can store up to two years' worth of data. The existing POS program kept just 13 weeks of material on-line.

"We can poll our records by many different variables, which helps us make smarter inventory decisions," Goodwin said.

Also attached to the system is a pen-based NCR UltraVersa portable computer. Managers stroll up and down store aisles with the UltraVersa, noting prices and checking bar codes. The machine can talk directly to a 486-based server over a wireless network.

Overall, NT and SQL Server for NT beta sites appreciated the help Microsoft gave them to create applications for the new products. But they said they plan to put those systems into production slowly, taking precautions. For example, King County Medical Blue Shield is running SQL Server for Windows NT only with applications that are simultaneously running on an IBM AS/400 minicomputer.

"This is the product's first release, so I'm not going to be blind and think nothing's going to happen," said Sean Dittmore, beta manager at the Seattle-based health maintenance organization.

To market, to market

To recoup a $170,000 outlay to build a Windows NT-based inventory/accounting system, Goodwin's & Sons plans to sell the program to other grocery chains. A 38-store New Zealand supermarket chain recently agreed to buy the product.

Geological Survey speeds up map production

By Gary H. Anthes
RESTON, VA.

The magic is in the digital orthophotos.

These are not computerized dental X-rays; they are a technological breakthrough in the way maps are made.

Work at the U.S. Geological Survey (USGS) is a little like the labors of Sisyphus, the mythical Greek figure condemned for all time to push a huge rock up a hill in Hades only to have it come rolling down again as it nears the top.

It took the USGS four decades to map the U.S. into 55,000 topographic quadrangles, each seven miles by nine miles on a side. As it takes years more to revise a map, most are out of date before they are printed.

But now, thanks to powerful workstations, geographic information systems (GIS) and digital orthophotos, the time needed to revise a map can be reduced by a factor of 10, while the resulting maps are retained in computer databases as well as on paper.

USGS is updating its old maps by scanning them from film and digitizing them, editing and annotating the resulting vector images with GIS-manipulable tags and codes and then overlaying them with recent aerial photographs fit precisely to the original map images by a mathematical process called "ortho-rectification."

Aerial photographs are scanned in and their digital images are precisely adjusted, pixel by pixel, for displacements caused by camera angle and terrain variations. Cartographers then sit at workstations and add, change and delete features in the map images based on what they see in the superimposed photo layer.

For example, cartographers can sketch in new roads, add houses, enlarge shopping centers or change forest boundaries with a mouse and a little help from the Arc/Info GIS package from Environmental Systems Research Institute, Inc. in Redlands, Calif.

Computing power to execute the equations needed to manipulate all those pixels was available only from mainframes, and that kept the process from being cost-effective, said Ernest B. Brunson, chief of the research, technology and applications branch at the Mapping Application Center.

Now, 200 cartographers at three locations on LANs do the job with Data General Corp.'s Aviion 530 workstations, Motorola, Inc.'s 88100 processors and 3G bytes of disk storage.

According to Eric Anderson, chief of the Mapping Application Center, it now takes a cartographer four to six weeks to update a map using the digitized map images and the computer-adjusted photographs instead of up to 18 months to do the work with paper maps and photographs.

However the method still has limitations, Anderson said. For example, ortho-rectification "flattens" the photograph so that it cannot be used to update map contours, which would be necessary to show how a new road cut through a mountain.

To do that, USGS employs stereoscopic pairs of aerial photographs that are superimposed over the digitized version of the old map. A cartographer wearing Polaroid glasses sees the terrain in three dimensions through a special Polarized screen — which gives him the impression of peering out of a hole in the bottom of an airplane — and he is able to adjust map contours accordingly using the Arc/Info software.

The new map update technology unfolding at USGS is really part of a two-pronged effort, with the first objective being to turn existing maps into computer-processable images tagged with identifiers for features such as roads, utility lines, rivers and buildings. That effort is about 10% complete, and the USGS hopes to have the entire database built by the year 2000, Anderson said.

Anderson said it costs the USGS about $10,000 to digitize and code each of the 88,5000 topographic maps.

A cartographer at the U.S. Geological Survey *updates a map using a GIS and digitized aerial photographs*

ON SITE

U.S. Geological Survey
Reston, Va.

Challenge: To streamline a manual process for updating 88,500 topographic maps.

Solution: GIS software, powerful workstations and computer-manipulated aerial photos.

Results: The most labor-intensive process was accelerated by a factor of 10.

Data General mulls Aviion microprocessor options

By Craig Stedman
WESTBORO, MASS.

With Motorola, Inc.'s 88000 RISC microprocessor facing an uncertain future, Data General Corp. has started doing test ports of its DG/UX Unix System V Release 4 derivative to other microprocessors. The company is trying to clear the path for a possible switch away from the 88000 as the engine for its Aviion servers in the future.

Stephen Gardner, DG vice president of Aviion marketing, would not specify which microprocessors are in line for test ports of the operating system. However, Gardner noted that DG is interested in "the most commodity-oriented ones," a category he said includes Intel Corp.'s Pentium and the IBM/Motorola PowerPC.

DG previously had said it remained staunchly behind the 88000, despite being one of just a handful of computer makers still using that chip as Motorola shifts its emphasis to PowerPC. Gardner reiterated that an immediate change is not in the offing but said DG is doing more involved "technology explorations" with other hardware architectures than it had previously.

"Sure, our level of activity has stepped up," he said. "But I think that's a logical thing to do given the new chip developments in the last 12 months. It's more driven by that than by concerns about the [88000]."

David Card, a Unix analyst at International Data Corp., a Framingham, Mass., market research firm, noted that even Motorola's own computer group has started telling users about plans for switching to PowerPC. "I think DG will have to make a statement fairly soon" on its migration plans, perhaps in the next six to 12 months, Card added.

DG expects to continue using the 88000 for "at least three or four years" and foresees both clock speed improvements and larger systems than the 16-processor AV 9500 scheduled to ship next spring, Gardner indicated. "There's no imperative for us to do anything" about the microprocessor, he said.

Gardner added, however, that the company's "crystal ball is subject to change." The test ports to the other architectures are intended in part to give DG "credibility with customers, to let them know that we're not deaf, dumb and blind" to the changes in the microprocessor market, he noted.

Rival vendors are using the uncertainty over the 88000 as a competitive weapon, and customers do bring the matter up, Gardner said. However, he described it as "a noise-level issue" given the portability of DG/UX, and several Aviion users agreed.

"From where I sit, it's no big deal," said Mitchell Stevelman, vice president of MIS at High Yield Management Securities, Inc., a brokerage firm in Clifton, N.J. For now, the 88000 provides better multiprocessor scaling than other architectures and more than enough raw performance, he added.

Stevelman is having no problem finding application software written to the 88000 and said he has been promised by DG that any switch to a new microprocessor will involve no more than a board swap and a DG/UX upgrade. "I expect it to be cake," he said.

Richard Duke, director of data services at St. Patrick Hospital in Missoula, Mont., also said he is unconcerned. "With their view of open architectures, we'll be able to make the jump," he said, adding that the portable nature of DG/UX was one of the main reasons the hospital bought Aviion machines.

Only about 7% of DG/UX's kernel code is hardware-dependent and would need to be changed to support another microprocessor, Gardner noted. He said DG does not want to settle on a new chip now "because today there's not one choice that looks like an obvious winner" in terms of microprocessor market share.

Briefs

System 3525 benchmarks

NCR Corp. announced benchmarking results for its System 3525 based on the Transaction Processing Performance Council's TPC-C benchmark. The NCR 3525, which was tested with two Intel Corp. Pentium processors running Informix Software, Inc.'s Online Database Server with NCR's Top End transaction processing monitor, performed at 666 transactions per minute (TPM-C) at a cost of $1,299 per TPM-C.

SHL, the ASK reseller

SHL Systemhouse, Inc. has agreed to resell database engines and development tools from The ASK Group, Inc. The deal is part of ASK's stepped-up campaign to sell more products through systems integrators.

Oracle adds to Financials

Oracle Corp. plans to add Datalogix International, Inc.'s Enterprise Manufacturing Management System to its Financials line. The Unix-based client/server manufacturing planning applications target process manufacturers.

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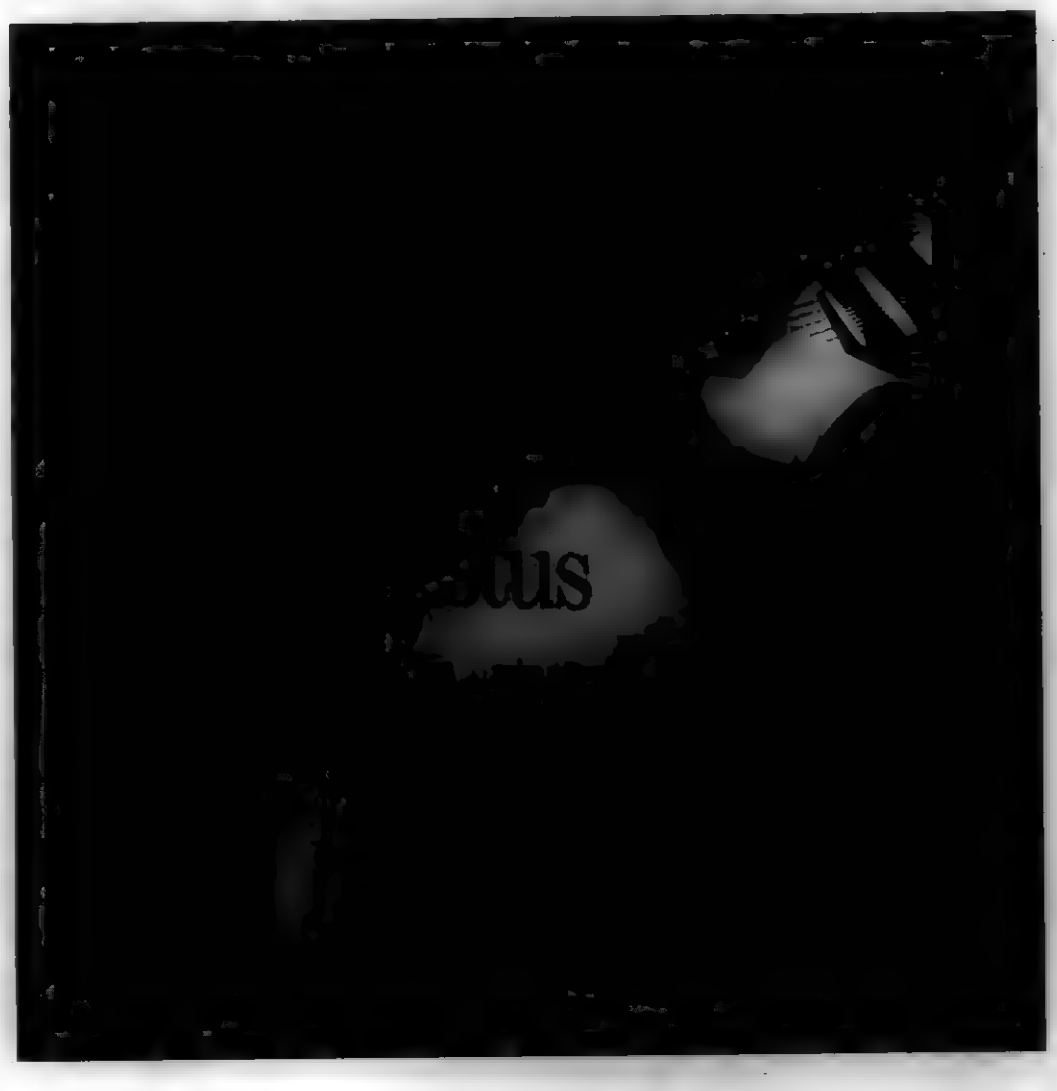

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BUILDING A KNOWLEDGE NETWORK

> ***"The pace of change in the nineties will make the eighties look like a picnic, a walk in the park."***
>
> Jack Welch
> Chairman and CEO
> General Electric
> *Fortune*
> March 26, 1990

What none of us realized in 1990 was that Jack Welch was guilty not of exaggeration but of understatement. It is not just the pace of change that is different, but the magnitude of the change. Success today depends on a company's ability to anticipate change, reduce product life cycles, adjust to changing government regulations, compete with companies in every corner of the globe, and transform ever increasing amounts of data into information that can be acted upon. It also depends on the ability of employees to learn to work in new and different ways.

"It is not just the pace of change that is different, but the magnitude..."

Today, businesses are downsizing and right-sizing, creating strategic alliances, and empowering their employees. They are tackling issues such as customer satisfaction and quality; they are reengineering their business processes; and they are striving to become more flexible by creating open learning organizations. The tool making all of this possible is technology.

The Great Enabler

Information technology speeds manufacturing and improves back office operations. Furthermore, the ability to tap into the vast amounts of information available provides that all-important competitive edge. For example, when a company shares information across the organization, layers of management can be eliminated, flattening the organizational structure. These flattened organizations can make—and implement—decisions quickly. Moreover, sharing information with customers and suppliers helps break down the organizational boundaries. When people share knowledge and work together, teamwork is enhanced, and when employees are empowered to deal directly with their customers, quality of service improves cementing relationships with customers.

Technology also provides information and tools that reduce costs and increase profit margins. It enables the reorganization, or reengineering, of business processes and functions. Moreover, technology eases the development of strategic alliances, whereby companies and their suppliers form long-term relationships, or companies join together to provide a wider range of services than any one of them can provide on its own.

But it is critical to remember that technology is not magic; it is a means of transferring and sharing information in an organization. After all, information shared, analyzed and acted upon is what provides the competitive advantage organizations need. The tools an organization employs for the management of technology, for bringing the right information to the right people, will determine whether or not information makes the order of magnitude difference organizations are seeking.

Applying Technology

End users need easy access to information, often in real time, to use it effectively. For example, a food and beverage company in the Midwest connected its information systems to its manufacturing systems to gain control of the flow of beer through its valves in response to information about sales, maximizing production capacity. A major clothing retailer restocks individual stores overnight because it can now transmit information gathered in a point-of-sale inventory control system to the central warehouse ordering system at the close of every business day, ensuring the availability of products in greatest demand.

Achieving these results is not simple. The development of information systems that fit organizational needs and can adapt to changes in the organization is a crucial issue. Selecting and implementing the right technology for the organization takes a thorough understanding of the nature of the business, its organi-

zational structure, its culture and the way management works. That is why those who assist organizations to choose their technological direction must look at the organization holistically. Optimizing functions and streamlining processes—reengineering—requires a thorough understanding of the processes, functions and technology in place.

For example, a top ten manufacturing company was able to reduce its performance measurements from 2000 individual measurements to 60 across the company through technology. A testing facility that thought it needed additional storage area to collect enough batches of specific products for future testing developed ways to optimize the testing process so that individual testing was cost effective, eliminating the need for storage. A company that custom builds homes can now present clients with screen images of the different possible configurations of rooms to choose from, eliminating the need for multiple individual blueprints, thus providing them with a competitive edge. One of Europe's largest banks now uses a parallel processing system to deliver the management information needed to service accounts within minutes, thus meeting its customers growing needs for sophisticated financial services.

Success today depends on transforming "data into information that can be acted upon."

These benefits are realized only when technology is used to maximize existing information to its fullest. But it is important to keep in mind that much of the information in an organization is not in the existing systems. Rather it is in the minds of employees. This information must be captured and incorporated into the organizational knowledge base.

Enhancing Knowledge

Capturing an organization's information and making it accessible to users across the company requires an investment of time and money. Not only must the right systems be put in place and the right applications chosen for accessing the information, but the organization's employees must learn to understand and use these new tools. The issues involved in providing the right technology are complex and often politically charged. For example, in today's new organizations information has to be closer to the individual user. This often means that central IT organizations are no longer the clearinghouse for all information systems, but rather provide guidance and standards while the line organizations or individual business units own the systems. In this computing environment, companies need help with issues of security and data integrity, they need help with the development of special applications that allow them to interface with their alliance partners, and they need tools that enable them to respond to customers in real time with critical information.

For example, to remain competitive a major bank needed executive support systems that facilitated portfolio management, a car designer needed a new design center that could speed delivery of new designs, and an aerospace company needed product data management. These tools could be developed for them because accumulated knowledge and experience across industries in numerous companies was available to ensure that all the latest developments in technology would be considered in choosing the right tools. The collective wisdom gained through the sharing of information makes a difference—and today that wisdom must be available in real time because of the speed of change.

CASE STUDY:

Price Waterhouse, a worldwide network of member firms, is one of the largest providers of professional services in the world, employing over 45,000 people. Long known as the premiere accounting/consulting firm, they conducted extensive client research and undertook a massive strategic planning effort in the late 1980s to solidify their competitive position in the coming decade.

Analyzing the many challenges that confronted those in their industry, they recognized valuable time was lost identifying the best people, based on prior experience and expertise, to staff client assignments; they knew how difficult it was to provide specific expertise about an evolving technology when they first had to locate that individual at Price Waterhouse; and they knew their clients would benefit tremendously if Price Waterhouse consultants working on an assignment in London could work in real time with people on the same assignment in New York.

Most of all, they realized their clients would be provided with added value, and their leadership position would be solidified, if they could find a way to give their clients access to the entire body of knowledge and experience of the firm while their competitors were providing advice based only on the experience of the people working on the assignment. After all, the principal product of a service firm is knowledge. Consultants provide advice to their clients; the greater the experience and expertise and the more timely the information, the more value they provide. The problem is that, in a world marked by constant change and an abundance of information, capturing and building on the expertise of such a large group of highly mo-

Price Waterhouse - Knowledge Fully Shared Solidifies Leadership Position

bile people presents an enormous challenge.

Price Waterhouse's leadership decided that to better serve their clients in the future, they had no choice but to collect the wisdom and experience that resided in the minds of their people and make it available to every member of the organization. They began by looking at the problem holistically. First, they analyzed their own organization to better understand the nature of the problem they faced:

- The enormous size of the organization (over 45,000 people) and the number of locations across the world (400 offices and 100 countries).
- The fact that as consultants, their professionals spend a great deal of time traveling and working at client sites.
- Their constant need for information—on various industries, regulations, economic and demographic factors, and technological developments—that becomes obsolete almost as soon as it is available.
- The necessity of assembling teams from many geographical areas to work on specific projects in many different locations.
- The importance of providing both staff and clients with information about technological developments from external sources on a need-to-know basis.
- The fact that Price Waterhouse has its own R&D laboratories (Technology Centre and Advanced Software Engineering Centers) that both needs information and has highly technical information to convey to those working on projects.
- The need to document information so that, for example, when a project is completed or an individual leaves the firm, the information gained is not lost.

Price Waterhouse turned to technology for an answer. After a great deal of experimentation, it built a proprietary system that allowed it to collect and analyze data, to store information, to access outside information sources, and to tie together the whole global organization. Furthermore, Price Waterhouse did not limit its use, but is sharing information with strategic alliances and suppliers as well as clients. It also spent a great deal of time changing the culture of the organization, instilling an appreciation of the value of flexibility and open communication in all those who are a part of the organization. Today, all Price Waterhouse staff are linked together on a network that provides vast amounts of information in real time, a network that allows staff members to work together though far apart, a network that captures all the information generated in the course of an engagement to provide a base for those involved in the next project to build on.

Today, a Price Waterhouse partner in Paris, one in Argentina, and one in California can work on an assignment together, without wasting valuable time and money traveling to the same location; the teamwork encouraged by this interactive system provides the enhanced productivity once achieved by physical proximity. Today, a Price Waterhouse partner can find someone with specific experience in a new technology for a project in hours by searching a data base of all employees; time wasted making numerous phone calls has been eliminated. Today, all Price Waterhouse people can remain on the leading edge by sharing research findings on a real time basis from their technology labs around the world; they no longer have to do the research themselves. Today, an institutional memory exists, allowing Price Waterhouse professionals to examine previous engagements and learn by their findings; they no longer have to reinvent the wheel. Today, Price Waterhouse tax partners in all fifty states can provide clients with information overnight about the effects of a change from a tax law passed yesterday; copies of the legislation can be scanned into the system immediately upon passage, a note can be sent out announcing a conference call to discuss it a few hours later, and the collective opinion of the Price Waterhouse experts can be sent out on the system in hours. Today, a team of Price Waterhouse consultants out on assignment can call into the network through their laptops and access all the resources they would have available if they were in their own offices; they can request information and materials, access presentations on technical or business issues, and set up new travel plans from their homes and hotel rooms, responding to changing client needs. Today, a Price Waterhouse partner can tap the entire firm for information in response to a client's question and provide an answer based on knowledge fully shared—the world is at their fingertips.

Price Waterhouse has successfully entered the age of information through the use of advanced technology, and is well positioned to help its clients do the same. In order to learn how Price Waterhouse can draw on its own experience to help you reach your full potential through information technology write: James Rafferty, Price Waterhouse, Management Consulting Services, 1251 Avenue of the Americas, New York, NY 10020 or call (212) 819-5000.

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Start-up to market Windows NT server with Microsoft

By Jean S. Bozman
SUNNYVALE, CALIF.

Netpower, Inc., a start-up funded by Silicon Graphics, Inc. (SGI), Stanford University and venture capitalists, is scheduled to announce today that it is shipping a Microsoft Corp. Windows NT server based on RISC chips.

The Netpower server family is one of the first groups of machines to support Windows NT applications in direct competition with RISC-based Unix workstations and servers, the company said. The servers are built with RISC chips provided by SGI subsidiary Mips Technologies, Inc.

Netpower will jointly market client and server versions of the computer with Microsoft, said Linda Hargrove, Netpower vice president of marketing. Microsoft has been involved with a precursor to the Netpower machine for some time, Hargrove said.

Microsoft was one of 20 beta sites for the server, she said. Others include Fidelity Investments in Boston and Nordstrom, Inc.'s department store chain in Seattle, Hargrove noted. Now, 9-month-old Netpower will join with Microsoft in regional sales events, she said.

Marketing will initially be aimed at users in the Windows NT software development community and in the computer-aided design market, said technology analyst Jeffry Canin at Salomon Brothers, Inc. in San Francisco.

Over time, the small firm can expect competition from two sides: Intel Corp.-based PCs, especially Pentium models, and Unix workstations, Canin said. However, Netpower's small size — reportedly less than 100 staffers — will allow for a PC business model that depends more on retail and channel sales than on direct sales.

Runs 32-bit applications

At the heart of the Netpower machine is a Mips R4400 RISC chip operating at either 50 MHz, 67 MHz or 75 MHz. It is a chip with a 64-bit internal address space that runs 32-bit applications, said Ed Frank, vice president of research and development, who helped design Sun Microsystems Inc.'s SPARCstation 10 Unix workstation. Prices range from $4,995 for the desktop Model 100 to $17,000 for the high-end Model 300 server; all models will ship immediately.

Frank claimed the price/performance of the Netpower NT system is better than many midrange Unix workstations, performing as well or faster at a lower price.

Interoperability with Unix applications will play a key role in the Netpower strategy. "We're working to be able to use our machines as X Window servers to a Unix application," Frank said, so that users can have both NT and Unix software on the same screen.

The next generation of Netpower servers will also support Sun's Network File System, allowing the NT and Unix servers to exchange files, he said. The machines will also run on TCP/IP open systems networks and can act as clients to a Novell, Inc. NetWare server.

Netpower's entry in the NT market will complement SGI's Unix strategy, said C. Robert Miller, chief executive officer of Netpower. "SGI thinks it's very important for the Mips [chip] architecture to succeed in the NT space," said Miller, who was CEO at Mips Computer Systems, Inc. when it was acquired by SGI. "From their perspective, it's a totally different business model [than the one] they're operating with today, where they're using Unix to address the high-end scientific market."

Miller did not disclose the size of Netpower or project its revenue for the coming year.

Woodside Technologies, Inc. has introduced Version 3.0 of its Fortress Unix Security System Software.

Version 3.0 offers a "directory tree" database editor, security checks and support for the Open Software Foundation's Motif and Sun Microsystems, Inc.'s OpenLook graphical user interfaces.

File-status and inoculation data are now stored in Data Encryption Standard-encrypted "protected files databases" to deter hackers, according to the Sunnyvale, Calif., firm.

The product is available for Sun's SPARCstations using the SunOS 4.1 operating system and for IBM's RS/6000s running AIX 3.2.

Fortress is priced at $495 to $795 per copy.

▶ *Woodside Technologies*
(408) 733-9503

Introl Corp. has announced FlexStor, distributed Hierarchical Storage Management software for Sun Microsystems, Inc. environments.

The product automatically monitors all data on the system and migrates files based on the setup criteria. Migration can be determined by the size, age, date, group or location of a file or by other user-defined parameters.

Noncritical files are relocated from on-line network disks to a less expensive storage level in the hierarchy.

According to the Minneapolis company, transparent migration between on-line disks is supported, as well as near-line optical discs or tape libraries and off-line tape libraries. For maximum performance, on-line disks are dynamically optimized.

Prices start under $4,000.

▶ *Introl*
(612) 788-9391

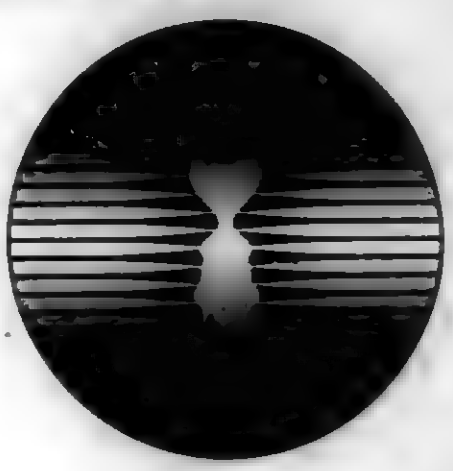
Artisoft, Inc. has announced the LANtastic Interchange software, a product that provides bridging and routing capabilities for LANtastic LAN Version 5.0 users.

According to the Tucson, Ariz., firm, the LANtastic Interchange software will link LANtastic networks that run over dissimilar hardware, cabling and topologies including Arcnet, Ethernet and Token Ring.

The product also has the ability to route data packets between networks, transporting each packet to the correct network segment along the quickest and most efficient path, which improves performance and reduces traffic. A statistics feature will let administrators monitor network traffic.

The software is priced at $199 per segment.

▶ *Artisoft*
(602) 670-7100



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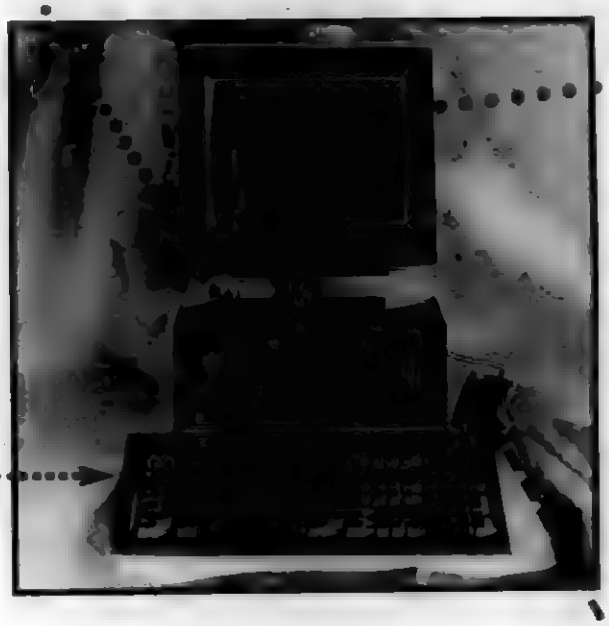

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Hard disk ☐170MB ☐240MB ☐340MB ☐440MB

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Hard disk ☐170MB ☐240MB ☐340MB ☐440MB ☐540MB SCSI-2*

EISA TOWER (8x12)

Processor ☐486DX2, 66 MHz ☐Pentium, 60 MHz

Memory ☐8MB ☐16MB ☐32MB ☐64MB ☐Other ____MB

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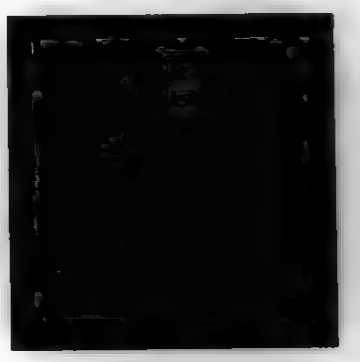

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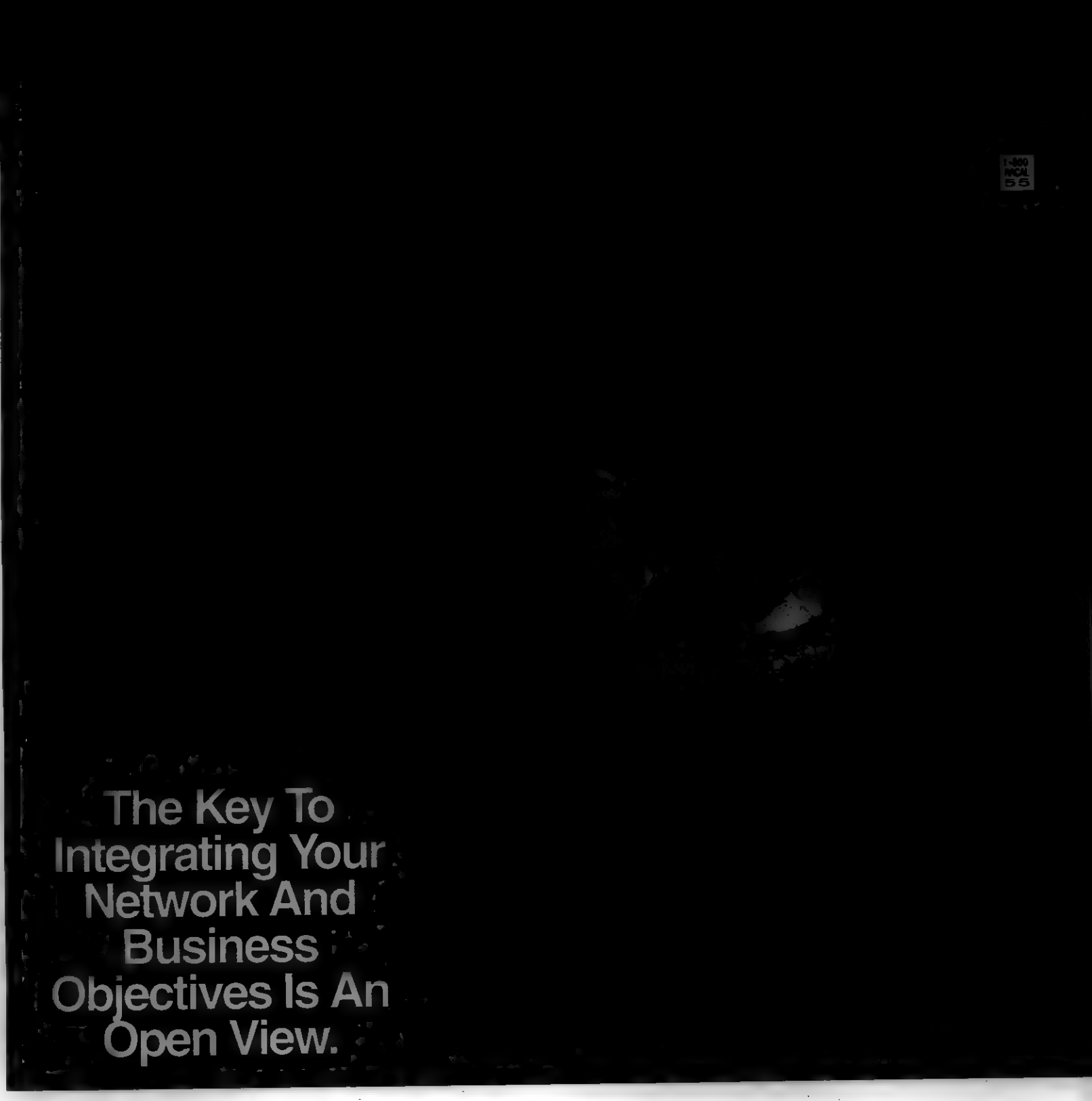

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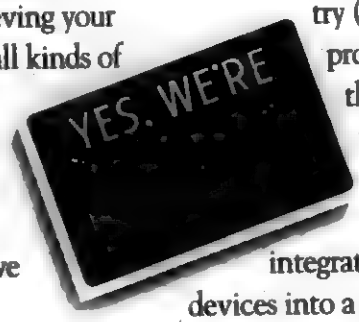

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3Com gets house in order

By Elisabeth Horwitt
SANTA CLARA, CALIF.

3Com Corp. moved to put its network management house in order recently when it announced Transcend, a set of applications for managing 3Com's range of hubs, routers and network adapters.

The applications run on a Windows-based console or the leading Simple Network Management Protocol (SNMP)-based enterprise network management systems, the vendor said.

3Com's delivery of such a system in a timely manner is crucial if it is to compete against its key rivals in the hub arena, Cabletron Systems, Inc. and SynOptics Communications, Inc., said Val Sribar, senior research analyst at Meta Group, Inc. in Westport, Conn.

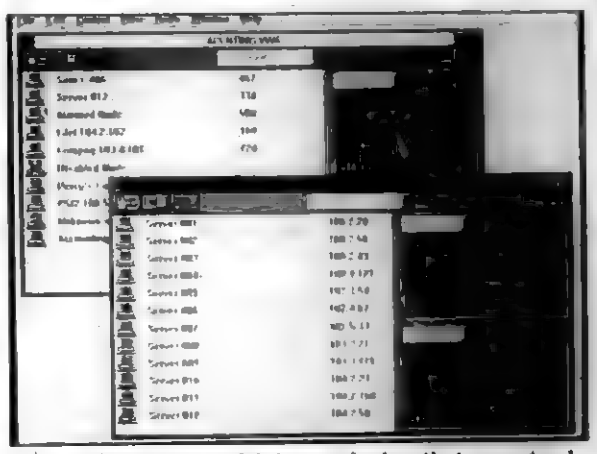
"Before, [3Com] had a very fragmented management strategy, principally because they had acquired a lot of products," he said.

During the past year or so, 3Com acquired BICC Data Networks with its Ethernet hubs and Star Tek, Inc. with its Token Ring hubs to complement its own line of bridges, routers and LAN adapters, wreaking havoc with a consolidated management approach.

By contrast, Cabletron and SynOptics have been shipping for a year or more their platforms for managing both their own hubs and other SNMP-compatible devices. These vendors are also offering their management systems as applications on a growing number of leading management platforms, such as Hewlett-Packard Co.'s OpenView and IBM's NetView/6000, Sribar said.

This is a key feature because it enables users to monitor their hubs from the same enterprise management platform that monitors their routers, adapters and networked systems via SNMP, he said.

While acknowledging that 3Com's network management strategy was "an area of weakness" until now, company spokesman Raj Dhingra claimed that the company has leapfrogged its competitors with Transcend.



Transcend *manages multiple user devices that can extend across multiple hubs and sites*

Agent in residence

Transcend is an object-oriented system that provides users with the ability to manage "logically related network devices as a single entity" through SmartAgent software that resides on 3Com hubs, routers and bridges, Dhingra said. While SynOptics and Cabletron have centered their network management strategies around their hubs, 3Com SmartAgents give users the option of installing network management intel-

3Com, *page 73*

Digital networks

Consortium paves way for 'data superhighway'

By Gary H. Anthes
WASHINGTON, D.C.

Seventeen U.S. computer and communications companies, universities and government agencies recently formed a consortium to build high-performance data networks and computer applications intended to prepare the way for the Clinton administration's proposed "data superhighway."

As its first project, the National Information Infrastructure Testbed (NIIT) will set up a high-speed digital network linking environmental scientists at nine sites in a "multimedia workgroup application" called Earth Data System. The scientists will share computational resources and earth imagery and other data as if they were working side-by-side.

The consortium said its goal is to integrate existing technologies in distributed computing and advanced communications to implement a number of real-world applications. The efforts will complement the network research test beds being developed by the Corporation for National Research Initiatives and others under

Consortium, *page 68*

Mobile trends bring higher telecom costs

By Joanie M. Wexler

■ Integrated Services Digital Network (ISDN) technology could play a significant role in the life of the mobile and telecommuting business worker, depending on the degree of coverage the networks eventually gain.

In fact, Forrester Research, Inc., a Cambridge, Mass., consultancy, predicted in a recent report that ISDN will become the dial-up networking method of choice for mobile users and small offices by 1995. The main reason is that modems do not deliver the same speed and trouble-free operation users are accustomed to with LAN-based computing, Forrester Research analyst Jay Batson said.

Addressing this potential trend, which would result in beefed-up corporate telecommunications activity, some vendors have recently started shipping products that help companies manage their wide-area network line costs. DigiBoard in Eden Prairie, Minn., for one, delivered software earlier this month that automatically sets up and tears down ISDN connections to Novell, Inc. LANs whenever appropriate.

Meanwhile, competitor Combinet, Inc. in Sunnyvale, Calif., shipped a single-user hardware/software product that works with additional types of wide-area links as well as upper-layer LAN protocols.

No need to log off

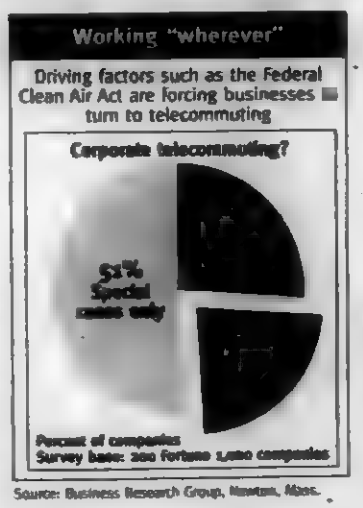
Such products relieve companies from having to rely on users to conserve costs. Remote users, accustomed in the LAN world to what they consider "free" bandwidth, tend to set up a call, then leave the connection open rather than logging off and initiating new sessions when they start work again, said Julie Thometz, DigiBoard's marketing manager of telecommunications.

Meanwhile, their companies pay for unused connections, which can run into multiple hours.

"In a university environment, people tend to log in and stay logged in until they go home," agreed Peter Olenick, manager of network systems at Princeton University's Computer and Information Technologies Group, a DigiBoard shop.

To conserve ISDN line charges — which consultancy TeleChoice, Inc. in Verona, N.J., said can cost up to 20 cents per minute for the use of just one of Basic Rate ISDN's two 64K bit/sec. channels — DigiBoard created the $995 PC IMAC for NetWare Systems.

The product's software component is a NetWare Loadable Module for Novell servers that works with DigiBoard's PC ISDN network interface card.



Source: Business Research Group, Newton, Mass.

However, "the question is, how does a piece of computer equipment know there isn't any work being done?" Olenick said. "And if I destroy the link because it's idle, do I lose any [unsaved] changes?"

According to Thometz, the software can distinguish between user data and Novell administrative packets, which in older versions of NetWare's IPX protocols are broadcast periodically throughout the network to ensure that connections are still humming. If the software sees only administrative packets for a particular length of time determined by the customer, it automatically disconnects the session.

Broad compatibility

Combinet's $990 version of its Everywhere bridge line plugs into any personal computing device with an Ethernet connection, including laptops, and manages not only ISDN but also switched 56K bit/sec. and dedicated telecommunications connections, according to Bob Downs, vice president of business development.

The Everywhere line is not specific to upper-layer communications protocols; its generic filtering feature allows users to select what kinds of packets they want to control, Downs said.

TeleChoice President Daniel Briere said that videoconferencing is likely to be a growing application for products such as those delivered by DigiBoard and Combinet.

"People turn off the monitor and think they've turned off the link," Briere said. Little do they know the clock just keeps running, he added.

Novell revs up remote MHS

Service allows greater access to NetWare messaging

By Lynda Radosevich

A number of recent developments could make life a little easier for users trying to get their messages and message-enabled work-flow documents from Novell, Inc.'s NetWare networks while on the road or in a remote office.

"Work flow does not discontinue when you walk out the door, and the remote issues of connecting and having the work flow go back to the enterprise are an important part of the process that most people forget," said Priscilla Emery, a vice president at consulting company New Science Associates, Inc. in Westport, Conn.

To help managers with remote messaging, Novell last week announced an updated version of its Message Handling Service (MHS). The remote software is aimed at people using portable computers at their desktop and on the road. It lets those users access NetWare's messaging service with the same interface for either modem-based asynchronous connections or direct network connections.

Users will have more than one choice of client software for Remote MHS.

Some assembly required

To use Remote MHS, companies must have Global MHS, a Novell NetWare Loadable Module that adds store-and-forward messaging functions to LANs running the NetWare operating system. When connected through a network adapter, remote users operate just like network users, but their personal mailboxes are stored on their local drive instead of on the server, according to Novell.

Novell said that Remote MHS will be available by early next month, and that drivers for the wireless RAM Mobile Data Network will be available for free shortly after the product ships.

While the Novell MHS software takes care of the "back-end" communications part of the remote messaging equation, applications vendors are stepping forward with client or "front-end" software.

For instance, Da Vinci Systems, Inc. in Raleigh, N.C., said it plans to ship on Dec. 15 a version of its electronic-mail software for Remote MHS 2.0. The updated software is integrated with Novell's Remote MHS to allow a simultaneous installation and single-point administration using the DaVinci interface.

Pricing has not yet been set. The current version is priced at $299 for a DOS/Windows version.

Decisions, decisions

Users will have more than one choice of client software for Remote MHS. Beyond, Inc. in Burlington, Mass., said that its BeyondMail E-mail software for DOS and Windows will operate with Novell's remote back end. Beyond is targeting customers using the work-flow and routing features of BeyondMail.

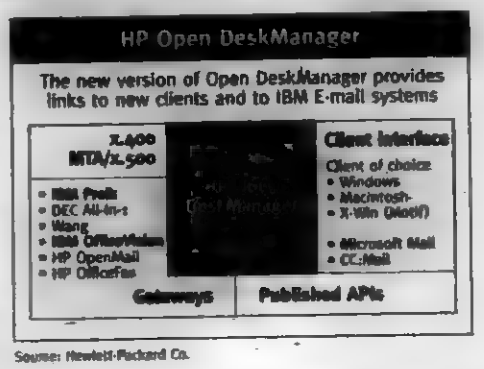
For example, a remote sales representative can request updates to a local product pricing database by creating a form in BeyondMail and sending it to a pricing mailbox at the main office. Beyond's remote software will be available in November for $295.

HP updates E-mail

By Lynda Radosevich
SAN FRANCISCO

Hewlett-Packard Co. announced several enhancements to its electronic messaging software for its proprietary HP 3000 minicomputer at the Interex '93 user conference here last week.

The Open DeskManager E-mail system, which HP claims has 1.5 million end users worldwide, will directly link Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail clients. That means that CC:Mail and Microsoft Mail users can exchange messages and share directory services with Open DeskManager users without using gateways. Also, managers can centrally administer the directories and gateways to other systems.



Source: Hewlett-Packard Co.

In addition, Open DeskManager's support for Lotus' and Microsoft's Messaging Application Programming Interfaces (MAPI) will allow groupware software written to those MAPIs to operate using the Open DeskManager.

"LAN-based E-mail systems today have a limited number of people that each post office can support. If you look at organizations with a few thousand people, you have several hundred post offices," said Steve Glagow, director of the electronic-mail service at BIS Strategic Decisions in Norwell, Mass.

The HP Open DeskManager has one post office and one place to manage the mail systems, and users have the choice of Microsoft Mail, CC:Mail or the HP interface. However, because of its proprietary base, the product aims to maintain the current HP Open DeskManager users and to show that HP is still committed to the product, Glagow said.

HP has a similar E-mail product, called HP OpenMail, for its Unix-based servers. HP said that gateways between Open DeskManager and IBM's Professional Office System are available.

Data superhighway

CONTINUED FROM PAGE 67

the sponsorship of the National Science Foundation.

The consortium's work may also address criticism that the federal government's High Performance Computing and Communications program is long on leading-edge research but short on delivery of real applications to serve broad segments of society.

Membership in the NIIT is open to any organization for a small membership fee. William Murphy, chairman of the NIIT steering committee and director of global accounts at Hewlett-Packard Co., said it is impossible to estimate the total contribution of members, with large firms applying the results of investments in the hundreds of millions of dollars.

Murphy said the NIIT is intended to prove out advanced — but existing — technology "and go to market with real live products."

Earth Data System users will be environmental scientists across the U.S. accessing gigabytes of data — for example, detailed satellite imagery of Brazilian rain forests — from remote servers. "The idea is being able to access huge amounts of information in real time in a place you want it to be," Murphy said.

"Also, the scientists may not know what data is available, so this will allow them to collaboratively browse through distributed databases to find out what is available, and then download it at 45M bit/sec.," he added.

Murphy said the intent is to give users tools that allow applications to be distributed, not just high-bandwidth pipes. "It's like we are building a test freeway. The freeway itself is already built, but there are no on-ramps, off-ramps, road signs, hotels, restaurants or gas stations, and there aren't even many vehicles to run on it yet."

Earth Data System is due to be operational in November. The following companies are involved in setting up the NIIT:

- **AT&T** will provide campus-area frame-relay networks at several sites, as well as network monitoring tools and high-speed routers as gateways between the frame-relay networks and LANs.
- **Sprint Corp.** will provide nationwide Asynchronous Transfer Mode (ATM) switching services to enable geographically dispersed sites to act as if they are part of one local group.
- **HP** will contribute workstations, servers and networking equipment and distributed computing expertise.
- **Network Systems Corp.** will supply high-speed routers to connect the ATM network and the LANs.
- **Oregon State University**'s College of Oceanic and Atmospheric Sciences will contribute environmental data and research expertise for the application.
- **Sandia National Laboratories** will contribute expertise in geographically distributed computing, massively parallel computing, networking and information security.
- **Smithsonian Astrophysical Observatory** will help design and manage development of the application.
- **University of New Hampshire**'s Earth, Ocean and Space Institute will contribute data, research expertise and application design.
- **Ellery Systems, Inc.** will supply systems engineering and application software.

Next year, the NIIT will bring up a health care application that will computerize patient records. NIIT said it will later work on applications in education, access to public records, manufacturing and financial services.

Adding to consortium lineup...

The same day the NIIT revealed its plans, Vice President Al Gore unveiled this administration's policy outline for the National Information Infrastructure (NII), a high-performance internet serving users in manufacturing, education, health care and science research.

Gore said the infrastructure will be built by the private sector, with modest government funding — $1 billion to $2 billion a year — for research, tests and standards setting. "The government should steer and not row," he said, adding that the administration will seek legislation to increase competition in the telecommunications industry.

Gore said the administration will establish an interagency information infrastructure Task Force and a private-sector council to advise the government on data highways.

"The administration's action agenda sends a clear signal that the further development of the NII is their top technology priority," said James Unruh, chairman and chief executive officer of Unisys Corp. and chairman of the Computer Systems Policy Project. —*Gary H. Anthes*

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If the performance of a monitored component drops below a specified level, our unique Pre-Failure Warranty kicks in. We'll actually replace a Compaq warranted drive or memory system free. Before it stops working. No downtime. Ringing cash registers. Happy boss.*

Still, no network's perfect. In the unlikely event problems occur, our server exhibits remarkable tolerance. Every ProLiant includes Compaq-designed hot-pluggable drives. ProLiant Models 2000 and 4000 come standard with advanced error-correcting memory and off-line backup processor features (whereby the server reboots automatically to a second processor). And, most notably, the Compaq Smart SCSI Array Controller together with the ProLiant Storage System ensures mission-critical data integrity. Should a network problem bring the server down, the Rapid Recovery Systems of the ProLiant are designed to bring it back up.

VER IS A MAINFRAME WITH AN ATTITUDE.

For example, Automatic Server Recovery 2 uses a historical record of server status and performance to perform an astonishing array of tasks. Like intelligently restarting the server, automatically correcting a variety of problems, and accessing a telephone pager to contact network administrators.

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*And finally, to accompany our new line of mission-critical servers, we're introducing mission-critical support. With ProLiant, we now offer extensive analysis, installation and service through our CompaqCare System Partners, a select group of highly trained systems experts backed by Compaq engineers. You can now choose 4-hour on-site warranty response upgrade** direct from Compaq. Again, there's our unique Pre-Failure Warranty. And, of course, all Compaq servers come with a 3-year on-site† warranty, and 7-day-a-week, 24-hour-a-day† technical support.*

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Standard Disk Controller	Integrated Fast SCSI-2 and Smart SCSI Array Controller (selected models)		
Storage Capacity	550MB–112GB Internal/external	1050MB–140GB Internal/external	1050MB–140GB Internal/external
Typical Usage	Departmental network services—primarily NetWare	Departmental network application services—NetWare, NT and Unix	Application services for preemptive downsizing—NT and Unix
Transaction Rating	50–150 TPS	200–300 TPS	300–400 TPS
Estimated Starting Street Price‡	$6,000	$8,900	$13,900
SERVER DEPENDABILITY AND AVAILABILITY			
Management	Second-generation Compaq Insight Manager (standard) combines with innovative hardware design to constantly monitor, assess and report server health and performance.		
Fault Prevention	Insight Manager alerts you to server status changes in over 800 component parameters, allowing proactive server management backed by 3-Year Pre-Failure Warranty		
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Fault Recovery	Standard rapid recovery services automatically return server to full operational status even in the event of a critical subsystem failure		
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SmartStart	Standard CD-based intelligent hardware configuration and system software installation, providing simplified server configuration for NetWare, NT or Unix. (CD-ROM drive standard)		
System Warranty	Free Three-Year, On-Site Limited Warranty		
Pre-Failure Warranty	Three-Year, On-Site Warranty replacement of designated components that fall below preestablished thresholds		
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CompaqCare System Partners	Highly trained, dedicated, third-party professionals who provide systems maintenance and comprehensive technical support		
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3Com

CONTINUED FROM PAGE 67

ligence across the range of 3Com devices.

For example, a small site that does not have enough users to cost-justify installing a hub can use a 3Com router with SmartAgent to collect information about LAN devices and ship it to a central management system. A SmartAgent installed in a network adapter can act as a domain manager for a group of PCs.

In addition, 3Com provides a Novell, Inc. NetWare Loadable Module proxy agent that can monitor NetWare installations, Dhingra said.

Transcend also runs as an application on Novell's NetWare Management System as a way of integrating management of 3Com products with NetWare and other SNMP-compatible devices.

Support for other network operating systems is in the works, 3Com said.

Transcend manages multiple user devices as a "logical network" — also known as a "virtual workgroup" — that can extend across multiple hubs and sites, the vendor said. For example, the administrator can define a user workgroup that includes all devices on one hub, plus a couple of users who happen to reside on a LAN in another building, Dhingra said.

The management application can then track traffic and error levels for that user group as a whole, rather than having to track each LAN as a separate physical entity.

But "virtual workgroup definition is a Pandora's box which has limited value with most approaches," Sribar said. He noted this is because of the difficulty of "pulling out management data" from routers and other devices that are being used by different virtual workgroups.

Transcending options

Transcend is available today as an application on the SunNet Manager platform from Sun Microsystems, Inc.'s SunConnect business unit. It also comes in the form of OS/2-based SmartAgents for hubs, routers and manageable adapters.

LinkBuilder FMS Manager, a Windows-based application for managing 3Com devices, is also available today. A Transcend application for HP's OpenView is due out by year's end; an application for IBM's NetView/6000, Novell's NetWare Management System and Microsoft Corp.'s Windows NT platforms is due to ship next year.

Also in 1994, 3Com plans to ship Transcend connectivity applications for campuses, buildings, remote offices and wide-area network backbones.

3Com is also shipping NetBuilder II, a family of solid-state flash memory products that are said to implement Transcend SmartAgents in the vendor's line of NetBuilder II bridge/routers.
The agents monitor traffic and error levels on 3Com hubs using Remote Network Monitoring and SNMP. A new autodiscovery feature automatically discovers bridge/routers.

Pricing for the NetBuilder software ranges from $350 to $2,000, depending on the features provided and platform. 3Com also announced a Windows-based Transcend application for managing its LinkBuilder stackable hub, priced at $495.

—Elisabeth Horwitt

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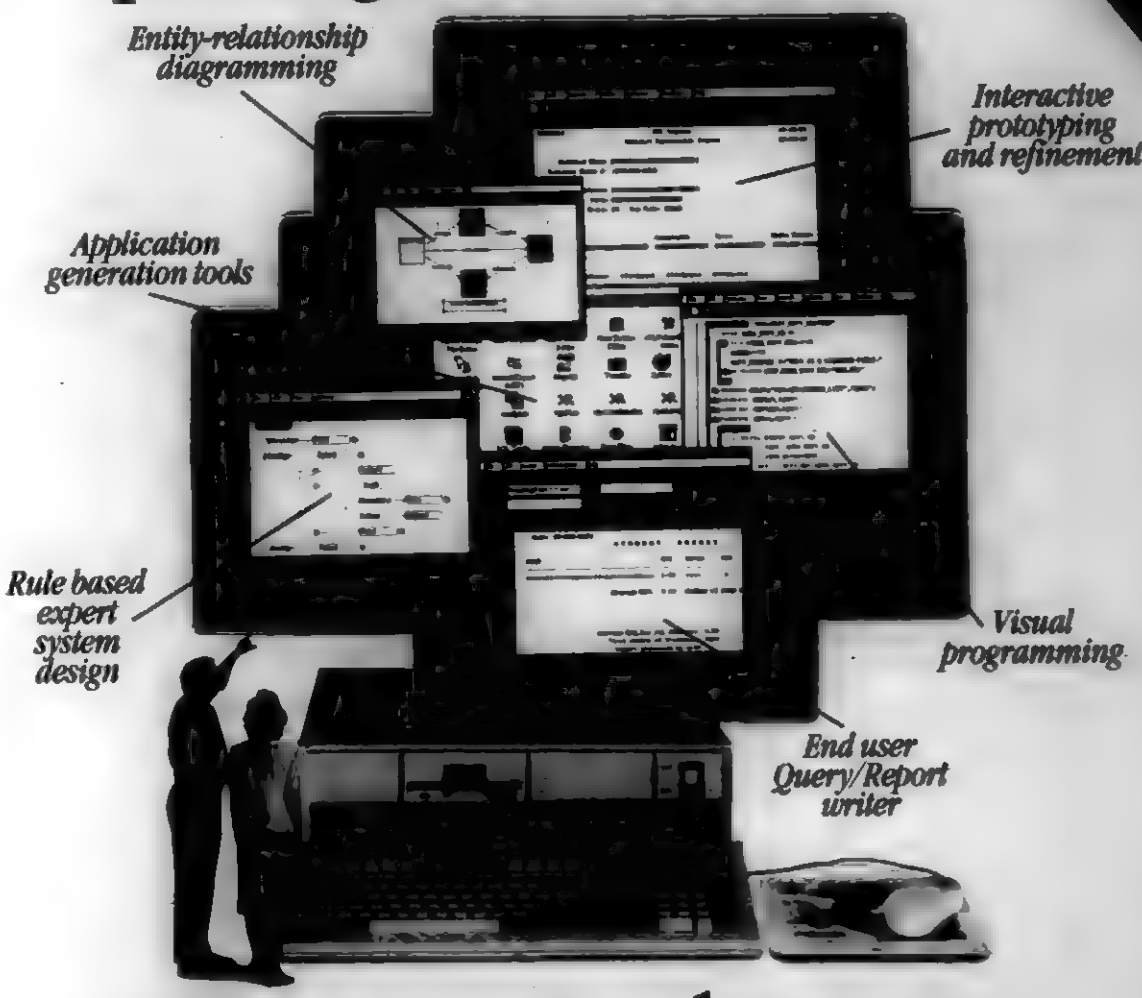

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'Everyman' videoconferencing services emerge

By Joanie M. Wexler
VENTURA, CALIF.

Though a century ago it was a technical wonder, the telephone has long been status quo on every corporate desktop. And in just a decade or so, the working world has quickly come to expect a fax machine in every office.

Next up on the taken-for-granted list could be commercial videoconferencing services in every neighborhood.

Nationwide retailer Kinko's Service Corp., teaming up with telecommunications company Sprint Corp., said recently it is building a commercial T1 (1.5M bit/sec.) videoconferencing and data network. The idea is to allow business people and consumers to dial up full-motion video meetings in Kinko's stores across the country.

Kinko's videoconferencing customers *can tune into bosses, business partners or Grandma*

Standards at work

Because of video compression standards spanning multiple vendors' equipment, customers will be able to connect not only with other Kinko's stores but also with 3,000 public and private videoconferencing rooms in 38 countries.

Kinko's, known for its desktop publishing and photocopying services, said its goal is to offer the services in 100 Kinko's locations by April and to have all 800-plus Kinko's stores outfitted with Picturetel Corp. desktop and low-end room systems in about two years.

The birth of retail videoconferencing services would represent another option in the corporate user's bag of networking tricks, business users and analysts said. For example, some said dropping into the local Kinko's for a meeting instead of continually traveling could help them use their time more efficiently and would complement the mobile nature of the emerging "virtual corporation."

"My gut feeling is that this has definite implications for me as a sales tool," said Michael Costantini, a product manager at Ingersoll-Rand Co.'s Process Equipment Division in Nashua, N.H., a Kinko's customer.

Costantini handles all the sales activity at the division. He said he is excited about the new avenue for meeting with existing and potential customers because it could free up time usually wasted in transit for more sales calls. Also, he said, he could afford to communicate more regularly with a key business partner in Japan.

To use the service, users set up a video link by dialing an 800 number; they can communicate with someone in another Kinko's store or in a public or private videoconferencing room somewhere else.

Kinko's has not yet nailed down pricing — or the initial implementation sites — but said it expects the regular hourly rate to be about $150.

When offered at regular rates, though, the service will not initially be priced for the average consumer, said Sarah Dickinson, an analyst at Personal Technology Research, Inc., a market research firm and consultancy in Waltham, Mass. She said that rather than running only high-quality videoconferences at 384K bit/sec., the company should consider 112K or 128K bit/sec. services to bring the price down.

"At least, consumers will probably want a choice" for a lower-quality link that is less expensive, she said.

On the corporate side, Costantini said he has determined that an average in-person sales call costs $150 to $250, "so Kinko's services would have to compete with that."

While Kinko's partner, Sprint, offers its own "drop-in" videoconferencing service, called the Meeting Channel, Sprint spokesman Norman Black said it uses higher-end gear and houses multiple monitors and cameras to accommodate large meetings.

By contrast, Kinko's, at least initially, would be providing smaller-scale and less expensive services. Also, Sprint's Meeting Channel coverage is narrower, with rooms in 65 locations across the country, compared with Kinko's goal of hundreds of store locations, Black said.

Network General offers long-awaited Rmon

By Elisabeth Horwitt
MENLO PARK, CALIF.

As a concession to users wanting lower-cost, standards-based LAN diagnostics and monitoring, Network General Corp. last week announced its long-awaited support of the Remote Network Monitoring (Rmon) standard.

Network General's most basic answer to that need is an Rmon PC agent, priced at $2,995, that sits on an I960-based PC board and monitors a given LAN segment. The agent can collect statistics from all nine Rmon groups, which include traffic and error analysis.

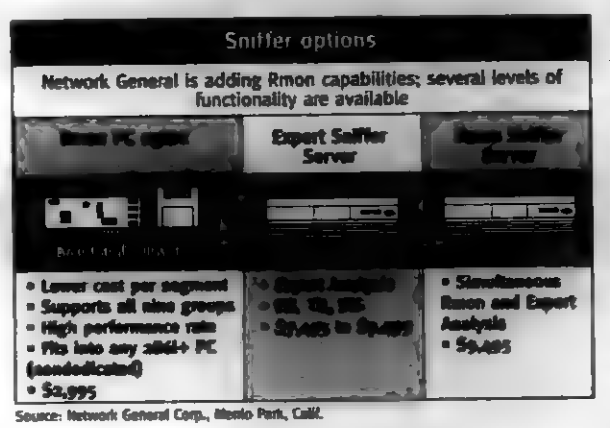
At that point, the agent sends the raw data to any network management platform to allow users to capture, display and analyze the information, said Pam Larese, Network General product manager.

The vendor also announced an Rmon version of its Distributed Sniffer Server product. Rmon information is first sent to the Sniffer central console, running on a Sun Microsystems, Inc. SPARCstation, which monitors multiple LAN subsegments in real time using a graphical user interface, Larese said.

The console can then send the data to the Rmon Sniffer Server, which translates the Rmon data into a format that can be processed by the Expert Sniffer software packaged with the Rmon server. The expert system program automatically analyzes incoming information, correlates it, figures out the most likely cause of a problem and guides the user through the process.

However, these features come at a cost. Each Rmon Sniffer Server starts at $9,495, including hardware that runs on a nondedicated 286 PC. In addition, users need the Sun SPARCstation console and software to act as a collection and display point, as well as the Rmon agents.

Network General can get away with high-end pricing because "no one beats them at decoding and analysis," said Val Sribar, senior research analyst at Meta Group, Inc., a Westport, Conn., research firm. However, Network General needs to catch up with LAN diagnostic software vendors that are busily teaming up with leading network device vendors such as Cabletron Systems, Inc. and SynOptics Communications, Inc., Sribar said.



Source: Network General Corp., Menlo Park, Calif.

The fruits of these alliances will be hubs and routers that monitor and diagnose their own LAN segments, Sribar said. Hewlett-Packard Co. is working toward this with its recent acquisition, Metrix Network Systems, Inc., whose diagnostic software runs across a variety of platforms, including SynOptics hubs, Sribar said. In the works is an HP application on OpenView that will collect and correlate data coming in from both Metrix's and HP's LAN diagnostic products, Sribar said.

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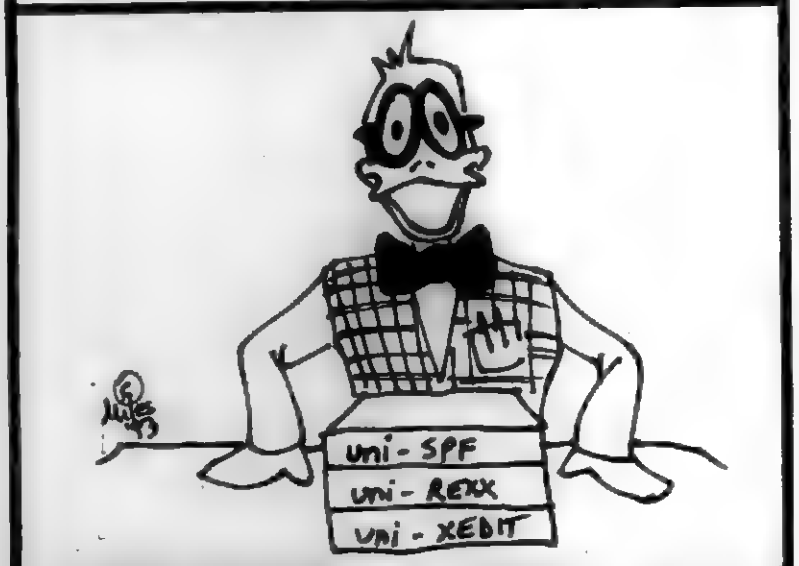

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Mike Keesee, Vice-President Planning

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The reaction at American Software to now working on the PC, Keesee points out, is very positive. "The developers will never go back to mainframe development again. No one here wants to return to mainframe development once they've had a taste of developing with Micro Focus Workbench.""

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GSA Contract Number GS00K93AGS6403.

Xyplex, Inc. has announced the 301 Port Switching Token Ring concentrator for the Network 9000 Routing Hub.

The product provides 12 RJ-45 Token Ring ports that support unshielded or shielded twisted-pair cabling and can operate at either 4M or 16M bit/sec., according to the Boxboro, Mass., company.

The concentrator offers dynamic error detection and two automatic ring wrap features.

The product costs $1,995.

▶ *Xyplex*
(508) 264-9900

Crescendo Communications, Inc. and **Hewlett-Packard Co.** have introduced 32-bit Extended Industry Standard Architecture (EISA) adapters that support HP Apollo 9000 Series 700 workstations using Fiber Distributed Data Interface (FDDI) over shielded and unshielded twisted-pair and fiber-optic cable.

The EISA-HP adapters provide 100M bit/sec. connections for an HP workstation to an FDDI or Copper Distributed Data Interface (CDDI) concentrator, according to Crescendo in Sunnyvale, Calif.

The product line includes the C320-HP CDDI EISA adapter, C321M-HP FDDI adapter and the C316M FDDI EISA and C325 CDDI EISA dual-attach options.

Prices range from $695 to $1,995.

▶ *Crescendo Communications*
(408) 732-4400

Linkon Corp. has introduced FaxPeak, an interactive voice response communications board with speech recognition and fax capabilities for Unix computers.

FaxPeak enables an organization to automate the delivery of information to its customers through a number of services ranging from fax broadcasting to fax-on-demand, according to the New York company.

Using one slot on a computer, FaxPeak can fax data and receive voice on up to eight different ports simultaneously.

The product also includes Linkon's LinkEngine multimedia communications board, fax and voice software.

FaxPeak is available for $2,995 for four channels and $4,995 for eight channels.

▶ *Linkon*
(212) 753-2544

Thomas-Conrad Corp. has announced the Sectra Network Management System, a report-oriented, Windows-based platform for network management.

According to the Austin, Texas, firm, Sectra was designed to accommodate multiple protocols and segments, exponentially increasing management needs.

The Sectra wiring hub supports Token Ring, Ethernet and Fiber Distributed Data Interface protocols. The company announced plans to provide a growth path to Fast Ethernet, Asynchronous Transfer Mode and other protocols as they appear.

The product is priced at under $5,000.

▶ *Thomas-Conrad*
(512) 836-1935

Siren Software Corp. has introduced Siren Mail, an Internet electronic-mail and fax communications center for open systems platforms.

The product offers the Open Software Foundation's Motif- and Windows-based character interfaces and uses standard TCP/IP and Unix mail transports, RFC822/MIME Internet protocols and fax servers to send mail messages and documents.

Siren Mail includes a built-in message editor that automatically formats the text of a message as a user enters it, according to the Menlo Park, Calif., firm.

A single-user license of Siren Mail costs $295, a five-user license $1,395 and a 10-user license $2,495.

▶ *Siren Software*
(415) 322-0600

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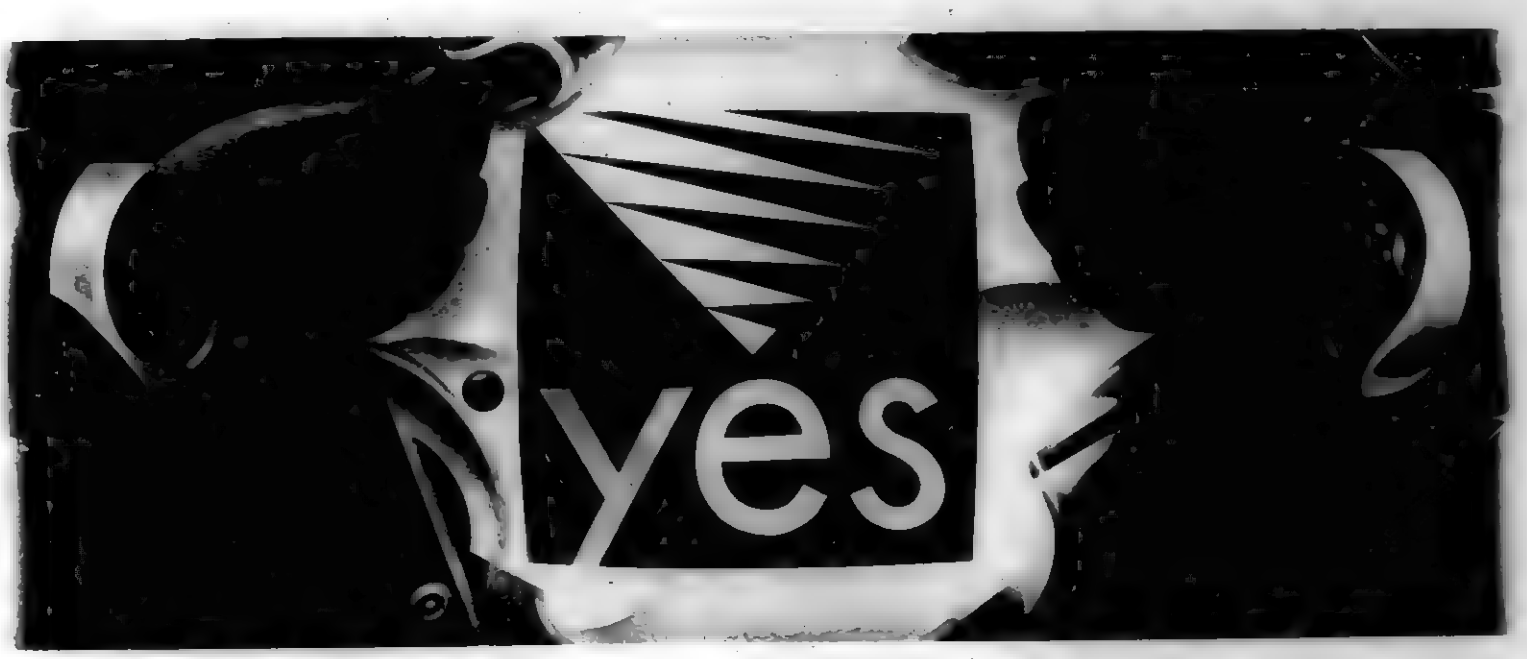

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Users gain cluster ability

By Thomas Hoffman
NAPERVILLE, ILL.

NCR Corp. recently added fault-resilient software to its product cache, providing NCR System 3400 and 3500 users with the ability to cluster as many as four servers to one another.

The package, dubbed NCR LifeKeeper FRS Clusters, supports the parallel server feature of Oracle Corp.'s Oracle 7. The parallel server is a single but distributed parallel database environment that enables users to run the same application across multiple servers.

Data sharing

LifeKeeper FRS Clusters features a distributed lock manager that allows the systems that are clustered to share information using the Oracle parallel server. The core package was designed to maintain a "heartbeat" between systems and, in the event of system failure, switches applications and communication interfaces to another system in the cluster.

The package is a follow-up to LifeKeeper FRS, a set of fault-resilient software that NCR introduced for its midrange computer systems last January. LifeKeeper FRS provides high-availability and failover between two systems, while the latest package secures data between two to four systems and additionally supports database clustering, according to Asif Naseem, manager of strategic planning and solutions services for NCR's midrange computer systems division.

IBM, Sequent Computer Systems, Inc. and Pyramid Technology Corp. have already introduced Oracle clustering software, according to John Morrell, research manager for Unix software at International Data Corp. in Framingham, Mass. However, NCR's LifeKeeper was designed with additional failover capabilities that competing products have not yet addressed, Morrell said.

Michael Garrison, manufacturing and industrial engineering manager at State Industries, Inc., said the Ashland City, Tenn., water heater maker plans to purchase the LifeKeeper package when it adds a second NCR 3450 server in the next six to 12 months. "We'll want fault-resiliency between those servers when we put the second [NCR] 3450 in, so we're already talking to NCR about LifeKeeper for that," Garrison said.

LifeKeeper FRS Clusters, which runs on 2.01 RAS of NCR's version of Unix System V Release 4, is priced from $9,000 to $40,000 per system. Early shipments have already begun, with general availability of the products slated to begin at the end of December.

NCR eyes software growth with new unit

By Thomas Hoffman
COLUMBIA, S.C.

NCR Corp.'s establishment of a dedicated software division is being viewed as an effort to unite diverse software efforts and to create the links necessary to carry out parent company AT&T's goal of a new portable computing environment.

The software division is also expected to lay the foundation for tighter development links with AT&T and Bell Laboratories, Inc. as AT&T moves forth with its plans to create "anytime, anywhere" portable computer software and products.

NCR's James E. Clark: *Competitive platform ports will be encouraged*

Software and services now make up more than 40% of NCR's annual revenue, or nearly $3 billion, according to Peter Kastner, a vice president at Aberdeen Group, a Boston-based market research firm.

However, although NCR's services revenue is growing at a faster pace than that of IBM, Digital Equipment Corp. and Unisys Corp., Kastner estimated that software sales currently account for only 7% of total revenue, or less than $500 million. This sales figure includes NCR's version of the Unix System V Release 4 operating system.

With the new software division, Kastner said he believes NCR will be better positioned to expand and develop its product cache. "NCR's software products have, to a certain extent, been languishing in different product groups. They may well do better in the full sunshine of their own product group instead of being shaded by bigger and more important product groups than they had been in," he added.

James E. Clark, who will head up the new software division, agreed. "We weren't getting the full thrust of the corporate might behind those efforts," he said.

Porting potential

For customers, the new division likely means NCR software will eventually become available on non-NCR hardware platforms. In addition to ongoing development efforts to migrate NCR software beyond its Unix environment to Microsoft Corp.'s Windows, Windows NT and IBM's OS/2, Clark said NCR plans to port its products to other platforms where user demand is strong.

"If there are enough customers who want that, [porting] will be done on a Hewlett-Packard platform, or Sun or IBM," Clark said.

Although Clark said the software division will focus primarily on product development for NCR's System 3000 platform, he added that competitive platform ports will be encouraged.

NCR, *page 105*

Client/server

Department store tackles inventory stockpiles

By Mark Halper
PLANO, TEXAS

Vivian Stephenson, vice president of MIS at Mervyn's department store, harbors no illusions of dismantling the mainframe operations that still run most of the company's business functions.

Mervyn's Vivian Stephenson: *The company is on target with its 1993 inventory reduction plan*

She does, however, see the wisdom of passing the data housed on the IBM ES/9000 mainframe down to a client/server system for processing on a Unix server and PCs, as evidenced by a new inventory management system that she estimates will help save the company millions of dollars this year.

"Mervyn's has the strategy to reduce inventory by $2 million to $3 million, and this is one of the tools that will allow us to do that," the MIS chief said.

After a four-month development period using KnowledgeWare, Inc.'s ObjectView development tool, the company launched its Planned Store Inventory (PSI) program last February on a 12-processor Sequent Computer Systems, Inc. Symmetry 750 Unix box housing an Oracle Corp. Oracle 7 database. Stephenson declined to say how much the company spent on hardware and software.

PC users download raw data from the mainframe into their ObjectView-based application, which transforms the data into a format recognized by a modeling application that resides on the Sequent box.

The ES/9000, meanwhile, continues to draw data that is updated daily from Mervyn's stores via a satellite connection.

Stephenson said the company is on target with its 1993 inventory reduction plan. Mervyn's senior technical analyst Steve Houston said the store runs about 26% of its inventory through PSI; he estimated that it may eventually use the system to handle 75% of its goods.

Reality check

In its early system development stages, Mervyn's ran prototype inventory management systems on PCs that simulated real-world merchandise movement.

Until last February, Mervyn's ran inventory management on a mainframe, which broke down demographic differences only by region, not on a store-by-store basis.

Much of the store's nonfashion menswear — items such as jeans, slacks and underwear — are on the system, Houston said, but fashion clothing is not yet. "They're harder to do because they change every three months," he noted.

Merchandising aid

The benefits of the new system are twofold because Mervyn's PSI also figures out exactly what merchandise is needed in particular stores, and when.

Before the retailer installed PSI, its approach to determining which items to ship where was practically a manual one, Houston said. Users would draw data off the ES/9000 using NCR Corp.'s 386-based Teradata database machines and the Focus fourth-generation language from Information Builders, Inc.

"They also used a lot of calculators," he recalled.

Mervyn's, *page 89*

Mervyn's tackles inventory stockpiles

CONTINUED FROM PAGE 79

The new precision merchandising translates into more sales — which Stephenson declined to estimate — and higher customer satisfaction because it increases the chances that consumers will find what they want to buy.

To illustrate the point, Stephenson noted, "We have 275 stores in 15 states, and we're trying to figure out how many red medium-size T-shirts to send to each of them, when you have different demographics in each."

Valuable information

The intelligence of the Sequent based PSI provides Mervyn's with such vital insights as to send lighter-colored shirts to Florida, helping the company avoid an overstock of red where red is not wanted, she said.

Since installing PSI, Mervyn's figures that it has scored at least a 96% success rate in having an item in stock when a customer requests it.

Meanwhile, Mervyn's client/server operation resembles its mainframe setup in one logistical sense: Mervyn's Sequent box sits far away from its Hayward, Calif., users, in a glass house with the ES/9000 in Plano, Texas.

Mervyn's moved data center operations to Texas two years ago because the old site, at the company's Hayward headquarters, sits squarely on a geological fault line.

Systems link

In Hayward, about 100 inventory control analysts operate PCs — tied together on a Token Ring network — that access the system via leased T1 lines running to Plano. An Interlink Computer Sciences, Inc. gateway in Plano provides the final link into the ES/9000's channels.

Houston said that developers spent arduous hours sorting out memory management conflicts between the PCs, which tie into the Sequent box over TCP/IP but also run Novell, Inc. NetWare for other tasks.

"Having the right merchandise in the right stores at the right time sounds simple, but it's difficult to execute," Stephenson said.

Still not a mainframe

Not everything is up to par. Stephenson noted that the system still lacks the sophisticated security and change management features the company has grown accustomed to in the mainframe world.

"Some of the things we got used to on the mainframe system are still in their infancy on the client/server side," she said. "We haven't had problems, but we don't consider them to be up to mainframe standards."

ON SITE

Mervyn's
Plano, Texas

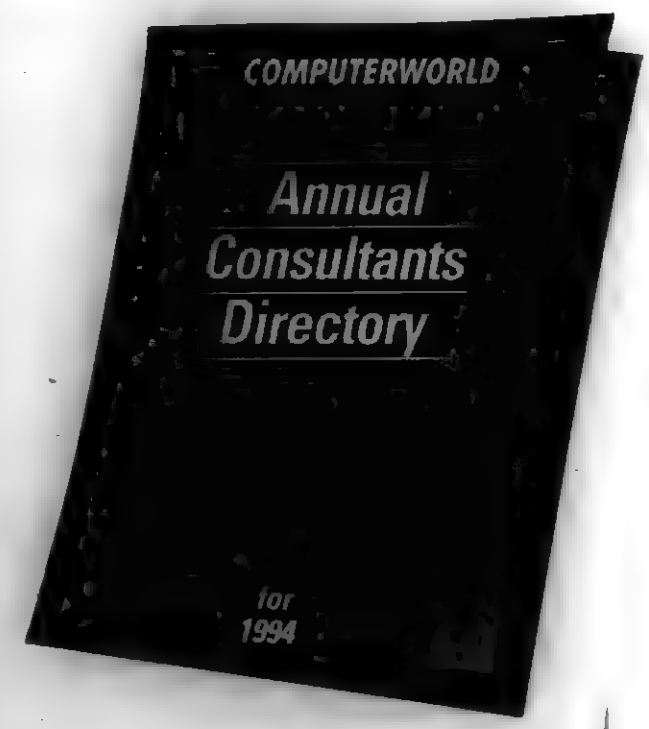
Challenge: To reduce inventory costs and increase sales by having the right products at the right stores at the right time.

Strategy: In-house-developed inventory management system that uses a Sequent minicomputer and Oracle database tied to a network of PCs on one end and a host mainframe on the other.

Status: On target to cut inventory costs by $2 million to $3 million this year. Company expects to control inventory with the new system by sometime next year.

Finding the Solution You Need Just Got Easier

Announcing Computerworld's 1994 Consultants Directory



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PORTRAIT OF THE IDEAL IS Manager

Digital's POLYCENTER Solution Paints a Better Alternative for Systems Management

The truth of the matter is this: your IS manager has only two hands. Of course, for your mainframe environment, that may have been enough. He or she managed a system that was located inside a single glass-walled computer room — probably right around the corner from his or her office.

That scenario is changing. And changing rapidly. Downsizing from mainframes, even large clusters, to small distributed servers linked with PC clients presents new and challenging system and network management requirements.

All the traditional functions IS once performed — maintaining corporate data integrity, maximizing performance, reducing costs, planning capacity, and more — must now be performed by individual users who may not be as experienced as IS professionals, and who could be located on the other side of the campus, the country, or the world.

Imagine a totally intelligent, self-managing environment of networked computing systems, working across an entire enterprise and all its multivendor system platforms and networks. This is Digital's POLYCENTER strategy.

Today, businesses that are moving to network-based, multivendor, distributed processing environments can turn to Digital for a complete systems and network management solution that's cost-effective. It's called the POLYCENTER solution.

Meeting the Challenges of Your Complex Computing Environment

According to the 1993 Sentry Market Research Survey, IS managers listed lack of systems management control as the greatest impediment to successful client/server implementation. In fact, the movement toward distributed computing brings with it a number of specific needs in the areas of:

- Storage Management
- Configuration/Change Management
- Fault/Problem Management
- Performance/Capacity Management
- Automation
- Security Management

Digital's full range of POLYCENTER products and services offers comprehensive solutions in each one of these areas. What's more, based on industry standards, the POLYCENTER solution is an integrated and open approach to managing enterprise systems and distributed networks, including those based on OpenVMS, OSF/1, ULTRIX, other UNIX variants, IBM MVS, MS-DOS, or Windows NT operating systems.

And as needs and technology change, so will POLYCENTER offerings be enhanced to meet all your business requirements — today and in the future.

Three Requirements — Three Solutions

Three POLYCENTER products that have been newly enhanced include DEC Network Save and Restore (DECnsr), POLYCENTER System Census, and POLYCENTER Scheduler. Each product addresses an area of management made more complex as a result of the move toward a client/server environment.

For Storage Management, You Need DECnsr Software

Storage management means making sure information is protected as well as quickly retrievable.

In a mainframe environment, the disk drives are all in one place — making the process of backing up data relatively easy to monitor and control. However, in a client/server environment, you're dealing with a variety of PCs and workstations. Users have disk drives right on their desks, and the information they keep on these drives is often critical to the company. Thus, backup is not only a good idea, but also essential. Yet, what are the chances that every user will back up their data every day?

With DEC Network Save and Restore, backup is automatic — and nothing is left to chance. No matter where data resides in the corporation and no matter which desktop client that information resides on, DECnsr software provides backup services either to a single system or to a group of systems on the network, and retrieves data from backup copies, when needed.

Most important is the fact that DECnsr software is one of very few backup solutions that offer support for a wide range of platforms including those of Digital, IBM, Hewlett-Packard, Sun, and others, as well as DOS platforms.

In addition, DECnsr software provides easy backup, restore, and fast file location operations, simultaneous output to multiple devices, and media management index for tracking tapes, among many other capabilities.

The benefits of DECnsr software are clear. You can expect not only a substantial decrease in lost data and lost time but also a dramatic increase in data integrity.

Configuration Management Made Easy with POLYCENTER System Census

Configuration management essentially means knowing what assets you have, where they're located, and in what condition.

In a mainframe environment, an IS manager simply has to walk into the computer room. But, it becomes more complicated when you're responsible for 50, 100, 500, or more multivendor systems distributed throughout the country or around the world.

Through three types of modules — data collection agents that reside on the network and collect information on their particular systems, a data consolidator that manages and updates a central database of all agent information, and a graphical user interface for easy identification of objects in the central database — POLYCENTER System Census software automatically gathers and displays system configuration information quickly, clearly, and accurately.

Information that is routinely available upon request includes:

- Hardware data, such as processor, memory, disk, tape, print server, adapter, and controller
- Software data, such as name, version, type, and license for operating system and layered products

continued

continued

- Logical structure data for VAXcluster systems (OpenVMS specific), disk partitions (ULTRIX specific), queues, and users

What else can the POLYCENTER System Census do for you? It can increase productivity by freeing scarce operation resources, plus reduce costs by uncovering any configuration redundancy.

POLYCENTER Scheduler Offers Increased Automation Functionality

Increased automation of business operations can translate into higher productivity, better service, and lower costs.

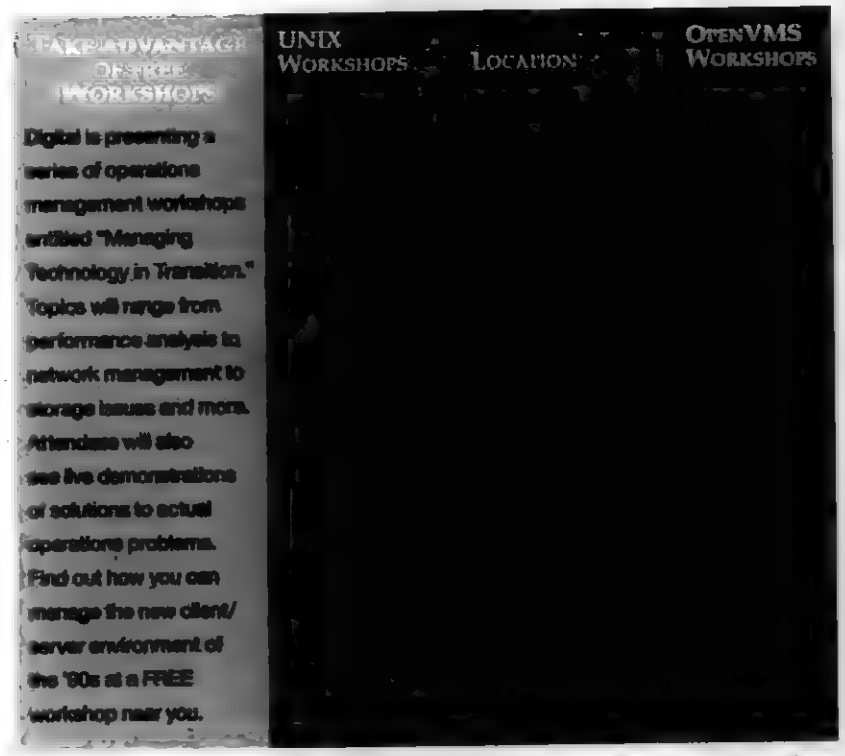
But automating tasks within a client/server environment is a tremendous undertaking for IS managers. Automating one mainframe system is not difficult compared to the process of automating tasks on many different systems distributed on the network.

Digital offers you the solution — POLYCENTER Scheduler. A production scheduling application that operates across LANs and WANs in a mixed OpenVMS, ULTRIX RISC, Windows NT, or DEC OSF/1 AXP environment, the Scheduler automates monitoring, scheduling, and repetitive applications such as payroll, manufacturing, resource planning, and financial consolidations.

It accomplishes all of this through a server module that keeps track of all the time elements involved (contingency plans, calendar dates, hours/minutes, etc.) and through client modules located on the network that actually run the tasks.

Digital's POLYCENTER Scheduler can help you cut error rates of production jobs, avoid costly reruns, reduce slack time between jobs, maintain job integrity through error recovery, plus much more. The bottom line? Greater productivity and even greater savings for your business.

For details on workshop registration, or to request a copy of the "POLYCENTER and Enterprise Information Systems Management" report, prepared by the Aberdeen Group, call Jill London at 800-457-8211. ■



TALK ABOUT A COMPLETE MIGRATION SOLUTION

Digital Gives You the Prime Example

DIGITAL OFFERS YOU A WAY TO PROTECT YOUR INVESTMENT IN PRIME COMPUTERS. THROUGH OUR COMPREHENSIVE SET OF MIGRATION SERVICES YOU CAN MAKE A TECHNOLOGY TRANSITION THAT'S RIGHT FOR YOUR COMPANY.

The economy has taken its toll on computer suppliers. However, there is a "light at the end of the tunnel" for those suppliers that have the ability to respond quickly to customer business needs. Digital is one such organization — finding new opportunities to help companies respond to today's business challenges.

But, where does that leave you? Or, more important, where does that leave your current computing investment?

A glance at today's headlines shows some computer companies consolidating and redefining their products and services to better meet your needs. Digital has been listening carefully to your concerns and is prepared to help.

How? By offering you a long-term, stable computing environment, a 25-year architecture with Alpha AXP, database and graphics capabilities, and a clearly defined path to get there. Together with recognized software vendors, Digital will provide the hardware products and software conversion tools you need to migrate to VAX VMS, Alpha AXP running OSF/1 or OpenVMS, ULTRIX on DECsystems, or SCO UNIX on Intel.

In short, we can provide you with a complete set of migration solution services.

Good News for Prime Customers

To remain competitive in today's market, businesses must anticipate their computing needs. Companies currently dependent on Prime technology are facing several challenges, including when and how to:

- Upgrade current technology without losing the entire investment in their Prime-based solution
- Move their business applications to a computing architecture that meets their open systems requirements
- Plan the migration to a new platform within a timeframe that makes good business sense and is easy to implement
- Implement a client/server strategy
- Contain or minimize operation costs

In spite of these challenges, there is good news. Through its investment protection program called Digital Solutions for Prime, Digital offers Prime customers a clear growth path to 21st century computing.

Simple, Practical Solutions

Whether your business goal is migration, coexistence, technology upgrading, or containment of operation costs, Digital has the consulting experience and tools you need today. In fact, our Solutions Integration Unit — along with our Independent Software Vendors — was on hand at the National Prime Users Group Conference recently to demonstrate Digital Solutions for Prime on the Alpha AXP platform.

Companies previously dependent on Prime have transitioned easily to Digital platforms because of all we have to offer, including:

- Prime migration/conversion consulting experience and extensive tool set
- A choice of operating system environments such as PICK, OSF/1, OpenVMS, ULTRIX, and SCO UNIX
- An unparalleled selection of software applications for each of these operating system environments
- Multivendor systems and network service

What's more, Digital offers unbeatable price/performance for a full range of systems, from the desktop to the data center. For companies considering Digital for the first time, we will cut your Prime maintenance costs significantly.

For information on Digital Solutions for Prime, call 508-467-6178. To schedule a multivendor service assessment, call 800-332-4636 and request a Digital representative in your area. ■

Imagine the best solutions for your business needs.

StorageWorks™ Product Family

WHAT YOU WANT IS WHAT YOU GET

Introducing the StorageWorks product family — Digital's giant step forward in the quest to offer cost-effective, open storage solutions. And the credit goes to you.

Recently we started talking — and listening — to our customers through a number of different avenues including surveys, on-site visits, and product direction forums. You spoke candidly about your business situations, your needs, and your expectations.

As a result of these discussions, Digital arrived at a computer storage strategy that answers all your requirements. The StorageWorks product family is the result of that strategy.

In brief, Digital's StorageWorks products can provide you with the flexibility to attach industry-standard storage devices across SCSI-based systems for CI clusters. In the future, this flexibility will extend to DSSI clusters and FDDI rings. Easily integrated with our current SDI/STI and RF/TF products, the StorageWorks products enable you to choose solutions that strike an ideal balance of performance, availability, and cost for nearly every storage requirement.

It's Yours for the Asking

Listen to the people who buy the products. It's a simple but important philosophy. And once we listened, the rest was easy.

You asked for a number of must-haves for storage solutions in the downsized business environments of the '90s. Not only should this new generation of storage be based on open standards, but it should be:

- High-performance
- Flexible
- Cost-effective
- Reliable
- Modular
- Easy to configure, to maintain, and to grow

And, most important, you sought to protect your current investment in storage and your new investment well into the future. In other words, you asked that we make storage work not only for Digital platforms but also for a variety of multivendor platforms.

With StorageWorks products, Digital has begun to fulfill all these business requirements. We've recently introduced our first line of StorageWorks products running on Digital platforms. And, as we continue to stay close to customer concerns, this product family will soon evolve into cost-effective multiplatform solutions for your ever-changing, multivendor environment.

What is the StorageWorks Solution?

We've all ordered a hamburger just the way we want it — the works, no pickles, a little onion, or just a dab of mustard. Imagine doing the same with storage. Imagine acquiring a storage solution that is customized specifically for your business.

The StorageWorks family of products implements a complete subsystems strategy that enables you to obtain the exact storage you need by choosing from an interchangeable set of components. These include storage devices, controllers, power, packaging, interconnects, cache, and software.

This modular approach makes it possible for you to mix and match devices and components in almost unlimited combinations. What's more, by designing these storage products so that you can replace every component yourself, Digital has achieved a breakthrough in storage cost-of-ownership.

It Begins with Building Blocks

SCSI-based storage devices such as magnetic and solid state [redacted] disk drives, tape drives, and CD-ROM drives — housed within carriers — are the basic building blocks of StorageWorks subsystems. These building blocks are easily swapped in to or out of StorageWorks shelves and enclosures when you want to expand or reconfigure your data storage capability.

Digital's family of StorageWorks controllers will optimize the performance of these building blocks through unique features that enable SCSI devices to achieve "bet-your-business" levels of availability, including the benefits of RAID (Redundant Array of Independent Disks) technology.

Key StorageWorks enclosure components include:

Building block shelves

[redacted] Supporting multiple building blocks either in cabinets or at deskside when enclosed in a pedestal kit.

Controller shelves

[redacted] Supporting electronics so as to provide enhanced capabilities to devices operating on multiple SCSI buses.

Datacenter cabinets

[redacted] Holding building block and controller shelves plus tape backup subsystems to provide complete storage solutions.

In addition, desktop expansion units enable PCs and workstations to use the same building blocks you configure on larger systems. And redundant elements and battery backup can be added at any time to build highly available configurations.

The Future of StorageWorks Products

As StorageWorks solutions extend beyond Digital platforms to focus on multivendor platforms, we will place increased emphasis on developing business partnerships to enhance our expertise on a variety of non-Digital platforms.

We will also continue to measure our products against those of our competition. If we need to change direction to stay ahead of customers' needs, so be it.

After all, Digital intends to be a leader in the storage solution business. With your input and our expertise, it won't be very long before that goal is achieved.

To learn more about Digital's StorageWorks product family, call 800-DIGITAL (800-344-4825), reference code BFF, and ask for a FREE StorageWorks information diskette. ■

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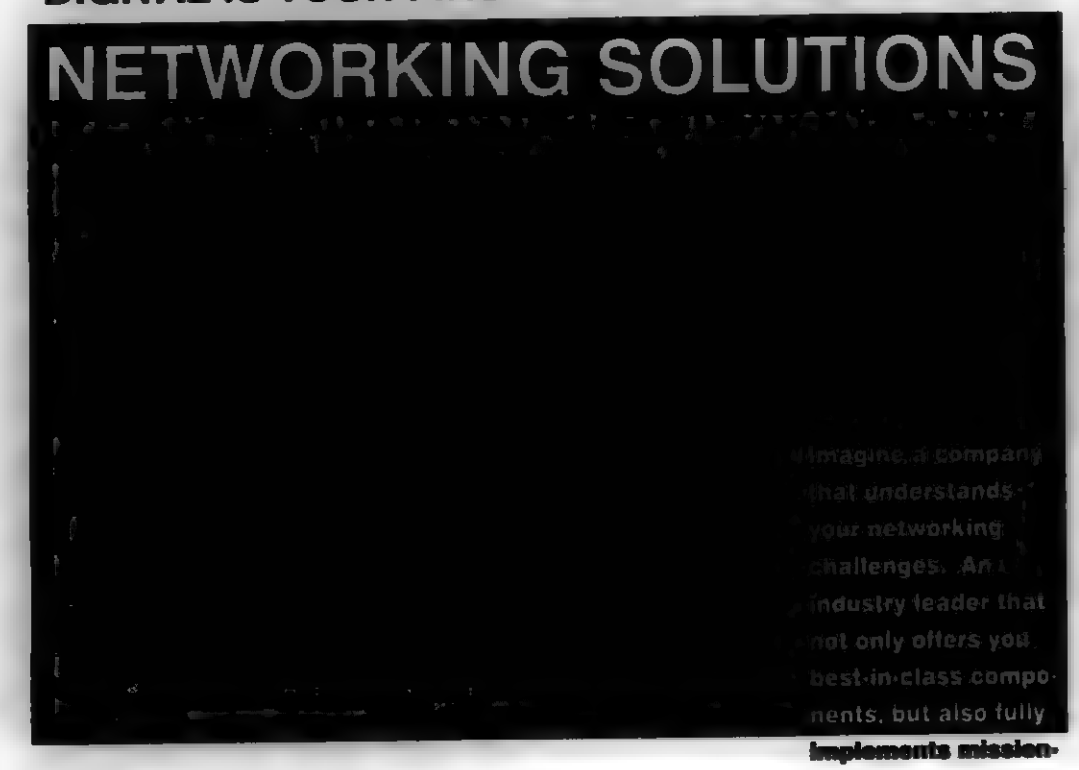

implements mission-critical networking no matter how complex your multi-vendor computing environment. If you're imagining Digital, you're right.

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- High-performance, reliable backbone routers with leadership TCP/IP performance
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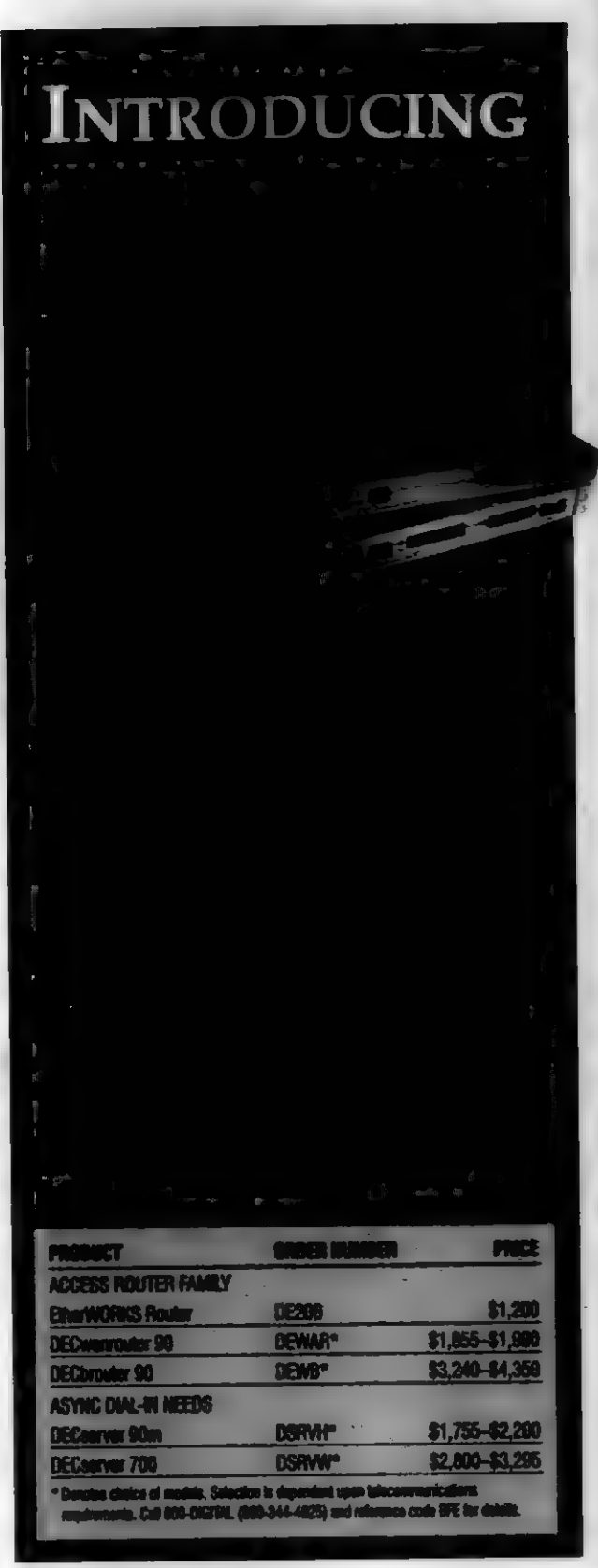
For more information on any of Digital's family of networking products and services, call 800-DIGITAL (800-344-4825) and reference code BFE. ■



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Hired to hack

Companies hire the Price Waterhouse team to hack into their systems and evaluate weak links

By James Daly
NEW YORK

If you want to know how strong a lock is, try to crack it. How well-built is that rope? Run a strength test.

The same principles hold true for information systems security, where a whole range of people are ready to hack into your system and tell you where the weak links are.

Among the most widely respected security experts is a team at Price Waterhouse's Management Consulting Services, which for the past few years has engaged in what are known as "Data Security Penetration Studies." Business has been good, said partner Jonathan Harris, because as networking spreads, so do a system's vulnerabilities.

"People are going after your system every way imaginable: dedicated lines, public phone systems, local on-site terminals," he said.

The Price Waterhouse team is a sort of do-it-yourself hacker unit. Comprising three or four people, the team attempts to penetrate computer environments by going over, under and around every security system you throw at it.

Although the team is typically hired by systems security, many times it is brought in at the behest of a senior executive. The computer department will not be told of the penetration study in advance. "It keeps people on their toes," Harris said.

Harris said the "hired hackers" approach the task on four levels: as outsiders with no company information; outsiders with some company information (such as an ex-employee bent on destruction); insiders with no company information; and insiders with standard company application programmer access.

The penetrators do not actually sport criminal records because clients are typically uncomfortable with that idea, Harris said. They are full-time Price Waterhouse employees. "We don't use stringers," Harris said. "The work is too sensitive, and we can't let that sort of knowledge get outside of our company."

A typical study by Price Waterhouse includes carefully designed security penetration activities of selected mainframe, midrange and desktop environments. Fees range from $40,000 to $120,000, and the study can take anywhere from two to eight weeks, depending on the attack scenarios and the number of sites involved.

Although each study is unique, Harris said he finds the same weak links in many sites. "It's usually pretty easy to get into a LAN because so many people use easily guessed passwords or the default password," Harris said. "And most LANs contain gateways into other environments. So once you're in, you have the keys to the kingdom."

The service conducts reviews of current security practices and then recommends a security plan. Upon completion of the study, Price Waterhouse provides the client with an evaluation of the level of information available to a potential hacker as well as the security measures that should be in place.

Such systems penetration services from established firms have drawn the derision of ex-hackers who have gone straight and provide similar services.

"These guys are not out there playing in the keyboard jungle day in and day out," said Ian Murphy, an ex-hacker who provides a security penetration service as president of IAM/Secure Data Systems in Norristown, Pa. "They get all their tips from manuals and briefings. They're not out there going through dumpsters, chatting on the hacker bulletin boards and getting the real story on what's vulnerable like we are."

Not true, said Harris, who claims his team is skilled in even the most minute technical details. "The main question you want to ask with any service like this is, 'Do you trust these people?' "

HP readies Image/SQL indexing

By Mark Halper
SAN FRANCISCO

Hewlett-Packard Co.'s database group last week outlined modifications to its Image/SQL database that will accommodate a highly desired indexing feature for the proprietary database.

But that feature will not be delivered for a year, and users will have to wait for other improvements they hope to see in the database. These include a Data Description Language (DDL) that would give the hierarchical database more of a relational feel. DDLs permit users to restructure data sets without unloading and loading data.

In the meantime, Jim Sartain, Image/SQL laboratory manager, said HP is modifying the database so that b-tree indexing programs from Dynamic Information Systems Corp. in Boulder, Colo., and Bradmark Technologies, Inc. in Houston will work with the database's SQL interface. The company will, however, stop short of actually bundling a b-tree feature into Image/SQL.

B-tree indexes slash the time it takes for users to execute generic searches in a database, such as when looking for all mentions of a particular town that may be scattered throughout voluminous records.

Until the new software is delivered, Bradmark's and Dynamic Information Systems' b-trees can use only a more traditional interface, effectively nullifying the SQL implementation of the database and relegating users to flat-file queries, Sartain said. That will be fixed.

Users have voiced a strong interest in b-tree indexing for Image/SQL. SIGimage, a special interest group related to the HP user group Interex, declared the b-tree feature its top request during a conference in Birmingham, England, last summer.

Image/SQL, formerly known as Turboimage, was written exclusively for HP's HP 3000 multiuser system and that machine's MPE-IX operating system.

Last December, HP announced it was taking a large step toward making Turboimage relational by adding SQL to the program [CW, Dec. 14, 1992]. That move pleased HP 3000 users who had long complained that HP was offering a relational database, called Allbase, to HP 9000 Unix users while neglecting the relational needs of HP 3000 users.

Image/SQL is currently in beta sites, where users are implementing DDLs from third-party suppliers including Adager Corp. in Sun Valley, Idaho, Dynamic Information Systems and Bradmark.

Adding a DDL to Image/SQL is one of several enhancements that HP has "under consideration," Sartain said. HP is also looking into providing on-line backup routines, support for binary large objects and two-phase commits, he said. The company plans to poll users' interests at the Interex conference.

Wirt Atmar, president of AICS Research, Inc., a University Park, N.M., Image/SQL report writer vendor, pointed out that if HP is to rightfully claim Image/SQL as a relational database, it must add an intrinsic DDL to the program.

"People have confused the word relational and SQL," he said.

Ken Sletten, project engineer at the Naval Undersea Warfare Center in Keyport, Wash., observed, "Right now, you can't add an index or drop an index on the fly — basically, you can't manipulate the structure of your database on the fly."

Alfredo Rego, president of Adager, noted that even though third-party vendors provide a DDL, they do not always conform to SQL standards. For instance, Adager's DDL is not written in SQL syntax, so it uses a different command vocabulary than what SQL prescribes.

Rego said the syntax difference is minor, but he and others agreed that users want a program that conforms to SQL standards.

Answering the call

Users praised HP for generally heeding the call of irate HP 3000 users who had complained about the firm's past failures to develop relational qualities for Image/SQL.

"HP has come a long way since the Boston Tea Party," Sletten said, referring to a 1990 Interex meeting in Boston at which HP 3000 customers staged loud protests demanding relational enhancements to Image/SQL.

Trying to please

HP asked users last week if they would like Image/SQL on the HP 9000 Unix platform — a move that would help HP retain accounts migrating from the HP 3000 to Unix. HP estimated that Image/SQL is loaded on all installed HP 3000s, which number 55,000. It declined to estimate the installed base of its Allbase database, which it sells for its HP 9000 Unix system and also for the HP 3000. Some users said they think HP will combine the two offerings.

Oracle chief sets delivery for Media Server

By Kim S. Nash
ORLANDO, FLA.

New versions of Oracle Corp. databases capable of manipulating video and sound are anchoring tests of interactive TV applications at Bell Atlantic Corp. and US West. Oracle's so-called Media Server products are expected to be on hand this week at International Oracle Users Week.

Experiments are in the works with Bell Atlantic and US West to bring applications such as home shopping and video on demand to homes within the telephone companies' calling areas, according to Oracle executives.

Media Server is an umbrella term for massively parallel database modules designed to handle images, full-motion video and CD-quality sound, according to Larry Ellison, Oracle's chief executive officer. Pieces of Oracle Media Server, including an object-oriented development tool kit for building interactive TV programs, are due to ship to developers in January, Ellison said.

Media Objects, which marks Oracle's entrance into object-oriented technology, also contains a real-time operating system and user interface designed to run on set-top boxes. Set tops are computer-style boxes that sit atop TVs to help home viewers navigate the interactive world.

Set-top boxes running Media Objects will be able to talk to DOS and Macintosh operating systems, Ellison said, adding that the product will require 2M bytes of disk space.

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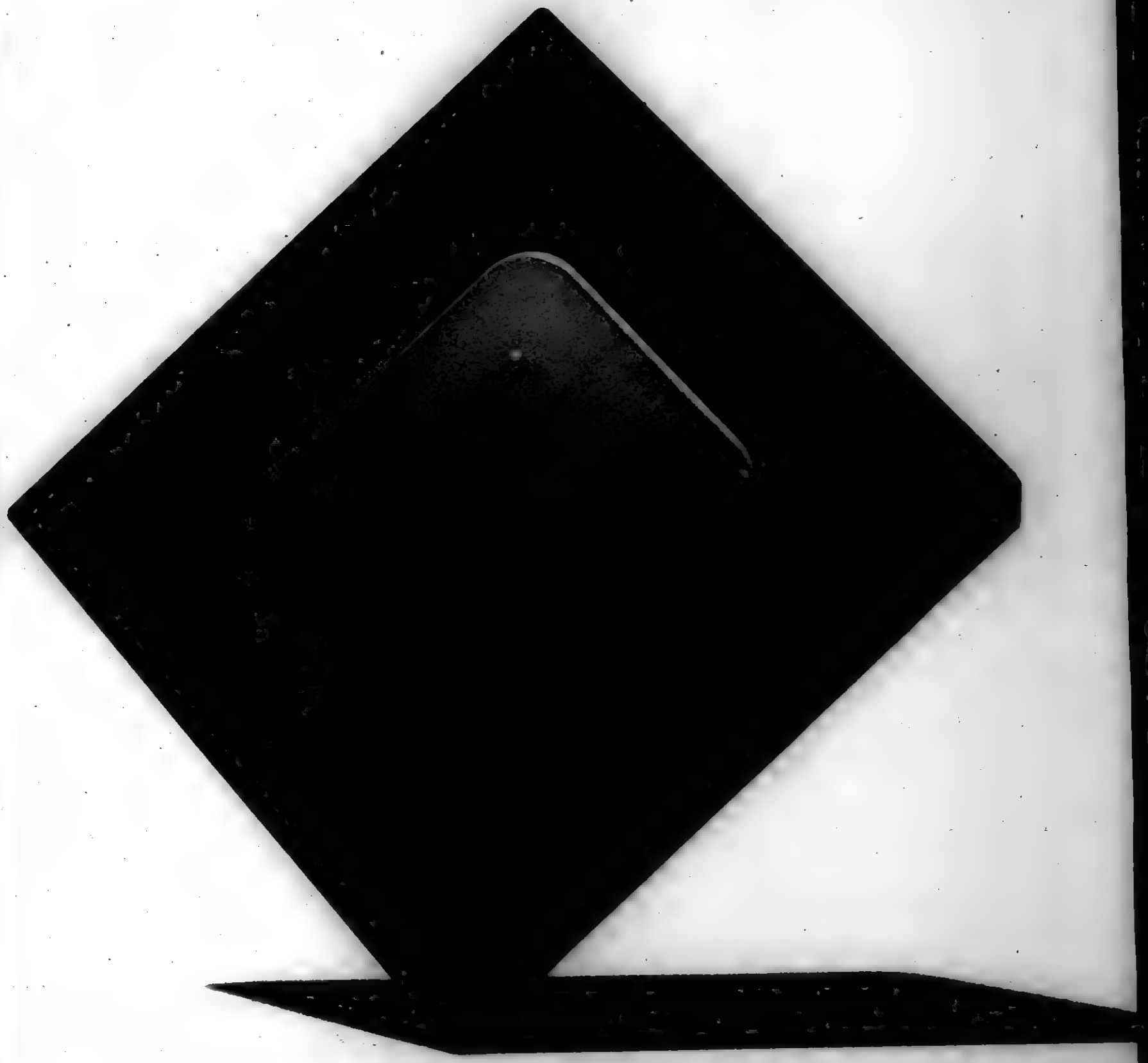

So before you buy a computer to run Windows NT, be sure to think about what's inside. After all, it only makes sense to choose the quickest processor that processed the program.

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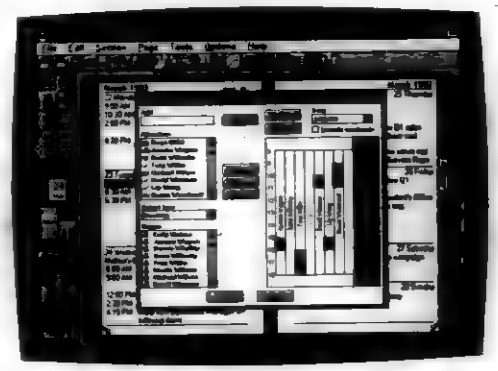

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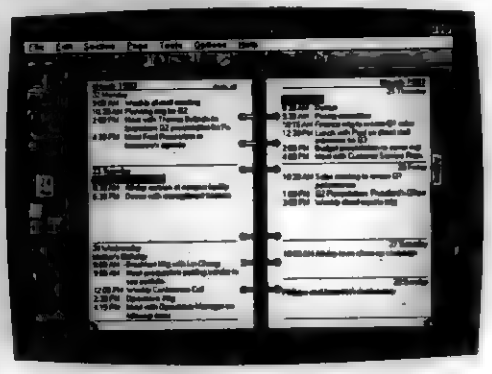

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NACCB

German firm heads to client/server era

By IDG News Service
KIEL, GERMANY

For Krupp Mak Maschinenbau GmbH, outsourcing marks the beginning of the client/server era.

The company's in-house profit center, Mak Data Systems (MDS), ran Krupp Mak's information systems operations until recently, when it placed that responsibility in the hands of a Dortmund-based data center that belongs to the Hoesch-Krupp group. At the same time, Krupp Mak began work on a decentralized architecture across all divisions of the mechanical engineering company.

MDS is determined to abandon in mid-1994 its 55 MIPS Hitachi, Inc. mainframe-based data center, which has supported IS services for 30 years.

"We know by now that the most economical solution is to get rid of the mainframe," said Hans-Ulrich Nelte, director of Krupp Mak's IS unit and chief at MDS. He estimated that the transition to a decentralized platform will take two to three years. "When we began thinking about a more economical IS solution three years ago, we were not aware that eventually we would go client/server.... Initially, we were considering the outsourcing route."

After two years of negotiations with outsourcing companies such as Electronic Data Systems Corp., Debis and NIS Kiel (an IS subsidiary of Preussag and HDW), Hoesch-Krupp decided to consolidate the IS activities of all its companies at the one Dortmund site.

Move to client/server

Hoesch-Krupp also decided in mid-1992 to set up a client/server architecture to be implemented in value-added Krupp Mak divisions. These include operations such as manufacturing, maintenance of production facilities, materials management and control, quality management, product development, marketing and sales, customer service and administration.

Krupp Mak considered a contract with an outsourcing company, but under a new Hoesch-Krupp policy the firm could tap an outsourcer to handle computer operations only for a limited, three- to four-year transitional period.

"Had we decided to keep our own IS operations running until all new solutions are implemented, we would have been faced with the mounting costs of the new environment, in addition to regular expenses incurred by operating our own data center. If you decide, however, to pass the entire data center into the hands of an outsourcer, you can cut these operating costs step-by-step, as the new system is being implemented," Nelte explained.

Of course, the outsourcer must accept the fact that the scope of services it is supposed to provide diminishes as the project proceeds. As more parts of the decentralized solution are finished, a firm should be in a position to cancel the corresponding "central" services provided by the outsourcer.

Such an approach, however, is not really to the liking of major outsourcing companies such as EDS or Debis. Their favored contract periods usually range from five to 10 years. Only NIS Kiel offered a contractual model that was comparable to the one drawn up by the Dortmund-based data center, Nelte noted.

Transition phase

In mid-1994, operations will be handed to the new site in Dortmund. Both Krupp Mak and MDS' external customers will then get their IS services on-line. Concurrently, the company will start building the new architecture, introducing new solutions piece by piece. At the end of the transitional phase, Nelte said he expects to have four IBM RS/6000 machines — in as yet unspecified configurations — acting as servers under IBM's AIX operating system. Various types of PCs will act as clients, taking the place of the current 500 PCs and 3270-type terminals.

MDS is banking on various software vendors. It chose SAP AG's R/3 package for commercial tasks and human resources. "Yet administrative functions are not really our key concern," Nelte said. "In fact, in implementing R/3, we found a solution to a problem that has actually long been resolved."

For value-added processes, Krupp Mak will use Software AG's Prodis Unix-based production control application, which the company considers to be a "perfect alternative product to R/3."

"Prodis is a core solution which allows us to adapt the software to our specific needs very easily," Nelte said. In areas such as product development, marketing and customer support, Krupp Mak will continue to use its own homegrown solutions. Software AG's Adabas will remain the central database.

The firm's affinity to SAP as well as to IBM — because MDS acts as distribution partner in the RS/6000 business — is partly because of long-standing business relations. Meanwhile, a number of MDS' clients are external customers, and the firm generates 45% to 50% of its sales revenue by offering solutions for Adabas and Software AG Natural environments.

The road ahead

It will take two or three years before all IS services are running on a client/server basis, Nelte predicted. The company expects to save some $1.06 million, or 30%, per year over today's IS operating costs. Nelte would not detail the project's cost.

"So far, we have calculated the costs for only two of the areas, and since the server configuration is still unclear, we are not able to be specific on the overall costs of the project as yet," Nelte said.

NCR software unit's efforts

CONTINUED FROM PAGE 79

"I think it's important to win over the hearts, souls and business of NCR's brethren, but I do not feel bound in any way to that environment," Clark said.

Clark also said he views the software division as an additional opportunity for NCR to implement AT&T's vision of converging computing and communications.

Software and services make up more than 40% of NCR's annual revenue, or nearly $3 billion.

Since AT&T acquired NCR in 1991, the two have worked closely with AT&T's Bell Laboratories research unit to develop technologies that can facilitate remote communications.

"I believe we'll be an important component of 'Anytime, Anywhere.' We think that's where the world is going," Clark said.

Software Engineering of America has announced Total Report Management Solution (TRMS) Release 4.3, an end-user/report management component of the firm's automated output management system Savrs/Trms, for MVS environments.

According to the Franklin Square, N.Y., company, the product features an on-line index and table of contents that enables users to quickly locate specific information in a report by selecting from a customized on-line list.

Scrolling or searching through the report by character or page is not necessary.

When there is a change in the value of designated fields on the report-image page, a Break On feature automatically creates distribution.

TRMS now supports records of up to 32K bytes in size.

Prices for TRMS range from $27,500 to $55,165.

▶ *Software Engineering of America*
(516) 328-7000

American Software has announced the AS/400 Client Series, workstation-based products using the IBM AS/400 as a server.

The series consists of a family of client applications and decision-support productivity tools for increased functionality and network capabilities for distributed processing among servers.

The tools were also designed for Microsoft Corp.'s Windows environment and Windows NT operating system.

According to the Atlanta-based company, the series encompasses a range of workstation-based application capabilities interacting with enterprise databases residing on one or more AS/400 enterprise servers.

Workstation-based functions such as customer service, accounting, purchasing, distribution/logistics and manufacturing are areas of focus for the product.

Pricing for the series is $100 to $600 per component.

▶ *American Software*
(404) 261-4381

Grafpoint, Inc. has announced GT-320 for Windows, GT-340 for Windows and GT-X 340, three Digital Equipment Corp.-style terminal emulators.

GT-320 for Windows is high-performance VT320 terminal emulation software for alphanumeric application users. GT-340 for Windows emulates VT340 terminals and can be used for Regis-style graphic applications.

According to the San Jose, Calif.-based company, GT-X 340 is an X Window System client application supporting Regis, Digital and VT320 alphanumeric terminal emulation on an X display.

Pricing begins at $195.

▶ *Grafpoint*
(408) 446-1919

SAP America, Inc. has announced the availability of Oracle Corp.'s Oracle 7 database for SAP's R/3 client/server business applications software.

According to the Philadelphia-based company, R/3 applications use Oracle's technology specifically to ensure stability and reliability in the management of large data sets and in the processing of large transaction volumes within a client/server environment.

Users may benefit from Oracle 7 features that include stored procedures, a parallel server option, triggers and transparent distribution with two-phase commit.

Pricing ranges from $19,000 to $76,000, depending on the number of users.

▶ *SAP America*
(215) 521-4500

Novadyne Computer Systems, Inc. has announced Reality-Check, an on-line software utility designed for the McDonnell Douglas Corp.-based Reality line of minicomputer and super minicomputer systems.

According to the company, which is based in Santa Ana, Calif., the software is a multifunction system management tool that continually monitors system resources, providing critical data for system management and automatically enhancing system integrity.

Pricing for the utility is $1,595.

▶ *Novadyne*
(714) 566-2000

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Wang to open Pace tools

By Craig Stedman
LOWELL, MASS.

Wang Laboratories, Inc. plans next month to add Open Database Connectivity (ODBC) support to the query tool in its Pace for Open Systems application development product line. That will represent the first step toward decoupling the Pace tools from the database with which Wang currently integrates them.

The company hopes the decoupling strategy will let it move Pace for Open Systems into the general-purpose development tools market.

Wang's linkage of the tools to its own database blocks that process and has been criticized by some users who are migrating from Wang's VS computers to Unix systems and changing databases [CW, July 12].

Support would help

The lack of support for outside databases "is very, very limiting, to say the least," noted Ajit Kapoor, a principal at Intelligent Solutions in Marshfield, Mass.

Neil Exter, director of open software marketing at Wang, said the company has sold more than 6,000 Pace licenses, although most were for the VS versions of the software. He declined to break out the number of licenses for Pace for Open Systems, which just started shipping this year.

The ODBC-compliant version of Wang's Query Builder tool should be able to query any database written to the ODBC specification for decision support purposes, Exter said. The new software will have "significantly different code" than the existing Query Builder and will be marketed under another name, although the Windows graphical user interface will be similar, he added.

Wang expects to follow up the Query Builder move in 1994 by separating the Application Builder portion of Pace from its database, Exter indicated. The company is trying to interest major relational database vendors in joint development deals, he said.

However, Exter noted that Wang is still "evaluating what the appropriate technical approach is" for hooking the development module and a companion dictionary tool to external databases. "When you're just doing query, it's a simple thing," he said. "When you start doing [application development], it becomes more difficult."

Exter would not say which outside database would be supported first, but industry observers pointed to The ASK Group, Inc.'s Ingres software as a leading candidate, given a recent deal under which Ingres will resell Wang's imaging software. Marilyn Bohl, director of worldwide engineering at Ingres, declined to comment on the matter.

Fleishman-Hillard, Inc., a St. Louis public relations firm, just started shifting from VS machines equipped with Pace to a Unix client/server setup using Informix Software, Inc.'s database and Powersoft Corp.'s development tools. But Stephen Jung, vice president of corporate computer services, said he would give Pace another

Wang, *page 110*

Setting the Pace

Wang's Pace for Open Systems application development software includes four tools for use on Windows-based PC's, plus the company's own database

DICTIONARY BUILDER:
Defines data properties and business procedure rules and stores them in a centralized dictionary. Supports triggers, referential integrity and event formulas.

APPLICATION BUILDER:
Creates Windows front-end applications through a GUI. Allows integration of image and video files and access to spreadsheets and word processing documents.

QUERY BUILDER:
Icon-based, ad hoc querying tool for retrieving data from a database.

REPORT BUILDER:
Generates reports, mailing labels, forms and form letters using retrieved data. Based on Concentric Data Systems software.

PACE SERVER:
SQL-based relational database with built-in client-level administrative tools. Runs on IBM and HP Unix systems.

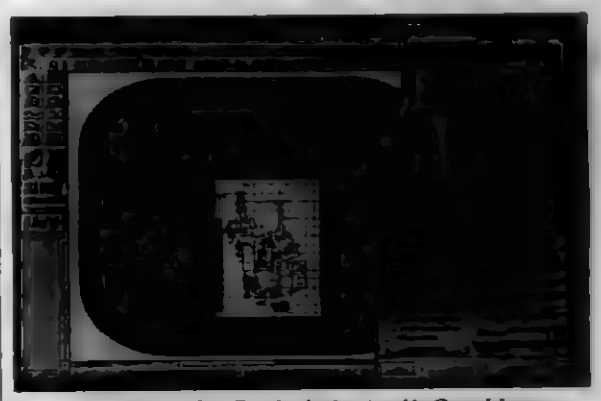
Source: Wang Laboratories, Inc., Lowell, Mass.

Applix lays framework for app integration

By Melinda-Carol Ballou
WESTBORO, MASS.

Applix, Inc. last week introduced ApplixWare, a series of products for integrating applications and business data for end users, information systems managers and application developers.

While some of the ApplixWare products, including a database access package and a programming tool, are new, Applix has primarily repackaged its office automation and other software to be more of an integrated family rather than



The ApplixWare product line *includes Applix Graphics, a drawing package that integrates graphics with data*

discrete products. This new family, Applix said, can be more easily combined with other third-party software.

"Applix is repositioning its products with new features toward more of what they really are . . . making Unix look like one integrated desktop," said Rikki Kirzner, an analyst at Dataquest, Inc., a consulting firm in San Jose, Calif. "It pulls all the office applications together to make Unix thoroughly usable."

Based on Applix's Asterx, ApplixWare makes it easier to access, share and present information across Unix, PC desktops and the enterprise, the company said.

Access to databases is provided via ApplixData, a new product. By the end of this year, Applix will offer ApplixBuilder, a programming tool for developing applications un-

ApplixWare, *page 109*

IBM expert system app answers tech questions

By Ed Scannell

Hoping to speed up the development of OS/2 applications, IBM's Personal Software Products (PSP) has rolled out an expert systems-based application that helps corporate and third-party developers solve their technical problems.

Integrating intelligent retrieval technology, AskPSP lets developers describe a problem in plain English. The system then either responds with a series of possible solutions, based on a library of case studies, or asks additional questions to hone down its search for answers.

AskPSP integrates a beta version of Inference Corp.'s CasePoint Version 1.3 for OS/2. CasePoint supplies high-speed, read-only access to case study libraries developed with Inference's CBR Express, a tool for creating case-based retrieval systems.

CBR Express incorporates Inference's ART-IM development tool, which lets developers create intelligent client/server applications, an Inference spokesman said.

Once AskPSP receives a question, it "immediately produces a ranked list of likely cases where you might find your answer," said Avron Barr, director of marketing at Inference.

At the same time, the program generates a list of questions to help users better understand a developer's particular situation and determine whether it has seen this set of circumstances before. The program uses deductive reasoning, asking questions that developers then use to zero in on the possible culprit.

Each answered question is scored or rated so developers know whether they are getting closer to or further away from a definitive answer.

Real questions from real users

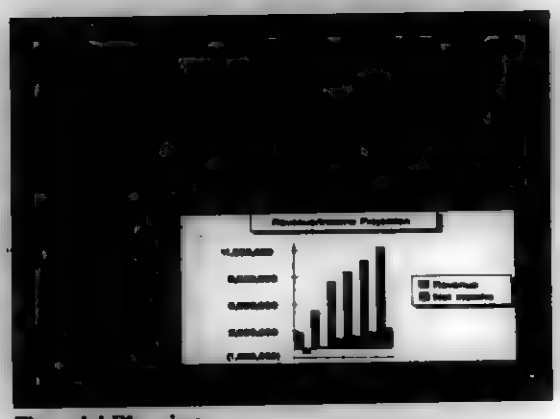
The individual cases that make up the library were written by people who answer the company's technical support hot line, not documentation writers.

The data contained in the cases is the most current information available and is organized around the way developers phrase their problems over the phone.

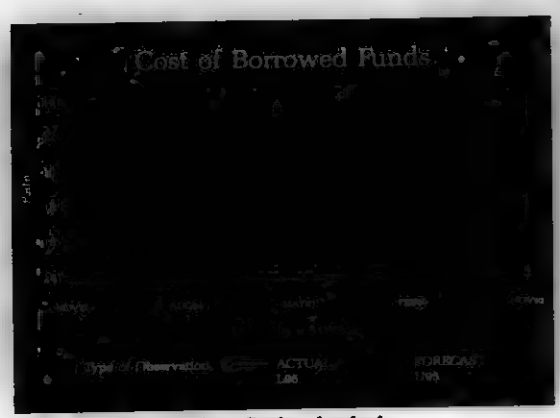
If developers cannot find a solution to a problem, they can generate an "unresolved case," which they can send to IBM technicians. The resulting body of unresolved cases then becomes a shared resource among developers, who can loosely collaborate with IBM technicians on possible solutions.

IBM has distributed AskPSP at no charge to more than 2,000 developers. The company said it will have a limited number of free copies of the program available to developers working on OS/2 and IBM LAN Systems products.

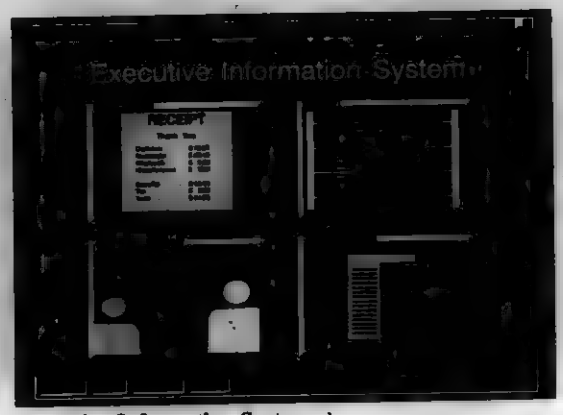
Corporate and third-party developers who want a copy of the program should call Personal Software Products Developer Assistance at (407) 982-6406.



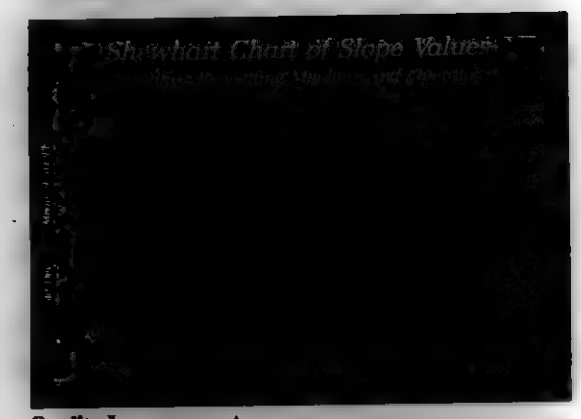
Financial Planning



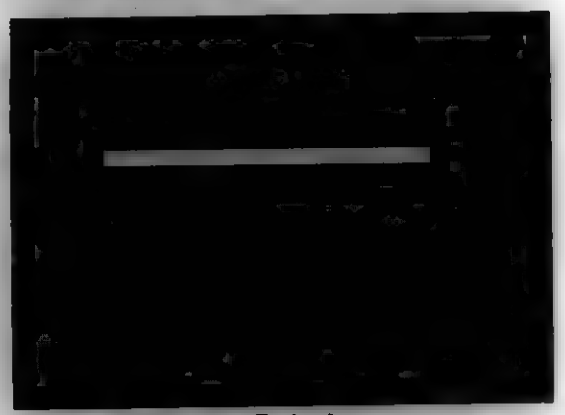
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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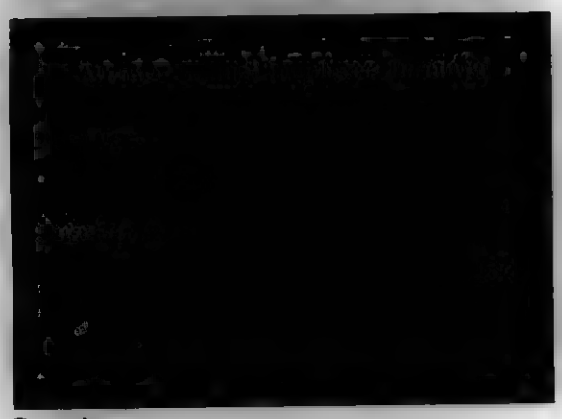
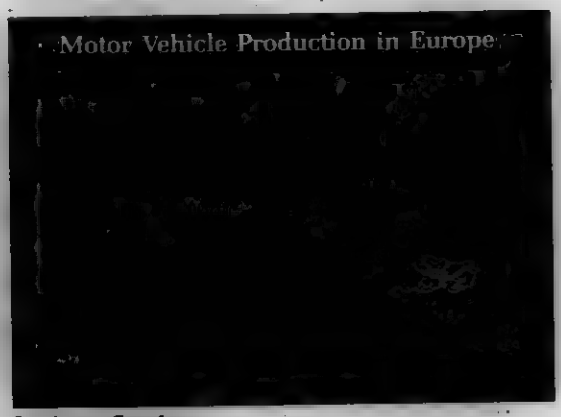
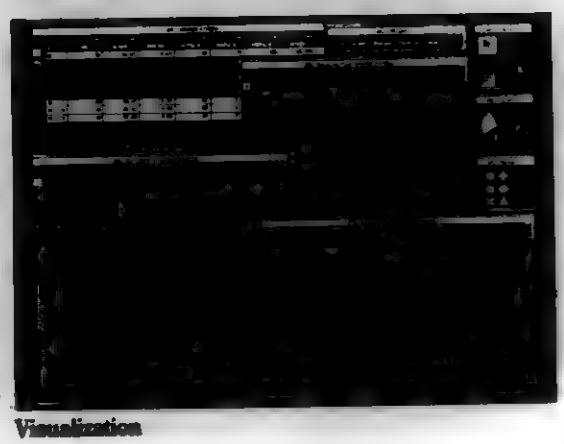


Reporting

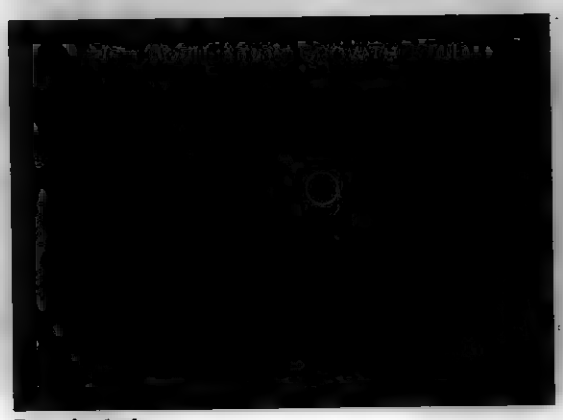
Market Research



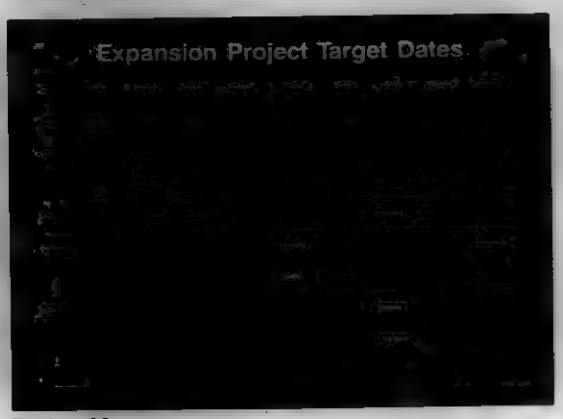
Business Graphs



Visualization



Data Analysis



Project Management

Tools bolster speech recognition applications

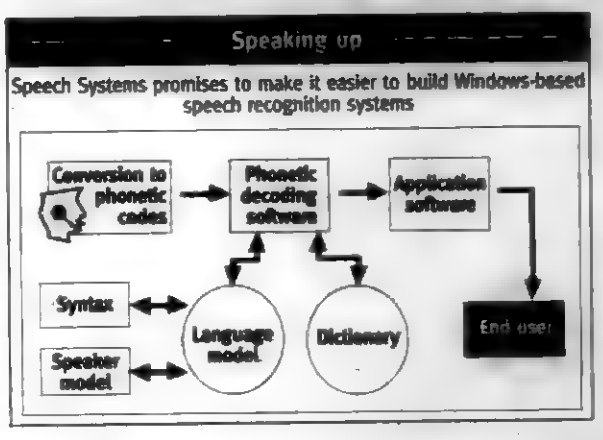
By Melinda-Carol Ballou
BOULDER, COLO.

Speech Systems, Inc. has released a new version of one of its software packages to help developers build speech recognition applications using some common development tools.

The company is now shipping Version 2.0 of Spot, which offers performance improvements and a range of new features.

Speech Systems' Spot VBX software can be used with Microsoft Corp.'s Visual Basic, and Spot can be used with Visual C++ and Borland International, Inc.'s C++ tools.

Spot and Spot VBX are part of a series of tools that Speech Systems supplies with its software developer's kit for Phonetic Engine 400 (PE 400). PE 400 is a PC-based speech recognition system that is speaker-independent and allows for continuous speech recognition.



Different voices

Speaker independence means PE 400 can recognize words from a variety of people instead of only one person. And rather than requiring discrete, separate utterances, PE 400 uses algorithms that translate speech into phonetic codes (see chart), which are then decoded by a language model that offers a structure for the syntax of the utterance.

The phonetic decoding software parses the data and matches it with its dictionary to establish the meaning of the spoken words. These are then transmitted to the application software.

The Loral Command and Control Systems Division of Loral Aerospace Corp. evaluated the PE 400 system for an application that would run inside a tank.

George Price, senior software engineer at Loral, said the ability of PE 400 to handle continuous speech cut the time to run one application in half.

"We evaluated another card that used voice matching for discrete inputs, and it took us three minutes. With [PE 400], it took us about a minute and a half to enter a message and get it transmitted, which is almost as fast as typing it," he said.

For its part, Lockheed Corp. is using Spot with Visual C++ and Borland's C++ tools to develop a speech application for data entry into a relational database management system and a global information system.

It opted for Speech Systems due to its speaker independence and flexibility. "They use grammar to represent command syntax, which makes it very easy to change commands without having to change code," said Rick Turek, software engineer at Lockheed Missiles and Space Co., a Lockheed subsidiary.

Spot VBX is a custom control tool for Visual Basic that shows up as a tool under Visual Basic and can then be dragged from the Visual Basic tool palette onto the form of the developer's application.

DLL interface

Developers writing applications in C or C++ can use Spot lib, a set of functions for creating speech recognition contexts and properties. The interface to Spot is through Dynamic Link Libraries; it can be used not only with tools such as Visual C++ but also with macros.

The new version of these tools offers pipelining, so Spot begins to decode utterances as soon as they are spoken rather than after the speaker finishes, which increases performance. The new version can also display alternative "decodes," or results to the end user, as well as partially decoded utterances.

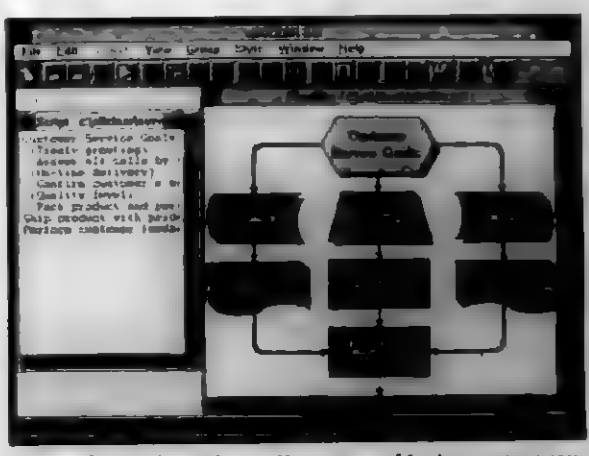
The PE 400 developer's kit, which includes Spot and Spot VBX, costs $499 until the end of December, when the price will rise to $999. The PE 400 Speech Recognition System, which includes an analog interface, a converter, two processors and a PC bus interface, sells for $3,400.

AllClear for charts

By Ed Scannell

Clear Software, Inc. has come up with a Windows-based package that lets users convert written descriptions of business procedures into flowcharts without drawing a single line.

AllClear for Windows works with a wide range of best-selling Windows spreadsheets, word processors and databases such as Lotus Development Corp.'s 1-2-3 for Windows and Microsoft Corp.'s Word for Windows.



AllClear for Windows *shows diagram and text on one screen*

Files from these applications can be transformed into diagrams and exported into Windows applications.

The package allows multiple diagrams to be opened at once. With a split screen, users can edit text on one side of the screen and see the changes in the flowchart on the other side, said Vadim Yasinovsky, president of the Newton, Mass., company.

The Internal Audit Department in the national office of the American Automobile Association (AAA) is using the program to document a range of processes in the organization — for example, to help employees better understand how an insurance claim is processed.

"The program helps us to identify what 'is' so we can compare that to what 'should be,'" said Donald Caniglia, AAA's manager of information security. Caniglia said he has also used AllClear for Windows to document information flows so he can carry out risk assessment of customers.

The program works by translating punctuation marks into specific chart functions. For instance, a period at the end of a line represents a single step, a question mark means a dual choice and a colon means a multiple choice. By following these cues, users can describe a particular process and then convert it to a standard flowchart in a few seconds.

Slated to ship by Oct. 1, AllClear for Windows is list priced at $295 for the standard version; other versions cost more.

Applix framework

CONTINUED FROM PAGE 107

der the ApplixWare umbrella with Extension Language Facility (ELF), Applix's interpretive programming language.

ApplixWare is based on an object-oriented architecture the company has dubbed "information objects." These are any data source relating to the desktop or the enterprise, such as ApplixWare applications, development tools, multimedia information, messaging application programming interfaces (MAPI) and external personal and business applications. This architecture provides user access to data from the desktop.

Underlying ApplixWare is ELF, which allows power users and programmers to customize their ApplixWare applications or to build and deploy their own.

Roy Shilling, a senior research engineer at Arco Exploration and Production Technology, the research and development division of Arco Corp. in Dallas, used ELF to develop custom drilling applications, for example. Dubbed the "drilling calculator," Shilling's group created 55 dialog boxes with complex drilling calculations.

Easier PC integration

Shilling said features available with the new Applix products make it easier to transfer files back and forth between the Unix-based Applix applications and current versions of Microsoft Corp.'s Word and Excel on Windows.

"This gives us better integration with PC users and makes it easy to transfer documents," he said.

The city of Fort Collins, Colo, is using Applix's Asterx for its on-line network operations manual. Users access the applications from either a Unix network or a Novell, Inc. LAN of PCs, according to Bill Roberts, automation and maintenance supervisor.

The following applications are included with the ApplixWare product line: Applix Words, Applix Graphics drawing package, Applix Spreadsheet and ELF. Also included are Applix Mail with support for spell checking, automatic sorting, conversion of incoming messages and shared folders; and Open Mail with X.400 support and filters to and from popular text formats. Options are also available for import/export to WordPerfect Corp.'s WordPerfect, Microsoft's Word, Interleaf, Inc.'s Interleaf and Frame Technology Corp.'s FrameMaker. Applix Data offers links to relational databases from Oracle Corp., Sybase, Inc. and The ASK Group, Inc.

Each member of the ApplixWare product line can be integrated with outside data sources, including MAPIs, multimedia information such as video, audio and images and real-time data feeds from external networks.

Applix Words and Applix Graphics, including ELF, are sold together for $695; Applix Spreadsheet is priced at $495. Applix Data costs $995, Applix Mail $195 and Applix Open Mail $295. Pricing for the optional filter packs is $295 each. These products are shipping now.

Jyacc hopes users will JAM with easier tools

By Melinda-Carol Ballou
NEW YORK

Jyacc, Inc. last week introduced a new version of the company's JAM development tools that brings visual capabilities and ease of use together with object orientation and the ability to manage heavy-duty, transaction-intensive applications, company officials said.

JAM Version 6 is a major rewrite of JAM. Central to the new release is a Visual Object Repository, which stores pictorial representations of application objects, according to Jyacc.

It also stores data elements and their properties and can contain information about how database tables are related, as well as entities such as push buttons and their behavior, procedures and bitmap images, the company said.

With the object repository, developers are able to intuitively build distributed applications — without having to write code — by dragging and dropping visual objects from the repository.

These objects then retain an inheritance link or relationship to their ancestors in the repository. Version 6 supports multiple levels of inheritance, data abstraction and encapsulation.

The new version also offers a Transaction Manager to handle the interaction between an application and one or more back-end databases. JAM defines a default transaction model that defines the optimal processing behavior for that database management system.

JAM also lets developers modify those models to globally affect application behavior. In this way, developers can attach user hooks to override the model or code their own database access..

JAM Version 6 offers an icon and menu-bar graphical editor, a debugger, a SQL-based, flat-file manager and the Visual Object Repository. It also offers support for development in character mode.

JAM Version 6 is slated to be available by year's end starting at $2,000.

Wang sets Pace

CONTINUED FROM PAGE 107

look if Informix support were added.

"Pace is pretty friendly," said Jung, who continues to use the VS version of the Wang software. "The question would be, how does it stack up against [other tools], both in development capabilities and resource usage?"

However, the new strategy comes too late in the game for Ramsay Millar, director of MIS at the British Columbia Tourism and Culture Department in Victoria, British Columbia, and former chairman of the Americas Pace Special Interest Group. "That's a great idea, but unfortunately it's too little, too late," said Millar, who unplugged most of his VS systems this year.

Resellers required

Wang is trying to sign up resellers to handle marketing of the ODBC-compliant version of its query tool. The company will do some direct sales of the product. "But the real thrust will be in alternate channels," said Neil Eaton, director of open software marketing at Wang. The software will use a Windows-based GUI and support the merging of queried data into word processing documents, he noted.

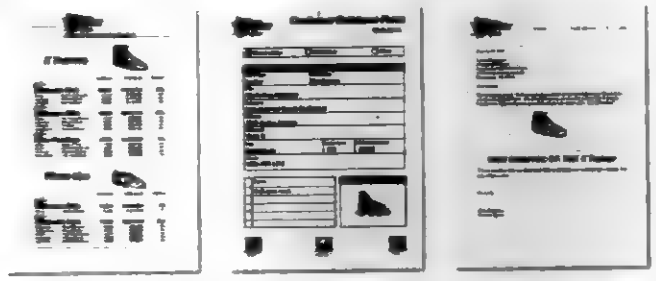
Analysts had mixed outlooks on Wang's ability to sell Pace beyond its installed base. "They've got a really nice tool," said Bruce Silver, a vice president at BIS Strategic Decisions, a Norwell, Mass., consultancy. "If people give it a fair look, it will be interesting."

Rich Finkelstein, president of Performance Computing, Inc., a consulting firm in Chicago, was more skeptical. "The market is already saturated, and this kind of metamorphosis usually doesn't work well," he said. "It's hard to unhook" tools that were designed for a specific database, he said.

AT 9 A.M. HE DIDN'T KNOW HOW TO WORK WITH A DATABASE.

When Don Glor came to work on the morning of September 15* he'd never used a database before. Two hours later he'd developed his first application — it looks like a fire truck; actually it's a customized inventory and billing management system for the South County Fire Department, San Mateo County, CA.

Don was using Lotus® Approach™—the only database designed for fire fighters. And lawyers and doctors and business people. And anyone who isn't necessarily a computer expert.



Approach lets you get to work right away in familiar, easy to understand desktop items. You can generate reports, forms or form letters — you can even print mailing labels to match any specification.

INTRODUCING APPROACH 2.1. THE RELATIONAL DATABASE ANYONE CAN RELATE TO.

All the power and functionality in the world is no good if you can't use it. Approach is expressly designed to be easy. There's no programming to learn. No endless documentation to study. And according to independent research, "The average Approach user produces real results with their database in 2 hours."

This will surprise anyone who has tried to work with databases like Paradox® or Access®. According to Don, "I tried Access and shelved it. It was just too difficult to get a handle on." That's not surprising considering the 543 page supplemental language reference for programmers Don would've had to pore through. Which looks like light reading next to Paradox's 1300 pages of programming instruction.

The difference is that their products were not designed for general business users.

With Approach you have database power that really is accessible, and you work in one of four familiar, desktop items — reports, forms, mailing labels or form letters — that look and work just like you expect them to, to help you be productive right out of the box.

Approach has won over 25 major industry awards and accolades.

The Alsys CASE Division has announced TeleUse/DB 1.0, a graphical user interface (GUI) builder that enables developers to create the Open Software Foundation's Motif GUIs for database applications.

According to the San Diego company, TeleUse/DB 1.0 provides 100% Motif widget support, which allows simultaneous support of interfaces for multiple databases when used with the TeleUse User Interface Management System. The migration path permits advanced functionality, such as dialog management, graphics and custom widget support. TeleUse is available for Sun Microsystems, Inc.'s SPARCsystems running SunOS 4.1.2 and Sybase, Inc.'s Release 4.9.2.

A single-user license costs $1,990.

▶ *The Alsys CASE Division*
(619) 457-2700

Persistence Software, Inc. has announced Persistence 1.4, a development tool designed for building object-oriented applications that transparently access data in relational databases.

Support is provided on Hewlett-Packard Co.'s Precision Architecture-RISC workstations and Sun Microsystems, Inc.'s workstations.

According to the San Mateo, Calif., company, Persistence employs an object model as input and can automatically generate C++ classes for interfacing with relational databases similar to the code that is generated by tools for constructing graphical user interfaces.

A developer's license costs $14,995, and software support is priced at $2,995.

▶ *Persistence Software*
(415) 341-7733

Sign-On Systems, Inc. has introduced Sign-On For Fox, a FoxPro Pen Interface library for Windows for Pen Computing.

The product includes more than 100 functions that interface directly within the Windows for Pen application programming interface, according to the Beverly Hills, Calif., company.

At the field level, programmers can change directories and recognizers and turn handwriting recognition on and off.

Sign-On For Fox costs $495.

▶ *Sign-On Systems*
(310) 274-7477

Michaels, Ross & Cole Ltd. (MRC) has introduced its external objects feature in Release 4.0 of the MRC-Productivity Series.

According to the Lombard, Ill., company, the product empowers end users and programmers to define virtually any non-MRC program or routine as an external "object," grab the object and seamlessly execute it from within an MRC application or report.

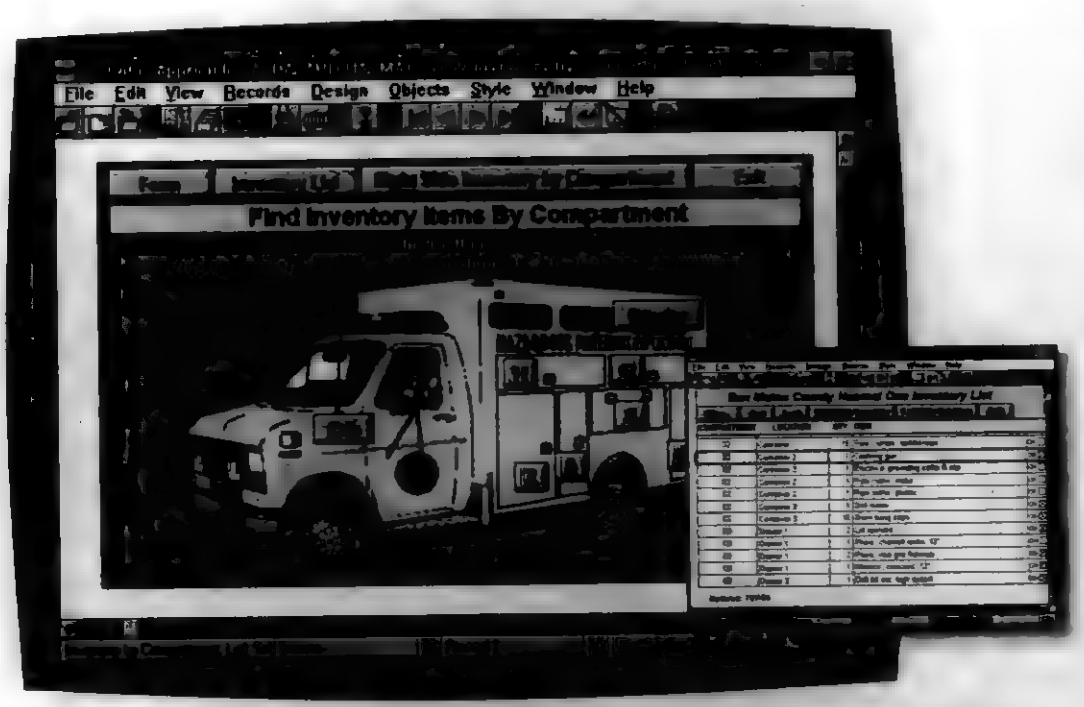
Users can access multiple layers of information from disparate databases by building their own drill-down applications with the product.

Prices range from $4,000 to $69,500.

▶ *Michaels, Ross & Cole*
(708) 916-0662

Product shorts

StratosWare Corp. has introduced MemCheck 3.0 Professional for DOS, an error detection and prevention tool for C and C++ programmers. MemCheck 3.0 Professional detects memory overwrites and underwrites, stack overwrites, memory leaks, out-of-memory conditions and heap corruption. Cost: $139. StratosWare, Ann Arbor, Mich. (313) 996-2944.... **Kedwell Software, Inc.** has introduced DataBoss for Windows, a product designed to develop Windows applications and generate standard C++ code. It integrates menu, window and report design with a relational database and provides instant access to dBase and DataBoss files. Cost: $695. Kedwell Software, Portsmouth, N.H. (603) 433-4777.



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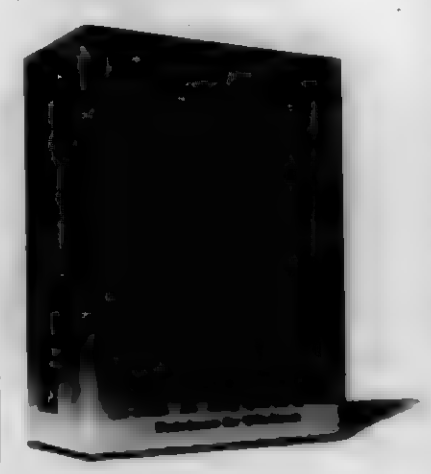

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The Integration Company

INVASION OF THE BODY PATCHERS

No longer just working stiffs, contract programmers are helping to train permanent IS staffs in new technologies

By Julia King

Paramount Pictures Corp. is casting contract players. But these hired hands aren't the usual bit players — they're cast in pivotal programming roles.

"There's a wave of new technologies that's accelerating, and we don't have people trained and ready to go now to do new or pilot projects," says Edward Altman, Paramount's executive director of systems development.

To bridge the gap, Altman hires outside contractors, who in total make up 25% to 33% of Paramount's 100-person information systems development team.

Using contractors is by no means new, of course. IS managers have long hired so-called "rent-a-programmers" from "body shops," the agencies that specialize in providing temporary IS personnel.

What *is* new, however, is how contractors are used. Instead of hiring contractors to save money or help them cope when shorthanded, many IS managers increasingly use contractors to train permanent staff in new technologies and to build new applications that use these technologies.

That makes the recasting of IS at Paramount more the rule than the exception, according to Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

According to a Forrester Research study, almost three-fourths of in-house IS professionals simply don't have the expertise in the new technologies their companies want to deploy. Outside contractors were used at 63% of the companies in a wide range of industries Forrester surveyed.

"As technology curves move faster and faster, IS departments simply can't expect to capture and nurture all the skills they need in-house," Hill explains. "More than ever, new technologies are being injected into companies by outside service providers."

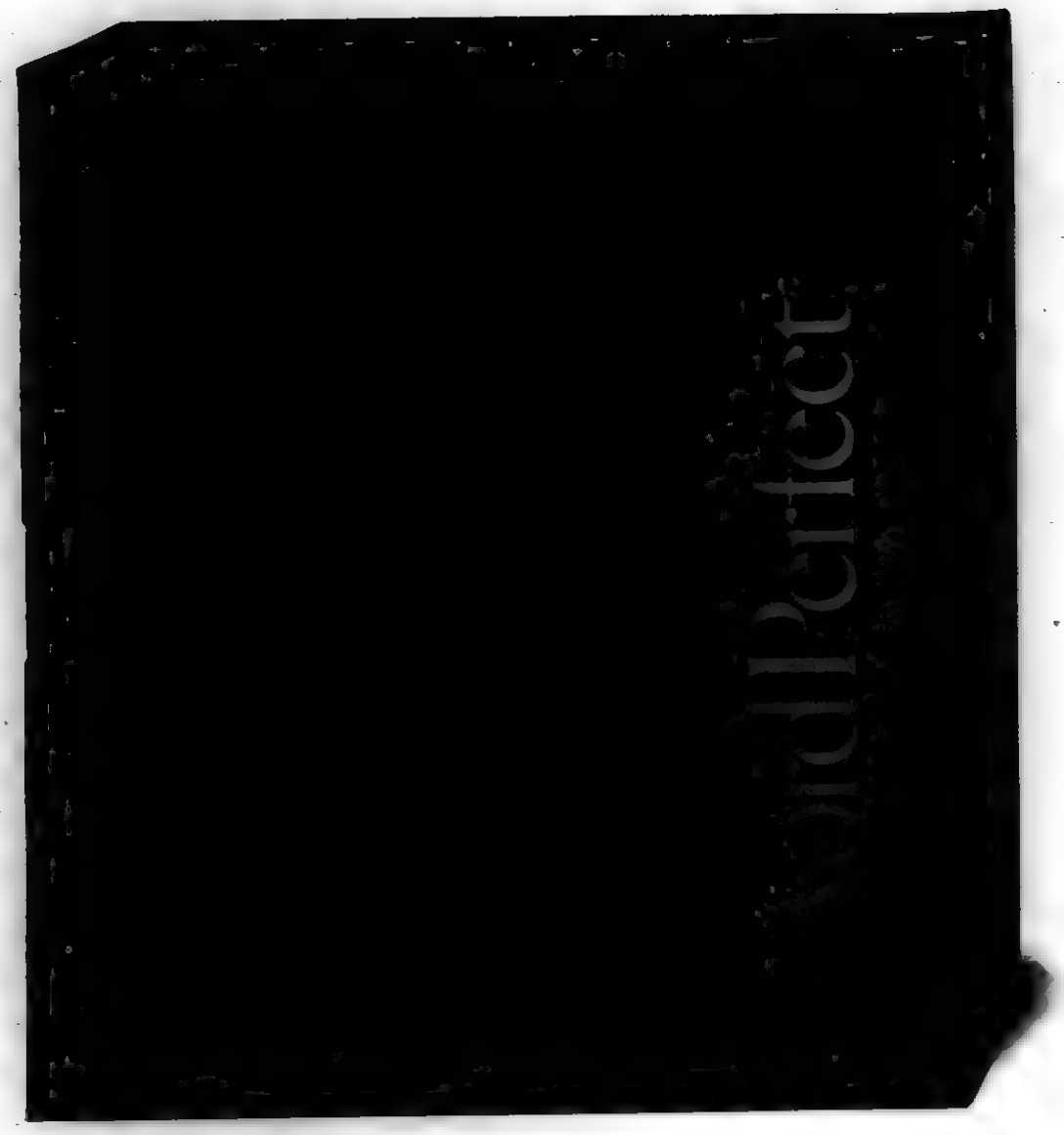
In greatest demand are contractors skilled in distributed LAN-based technologies, computer-aided software engineering and Unix. Object-oriented programming expertise and client/server development methodologies are also widely sought, says Neal Grunstra, president of Mind Bank Consulting Group, Inc. in Vienna, Va., which provides senior information technology professionals to large companies. Other providers of contractors with leading-edge skills, such as Valinor, Inc. in Manchester, N.H., report growing demand for different combinations of skills.

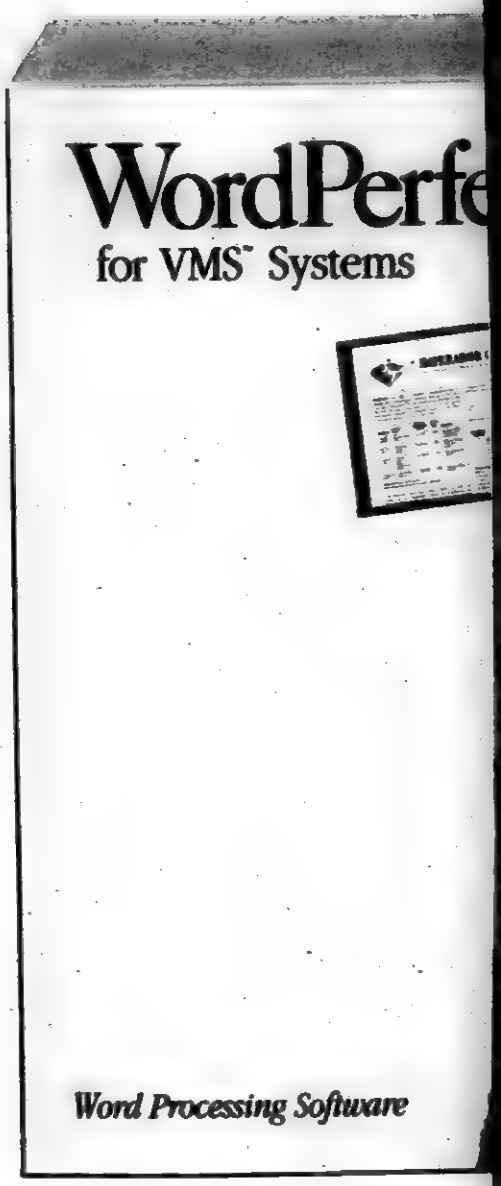
Contractors, *page 116*

Alan Levenson

Southern California Gas' Ed Trainor: *'There's not much economic difference in the cost of contractors vs. employees. . . . With the benefits and overhead associated with the employee, the costs even out.'*

King is a free-lance technology writer in Ridley Park, Pa.





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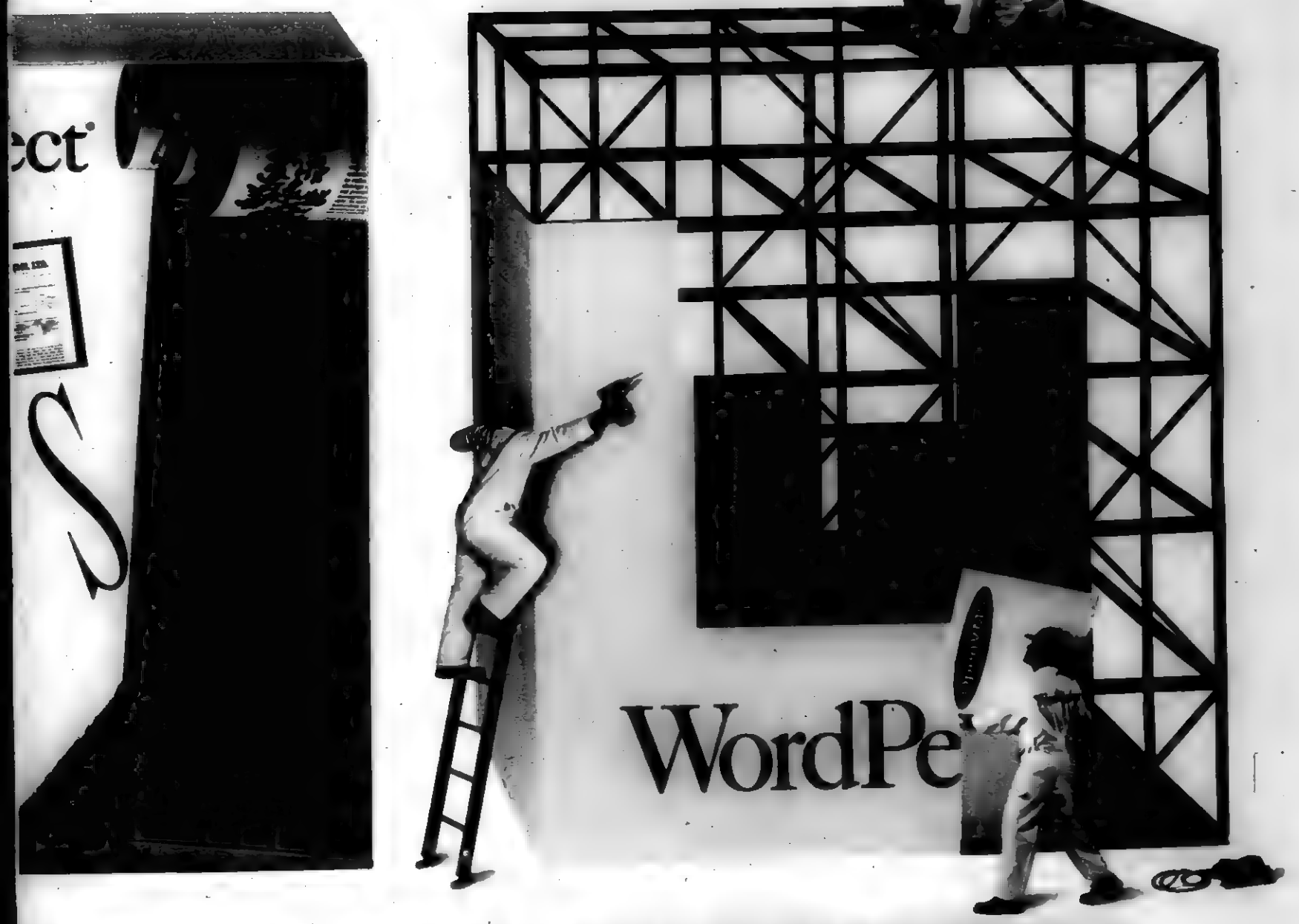

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Contractors

CONTINUED FROM PAGE 113

But because most companies implement several new technologies simultaneously, finding contractors with unique combinations of cutting-edge skills is not easy. Agencies that can provide these services have grown rapidly. Mind Bank, for example, earned $2.8 million from contractor placement in 1991 and expects to hit $7 million this year, Grunstra says.

Valinor reports that its earnings from software development services alone have doubled in two years.

Applications experts

"I see contractors being used more and more for quick-strike application development," observes Rich Murray, a Los Angeles-based principal at Nolan, Norton & Co., an information technology consultancy based in Boston.

"In the 1970s and '80s," Murray says, "contractors were hired to come in and write Cobol code. Now many are doing very targeted development on specific systems like sales force automation."

Paramount is a good example of a company that uses contractors to keep applications development moving. Caught in a technological squeeze as it evolves from mainframe and minicomputers to network-based client/server systems, Paramount sorely needs programmers experienced in mainframe database and transaction-processing systems. It also needs experts who can develop pilot applications that incorporate distributed technologies like IBM's OS/2 operating system, Novell, Inc.'s NetWare network operating system and Sybase, Inc.'s relational database.

Bose's Tom Charbonneau: *'Employees cannot retrain in newer technologies plus maintain legacy systems at the same time. Neither can contractors.'*

If computer professionals skilled in both established and emerging technologies were readily available, Altman says he'd grab as many as he could.

But like most cost-conscious corporations, "Paramount is loath to hire additional staff," Altman says — especially in view of Paramount's pending merger with Viacom, Inc. "We also don't know if the pilots will survive and what our specific long-term needs will be, so it's not worth a massive in-house training effort today."

Contractors provide a way to build pilots based on new technologies without investing permanent staff in high-risk projects.

Beyond a demand for those skills, however, is the growing expectation of IS managers that contractors provide on-the-job training in technologies to in-house employees.

"IS is definitely looking for skills transfer. One of the requirements in many of today's contracts is that contractors make in-house employees smart while building new systems," Hill says.

Contractors are also hired as outsiders by corporations to back-fill positions temporarily vacated by employees sent off-site for training in advanced technologies, Nolan, Norton's Murray says.

"It's just like retooling a factory," says Alan Ditchfield, chief information officer at The Progressive Corp. in Mayfield Heights, Ohio. "You send the regular person out to retrain and a contractor handles things until he gets back." Currently, contractors compose 10% of Progressive's 270-person programming work force, Ditchfield reports.

Overseas savings

Some IS managers who seek to cut personnel costs are using overseas contractors.

Robert Menar, a senior vice president who heads the information services division of Carter Hawley Hale Stores, Inc. in Los Angeles, already knows the savings that using overseas IS expertise can yield. Mainframe CICS programmers in Beijing recently built an entirely new system for the company's catalog mail-order operation in less than six months.

"They're outstanding," Menar says of the Chinese programmers with whom in-house IS personnel exchanged system specifications and code via electronic mail. "They produce quality code, and you can buy these programmers for $22 an hour, which is unbeatable."

Menar and other IS managers peg the hourly rate of U.S. contractors at between $40 and $60.

Juggling employees and IS contractors

Contractors are making bigger-than-ever contributions to IS departments. But their growing importance creates difficult management issues. Just for starters:

- Whom do you entrust with supporting critical applications that still reside on the mainframe?
- Who is best-suited to work on new development projects?
- How will giving development to contractors affect employee morale?

IS managers who use contractors must make a choice: Use either new or old technology, not both.

"Employees cannot retrain in newer technologies plus maintain legacy systems at the same time. Neither can contractors," says Tom Charbonneau, manager of corporate IS and business administration at Bose Corp. in Framingham, Mass.

Under the gun to get new distributed systems out the door fast, IS management must decide which group is best-qualified to each set of tasks and then "strike a careful balance between the skills and knowledge of both groups," Charbonneau says. "There's no question that it's difficult to manage two different types of people."

Employees concerned about job security are naturally apprehensive about turning over any work, especially new development, to outsiders. Contractors, meanwhile, have little native knowledge of legacy systems. That makes outsiders an illogical choice as custodians of mainframe-based applications.

However, "employees with a long-term relationship with the company get nervous if they get pushed into maintenance and see contractors getting to work on what they consider the good stuff," Charbonneau says. "There's also the worry that if a contractor leaves without properly training employees, you're stuck."

Charbonneau's solution: Assign all contractors some maintenance responsibilities. He also earmarks 30% of all IS employees' time on the job for retraining.

"We're using contractors to do Unix and client/server development, and it always crops up that employees will be uneasy," he says. "You have to reassure employees that they're not being left in the dust. You have to manage that as a person. That means meeting with employees and explaining what's going on."

At Southern California Gas, vice president of IS Ed Trainor is using a combination of training and financial incentives to keep up employee morale during the transition from mainframe to client/server systems.

Currently, the gas company's 500-person IS department relies heavily on contractors for developing client/server applications. About 100 IS contractors work there. But, as Trainor sees it, the company still has a duty to retrain IS employees in emerging technologies, even though it plans to cut staff once these

TIPS FOR MANAGING CONTRACTOR TALENT

- Plan ahead. Finding contract developers with the unique combination of skills you need will take time and research.
- Require both independents and those who work for agencies to sign an agreement setting forth their exact relationship with your company, specific work requirements and deliverables and the conditions under which they can be terminated.
- Process payments via purchase orders, which can be tracked through the accounting process.
- Pay by the project rather than an hourly or weekly rate.
- Set forth in writing specific expectations regarding training of in-house employees.
- Delegate responsibility for overseeing skills transfer to a particular employee project manager.
- Familiarize yourself with IRS guidelines concerning workers' status.

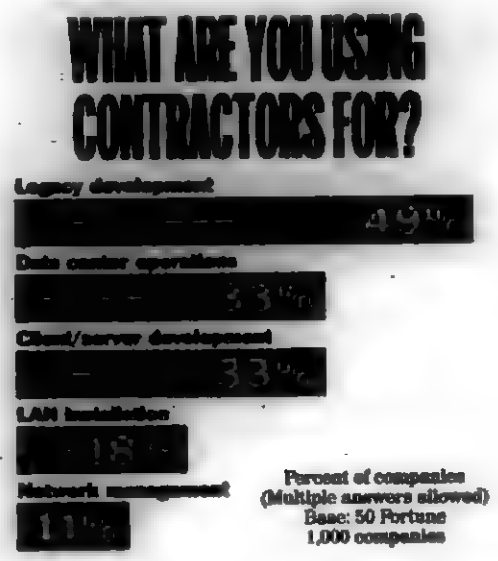
Yet in these days of buckling IS budgets, many IS managers don't seem to be troubled by the fees they are charged by the agencies that supply contractors.

Many managers regard the flexibility to engage technology-savvy contractors on an as-needed basis well worth the premium hourly rates they pay for them.

"You typically look at costs over the life cycle — a year's salary plus benefits vs. the cost of the project," says Gary Senese, vice president for MIS at Rubbermaid Commercial Products, Inc. in Winchester, Va.

When you calculate costs this way, Senese says, "The per-hour costs are probably similar. The biggest thing I get as a manager is flexibility to add and subtract resources as needed.

"The idea," he says, "is to spend money wisely and maximize your return. You can always buy cheap, but this is not the primary motivator for using contractors. My goal is to get the most productivity out of the dollars spent on IS."



Source: Forrester Research, Inc., Cambridge, Mass.

Contractors vs. employees

Still other managers say that higher hourly rates don't necessarily translate into higher costs.

Once the cost of fringe benefits, payroll taxes and other expenses associated with employees are figured in, contractors cost about the same, or sometimes even less, than employees, they say. In the long run, hiring contractors may even be more cost-effective than hiring full-time employees.

"There's not much economic difference in the cost of contractors vs. employees. You may be bringing in an employee at $50,000 a year and a contractor at $100,000, but with the benefits and overhead associated with the employee, the costs even out," says Ed Trainor, vice president of IS at Southern California Gas Co.

"The employee has jury duty, maternity leave and training, and due to all of these things, employees are between 75% and 80% productive," Trainor says.

"Contractors are only paid when they are working. When you do the arithmetic, there's not much difference. They're relatively substitutable." ■

technologies are fully deployed.

"If we left our employees to work only in the existing environment, they wouldn't be skilled at cutover time, and we felt it was our obligation to give them a chance to be competitive," he says. "The other option would have been to downsize now and try to guess who would be competitive and who wouldn't a year from now. Frankly, our crystal ball just isn't that good."

So, for the time being, the gas company keeps all its staffers. Moreover, to sustain their morale, the company financially rewards those assigned to maintain the legacy applications they know will be put out to pasture.

Trainor says the company is also exploring the possibility of permanently contracting this type of maintenance to overseas programmers. "We already know what the potential [for savings] might be and it's really quite large, large enough to warrant the next level of study," he says.

Motivating factors

But paying contractors is one thing; motivating them to produce consistently high-quality work is quite another. And it's an issue IS managers should consider. After all, managers don't have to worry about paving contractors' path to the top of their profession.

Indeed, outsiders' career concerns, unlike those of employees, are of little interest to the IS managers who hire them.

"Frankly, I'm not all that concerned about [contractors'] careers. That's one of the things you get a lot colder about," says a systems development manager at a $1 billion specialty clothing company who requested anonymity. "If you need them to go program, you tell them to program and you let their [agency] management worry about their careers."

Progressive's CIO, Alan Ditchfield, is equally blunt on the issue. "If a contractor isn't motivated, you get rid of him."

Different incentives

On the other hand, what managers give up with contractors is the power to use performance review as an incentive, notes Gary Senese, vice president of MIS at Rubbermaid Commercial Products. Rubbermaid's 10 IS employees serve as project managers in charge of an ever-shifting population of specialized contractors.

"One of the first challenges for in-house project managers is learning how to manage contractors who aren't part of the team and who don't have the same incentives as they themselves do," Senese says. "There's a different set of management skills necessary, and we're still learning how to do this." —*Julia King*

Who's a contractor? IRS cracks down

If you're interested in hiring contractors, the Internal Revenue Service is interested, too. And the agency is cracking down on companies that misclassify contractors.

Robin Mattern, a contract programmer who has worked for the same client every day for two years, is exactly the kind of worker that has piqued the interest of the IRS.

The agency's 5-year-old Employee Tax Examinations (ETE) unit specializes in investigating contract workers and the companies that hire them. The unit's goal, IRS spokesman Don Roberts says, "is not to declare war on independent contractors but rather to make sure that people who are employees are treated as such. Misclassifying employees as contractors puts workers at a disadvantage and employers at an unfair competitive advantage."

For companies such as Mattern's current employer, an advantage of hiring contractors is the huge savings that can accrue in payroll and other taxes, none of which applies to contractors.

Companies whose labor force consists entirely of employees, on the other hand, are required to pay not only income taxes but also Social Security and workers' compensation insurance.

Since ETE's inception, the IRS has snared more and more companies that have taken the contractor shortcut.

Thousands reclassified

The agency says that in fiscal 1992, ETE reclassified 90,000 independent contractors as employees. During that year, Roberts says, the IRS disposed of 1,700 cases. Another 9,000 cases were closed without the IRS' opening an audit. In many cases, he says, companies agree with the IRS auditors' findings, and only a "small amount" of cases are contested.

One contested case concerned Mind Bank Consulting Group, which provides high-level IS professionals on a short-term basis to Fortune 1,000 companies.

Mind Bank President Neal Grunstra says the IRS audited his company four years ago on the contractor/employee issue, wanting to reclassify 33 workers and collect $250,000 in fines and back taxes. Grunstra says his company appealed the case and won.

Managers concerned about the status of people working for them can allay their doubts by consulting IRS guidelines. The IRS offers a 20-point checklist that it uses internally to resolve employment status disputes.

Checklist topics range from the kinds of equipment or tools a company provides a worker to the location of the work site to how a worker is compensated.

For example, employees, rather than contractors, usually work on company premises or at a location designated by a company, according to the IRS. Also, employees usually work during hours specified by an employer. Independent contractors, on the other hand, generally set their own hours, according to the guidelines.

The checklist is available by telephoning (800) TAX-FORM and requesting IRS Publication No. 937, titled "Employee Taxes and Information Returns."

Take precautions

In addition to familiarizing themselves with the IRS guidelines, companies should take additional steps to protect against run-ins with the IRS, advises IS manager Tom Charbonneau at Bose Corp. in Framingham, Mass. His recommendations include the following:

- Hire contractors only through contracting agencies, which are responsible for paying all appropriate taxes.
- Require every contractor to sign an agreement that details the exact relationship between worker and company and spells out work requirements and deliverables.
- Process contractor payments via purchase orders rather check requests.

"You also need to be very careful about providing contractors with space because this could be construed by the IRS that they are employees," Charbonneau warns. "Preferably, you want contractors to work off site and check in with you."

At Southern California Gas, Vice President of IS Ed Trainor hires contractors only through agencies. Independents, he says, place companies at a higher risk to IRS exposure.

"You may be preparing a[n] [IRS form] 1099 for a contractor, who in turn may not be paying taxes," Trainor says. "The IRS then applies its employee-vs.-contractor test, and it's theoretically possible that a contractor could claim that they were actually an employee. For that reason alone, we bring in contractors only through agencies."

—*Julia King*

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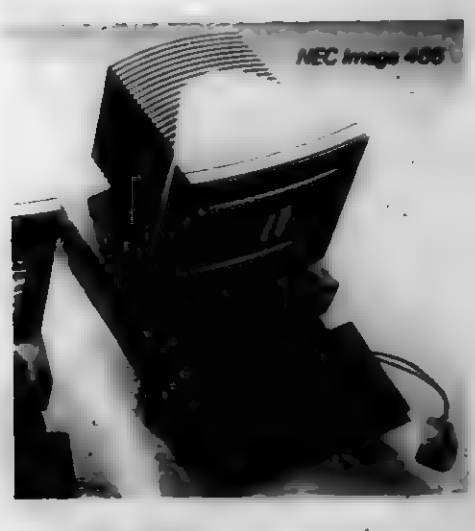

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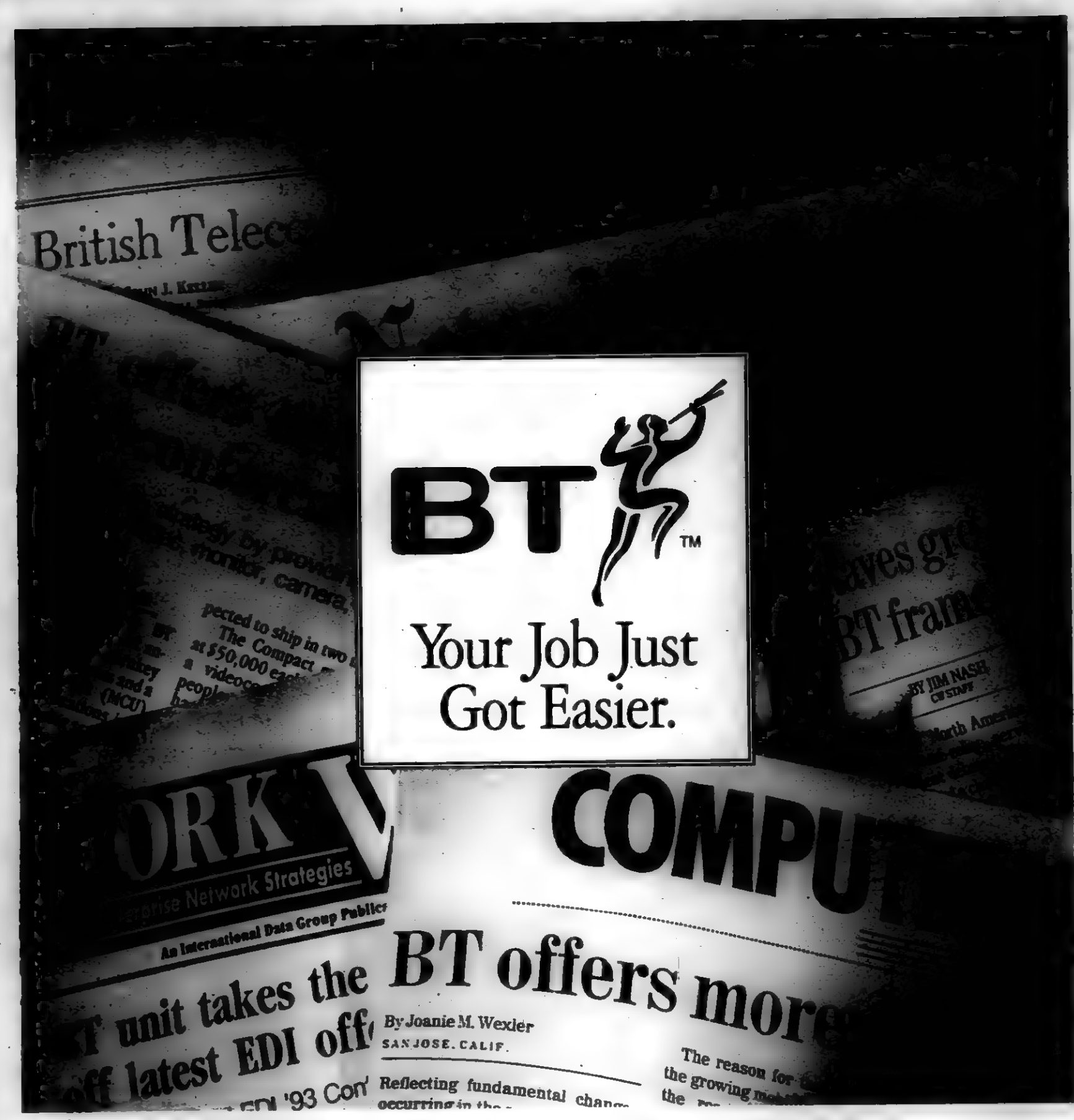

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Games integrators play

The stakes are high. So, while there are plenty of good and capable companies out there . . . . . the way to guarantee you come out a winner is to know the bluffs — and control the deal.

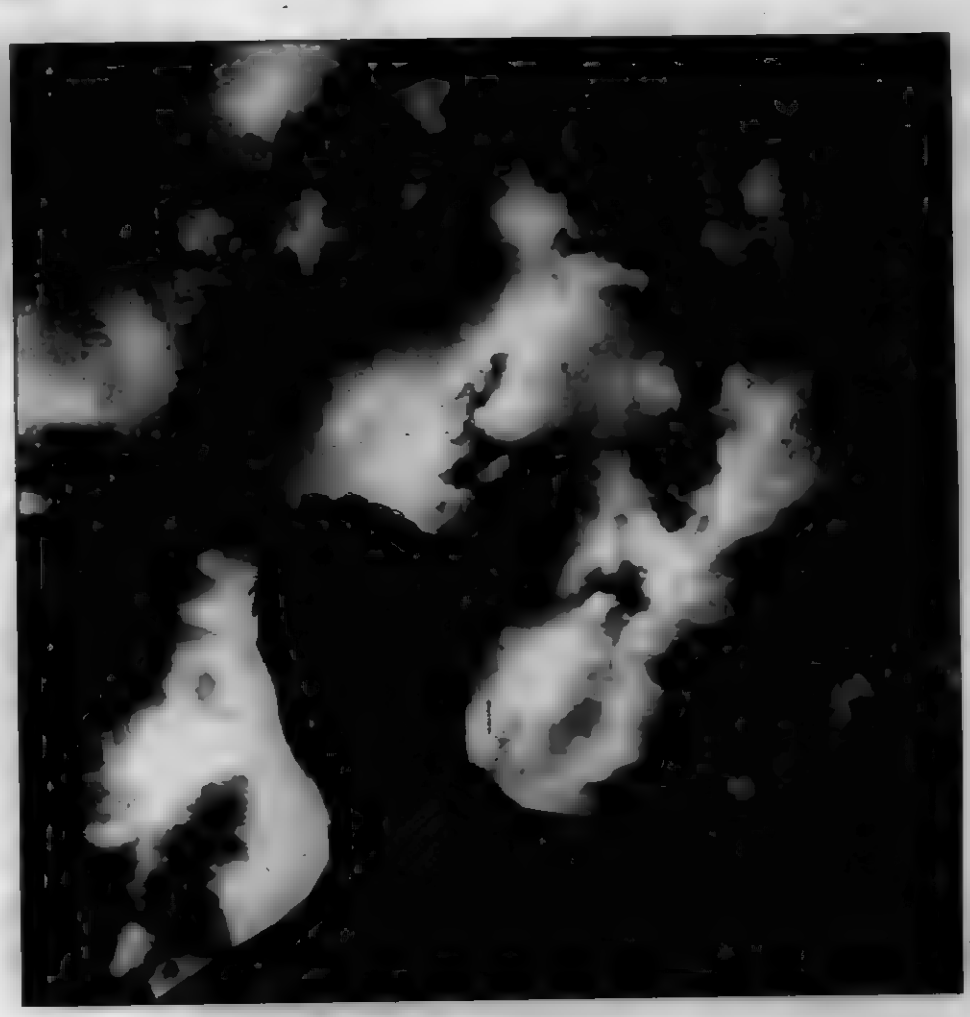
When Ron Finlason took a look at the bid in front of him, he did some quick arithmetic and decided his company didn't need a Big 5 accounting firm to do what it could do for itself at 35% to 40% less.

Finlason's company, The Harper Group, was on the verge of hiring the consulting and systems integration subsidiary of a national accounting firm for a very large project, when he appeared on the scene. The firm had been on-site for about six months already conducting a needs assessment and analysis. When a recommendation was finally produced, executives at the San Francisco freight and import/export company realized they weren't qualified to judge its merits. That's one of the things they hired Finlason to do — oversee integration and re-engineering efforts and interpret the recommendations of big-ticket integrators.

By Abby Christopher

Finlason's interpretation was simple: way too much markup.

"The problem I had with their bid and the others we got was their billing model, their overhead," he says. "A big chunk of their bid included $80 to $90 an hour for the 'grunts' who were going to do the basic code. But the going rate for that kind of work is $50 to $60 an hour."



The Harper Group's Ron Finlason recommended that his air freight firm reject an integrator's sky-high bid and tackle most of the re-engineering work itself

Games, *page 122*

Games

CONTINUED FROM PAGE 121

Based on Finlason's recommendation, The Harper Group decided to do the bulk of the work itself, including linking seven disparate freight-tracking systems located at offices around the world. When outside help is needed, the company hires systems analysts and programmers on an as-needed basis for $50 to $60 an hour.

Do-it-yourself is not an option for many companies, and it wouldn't be appropriate in a lot of circumstances, but many companies that work with systems integrators say it's a relationship fraught with danger for the unwary and naive. You have to know exactly what you need, negotiate hard to get it, and keep your eyes open through the whole process.

Some of the most bitter complaints about integrators have nothing to do with the size of their bills. What customers and industry experts peg as the biggest problems are inflated claims of expertise in their business or industry, boasts of technical know-how that turn out to be illusory and bait and switch tactics that leave you without the promised technical talent.

"We know your business"

For the most part, systems integrators are not trying to deceive you, but face it: They want to sell you a service, and sometimes selling means applying a little can-doism. It's up to you to probe backgrounds, ask hard questions and, if the integrator seems ideal in every way but this, write the contract so they, not you, bear the cost of their education.

That's exactly what KFC Corp. and Taco Bell, two of Pepsico, Inc.'s fast food businesses, did when they decided to hire Ottawa-based SHL Systemhouse, Inc. to design a point-of-sale (POS) system for their restaurants in North America. SHL Systemhouse had no particular background in the fast food industry.

Peter Zaretsky/Black Star

Bill Soper
Chevron Canada

Staff changes can cost you time.

But as Audrey Broska, strategic consultant to the information technology group at Taco Bell and project executive on the POS job, says, the firm did have other important attributes: a worldwide organization to support the companies' interest in global POS development and expertise in open systems and object-oriented design. Solution: stipulate up front that the integrator must learn the fast food business at its own expense.

According to Michelle Wells, systems development manager at KFC, members of the SHL Systemhouse team have become a familiar sight at KFC's research and development restaurants, where they do the jobs they are trying to automate and integrate.

SHL Systemhouse hands have also put in time inventorying food and restaurant supplies, making tacos, taking orders and ringing up sales at Taco Bell restaurants in Southern California. This on-site labor was a specific stipulation of the agreement, as was SHL Systemhouse's hiring of a quick service consultant for lessons in fast food business, Broska says.

"If you don't know what it's like to have 50 high school kids in front of you in the restaurant, you don't know how to design the systems [to] be intuitive," she says.

Live experience with the work process and the environment cannot be overvalued, says John Parkinson, a managing partner at Ernst & Young. Parkinson says there are several financial institu-

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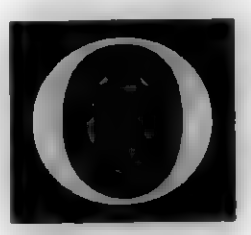
The games *you* play



By Susan Scrupski

OK, now that you've heard all about the problems you want to avoid, you may be thinking that, as a group, systems integrators are a) incompetent b) arrogant c) sharks or d) all of the above.

If any of those were accurate descriptions of even a sizable segment of integrators, this service category would be headed toward extinction instead of growing by double digits every year.

Integrators don't deny projects can run into problems — sometimes big ones — but they do maintain that customers have to assume part of the blame. Integrators insist that on many projects, they are placed in impossible situations that guarantee failure. In those situations, they say it's the customer — not the integrator — that sabotages the project and often the relationship.

Clarity called for

The biggest stumbling block, integrators agree, can be a client's failure to formulate clear business goals. "The person asking for the integration must explain the business objectives," says Peter Abene, director of corporate marketing at Electronic Data Systems Corp. This means not only the basics of what you want to accomplish, he says, but also a full description of the environment in which the system will be used.

Abene gives an example of an integrator that has met all the technical specifications in a contract only to discover, after the project's completion, that end users had expected laptops, not desktop PCs. "If that kind of information didn't get carried through into the technical specifications, [then] you didn't meet the business objectives, and the project could be considered a failure," he says.

Customers also frequently discount the training that will be required to take advantage of a new system, Abene says.

A related problem, integrators say, is customers' failure to understand that, at some point, planning must end in a firm commitment to specifications. A poorly defined scope is "a major roadblock," according to Doug Catalano, president at CSC Partners. "You're asked to do a job that is reasonably specific, and during the deployment state, the client begins to ask for more functionality."

Doug Catalano
CSC Partners

The time to ask for more functionality is not when the system is ready to be deployed.

This kind of back-end loading of extra requests is more than a nuisance; it has big cost implications and can poison a good relationship. Michael Drury, Hewlett-Packard Co.'s project services manager at the company's professional services organization, explains. "It's particularly difficult when the client doesn't agree that what they are requesting is a change in scope but contend it is 'clarification' of things." What the client doesn't realize, he says, is that a 10-minute software rewrite can affect countless other tasks in the project.

Peter Abene
EDS

Customers sometimes leave out important details, such as the fact that end users are expecting laptops, not desktop systems.

One thing customers definitely should tell integrators but often don't, they say, is exactly what the political stakes are. "Too many times, a project is sold [internally] like a product," says Vince Chickillo, marketing operations manager at Digital Equipment Corp. People aren't cognizant of how deep the trouble can go if everyone involved isn't fully apprised of what's at stake, he says.

On a related note, the people who will actually be using the system are often not mentioned — and sometimes not even consulted — about what they want and need. Chickillo says that if the decision maker is different from the end user, trouble often follows.

"Sometimes [the end users] have no clue; they're not even asked to participate," he says. In fact, according to Dennis McGuire, a consultant who regularly advises clients on integration contracts, "The No. 1 problem [when contracts run awry] is when users do not adequately support the project."

Another sure project killer is inadequate staff resources on the customer side, Drury says. "You're always dependent to some extent on the client's resources, even if it's just to ask questions," he notes. "But it's often the case that they're too busy to help you with a project they committed to." ■

Scrupski is president of SS Consulting and editor of the newsletter "The Integrator," based in Barnegat, N.J.

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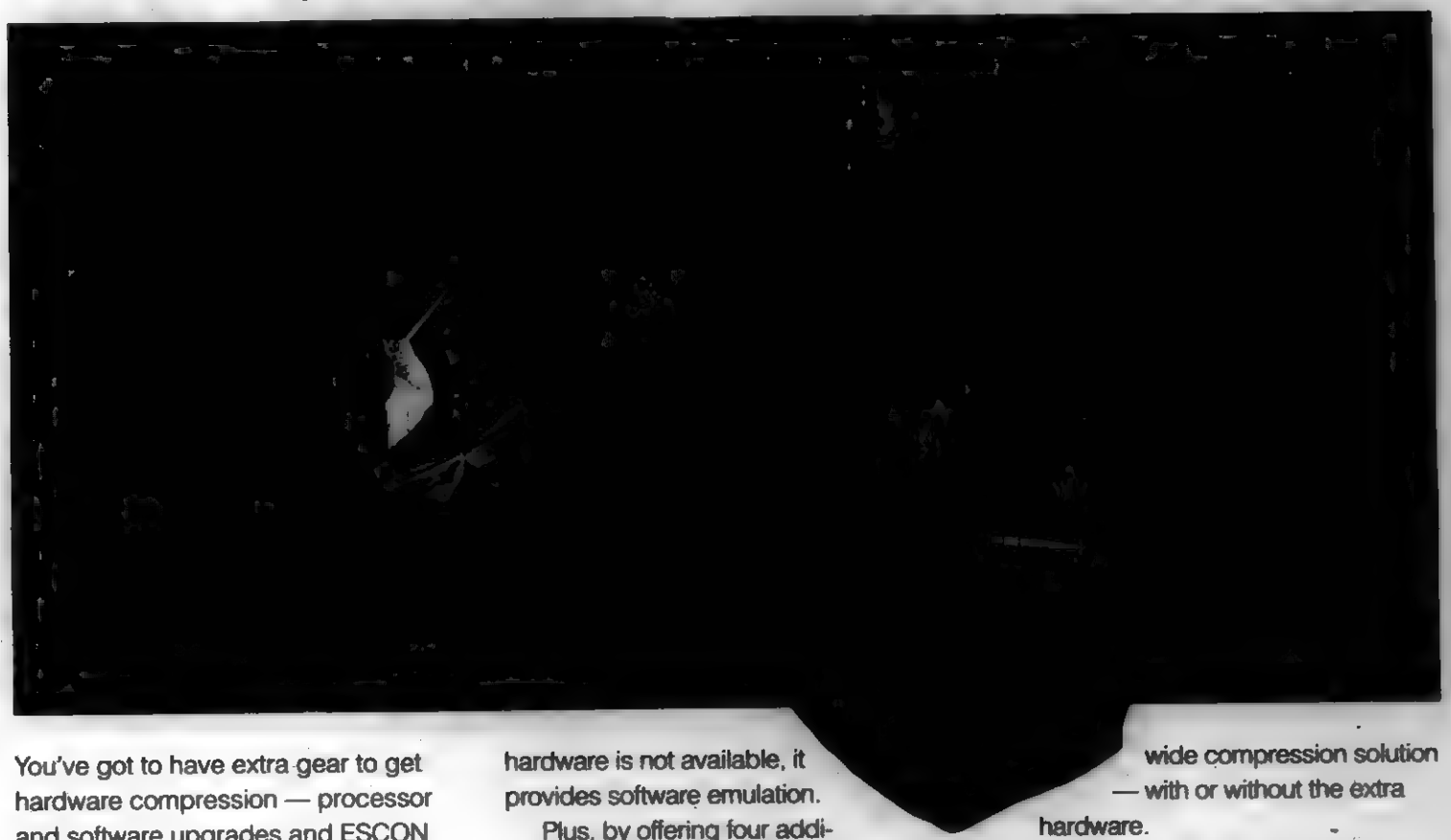

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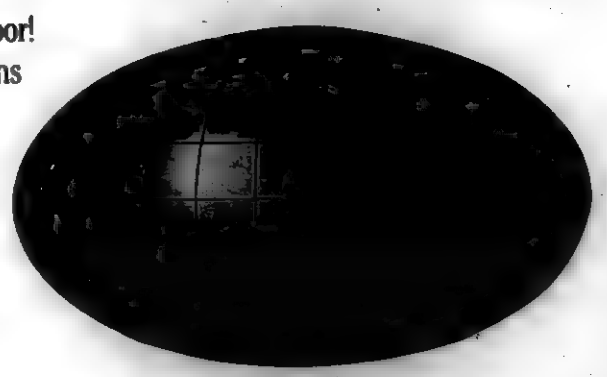

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Games

CONTINUED FROM PAGE 122

tions that would be a lot better off today if they had done what KFC and Taco Bell are doing. These financial powerhouses "sunk hundreds of millions of dollars into systems integration projects, only to wind up scrapping them." How could that happen? In most cases, Parkinson says, the problem isn't the technology but the fact that the end result just wasn't suitable for the business environment.

"We have tech talent"

If you hear that line, you owe it to yourself to swallow it with a grain of salt. Mike Corey, vice president at Database Technologies, a Sudbury, Mass., consultancy, says technical virtuosos are spread pretty thin across the industry these days. "Even the biggest systems integrators are scrambling for talent," he says.

Limitations are particularly pronounced in terms of experience with new software and development tools. Preliminary screening of potential contractors is crucial. In fact, many firms are starting to interview each member of an integrator's proposed team as if each were a prospective employee. Others are suggesting that integrators let their team members learn new tools on their sites — before the meter starts running.

That was the gist of an agreement Kaiser Permanente, a health care firm in Oakland, Calif., struck with the integrator it hired for a multimillion-dollar, four-year, payroll/personnel project.

"We hired them under very specific conditions," says Barbara Beck, manager of systems development at Kaiser. "They had a one- to two-week grace period to learn the technology needed for the systems design and development. We didn't pay the staff that worked on the project until they were up to speed."

"We're here to stay"

Frequently, customers say, the integration team you start with — or think you're starting with — is not the one you wind up with.

Staff switches are most common on longer, more complex projects. Partway through, experienced contract staffers may be replaced with less seasoned workers. This slows down completion of a project. Right now, Bill Soper, MIS manager at Chevron Canada Ltd., is concerned about hanging on to the

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Tom Sweeney

KFC's Michelle Wells: Integrators were put to work behind the counter, performing the very POS tasks they were hired to automate and integrate

Survival tips

Almost every IS professional has at least one systems integration war story. Most of us have several.

By Vicki Hudson

After the dust has settled and the consultants have departed, project processes are reviewed to figure out where things began to slip. Invariably, that question leads back to the beginning of the project, to the point where confusion was first sown and IS loosened its grip and stopped actively managing the process.

Based on many projects I've watched and a few I've experienced, I see a pattern to the way in which projects go wrong. What follows is a composite of the most common mistakes.

Our task is to replace almost half of the existing business applications, which cut across nearly every department. This is the largest IS effort attempted in several years.

Before any decisions are made, lengthy discussions are held, and an attempt is made to plan for every contingency. Inevitably, however, things are missed and misunderstood.

The software that is purchased meets requirements and is clearly the best choice in terms of price and functionality. The vendor is available and willing to make any necessary alterations. The problem is, the firm is small and unaccustomed to working with an organization as large as ours. It will clearly need a lot of help.

How to keep the boat afloat

- Define your expectations in writing.
- Invest in project and contingency planning.
- Recognize that you, not the integrator, own the problem you're trying to solve.
- Believe what is written and nothing more.
- Don't assume the integrator can figure out your culture, organization and existing applications. Involve as many of your people as possible — IS staffers and end users.
- Apply quality and project management procedures — task tracking, change management, etc. — from Day 1.
- Don't assume the staff involved in the sales effort will be the same staff assigned to your project.
- Take the time to review deliverables periodically and to make sure you know how end users think things are progressing.

A reputable, experienced consulting group is selected to oversee the project. It vows to assemble the best possible team quickly and assures us that this team will be flexible in its approach to our problem. Our IS group relaxes and decides that the project is in safe hands.

Several internal staffers are assigned to the team but only part-time. Their skills are required to keep the existing systems running.

Little documentation exists on the business processes and applications in existence, and no serious attempt to create it has been made, which leads to underestimation of the scope of changes and makes effective management of organizational change impossible.

Because the goal is to change the business, a heavy commitment of time and effort is required from users, but little attention is paid to selling the idea of the project and participation in it throughout the organization. No one really has a clear view of how much this will all take.

The consultants move in and begin asking questions — more questions, requiring more time than anyone has really anticipated.

The users, who have never been involved in a systems development effort before, receive little guidance in project management or normal development processes. This will mean modifications after the system is put into production.

Managing the number of changes deemed critical becomes an awesome task, and the software vendor can't keep pace. The quality of the delivered software suffers. Acceptance testing becomes a major responsibility.

Staff changes, technology issues and philosophical differences among the consultants, the vendor and the internal staff cause delays that impact both the schedule and the final product. The job gets done, but no one will call it a success. ■

Hudson is director of technology planning and management at The U.S. Shoe Corp. in Cincinnati.

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Who's who

If you want to hire an integrator, don't worry about limited selection. There's a mind-boggling variety of players competing for this kind of business right now. In fact, your biggest problem is going to be sorting out the options.

To help you cut through the confusion, we've identified the major types of providers and some of their strengths and weaknesses. We've also included examples of companies that fit these categories. Here's how they sort out:

▶ MANAGEMENT CONSULTING FIRMS
These are business consultants with considerable industry and "process" expertise. Lean toward these firms if you're in the market for strategic business process rethinking. But proceed with caution: One recent study by International Data Corp. reports that these firms are sometimes far less technically capable than they would lead you to believe. Exceptions here might be companies such as CSC Index, Inc. (which can lay as much claim to the re-engineering movement as Michael Hammer) and Booz Allen & Hamilton, Inc., which has its own commercial information systems group.

Examples: McKinsey & Co., Boston Consulting Group, Bain & Co., Monitor Co., Arthur D. Little, Inc.

▶ LARGE ACCOUNTING FIRMS
In this instance, you might think of these as the Big 5, as Andersen Consulting has moved so far from its accounting roots. The information technology practices of large accounting firms have impressive technical credentials and a generous number of high-profile accounts. Most of these firms have specialties in emerging technologies and an understanding of how to apply them to industry-specific business processes.

Examples: Ernst & Young, Coopers & Lybrand, Price Waterhouse, KPMG Peat Marwick, Deloitte & Touche.

▶ LARGE MULTISERVICE FIRMS
These companies represent your classic systems integrators: large (more than a billion in revenue), independent firms that provide a full spectrum of services, from strategic consulting and business process re-engineering to facilities management, sometimes through a variety of divisions or subsidiaries. For example, Computer Sciences Corp. provides management consulting through CSC Index, systems integration through CSC Partners and large-scale commercial facilities management contracts through its Industry Services Group. The greatest advantage in working with a large, well-known company is the low risk of default on contract commitments.

Examples: Electronic Data Systems Corp., CSC Index, Integrated Systems Solutions Corp., Andersen Consulting.

▶ SMALL MULTISERVICE FIRMS
There is less diversity among the smaller services providers. These companies will offer a full suite of services but often specialize in one area. One advantage in working with small firms is that management will respond quickly to client requests and will generally commit more senior people to projects. Many of the companies in this category will be in the big leagues in a few years.

Examples: Technology Solutions Corp., Perot Systems Corp., SHL Systemhouse, Inc., American Management Systems, Inc., Logica NA.

▶ SMALL NICHE/BOUTIQUE FIRMS
The hottest emerging integrators in the market today are found in this category. Whether it's client/server migration, object-oriented application development, wireless LAN solutions, computer-aided software engineering or imaging technology, these firms generally carve out specialized niches. This group has some of the best expertise in emerging technologies and is usually quite good at transferring these skills to customers' staffs.

Examples: BSG, Innovative Information Systems, Inc., Lante Corp., Trident Systems, Inc., Fiserv, Inc.

▶ NETWORK COMMUNICATIONS VENDORS
If it is an advanced enterprisewide network you're after, communications vendors are well-positioned to help you build and manage intelligent and expandable connections. Advantages include good technical credentials and a grasp of data, voice and video communications.

Examples: AT&T, MCI Communications Corp., Sprint Corp., WilTel, Advantis, Syncordia, the regional Bell operating companies.

▶ SYSTEMS AND SOFTWARE VENDORS
A staggering number of product manufacturers are starting up independent integration and services organizations. The extent of bias toward the vendor's own products varies. Some companies candidly position their consulting arms as inclined to use their own products, while others seek true independence. Most do lean, to some degree, toward their parent's offerings. Using a vendor's systems integration unit can make a lot of sense if you have a substantial investment in it. You may even find that it will work harder to please so it doesn't lose your systems business.

Examples: IBM, Digital Equipment Corp., HP Professional Services Organization, Oracle Consulting, Microsoft Consulting Services, Lotus Consulting.

▶ NETWORK INTEGRATORS
This group contains a couple of subcategories. The bigger segment is LAN resellers offering network integration services. Complex LAN-to-LAN networking is their primary focus, although many also handle multiplatform networking, groupware and client/server application development.

The second type, which goes by the name of network systems integrator, is something of a hybrid. Typically, such a firm is comfortable in network technology but goes beyond that to provide project management and ongoing support of complex, inter-LAN networks.

Examples of Type 1: USConnect, LANSystems, Inc., Data Systems Network Corp., Network Management, Inc., The Asset Group. Type 2: Syntrex Technologies, Inc. ■

—Susan Scrupski

Games

CONTINUED FROM PAGE 125

team that's been working with him for two years on a $7 million order entry and gas delivery system, due to be completed in four years. "Changing staff can cost you months of productivity," he says. It can take three to six months, depending on the project, to orient new integration staff, Soper says. Chevron estimates that this can actually cost upward of $6,000 a month.

Soper says he is hopeful he'll be able to retain most of the top integration staffers because "it is a good, high-visibility job, a good reference account that will help them get more work." Still, he says, in the future he'll stipulate staff tenure at the outset.

However, writing rules into the contract may not make a lot of difference. Beck has tried writing contract terms focused on keeping specific people and laying down rules for staff replacements but says this "continues to be a common hazard for any long project."

"We know what's best"
The best protection against a bad experience with an integrator is knowledge of what's needed, the going rates for services, the kinds of technologies that could be applied and how to assess the quality of deliverables.

Some firms use consultants to interpret and evaluate what integrators are proposing and doing. Others hire or appoint a permanent employee to do it. In either case, the scope of the job is not only watchdogging the integrator but also making provisions for important matters such as skills transfer.

Many companies that work with integrators say it's a relationship fraught with danger for the unwary and naive.

"There are many cases where no one in the user organization knows how to use the new systems designed and installed by the systems integrator," Parkinson says. "During the course of the integration project, users have to learn how to take advantage of the new capabilities or decide to outsource. Otherwise, they become hostages of the systems."

Neglecting training and maintenance issues can also produce some major unforeseen costs. Parkinson points to the experience of Schroeders, a London merchant bank that hired a systems integrator to work on a two-year, $12 million contract. The integrator designed a new development environment and database and converted many of the systems to a new operating system, he says, but no provisions were made for maintenance or the training of Schroeders' information systems staff.

As a result, the company had to ask its integration firm to return to conduct training and run maintenance. The integrator worked out a $4 million deal with Schroeders to do on-call maintenance and training for one year.

Parkinson recommends that clients build in critical services when negotiating contracts to avoid staff problems such as low morale, as well as to avoid drawing up costly last-minute contracts. ■

Christopher is a free-lance writer based in Somerville, Mass.

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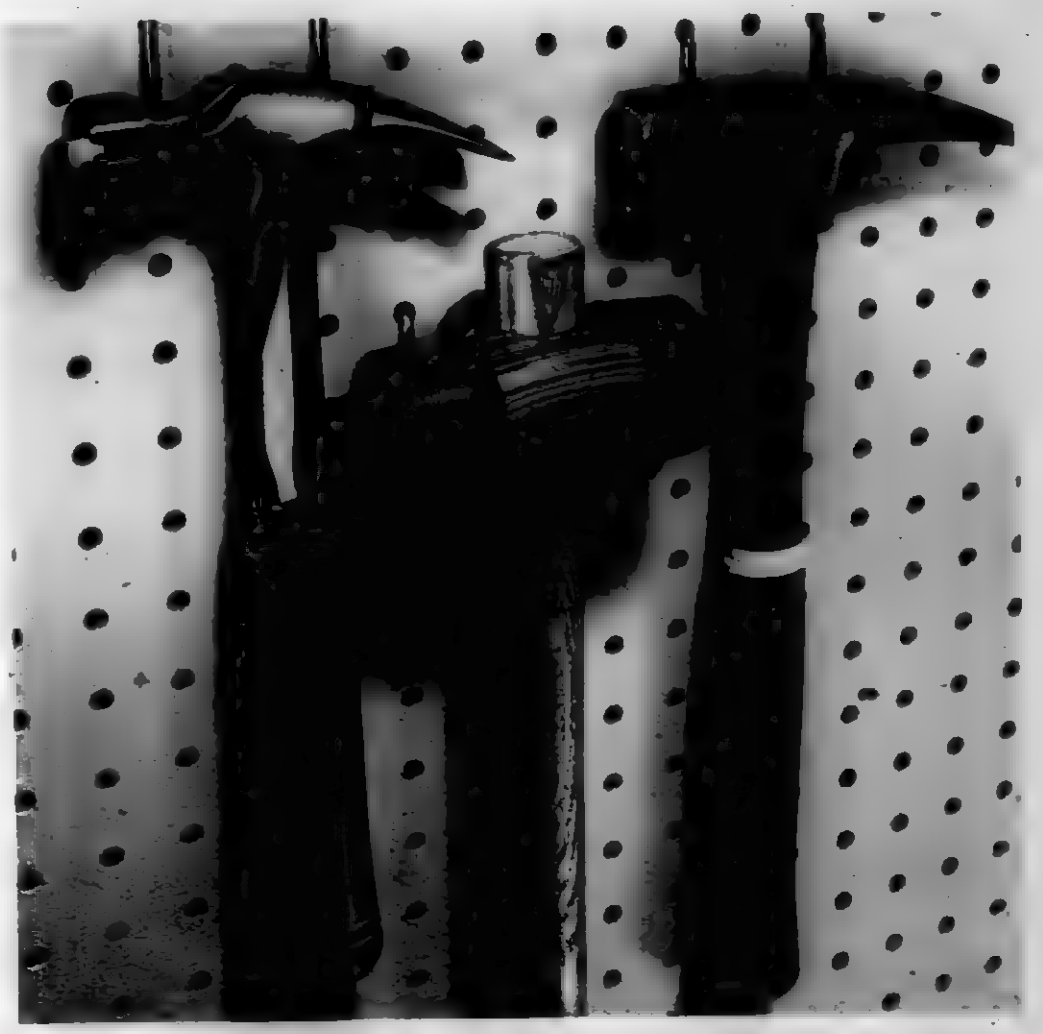

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In Depth

CITY LIMITS

TO DELIVER TECHNOLOGY, LOCAL GOVERNMENT TECH CHIEFS COMBAT FIEFDOMS, TOUGH REGULATIONS AND EMPTY COFFERS

BY ELLIS BOOKER

Vice President Albert Gore's recent report on streamlining the federal government might well include a page taken from its local offspring. Towns, cities and counties across the U.S. have already come to see information technology as a lever for "reinventing" government, improving its services while eliminating waste and cutting bureaucracy.

Much like their private sector counterparts, information systems departments in municipal government are struggling to downsize and streamline technologies such as client/server computing and administrative arrangements such as data center outsourcing. But in their path are challenges such as fiscal crises, tough procurement regulations and constituents that give more weight to public rather than technical services.

The money shortage affecting IS shops everywhere can also be found hobbling local government IS.

"Funding is a killer," declares Vivienne Dacey, MIS division administrator for the city of Phoenix.

One of Phoenix's top IS projects — a TCP/IP metropolitan-area network that in November will link, initially, 400 of the city's 3,000 departmental PCs on an Ethernet backbone — got through because it was piggybacked on another project: the building of a new city hall.

Others aren't as lucky. "Lots of cities can't afford to get rid of decrepit systems — mostly mainframes — because it would cost too much to build or buy software for whatever new hardware they wanted to bring in," says Kenneth Kraemer, director at the Center for Research on Information Technology and Organizations at the University of California at Irvine. Kraemer recently completed a survey of IS trends in 2,500 cities and counties across the U.S.

Not only are budgets constrained — in Kraemer's sample, 60% of cities expect their IS budget to hold steady in 1994, and 22% expect a decrease — but local government IS is increasingly getting allocated a smaller percent of the total budget than is the case in the private sector. Kraemer's analysis shows that cities spend an average of 4% of their total operating budgets on IS, compared with 8% of total operating budgets spent by private sector service firms.

Beyond funding issues, government IS shops must struggle to reach their goals despite special requirements and pressures encountered only by public agencies.

While private sector companies are often made up of different departments working in harmony, municipal governments are composed of public services and infrastructures, often with conflicting needs. These institutional "fiefdoms" within local governments can make enterprise IS projects a difficult proposition.

For instance, the town of Framingham, Mass., has until recently had a fractured setup, with the IS department under the control of its selectmen — a three-member board. Only those departments under the selectmen had to comply with IS-set directives. A new bylaw, however, enables IS to set directives for all departments.

Bob Wacek Photographer/Las Vegas, Nevada

CITY OF PHOENIX'S VIVIENNE DACEY: "BEING FISCALLY FUNDED CAN BE A DIFFICULTY"

More bureaucratic hurdles

Local governments are also dogged by daunting procurement regulations. Unlike the feds, many city and county governments operate under balanced budget mandates and, therefore, cannot use deficit spending to fund technology initiatives.

"The procurement procedures were implemented in the past 100 years to make sure there are no kickbacks," says Wilpen L. Gorr, professor of public policy and MIS at the Heinz School of Public Policy and Management at Carnegie Mellon University in Pittsburgh. Today, however, "by the time you go through the steps, the technology has changed."

And then there's the transient factor of public employment. Gorr and others note that cities and counties, run by people who must stand for election every few years, tend to be reactive, funding projects that are immediately visible to the voting public, such as extra policemen or firefighters.

"Being fiscally funded can be a difficulty," says Dacey, who adds that she needs to look "way beyond" that horizon to plan IS investments properly. Her IS department's operating budget has see-sawed, moving from $11.4 million for the 1991/1992 fiscal year to $10.9 million last year to $11.5 million this year.

Dacey says the city as a whole is far behind in automation. "We have to find a way to get into the 20th century, let alone the 21st."

Some cities opt to float municipal bonds to pay for long-range capital projects. In 1988, Phoenix created a $22 million municipal fund to pay for projects in five areas: records management; office automation/information sharing; an applications development center; a geographic information system (GIS); and a municipal court management system.

It doesn't help that the success of IS technologies in the private sector have caused the public service expectations of voters to grow. "Citizens are coming to expect 24-hour service and getting their questions answered while they are on the phone," says Tom Fletcher, associate director of the Program on Strategic Computing and Telecommunications in the Public Sector at Harvard University's Kennedy School of Government in Cambridge, Mass.

As a result, a much talked-about goal in government circles at all levels today is the creation of an "accessible, one-stop set of electronic services to take the guesswork out of dealing with government," Fletcher says.

To achieve this feat, three items are dominating the attention of local government IS departments:

- Standardization of hardware and data for use between departments and among levels of local and federal government.

City limits, *page 137*

DEEP COFFERS

Top 10 cities by IS budget (in millions)		Number of government IS employees
Los Angeles		500
San Diego		220
Jacksonville, Fla.		235
Dallas		285
San Francisco		230
Cincinnati		170
Houston		194
Long Beach, Calif.		95
Seattle		180
Detroit		105

Source: *City & State* magazine

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Source: Survey of Computerworld on CD subscribers, May 1993.

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City limits

CONTINUED FROM PAGE 133

- Information infrastructures, especially related to networks.
- Technical/political issues (information access regulation and privacy).

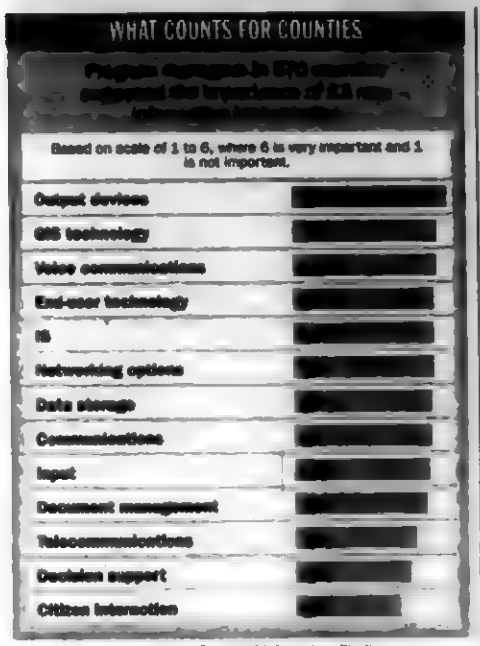
Some local governments are even going beyond merely using technology to providing service and making money. Local governments typically have more latitude in generating revenue from technology than their federal counterparts due to flexible accounting rules.

Fairfax County in Virginia generated roughly $200,000 last year from its on-line database for lawyers and real estate firms. Prince Georges County in Maryland is also generating revenue from an on-line court records system deployed three years ago with Bell Atlantic Corp.

"Local government is taking a dynamic role in managing information and providing needed services to the private sector, which is a twist," says Costas Toregus, president of Public Technology, Inc., a Washington, D.C.-based nonprofit research company for cities and counties.

Fletcher summed up the pressure on local government IS: "To say that city hall is open 9 to 5, Monday through Friday, is becoming less and less satisfactory to citizens." ■

Kim S. Nash, Thomas Hoffman and Stephen P. Klett Jr. contributed to this report.



Source: Syracuse University, School of Information Studies

Private sector 'graduates'

As government IS plays catch-up with the commercial sector, it is increasingly tapping from that well of know-how, expertise and can-do attitude found in the private sector.

For instance, the Top 2 IS officers for the city of Phoenix came from large nongovernmental companies. Vivienne Dacey, MIS division administrator, and IS director Laraine Rodgers both came to Phoenix from AT&T.

Dacey, who has an IS budget of approximately $11 million this year, says that in her own IS hiring she looks for wide, private sector experience. Private sector employees, she says, are more goal-oriented and not as mired in bureaucratic thinking.

However, not everyone agrees that staffing government IS shops with employees weaned in business is a great idea.

"[These employees] have to have some appreciation for the legitimate political restraints," such as privacy issues and accountability to constituents, says Tom Fletcher at Harvard's Kennedy School of Government.

Still, the problem of IS staffing in local government is pandemic. In general, government is a revolving door for technical people, according to Professor Wilpen L. Gorr at Carnegie Mellon University.

"A lot of people who want to get technical training will start with a government agency and then move on to a private firm where the pay is better," Gorr says.

Facing this reality, some IS executives in local government are hiring the only employees they can afford. Most of the 81 employees at Fairfax County's Cooperative Computer Center in Virginia, for instance, were hired right out of high school and trained in-house.

—Ellis Booker

HEALTHY: DADE COUNTY

Invigorated by GIS, fiber-optic projects

Don't expect to find miles of red tape strangling Dade County, Fla., or its IS operations. Once Joacquin Avino became the Dade County manager in June 1988, he encouraged the municipality's supporting agencies to run their groups like private businesses.

Since then, Dade County's IS division has entered into a handful of cooperative alliances with private sector firms, including a shared GIS project with Florida Power & Light Co. and a fiber-optic highway barter agreement with Intermedia Communications of Florida, Inc.

In 1987, Dade County laid 20 miles of fiber-optic wire to connect its primary data center with the downtown government center and the justice center. Then, in 1990, Intermedia approached Dade County about obtaining a right of way to lay its fiber-optic lines through county conduits.

Manuel Garcia

Realizing that a barter agreement would benefit both, the two groups later that year signed a contract that netted Dade County $200,000 a year in revenue and 25 free miles of fiber-optic connections, says Manuel Garcia, director of Dade County's information technology department.

The deal saved Dade County $1.5 million because Intermedia laid down the additional fiber.

Using the fiber-optic backbone, Dade County expects to connect 20,000 of its switches and computer terminals by the end of 1997, Garcia says. At present, the county has linked 4,000 terminals and PCs through the initial fiber project, which has saved the municipality an extra $300,000 annually in data circuit costs once paid to the phone company.

Dade County has also profited from a GIS development contract it entered into with Florida Power in May 1992.

A few years earlier, Dade County had developed a network-based street GIS used by the police and other departments. However, Garcia says, the GIS wasn't accurate enough.

Enter Florida Power, which had been running its own pilot GIS to route its service technicians. By sharing costs to create the GIS files with Florida Power, the county saved $1.5 million in development and expects to save $120,000 annually in maintenance. The files are expected to be developed by year's end.

—Thomas Hoffman

AILING: CITY OF ANAHEIM

Squeezing life out of wheezing systems

City of Anaheim's Dan Amyx: 'We just don't have the cash to play with'

Bruised by economic recession, information systems at the city of Anaheim, Calif., have come to a standstill.

It all comes down to money.

More than 10% — or $1 million — has been carved out of Anaheim's original $6 million IS budget for fiscal 1993. The city's IS staff of 36 is about half the 70-odd data processing personnel that worked for the city two years ago.

"Until a few years ago, we always planned long-term projects. Now our biggest new project is surviving," says Dan Amyx, manager of data processing. Anaheim can't afford new technologies, even if it would save money in the long run.

"We just don't have the cash to play with," he says.

Like most local governments, Anaheim's IS group charges back to user departments based on processor use, space and equipment maintenance levels. Right now, only one user — the public utilities group — is embarking on new projects and accounts for more than half of the IS department's business. The group plans to install an IBM AS/400 for customer billing.

"That'll be a 12- to 18-month project," Amyx says, "if the city council approves it."

Anaheim's budget depends on tax dollars brought in by well-attended attractions such as Disneyland and the California Angels' Anaheim Stadium. "When people aren't coming to conventions or taking in ballgames, that's a drop in dollars for us," he explains.

The city has thus far kept IS in-house, refusing to go the outsourcing route that Orange County (where Anaheim is located) chose 15 years ago. It fears losing control and ultimately paying more for external services than it would cost to keep IS internal.

Anaheim is, however, considering farming out specific tasks. One target is its 16-year-old billing system, which can't accommodate the U.S. Post Office's Zip+4 system. A request for the proposal is slated to go out this month.

"We hate to give up control, but there are some things other people can do more cheaply than we can," Amyx acknowledges.

—Ellis S. Nash

it's all time high, wiping out more than billion in shareholder value.

'Steep Learning Curve'

These pressures leave little time for a new boss to master IBM's business. Fully 81% of IBM customers surveyed by Computerworld magazine say IBM needs to hire a CEO with a technology background. With Mr. Gerstner lacking such a pedigree, "he's going to be on a very, very steep learning curve," says David Hanna, a former IBM executive who is now president of Hanna Group, a computer-consulting

THE WALL STREET JOURNAL
March 25th, 1993

Computers & Automation

"Information systems managers are grasping onto this as a Holy Grail," said Paul Gillin, executive editor of Computerworld, which is just one of many industry trade publications that spotlight reengineering on a regular basis. "It is an important leap for corporations."

The hype should reach crescendo in May, when a new book by management consultants Michael Hammer and James Champy will be [illegible] "Reengineering the Revolution."

Investor's Business Daily
March 25th, 1993

Their question: Where are the productivity savings?

The New York Times
April 25th, 1993

CORPORATE executives appear to be more knowledgeable about computer technology than ever before, but they have also become more demanding and less forgiving, a new survey has found. While they believe information technologies are the key to competitive advantage, they also say that they have not been getting their money's worth.

The survey, conducted by the computer industry newspaper, Computerworld and Andersen Consulting, also found that 81 percent of top executives are personally using computers in their daily jobs, nearly double the percentage reported when the survey was first taken four years ago.

More than 200 chief executives, chief operating officers, and chief financial officers, representing a broad range of businesses, participated in the study, the results of which were published in Computerworld last week. Annual company sales ranged from $250 million to $20 billion.

CUSTOMERS HAVE THEIR SAY TOO

■ IBM directors should forget about hiring another salesguy to replace John Akers as CEO. And whoever he is, Aker's successor should fire a whole lot more people. So says a Computerworld survey of executives at 100 companies that spend at least half their computer budgets on IBM products. The participants, who work at the likes of Kmart and Parker Hannifin, a maker of pneumatic and hydraulic components, also said IBM's reorganization into smaller business units should go further.

Computerworld, in addition, interviewed various computer industry luminaries, including Steve Jobs. The Next CEO marveled that none of IBM's machines from mainframes to PC's uses the same software. Says Jobs: "IBM's troubles stem from the fact that they approach everything from a hardware strategy, and the Nineties is a software decade."

Not everybody agreed that breaking up is the way for IBM to go. Said Larry Ellison, CEO and co-founder of Oracle, a software company: "This is the

[illegible] Richard is a retired I.B.M. vice president.

A survey of some 100 of I.B.M.'s largest customers by Computerworld magazine found that 51 percent preferred someone with a technical background to be the computer giant's new chief executive, while 36 percent said technical expertise was not essential and 13 percent had no opinion.

But some industry experts say technology know-how is [illegible]

93 FORTUNE 11

FORTUNE
April 5th, 1993

[illegible] system.

[illegible] wor large, private owned, real-tir compu netwo Boca Ra

HEY, THERE'S A MOUSE in the corner office. The percentage of executives who regularly use computers nearly doubled in four years, to 81% from 42% in 1988, says a study by Computerworld magazine and Andersen Consulting. Fewer than half think they are getting their money's worth from corporate computer systems.

THE WALL STREET JOURNAL
April 20th, 1993

The New York Times
March 25th, 1993

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UNIX VARIANTS
How different are they?

By Joe Panepinto

IN THE 1970s AND 1980s, the proliferation of Unix flavors led to innovation. In the 1990s, the resulting Unix smorgasbord can lead to indigestion.

At last count, more than 40 Unix variants were commercially available. A debate about which Unix is best could rapidly escalate into a technical feature-by-feature snooze-fest at best, a grand-scale holy war at worst.

For those seeking an information systems career in Unix systems administration, programming or development, there are a few overriding concerns — among them, how steep is the learning curve from one Unix variant to another and what are some of the differences between variants.

The learning curve

From a careers and skills perspective, the basic differences among the Unix variants emanate from differences in the operating system kernels on which they are based: Berkeley Software Distribution (BSD) or Unix System V from Unix System Laboratories, Inc. In addition, there are hybrid Unix variants that stray far from either BSD or System V such as IBM's AIX, the Open Software Foundation's OSF/1, Apple Computer, Inc.'s A/UX and Next, Inc.'s NextStep. Those versions of Unix incorporate some elements of object-oriented technology and have steeper learning curves, especially for systems administration.

In general, however, skills in Unix are easily transferable and are becoming even more so. In addition, many of the best features of BSD and Unix System V have been brought together in Unix System V Release 4.

Analysts agree that market consolidation is based almost entirely on marketing decisions and not on technical differences among the Unix variants

The Top 5 variants in the worldwide commercial Unix application market	The Top 5 variants in the worldwide technical Unix application market
1. IBM's AIX	1. Sun's Solaris 1.0
2. Hewlett-Packard's HP/UX	2. HP's HP/UX
3. NCR/AT&T's System V Release 4	3. IBM's AIX
4. Sun's Solaris 1.0	4. Silicon Graphics' Irix
5. Siemens/Nixdorf Information Systems' Sinix	5. Integraph's Clix

Source: International Data Corp., Framingham, Mass.

"Learning one Unix variant means you're 90% or 80% of the way to learning any of the others," says Norton Greenfield, director of Unix systems at Computer Intelligence/InfoCorp in Santa Clara, Calif. Bill Reiken, principal consultant at .SH Consulting in Santa Clara, Calif., says he sees the differences among Unix variants as interpretations of a single language and not as wholly different languages.

"A knowledgeable person could speak in New England or Texas and still be understood, though there could be some very frustrating differences in the accents," Reiken says.

For Unix programmers and developers, the development language is always the same: ANSI C; the standard application programming interfaces are the same: Posix, X Portability Guide, System V Interface Definition; and the shell languages are the same: sh, csh, ksh. Even so, programming differences do exist.

For example, if a programmer wishes to zero out a block of storage in System V Release 4, the command is memset; BSD systems use the command bzero.

"If people want to make sure their knowledge doesn't become obsolete, they should train on [System V Release 4] because it is where there has been a large effort to bring all this stuff together," says Ray Swartz, president of Berkeley Decision Systems, makers of Training on Video products for learning Unix.

Even for those who have been weaned on BSD Unix, the transition is not difficult. In the example above, the programmer does not need to memorize the BSD equivalents of System V Release 4 commands because System V Release 4 provides a ucblib directory that contains an archive library with equivalent BSD commands. The programmer only needs to name the library on the compile line, and all the recognized BSD commands will be converted to System V Release 4.

Unix systems administrators face similar niggling differences. For example, the control files are different. in BSD, the .rc (run command) shell script is a single ASCII file that calls to other files for startup and customization (for example, TCP/IP); in SVR4 there are different .rc directories at each run level.

"The differences are there, but an experienced Unix system administrator would be able to navigate either system with the basic Unix knowledge that .rc stands for run command," Reiken says. To find all control files, a system administrator on either BSD or System V Release 4 Unix could use the command ls\etc*rc*.

"Everyone who doesn't like Unix makes a big deal about the differences," says Paul Cubbage, principal analyst of software tools at Dataquest, Inc. "But once you learn Unix, dealing with the variants is not a big deal."

Panepinto is a free-lance writer in Amherst, Mass.

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RANDOM NOTES

LAN training

IN 1992, the average price for either operational or administrative training for LANs was $750 per day for an average of four days, or $3,000 per LAN. By 1995, this is expected to drop only $100, to $2,900 per LAN. Training time is expected to remain constant.

Source: Market Intelligence Research Corp., Mountain View, Calif.

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Source: Help Desk Institute, Colorado Springs

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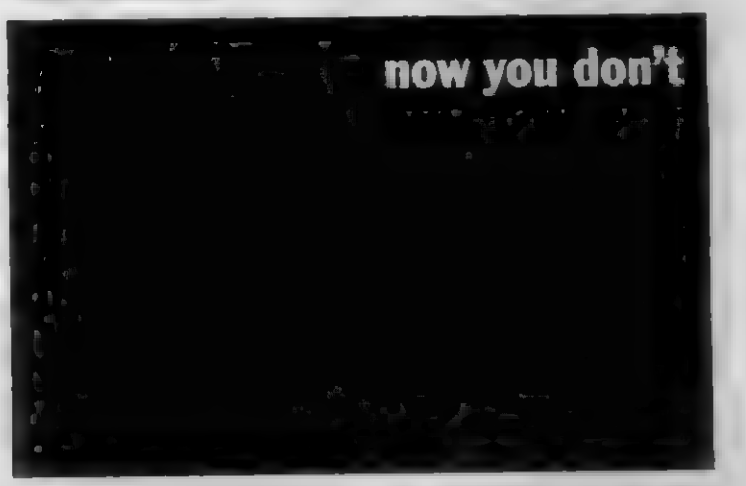
The program was designed for trainers and managers who wish to learn more about teaching remote learners via live television. It will air Oct. 5 at 12:30 p.m. Eastern time and will be broadcast to both HP sites and others licensed to host the event. For more information, contact Virginia A. Ostendorf, Inc. at (303) 797-3524.



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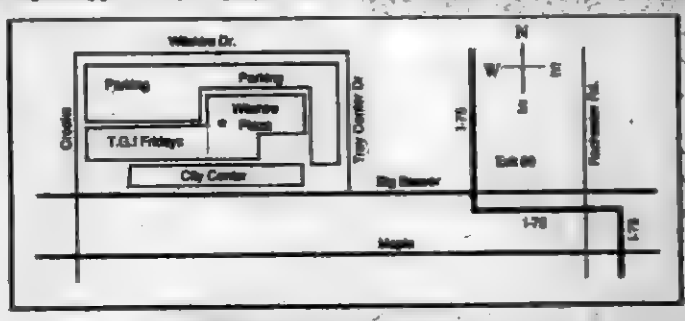

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Several positions are available for individuals whose backgrounds clearly demonstrate strong project management skills and a thorough understanding of ORACLE and DB2. These positions require 5 - 10 years directly related experience along with well-developed analytical and communication skills. Higher education, local government and/or utility industry experience would be an asset.

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Entry, Intermediate & Senior Levels

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Please forward your resume, indicating salary history and geographic preference, to: **Corporate Recruiting Dept. CW39-CP, Systems & Computer Technology, 4 Country View Road, Malvern, PA 19355.** Equal Oppty. Employer, M/F/D/V.

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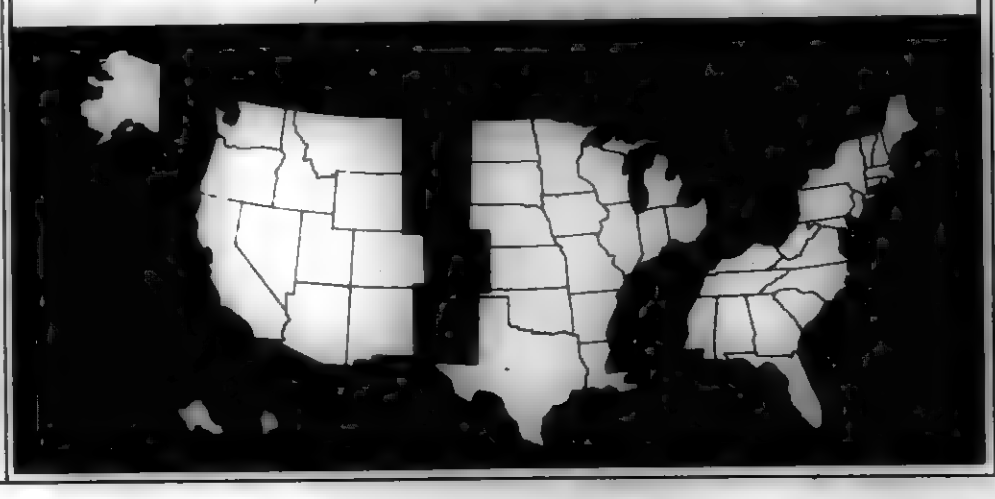

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Systems Analyst to analyze, design, develop, code, test, and support User Interface, Report, and Bar Coding Systems in a Client/Server Networked environment under Novell LAN, UNIX, OS/2 and DOS using HP9000/8XX, ORACLE 6.0, CASE Dictionary, 5.0, CASE Generator 2.0, PL/SQL, SQL PLUS, SQL Forms 3.0, SQL ReportWriter 1.1 and SQL Menu 5.0, for large automotive shipping, receiving, and material tracking system. Product AIAG Bar Coded Labels using SQL Forms/SQL Report Writer/ZPL (Zebra Programming Language) Require Master degree in Computer Based Info. Systems and 1 yr exp. as a Graduate Assistant which included hardware maintenance and software installation and management of network system. Must submit proof of Master's level project creating ORACLE Relational Database Management System in a client/server networked environment and the following Master level courses: System Analysis and Design, Database Management Systems; Data Networks; and Software Engineering Management. 40 hr wk, 8am-5pm. $37,164/yr. Send resume to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Ref. No. 75593 Employer Paid Ad.

Systems Analyst - Salary: $35,000.00 per year Hours: 8:00 am to 5:00 pm - weekdays. Position available for a Systems Analyst to develop, design and analyze window-based network database, data acquisition and statistical quality control software. To develop real-time and graphical user interface based software for both industrial and business applications. To analyze business problems and procedures to redefine data and convert it to programmable form and to specify detailed mathematically logical operations for computerized applications. Must have Master of Science (M.S.) in Computer Science field. Also, must have knowledge of graphical system relational databases as shown by graduate course work. Job opportunity located in Greenville, South Carolina. Applicant should send resume to: Certification Representative, South Carolina Employment Security Commission, P.O. Box 328, Greenville, SC 29602. Job Order No. 2000133. Must have proof of legal authority to work permanently in U.S. EEO/AA Employer

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You will install, configure, and tune INGRES relational databases. Additionally, you will also provide training and consultation on INGRES and other relational databases. To qualify, you must have 3+ years' related experience in the RDBMS environment. In-depth understanding of SQL and strong UNIX experience are essential. Strong working knowledge of networking applications and prior vendor experience are required. A BSCS or equivalent and demonstrated ability to perform individual and group training are highly desirable. **Job Code: CW1.**

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Train and consult with customers on development and customization of MANMAN/X applications using code generator and 4GL. Three or more years' hands-on tools experience developing business/financial applications and relevant life cycle experience including design, development, debug, etc. are essential. Demonstrated experience with Windows 4GL, Motif and other development tools desired. Manufacturing systems experience should be complemented with strong working knowledge of networking applications, UNIX Operating Systems, and Relational Databases. A BSCS or equivalent and previous hands-on technical training experience are a must. **Job Code: CW2.**

Systems Consultants

You will install MANMAN/X software and load new releases, as well as teach customers how to use MANMAN/X system tools. Candidates must have 3+ years' extensive UNIX experience including supporting complex UNIX installation sites and prior experience as a Systems Manager. Other requirements include hands-on experience with the following: performance tuning, kernal configuration, relational technology, and networking applications. A BSCS or equivalent and demonstrated ability to perform individual and group training are highly desirable. **Job Code: CW3.**

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Work with customers to manage implementation projects for our advanced manufacturing and financial systems. Requires a college degree or equivalent and 5+ years' relevant experience in one or more of the following: master scheduling techniques, Job Shop/JIT manufacturing technologies, and financial reporting, as well as inventory, purchasing and order administration systems. Strong project management and communication skills are essential. **Job Code: CW4.**

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Work with sales representatives to provide a 'solution sell' to customers including preparing and conducting customized presentations and product demonstrations on two or more hardware platforms, as well as on-site consultation. Requires a college degree or equivalent and 5+ years' experience in one or more of the following: manufacturing systems pre-sales, manufacturing management with MRP systems, and/or manufacturing planning, MRP consulting, financial reporting, and inventory/purchasing/order administration systems. APICS certification and strong working knowledge of ASK product offerings are highly desirable. **Job Code: CW5.**

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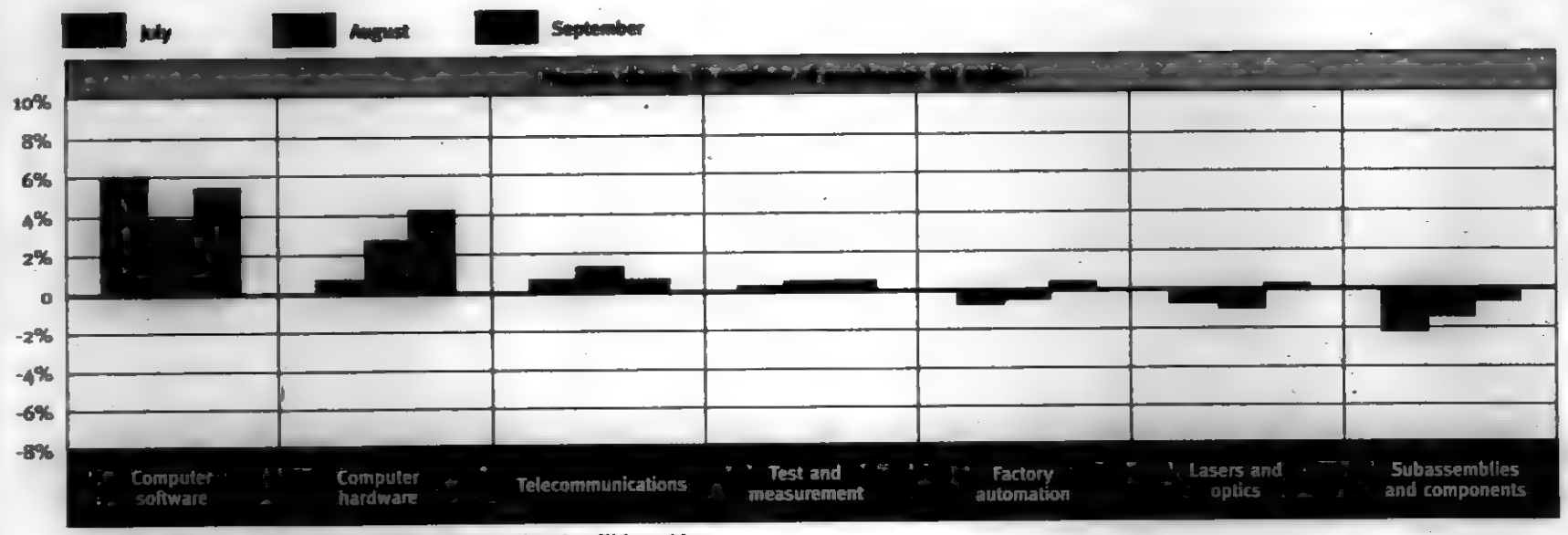

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Completed applications and supplemental qualifications must be received in the Bureau of Human Resources by 5:00 p.m. October 18, 1993. Application materials, career opportunity bulletins, and supplemental qualification sheets are available at all Maine Job Service Offices or by contacting:

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the PRICE for ADVICE

Even though they're in the minority, some consultants don't have your best interests at heart

By Dan Allen

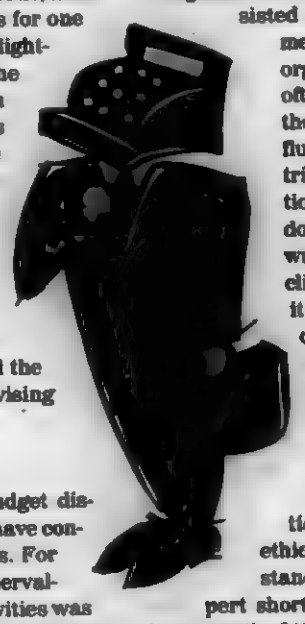
As a rule, information systems management consultants display the highest integrity. They work hard, bill their time accordingly and are generally on the up and up.

On occasion, however, a few stray from these good intentions. They overstate their abilities, hide unflattering truths and allow their clients to act as the check and balance on their activities. Luckily, those consultants are few and far between.

To guard against questionable practices, it's important to understand how consultants bill their time. Each day, they must charge eight hours to one or more project codes. The goal is to charge as much as possible to paying client codes and avoid charging to nonclient codes such as training and proposal development or to codes with no budget.

Because the number of billable hours is used as the basis for promotions and firings, some consultants pad their figures. Asking for detailed time accounting reports may help, but consultants know how to play the game.

I was once on a 30-member consulting team conducting 10 simultaneous, independently contracted projects for one client. The combined fee ran slightly more than $1 million, and the client insisted that the team track its time. Some projects ran wildly over budget, while some ran significantly under. We itemized the bill by project, but it didn't accurately reflect our time, so we adjusted it. It also didn't hint that 15% of the fee funded the time it took to fabricate the bill. Essentially, we billed the client about $150,000 for devising the elaborate scam.



Start-up budgets

If we had mentioned the budget discrepancies, the client might have considered some items frivolous. For instance, one of the most undervalued and underbudgeted activities was the time required to get a project off the ground. Consultants usually include a few days as a token start-up budget for a three-month engagement, but preparation can take more like a month. Start-up time includes courtesy calls to client personnel and studying information to understand the project's goal. In this case, if the client had known we spent a month getting started, we might have looked incompetent.

In the above example, the client was satisfied with the results, but none of the day-to-day team members had significant experience in the client's industry or generic issues. Our expertise consisted of brokering agreements among the various organizational groups, often rubber-stamping the views of the most influential. It was our contribution to the reputation consultants have for doing little more than writing down what the client says and parroting it back. While parroting, or more politely, reflecting, is legitimate and potentially valuable, the service requested was significantly more sophisticated.

At times, certain practices almost cross clear ethical boundaries. For instance, we brought in an expert shortly before the end of a three-month, $100,000 project. The expert found the draft project recommendations so out of date that he recommended starting over. Instead of telling the client and risking our credibility, we went forward with an amateurish report and the expert, who was also a partner at our firm, backed us up.

Proceed with caution

Of course, none of this should dissuade you from using consultants. Currently, I'm working with four different consultancies, and I can't imagine the project succeeding without them.

You must understand that they are human; deal with them in an open and candid way, and avoid putting them in a position where your interests conflict. If the client with the 10 subprojects had realized how difficult it is to track 30 people's time across 10 projects, he wouldn't have asked for such a detailed report or at least would have been directly involved to ensure its integrity.

You must also be willing to work openly to adjust budgets as variances are identified. In our case, there should have been no embarrassment. The client would have probably understood that project estimates are rarely accurate and would not have pressured us to keep to an unrealistic budget.

Finally, there are two primary defenses to protect against phony expertise. First, establish long-term relationships with consultants so you can come to understand their strengths and weaknesses. Second, become enough of an expert yourself to recognize a con when you see one.

Allen is a former management consultant.

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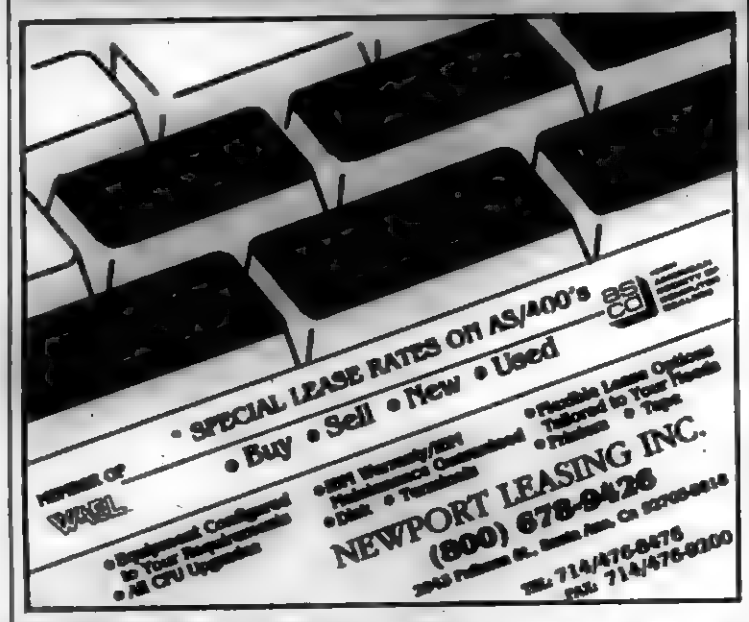

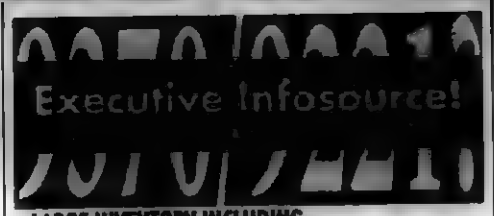

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PS/2 Model 90-0H9	$1,700	$1,525
PS/2 Model 95-0JF	$3,000	$2,650
Compaq Prolinea 4/66	$2,000	$2,100
Prolinea 486/50	$1,450	$1,575
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SLT-386	$925	$850
LTE-386	$575	$600
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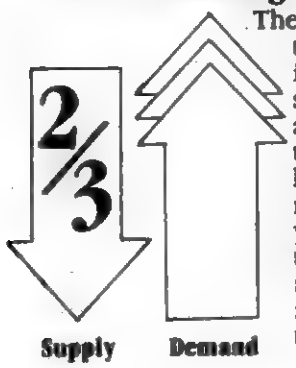
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

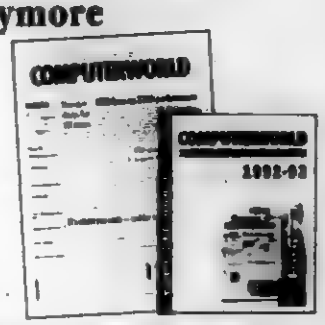
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active ☐ ☐
7 are Passive ☐ ☐ ☐ ☐ ☐ ☐ ☐
1 is a Non-mover ☐

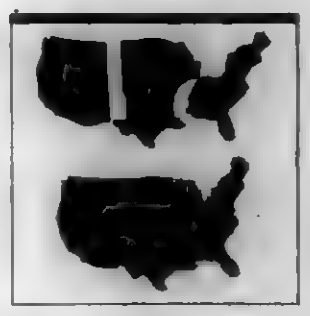
In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 629,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions



A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

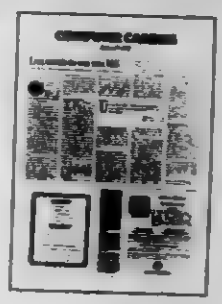
Computerworld needs just 2 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional rate of just $199.42 per inch, your cost-per qualified candidate reached is better than any newspaper. Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad



Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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Gainers

Percent

Digital Comm. Assoc.	37.6	Microcom Inc.	-14.7
Cirrus Logic	25.8	Platinum Technology(L)	-14.6
Telxon Corp.	24.4	Data Race Inc.(L)	-13.7
Ultimate Corp.	22.7	Omega Corp.(L)	-12.5
CE Software	21.7	Netrix Corp.	-10.5
Dynatec Inc.	19.8	Data Switch Corp.	-10.0
Tandon Computers Inc.	19.2	Parsons Int'l Inc.	-9.6
Compex Computer	18.9	CompSoft	-8.3

Losers

Dollar

Stratus Inc.	11.88	3M Corp	-4.00
BMC Software Inc.	7.88	American Info Techs Corp.	-2.25
Cirrus Logic	7.88	Bell Atlantic Corp.	-1.75
Oracle Corp.	6.63	Data Race Inc.(L)	-1.75
Cabletron Systems	6.13	3Com Systems Inc.(L)	-1.75
Motorola Inc.	6.13	Platinum Technology(L)	-1.63
Lotus Development	5.38	Storage Technology	-1.63
Digital Comm. Assoc.	5.13	Novell Inc.	-1.38

Some IPOs sink after soaring

NetManage, Inc. (NETM) showed last week that the initial public offering (IPO) craze is not over for technology companies. But the splashiest IPOs in the past year have not provided the best long-term returns.

NetManage, a Cupertino, Calif.-based maker of network applications and development software, zoomed up 52% to close at 24¼ on its first day of trading. Several other high-tech IPOs this year, including Powersoft Corp. (PWRS), Gupta Corp. (GPTA) and MathSoft, Inc. (MATH), have come close to doubling their share price on first-day enthusiasm.

However, at Tuesday's close, Powersoft ranked as only the 20th best gainer (up 37%) among computer stocks that hit the market in the last year, starting July 1992. Meanwhile, after less spectacular starts, superserver vendors Parallan Computer, Inc. and Tricord Systems, Inc. have both outperformed Powersoft. Each is up roughly 75%. Banyan Systems, Inc. (BNYN) is up 82% since its IPO, and PeopleSoft, Inc. has gained 78%. (See chart for the top gainers.)

The one-year period saw 51 computer-related IPOs that were worth $10 million or more; on Tuesday, 27 of them stood above their IPO price. Seven more were roughly even with their initial pricing, while 17 issues had lost ground.

Gupta and MathSoft numbered among the losers. Gupta finished Tuesday at about 20% below its February IPO price of 18, while MathSoft was down 56% from its IPO price. Joining MathSoft at the bottom of the list were Computervision Corp. (CVN) at 75% off its initial price, Netrix Corp. (NTRX), down 64%, and Electronic Retailing Systems, Inc. (ERSI), down 48%. —*Derek Slater*

Best buys

TOP PERFORMING STOCKS THAT WENT PUBLIC IN THE FOUR QUARTERS STARTING JULY 1992

Company	IPO date	IPO price	Recent price	Change
Cambridge Technology Partners	4/8/93	5	12⅜	148%
BHC Financial	4/7/93	14	33½	139%
Platinum Software Corp.	10/22/92	14	29	107%
Computervision Corp.	10/20/92	14¼	30⅛	106%
Data Research Associates Inc.	7/1/92	7	13½	93%
The 300 Co.	5/3/93	15	28¾	92%

Exch	52-Week High	52-Week Low	Sept. 24 3 PM	Wk Net Change	Wk Pct Change
Computer Networking Products					
OTC	40.00	15.63	3 COM Corp.	30.38	3.13	11.5
NYS	91.13	63.38	American Info Techs Corp.	87.38	-2.25	-2.5
NYS	65.00	40.63	AT&T	59.50	0.13	0.2
OTC	4.06	0.75	Artel Communication Corp.	3.06	-0.25	-7.5
OTC	24.50	12.50	Banyan Systems Inc.	18.88	0.38	2.0
NYS	64.88	44.50	Bell Atlantic Corp.	62.63	-1.75	-2.7
NYS	62.88	46.75	Bellsouth Corp. (H)	61.13	-0.50	-0.8
NYS	14.75	3.63	Bolt, Beranek & Newman	10.75	0.25	2.4
OTC	18.50	9.50	Brooktrout Technology	12.50	0.50	4.2
NYS	119.00	56.63	Cabletron Systems	109.00	6.13	6.0
OTC	35.00	6.63	Centigram Communications	31.88	1.13	3.7
OTC	55.50	20.25	Chipcom Corp.	54.75	4.75	9.5
OTC	59.25	24.00	Cisco Systems Inc.	47.25	1.00	2.2
OTC	14.38	5.50	Compression Labs Inc.	14.25	0.50	3.6
OTC	36.00	17.00	CrossComm	28.00	0.50	1.8
OTC	4.63	1.63	Data Switch Corp.	2.25	-0.25	-10.0
NYS	19.88	12.38	Digital Comm. Assoc.	18.75	5.13	37.6
OTC	12.75	3.75	Digital Systems Int'l Inc.	4.50	0.50	12.5
OTC	67.88	10.75	DSC Communications	61.25	1.75	2.9
OTC	9.50	4.75	Fibronix Int'l Inc.	5.88	-0.63	-9.6
OTC	24.00	8.75	Fibronics Int'l Inc.	15.00	2.00	15.4
OTC	4.38	1.50	Gandalf Technologies Inc.	2.13	-0.19	-8.1
OTC	7.06	0.75	Gateway Communications	0.88	0.00	0.0
NYS	15.75	3.25	General Datacomm Inds.	11.75	-0.38	-3.1
ASE	3.75	2.00	Go Video	2.63	0.19	7.7
NYS	39.00	32.38	GTE Corp. (H)	38.38	0.38	1.0
NYS	94.75	63.25	ITT Corp.	92.25	-0.38	-0.4
OTC	29.88	16.81	MCI Communications Corp.	27.50	-0.88	-3.1
OTC	6.50	1.50	Microcom Inc.	2.50	-0.50	-16.7
OTC	24.25	3.50	Netrix Corp.	4.25	-0.50	-10.5
OTC	19.00	6.50	Network Computing Devices (L)	7.25	0.25	3.6
NYS	15.00	5.38	Network Equipment Tech.	8.50	0.50	6.3
OTC	20.13	8.00	Network General	12.88	0.63	5.1
OTC	15.75	6.88	Network Systems Corp.	7.75	0.00	0.0
OTC	73.88	8.94	Newbridge Networks Corp.	68.75	4.75	7.4
NYS	46.00	21.38	Northern Telecom Ltd.	24.88	-0.63	-2.5
OTC	35.25	17.63	Novell Inc.	17.75	-1.38	-7.2
NYS	48.88	39.50	Nynex Corp. (H)	47.75	-1.00	-2.1
OTC	30.00	14.50	Octel Communications Corp.	22.50	1.50	7.1
OTC	6.13	3.38	Perric Data Comm Networks	4.13	-0.25	-5.7
OTC	30.50	12.50	Picturetel Corp.	18.75	1.25	7.1
OTC	11.50	3.63	Proteon Inc.	4.88	-0.13	-2.5
NYS	37.88	17.50	Scientific Atlanta Inc.	37.63	2.00	5.6
NYS	47.00	31.75	Southwestern Bell Corp.	43.25	-0.75	-1.7
NYS	37.38	22.25	Sprint Corp.	36.38	0.63	1.7
OTC	27.00	12.50	Standard Microsystems Corp.	23.75	2.25	10.5
OTC	18.50	9.25	Stratacom Inc.	12.50	-0.50	-3.8
OTC	42.75	12.84	Synoptics Communications	27.75	2.25	8.8
OTC	6.63	2.88	Telebit Corp.	6.38	1.25	24.4
OTC	16.00	2.63	Telematics Int'l Inc. (H)	16.00	1.00	6.7
OTC	32.75	15.25	US Robotics	32.25	3.50	12.2
NYS	48.75	35.25	US West Inc. (H)	47.88	-0.25	-0.5
OTC	56.00	19.50	Wellfleet Communications	50.38	4.38	9.5
OTC	19.50	7.25	Xircom	17.00	0.00	0.0
Desktop Workstations						
OTC	5.56	2.50	Advanced Logic Research	2.75	-0.13	-4.3
OTC	65.25	23.50	Apple Computer Inc. (L)	24.75	-0.75	-2.9
OTC	24.25	12.75	AST Research Inc.	18.13	2.63	16.9
NYS	9.25	2.50	Commodore Int'l.	3.25	0.00	0.0
NYS	61.75	31.00	Compaq Computer Corp.	58.75	1.25	2.2
OTC	69.88	13.50	Dell Computer Corp.	17.38	0.13	0.7
NYS	89.25	50.25	Hewlett Packard Co.	69.88	1.00	1.5
NYS	41.25	17.63	Silicon Graphics	41.25	2.63	6.8
OTC	41.00	24.00	Sun Microsystems Inc.	26.88	1.25	4.9
NYS	36.88	24.63	Tandy Corp. (H)	35.88	0.00	0.0
OTC	7.00	2.88	Zeos International Ltd.	3.00	-0.19	-5.9
Large Systems						
ASE	9.38	4.50	Amdahl Corp.	5.88	0.38	6.8
NYS	8.75	3.63	Convex Computer	5.50	0.88	18.9
OTC	6.13	2.25	Cray Computer	4.50	0.25	5.9
NYS	30.88	19.00	Cray Research Inc.	23.75	0.38	1.6
NYS	13.88	7.75	Data General Corp.	8.63	0.00	0.0
NYS	49.25	30.38	Digital Equipment Corp.	38.25	-0.25	-0.6
NYS	44.00	28.75	Harris Corp.	42.38	1.75	4.3
NYS	82.88	40.63	IBM	41.88	-1.13	-2.6
OTC	25.75	5.50	Kendall Square Research	22.50	1.75	8.4
NYS	141.50	83.00	Matsushita Electronics	134.75	-1.25	-0.9
OTC	23.75	8.25	NetFrame	15.75	-0.75	-4.5
OTC	23.50	9.25	Parallan Computer	21.50	2.00	10.3
OTC	33.25	6.00	Pyramid Technology	20.63	-0.25	-1.2
OTC	24.00	11.25	Sequent Computer Sys.	15.50	0.50	3.3
OTC	7.13	1.38	Sequoia Systems Inc.	2.25	-0.13	-5.3
NYS	44.50	20.25	Stratus Computer Inc.	24.75	0.75	3.1
NYS	16.88	8.50	Tandem Computers Inc.	11.63	1.88	19.2
OTC	23.50	10.63	TriCord Systems	20.25	1.00	5.2
NYS	13.88	7.75	Unisys Corp.	11.75	0.25	2.2
Software						
OTC	37.00	12.63	Adobe Systems Inc.	18.00	1.25	7.5
OTC	20.75	10.25	Aldus Corp.	20.50	1.75	9.3
OTC	11.25	5.50	American Software Inc.	6.88	-0.50	-6.8
OTC	28.13	9.50	Ase Computer Systems	11.13	0.13	1.1
OTC	56.75	38.75	Autodesk Inc.	48.50	0.25	0.5
OTC	8.50	2.50	Bachman Info. Systems	3.50	0.13	3.7
OTC	43.00	24.75	BGS Systems Inc. (L)	24.75	-1.75	-6.6
OTC	84.13	38.75	BMC Software Inc.	61.75	7.00	12.8
OTC	28.25	18.00	Boole & Babbage	24.88	0.88	3.6
OTC	42.00	12.75	Borland Int'l Inc. (L)	19.00	1.13	8.1
OTC	5.00	2.75	CE Software	3.50	0.63	21.7
ASE	40.25	11.16	Cheyenne Software Inc.	31.63	0.38	1.2
OTC	19.50	8.25	CompSoft	13.75	-1.25	-8.3
OTC	8.88	5.63	Cognos Inc.	7.38	-0.25	-3.3
NYS	32.75	14.50	Computer Associates	32.75	2.63	8.7
NYS	9.63	2.75	Computervision Corp.	3.13	0.00	0.0
OTC	34.75	19.25	Computware Corp.	23.13	-1.13	-4.6
OTC	14.75	5.75	Consware Inc.	9.25	0.13	1.4
OTC	31.50	10.75	Corel Corp. (H)	30.88	0.50	1.6
OTC	15.25	5.00	Easel Corp.	6.25	-0.25	-3.8
OTC	25.25	12.00	4th Dimension	21.25	-0.50	-2.3
OTC	19.25	5.25	Frame Technology	7.88	0.25	3.3
OTC	17.50	8.00	Group I Software (L)	9.50	1.50	18.8
OTC	35.25	14.00	Gupta (L)	14.88	-0.38	-2.5
OTC	11.00	4.50	Hogan Systems Inc. (H)	10.75	0.50	4.9
OTC	25.75	11.25	IMRS	17.00	-1.00	-5.6
OTC	44.75	24.75	Information Resources	41.25	-0.25	-0.6
OTC	27.25	10.13	Informix Corp.	21.75	3.00	16.0
OTC	14.50	8.50	Intergraph Corp.	10.00	-0.63	-5.9
OTC	13.63	5.88	Interleaf Inc. (L)	6.50	0.00	0.0
OTC	16.50	4.75	Intersolv Inc.	8.25	0.13	1.5
OTC	16.00	7.75	Knowledgeware Inc.	10.50	0.38	3.7
OTC	54.75	15.50	Legent Corp.	21.13	2.00	10.5
OTC	43.75	14.75	Lotus Development	43.75	5.50	14.4
OTC	29.00	4.25	MathSoft	6.00	0.75	14.3
OTC	23.25	4.50	McAfee Associates	8.50	0.25	3.0
OTC	11.63	2.50	Meca Software	6.81	-0.06	-1.3
OTC	12.00	5.25	Mentor Graphics	10.00	0.38	3.9
OTC	46.00	26.25	Micro Focus	27.25	0.75	2.8
OTC	13.25	4.38	Microgrape Inc.	7.75	1.00	14.8
OTC	98.00	70.38	Microsoft Corp.	78.75	2.25	2.9
OTC	59.25	18.63	Oracle Corp.	59.25	6.63	12.6
OTC	40.00	23.50	Parametric Technology	38.25	1.50	4.1
OTC	40.50	22.50	Peoplesoft	33.25	1.00	3.1
OTC	7.13	3.75	Phoenix Technologies	4.19	0.00	0.0
OTC	40.00	22.00	Powersoft	28.75	1.00	3.6
OTC	30.25	11.34	Platinum Software	29.88	-0.13	-0.4
OTC	25.00	9.50	Platinum Technology (L)	9.50	-1.63	-14.6
OTC	61.50	37.25	Progress Software Corp.	50.00	3.38	7.2
OTC	7.38	2.56	Quarterdeck Office Sys.	2.75	-0.06	-2.2
OTC	32.00	15.75	Rainbow Technologies Inc.	25.13	-1.00	-3.8
OTC	31.38	4.00	Rasterops	9.50	-0.75	-7.3
OTC	15.25	3.63	Ross Systems	12.88	1.88	17.0
OTC	28.75	9.63	Sapiens Intl. Corp. N.V.	26.50	-1.13	-4.1
OTC	14.50	5.50	Software Publishing Corp.	6.50	0.00	0.0
OTC	14.25	2.63	Software Toolworks Inc.	12.38	-0.88	-6.6
OTC	2.75	0.75	Spinnaker Software	1.59	0.03	2.0
OTC	13.75	3.38	State of the Art	11.00	0.50	4.8
NYS	24.63	15.00	Sterling Software Inc.	22.25	0.25	1.1
OTC	21.63	8.00	Struct. Dynamics Research	15.38	0.50	3.4
OTC	77.50	32.75	Sybase Inc.	66.50	11.00	19.8
OTC	19.50	5.88	Symantec Corp.	19.50	1.38	7.6
OTC	25.50	10.00	System Software Assoc.	16.88	2.25	15.4
OTC	6.38	2.75	Telezic Corp.	4.38	0.38	9.4
OTC	24.25	11.25	ViewLogic Systems	23.25	2.13	10.1
OTC	23.50	5.50	Walker Interactive Systems	6.75	0.00	0.0
OTC	3.19	1.00	Wordstar	1.19	0.00	0.0
Semiconductors						
NYS	32.88	10.63	Advanced Micro Devices	30.13	0.75	2.6
NYS	27.00	9.75	Analog Devices Inc.	27.00	2.00	8.0
OTC	37.75	10.50	Atmel Corp. (H)	37.75	3.50	10.2
OTC	6.25	2.75	Chips and Technologies	5.50	0.63	12.8
OTC	39.75	13.00	Cirrus Logic	34.13	7.00	25.8
NYS	16.75	7.88	Cypress Semiconductor Corp.	12.75	0.25	2.0
NYS	19.00	10.38	Dallas Semiconductor	18.25	1.38	8.1
OTC	68.38	30.38	Intel Corp.	68.38	3.63	5.6
NYS	19.25	5.38	LSI Logic Corp.	17.88	0.38	2.1
OTC	25.75	11.66	Lattice Semiconductor	25.25	2.00	8.6
NYS	62.25	14.38	Micron Technology (H)	62.25	4.00	6.9
NYS	99.13	41.38	Motorola Inc.	98.25	6.13	6.6
NYS	20.88	10.13	National Semiconductor	20.63	0.75	3.8
OTC	15.75	6.50	Sierra Semiconductor	7.75	0.50	6.9
OTC	51.75	25.50	SynOptsys	48.75	2.63	5.7
NYS	84.25	39.00	Texas Instruments	78.75	2.63	3.4
OTC	18.63	6.50	VLSI Technology (H)	18.63	1.50	8.8
OTC	13.75	3.00	Weitek (H)	13.75	1.00	7.8
ASE	9.63	3.63	Western Digital Corp.	5.00	0.13	2.6
OTC	47.25	14.60	Xilinx	47.25	3.00	6.8
OTC	35.50	18.00	Zilog Inc. (H)	35.50	3.00	9.2
Systems Integrators						
OTC	48.00	15.75	American Power Conversion	42.75	4.00	10.3
OTC	21.38	15.50	Barctec Inc.	21.38	2.13	11.0
OTC	18.00	3.50	Cambex Corp.	4.50	0.50	12.5
ASE	18.38	3.88	Cognitronics Corp.	4.25	-0.13	-2.9
NYS	25.50	9.00	Conner Peripherals	10.13	0.13	1.3
OTC	58.50	15.00	Creative Technologies Inc.	20.00	0.88	4.6
OTC	30.75	10.50	Data Race Inc. (L)	13.00	-1.75	-13.7
ASE	13.25	4.75	Databank Corp.	8.38	-0.25	-2.9
NYS	36.00	6.88	EMC Corp.	36.00	2.38	7.1
OTC	10.50	5.25	Emulex Corp.	6.75	0.50	8.0
OTC	19.00	13.25	Evans & Sutherland	16.75	0.00	0.0
OTC	20.63	7.50	Exabyte	9.75	0.38	4.0
OTC	34.00	9.13	Intelligent Info. Systems	26.75	0.75	2.9
OTC	8.88	2.50	Iomega Corp. (L)	2.63	-0.38	-12.5
OTC	15.25	5.75	IPL Systems Inc.	7.00	-0.25	-3.4
OTC	24.00	14.25	Komag Inc.	16.38	0.13	0.8
OTC	19.63	4.38	Maxtor Corp.	5.50	-0.38	-6.4
OTC	10.38	5.75	Micropolis Corp.	6.75	0.50	8.0
NYS	117.00	97.00	3M Corp	103.75	-4.00	-3.7
OTC	7.75	4.00	Pointdrive Inc.	7.63	0.50	7.0
NYS	17.25	6.88	QMS Inc.	9.00	1.13	14.3
OTC	17.88	9.50	Quantum Corp.	10.88	-0.50	-4.4
OTC	7.13	3.13	Radius Inc.	4.50	-0.13	-2.7
NYS	16.88	9.13	Recognition Equipment	16.13	0.50	3.2
OTC	13.88	3.75	Reson Inc.	4.13	-0.13	-2.9
OTC	22.38	12.00	Seagate Technology	18.63	1.00	5.7
NYS	65.00	18.00	Storage Technology	25.88	-1.63	-5.9
NYS	27.88	17.63	Tektronix Inc.	24.38	0.25	1.0
NYS	88.88	70.13	Xerox Corp. (L)	71.50	-0.25	-0.3
Terminals						
OTC	23.75	14.88	American Mgmt. Systems	16.50	0.38	2.3
NYS	4.75	2.38	Anacomp Inc.	3.00	0.13	4.3
OTC	35.75	17.75	Analysts Int'l.	32.25	-0.50	-1.5
NYS	56.13	44.63	Auto Data Processing	51.50	2.38	4.8
NYS	17.75	13.00	Ceridian Corp. (H)	17.50	0.13	0.7
NYS	17.38	13.13	Comdisco Inc.	16.00	-0.13	-0.8
OTC	11.00	4.50	Computer Horizons	10.50	-0.50	-4.5
NYS	92.38	65.88	Computer Sciences	91.75	1.75	1.9
NYS	9.25	6.00	Computer Task Group	7.00	0.00	0.0
NYS	40.50	19.00	CompUSA Inc.	30.38	-0.38	-1.2
OTC	14.25	7.00	Corporate Software	11.00	-0.25	-2.2
OTC	12.75	6.63	Egghead Discount Software	7.00	-0.13	-1.8
NYS	35.88	26.00	General Motors E (EDS)	32.00	0.00	0.0
OTC	25.50	10.50	Inacom Corp.	16.50	-1.13	-6.4
OTC	19.88	8.13	Intelligent Electronics	19.88	0.38	1.9
OTC	15.13	7.13	Merisel	14.75	0.88	6.3
OTC	24.50	5.75	Microage Inc.	21.63	0.13	0.6
OTC	33.00	19.00	Paychex	31.25	-0.75	-2.3
NYS	87.25	21.63	Policy Management Sys.	26.50	1.38	5.5
NYS	43.63	20.75	Reynolds and Reynolds	39.25	0.88	2.3
OTC	19.00	12.13	SEI Corp.	18.38	0.38	2.1
OTC	24.38	17.50	Shared Medical Systems	21.38	-0.50	-2.3
OTC	12.63	5.75	SHL Systemhouse	9.88	-0.13	1.3
OTC	30.75	20.00	Software Spectrum Inc.	25.25	0.00	0.0
OTC	40.75	23.75	Sungard Data Systems	39.25	0.00	0.0
NYS	4.38	1.13	Ultimate Corp.	3.38	0.63	22.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

Investors eye Wang

As expected, Wang Laboratories, Inc. emerged from Chapter 11 bankruptcy protection last week. But in a last-minute surprise, two investment firms filed sealed bids with the court for the right to buy new stock from Wang in a private sale, producing a better deal than Wang had signed with one of the firms in August. Wang said it expects to return to profitability next quarter.

Oracle posts profit

For its first fiscal quarter of 1994 ended Aug. 31, Oracle Corp. said revenue increased 30% to $398 million from $307 million in the same period a year ago. Net income for the period rose 275% to $87 million, compared with net income (before a onetime accounting charge) of $10 million in the same period a year ago.

TSC revenue drops

Following the surprise ouster of its two top executives earlier this month, Chicago-based Technology Solutions Co. last week reported that its first-quarter revenue fell 12%, from $15.5 million to $13.8 million from a year ago. The systems integrator did post increases in both net and operating income for the quarter.

Buyout afoot

Digital Communications Associates, Inc. (DCA) in Alpharetta, Ga., has approved a $195 million takeover bid from Welsh, Carson, Anderson & Stowe and Donaldson, Lufkin & Jenrettes's Sprout Group. The acquiring firms will pay $18.75 for each of DCA's 10.1 million outstanding shares of common stock.

Record earnings

For its first quarter ended Aug. 31, 3Com Corp. reported net income of $26.1 million, up 78% from the year-earlier period. Sales for the quarter increased 20% to $162.1 million from the comparable period last year.

Internetworking Darwinism

Some vendors suffer as market evolves

By Joanie M. Wexler

The salad days of many internetworking companies are waning as the shakeout that so often signals a maturing market rears its head.

The main evidence of the shifting tides: the out-of-orbit financials reported by top-tier vendors such as Cisco Systems, Inc., Wellfleet Communications, Inc., Cabletron Systems, Inc. and SynOptics Communications, Inc., compared with multiple-quarter downturns for technology-savvy but less pervasive companies such as Proteon, Inc., Ungermann-Bass, Inc. and Retix.

The dynamics of the network equipment industry, in which players were once prolific almost in spite of themselves, are shifting in step with user buying patterns to allow the "rich to get richer and the poor to get poorer," several analysts said.

Translation: The router and smart hub powerhouses that early on muscled their way into reams of corporate accounts are continuing to prosper at a dizzying pace — one that is accelerating as customers move toward enterprisewide, rather than departmental, purchase decisions.

These companies' early infiltration strategies have sewn up a lot of business for the future. And in many cases, that success will shut out smaller players regardless of what whizbang features these competitors might add to their products.

"Customers are now buying a 'company,' not just a product," said Todd Dagres, vice president of data communications research at The Yankee Group, a Boston consultancy. "Buyers are going with who is safe and looking at how much they're spending on R&D."

These attitudes serve to fuel the successes of the already aspiring vendors, he said.

This is reflected in the polar financials that have market leaders enjoying double-digit percentage growth rates in their stock prices while their second-tier counterparts suffer double-digit percentage losses (see chart above).

Facing the music

With these figures in mind, as a customer, "are you going to be the one to explain if you go with a vendor who isn't mainstream, and they run into trouble?" said Robin Layland, principal consultant at Layland Consulting in West Hartford, Conn., and former network planner at The Travelers Corp.

Hub giant Cabletron attributed much of its success to its notorious tightfistedness. "When times get tough, the guys in the best position will be those who are in best control of their costs and can still deliver," Cabletron Chairman Craig Benson said.

Rival SynOptics predicted some shakeout because companies focused on a single technology are headed toward commodity markets. While SynOptics infiltrated the Ethernet-over-unshielded copper wiring (10Base-T) market ahead of standards, "six months after the standard, there were probably 200 companies offering 10Base-T hubs," said Gary Law, director of business alliances at SynOptics.

"This drove the cost down, leaving no margins for vendors with nothing else to sell and no money to expand into other areas," Law said.

Some firms, such as 3Com Corp. and Ungermann-Bass, have acquired other hub companies to fill in product gaps.

The more things change.

AS EXEMPLIFIED IN THE SMART HUB MARKET, THE RICH ARE GETTING RICHER AS CONSOLIDATION AND NEW USER BUYING PATTERNS KICK IN

Company	Stock price Sept. 28, 1992	Stock price Sept. 28, 1993	Percent change
3Com Corp.	14 3/8	27	91%
[illegible] Corp.	26 3/8	49 7/8	89%
SynOptics Communications, Inc.	14*	25 1/2	82%
Cabletron Systems, Inc.	62 3/8	103	65%
Bytex Corp.	5 1/8	4 1/2	-12%
Optical Data Systems, Inc.	18 1/8	10 1/4	-44%
Lannet Data Communications Ltd.	24 7/8	14	-44%
Proteon Inc.	10 1/8	5	-51%

*SynOptics' 1992 stock price is adjusted to reflect a 3-for-2 stock split in early 1993.

European woes

The last two quarters have been "very difficult" for Ungermann-Bass, according to Chief Executive Officer Ralph Ungermann, who resigned in July. He attributed the firm's problems to its traditional focus on a high-end market turned sluggish and a poor economic climate in Europe, once fertile ground for Ungermann-Bass.

Retix, too, attributed its 15.2% net loss for its second fiscal 1993 quarter ended July 3 to a weak European economy. The company, known initially for its Open Systems Interconnect business, hopes to pick itself up in the third quarter with its foray into the telecommunications market.

Retix recently became partners with McCaw Cellular Communications, Inc. to provide the internetworking component of that company's cellular network.

Like Retix, struggling vendors "have to reinvent themselves and find a product or concept that people don't know they need yet, then create the need," Dagres said.

In the case of Proteon, long a strong technology player credited with inventing several technologies and driving many networking standards, "merchandising has become more important than it ever was before, and technology [competence] is assumed," said Elliott Honan, acting president since longtime President Patrick Courtin abruptly resigned in July. The company, which has reorganized into two independent business units, one on LAN adapters and one on internetworking products, "will get better at selling," he vowed.

Cisco mates for market advantage

With time to market a burning issue in the computer networking arena, vendors are busy buying out or partnering with others to quickly gain expertise, technology and products. The smaller partner's payoff is typically access to the more pervasive vendor's account base.

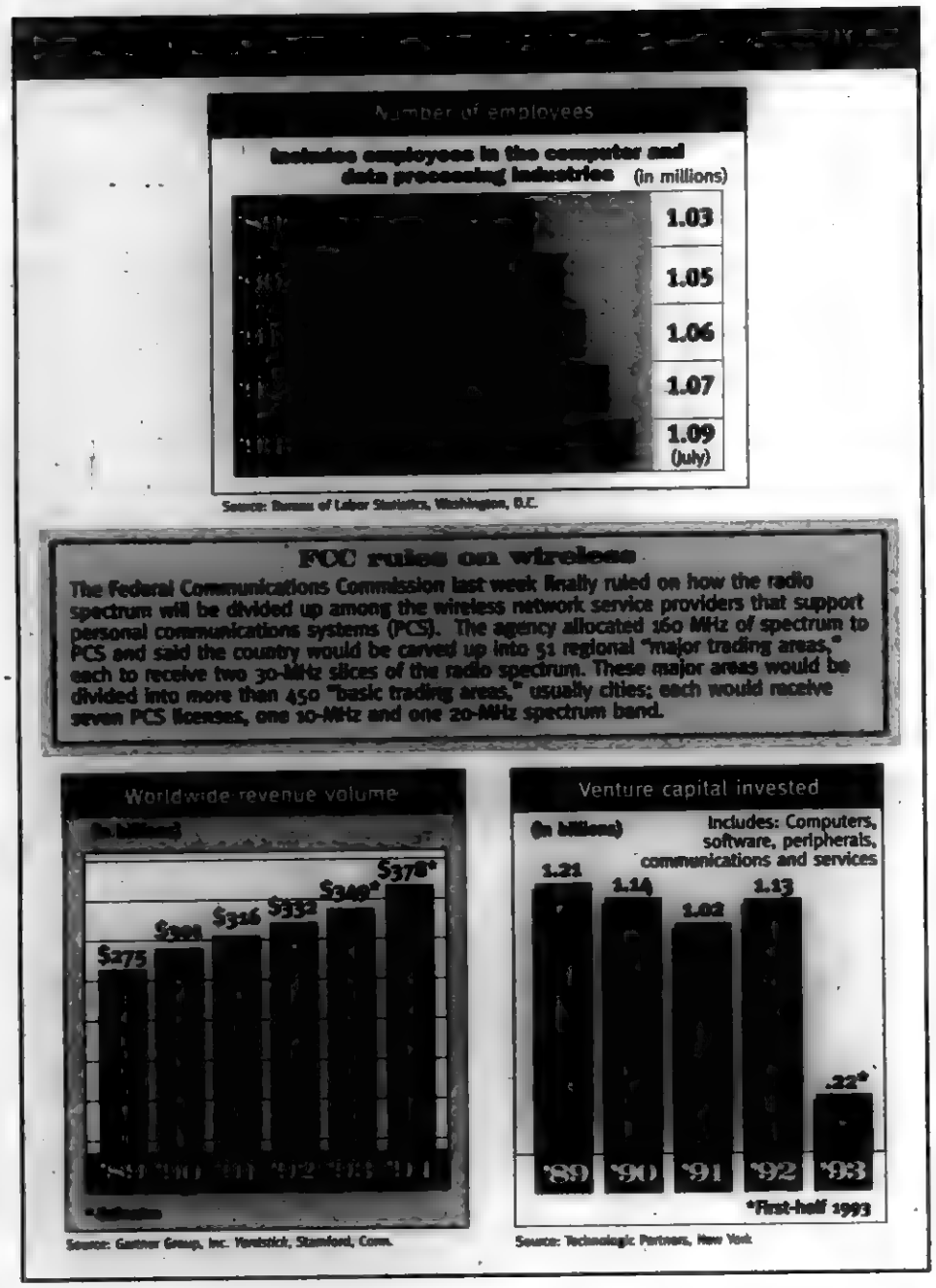
A recent example is Cisco's intended acquisition, announced last week, of start-up Crescendo Communications, Inc., a Sunnyvale, Calif., vendor of high-speed workgroup connectivity products. Cisco plans to buy the 60-person company for 2 million shares of Cisco common stock, which closed at $47.25 per share at press time last week.

For Cisco, the main impetus behind the buy was the router giant's quest for LAN-switching technology, said Paul Homburger, manager of business development.

That represents the next generation of high-speed internetworking, which analysts said will first coexist with, and eventually supplant, routing technology.

"There has been an increasing gap in the performance of workstations and networks," said George Kelly, principal at Morgan Stanley & Co., a New York financial analysis firm. "I think Cisco saw that teaming with Crescendo would give them multiple ways to solve the bandwidth bottleneck problem."

— *Joanie M. Wexler*



The 5th Wave *by* Rich Tennant

Inside Lines

Managing the internetwork

Novell plans next week to announce its long-awaited distributed version of NetWare Management System (NMS). Anticipated are a suite of system and network management applications that are expected to run as NetWare Loadable Modules (NLM) for managing distributed NetWare LANs and servers. The NLMs will be able to talk to one another to correlate data on an as-needed basis. Currently, all data goes to a Windows-based system, clogging the internetwork and raising user concerns about scalability. Mid-1994 seems to be the best-case scenario for shipment, a third-party source said. Meanwhile, Novell will introduce Rmon support so that NMS can collect Rmon-based LAN traffic and error data from a fleet of Novell's LANalyzer nodes.

Five's alive

Digital plans to introduce its long-promised Pathworks Version 5.0 LAN software next week at Networld. Due out by the end of the year, Version 5.0 includes a redesigned graphical user interface and a new ManageWorks component for managing native Novell NetWare and Microsoft LAN Manager servers from a client PC without a Pathworks server on Digital hardware. Digital wants to use ManageWorks to position Pathworks as a tool for integrating management of mixed LANs across a corporation in hopes of moving the software beyond the company's installed base. Some analysts remain skeptical about its chances on that score, however.

Partners of necessity

IBM has a "pre-alpha" version of its portable DB2 up and running under Windows NT in its Toronto laboratories, according to one source. Microsoft reportedly "is very interested" in seeing the project completed, as it might give Windows NT a *Good Housekeeping*-like "seal of approval" for many IS organizations already familiar with host DB2. The product, however, needs a lot of work before it gets to be a candidate for a serious beta release.

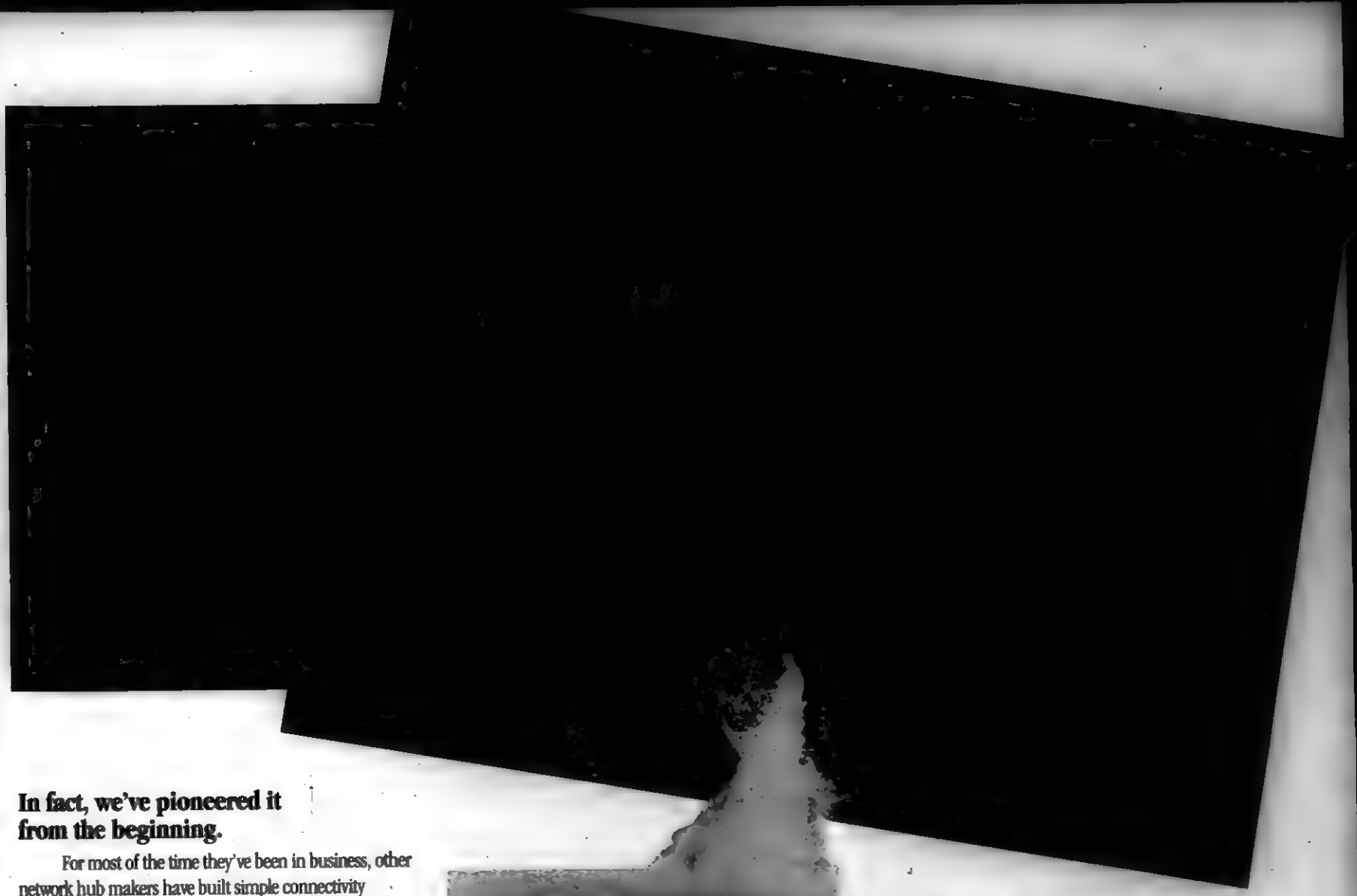
Can we 'tawk'?

Yet another user body is about to take a crack at that most fricosme and amorphous of subjects: What do corporate users really want out of a network management system, and how do they get vendors to start providing the products to fill these needs? The Oct. 11-12 meeting of the Open User Recommended Solutions consortium in Boston will see the formation of a network management task force, whose founding members will be EDS, Pacific Gas & Electric, Intel, IBM and Legent.

Sprouting services

Banyan will announce this week at its ABUI user group meeting, and then at Networld the following week, the data and application distribution service it hinted at a couple of weeks ago [CW, Sept. 13]. The service will automatically move data or software updates from one disk or PC to another across a distributed enterprise network that can include Novell's NetWare, Banyan's Vines and Unix systems. While Microsoft's Hermes and Novell's Network Navigator will provide software distribution, this is the first data distribution package integrated with network operating systems; it is much-needed by corporate client/server installations, our source tells us.

A joke making the rounds at Unix Expo attempted to explain why Novell failed to announce last week that it was donating its Unix system specifications to X/Open Co. as a trademark form of Unix (see story page 14). Many vendors and industry groups were consulted in a furious round of discussions during the last week, the story goes. "The way I heard it described," one industry analyst said, "they went through the entire agreement from A to Z, and when they got to Z, it finally fell apart — and the Z stands for Zander." Bill Zander is president of Sun's SunSoft business unit, which sells its own Unix implementation, Solaris 2.X. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-3931 or 76597,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-3555.



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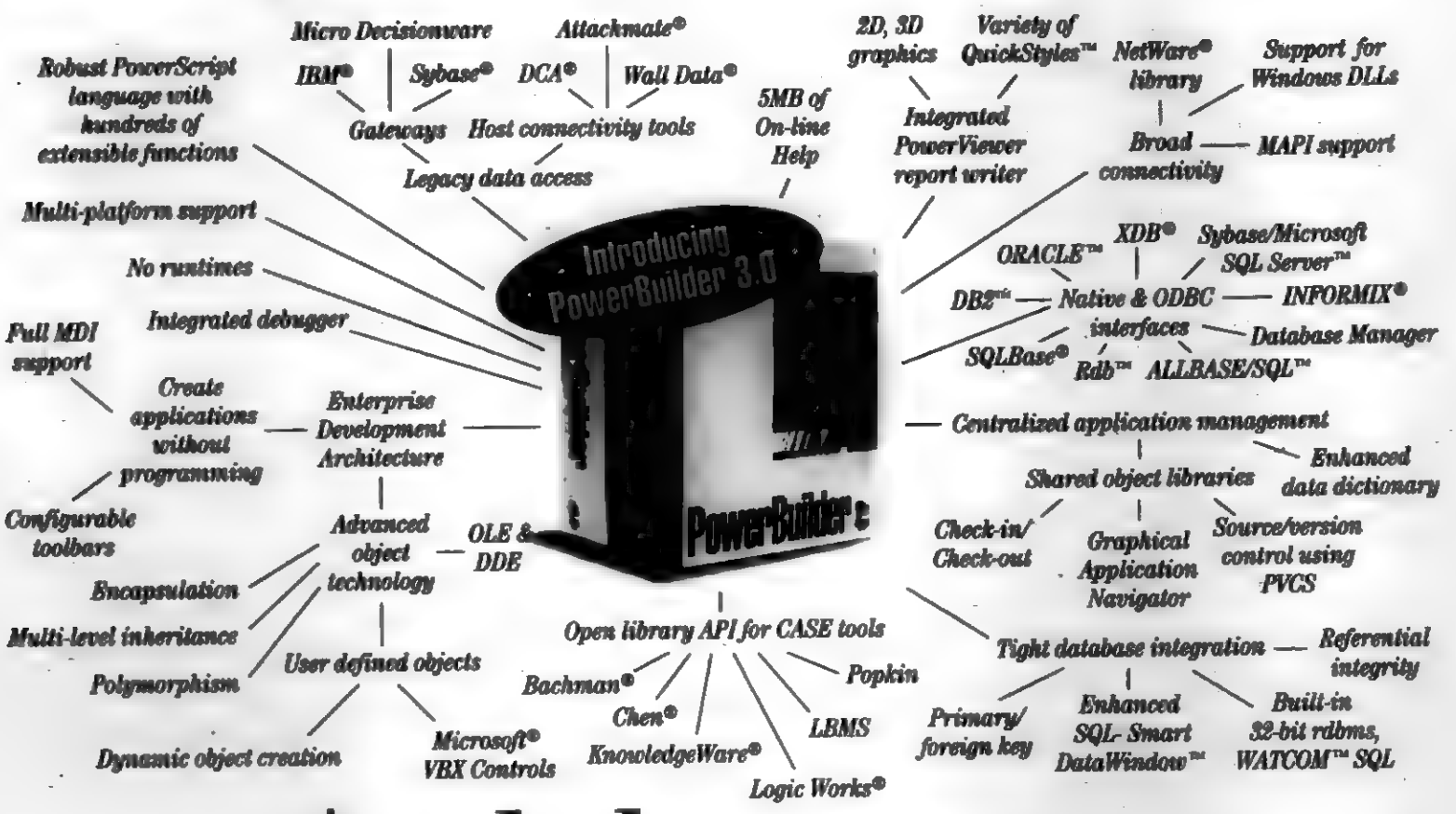

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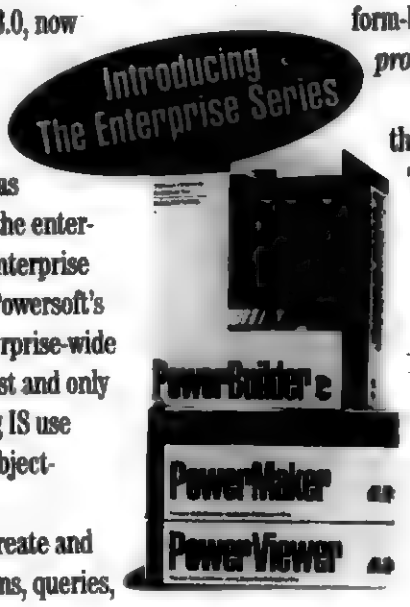

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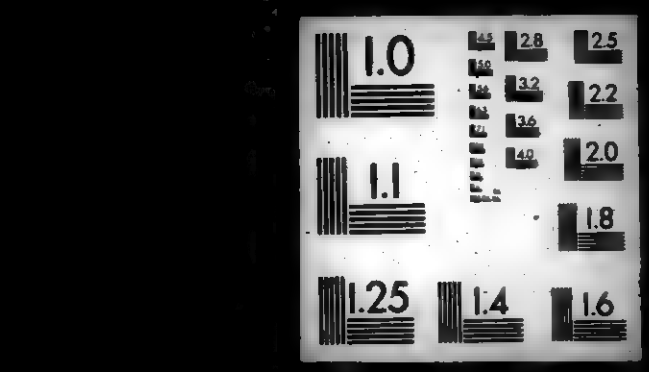
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COMPUTERWORLD

Third parties grouse over Banyan's GUI plan

By Elisabeth Horwitt
OTTAWA

■ Banyan Systems, Inc.'s promise to roll out Windows-based graphical front ends across its major network services raised red flags among some developers and customers at last week's Association of Banyan Users International meeting.

Even more galling to third-party developers who make a living off such products is that Banyan has indicated that it will give away its Windows-based front ends, according to one user. Banyan declined comment on the matter.

Key among the services on which Banyan will focus is a Windows-based, icon-driven network management system that is Simple Network Management Protocol Version 2.0-compatible. It is due out by the middle of next year, Banyan spokesmen said.

Third-party competition

While conceding that Banyan's existing management utilities are in dire need of an easier-to-use front end, some users criticized the vendor for competing with, and potentially alienating, third-party vendors that already offer similar products.

"Banyan's announcements at the conference ... mirror the controversy of why Banyan, despite

Banyan, *page 16*

Top ratings

Banyan users gave their product the highest overall score in a LAN operating system satisfaction survey. For results and story, see page 89.

SCORE

74	Banyan's Vines
69	Novell's NetWare
66	IBM's LAN Server
66	Microsoft's LAN Manager

Windows revs engine

Workgroup upgrade to get Chicago's 32-bit file system

By Ed Scannell
and Michael Fitzgerald
DALLAS

Microsoft Corp. this week will begin a steady push to replace its best-selling Windows 3.1 by unveiling a follow-up to Windows for Workgroups. The move, however, could face stiff resistance from some OEMs and users who do not see the immediate need for the product's added functionality.

With Windows for Workgroups Version 3.11, which features a 32-bit file system based on the company's forthcoming Chicago operating system, users can for the first time configure the program as either a stand-alone or a networked product.

Microsoft officials said such capabilities could eventually obviate the need for Windows 3.1. The product, slated to debut at Networld '93 here, is scheduled to ship in November.

"We are working as aggressively as we can to convince as many OEMs as is appropriate to bundle it," said Steve Ballmer, vice president of Microsoft's sales and support group. "We may not get it on every machine, but we are optimistic we can move millions of units

Windows, *page 15*

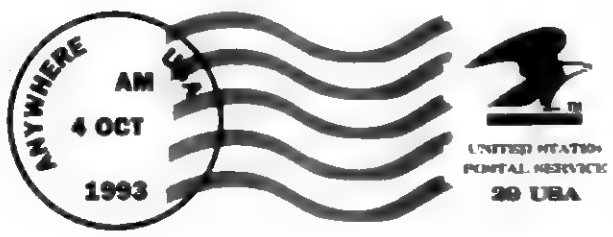
NETWORLD

•SynOptics positions superhubs to usurp routers. *Page 12*

•Digital pushes Pathworks as multivendor manager. *Page 14*

•Novell to market software to aid users' move to NetWare 4.01. *Page 14*

Postal Service Sorts Through Automation



By Gary H. Anthes
MERRIFIELD VA

The U.S. Postal Service is spending billions of dollars to modernize its operations and information systems, but efforts to trim its $50 billion budget have been an uphill battle against soaring labor costs.

Over the past decade the Postal Service has rolled out myriad new technologies, from mammoth machines that read and sort the mail to data networks that carry mail images and experimental neural networks that recognize handwriting. But automating the labor-intensive Postal Service presents an awesome challenge: how to make machines and computers handle 166 billion items a year when no two are exactly alike.

As daunting as the Postal Service's mission is, its automation objective is remarkably simple. "Our core strategy is to sort mail using bar codes," said William J. Dowling, vice president of engineering research and development. "My responsibility is to get bar codes on the mail."

The reason is just as simple: With 682,000 employees, 83% of the postal budget goes to labor. Two people can sort 32,000 letters bearing bar-coded ZIP codes in an hour at a cost of $3 per thousand. Using an older sorter that requires ZIP codes to be

Postal Service, *page 26*

PC Co. backlog stalling sales

By Michael Fitzgerald

The IBM PC Co.'s backlogs, touted by the company as a sign of its strength in the market, are turning into a liability as some users have started to shift orders away from the PC Co. to competitors.

The backlogs stretch beyond the well-publicized shortage of active-matrix color screens that have made ThinkPad notebooks hard to come by. Also in short supply are most models of the low-cost ValuePoint line and some models of the flagship PS/2 family.

The PC Co. backlogs come at a time when competitors such as Compaq Computer Corp. have largely solved their supply-and-demand imbalances.

"We were looking for [PS/2] Model 56s, and we've just bought some Compaqs instead," said Joseph Trickey, PC coordinator at Stratton-Cheeseman Management Co. in East Lansing, Mich. "For IBM it just looked like it's always going to be a month or so, and it's just not worth the wait." Trickey said that in the long term, his company hopes to continue buying from the PC Co.

Things appear no better on the ValuePoint side.

"Our [availability] situation is terrible," said Roy Gregory, manager of personal computing at Scrivner, Inc., a $6 billion food

PC Co., *page 10*

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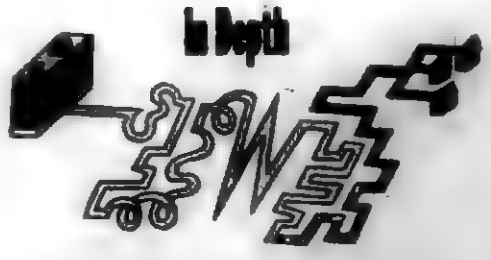

CLIENT/SERVER

Breakdown

Welcome to today's client/server, where backup jobs take 22 hours and mainframe and server data don't stay in sync. No wonder 45% of 350 IS managers in a recent survey said their client/server plans are in limbo.

See In Depth, page 107

The truth about

Before you decide what client/server platform is right for you, make sure you know what's true, and what's Not True.

Fact: the OS/2® client/server solution preserves your current hardware and software investment, accessing your mainframes, minis and PCs when necessary and bringing their power and capacity to the desktop level. Fact: the Windows NT™ solution is based on PC servers and desktops and *doesn't* embrace all your existing resources. That could mean porting applications and data. The only plus that offers is the cost of porting *plus* the cost of additional PC servers.

Fact: OS/2 2.1 runs DOS, Windows™ and more than 1,200 native OS/2 applications. With LAN S... or Novell® NetWare,® OS/2 suppor... Windows, OS/2 and Mac clients. Fa... not likely NT will support all your existing applications. It won't run existing 32-bit applications like WordPerfect® 5.2 for OS/2 and Lotus® 1-2-3® for OS/2. It *will* require additional software to support DOS, OS/2 and even Windows clients. Worse yet, *Infoworld* sources report that Windows 3.x applications run *20% slower* under NT than they do under OS/2 2.1!

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client NT

Domain/DACS,™ AlertView,™ Foundation Manager™), and more. Fact: The NT strategy is still Not There, and neither are native client/server applications.

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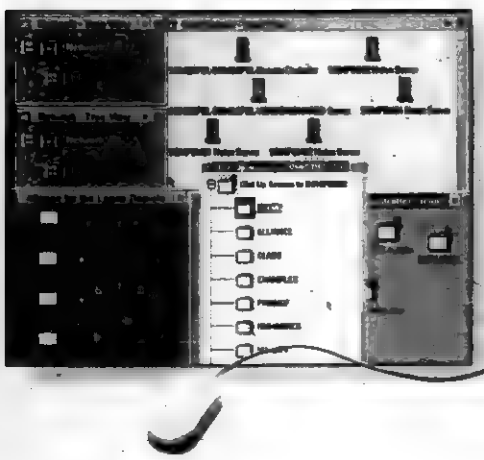

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It's time to separate the facts from the fiction...

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October 4, 1993

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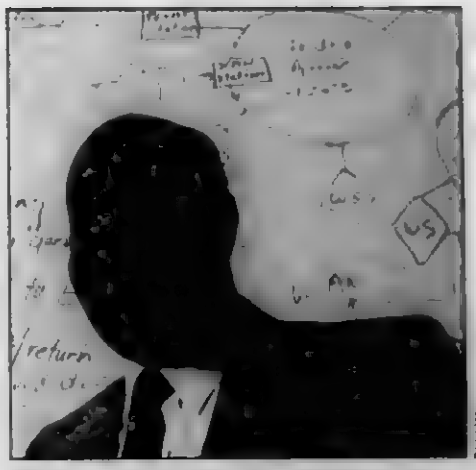

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■ XBase is dead, proclaims IS director **David Ciolkowski**. Long live Basic. *Page 80*

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Executive Briefing

Don't trust conventional wisdom when it comes to your career. CIOs have often been told that getting close to the center of power (the CEO) is the secret to job longevity. Not true, says Michael Earl at the London Business School's Centre for Research in Information Management. Technical know-how and good relations with peers are much more important than a buddy relationship with the top boss. *Page 84*

Other important don'ts for those who want to get ahead in IS: Don't confuse an outsourcing study with a benchmarking study. The former is geared to comparing costs and looking for the cheapest option, while the goal of the latter should be to measure your operation's effectiveness against the highest standard you can find. *Page 123* And don't give end users more power than they can handle. Some client/server pioneers have found, to their sorrow, that rushing to provide greater access can cause big version control headaches. *Page 111*

IS execs are also grinding their teeth over vendor delays. For instance: **IBM PC Co.**'s backlogs are so varied and lengthy some customers are turning to other suppliers. *Cover 1* Wanna-be-users of **Lotus Notes** are chafing over the fact that versions for Unix, NetWare and Windows NT aren't expected for almost a year *Page 2* The **Open Software Foundation**'s Distributed Management Environment is taking so long to appear that some IS execs are starting to pursue alternate strategies. *Page 55* And companies interested in mobile computing are frustrated by the lack of integrated application development tools. *Page 35*

Can this kind of negative turn into a positive? Sometimes. **IBM** was a late starter in the client/server market with its OS/2 LAN Server, and Version 1.0 was not a knockout product. But Version 3.0 is drawing raves from customers such as the **Atchison, Topeka and Santa Fe Railway**. *Page 43*

Although, they've been waiting for this kind of development for quite a while, firms interested in client/server applaud the ongoing trend toward joint efforts between vendors of host-based tools and client/server tools. The latest collaboration is between host and PC RAD tool specialist **Sapiens International** and client/server player **SmartStar Corp.**, which will unite their development tools to span multiple platforms and databases. *Page 77*

Microsoft to throw Office counterpunch in suite war

By Michael Vizard
REDMOND, WASH.

Microsoft Corp., which already sells more than half its applications as part of a software suite, plans to rev up its Microsoft Office suite later this month with greatly enhanced upgrades of its word processor and spreadsheet software.

Leading its latest onslaught of applications will be Version 6.0 of its Word word processor and Version 5.0 of the Excel spreadsheet. Both updates will support IntelliSense agents, which automate particular tasks such as formatting documents. Word 6.0 will also support Wizards, prepackaged forms and improved compatibility with WordPerfect Corp.'s namesake word processor.

"This is the biggest upgrade of an application package I've ever seen, and everything seems to work. We're extremely pleased," said John Wolley, a Microsoft Word beta tester who is a technical writer at Indus Group, Inc., a utility software manufacturer in San Francisco.

"It's fundamentally faster, especially for manipulating large amounts of text. The print speed is also much faster," said Daniel Willis, a Word beta user and a lead systems analyst for operating systems, utilities and Intel Corp. platforms at 3M Co. in St. Paul, Minn.

Similarly, beta users of Excel 5.0 report that they, too, are pleased with Microsoft's latest spreadsheet offering (see related story, page 35).

For information systems directors, the most significant element of Microsoft's Office 4.0 will be support for Version 2.0 of Microsoft's Object Linking and Embedding (OLE) interface.

Microsoft will heavily tout the addition of OLE 2.0 support as a competitive advantage over suites from Lotus Development Corp. and Borland International, Inc. OLE 2.0 gives applications a common macro language, allows users to call and edit data in another application using that application's native command format and supports a true drag-and-drop capability across applications.

Lotus' John Landry: *Widespread OLE 2.0 support will not happen until 1994*

In particular, OLE 2.0 will make it more attractive for users to buy suites in order to gain those sophisticated cross-application functions.

As a result, industry analysts said, the PC software market will evolve from a set of discrete applications to a document-centric model under which applications are tightly integrated (see story at right).

But whether OLE 2.0 support will have an immediate effect on buying patterns remains to be seen. "OLE 2.0 will become more important when more than one or two applications support it. We expect to see it have an effect starting in the first quarter," Willis said.

Lotus Chief Technology Officer John Landry also downplayed the immediate significance of OLE 2.0 because not many applications support it yet.

"We intend to fully support and exploit OLE 2.0, but right now the only major applications that can use OLE 2.0 are Excel and Word," Landry said, adding that he does not expect to see widespread support for OLE 2.0 until sometime next year.

In the meantime, Landry said, Lotus will continue to tout the integration of Lotus applications in SmartSuite and the Notes groupware environment (CW, Sept. 20). All Lotus applications currently support Lotus/FX, an OLE 1.0 implementation formerly known as the Application Field Exchange that simplifies the exchange of data across Lotus applications and Notes.

In addition, in recent weeks Lotus has been offering customers licensing deals that include SmartSuite and Notes, and it plans to formally offer a combined SmartSuite/Notes offering sometime next year (see story below).

OLE's suite song

The varied implementations of Microsoft's OLE interface may be the Trojan horse that pushes many information systems organizations to make a wholesale shift to software suites.

As vendors bring on support for OLE Version 2.0, they will entice users to purchase their software from a single vendor with consistent OLE 2.0 implementations across its applications.

"We're already leaning that way because of the desire to have common interfaces across applications. OLE 2.0 will heighten that need because we'll want applications that support the same interfaces," said Daniel Willis, a lead systems analyst at 3M Co. in St. Paul, Minn.

Procurement process

Driving this push to standardize on products from a single vendor is the fact that OLE 2.0 consists of more than 400 separate interfaces, which software vendors can implement piecemeal.

As a result, numerous software incompatibilities across applications are likely as one vendor opts to include an OLE 2.0 interface that another vendor has chosen not to support (CW, Sept. 27). Because of these issues, software vendors are going to vigorously push customers to standardize on a particular vendor's OLE 2.0 implementation.

"The days of the software lock-in are back — not that they ever really left," said Norm Weizer, president of Weizer Associates, Inc., a consulting firm in Lexington, Mass.

"There's a perception out there that all OLE 2.0 implementations are going to be plug and play, which they are not," said John Landry, chief technology officer at Lotus.

"This will push people toward suites from a particular vendor. As a software vendor this doesn't bother me, but I'm kind of surprised we haven't heard more noise about it," he added.

Currently, Microsoft seems disinclined to get in the OLE 2.0 compatibility-testing business.

"We've recommending that people use Microsoft Office as a baseline for determining OLE 2.0 compatibility," said Chris Peters, general manager for Microsoft's Word.

—Michael Vizard

Notes targets object development

By Michael Vizard
CAMBRIDGE, MASS.

Lotus Development Corp. last week outlined a 12- to 18-month strategy to transform its Notes groupware offering into a set of distributed systems services for building object-oriented applications.

Detailed at the company's annual technology briefing, the plan calls for putting Notes in a position to compete with Microsoft Corp.'s forthcoming Cairo object-oriented operating system, due in 1995.

The key to unlocking the real potential of Notes will be Version 4.0, which is currently expected in the fourth quarter of 1994.

That version will include a substantially improved graphical user interface, support for an object-oriented derivative of the Visual Basic language, called LotusScript, and an event-driven application development environment, code-named Notebook, that will span both Notes and relational database systems.

The arrival of LotusScript and Notebook are particularly important for positioning Notes as a distributed environment because Notes currently lacks a set of robust development tools. Currently, Notes developers are limited to working with the Notes macro language, templates delivered by Lotus or an application programming interface written in C language.

Networked Notes

Lotus will announce this week at NetWorld the NetWare-loadable Module implementation of Notes, expected to provide the fastest server platform for Notes.

Originally scheduled to be deployed this year, the Notebook project has been expanded to become a more robust deployment environment that will support either LotusScript or Visual Basic. Once it is deployed, Notes developers will be able to create applications that integrate data from Basic applications, Notes applications and applications typically associated with relational database management systems.

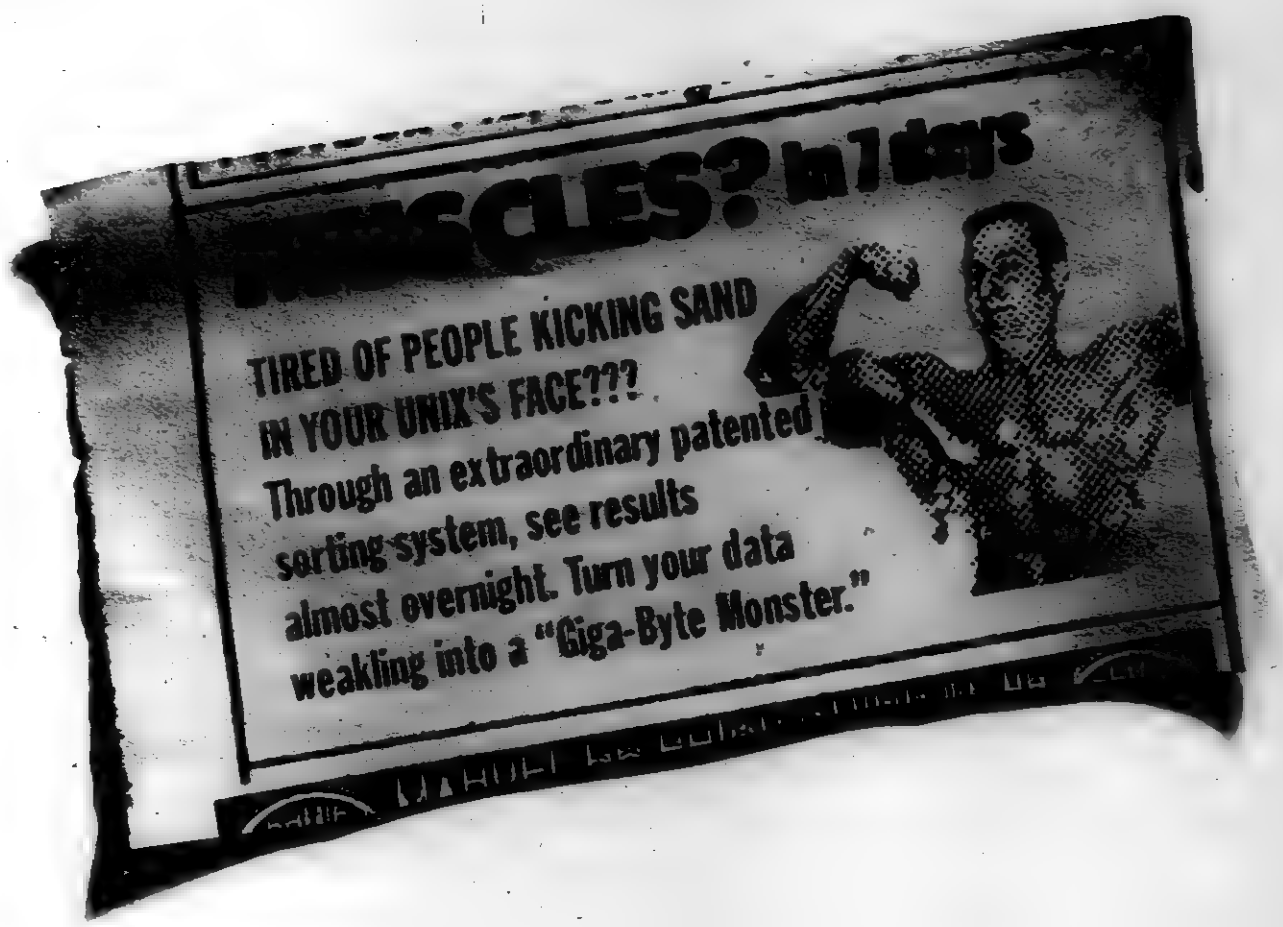
"We have a two- to three-year head start over Microsoft in terms of knowing what it takes to build this kind of a distributed environment," said Lotus Chief Executive Officer Jim Manzi. "We're going to do whatever it takes to build a big industry around Notes for third-party applications," he added.

But right now, Notes is still limited to a relatively small number of applications at most sites that have adopted OS/2 servers. The widespread delivery of Notes on Unix, NetWare and Windows NT platforms is scheduled to take place early next year (CW, Sept. 27).

"I'm hopeful about the directions Lotus is heading in. . . . But right now [Notes] is being held back because it only runs on an OS/2 server. We're looking for either an AIX or NT server," said Greg Shetel, director of systems planning and research at the Gillette Co. in Boston.

The challenge for Lotus is to leverage Notes on multiple platforms that will run on OS/2, Unix, Windows NT and NetWare before Microsoft can create its Cairo distributed object-oriented environment. That effort is expected to start with the layering of Version 2.0 of its Object Linking and Embedding (OLE) interfaces atop its Windows NT operating system.

In contrast, Lotus intends to adopt OLE 2.0 as the storage mechanism for Notes and then deploy that environment across the heterogeneous installed base of its customers.



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DEC to slash high-end workstation tags

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. plans to chop in half high-end pricing on its Alpha AXP workstation line as part of a wide-ranging product introduction next week, sources said. But the company has postponed the rollout of two low-end workstations that were expected to be part of the festivities.

The low-end machines were identified by one source familiar with the company's plans as the DEC 3000 Models 300LX and 300X. The 300LX was expected to use a 150-MHz microprocessor and start in the $5,000 range for a full configuration. Digital's current entry-level model, the 300L, has a base price of $4,995 but costs about $6,500 with a disk drive.

A Digital spokesman would not comment on reports that the two machines were pulled back. But he did confirm that no low-end workstations are on tap next week, noting that Digital was "pleasantly surprised" by the lack of an under-$5,000 system in IBM's RS/6000 introduction two weeks ago [CW, Sept. 27].

That makes it easier for Digital to wait until early next year to refresh the low-end DEC 3000 models, analysts said. Another Alpha workstation rollout is expected in January, including systems that would use the Peripheral Component Interconnect I/O bus rather than Digital's Turbochannel technology, which should buy the workstations higher throughput.

Terry Shannon, an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y., noted that the existing 300L and 300 would only have had six-month life cycles if they were replaced now, which "would be pretty ephemeral."

But Laura Segervall, an analyst at International Data Corp. in Mountain View, Calif., said Digital could use a better low-end offering to compete more effectively with Sun Microsystems, Inc. as it tries to regain the workstation market share it lost in the last few years.

Cranking it up

Digital's new Alpha AXP workstations and systems are expected to provide faster performance mainly through microprocessor clock speed upgrades

Processor/Speed	Base price
DEC [illegible] Model 400	$19,995
[illegible]	$36,000
DEC [illegible]	$10,300
DEC [illegible]	$62,000
DEC [illegible] (data center server)	$168,000

Note: Server versions start at $21,000 for Model 6000 and $42,000 for Model 8400

Source: Digital Equipment Corp.

Thus far, despite Alpha's addition, Digital does not appear to have made much progress, Segervall added. "It's not a turnaround year for them," she said. "They don't seem to have been able to capitalize on the fact that they had the hot box for the year the way [Hewlett-Packard Co.] did" in 1991 and 1992."

Digital is getting much more aggressive at the high end of the DEC 3000 line. Next week it is expected to introduce a version of its Model 500X workstation, to be called the Model 800, that sources said will run 10% faster and start at about $36,000, down from the current 500X base price of $69,995.

The Digital spokesman confirmed there would be "a substantial reduction in the price of the high-end machine." Sources indicated the 800 is expected to offer performance equal to or better than IBM's new Powerstation/Powerserver 58H, which starts at $64,450.

The pricing and throughput capabilities of the 800 and other Alpha-based systems that Digital plans to unveil (see box) appeal to Frank Brake, director of international operations for technology business development at Newport News Shipbuilding and Drydock Co. in Newport News, Va. "It's bold-stroke stuff," Brake said. The shipbuilder, a major Digital customer, is considering using Alpha workstations on multiple projects, he added.

Steve Ruger, MIS manager at Smith Industries Ltd., an aerospace company in Malvern, Pa., said he had planned to hold off on buying a DEC 4000 midrange system until next spring. But new 4000 models due out next week "will almost certainly drive me back into the market," he noted.

However, Matt Holdrege, senior network specialist at PacifiCare Health Systems, Inc. in Cypress, Calif., said PacifiCare will still likely wait another year before moving to Alpha. "We want to see the technology become mature, and we want to see more third-party support," he said.

Preoccupation

Digital will have a lot on its mind next week. Besides the new Alpha AXP systems, it is slated to introduce a groupware package called LinksWorks and a new version of its object-oriented ACA Services software, renamed Object Broker, that integrates Microsoft Corp.'s Object Linking and Embedding protocol with the Object Management Group's Common Object Request Broker Architecture. Digital will also detail Version 2.0 of its DEC OSF/1 operating system and discuss plans for adding symmetric multiprocessing and clustering support to DEC OSF/1, though those capabilities will not appear until 1994. Several layered software programs for OSF/1 are also due to be added as part of a renewed effort to become a factor in the commercial Unix market.

Open systems

Conference to test COSE's workability

By Jean S. Bozman
SAN JOSE, CALIF.

The first tangible evidence that the 7-month-old Common Open Systems Environment (COSE) is working could come later this month, when the Unix "dashboard" is shown at COSE's Common Desktop Environment (CDE) conference here. CDE's consistent look and feel is intended to unite the vendors' Unix desktops as a foil against Microsoft Corp.'s Windows NT.

Users at the conference, slated to take place Oct. 26-28, cannot expect to take away a finished product, said CDE conference chair Josina Arfman, a program manager at IBM's Advanced Workstation Systems headquarters in Somers, N.Y.

"What they walk away with is not production code, but early developers' release code," she said. "It is a proof-of-concept they can take back with them to play with and see where it fits in their environment."

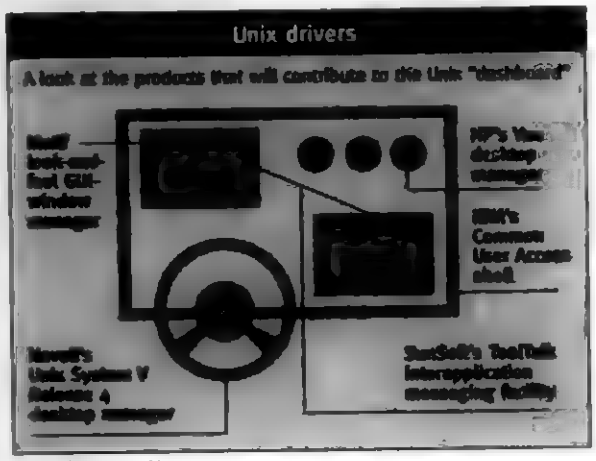
Several users who said they will attend the conference want to use CDE to unify the look of existing Unix applications as they play on different vendors' computers at their sites. "We're trying to bring together all of the different hardware platforms under one presentation," said Neal Mackanic, a computer programmer who works at the Lawrence Livermore National Laboratory's energy-research supercomputer center in Livermore, Calif.

Software development kits will be distributed to attendees on CD-ROM disks. But the developers will eventually buy finished CDE tool kits adapted for a specific Unix platform from COSE vendors. CDE products are expected to ship sometime in the first half of 1994, COSE said.

COSE's task of unifying Unix will not be done as easily as grafting together the pieces of CDE, industry analysts said. Even so, that work may not be completed until December, as bits and pieces of COSE vendors' desktop products are woven together (see chart). Other COSE activities are at less advanced stages, including working groups on federated naming, networking and systems management.

Unix drivers

A look at the products that will contribute to the Unix "dashboard"



Source: Computerworld

Will they integrate?

Industry analysts said they are curious to see the degree of integration between the various CDE components.

"Most of the Unix vendors are not committing to deliver anything before the middle of 1994," said Rikki Kirzner, a principal analyst at Dataquest, Inc. in San Jose, Calif. "The [independent software vendors] can't do anything until then, so the [CDE] software development kit will let them get started early. They can get in the right ballpark, so that by the time the version upgrades come out, they won't have that much work to do."

The five vendors that formed COSE in March — IBM, Hewlett-Packard Co., The Santa Cruz Operation, Novell, Inc.'s Univel (now part of Novell's Unix Systems Group) and Sun Microsystems, Inc.'s SunSoft, Inc. — cooperated to create the unified Unix dashboard [CW, March. 22].

Corrections

- Due to an editing error, the IBM group responsible for ImagePlus software was misidentified [CW, Sept. 13]. The Software Services Division (formerly Programming Systems) handles that product line.

- Due to a reporting error, a story in the Sept. 27 issue on Novell, Inc.'s intent to trademark its Unix System V Release 4 code through X/Open Co. incorrectly identified Ronald Bell, chief technology officer at Unisys Corp.

- The CW Guide to Sales Force Automation [Sept. 20] listed a wrong number for The Perera Group's sales automation workshops. The number is (617) 261-0112.

- Due to a reporting error, the telephone number for Lysis Corp. was incorrectly listed in the Sept. 13 issue. Lysis can be reached at (404) 373-3359.

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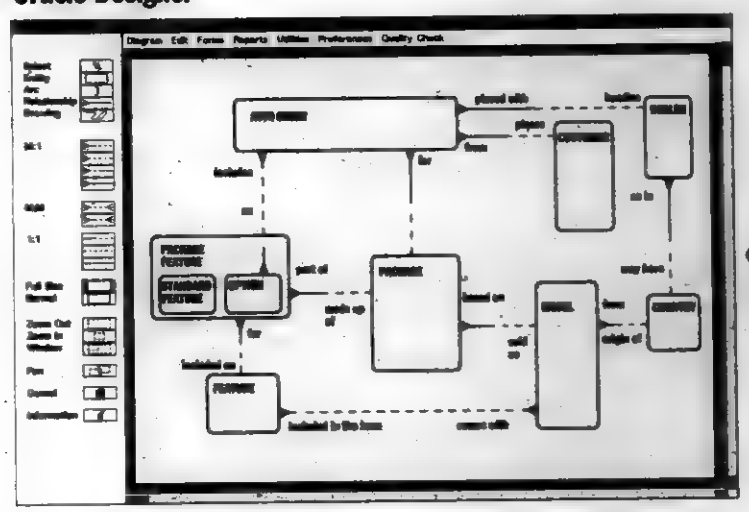

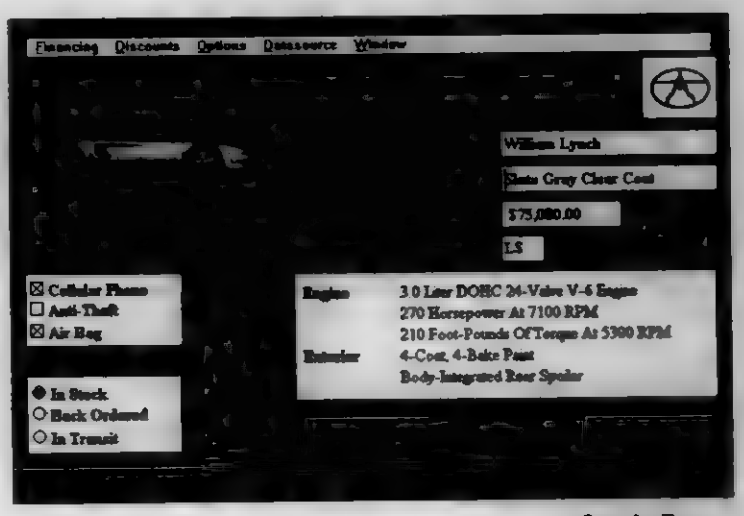

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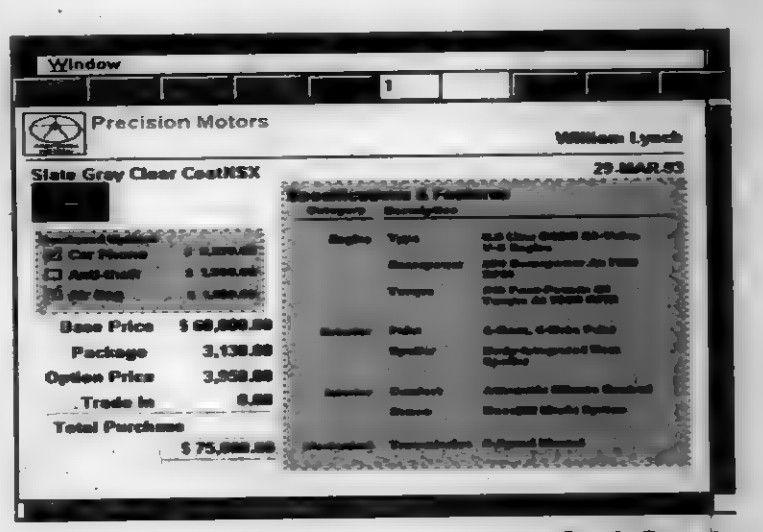

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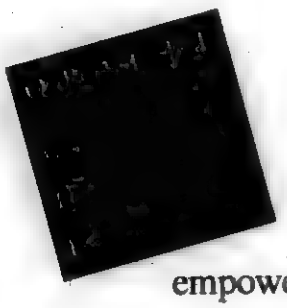

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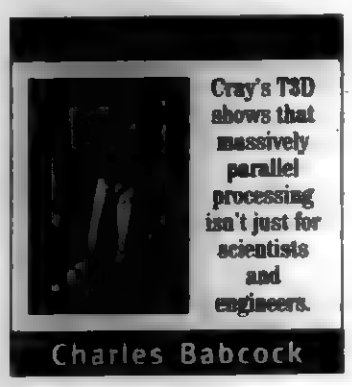
Two Cray workhorses harnessed in tandem

Cray Research, Inc. unleashed a super attack on the bottlenecks of parallel processing with the unveiling of the Cray T3D in Washington last week. The T3D may one day be viewed as the engine that pushed massively parallel processing out of the scientific/engineering trenches and into the mainstream.

The T3D closely links a parallel processor to a Cray C90 vector supercomputer. Together the two architectures gobble up tasks that neither would consume as efficiently on its own. The approaches address different types of problems, says Christopher Willard, manager of high-performance technology at International Data Corp. in Mountain View, Calif. Willard formerly oversaw wind tunnel computational fluid dynamics using supercomputers at the NASA/Ames Research Center in Moffet Field, Calif.

A massively parallel system is most effective when a task can be separated into parts with associated data. Parallel systems make use of lots of cheap microprocessors, each with its own memory, instead of having a centralized pool of memory. Hence, data is likely to be spread throughout the system along with the CPUs. If there is a high degree of cross-dependence on the data, then a parallel system will incur overhead as one processing element tries to communicate with another — a condition known as latency.



Cray's T3D shows that massively parallel processing isn't just for scientists and engineers.

Charles Babcock

A vector system, on the other hand, is a kind of sharply focused assembly line, executing the same operations on large sets of data, such as multiplying every element of an array by 12 and then adding up the results. Because a vector system operates from a common memory pool, the need for data independence is lessened, but vector processors work their wonders on a relatively limited number of tasks.

Problems of computing atmospheric effects or flow dynamics in auto or aerospace design are frequently a mix of both tasks, but previous attempts to harness parallel and vector processors have been kludgy at best. With the T3D, Cray's supercomputer operating system, Unicos, runs on the C90 and a microkernel of Unicos runs on each parallel processor, sharing the load.

With the T3D, programmers who have struggled in one realm will have the chance to test their applications, subroutine by subroutine, in another and find the combined approach that works best.

Cray, which makes its entry into the massively parallel market with the T3D, brought supercomputing packaging to parallel processing design. The T3D name stands for a three-dimensional torus, or ring. Cray took a two-dimensional matrix of processing elements and closed its dangling end wires into a ring. The ring shortens the distance between the outermost and innermost processors, shortening message path lengths. As a parallel design, the T3D is "most elegantly engineered," says Gary Smaby, president of the Smaby Group market research firm in Minneapolis.

Cray built supercomputer-style switching into the processor interconnections, allowing messages to move bidirectionally at 300M bytes per second. The result is high bandwidth and low latency with a gain in performance.

Although the T3D is made from 32 or more Digital Equipment Corp. Alpha microprocessors, it is still a supercomputer and still entry-level-priced in Cray's $2.2 million to $7 million range.

But there's no reason why some of the rapid gains the T3D represents couldn't be mapped to less pricey versions of a massively parallel/vector processor built from SPARC, Intel, Precision Architecture or PowerPC microprocessors. Cray may not wish to execute all these versions, but in perhaps three or four years, other suppliers of parallel systems can start mimicking the Cray approach and make less expensive combinations available.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

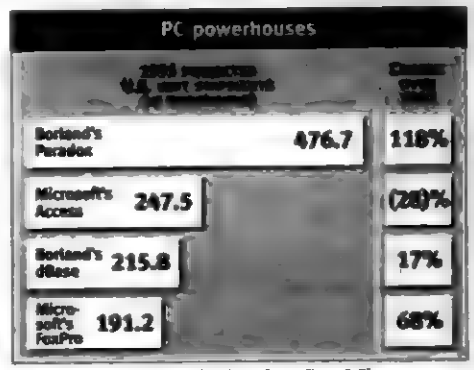
Borland database plans puzzle users

By Michael Vizard

LAKE BUENA VISTA, CALIF.

Sorting through the myriad of database strategies used by Borland International, Inc. should become more complicated following the addition of object-oriented extensions to the XBase language for dBase IV for Windows in 1994.

Borland is committed to a dual database strategy for Windows that focuses on Paradox and a forthcoming version of dBase IV for Windows, due in the first half of 1994. That version of dBase will include several object-oriented extensions to the standard XBase language now employed by dBase IV developers, company officials said.



Source: Computer Intelligence/InfoCorp, Santa Clara, Calif.

However, Borland has already deployed Paradox for Windows, which includes an object-oriented language, called ObjectPal, that supports both Paradox and dBase IV file formats. As such, many dBase customers who are looking to move to Windows before 1994, are evaluating Paradox as well as rival offerings from Microsoft Corp., Computer Associates International, Inc. and Software Publishing Corp.

The challenge facing Borland is that while ObjectPal is a robust object-oriented language, it has little in common with the Pal language Borland used in Paradox for DOS. That has made the migration a rough road to travel for experienced users who attended the Paradox users conference here last week.

"They've given elements in ObjectPal with similar functions to the ones in Pal the same name, but they're totally different. You have to rewrite everything in ObjectPal," said Eric Grau, co-owner of EMG Consulting in Niagara Falls, Ontario.

Another challenge facing information systems departments is that ObjectPal is not compatible with other applications beyond Paradox dBase, which eliminates the ability to leverage skills across multiple applications. In contrast, alternatives such as Microsoft's Visual Basic and CA's Visual Objects work with multiple products.

Borland has had continual problems moving its Pal users smoothly over to the object-oriented version. Users report that experienced Pal programmers find their old habits a handicap when learning a new way of programming.

"If I had never known Pal, I think ObjectPal would be easier to learn," Grau said.

"People are just now beginning to tap into ObjectPal. They haven't really changed the way they think about programming in Paradox. They're still using Pal techniques in ObjectPal, which means you can build applications faster but you're not getting the full potential out of the language," said Greg Salcedo, a co-owner of Para/Matrix Solutions, Inc., a consulting firm in Kent, Wash.

Revised Borland C++ tools add flexibility

By Melinda-Carol Ballou

With a planned new version of its 16-bit C++ tools, Borland International, Inc. is preparing the way for 32-bit development and deferring to the ubiquity of Microsoft Corp.'s Visual Basic.

Dubbed Boriand C++ Version 4.0, the 16-bit tool set will offer support for Visual Basic's VBX custom controls, along with a migration path to 32-bit environments.

Boriand is beta testing this next generation of C++ tools for 16-bit environments. It is expected to ship them next month at the same time as its recently debuted C++ for Win32 32-bit tools, according to sources close to the company.

Key to the new version will be the portability of the 16-bit applications created with Borland's C++ for Win32, along with exception handling and support for Object Windows Library (OWL) 2.0, the sources said. The 32-bit support will offer developers the ability to make the transition as 16-bit programs run out of juice and as higher-performance hardware and 32-bit operating systems become widespread.

Also available with Version 4.0 of the 16-bit tools is an enhanced and user-configurable Integrated Development Environment with support for visual programming, the ability to use and create custom controls for Visual Basic and an enhanced object browser.

Industry analysts said support for the popular Visual Basic controls will allow developers to extend their work on Visual Basic into Borland's C++ environments when they require more robust capabilities. Microsoft already offers such C++ support for Visual Basic controls with its own Visual C++ tools. This support allows developers to create extensions to functions or plug in existing VBX controls, which are predefined pieces of functionality that save programming time.

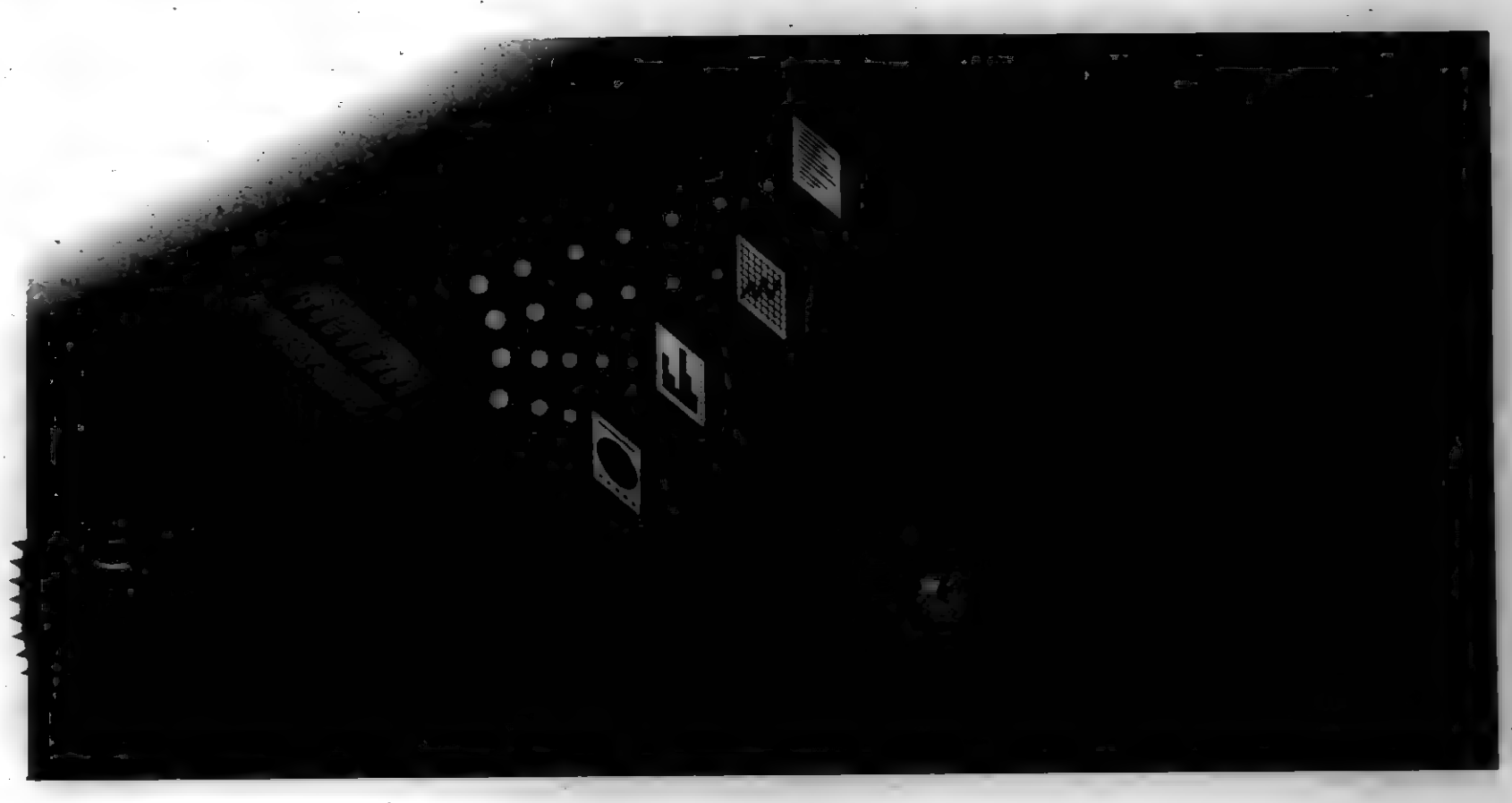
Upbeat views

Beta users spoke positively about the portability and greater flexibility of Version 4.0.

"Although we have no pressing need for 32-bit [capabilities] right now, we want our 16-bit code to be able to go forward when we need it to," said Frank Imburgio, project leader at Dean Witter, an investment firm in New York.

He added that OWL 2.0 will no longer be compiler-specific because it will offer support for a new C++ template as opposed to specialized Boriand dispatch functions. It will also provide higher-level functionality to manipulate parameters and multiple document interface support.

Borland has not yet decided whether it will offer the development tools as two separate products — as Microsoft does with its 16-bit Visual Basic and Visual C++ — or whether it will package them.



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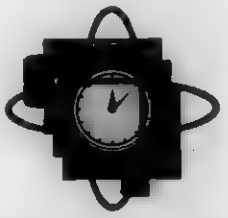

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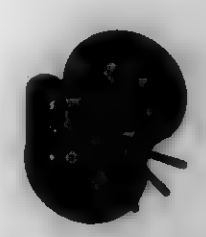

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News Shorts

IBM confirms sting reports

IBM confirmed a report last week that it had experienced extensive theft and fraud in its warranty operations and had conducted a sting operation in conjunction with the **Federal Bureau of Investigation**. While refusing to confirm that fraudulent parts returns may have cost the company hundreds of millions of dollars, an IBM spokesman said that during the last 18 months, "IBM has dramatically tightened up its processes in the wake of this. . . . This is not something that is happening now."

U.S. to ease export restrictions

The federal government said it will drastically reduce restrictions on computer exports. If fully implemented, the plan will free $35 billion worth of computers for exporting, the U.S. **Department of Commerce** said. The administration said it will immediately raise the threshold below which computers can be freely exported to most countries from the current 12.5 million theoretical operations per second (*Mtops*) to 194 Mtops, about three times the power of Intel Corp.'s Pentium microprocessor [CW, Aug. 23]. Mtops is a government-devised measure of processing power. The administration said it will then seek a multilateral agreement with U.S. allies to boost the threshold to 500 Mtops. Vendors hailed the move as a sign that the administration is serious about the U.S.' high-tech competitiveness.

Encryption exports investigated

A federal grand jury is investigating the export policies of two software companies in a case that could have far-reaching repercussions for international software distribution worldwide. **ViaCrypt** in Phoenix and **Austin Code Works** in Austin, Texas, are being investigated for their foreign distribution plans for PGP, a data encryption program, according to an assistant U.S. attorney. The **National Security Agency** has supported strict controls on the export of data encryption products, citing national security. However, organizations such as the Software Publishers Association said such laws cost U.S. firms millions of dollars a year in lost sales.

CA wins infringement suit

A seven-member jury in the U.S. District Court in Denver has awarded **Computer Associates International, Inc.** $10 million in damages in a 1988 lawsuit it filed against **American Fundware, Inc.** for theft of CA's trade secrets. The action stemmed from a 1979 agreement between **Stuart P. Orr & Associates** and **Steamboat Computer Services**, in which Orr & Associates had agreed to license its software code and accounting functions to Steamboat. The jury found that Steamboat, which has since become American Fundware, had illegally used the code for its own accounting software without paying royalties to Orr, which CA acquired in 1983. American Fundware said it is considering an appeal. A CA request for an injunction against sales of American Fundware is pending.

EMC enhances RAID products

EMC Corp. in Hopkinton, Mass., last week announced enhancements to its Symmetrix Integrated Cached Disk Array 4000 and 5000 series storage products. EMC added an optional Enhanced Channel Adapter feature, a parallel channel storage director, to the Symmetrix 4800. EMC also added a Hyper-Volume Extension, comparable to a solid-state disk, to the Symmetrix 5500 and announced that the 5500 now supports connections to multiple IBM ES/9000 environments.

More news shorts, *page 16*

Apple groupware draws near

Client software debuts this week

By James Daly
CUPERTINO, CALIF.

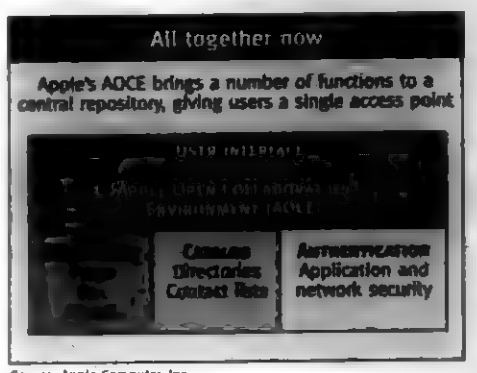
Apple Computer, Inc. will tease Macintosh users with a taste of collaborative groupware capabilities this week when it finally unveils the first pieces of its long-awaited Apple Open Collaboration Environment (AOCE).

AOCE is a set of application programming interfaces (API) that promise to tie the loose strands of voice mail, fax, electronic mail and remote paging into an integrated communications fabric. Developers will be able to tap into the power of the extension simply by hooking into AOCE APIs.

Apple will dribble out most of the key portions of AOCE in the next six months. PowerTalk, the client half of AOCE, will be available immediately with System 7 Pro, a $149 system software package that adds system extensions such as Quicktime as well as communications features that heavily networked corporate Macintosh users need.

However, the $999 PowerShare Collaboration Server package, which will centralize management of the AOCE services, will not ship until December or January. A 10-user multipack of System 7 Pro will sell for $999.

The AOCE offerings are Apple's first stab at the type of interactive groupware capabilities provided in products such as Notes.



Source: Apple Computer, Inc.

While user enthusiasm for AOCE remains high, the particulars have already drawn some complaints. Topping the list is cross-platform capability, which will not be available for at least six months. "I love the idea, but they don't have all the pieces in place yet," said Nancy Treanak, a project manager at Sprint Corp. in Kansas City, Mo.

Hold your horses, Apple officials said. "A race is not over as soon as you say ready-set-go," said Gursharan Sidhu, director of the Collaboration Products Group at Apple. "We still have a ways to go with this, but it's a start."

Until those cross-platform capabilities are added, users will have to maintain transport and delivery services on other platforms.

Even with these shortcomings, collaborative computing is where users want to go. Marcello Gallardo, a test specialist at Princeton University, said he could envision an AOCE in which professors could mail lecture changes or course additions to every student. Such updating is very difficult now because of the wide variety of E-mail packages students use.

Kirk Loevner, vice president of AppleSoft Products, said the firm is looking into preinstalling System 7 Pro on some Apple high-end Macintoshes but exactly which ones has not yet been decided.

System 7 Pro will also include a mail feature that will allow developers to add E-mail functions to applications through a mail header that offers drag-and-drop fields as well as a feature to attach digital signatures to documents.

SNA over LAN scheme starts to take shape

By Joanie M. Wexler
RALEIGH, N.C.

Vendors at last week's Advanced Peer-to-Peer Networking Implementors Workshop put aside their political agendas and nailed down technology goals and delivery timetables for Data Link Switching (DLSw), the emerging industry-standard scheme for blending IBM protocols onto LAN internetworks.

The consortium of participating companies, including major router and IBM host connectivity vendors, put DLSw on a track for a standard SNA-in-IP encapsulation scheme well-defined by February and signed off in October 1994.

"The group made a lot of progress, and a lot of controversy was resolved," said Robin Layland, principal at Layland Consulting in West Hartford, Conn., who attended the event.

For example, Layland said, one development was an about-face on bundling NetBIOS protocols into DLSw. NetBIOS support was moved out of the required base set of functions and into the optional category.

For users, this means that if a vendor claims to support DLSw, that does not necessarily include NetBIOS, Layland explained.

The group also came up with important flow control schemes that keep remaining active communications sessions humming if one goes down. For example, if several SNA devices mapped to the Internet Protocol are communicating to a remote location and one session dies, the scheme will see to the integrity of the others.

Patent problems

However, the omnipresent IBM patent issue reared its head once again during flow control discussions. IBM holds so many general patents that it would be difficult for vendors to implement any scheme that would not infringe on them and cost them, and their customers, more money to blend heterogeneous networks.

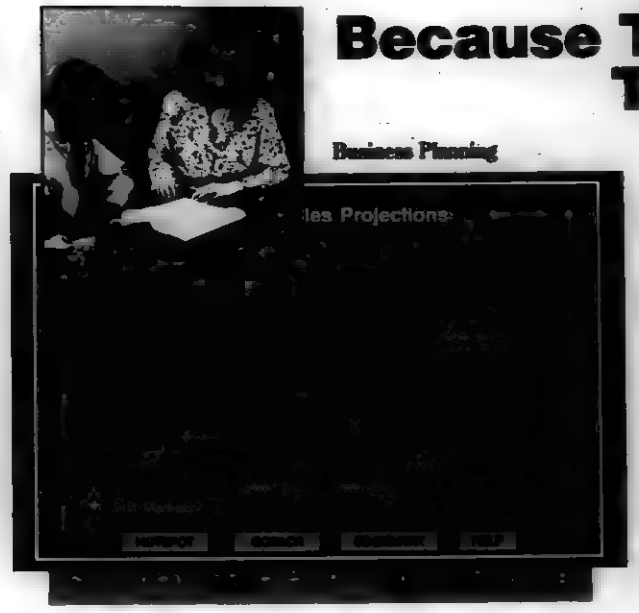
IBM is reportedly checking with its lawyers and will report to the group in one month as to whether it would waive patent fees.

Another new feature added to DLSw will allow like devices at either end of a connection to exchange vendor identifications, allowing customers to automatically take advantage of those devices' proprietary "extra" features, Layland said.

The vendor ID capability benefits users who want features that transcend the standard and is an incentive for vendors to be innovative with their products. However, "this does put a push behind proprietary technology," Layland said.

From a multivendor interoperability standpoint, IBM said it would revise its DLSw specification filed with the Internet Engineering Task Force to include more of the functions its 6611 router does today with DLSw, said Lori Dreher, a senior product manager at router maker Wellfleet Communications, Inc., who also attended.

David J. Berman, Wellfleet's director of IBM networking, said this is good news because "we have huge requests in financial accounts to interoperate with 6611s." IBM contributing more of its DLSw idiosyncrasies means "we'll be more likely to successfully work with the 'real' 6611," he said.



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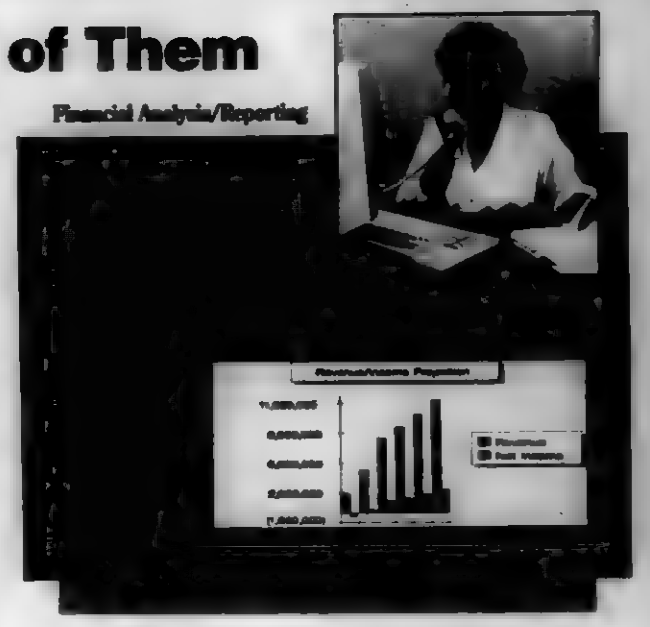

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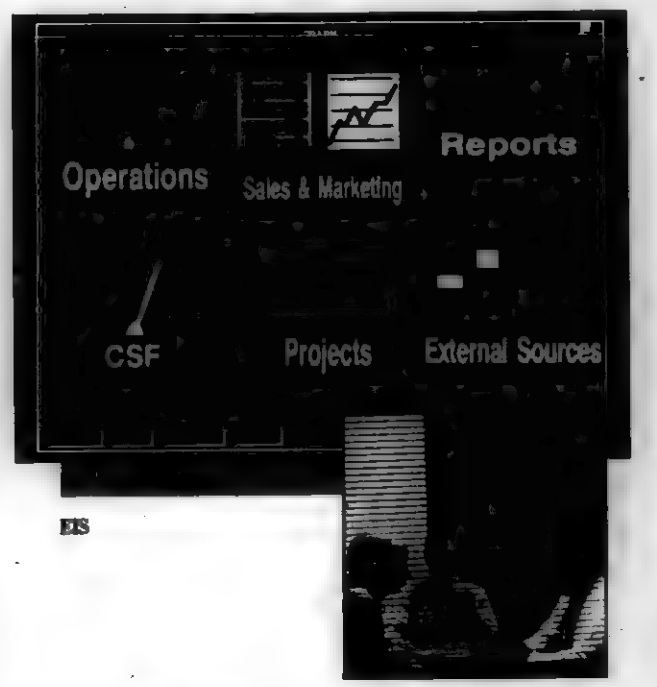

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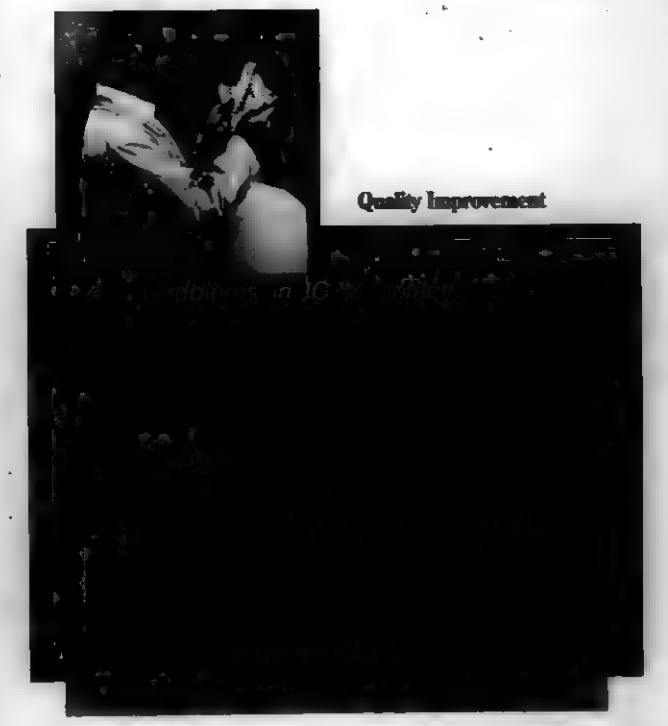

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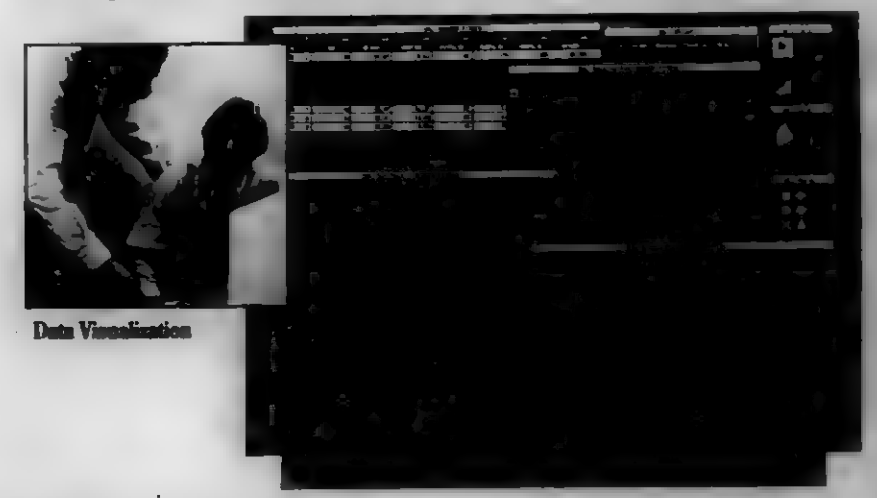


Data Visualization

IBM PC Co.

CONTINUED FROM COVER 1

wholesaler in Oklahoma City. Gregory said he was "having real difficulty getting ValuePoints" and was buying PCs from Compaq and NCR Corp. instead.

Major resellers also noted that frustrated customers are starting to jump ship from the PC Co.

"Typically, clients are very reluctant to change once they focus in on a particular standard, but what we are seeing now is clients coming back to us to see what equivalent products [to specific IBM models] we would recommend," said Alan Hald, vice chairman of MicroAge, Inc. in Phoenix, which resells both IBM and Compaq products. Hald said this was not the case six months ago.

Bruce Claflin, president of PC Co. Americas, said that "We do deserve a stick in the eye" over continued supply problems, but emphasized, "the majority of orders we have right now we will mostly fill in the fourth quarter and first quarter of next year."

Claflin said ThinkPad demand will exceed supply "well into" 1994, despite plans to more than double shipments. He said the company would catch ValuePoint demand in the fourth quarter, but that PS/2 would probably slip into the first quarter.

Claflin said PS/2 constraints were caused in part by dynamic RAM shortages and difficulty in getting some Micro Channel Architecture components.

Richard Zwetchkenbaum, an analyst at International Data Corp. (IDC) in Framingham, Mass., said IBM is "failing to capitalize on a market opportunity."

IDC expects the PC Co. to ship 4.3 million units in 1993, a 35% increase over 1992 but less than it could have shipped. An IBM spokeswoman said officials believe shipments could have grown 50% if the company had been able to meet demand.

Users now boast about when they actually get PC Co. products, particularly the color ThinkPads. "We got [a ThinkPad] recently in seven to eight weeks, rather than in the 15 to 20 weeks we were expecting," said Bruce Linker, vice president of information systems at a financial services company in New York. Linker attributed his good fortune to a contact with the ability to pull strings.

Anticipated delivery time of backlogged IBM PCs

	ThinkPad 350 (color)	ThinkPad 750 (color)	ValuePoint 2 (486DX)
IBM PC Direct	6 weeks	1 year	2 weeks
Computer City (Fort Worth, Texas)	Data not available	Data not available	1 to 1½ weeks
Micro Center (Columbus, Ohio)	Indefinite	Indefinite	2 to 3 weeks
Microage (Tempe, Ariz.)	On back order for eight weeks		Data not available

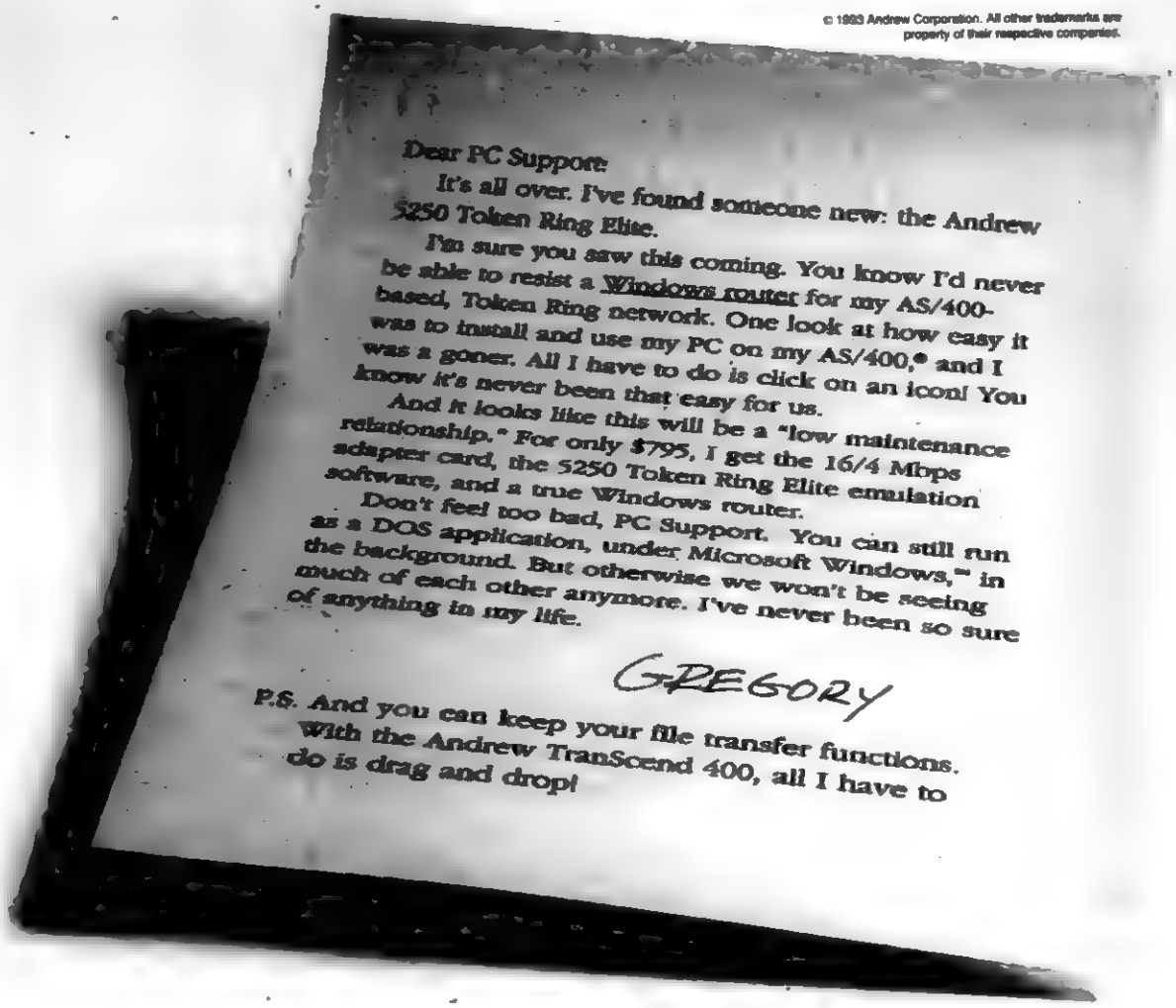
Playing favorites

The PC Co. does appear to be taking care of its most-favored customers, however, particularly those in its new Premium Partners program [CW, Sept. 9].

"We're not having supply problems," said George Oliver, manager of information delivery technology at the Royal Bank of Canada in Toronto. Royal Bank is not a Premium Partner, but it is a major IBM account.

An internal CompuCom Systems, Inc. memo obtained by *Computerworld* went so far as to instruct field sales representatives to "Please move your [backordered IBM] orders over to [Compaq] and begin filling those back orders."

Phillip Wise, CompuCom's executive vice president, downplayed the memo, saying it was written by an aggressive assistant buyer and in no way reflected a corporate directive. But Wise added that the PC Co. has "pretty sizable backlogs" and that his IBM buying team had prepared a 40-page document on how customers could achieve Premium Partner status, or how to move their demand over to the ValuePoint product line.



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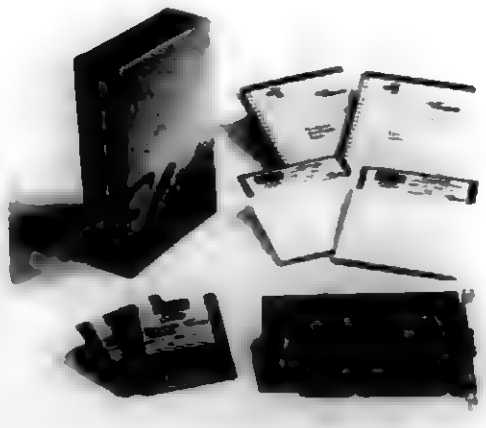

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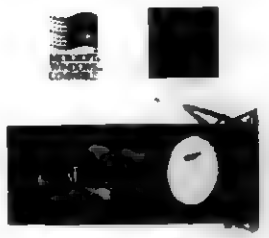

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GSA Contract Number GS00K93AGS6403.

'Superhubs' invade router turf

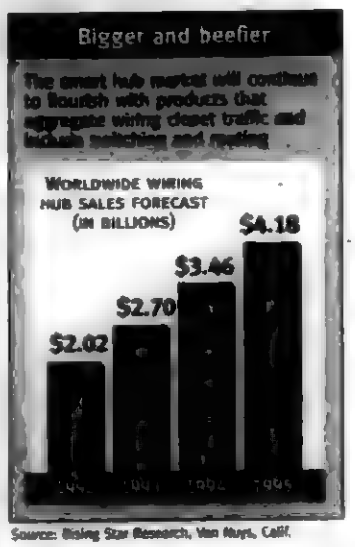
By Joanie M. Wexler
DALLAS

A new era in backbone networking will officially kick in at this week's Networld '93 show here with the formal debut of SynOptics Communications, Inc.'s intelligent "hub of hubs" and corresponding network management system.

SynOptics last week publicly described its System 5000, the first of several expected hub rollouts targeted at usurping routers as the cornerstone of backbone networks.

These mammoth hubs will aggregate wiring closet traffic from across corporate computing enterprises and will ultimately bundle in routing and high-speed switching to accommodate quickly proliferating enterprise networks.

The fusion of these functions is important because "users are looking for enterprise integration" to get a managerial grip on distributed computing environments, said Todd Dagres, vice president of data communications research at The Yankee Group in Boston.



Source: Rising Star Research, Van Nuys, Calif.

No more sharing

Also, he noted, companies are looking to migrate from shared to switched networks, which requires simultaneous support of routing, switching and packet-to-cell conversion technologies to protect existing investments.

Users are moving to switching because it builds in configuration flexibility that prevents them from continually adding hubs as their networks grow, Dagres said. He was referring to switching's inherent ability to let users build "virtual" networks, which give them the freedom to "move" resources among networks with a mouse click rather than recabling.

Users said such capabilities, evident in the SynOptics box and expected to emerge in the next six months from rivals Cabletron Systems, Inc. and Chipcom Corp., are important.

"Allowing us to create a logical network" through SynOptics' Optivity 4.0 management system and the System 5000's Asynchronous Transfer Mode (ATM) switching is a major benefit to SynOptics shop Cargill, Inc. in Minnetonka, Minn., said Loren Sinning, a network specialist.

On the other hand, Sinning said, bundling routing into hubs — a philosophy SynOptics ping-ponged about last week — is not important to Cargill.

Heavily invested

Early in the week, Mark Hoover, SynOptics' director of systems architecture, discarded the notion of integrated routing on the premise that "most people have already invested in routing technology and aren't looking to reinvest," a rationale Sinning echoed.

However, a day later, the company acquired high-end router company Coral Networks, Inc. (see story page 131) and said it will blend that technology into its hub line.

This is a positive about-face for Presbyterian Healthcare System, a SynOptics shop based here. "Internal to the hub, I would like to link an Ethernet to a FDDI," said Mel Lively, a network manager, who currently links dissimilar LANs through an external bridge.

"Internal internetworking should be cheaper and faster, and the simpler you make something, with fewer components, generally the more reliable it is," he said.

Meanwhile, Chipcom said it has a new platform coming in the first quarter of next year that adds cell switching. Dave Fowler, vice president of marketing, said that before the end of the year, Chipcom will have an ATM switch in its existing hub.

Cabletron said it will introduce a new platform early next year sporting built-in internetworking, distributed management across each hub module and fault tolerance.

Hub-ba hubba

Switching hubs, subsets of the "master hub" concept, will receive heavy attention at this week's Networld show, and some of the top players will add product accoutrements.

For example, San Jose, Calif.-based Alantec Corp., which combines LAN routing and switching in its wiring hubs, will begin routing Apple Computer, Inc.'s AppleTalk protocols, said Paul Schaller, vice president of marketing.

Alantec will also tag on support for Fiber Distributed Data Interface over single-mode fiber, pushing the 100M bit/sec. LAN distance from two to 20 kilometers. It will also add the Simple Network Management Protocol "set" feature.

Aside from hub activity, remote access into LANs promises to be a big showstopper. For example, IBM will premier its 8235 dial-in server, which supports Ethernet, Token Ring and eight modem ports, said Laura Knapp, senior systems program advisor.

The product, which is the first fruit of IBM's weeks-old relationship with Shiva Corp., resides at the host site, allowing remote PC users of DOS, Windows or OS/2 clients running TCP/IP, Novell, Inc.'s IPX or IBM's NetBIOS or SNA to dial into the home network and "access everything they could normally access," she said.

A separate IBM networking group is expected to finally announce the product version of its OS/2-based remote access software, long code-named "Thunderbird." The product will come optionally bundled with serial I/O controllers from Star Gate Technologies, Inc. in Solon, Ohio, and will go on sale next month, according to an industry source.

— Joanie M. Wexler

Wide-area networking

NetWare module expands network management view

By Joanie M. Wexler

■ With a little help from a friend, Novell, Inc. opened the door last week for NetWare administrators to embark on the task of wide-area bandwidth management.

A joint product rollout with telecommunications equipment maker Motorola Codex, Inc. in Mansfield, Mass., has spawned the first wide-area network (WAN) NetWare Loadable Module (NLM) for the NetWare operating system, the vendors said. The goal is to extend LAN administrators' management view across enterprisewide private networks.

The NLM, dubbed "WANvisible," comes bundled for free in NetWare for Branch Office Solutions, or it can be downloaded at no cost from NetWire, the worldwide Novell bulletin board service.

WANvisible works in concert with the 3512, a $2,395 Codex-built data service unit (DSU) announced last week. DSU translates LAN packets into a form that can be transmitted over wide-area links.

WANvisible also runs with Codex's V.fast-with-compression modem announced several weeks ago.

"The whole concept of allowing a DSU to be managed by Novell is a strategic coup," said Robert E. Willis, president of Alpine Computer Systems, Inc., a Novell reseller in Holliston, Mass.

He said the move gives him "a low-cost way to set up branch office applications for customers where the communications translation gear doesn't outprice the file server."

NetWare visibility
WANvisible and the Codex 3512 today will allow WAN management on a NetWare console in a window separate from the LAN environment.

NetWare administrators can use the products to determine not only that there are WAN problems but also whether they are in the DSU or in the link itself — a general WAN management hurdle today, said Dave McNamara, director of marketing at Motorola Codex.

What this solves for the Novell administrator is, "'I don't want to have to run to the telecom guy every time there's a problem. Why can't I manage the WAN off the server myself?'" explained Joe Noel, director of networking research at Dataquest, Inc. in San Jose, Calif.

Similar capabilities do exist today. For example, Enron Gas Services Corp. in Houston runs an NLM with a hardware board from Newport Systems, Inc. that "puts a V.35 modem interface into a Novell server and plugs into a DSU to route [Novell's] IPX and [Apple Computer, Inc.'s] AppleTalk over a WAN link," said Jim Queen, director of enterprise networking.

However, he added, the Novell/Codex gear "might give more reporting and diagnostics on the WAN side, so I'd be very interested in looking at it." Because Enron is using DSUs from another vendor, however, Queen said he would be more likely to try out the 3512 and WANvisible in new installations.

Compression inside the Codex 3512 and V.fast modem allows users to squeeze 256K bit/sec. speeds out of their 56K bit/sec. dedicated lines — the most widely installed private link speed, according to Dataquest.

Gerry Machi, vice president and general manager at Novell, estimated that users could save about $14,000 to $21,000 per year at 56K bit/sec. speeds, depending on the distance of the circuit.

In addition, Machi said, a multiplexer within the 3512 lets users divvy up a private link and dedicate bandwidth to point-to-point-oriented SNA traffic and another channel to broadcast-oriented LAN traffic so that users can combine legacy and distributed networks on to a common backbone.

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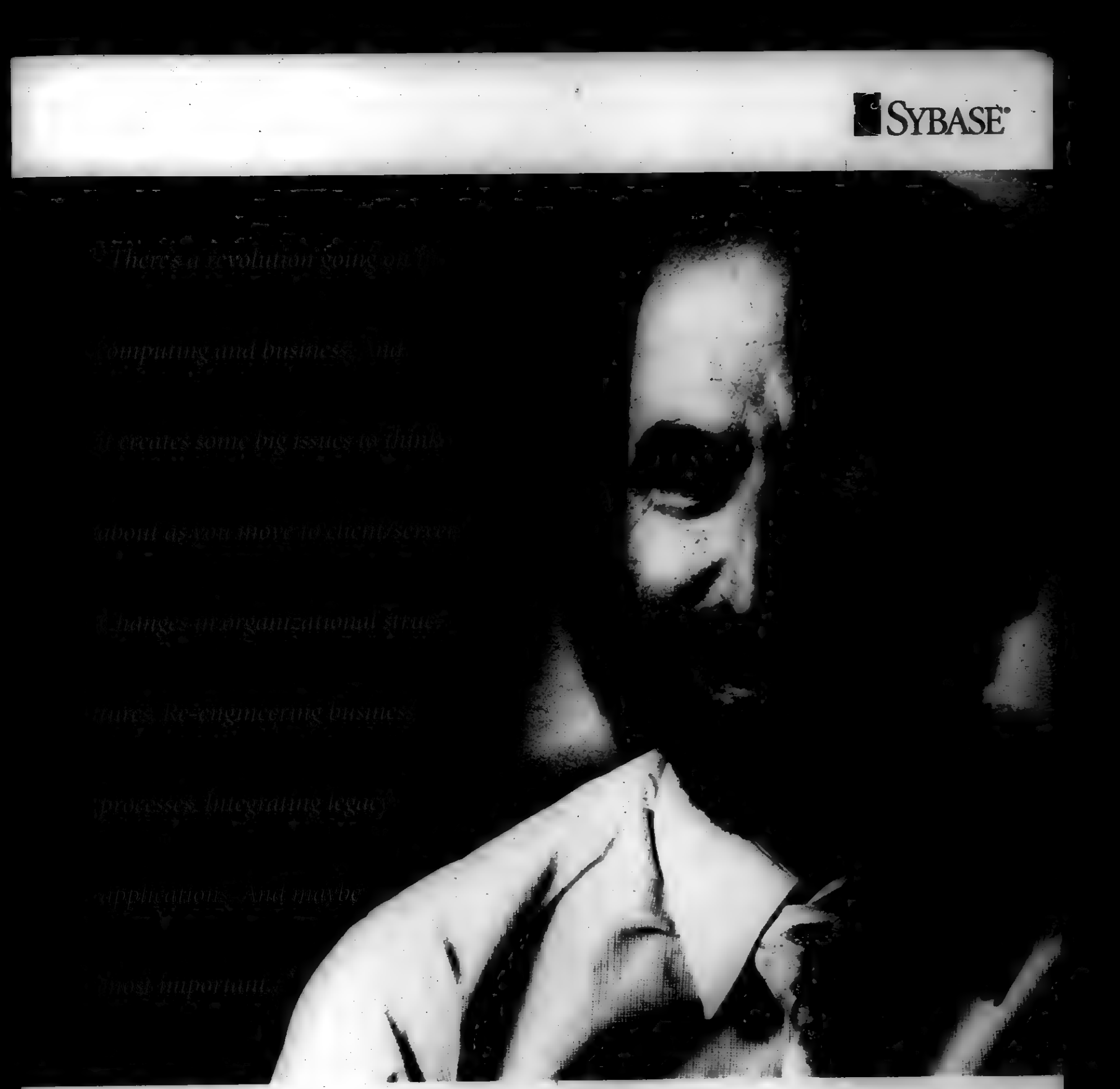

When Bob Epstein, Executive Vice President and a founder of Sybase, talks about computing and business, people listen. After years of developing client/server products and talking with customers, he's seen what works, and what doesn't. Hear what he has to say in a remarkably candid recorded conversation. **For your copy of *"Client/Server And The New Organization,"* call 1-800-SYBASE-1.**

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Pathworks goes multivendor

By Craig Stedman
MAYNARD, MASS.

The multivendor LAN management capabilities of Pathworks Version 5.0, networking software that Digital Equipment Corp. is introducing this week, strike a chord that several users said they want to hear. However, analysts are unsure of how well the tune will play outside Digital's installed base.

"They [Digital] at least have something to talk about" with Pathworks 5.0, said Stan Schatt, director of LAN services at Computer Intelligence/InfoCorp in La Jolla, Calif. "But they have a tough sell just getting non-VAX customers to realize that they have a [LAN] system."

The Pathworks release, due to ship this year, includes a ManageWorks component that supports management of native Novell, Inc. NetWare and Microsoft Corp. LAN Manager networks across a corporation from a single client PC with or without a Pathworks-equipped server, according to Digital officials.

Katrina Holman, group manager for Pathworks product marketing, said the company is trying to create a second market for Pathworks as a management tool for Fortune 1,000 customers with mixed retail LAN environments. "We are embracing the network that's already there," she noted.

That embrace is "an absolute necessity" for Digital because of its relatively small presence in the LAN market, Schatt said. He said he expects Pathworks' market share to decline gradually, despite the new management strategy.

Digital will be one of the first vendors to market a low-end, client-based product for managing LANs from different vendors, according to Schatt and other analysts. Most LAN management tools available now are tied to specific networks and do not include the fully integrated management capabilities that Digital is promising, they said.

Some Digital customers said they have been looking for the kinds of features Pathworks 5.0 is supposed to provide.

"This could make our life a lot easier," said Henk Hazelhoff, a telecommunications consultant at Dow Chemical Co. in Midland, Mich. Dow wants to eventually standardize on Pathworks LANs, but for now needs a method of bringing its 50 or so NetWare installations under central control, he added.

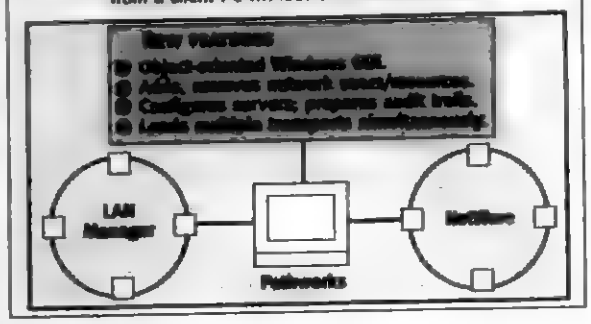
The NetWare LANs are in sales offices and other remote sites and have been managed locally, he noted. "We're just beginning to connect those users [into the corporate network] and haven't got a global way to do that yet," he said.

Dr Pepper Co./The Seven-Up Co. in Dallas is also looking to move from managing its various NetWare LANs separately. "It would be nice to merge that into one product on one PC with one piece of software managing the whole mess," said Ed Homko, Dr Pepper's systems manager.

However, PacifiCare Health Systems, Inc. in Cypress, Calif., is concerned about Pathworks 5.0. The management features sound useful, "but our worry is that it's going to be more of a LAN manager" than a full network, said Matt Holdrege, senior network specialist at PacifiCare.

A new path

Pathworks Version 5.0 will be able to manage non-Digital LANs from a client PC without a Pathworks server



Novell to meet app, net management concerns

By Elisabeth Horwitt
DALLAS

Networked systems management and application development, perhaps the two most important and problematic aspects of corporate client/server environments, will get some welcome attention from Novell, Inc. at this week's Networld '93 show.

Novell will begin by announcing several new partners for AppWare, its client/server application development environment. Its partners include Gupta Corp. and Borland International, Inc., which will provide database modules and application development for AppWare Foundation.

Next on Novell's Networld agenda will be an update of its NetWare Management System (NMS) strategy. The vendor will announce a NetWare Loadable Module version of its Simple Network Management Protocol-based network management platform, as well as support for the Remote Monitoring standard.

New management tools

Novell should also announce AppWare tools for NMS, facilitating the development of new applications for the network management system, according to Rick Villars, a director at International Data Corp., a Framingham, Mass., research firm.

Other vendors, too, will get on the NetWare management bandwagon. IBM is expected to announce at Networld LAN NetView, its OS/2-based system for managing NetWare, Microsoft Corp.'s LAN Manager and Windows NT and its own LAN Server. And Hewlett-Packard Co. is expected to enhance its NetWare management application on OpenView.

Messaging, too

In the messaging arena, Novell will announce that NetWare customers will be able to use Microsoft Mail for Windows client software directly with NetWare Global Message Handling Service (MHS) by the end of October.

Novell will supply drivers that use Microsoft application programming interfaces to give Microsoft Mail clients direct access to Global MHS message transport, gateway and directory services. This means that Microsoft Mail users could exchange mail directly with users of any other MHS clients without gateways.

"It's a good idea from both sides," said Ed Wilk, a network manager at NetWare and Microsoft Mail shop WHDH-TV in Boston. "Any time a manufacturer gives you hooks to another part of the world, we're better off."

Also at Networld, Novell and AT&T will announce a Telephony Services Early Implementors Program for the introduction of telephony services for NetWare.

Staff writer Lynda Radosevich contributed to this article.

NetWare 4.0 migration tool to debut

By Elisabeth Horwitt
PROVO, UTAH

Novell, Inc. will shortly become the distributor of a third-party product that promises to alleviate the agony of migrating from NetWare 2.X and 3.X to NetWare 4.01's NetWare Directory Service.

The software package, which Novell co-developed with Preferred Systems, Inc., could give a much-needed jump-start to corporations' sluggish move toward Novell's enterprise-oriented network operating system.

Directory Services (DS) Standard eliminates 60% to 80% of the administrative grunt work involved in shifting from the bindery-, server-based 2.X and 3.X directories to 4.01's enterprisewide directory structure, according to Jack Serfass, president of the West Haven, Conn., software firm.

One of the biggest headaches involved in merging multiple 2.X and 3.X directories into a single global structure is that users often go by different names in different server directories. DS Standard can compare the different directories, locate the inconsistencies and do a global search and replace to fix them, Serfass said.

The program also automatically "discovers" different 2.X and 3.X databases and reads them into an off-line database. Network administrators can make changes without affecting users, taking the network down only when they are ready to implement the new directory, Serfass said. This cuts total network downtime during the migration by 80% to 90%, he added.

Such capabilities would be extremely useful to Hoechst Celanese Corp., which is currently in the middle of its migration from NetWare v3.11 to 4.01.

"We're very interested" based on a description of the product, said Lorie Moukias, project leader at the chemical company in Somerville, N.J. At its current leisurely pace, the firm should be fully migrated to NetWare 4.01 in 12 to 18 months, he added.

TransAmerica Financial Services used Origen, an existing Preferred System product that DS Standard is based on, to make directory changes while migrating from 2.X to 3.11 servers. The TransAmerica Corp. division found that the program cut total migration time from 10 to four hours per server, said Sheryl Grossman, senior technical analyst.

A major reason for the time savings was Origen's ability to update users' assigned directory rights globally, instead of one by one, Grossman said.

The division plans to purchase DS Standard to help with a migration to 4.0, to begin shortly.

Out of the box

Scheduled to ship in the first quarter of next year, DS Standard will include these additional features:

- A Windows interface that enables users to make changes to a Version 4.01 directory tree by dragging and dropping objects such as user names and groups.
- Assistant, a checklist program that guides users through the 4.01 directory design process.
- An alarm system that automatically alerts the administrator when directory attributes exceed a preset threshold.

Preferred Systems is now shipping Origen Priority Kit, which supports automatic standardization and consolidation of 2.X and 3.X directories and their migration to the bindery emulation version of NetWare 4.01.

Priced at $695, the kit includes a free upgrade to DS Standard, which adds the support of NetWare directory service.

DS Standard's pricing has not been set.

— Elisabeth Horwitt

Windows

CONTINUED FROM COVER 1

through OEMs before Chicago [32-bit Windows] ships."

Ballmer said all the functions of Windows for Workgroups 3.11 will be available in Chicago. Microsoft, however, has yet to decide how many versions of Chicago it will produce and whether it will bundle Windows for Workgroups 3.11 in more than one version.

"For the next year, [Windows for Workgroups] 3.11 is available, and when Chicago ships, there will be a version of Chicago that basically replaces it," Ballmer said.

Information systems managers who initially install the program as a stand-alone replacement for Windows 3.1 can turn it on as a network version with a single menu selection.

OEMs unconvinced

While Ballmer said Microsoft is positioning the upgraded workgroup product to replace stand-alone Windows, OEMs that were contacted last week were noncommittal.

Some said flat out that they do not yet see enough demand to warrant bundling Windows for Workgroups in place of Windows. "We don't see demand for it. Bundles are for the masses, and the masses are not asking for it," said Daniel Sheppard, director of marketing at AST Research, Inc.

Sources at several hardware makers said they are enthusiastic about the features in the new Windows for Workgroups but added that Microsoft is asking too much in royalties to justify bundling it in place of Windows 3.1.

One source said that for Windows for Workgroups, Microsoft was asking almost double the roughly $15 per box royalty for Windows 3.1, and others agreed that this was too much to pay. In response, Ballmer said final pricing to OEMs for Windows for Workgroups would not be significantly more than that for Windows 3.1.

These sources and analysts raised the issue of how Windows for Workgroups will play with corporate IS. "MIS is scared to death of Windows for Workgroups. They don't want all these networks scattered about," said Kimball Brown, an analyst at Computer Intelligence/Infocorp in Santa Clara, Calif.

Brown said he expects to see most vendors offer a choice.

Zenith Data Systems already bundles Windows 3.1 and Windows for Workgroups on its Z-Note and Z-Station premium lines of notebooks and desktops. Zenith Data said it would move to only Windows for Workgroups 3.11 on those systems.

Faster and easier

The new 32-bit file system significantly increases speed in accessing data on both local and server hard drives, according to users and Microsoft. "It allows users to go right to the hard disk for data without having to go through DOS to get there," said Rogers Weed, lead product marketing manager for Windows for Workgroups.

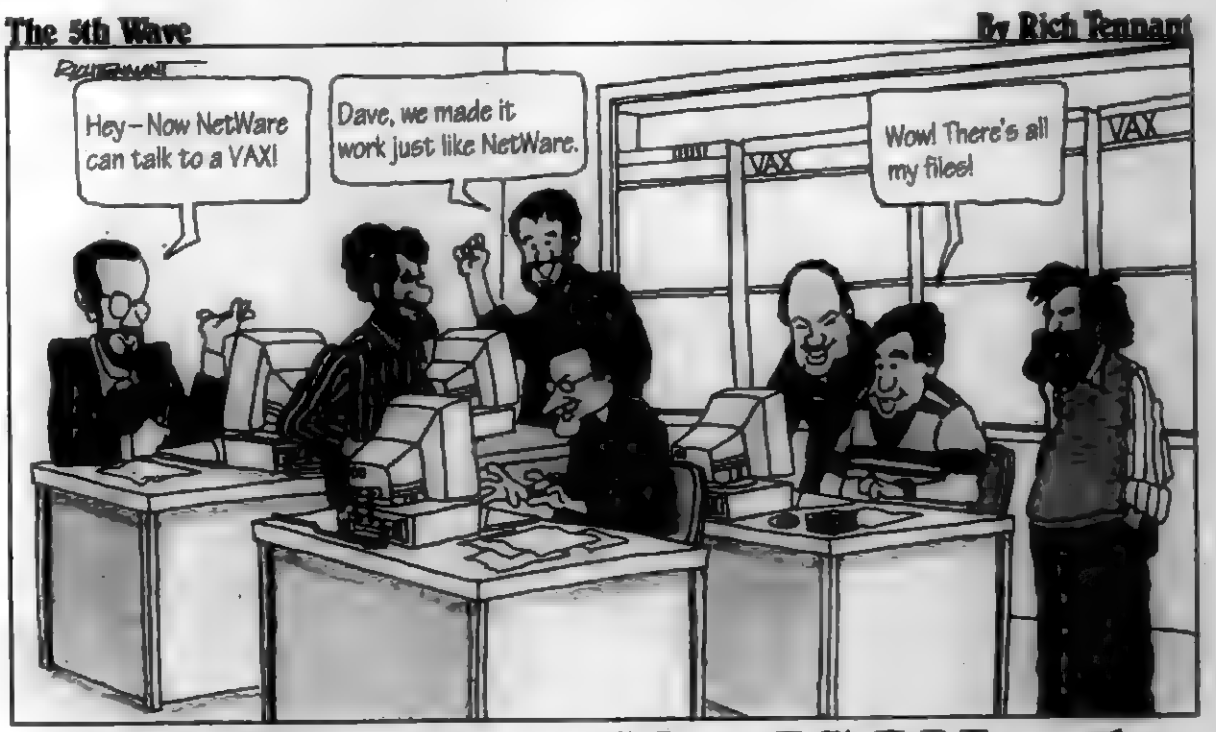
"You do notice the added performance in getting to local and network drives," said Tom Gibson, PC coordinator and beta tester at Weyerhaeuser, Inc. in Portland, Ore. "And so far, I have no problems running existing applications."

The company has also added a 32-bit redirector, a 32-bit version of its NetBEUI transport and features for supporting Novell, Inc.'s NetWare.

Microsoft said it believes it has eliminated many of the complaints IS managers had about Windows for Workgroups administration and security. "IS focus groups wanted the ability to centrally control the access privileges for their less experienced users, and I think we have given them that," Weed said.

While many diehard Microsoft corporate accounts like what they see in the new version, many others are struggling with where peer-to-peer products such as Windows for Workgroups fit into their overall strategies.

"If you are just eliminating 'Sneakernet' problems, then peer-to-peer gets you by. But if you want to protect your development investment, you are probably better off in most cases with a server-based environment," said John Chapman, senior technology consultant at Amoco Corp.'s technology introduction group in Chicago.



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News Shorts

Wang imaging to support Sun

Wang Laboratories, Inc. said last week it plans to port its Open/image imaging software to **Sun Microsystems, Inc.**'s SPARC workstations and servers running under the Solaris 2.0 operating system. Sun's version of Open/image will become available in phases between November and February, Wang said. Wang does not plan to market the SPARC machines itself, a change from its deals with **IBM** and **Hewlett-Packard Co.** The company also introduced a version of Open/image that supports X Window System terminals as clients. It is priced from $495.

Cognos to unveil client/server tools

Cognos, Inc. will this week unveil its client/server tool set [CW, Aug. 9] at its user group meeting in Orlando, Fla. Dubbed Axiant, the new technology is built around a multiuser object-oriented repository and Cognos' PowerHouse engine. Axiant offers visual development, support for Rapid Application Development and automated maintenance, officials said.

Westinghouse adopts CDPD

Westinghouse last week became the first announced customer and also a reseller of CDPD, an overlay technology that sends packet data over unused channels on analog cellular channels. The company will use both a national CDPD network, provided by a team headed by **GTE Mobile Communications** and **Bell Atlantic Mobile Systems**, and a national radio packet network provided by **RAM Mobile Data**. The value of the contracts was not disclosed. The Westinghouse deal includes a commitment to have CDPD in the 61 largest U.S. cities by the end of 1994.

Panasonic adds CD-ROM to notebook

Panasonic Communications & Systems Co. announced a notebook computer with a detachable 3½-in. CD-ROM drive. The Panasonic CD-ROM notebook, based on an Intel Corp. 25-MHz i486SX, has three versions, including one with a 10.4-in. active-matrix screen for $4,299. This version will ship in November. Panasonic will offer options for full-motion video, a floppy disk or an extra battery for the CD-ROM space. The color LCD will be the first that matches the display size in the **IBM PC Co.**'s ThinkPad.

AST adds to servers

AST Research, Inc. last week rounded out its server line with an entry-level Extended Industry Standard Architecture (EISA)-based family called Premmia MTE. The servers include six drive bays and six EISA slots, up to 1G byte of hard disk storage, 8M bytes of RAM expandable to 128M bytes, up to 512K bytes of second-level cache and an Intel 33-MHz i486DX or 66-MHz 486DX2 microprocessor. Pricing starts at $2,000.

SHORT TAKES **NCube** announced the Parallel Storage Bay for high-capacity, high-throughput applications and introduced the Ncube 2S M5 deskside system. . . . **Encore Computer Corp.** announced support of **Oracle Corp.**'s Oracle 7 Release 7.1, Parallel Query Option and Oracle 2.0. . . . **Rabbit Software Corp.** and **Tangram Systems Corp.** announced a merger to form Tangram Enterprise Solutions, Inc. . . . **Vmark Software, Inc.** will purchase the portion of **Computervision Corp.** that services Prime Information customers. . . . **IBM** gained rights to sell and support **Gupta Corp.**'s SQLWindows for the IBM AS/400 outside. . . . Disk drive maker **Conner Peripherals, Inc.** expects to report a third-quarter loss greater than analyst expectations. . . . **HP** introduced a 10G-byte mass storage system for use with networked PC-based servers from companies including HP, **Compaq Computer Corp.**, **AST Research** and **Dell Computer Corp.**

Down the road

Users at last week's ABUI meeting were treated to previews of several major upcoming Banyan announcements.

Chief among them was a distributed architecture for managing Banyan's Vines network operating system and enterprise network services via GUI and SNMP Version 2.0 protocols.

Banyan already provides SNMP-based management of Vines servers; however, the SNMP Version 2.0-based system, due out in mid-1994, will support a distributed infrastructure in which Vines servers can act as management nodes for local networked devices, according to a Banyan spokesman.

Incorporation of SNMP management information bases within Banyan services such as StreetTalk III and E-mail will allow users to manage such services via an SNMP-compatible platform such as Hewlett-Packard Co.'s OpenView.

Banyan's Event Logger utility, which is incorporated into Vines 5.5, will enable Vines-based management nodes to proactively notify a management console of key events rather than waiting to be polled, as with typical SNMP systems.

Also in the works is a Windows-based GUI for its M° suite of management services, the spokesman said (see story below).

Banyan also previewed an announcement of its Enterprise Data Distribution (EDD) offering, which will be made this week at Networld. EDD will enable users to distribute and collect all types of data as well as software across the range of clients and network operating systems supported by Banyan's enterprise services.

Other Banyan announcements previewed last week include the following:

- Direct TCP/IP support for Unix, DOS and Windows clients of Vines and Enterprise Network Services. This will eliminate the need for two protocol stacks on clients that need to talk TCP/IP.
- Integration of StreetTalk with the X.500 Global Directory within 12 to 18 months.

—Elisabeth Horwitt

Banyan's plan

CONTINUED FROM COVER 1

its desire to encourage independent software vendor development . . . [is] driving many users away from patronizing independent software vendors," said 1st Lt. Rob Page of the U.S. Marine Corps.

Such tactics "could make some [independent software vendors] gun-shy of further development in Vines and limit users' choices," said Randy Bradley, chairman and chief technical officer, at NetPro Computing, Inc. in Scottsdale, Ariz., which develops Windows front ends for Banyan network management services. "The question becomes whether you can have a robust third-party community living off the fringes, never knowing where [Banyan] will compete with us next."

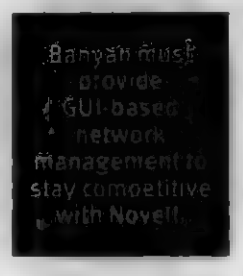
Trouble lurking

Given Banyan's history of reliance on third parties for front-end applications, such defections could be disastrous for customers. "Some users with a glass-house mentality will want all their products from one vendor, but others want the innovation provided by third parties," said Roger Mertz, a network manager at Crown International in Elkhart, Ind.

Banyan spokesman Jim D'Arezzo responded that while Banyan "absolutely believes" in supporting its third parties, "there will be times where our paths overlap." Banyan must provide graphical user interface (GUI)-based network management to stay competitive with archrival Novell, Inc., which has incorporated a GUI into the network administration piece of NetWare 4.01, D'Arezzo said.

"It's become a point of comparison, so we can't just say, 'Go buy a third-party product,' " he said.

Over the past year or two, Banyan has repeatedly introduced a competing product "just when you have something stable," said Matt Gillies, a network engineer at Incognito Software, Inc., a Vancouver, British Columbia, vendor of Unix-to-Vines networking products.



For example, Banyan contracted with Isocore to develop its own Simple Mail Transfer Protocol gateway "instead of just recommending ours, which we spent two years developing," he said.

Indeed, Banyan's inability or unwillingness to aggressively court third-party vendors was a primary area of concern for attendees that responded to a *Computerworld* electronic-mail survey at the conference.

"I would like to see more hospitality extended to Vines developers in order to facilitate an increase in third-party software development," said Robert Skogstad, network administrator at Clark, Klein & Beaumont in Detroit. Several others agreed.

Furthermore, Banyan is behind rivals Microsoft Corp. and Novell in providing open, inexpensive or free application programming interfaces (API) and developers tool kits, independent software vendors and users said. Lack of open APIs has caused "a number of interface and compatibility problems" with Vines, said one user, who asked not to be identified.

"Banyan needs to offer Windows-based solutions out of the box, but they should license the software from third-party developers who have the expertise and the products that work now," said David Day, a systems analyst at Dow Brands in Indianapolis.

We want Windows GUIs

Network administrators at the show said they definitely want Windows-based GUIs for Banyan's directory, E-mail and management services, which are difficult and time-consuming to administer. But several users said they did not need such front ends from Banyan, given that independent software vendors such as NetPro, Trellis, Inc. in Hopkinton, Mass., LAN Shark Systems, Inc. in Reynoldsburg, Ohio, and Incognito already offer such products.

For example, NetPro's Streetwise, a Windows-based administrative tool for Banyan's StreetTalk, "saves me hours of management time every day," said Andrew Gahm, senior functions analyst at West Jersey Health Center in Gibbsboro, N.J. "Before, I had to keep exiting Windows every time I wanted to fix or change something."

Banyan will roll out Windows-based GUIs over time for administering its major services such as StreetTalk, Intelligent Messaging and Enterprise Network Services, company spokesmen said.

Don't look now, but Banyan Vines professionals have become marketable at Novell sites. *See Careers on page 113.*

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The HP LaserJet 4Si MX printer is loaded with features that define state-of-the-art. HP's enhanced PCL5 and genuine PostScript™ Level 2 software from Adobe™ come standard. Printer environments are saved while switching. Setup is a cinch with network software utilities and drivers included in the box. And, if you need any reassurance about trouble-free operation, you have it in our Simple Network Management Protocol (SNMP) support.

At 17 ppm, this is the fastest LaserJet ever, with I/Os and RISC-based formatter capabilities matched to support its speed. It delivers impeccable 600 dpi print quality—thanks to HP's microfine toner and Resolution Enhancement technology. Plus, it comes standard with two 500 sheet input trays.

But what if you don't need the full capabilities of the HP LaserJet 4Si MX printer right away? HP offers another printer that's probably a perfect fit. The HP LaserJet 4Si printer delivers the identical 17 ppm performance and superb 600 dpi print quality. It also has room to grow. The two MIO expansion slots let you add HP JetDirect network interface or third party cards. And you can add on Adobe's genuine PostScript Level 2 software and SIMM memory modules, as you need them.

To find out more about the multiple-network HP LaserJet 4Si MX printer and the upgradable HP LaserJet 4Si printer just call 1-800-LASERJET, Ext. 7299.† Capabilities this advanced make a world of difference—in any environment.

HEWLETT PACKARD

Oracle serves up (some) 7.1 goodies

By Kim S. Nash
ORLANDO, FLA.

Oracle Corp. announced last week several additions to its Oracle 7 database at an annual meeting of the International Oracle Users Group held here. But the two options that turned users' heads — Parallel Query and enhanced replication capabilities — will not be ready when Oracle 7.1 ships in January.

"The groundwork is there [in 7.1], but we want to be sure replication and parallel technology is ready for prime time before we send it out," said Ken Jacobs, vice president of product planning.

Oracle is trying to get promised products, such as database upgrades, out faster, said Jeff Henley, chief financial officer. "This means making some compromises and not having every last feature" immediately in a new product, Henley said.

However, users can expect to see the following features, among others, in Oracle 7.1:

•PL/SQL extensions that, for example, let users program functions for a server that previously had to be done on a client.

•Read-only table spaces, which save time and resources during database backup.

•Several Oracle 7 bug fixes.

•Improved naming devices to better track users and secure the database.

Meanwhile, Oracle gave users glimpses of features to come. For example, instead of relying on two-phase commit to keep duplicate databases in sync, future Oracle 7.1 releases are expected to sport transaction-based replication, which automatically replicates changes across multiple tables and databases without waiting for a request. Oracle's planned features are similar to those offered by Sybase, Inc. and The ASK Group, Inc. in its Ingres database [CW, Sept. 20].

Speed counts

Parallel Query Option was designed to chop up data requests, spreading various pieces of the query to as many processors as are available on a given symmetric multiprocessing or massively parallel machine. Distributing a query across many CPUs can speed up processing time by tenfold or more, Oracle said.

Users at the show's general session gushed when they saw a demonstration. A query of a 5,000-row Oracle database table on a 20-CPU box from Sequent Computer Systems, Inc., done the traditional way — using one processor — finished in 6 minutes, 47 seconds. The same request processed in parallel mode screeched through in 23 seconds.

"Holy [expletive], that thing is hot," said Craig McCrary, project analyst at Applied Benefits Research, Inc. in Palm Harbor, Fla.

"I'm interested in Parallel Query, but I'm more interested in better backup and recovery first," said Lorin Gallistel, a database analyst at Northern Telecom, Inc.

Side dishes

As expected, Oracle also unveiled the following [CW, Sept. 20, 27]:

•**Oracle Office 2.0**, a suite of electronic-mail and document management applications, is due in the first quarter of 1994. The new version will become a competitor to Lotus Development Corp.'s Notes.

•**Media Server** is a version of the Oracle database that handles full-motion video, CD-quality sound, images and text. **Media Objects** is a set of tools for building a user interface for set-top boxes envisioned to sit atop people's TVs to let home viewers navigate New Age interactive TV. Both are scheduled to ship to developers in January.

•Oracle signed up heavyweight mainframe and high-end Unix software makers, including BMC Corp. and Legent Corp., to build and/or port systems management tools for Oracle databases.

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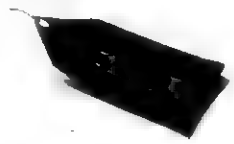

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WordPerfect Office wins fans

By Lynda Radosevich

WordPerfect Corp.'s Office messaging software, relegated mainly to small LANs in the past, is beginning to make headway into enterprise networks, where it may give electronic-mail market leaders Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail a run for their money.

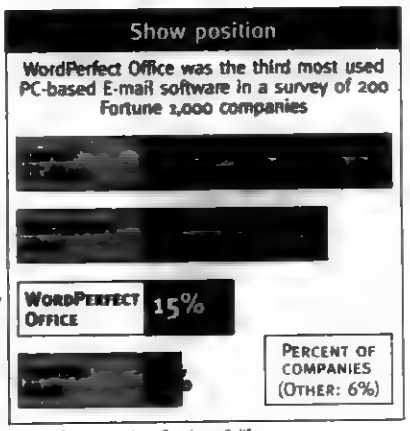
Corporate accounts include United Press International (UPI) and Mercedes-Benz of North America, Inc. Also, American Airlines recently signed a large purchase contract, and Shell Oil Co. is close to signing one, according to a source close to the deals.

"I think WordPerfect Office bears watching in the E-mail market," said David Ferris, editor of the "Ferris E-mail Analyzer," a newsletter in San Francisco.

All-in-one package

Users said the main reason they picked Office over the leaders is that it integrates E-mail, personal calendars, task management and group scheduling into one application.

The benefits include one interface for end users and one directory for administrators. Both CC:Mail and Microsoft Mail are just getting around to offering scheduling, and their scheduling software is still separate from E-mail applications.



Source: Dataquest, Inc., San Jose, Calif.

"Because we would have to purchase separate scheduling and calendaring with Microsoft Mail, the cost was going to run between $57 and $62 per person. With WordPerfect Office, it was $33," said Linda Smith, a PC support and LAN analyst for Printing Products North America (PPNA), a division of multinational conglomerate Hoechst Celanese Corp.

Performance drawbacks

However, users said while Office 4.0, released in June, takes care of many scalability problems of earlier versions, performance is slow, especially on the DOS platforms.

The PPNA division is migrating roughly 1,000 users from IBM's Profs to Office 4.0 via an X.400 gateway. The division used an earlier version of Office that required three to four hours of downtime each week to synchronize directories with Profs.

Version 4.0, which has been in production for four weeks, has an updated X.400 gateway that does not require any downtime, Smith said.

Because rolling out PC-based E-mail across an enterprise is so complicated, users said WordPerfect's support was another reason for choosing Office.

"We just found Microsoft to be difficult to work with in terms of support. WordPerfect has always bent over backward," said Gregg Smith, president of Applied Intelligence Group, Inc., a systems integrator in Alexandria, Va.

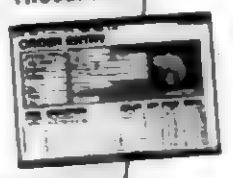
The group is installing Office 4.0 for UPI's offices throughout the world. Although UPI purchased Microsoft's bundled suite of office applications, including E-mail, it went with Office for E-mail because of networking support issues and Office's good remote communications, Smith said.

For the Environmental Protection Agency, Office 4.0 took care of some "show-stopping" directory synchronization and gateway problems, said Mike Stein, acting chief of the information center branch in Washington.

RemoteWare and the SEMINAR Charlie missed

AT THE VERY MOMENT AN EXPERT WAS EXPLAINING THE COST- AND SANITY-SAVING BENEFITS OF REMOTEWARE-CREATED AUTOMATED WORKFLOW SYSTEMS TO A ROOMFUL OF HIS FELLOW CLIENT/SERVER AFICIONADOS [redacted] was sitting

in a tiny center seat, in coach, staring blankly at a fly nimbly exploring the OXYGEN PANEL above him. It had come down to a scheduling conflict. One more FREE product seminar, half-day, inevitably bad deli sandwiches... potato chips that had gotten too close to the kosher dills and gone soggy. Or this junket to clean up yet another set of branch communication difficulties in Opelika, St. Louis, and San Antone. So the picture of this fly on the ceiling RUBBING ITS FRONT LEGS TOGETHER with an ominous delight didn't have the significance for him it might have had he seen that MEANWHILE, BACK AT THE SEMINAR THE REMOTEWARE FOLKS WERE SPINNING COLORFUL TALES OF SUCCESSFULLY-IMPLEMENTED FIELD COMMUNICATIONS SYSTEMS, HOLDING CHARLIE'S TECHNO-PEERS FROM COMPETING COMPANIES CAPTIVE WITH THE PROMISE OF THOUSANDS OF FULLY-AUTOMATED, EASY-TO-MANAGE AND UNATTENDED DIAL-UP COMM SESSIONS, AND RIVETING ACCOUNTS OF REAL COMPANIES WITH HUNDREDS OF MOBILE CORPORATE LAPTOPS AND REMOTE BRANCH OFFICES USING CENTRALLY-CREATED AND MANAGED ELECTRONIC FORMS, DOCUMENTS, AND REPORTS, ALL LINKED TO CENTRAL SYSTEMS AND DATABASES, AND ALL NEATLY SUPPORTED BY INTEGRAL ELECTRONIC SOFTWARE DISTRIBUTION CAPABILITIES!



So these were the things Charlie was missing: solutions to the very problems that had made this one more night away from home a necessity. That, and what actually turned out to be a delicious RemoteWare lunch of pasta salad, FRENCH BAGUETTES with prosciutto and mozzarella, and fresh strawberries.

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Postal Service sorts through automation

CONTINUED FROM COVER 1

keyed in, 17 people sort the same volume at a cost of $19 per thousand. And by hand, a worker sorts 800 letters in an hour at a cost of $43 per thousand, 14 times the cost of fully automated operations.

The old and the new

The 14-acre mail-processing center here is a microcosm of the entire U.S. Postal Service, with an armada of machines that spit out mail faster than the eye can see next to Benjamin Franklin-era pigeonholes where workers still sort by hand. One of 260 such plants in the U.S., the center processes 3.7 million pieces of mail daily, as much as is handled in all of Finland.

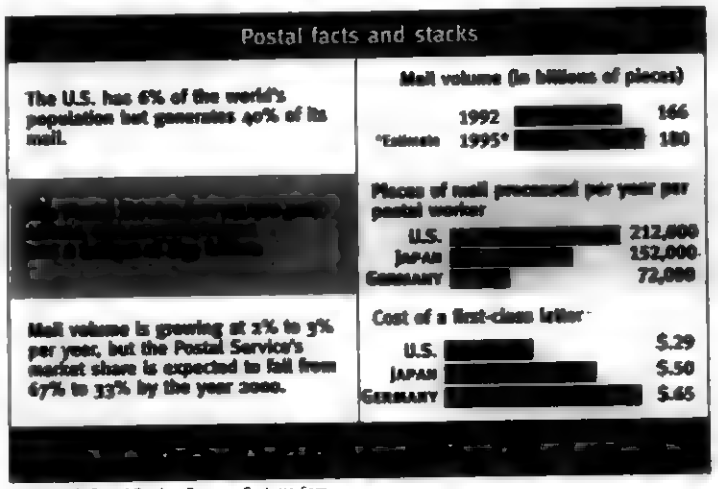
Processing letters — about 70% of all mail volume — is done in three tiers. At the top, mail already bar-coded by bulk mailers sails through with hardly a glitch, earning those mailers the lowest rates.

Envelopes with neatly typed or printed ZIP codes pass through optical-character recognition (OCR) equipment, which reads the ZIP codes, applies bar codes and sorts and sends the envelopes out. The most advanced gear adds two digits to the nine-digit ZIP codes and sorts the mail into the exact sequence that the neighborhood mail carrier walks.

The Postal Service is also beginning to use remote bar-coding technology to process letters with ZIP codes that the OCR machines cannot read. Now in place at 25 locations — expected to grow to 250 by 1996 — these systems scan the face of envelopes and send high-quality images over a network to video terminals at remote locations.

Images from Merrifield are sent 150 miles away to Salem, Va., where wages are relatively low, to contractors who key in enough of the address to enable software running back at Merrifield to determine the ZIP code. The code is then transmitted over a network to a machine — which has been holding the envelope — for application of the bar code and sorting.

The Postal Service is pinning its hopes on new handwriting recognition techniques to handle some of the volume now going to these remote coding sites. Research at the State University of New York at Buffalo is expected to reduce by half the 20% of mail that must be manually processed (see story left).



Source: U.S. Postal Service, Paramax Systems Corp.

The Postal Service started its automation push in 1982 with the introduction of OCR and bar-code technology. The service plans to spend $3.4 billion in the first half of this decade on a second wave of advanced automation, which it hopes will allow it to avoid some $3 billion a year in salary expenses.

An uphill battle

The service says automation has eliminated 38,000 positions in three years and will trim another 22,000 by 1995. But in a report last year, the U.S. General Accounting Office (GAO) said, "Automation is unlikely to ... reverse the persistent tendency for costs to outpace inflation."

The GAO said that in 1991, $138 million in labor savings from automation were "overwhelmed" by $627 million in wage and benefits increases in those areas affected by the automation.

In a reply to the GAO, the Postal Service said it was unfair to judge its automation program at its "beginning stages," but it went on to admit that "it is unrealistic to expect our automation program to do more than restrain the growth in costs." Nevertheless, the Postal Service said automation boosted productivity 4% last year.

Indeed, despite a recent reorganization and downsizing by Postmaster General Marvin T. Runyon, the Postal Service expects to record an operating loss this year of $500 million — $140 million attributable to operating cost overruns and $360 million from a revenue shortfall due to postal-rate discounts to nonprofit mailers.

Translation, please?

The problem is, there are different strokes for different folks.

And that's got researchers at the Postal Service-funded Center of Excellence for Document Analysis and Recognition (Cedar) at the State University of New York at Buffalo working on "stroke extraction" software, which relates the characteristics of pen strokes to letters of the alphabet.

The objective is to solve a tough computing challenge — how to recognize handwritten scrawls with enough speed and reliability to derive a bar code for postal sorting.

After coming up with one or more plausible translations of a letter or word, Cedar's software checks for context. For example, if it could not decide whether a ZIP code is 70004 or 20004, it might note that the previous address line said, "Washington, D.C." It then could check a database and see that there are no ZIP codes in Washington beginning with a '7.'

The Postal Service wants the Cedar system to be able to process 50% of handwritten mail with 98% accuracy, with the balance handled by human sorters. The goal is for the Cedar system to process 13 envelopes per second, something it will be able to do when it is rolled out in 18 months, according to Cedar Director Sargur Srihari.

For now, on a Sun Microsystems, Inc. SPARCstation, the software deciphers addresses and ZIP codes 40% of the time, Srihari said. It recognizes the five-digit ZIP code alone — enough to get the mail to the right post office — 75% of the time.

— Gary H. Anthes

The Postal Service's *Cedar is developing a system that can read and decipher handwritten addresses*

The General is watching

Having automated all "the administrivia," the Postal Service is moving on to more challenging systems, according to Richard D. Weirich, EIS vice president.

One of these is the Postal Service's corporate executive information system (EIS), which tells management in near-real time how well the organization is performing.

Postal Service's Richard D. Weirich: *EIS is motivating plant managers to productivity*

Weirich said EIS is a favorite tool of Postmaster General Marvin T. Runyon, whose recent overhaul of the huge agency was based in part on a desire to improve the flow of information among the agency's operating units, EIS organization and Postal Service management.

From a terminal in his office, Weirich demonstrated how managers check mail inventory left each morning at each of the Postal Service's 260 processing centers. They can determine whether those levels exceeded standards and whether the centers met their delivery schedules to post offices.

Users can also look at the results of the latest quarterly customer satisfaction surveys, which show how customers ranked home delivery, post office window service and 35 other items in a given region or city.

According to Weirich, the EIS influences line managers, even those who never use it.

In a field visit recently, Wierich said he asked a plant manager what motivated him, to which the manager replied, "I want to get my inventory down tonight because I know Marvin Runyon will look at his computer tomorrow, and he'll see a blinking light if I don't."

— Gary H. Anthes

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Software profits speak many languages

U.S. vendors say foreign markets turn quick cash, account for almost half of all software revenue

By Cara A. Cunningham

Users of 1-2-3 for Windows 4.0 can simultaneously recalculate, *calculer maintenant*, *neuberechnen* and *zaikeisan* their spreadsheets thanks to an unprecedented worldwide rollout last summer that saw Lotus Development Corp. release its upgrade in 23 languages.

The software giant's bold release schedule — English, French, German and Japanese versions were shipped in June, with 19 additional languages to follow — epitomizes a new strategy among U.S. vendors, which now churn out foreign-language versions of software concurrently with the English release.

Multinational companies can standardize on one software application for all of their geographies, non-U.S. users benefit by quickly getting their hands on major releases and updates, and vendors are able to more quickly see profits from the foreign markets that now make up as much as half of their revenue.

Demand is high

"We insisted on translated versions in our approach to vendors," said Didier Mougenot, director of information systems at Valeo, a Paris-based manufacturer of automotive components, which recently purchased almost 200 copies of 1-2-3 for Windows 4.0 in multiple languages directly from Lotus. "It is very difficult to deal with the fact that a software vendor doesn't have a certain product for a given country."

"There are more multinational companies working with us these days, and they demand multiple-language versions before they will buy any of the product," said Jeffrey Bier, vice president of Lotus' spreadsheet products division in Cambridge, Mass. "Clearly, we are holding off a large portion of our revenue if we don't have non-English versions."

The impetus for U.S. vendors to translate their software is increased revenue. For the past few years, companies such as Microsoft Corp., IBM, WordPerfect Corp. and Borland International, Inc. have seen the overseas market provide more than 50% of their total revenue, company officials said.

Couple these strong opportunities with the U.S software market's current rash of price-cutting and it becomes clear why software developers are looking beyond their national borders to fortify their sales.

"More than half of our revenue for OS/2 is from outside the U.S.," said Wally Casey, director of marketing at IBM's Personal System Products division in White Plains, N.Y. "I can't afford to be more than a couple days [behind the English release] with foreign-language versions."

Even as they chase after profits abroad, developers are learning that translating, or localizing, software is an expensive, time-consuming process that requires product managers and engineers to rethink the way software is developed.

Many larger software vendors that have already enjoyed returns on their localization investments are now learning to streamline the process by beginning translation early in a product's life cycle, instead of as an afterthought. Although the cost is still high and there is no way to automate the entire translation process, companies such as Microsoft and WordPerfect now accept localization as a part of regular product cycle costs.

"Any way you cut it, internationalization costs a lot of money," said Rich Barth, Microsoft's Windows NT product manager. "It's important for us to do it very efficiently."

Nipped in the bud

To help cut down on the amount of recoding involved in producing multiple-language versions of a product, Microsoft now makes allowances for foreign-language support in the early stages of a product's life. "We began training developers not to be language-specific," Barth explained.

Programmers include more flexibility in the original U.S. version of a program, with dialog boxes that can be sized to accommodate longer words often found in languages such as German and date boxes that can handle European as well as American conventions. Also, all cultural references must be removed from the interface, training material and documentation, Barth said.

This process, known as internationalization, is done by most software vendors that intend to localize their products. Then, instead of recoding the entire product, developers isolate interface components in the internationalized English version into a separate file and translate only that portion.

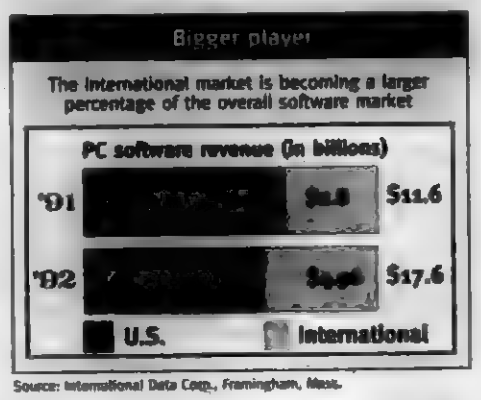
The less coding that has to be done for the translated versions, the faster the software can be released into foreign markets, a key aspect of international success.

WordPerfect, which internationalizes its English versions to expedite the translation process, has developed some internal macros and batch files to help automate the localization process.

"But as far as the translation itself goes, it is still very human labor-intensive," said David Pearson, director of international PC product marketing at the Orem, Utah-based company. "A direct translation just doesn't cut it. Our translators take great pride that they are not just doing a word-for-word translation, but truly localizing."

"Translating is subjective and more of an art than a science," agreed David Greco, president of World Ready Software, a San Francisco company that advises software vendors on localization techniques. Greco maintained that there is a hidden benefit to translating software.

"The more languages that you do, the more refined the product will be," he said. "It's like doing multiple beta tests."



Source: International Data Corp., Framingham, Mass.

Cunningham is an IDG News Service U.S. correspondent. Additional reporting by IDG News Service's European correspondent.

Deals

Partnerships, products make the scene

PARIS — Groupe Bull and IBM Europe issued a statement reaffirming plans for the "successful continuation" of their partnership after **IBM France**'s chairman cast doubt over IBM's financial commitment to the ailing French vendor.

During the announcement of IBM's PowerPC here in Paris, Claude Andreuzza, president of IBM France's management directory, said, "It would not bother us a bit if we saw our share [in Bull] diminish. We are not Bull's banker."

The French government is preparing to recapitalize the state-controlled Bull by injecting several billion francs into the company. IBM would be asked to follow suit in order to maintain IBM's 5.68% equity stake it secured two years ago in a broad partnership with Bull.

The joint communique issued this week said the two companies would consider the equity question in "due time" and declined further comment. The statement also said the introduction of the PowerPC and PS/2 technologies reinforced their existing agreements.

LONDON — Electronic Data Systems Corp. has launched a European version of its Technical Products Division, which sells desktop systems and services in the U.S. The European division will offer PC hardware, data communications, software applications, corporate licensing and systems integration services.

It will establish a centralized European warehouse and distribution facility in Eindhoven, the Netherlands, and arrange direct support services. The company claims to be one of the Top 10 PC resellers in the U.S. and aims to replicate that success in Europe by meeting multinational companies' need for cross-border sales and support.

TOKYO — NEC Corp. announced a multimedia communications system and groupware software that lets remote users share applications and data while exchanging handwritten memos, voice and full-motion video in real time.

The software, called Multimedia Group Work System OfficeMermaid, runs on an NEC EWS4800 Unix workstation equipped with a digital video camera, a microphone, a digitizing tablet and a specially designed expansion board integrating communications control and coder/decoder (codec) circuits. The EWS4800 is built around a Silicon Graphics, Inc. Mips R4000 64-bit RISC CPU and runs NEC's EWS-UX/V operating system, based on Unix System V Release 4.2.

The controller/codec board shrinks electronics that previously required a separate cabinet onto a few chips mounted on a single circuit board, making it possible for the entire system to be contained in the workstation, an NEC spokesman said.

The system will start shipping in Japan on Dec. 21 and outside of Japan in October 1994. Prices start at $24,550 for an Integrated Services Digital Network version and $21,650 for a LAN version.

HONG KONG — Reuters Ltd. has unveiled an information search and retrieval service that gives users access to a database of 10 million articles collected from its own and international newspaper sources. The service, while not the first of its kind, is offered at a lower cost than others on the market, the company said.

The Reuter Business Briefing allows companies to conduct research quickly by pulling up relevant newspaper and magazine articles written about a certain company or industry in a particular country and covering a specific topic, according to Reuters.

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An immutable fact of life is that everyone wants something they are not likely to get or wants to be someone they cannot be. Take Unix

users, for example. They want to be like PC users, able to pop their Unix applications out of one machine and run them without any modifications on another, with each of the machines running some Unix variant.

Or, for another example, take most of the industry's top executives. They want to be Bill Gates, at the controls of a steamroller like Microsoft.

How about you? If you are Novell chief Ray Noorda, you might like to be invisible right about now after failing to unite the various Unix factions beneath an umbrella plan to turn Unix over to X/Open Co., an independent standards body.

The plan sounded good, obviously too good. Novell, which bought the Unix trademark earlier this year, was to deed the trademark rights over to X/Open, which would henceforth certify Unix compliance. Users would then see the cost of Unix application development plummet. (One application would be developed for all Unix platforms, irrespective of the flavor of Unix featured on that box.) And they'd get the portability PC users have always enjoyed.

What tripped up Novell on the way to the altar was the same force that has undone almost every consortium the computer industry has produced: self-interest. It is proving a far more potent influence, even more so than the fear of Microsoft's dominating the 32-bit environment with Windows NT the way it dominates the 16-bit world with MS-DOS and Windows.

For example, Novell is only a bit player in a desktop Unix market dominated by The Santa Cruz Operation and hotly pursued by Sun. The SCO's legitimate fear was that the "Unix" Novell would hand over to X/Open would favor development of Novell-based products, like UnixWare. Hey, why invite a competitor into a market you already own? The answer is, you don't.

And why should Novell, which paid more than $300 million for the Unix trademark, hand it over to someone else — even a standards body — without linking the gift to its self-interests? The answer is, it won't.

Therefore, why should you Unix customers hold out hope for some agreement among the different Unix factions that would produce a source-code-level armistice and eventually yield the portability you want? The answer is, it's not coming any time soon.

There *does* seem to be momentum to implement a set of common APIs for Unix following an agreement by 75 vendors earlier this month to do exactly this. And Ray Noorda and Novell have to do *something* to show some Unix leadership, lest they risk trashing a $300 million investment and deeding Unix leadership to other vendors.

But don't hold your breath. You'll see a unified Yugoslavia before you'll see a truly unified Unix. The fear of Microsoft and NT is not yet that great, and the politics of consortia are too overbearing to give you what you want.

Bill Laberis

Bill Laberis, *Editor in chief*

Off the mark

"Protect yourself" [CW, Sept. 6] offered an extremely misinformed and biased account of the contract employment industry.

In the first place, while placing consultants out as 1099s was the industry norm before Congress passed Section 1706 in 1986, virtually every contract employment company today hires all of its consultants on a W-2 basis. Temporary/consulting services still placing 1099s today are very much the exception.

Your article also misses the point with regard to the licensing of temporary/consulting services. The truth is that since we are always the "employer of record" for our consultants, we are required to adhere to all the laws that govern workers, including providing coverage for our consultants under workers' compensation.

The fact is that the majority of firms in our business offer their consultants much more than the minimum required by law. In our nationwide network of offices we offer many additional benefits and treat our computer consultants as our most valued resource. Computer professionals should know that contracting with the right firm can be a most rewarding and pleasant experience.

Ellis Schultz
Owner
Uniforce MIS Services
Portland, Ore.

GUI is only tip of big iceberg

Your Aug. 23 issue featured an article on client/server tools using graphical user interfaces (GUI). There was a quote from Peter Schleider regarding the "limited" popularity of structured analysis in the new world of client/server development.

It is amazing to see the lack of understanding in our profession regarding the essential service we can provide in building models that assist businesses to manage themselves. No serious in-depth discussion of business policy and process will be keyed off by a discussion of a GUI front end.

The GUI is only the tip of the business system iceberg. Hidden beneath it are strategic goals, business policy statements, business event analysis, organization to function matrices, etc.

Those models can all be stored in our KnowledgeWare CASE tool. And we can generate our GUI distributed application from the same repository in which we document the entire business model, tying essential components together. Is that not what systems organizations should be about?

It is only with models and repositories such as these that systems organizations will be able to respond quickly to changing business needs.

John F. Skeleton
Senior systems analyst
Star Tribune
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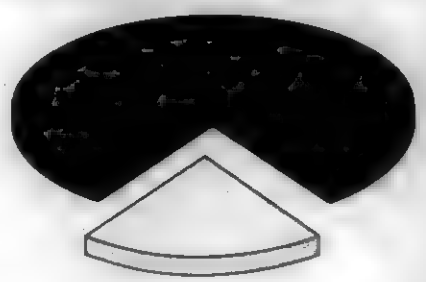

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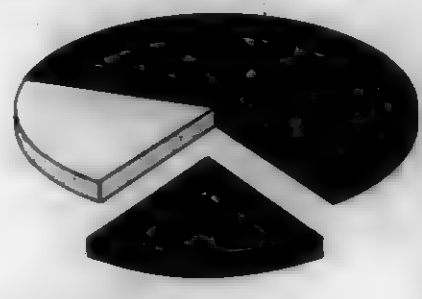

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Tone-to-tone communication

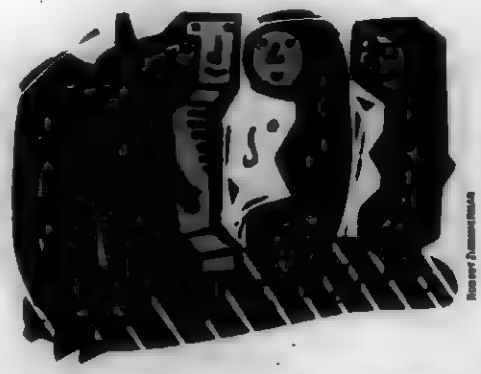
Michael Cohn

This *should* be the golden age of communications. We have pagers and faxes. There is electronic mail. We've got fiber optics and videoconferences and bridges and routers and cellular phones that fit inside a shirt pocket. Coming soon will be interactive TV, videophones and wristwatch personal communication devices. But with all this, we communicate less and less effectively than we have since the days of the Pony Express.

For the 1800s, the Pony Express was a heck of a system, but it sure wasn't fault-tolerant. Mail was misplaced. Riders were robbed. Businesses went belly-up waiting for a horse that never came in. (The same thing happened to my uncle at the Preakness, but that's another story.) Back then, conversations were asynchronous ... message traffic moved one way at a time with a month or four lost in between.

Alexander Graham Bell pretty much fixed all that, though, or so we thought. The telephone provided real-time bisynchronous communication. The world changed overnight, and soon people were getting pizza in 30 minutes or less.

Everything moved forward in a straight line for most of the 20th century. There were a few milestones in asynchronous communication, like the fax machine and the Elvis stamp, but most folks stayed rather enamored with live, two-way communication — unless they had just lost a quarter in a pay phone.



Then some irresponsible entrepreneur invented the answering machine, and suddenly everything started downhill. No one answered the phone. No one rushed from the tub. People just let the machine get it and folks simply stopped talking to each other outside the office. Even worse, although no one realized it at the time, this tool of conversation-avoidance sowed the seeds for the most dreaded, impersonal, productivity-inhibiting invention known to man — phone mail.

Thanks to phone mail, no one communicates anymore. No one converses. No one chats. They pick up the phone, record a message and "send" it via phone mail.

People use phones like fax machines, and conversations are asynchronous once again: Call ... leave a message ... wait for a return message ... then you're "it" again.

Phone tag has become the national pastime. Dialogues that took minutes now take days. Heaven forbid we '90s folk actually risk a voice-to-voice exchange of information. Instead, we just check phone mail and conveniently avoid having to explain to the boss about that $300 item on the expense report for champagne.

With all our gadgetry, it should be easy to keep in touch. We could carry wireless workstations. We could put phones in our cars. We could wear beepers and call back in five minutes. But the fact of the matter is that these products are moving in a direction exactly opposite to our national mood. We don't want to do any of those things. We don't want to be reachable at all times. In fact we'd rather not be reachable at all. Given our druthers, we'll just say what we have to say after the beep and then break the connection.

With everything else going on these days, I guess no one feels like communicating anymore.

A few folks might think I'm all wet. Well, I'm not afraid of a good argument. Go ahead, call me. Give me an earful. And if I'm not there ... leave a message.

Cohn picks up his messages at a very large computer company in Atlanta.

Cracking the code

ADVENTURES IN INFORMATION *by* Patricia B. Seybold

It's 2 a.m. The phone rings. The programmer curses as he picks up the receiver. There's a bug in one of the changes he made to the new withholding calculations in the payroll system. He heaves himself out of bed and lumbers off for an early morning patch session.

The CEO won't ever see those changes and most likely wouldn't understand them if she did. The same is true for the vice president of human resources and the employees whose paychecks are being calculated. They all think they know what rules were implemented when the new tax laws went into effect, but there really aren't any guarantees.

Scary, isn't it?

It's particularly scary when you stop to think about the hopes we're investing in business process redesign. We debate and struggle to come up with new procedures and policies, and then we hand them off to be implemented in ways that only the technical staff will completely understand. The rules that govern the redesigned business processes will be locked up in application logic, codified in a database and maintained, as our programs have always been maintained, by systems analysts and programmers. Even if the applications are distributed and the implementation is client/server, the application logic will still be locked away and maintained by specialists.

That's not good enough for a knowledge economy. I want the rules of my business written down in English so I can understand them. I want to be able to see a graphic representation of what happens when a customer calls in to make a complaint or order a product. And I want to see what *is* happening, not what's *supposed* to happen.

I want a living, dynamic set of business rules separated out from my data but linked to it actively. I don't want people to have to remind themselves of how we do this or what our policy is on that. I want them to have that information at their fingertips *and* have the ability to change the rules of the game on the fly to satisfy a customer.

Some companies are making progress unlocking the rules of their business, but they're in the minority. I see two approaches afoot. The first is the top-down approach, where you start by modeling your business and its processes using object-oriented techniques. Companies as diverse as John Deere, Merck and Citicorp are creating object simulations of their businesses. Business objects and the rules that govern their behavior are crystal clear to nontechnical people. But mostly these are still models, separate from the applications. It's only when you actually implement the model using object-oriented techniques that your applications and their rules take on the dynamic characteristics of the real world.

The second approach starts with specific applications and uses work-flow technology. Ad agency Young & Rubicam and its clients at Chevron worked on a process redesign to streamline their work together. They implemented the new business processes using work-flow technology. The new rules of the game are codified, implemented in a shared application and visible and changeable by the employees doing the work.

There *are* signs of progress. But they are occurring at the fringes of mainstream computing as firms adopt object-oriented techniques and/or implement rules-based approaches. That's not enough. We need to unlock the rules from all of our applications.

Seybold is president of the Patricia Seybold Office Computing Group in Boston. Her Notes address is Patricia Seybold @ PSOCG. Her Internet address is PSeybold @ MCImail.com.

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Visual Basic language: So far, so good

By Michael Vizard
REDMOND, WASH.

Beta users of Microsoft Corp.'s Visual Basic Applications (VBA) edition report that the language, which will become Microsoft's standard macro language across its applications, is already in a fairly stable format.

Announced during the summer and scheduled for delivery this fall, VBA will be delivered first in Microsoft's Excel 5.0 spreadsheet and Project 4.0 project management software applications. Following these implementations, VBA will be incorporated into all other Microsoft applications.

Don Baarns, *president of Baarns Consulting: 'We're trying to break Excel 5.0'*

However, while VBA will initially be available only for Excel and Project, a Microsoft Word application will be controllable by these applications as a VBA client.

Microsoft does not intend to license VBA to other vendors; instead it has opted to use VBA as a competitive tool that will differentiate its applications from rivals. As such, Microsoft rivals said, VBA is a proprietary language aimed at locking people into Microsoft applications.

"We just develop with Microsoft applications, but I could see how it would be nice to use VBA with other applications," said Pete Claar, a PC software developer at a large retailer in the Northwest.

However, other users noted that porting VBA to multiple applications is a formidable task.

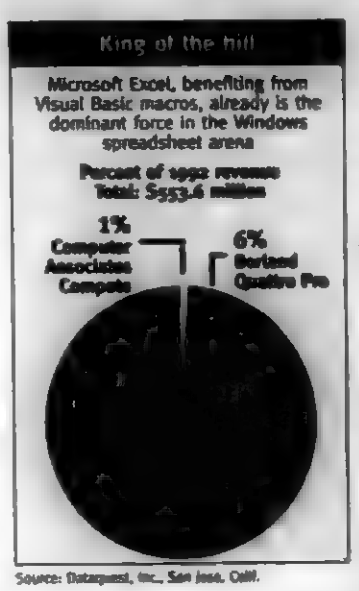
"VBA is not a portable language. It's very tightly integrated with specific applications, and it's not a trivial process to add support for it," said Don Baarns, president of the Baarns Consulting Group, Inc. in Sylmar, Calif., which specializes in developing custom applications based on Excel.

According to Baarns, VBA is a subset of Microsoft's Visual Basic language that has been enhanced with controls specifically aimed at the application with which it is integrated. "For example, there are a lot of controls that are specific to the Excel spreadsheet metaphor," Baarns noted.

"I think [people who complain] about VBA are just sour grapes. They don't understand what it takes to make a language like VBA across all applications. Each application has to have its own controls," Baarns said.

Both Claar and Baarns gave the beta version of Excel 5.0 high marks.

"We built custom applications with 10,000 lines of code, so we're trying to break Excel 5.0. But most [people] using standard spreadsheet applications wouldn't know Excel 5.0 was beta code," Baarns said.



Source: Dataquest, Inc., San Jose, Calif.

Stability counts

"I got a pre-beta release, and so far it's pretty stable. There have only been a couple of minor bugs that you would expect to see," Claar said.

Baarns cited a new pivot table feature in Excel as a "nuclear feature" that will enhance the analysis tools in Excel. The Pivot tables essentially allow a user to predefine a set of data and then view that data in multiple dimensions simply by clicking on it.

"Previously, you would have to have bought a package like [Lotus Development Corp.'s] Improv to do this kind of analysis," Baarns said.

Meanwhile, Claar cited support for workbooks, in which multiple worksheets can be consolidated in a single package, as a major new feature. "It's a major enhancement to the worksheet metaphor. It forces you to think of worksheets as a package."

"Microsoft says you can have 256 sheets in a workbook, but we've already put 1,000 sheets in a workbook," Baarns said.

Other key features include the ability to edit sheets directly from VBA and a SQL query language that can be used against data in Excel or against data stored in a SQL database.

"A lot of people store all kinds of things in spreadsheet, like phone lists, that could just as easily be stored in a database," Baarns noted.

Mobile users face nitty-gritty issues

By James Daly
SAN JOSE, CALIF.

Information systems executives attending the recent Mobile World conference were working hard to get past the flash of portable computing without getting burned.

Many of those attending the three-day show acknowledged that while there is a sci-fi appeal to ubiquitous computing, there is a whole range of bread-and-butter concerns that still need to be addressed. These include managerial, financial, legislative and societal issues.

"You can't just throw technology at people and expect them to gobble it up," said Barton Goldenberg, president of Information Systems Marketing, Inc., a mobile computing research firm in Washington. "And it remains to be seen whether the hypothetical demand is still there."

One important issue concerns the training and support of workers newly equipped with unfamiliar portable devices such as personal digital assistants (PDA). According to research firm International Data Corp. in Framingham, Mass., support costs can run up to 15 times the purchase price of the original system.

Making new systems such as pen-based devices as intuitive as possible is key. "People need to concentrate on their job, not trying to get their computer to work," said Wayne Warwick, a project manager at the ITT Hartford insurance firm. The $7.3 billion Hartford, Conn.-based firm recently finished a pilot project that could eventually equip hundreds of agents with pen-based machines to speed the process of risk evaluation.

Building applications for the new machines and tying them into the old legacy systems also remain hurdles.

> The thought of sensitive data's skittering unfettered over the airwaves has given some security managers knots in their stomachs.

"We still must rely on the traditional IS function to bring everything together," said Ray Mueller, president of the Lakewood, Colo.-based MIS, Inc., which provides data processing services to more than 60 Arby's restaurants throughout Colorado, Wyoming and Florida.

"For instance, there's not a single set of integrated application development tools that we can use to bring everything together."

In addition, the thought of sensitive data's skittering unfettered over the airwaves has given some security managers knots in their stomachs. While encrypting the data does provide an essential safeguard, "don't kid yourself,

Mobile users, *page 37*

Multiprocessing for the desktop on tap

By Michael Fitzgerald
IRVINE, CALIF.

A third-tier manufacturer recently introduced a multiprocessing desktop computer and said it would make only those machines from now on, in anticipation of what it hopes will be a trend.

"Everything we do in the future will be multiprocessing—we think it's the only avenue for higher-performance machines," said Thomas Ludwig, chief executive at T&T Research in Irvine, the research division of VTech Computers, Inc. VTech claims sales of $565 million for its PCs and its primary product, game machines.

Most multiprocessing systems today are server systems, though NCR Corp. offers the System 3360, a single-user system that runs on dual Pentium chips. NCR has targeted Windows NT developers with that product.

Ludwig said VTech would also go after the 90,000 developers who have purchased the NT software developer's kit. Support for multiple processors was built into NT, which makes the software development community a natural target market for multiprocessing desktops.

VTech claims that its dual-processor Intel Corp. 1486-based machines will outperform systems based on a single 66-MHz Pentium chip.

But VTech may find itself stuck in a multiprocessing niche, one user and several analysts said.

George Roukas, director of computer services at a large financial services company, said he does not see the need for multiprocessor power on the desktop. "We're not even going to need Pentium at the desktop, at least from what I can see," he said.

"We don't see it as a trend in the next six to 12 months — most multiprocessing stuff is centered around servers and will be for

Multiprocessing, *page 37*

Software

Alpha targets DOS loyalists

By Ed Scannell

Alpha Software Corp. has delivered a new version of its relational database with several new features aimed at corporate developers, believing there is still a lot of life left in the DOS market.

Despite the hype and apparent commercial success of Microsoft Corp.'s Windows-based Access during the last year, Alpha officials said they believe the vast majority of users with 386-based or lower systems still require a DOS-based database that inherently offers greater speed and is easier to program for average users.

Alpha may have a point.

On the strength of its Alpha Four series, the company has climbed into the Top 3 for unit shipments among database suppliers behind Microsoft and Borland International, Inc., selling over a half-million copies.

"We really believe users will continue to rely on DOS databases to solve real-world problems until the hardware gets to the 486 and 8M bytes [of RAM] you need to properly run Windows databases," said Richard Rahims, chairman of Alpha Software.

At least one reseller agreed.

"The good thing about DOS-based programs is they run on almost any machine as opposed to Windows which still has a pretty high base-level requirement," said Rick Scali, president of AIM Computer Systems, Inc. in Daytona Beach, Fla. "Believe it or not, not everyone we sell to needs Windows."

AIM Computer Systems, a value-added reseller, often customizes applications using Alpha Four for various vertical markets, including the medical market.

Added expense

However, many of the company's customers cannot afford the expense sometimes involved with developing more sophisticated applications in graphical environments. Nor can they afford the time it takes to do so.

"Some of our clients can't justify spending thousands developing a custom program. With Alpha, though, we find you don't need to have that kind of investment in programming time," Scali said.

While it likes the chances for DOS-based databases during the next couple of years, Alpha officials concede the inevitability of increased popularity of Windows databases.

Consequently, the company is working on a Windows version of Alpha Four that is scheduled for release sometime in 1994. This product will in no way lessen support of its existing DOS-compatible series.

The lastest version of the program, called Alpha Four Version 3.0, now includes automatic referential integrity, real-time posting, scrollable regions and cascading and conditional lookup tables.

The program's new referential integrity ensures that information put in the parent database is matched by information in any child database for which a link has been established.

This capability prevents matching records from being eliminated or lost if the common field in the parent database has been altered in any way.

Multifile entry function

One of the more important features of the recently released product, according to company officials, is its ability to do multifile data entry. Information can be entered into any field of any database with this capability.

This can add significant speed to data entry while cutting down on the time it takes to develop an application.

Multifile data entry also offers more flexibility with the inclusion of scrollable regions. A scrollable region will display all the matching records from a database in a window that users can scroll through to display all matches.

An example of this capability is an invoice in which all the line items for a customer's purchase can be viewed on-screen at once.

If the invoice has more line items than can fit in that screen, scroll arrows will display to the right of that region so users can move up and down through the window to display every line item.

Designs made easier

Version 3.0 has an Application Outliner intended to make application designs easier.

Custom menu screens are created and each menu choice is given its own submenus or custom scripts, which define what actions will be performed by the selected menu choice.

The new version has a data dictionary that company officials refer to as field rules. Field rules are defined on the database level and are associated with fields in the database, regardless of which data entry screen is being used.

Users can create multiple data entry forms and retain the same rules on each of the forms they create. Field rules will carry over into applications so once they are created, they remain active throughout the manipulation of the database.

WordPerfect version takes on manager tasks

By Michael Vizard

OREM, UTAH

One of the little known benefits of the forthcoming WordPerfect 6.0 for Windows is that it can effectively replace the Windows Program Manager using a button bar facility that supports non-WordPerfect Corp. applications, beta users reported.

Announced last month, WordPerfect 6.0 for Windows is expected to give WordPerfect its first truly competitive word processing package for the Windows market [CW, Aug. 30]. It includes the ability to customize the user interface, templates for creating documents, an improved menu structure, coaches that walk users through a task, the ability to preview documents and the new button bar.

Button bar

"You can stay in WordPerfect all day long and access everything else through the button bar," said Joe Malloy, an associate professor of German at Hamilton College in Clinton, N.Y. "I still use the Norton Desktop, but I could see how you could use the button bar to do essentially the same thing."

After creating a link between WordPerfect and other applications, users can place an icon in the WordPerfect button bar that will automatically launch that application when clicked. In addition, users can write macros that automatically launch all the applications in the WordPerfect button bar.

Icon access

For example, Richard George, director of clinical publishing and communications at Synergen, Inc., a biotechnology company in Boulder, Colo., said he has put an icon for the Windows calculator in the button bar to make it easier to access.

Similary, Malloy reports that he keeps a C-prompt icon in the button bar to access DOS. "The new version is really nice, but I still find it slow compared to DOS for some things."

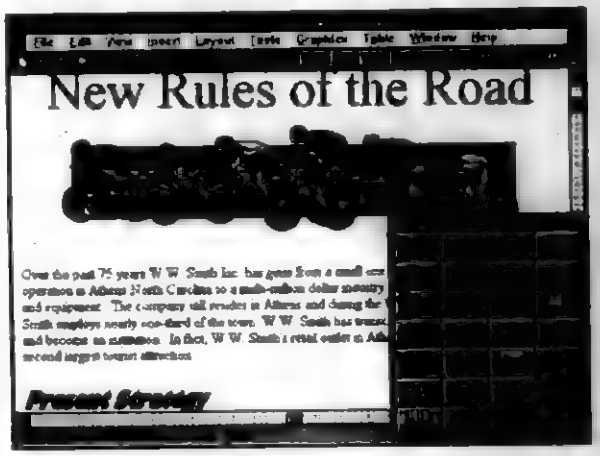
However, George noted that non-WordPerfect applications are stored in different formats. As such, he relies more on the Open Dialog facility for sharing data between applications.

"You can either use the Clipboard facility in Windows or convert the data into a file format that is supported by WordPerfect," George noted.

WordPerfect 6.0 for Windows is expected to ship this month and is priced at $495.

Automation agents

While Microsoft is adding agents that automate specific tasks in the next version of Word, WordPerfect has opted to deploy Coaches that show a user how to perform a particular task. WordPerfect officials concede, however, that they will be automating tasks in future releases.



WordPerfect 6.0: *Users can place an icon in the button bar that automatically launches an application*

WorkSheet tracks trading

By Michael Vizard

NEW YORK

Traders at Midland Global Markets, a subsidiary of The Hong Kong & Shanghai Banking Corp., are adopting technology that has been used in the scientific and engineering community to help them analyze trading patterns.

Using a graphical spreadsheet called the Expo WorkSheet, developed by Leading Market Technologies, Inc. in New York for Windows and Unix workstations, currency traders at Midland Global Markets have been performing what-if scenario analyses to determine when to buy and sell particular currencies.

Currency trader Roberto Vidal said the Expo WorkSheet, which is based on the same technology as data analysis software from DSP Development Corp. in Cambridge, Mass., is better suited for this type of analysis than the standard spreadsheet. This is because it has a real-time analytical engine that allows him to respond quickly to market changes by monitoring graphics that are connected to the engine.

Currently, Vidal runs Expo WorkSheet on a DECstation 5000 class system from Digital Equipment Corp., but he said he intends to deploy a Windows version in the short term.

"My DECstation doesn't support data feeds, so I'd like to put Expo WorkSheet up on a Windows system and connect it to the Knight-Ridder service," Vidal said.

Expo WorkSheet prices start at $2,995.

Mobile users

CONTINUED FROM PAGE 35

you're not going to duplicate the type of security you have on a mainframe," said Tom DeWald, manager of technical development at Mastercard International, Inc. in St. Louis.

Cost-justifying new portables also presents a challenge, especially with newcomers like PDAs. That task could become easier in the next year to 18 months when more companies begin to offer content services, such as the ability to tap into an array of databases or schedule travel.

"I think the day is not too far off when, for a flat fee of, say, $29.99 a month the user will be offered a whole host of services," said Harriet Donnelly, managing director of personal communicator business development at AT&T in Parsippany, N.J.

Analysts said the allure is strong for companies to provide expansive offerings in this field of content services.

"Hardware will become commodity-like," said Richard Silber, who directs Norwell, Mass.-based BIS Strategic Decisions' Mobile and Wireless Communications Market Advisory Service. "The serious money will come from recurring service revenues. That's where you'll find the billion-dollar baby."

The result? Many people will fence-sit until the portable infrastructure is more clearly developed. "We're in an age of unpredictability, so we're not ready to place our bets just yet," said one attendee who requested anonymity.

But when these fixtures are put in place, analysts such as Raymond Boggs at BIS Strategic Decisions said they expect emerging products like PDAs to appeal strongly to advanced corporate users with a serious interest in communications.

"The corporate mobile worker represents a growing potential market," Boggs said. "They have very real technology needs."

Multiprocessing

CONTINUED FROM PAGE 35

some time," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Giusto added that multiprocessing on the desktop makes little sense because "about the only place it might be attractive right now is for folks running workstation applications. For a Windows-based machine, I don't see a need for it."

VTech has adopted an aggressive price on its Platinum SMP system, however, which might draw some interest from users. A base model system with 33/66-MHz dual-DX2 processors costs $3,999.

"MP is just a way of turbocharging your system," Ludwig said.

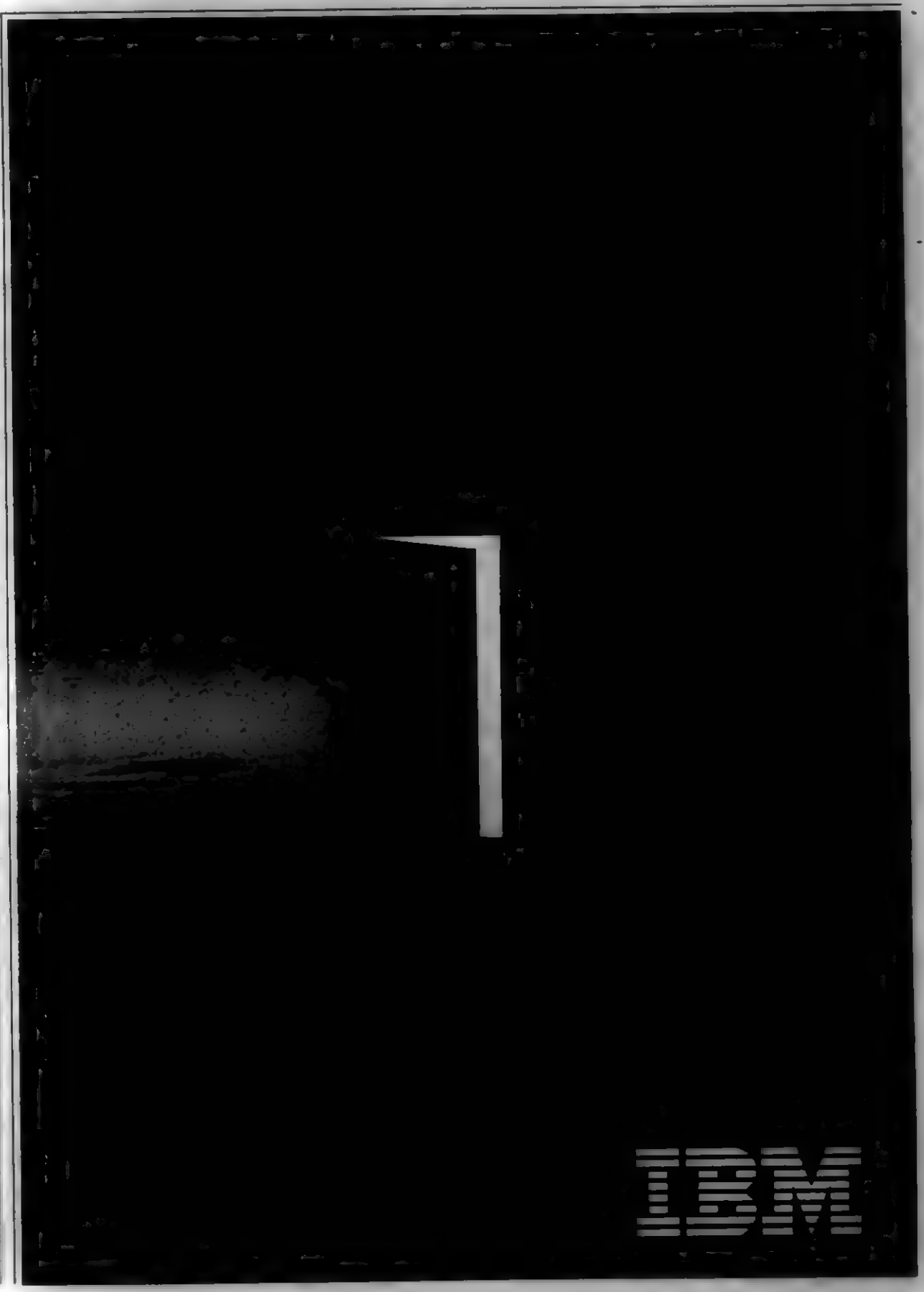
The architecture uses a shared-cache design, which saves VTech money because the company does not have to install dedicated cache support for each processor, Ludwig said. Because of the shared-cache architecture, the Platinum does not scale beyond two processors.

VTech will add Ethernet and audio support to the Platinum series before the end of the year, Ludwig said.

Briefs

Special effects

WordPerfect Corp.'s WordPerfect 6.0 will include a text-manipulation application called TextArt. Jointly developed with Bitstream, Inc., TextArt lets users create special effects with type by giving them the option of choosing from among 40 different shapes. Users can then add colors, fills and shadows to the shapes. TextArt is an Object Linking and Embedding miniapplication that will be accessible from the default button bar of WordPerfect 6.0. That lastest edition of the venerable word processor is slated to ship in the fourth quarter. Bitstream will also ship a collection of 100 True Type fonts called the WordPerfect for Windows 6.0 Font Pack for $39.95.



PC-based postal kiosk axed

By Gary H. Anthes
WASHINGTON

The U.S. Postal Service has pulled the plug on the Postal Buddy, a user-friendly, PC-based talking kiosk that processed change-of-address forms and dispensed stamps and other items at 183 post offices, supermarkets and shopping centers around the country.

The Postal Buddy, introduced last December, was cited by Vice President Al Gore in his recent report on "reinventing government" as an example of how information technology can bring government services conveniently to the public.

The Postal Service issued a terse statement in which it declined to elaborate, saying it had canceled its agreement with Postal Buddy Corp. in San Diego because the interactive multimedia devices had failed to meet revenue projections of $35 to $55 per kiosk per day. They were bringing in just $15 to $30 each per day, far below the $42 point at which the company was to have begun sharing revenue with the Postal Service, the statement said.

Sidney Goodman, Postal Buddy Corp. president, said a recent advertising campaign had pushed revenue to more than $40 per machine per day at the time of contract termination. He said revenue was never intended to justify the kiosk.

"It was to have been a no-cost program for them for which revenue sharing was to have been the icing on the cake," he said.

Indeed, a Postal Service spokesman told *Computerworld* last December that revenue was not important and that the machine's main purpose was to help the Postal Service streamline the processing of 42 million address changes annually. These cost the Postal Service $1.3 billion [CW, Dec. 21, 1992].

The Postal Service said last year it expected 10,000 Postal Buddies to eventually process half of all address changes, saving the service between $300 million and $500 million in data-entry labor during the 8½-year contract.

Postal Buddy *was only bringing in $15 to $30 per day, short of the $42 figure at which the Post Office would have made some money*

Partnerships hurt

Goodman added that the sudden and arbitrary cancellation will have a chilling effect on similar government/industry partnerships.

"Here's a program that the vice president's office held up as a model. Terminating it in a whimsical fashion like this may deal a fatal blow to any such venture ever planned," he said.

Goodman said he anticipated the Postal Buddy would be put back in service.

"I guess it's probably not over," a Postal Service spokesman said last week. "But it's in the hands of the lawyers now."

Farewell, buddy

Postal Buddy was built around an Intel Corp. 1486 microprocessor running OS/2 and an Intel i750 Digital Video interactive chip for audio, video and high-resolution graphics. It held 27 internal peripherals including disk drives, a modem, a color monitor, a credit-card reader, a postage stamp dispenser and printers.

Using voice and video prompts, Postal Buddy guided users to enter change-of-address information via keyboard and touch-screen sensors. Addresses were validated locally by scanning a database of 120 million addresses for "ZIP + 4" codes.

A communication server at Postal Buddy Corp. retrieved address changes via telephone each night. After additional validation, the address changes were sent electronically to the Postal Service's computerized mail-forwarding system at the National Address Information Center in Memphis. From there, address change data was sent electronically or by paper to businesses selected by the user. —*Gary H. Anthes*

High-tech tools help report on low-tech war

By Michael Fitzgerald
ZAGREB, CROATIA

Serbian forces shipped a little forget-me-not here two weeks ago — five missiles — startling the populace in this war-torn capital, which has been quiet for some time.

For Dave Manney, it is just part of the job.

Manney has been roaming Croatia and Bosnia since April as a journalist/fund-raiser for Mercy International-Americas, a nonpartisan relief agency that distributes food, medical supplies and the like to refugees from all sides. He reports on refugees, hospitals and the work that Mercy International does in exchange for having its toll-free number printed or shown at the end of his articles.

His stories have had an impact. One piece, published in a footwear trade magazine, prompted a donation of some $75,000 in shoes from Reebok International Ltd. and other companies.

Manney uses a 3170 notebook computer donated by NCR Corp. He also takes photographs and videos. He sends stories not via modem but by fax, using BitFax 2.0 from Bit Software, Inc. in Fremont, Calif.

Hard copy

Manney said he faxes stories because editors prefer to see stories in hard copy. Phone lines in Croatia are generally reliable, he added.

The notebook is handy because Zagreb has power for only six hours even on good days. Manney said the 3170's dual battery pack has allowed him to work and file stories despite the power situation in Croatia and Bosnia.

Manney said he does not go anywhere that United Nations forces have not gone first.

"The places I go are safe by Bosnian standards," he said, hastening to add, "Anybody who's over here is either a Western war correspondent or they're just stupid."

Dave Manney *uses an NCR 3170 notebook in his work on behalf of Mercy International-Americas in the former Yugoslavia*

While Europe's 220W power grid fried Manney's portable printer despite a 110W to 220W adapter, the notebook has handled the shift without trouble. The notebook also endured a direct hit from a drunk driver whose vehicle rear-ended Manney's car in Bosnia.

> Manney once drove through sniper fire with his notebook between his head and the car door, hoping the notebook's performance might prove bulletproof.

Manney returns to North America this week to set up a traveling exhibit about the Balkan War. He expects to return to Croatia in three weeks, barring another outbreak of war there.

After that, he heads to "Pakistan and Afghanistan and some of the former Soviet republics," he said. "All the garden spots."

Mercy International-Americas can be reached at (800) 465-0088.

IBM to build systems for Inmac

Distributor plans PC foray in U.S. market

IBM recently announced its first effort to make build-to-order PCs for another vendor: Its Austin Industrial Business Center will begin building systems for Inmac Corp.

Inmac, a distributor of computer products that has not previously sold PCs in the U.S., will initially offer four models of the Inmac Insignia based around Intel Corp.'s 33/50-MHz i486DX and 33/66-MHz DX2 chips and IBM's 25/50-MHz 486SLC2 processor.

Base configurations will range in price from $1,299 to $2,599. The Austin Industrial Business Center currently makes PCs for Lexmark International, Inc., Reply Corp. and CompuAdd Corp., but not on a build-to-order basis. It also builds the RS/6000 and motherboards for the IBM PC Co.

—*Michael Fitzgerald*

Lotus launches Ami Pro on Unix

By Michael Vizard
CAMBRIDGE, MASS.

Lotus Development Corp. has a version of its Ami Pro word processing software on Unix for Hewlett-Packard Co. systems. Implementations for Unix systems from IBM and Sun Microsystems, Inc. are due in early 1994.

Ami Pro includes support for a Link, Embed and Launch-to-edit (LEL) interface, which will allow Notes users on Windows systems to view and print Ami Pro documents using a facility that is similar to Version 1.0 of the Microsoft Corp. Object Linking and Embedding interface in Windows. However, to edit that data, users would have to have an LEL-enabled application.

In addition, Lotus said it will not support LEL on its 1-2-3 for Unix spreadsheet until it delivers a portable 1-2-3 implementation that will share the same code base on all platforms. Company officials declined to say when this project would come to fruition.

No other applications currently support LEL, but Lotus plans to make available an LEL developer's kit later this year.

Ami Pro for HP/UX, priced at $495, will be available in the fourth quarter.

Hardware

NCR Corp. has introduced NCR 3227, a compact Intel Corp. 486-based desktop workstation.

According to Dayton, Ohio-based NCR, the product is a full-function, standard AT-bus workstation that can grow as users' needs change, with RAM expandable up to 32M bytes.

Key features include VESA-standard local bus video with Windows acceleration, two serial ports, a parallel port as well as a mouse, keyboard and VGA connectors.

The NCR 3227 has a footprint of 12 by 12.2 by 2.5 inches and supports a variety of 1486 microprocessors ranging from 25 MHz to 66 MHz to Intel Corp.'s Pentium OverDrive processors.

The NCR 3227 was designed to comply with the Environmental Protection Agency's Energy Star program for low energy use.

Prices start at $890.

▶ *NCR*
(513) 445-5000

E-Machines, a division of **SuperMac Technology, Inc.**, has introduced EtherDock, a portable docking station.

According to the Sunnyvale, Calif., company, EtherDock is the only docking station for the Apple Computer, Inc. PowerBook portable computer that is complete with onboard Ethernet support.

Capabilities include two serial ports, a port for an external floppy drive, a SCSI connector for adding an external hard drive, CD-ROM scanner and an audio in/out connector for adding sound to the desktop. Full 10BaseT Ethernet support is also included.

Additional hardware is not necessary because EtherDock provides the ports and connections needed for desktop use, the company said.

EtherDock costs $699.

▶ *E-Machines*
(408) 541-6100

Software

Decisioneering, Inc. has introduced Crystal Ball, a general-purpose forecasting and risk analysis software package that helps users make decisions based on Lotus Development Corp.'s 1-2-3 Release 4 for Windows spreadsheets.

Instead of just a single number, Crystal Ball illustrates forecasts numerically and graphically, displaying the entire range of possible outcomes, the Denver company reported.

Users can apply either a range of values or a probability distribution to each spreadsheet cell containing an uncertain number. Random values for each of these cells is generated according to the specified range or probability distribution. The product can graphically display the distribution of the results.

Crystal Ball for 1-2-3 Release 4 for Windows costs $295.

▶ *Decisioneering*
(303) 292-2291

Jurisoft, a division of Mead Data Central, Inc., has introduced CompareRite 5.0, a PC-based software program.

According to the Cambridge, Mass., company, the product was designed to quickly and accurately compare revised versions of the same word processing document.

CompareRite 5.0 is redlining software that can support Windows and DOS environments on one program. It also compares and highlights changes within documents created in the same or different word processing environments.

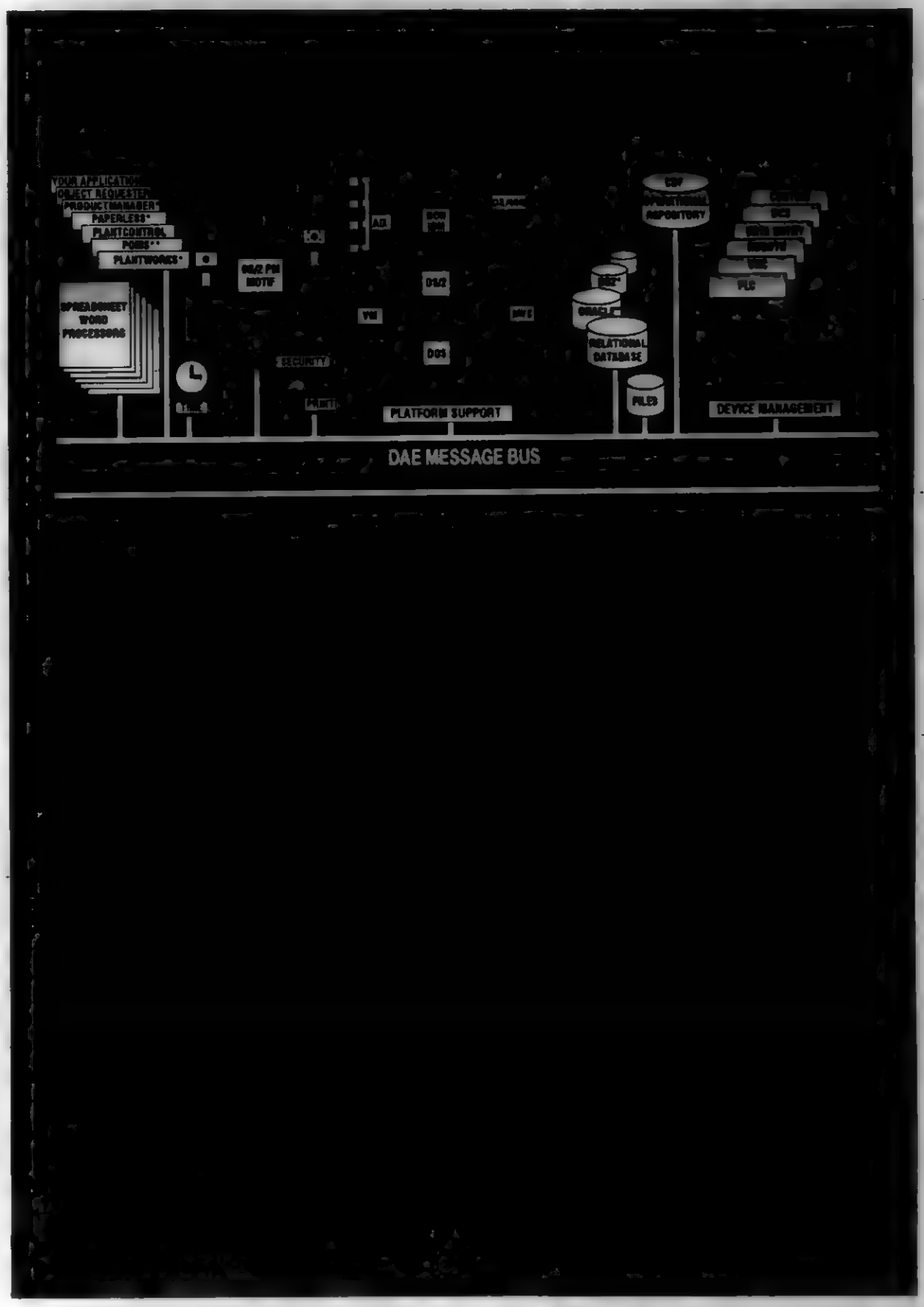
The product can also compare footnotes, view additions and deletions side by side and use a variety of styles to present differences between documents, including italics, boldface, underlining, quotations and brackets.

CompareRite 5.0 software is priced at $189.

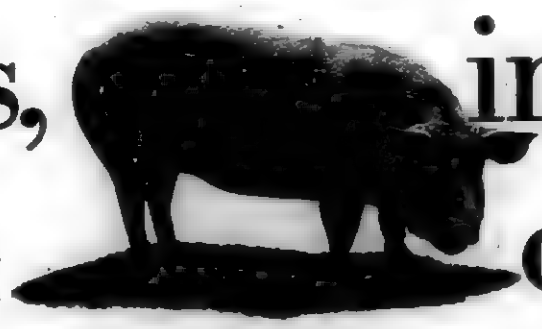
▶ *Jurisoft*
(617) 864-6151

Product short

Sharp Electronics Corp. has introduced JX-325, a full-color, flatbed scanner. JX-325 features 24-bit color, 300 by 600 dots per inch resolution, single-pass scanning and compliance with the SCSI-2 standard. The product is bundled with Adobe Systems, Inc.'s Adobe PhotoShop. Cost: $1,295 for the Macintosh bundle and $1,395 for the PC bundle. Sharp Electronics, Mahwah, N.J. (201) 529-9503.



What makes Wall Street touch with the latest dynamics currencies, commodities strange things most of

savvy enough to always be in of companies,  industries, and all those other us don't understand?

PCs, workstations and midrange computers, linked to

Mainframes, what else?

To describe a brokerage as an information-intensive business is a bit of an understatement. Like certain other industries, the information *is* the business.

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And since for businesses like this, time literally is money, companies have come to depend on mainframes to give them access to that information instantaneously. 24 hours a day, 7 days a week.

The fact is, no matter what your business, if it depends on information, nothing can "serve" the rest of your computer network "clients" to nearly the degree a mainframe can. And the new "openness" of mainframes allows them to serve just about any kind of hardware and software.

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IBM

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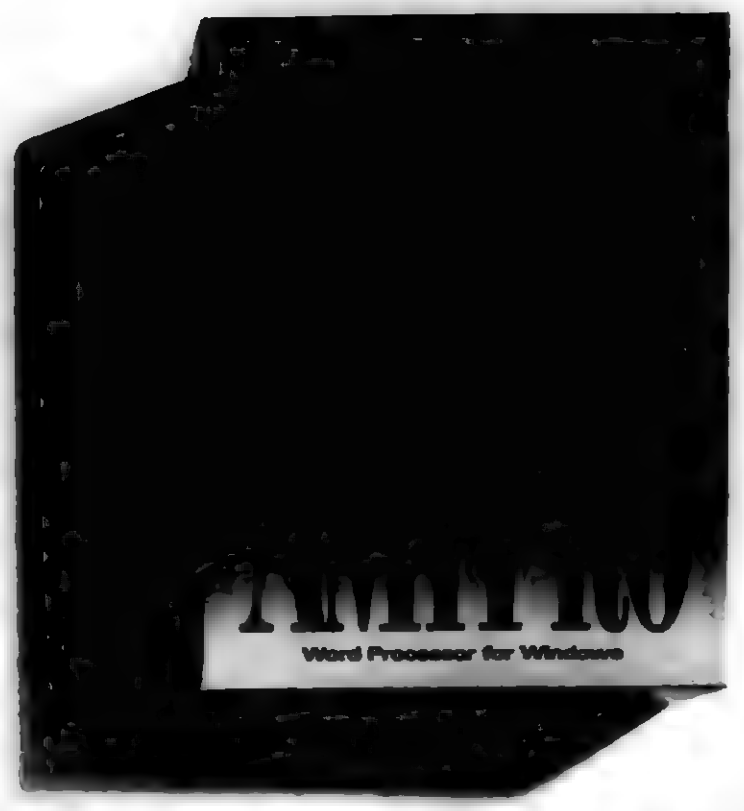

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*A maximum of 50 copies of Ami Pro will be provided to each participant. Copies provided to each agency, division, group, subsidiary or other affiliate of a participant will be aggregated for the purpose of this limitation. Supplies are limited. **Qualifications:** 1. The individual or entity wishing to participate in this program ("Participant") must currently own at least ten units of any stand-alone DOS or Windows word processor installed in the location where Ami Pro is to be installed. 2. The Participant must agree in writing to install all free copies of Ami Pro which it receives under this offer on Windows-ready PCs (386 or higher) within 30 days of receipt. This agreement must be signed by the individual owner, or by an authorized representative of the entity that is the owner, of the word processors. 3. The offer must be accepted between September 13, 1993 and October 31, 1993. 4. Units of Ami Pro provided under this program may not be applied toward volume purchase commitments, discounts, other promotions or credits. 5. Lotus Development Corporation, its advertising agency, software manufacturers, distributors, and resellers, and their respective employees and agents, are not eligible to participate in this program. In addition, individuals who already have Ami Pro, as well as entities and individuals eligible to purchase educational versions of Lotus products, are not eligible to participate in this program. 6. Decisions with respect to this program will be made by Lotus Development Corporation and those decisions are final and binding. 7. Other restrictions may apply. 8. This offer may be withdrawn at any time without notice. 9. To enter, call 1-800-831-9679. In Canada, call 1-800-GO-LOTUS.

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Users give LAN Server thumbs up

By Elisabeth Horwitt
AUSTIN, TEXAS

If IBM's OS/2 LAN Server fails to make it as a dominant network operating system, it will not be due to functional deficiencies, according to two companies that have been using it for a year or more.

While IBM recently claimed that LAN Server is second only to Novell, Inc.'s NetWare in market share, it is a very far second — about 6% last year, compared with Novell's 67%, analysts said.

And as a comparatively late starter in the client/server arena, LAN Server faces an uphill battle as it carves out a market for itself, with the exception of "Big Blue accounts that laid their [computing] strategy at IBM's doorstep and said 'Here's what I want, give me everything I want,'" said Dick Dionne-Keay, an industrial analyst at Summit Strategies, Inc., a Boston research company.

LAN Server users confirmed that they chose IBM's network operating system partially because they believed IBM would provide the best connections between their client/server systems and IBM's own mainframes. However, they affirmed that the platform itself has strengths, particularly when it comes to supporting demanding mission-critical applications.

What Will Be

IBM last week announced a program for certifying that software developers and systems integrators have the requisite skills in OS/2 and LAN Server engineering and application development.

Running at railroad

The Atchison, Topeka and Santa Fe Railway Co., for example, has been using LAN Server and OS/2 applications to run critical applications, including those for customer service and the one that runs the railroad at the systems operations center in Schaumburg, Ill. "We feel that [the OS/2 LAN Server-based platform] is an industrial-grade implementation that works," said Don Harrison, director of quality assurance for the railroad's management services department.

The railroad uses NetWare as its office systems platform for applications such as word processing; however, the DOS-based Novell platform lacks key features, such as multithreading, that the railroad needs for its mission-critical applications, Harrison said.

More recently, the railroad implemented LAN Server, in combination with OS/2 and IBM's Callpath PBX-to-LAN software, as the basis for its customer service and call center management application. In this case, IBM's network operating system was selected because it went with the application environment that seemed to work best with this new application.

System was a success

The resulting system "was one of the most successful we implemented," Harrison said. "It was basically done in six months from design to implementation, and it went up without any problems."

"LAN Server 3.0 has met all our needs so far in terms of performance, reliability, plus the SNA connection is a big plus," said Carlos Reyes, manager of data communications technical services. The railroad is now using OS/2 Communication Server's LU6.2 connections to its mainframe DB2 databases.

"We have a strategic architecture plan which is reviewed every six months; as of now, our platform is OS/2, and we'd have to have a compelling reason to change," Harrison said.

The railroad is also extremely inter-

LAN Server, *page 49*

KFC does financials right, moves accounts to client/server

By Kim S. Nash
LOUISVILLE, KY.

ON SITE

KFC Corp.
Louisville, Ky.

Challenge: To wean accounting departments at 10 units worldwide from a mishmash of 25-year-old mainframe and minicomputer gear to company-standard hardware and software.

Technology: HP 9000 Unix-based servers, PCs, FourGen financial applications, Informix databases.

Results: While units in Puerto Rico and Mexico and headquarters in Louisville install standardized systems, KFC's Australia unit has been able to give managers sales and other reports days and sometimes weeks faster.

What if the Colonel's latest secret recipe isn't packing 'em in Down Under? New accounting and inventory systems now let managers at KFC Corp. headquarters here change marketing tacks in Australia — putting dollar-off coupons in local papers, for example — several days or weeks sooner than they could before.

That is because Australian KFC sites have installed a faster financial system that has more functions than the IBM System/36-based system the fast-food chain previously used. Client/server accounting applications from Seattle-based FourGen Software, Inc. are the new kids on the block. The FourGen software will run in parallel in Australia with a legacy system for at least a year, until KFC is satisfied that it is glitch-free.

Meanwhile, KFC, a division of Pepsico, Inc., is a year into replacing a mishmash of homegrown and hypermodified accounting systems that run on mainframes and minicomputers more than two decades old. Yes, client/server is the mandate. But more importantly, incoming software and hardware is standardized across KFC's 10 business units worldwide.

"We grew a hodgepodge [of financial systems] over the years, and now it's an *old* hodgepodge," said Ken Harris, vice president of worldwide information services.

Eighteen months ago, KFC's information systems staff sat down with managers and end users to outline specifications for new accounting applications. Hardware and relational databases were chosen a couple years before: Hewlett-Packard Co. HP 9000 Unix-based servers and workstations loaded with Informix Software, Inc. databases.

Tools closed sale

Informix's development tools sold KFC on the database. "At the time we were looking around, Oracle and Sybase had little to offer in that area," Harris said. Oracle Corp. offered computer-aided software engineering products, but Harris said they were not robust enough. Sybase, Inc., meanwhile, only recently unified its tools strategy.

On the hardware side, KFC likes the scalability of HP servers, said Bill Melvin, manager of financial systems development. KFC units run the gamut from very small eight- to 10-user sites to 100-user units. "HP fits at all those places," Melvin said.

Any new financial packages had to work within those parameters, Melvin said. He said he wants ultimately to integrate accounting with several operations systems built in-house under Informix during the past few years, such as retail and inventory applications.

FourGen fit the technological bill. The applications were built with Informix-4GL and related development tools and require the Informix On-Line database. Among the benefits expected from installing identical systems worldwide is a decrease in IS and end-user training costs, Harris noted.

FourGen also met KFC's desire for a smaller vendor with which a large worldwide contract would carry weight.

"We wanted a company that would take our business requirements into consideration as they developed the products," Harris said. For its 10 years in business, it has just about 40 major customers, according to Gary Gagliardi, FourGen president.

Life will not change much for cash register clerks at KFC outlets when the new software is completely installed.

The real differences will come behind the scenes, where store and business unit managers can get inventory and sales reports back to headquarters faster.

The graphical interface of FourGen general ledger, accounts payable and receivable and other modules lets users more easily navigate the system themselves, he explained.

For example, Australia's installation has shed light on more efficient marketing opportunities.

"From a planning perspective, we can ask questions as specific as 'What's the profit margin of X new product around the world?'" Melvin explained. "We couldn't get at that kind of information quickly enough before."

Data on food sales and promotions is collected and manipulated continuously. Some of it is accessible locally, too, which is a huge change from periodic batch processing. "We know how customers are voting with their pocketbooks and how to better capitalize on that," Harris said.

Once FourGen is fully rolled out, KFC hopes to slice "several weeks" from the time it normally takes to close the books worldwide at the end of a fiscal year.

As for financial payback, 18 months to two years "is a reasonable time period" by which to break even on the company's FourGen investment, Harris said. He declined to specify how much money has gone into the project so far.

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DG unveils Clariion for NetWare

By Craig Stedman
WESTBORO, MASS.

Data General Corp. last week introduced versions of its Clariion Series 2000 redundant arrays of inexpensive disks (RAID) targeted at servers running Novell, Inc.'s NetWare. DG also said it expects to add support for Microsoft Corp.'s Windows NT operating system by mid-1994.

The Clariion array has been sold for use with DG's Aviion systems and Unix machines from Sun Microsystems, Inc. and IBM for the past year. The company is now trying to broaden the market for the product as part of an effort to build Clariion into a stand-alone OEM business that augments its systems sales.

Joe Uniejewski, director of marketing at the Clariion business unit of DG, noted that the NetWare storage market is expected to grow at a faster rate than the Unix sector due to the prevalence of NetWare-based PC LANs and their burgeoning capacity needs.

Competition tough

Jim Porter, president of Disk/Trend, Inc., a storage market research firm in Mountain View, Calif., agreed that NetWare arrays have "certainly got a whole lot more customer potential" than Unix subsystems.

However, Porter added that the NetWare market is also much more competitive. There are already about 30 companies selling NetWare-enabled arrays, compared with a dozen or so Unix vendors, he said. A wider range of product options is also available for NetWare, particularly at the low end.

Porter said Clariion would fit in among "the upper class" of NetWare arrays, due to its high level of fault tolerance and the fact that DG's prices "are not the cheapest." He noted, however, that the pricing should be competitive with other vendors at the top of the market, such as IBM, Hewlett-Packard Co., Digital Equipment Corp. and NCR Corp.

Cost is an issue for Richard Duke, director of data services at St. Patrick Hospital in Missoula, Mont., which uses DG's first-generation RAID array with its Aviion systems. Duke said Clariion for NetWare "is intriguing to me, but not intriguing enough right now to pay the bigger price."

Instead, the hospital uses low-end arrays from Micropolis Corp. with its NetWare LAN. Duke noted that he is paying less than $6,000 for a second 3G-byte Micropolis array that is due to be installed shortly. In comparison, a 2.5G-byte Clariion unit has a list price of $28,000.

Price not a factor

Price is less of a constraint for Mitchell Stevelman, vice president of MIS at High Yield Management Securities, Inc. in Clifton, N.J. He said he expects to put Clariion for NetWare arrays into the company's regional offices over time. A Unix model that High Yield now has "works really well," he noted.

The NetWare versions of the disk array and a companion tape unit use the same base hardware as the Unix products, with added support for a caching feature that is under development, Uniejewski said. The arrays will be certified for both NetWare v3.11 and NetWare 4.0 when they ship late this month, Uniejewski added.

Source: Data General Corp.

Storage Dimensions releases low-priced RAID-5 for NetWare

By Stephen P. Klett Jr.
MILPITAS, CALIF.

Storage Dimensions is slated to show redundant arrays of inexpensive disks (RAID) Level 5 software for small Novell, Inc. NetWare-based networks at NetWorld Dallas '93 this week. The software is intended to win over users wary of the high costs associated with RAID-5 technology.

Designed for networks with capacity needs from 2G bytes to 30G bytes, LANStor RAIDMaster marks Storage Dimensions' first foray into the software array market. The company also offers a hardware array, called LANStor Continua, which makes it the only vendor that sells both hardware and software RAID systems, according to industry observers.

"The Continua array has been popular among large corporations involved in downsizing to LANs but has been too expensive for users on the low end," said Greg Brashier, director of the LANStor business unit.

Citing internal benchmarks, Storage Dimensions claims that RAIDMaster's throughput levels are 45% to 75% higher than those of competing software arrays from Corel Corp. and Chantal Systems.

In the event of a system failure, Brashier said, RAIDMaster can reconstruct a 4G-byte array in 28 minutes. A scheduling feature allows network managers to balance network load with data reconstruction needs. For example, network administrators can assign from 10% to 100% of the CPU cycles to array rebuilds. In addition, failed drives can be replaced without interrupting data access.

RAIDMaster also allows users to select data block transfer sizes, ranging from 4K to 64K bytes, allowing them to match performance of different block sizes to specific applications.

Eliminates extra cost

The bulk of the cost associated with RAID systems comes from having to buy disk drives and controllers compatible with the vendor's array software. Software arrays eliminate this expense by allowing users to turn their hard drives into a RAID system.

For example, a user with three Extended Industry Standard Architecture (EISA)-based SCSI drives can load the RAIDMaster software and have a RAID-5 system with about 1G byte of storage for $895. In comparison, a 2G-byte configuration of LANStor Continua costs roughly $15,600.

However, for larger networks where performance is the No. 1 consideration, hardware arrays are the ideal choice, said Bob Abraham, vice president of the market research firm Freeman Associates, Inc. in Santa Barbara, Calif.

Hardware arrays provide better performance on large-scale read/writes because the hardware and software are optimized for each other, he said. Another plus is that while software arrays use the host computer's CPU to manage the array, hardware arrays have their own processor board, which adds to the cost but improves performance.

"The management portion of software arrays has to be more universal in nature to work on a variety of hardware platforms," he said. "The main advantage of a software array is cost. If properly done, they are scalable and have considerable appeal for those users on the fence."

RAIDMaster is available now, bundled with either an EISA or Micro Channel Architecture host adapter from Storage Dimensions. An independent version compatible with all manufacturers' adapter cards is slated for Nov. 1.

Through Dec. 31, the bundled version will start at $595, and the stand-alone version will cost $295. Thereafter, the array will start at $895 and $595, respectively.

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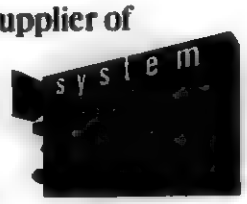

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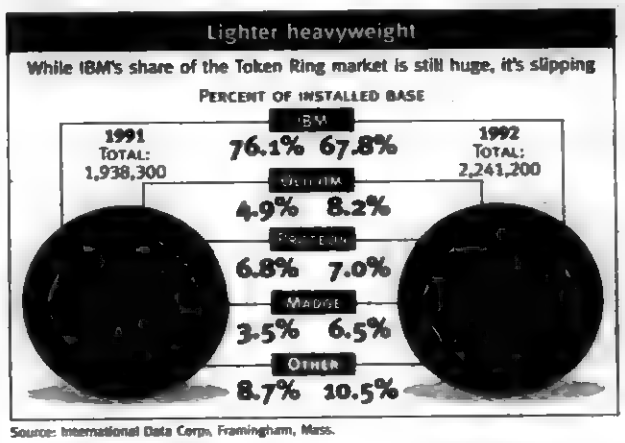
Token Ring quickly gaining speed

By Lynda Radosevich

■ Token Ring vendors are stepping forward to offer users a higher-speed future.

For instance, Proteon, Inc. unveiled a new line of Token Ring adapters last week based on recently introduced Texas Instruments, Inc. technology. Also, IBM and Proteon made proposals to the IEEE 802.5 committee last week to adapt an evolving 100M bit/sec. technology from Hewlett-Packard Co. and AT&T for Token Ring frames [CW, Sept. 27].

The Proteon Token Ring announcements are aimed at IBM mainframe shops with 1,000 or more employees, which compose the majority of Token Ring users, according to Karyn Mashima, vice president of corporate marketing at Proteon.



Source: International Data Corp., Framingham, Mass.

Applications driving the technology include imaging, specifically in the banking and insurance industries. Also, multitasking operating systems, complex graphical user interfaces and, somewhere down the road, multimedia applications will tax current Token Ring network servers, Mashima added.

Proteon's first step to meet that need and regain the second-place market position it lost in 1992 (see chart) was to introduce its ProNet line of 4M and 16M bit/sec. adapters last week. The adapters include a slot for an optional network accelerator chip from TI called the PacketBlaster that accelerates small-frame transmit and receive rates.

The ProNet line also includes software drivers that boost throughput by 24%, whether or not a user opts for the TI chips, Proteon said.

The ProNet 4/16 Plus for XT/AT bus computers lists for $665 and is available now from resellers. A $750 card for Extended Industry Standard Architecture bus computers will ship in November, and a $665 version for Micro Channel-bus PCs will ship in December. However, the actual PacketBlaster chip will not be available until the first quarter of 1994.

Meanwhile, IBM and Proteon both proposed to the IEEE 802.5 committee extensions to the 100M bit/sec. HP/AT&T technology called 100BaseVG. In July 100BaseVG was awarded its own IEEE standards committee, the 802.12.

The proposals seek to use 100BaseVG's prioritization scheme, which already resembles Token Ring's prioritization, and adapt it to Token Ring frames. The IBM proposal, which is backed by HP, is called 100VG-AnyLAN.

Too close for comfort

The question some users and analysts pose, however, is whether there is room in the market for the ever increasing numbers of high-speed networking technologies, including the Asynchronous Transfer Mode and Fiber Distributed Data Interface, and two types of Ethernet-style 100M bit/sec. networks.

"This is the technological equivalent of the pet rock. Nobody knows how the users will migrate. It's a $20 billion market, and vendors are saying 'Let's build a big fence and hope users run into it.' The vendors will hedge their bets by having as broad a range as possible," said Tom Nolle, president of the consulting company CIMI Corp. in Voorhees, N.J.

Proteon officials said they will deliver Token Ring and Ethernet adapters based on 100BaseVG beginning in mid-1994.

Separately, Proteon officials outlined the following product plans for 1994:

- A combined Ethernet/Token Ring adapter for portable computers with PCMCIA slots in mid-1994.
- Adapters designed to plug in to the Peripheral Component Interface slot on the local bus of Intel Corp. Pentium-based computers in mid-1994.
- A 100BaseVG and ATM hub/router (no time frame given).

LAN Server

CONTINUED FROM PAGE 43

ested in IBM's systems management strategy, which will enable NetView users to manage LAN Server and OS/2 networks using the soon-to-be-announced LAN NetView as a go-between.

"It's very important to us that we have tools in place to manage our client/server environment; it looks to us that IBM is attempting to do that," Harrison said.

One large California organization has been using LAN Server to provide files, mainframe access and all software to a community of diskless DOS PCs.

Like the railroad, the organization is impressed with the robustness of the OS/2-based platform, "particularly Version 3.0; Version 1.0, which we started with, was not so good," said a manager in that group.

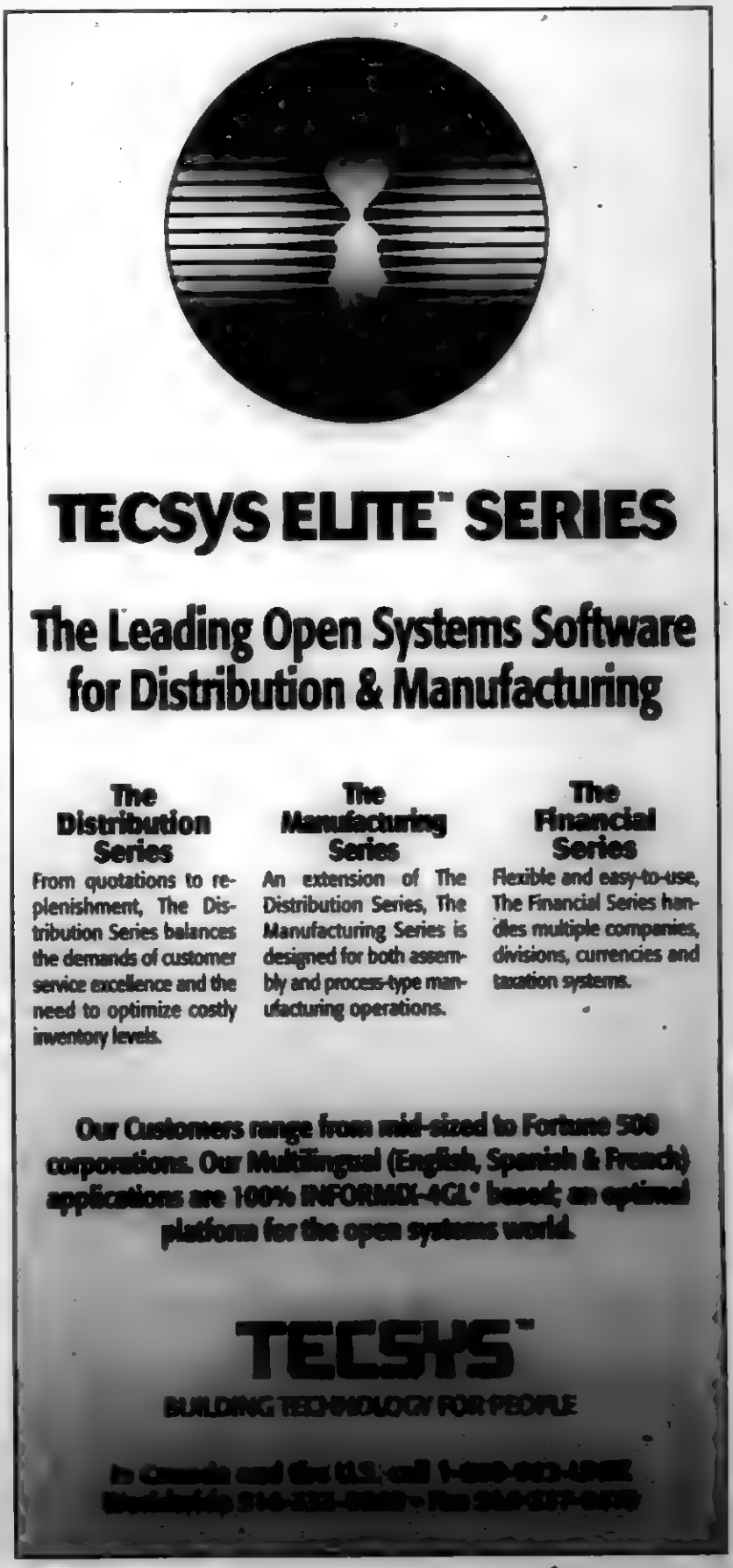
With 3.0's protected mode, applications are safer than in a Windows or DOS-based platform, he said.

NetWare more expensive

The firm looked at Novell when it was choosing a network operating system about 18 months ago and found NetWare to be much more expensive.

IBM also provides the platform with a low-cost host gateway via OS/2 Communications Server, which now resides on the same LAN Server platform as the file server, the manager said.

When asked what else he wanted to see IBM provide for its server, the manager replied: "As with any other product, we want it [to be] faster."



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Hitachi Data Systems

Hitachi Data Systems markets intermediate and large industry-standard mainframe computers, and disk, cartridge tape and semiconductor storage systems.

[redacted]

Compuware Corp. has announced EcoChargeback, an integrated resource accounting system for client/server Unix and relational database environments.

EcoChargeback correlates database resource use with Unix accounting data, according to the Farmington Hills, Mich., company. Database and Unix accounting information is collected by the product's agents and stored in a centralized accounting database.

Information can be retrieved from the database by user, application, workgroup, database or server.

Prices start at $8,000.

▶ *Compuware Corp.*
(313) 737-7300

Workflow Systems, Inc. has announced the FlowLogic/Work Operating System.

According to the Burlington, Mass., company, the product allows applications such as document management systems to interface seamlessly with project management, product configuration management, electronic time card and logistics management systems.

All data including text, images, spreadsheet and computer-aided design and engineering is managed in its native form via third-party vendor tools for tasks such as viewing, editing and redlining.

The FlowLogic system can also model and manage processes such as inventory management, document management, project management and engineering change control.

FlowLogic costs $1,000 per seat.

▶ *Workflow Systems*
(617) 272-8150

Unisys Corp. has announced the entry-level InfoImage Folder, an electronic file-folder management system that accommodates business-size and large-format documents.

According to the Blue Bell, Pa., firm, InfoImage Folder was designed for use as a pilot configuration by clients interested in evaluating imaging technology and its potential applications in their enterprises.

The configuration can expand to support additional departmental applications and users.

The eight-user Imaging Server Starter Kit, which includes all the Unix-based InfoImage Folder server software and the Event Manager work-flow software, costs $18,048.

▶ *Unisys*
(215) 986-4011

Softronics, Inc. has introduced Softerm GroupWare, rightsizing communications software for the enterprise networks.

Softerm GroupWare offers a variety of homogeneous libraries that enable users to select specific connectivity feature requirements.

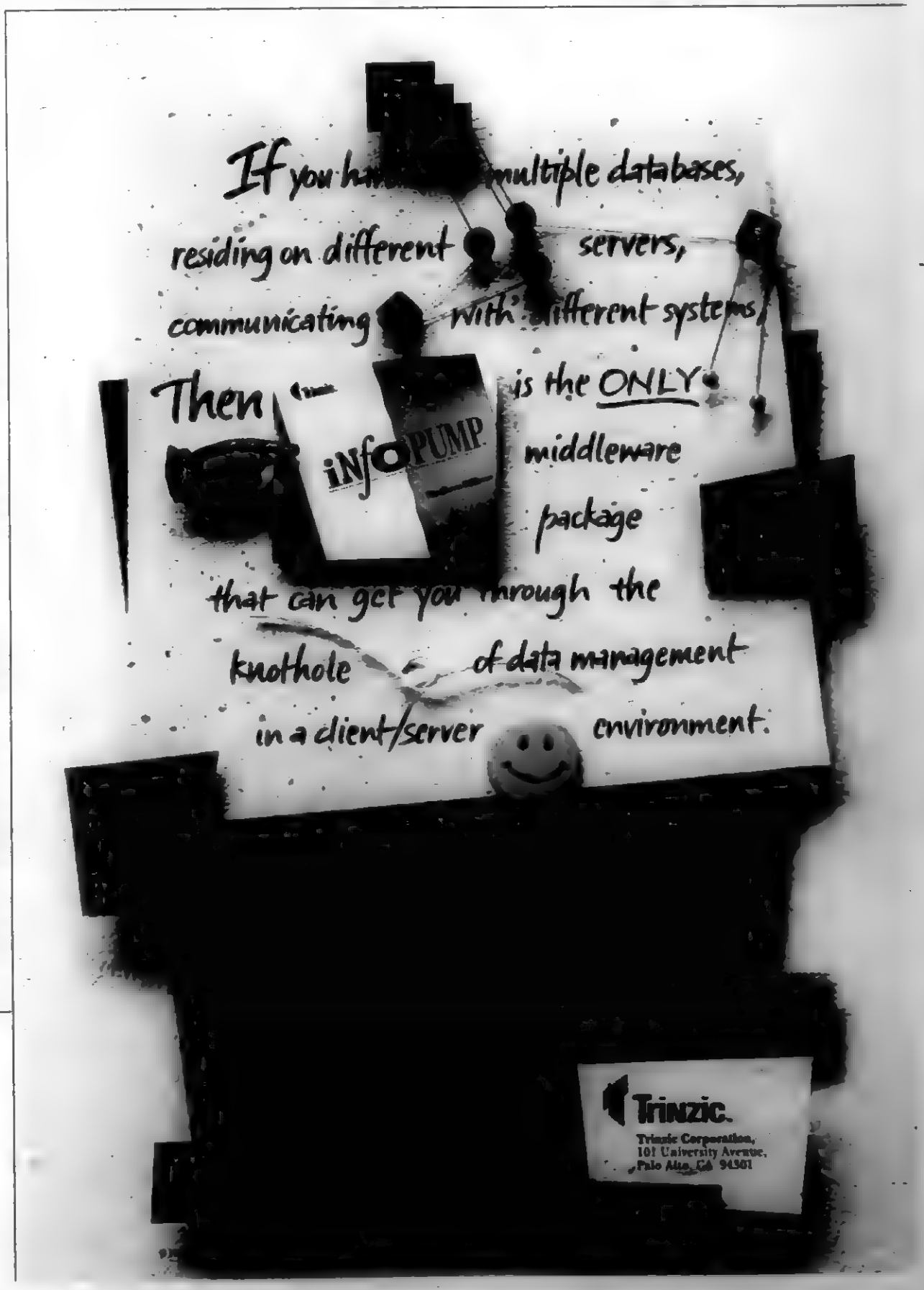
Before shipping the software, the Colorado Springs, Colo., company will customize it; or, users can do so with the Admin programs included. Softerm GroupWare can also be individualized for each workstation. The product is available for Windows and OS/2.

Softerm GroupWare prices range from $2 per workstation for a 1,000-user network to $50 per workstation for a five-user network.

▶ *Softronics*
(719) 593-9540

Product short

E Ware, a division of Visual Cybernetics Corp., has introduced Enote Version 2.0, instantaneous messaging software for Windows 3.1. Enote 2.0 delivers messages to the screen instead of the mailbox. Features include drag-and-drop operations, groupware functionality, context searching, Dynamic Data Exchange support and a spell checker. Cost: starts at $399. E Ware, New York (212) 564-7791.



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Feds dole out airwave slices

By Joanie M. Wexler
WASHINGTON

The recent culmination of the Federal Communications Commission's two-year decision-making process for a plan to divvy up radio spectrum among wireless personal communications services (PCS) providers is reminiscent of Rick Nelson's 1972 Top 10 hit, "Garden Party."

The reason is that the FCC's charter in figuring out how to fairly allocate PCS spectrum — a decision that will impact the multibillion-dollar wireless business (see chart) — was to satisfy a diverse set of needs among a vast array of potential service providers. And as Nelson crooned: "You can't please everyone, so you've got to please yourself."

According to several analysts, this is exactly what the FCC did with its plan to divide 160 MHz of spectrum in the 2-GHz frequency range into islands of myriad regional and local licenses. More licenses mean more revenue for federal coffers, observed Andy Seybold, a consultant and editor of "Andy Seybold's Outlook on Professional Computing" newsletter.

The trade-off could be a slowdown in the progress of ubiquitous service availability, he said.

The agency's plan is to scatter thin slices of auctionable frequency across hundreds of regions. Surprisingly, the FCC made no provision for any nationwide licenses — contrary to several long-distance carriers' consortium-style proposals — that could accelerate nationwide PCS.

The decision not to do that means that come May, when the FCC holds its spectrum auction, hundreds of licenses will be issued, with no federal mandate on what type of transmission technology will be used.

Crisis in the making

For end users that means "a standards crisis," said Amy Stephan, director of PCS at Telocator, an 80-company industry association based here. "Absent from any government of standards, you have the possibility of several different types of technology to be deployed" and the resulting interoperability holdups, she said.

"Ultimately, the consumer will end up paying the cost of that," Stephan added.

Phil Evans, director of telecommunications at Perot Systems Corp. in Dallas and a member of the International Communications Association user group, agreed. "I suspect this will delay the ultimate rollout relative to a plan that would have... allowed a company to offer nationwide service," he said.

The FCC's scheme will necessitate "a lot of wheeling and dealing for companies that win bids in various regions to put together some sort of mosaic that makes sense across the country," Evans said.

On the other hand, this is only a problem "if you believe that the people who receive the licenses are the people who will build the networks," said David Coursey, a consultant and editor of "P. C. Letter" in San Mateo, Calif.

Coursey said he expects the industry to follow the path of cellular and paging networks where people participated in a lottery and then sold their spectrum to someone else. "I'd expect the industry to eventually congeal around a couple of major providers" through such activity, he said.

Evans pointed out, however, that the PCS auction process requires a much heftier financial commitment on the part of bidders than did the cellular and paging lottery procedures, where participants paid a flat entry fee and "won" spectrum. "PCS participants are going to be more serious contenders," Evans predicted.

Creates competition

The FCC plan does serve competition, making room for new and existing players to get into the PCS act. The scheme accommodates seven PCS service providers in each of the nearly 500 trading areas, in addition to the two cellular, two paging and one specialized mobile radio providers already allowed in those areas today.

Stephan questioned whether there would be room for healthy competition for so many players in such a young market. But Louis J. Rutigliano, vice chairman of Ameritech, the Chicago-based regional Bell holding company, called it a positive sign that the FCC will allow existing regional telephone companies to offer new wireless services in areas where they currently provide cellular offerings.

"However, limiting the amount of spectrum we can use may limit the types of service we can offer," he said.

He was referring to the FCC provision that allows current cellular providers to bid for just 10 MHz of spectrum in their own markets. The skinny bandwidth makes it difficult to support the aggregate traffic of many customers or high-bandwidth applications.

Meanwhile, each of the 51 regional trading areas will be allotted two 30-MHz spectrum slices, broken into one 20-MHz and four 10-MHz local licenses.

[illegible]

The 2-GHz frequency band already has some incumbent microwave users in it. This means PCS auction bidders who wind up with some already occupied spectrum will have to pay the cost of migrating the incumbents into new homes in the 6-GHz band. This factor has some players clamoring for wider slices of frequency to justify these costs.

Wireless gets its wings

Personal communications services (PCS) are predicted to bring wireless to the masses

Source: The Yankee Group, Boston

Open systems

Users grapple with DME delays

By Jean S. Bozman
CAMBRIDGE, MASS.

Delivery of the Open Software Foundation's 2-year-old Distributed Management Environment (DME) technology is running late, with shipments of the first components to systems vendors set to begin by January. However, analysts said users may not get DME-based products until mid-year.

Accordingly, users are adopting strategies to fill the open systems management gap: Some are building a portfolio of separate software tools, some are shopping for existing vendor "frameworks" of tools, and some are simply waiting for standards to emerge.

Originally scheduled to ship in its entirety this year, the OSF's DME will be delivered in "phases," with the first components available by year's end. Even so, a print-service module will not ship until the second quarter of 1994, and the DME object-oriented framework for all DME services is not due to ship until late 1994 or early 1995, the OSF said.

Industry analysts said DME's rollout is not going as smoothly as that of its companion technology, Distributed Computing Environment (DCE) [CW, Sept. 20]. DCE tool kits from IBM, Hewlett-Packard Co., Digital Equipment Corp., Transarc Corp. and others were shipped to users this year.

DME development has been a

DME, page 60

Waiting game

Analysts said the DME delay was caused by OSF politics among vendor members that sell competing network management products. Meanwhile, the Common Open Systems Environment's systems management workgroup will start selecting system management parts in 1994 to speed the industry-standards process.

Users still ponder PC-in-hub option

Cabletron latest firm to offer 486 module

By Joanie M. Wexler
ROCHESTER, N.H.

■ Network planners are still divided in their opinions as to whether bundling PC modules into smart wiring hubs for file serving and other functions is a good idea.

Users revisited the trade-offs of this network design option last week when Cabletron Systems, Inc. became the latest vendor to offer a 486-in-a-hub module. Users pondered issues such as management and lower-cost advantages vs. potential drawbacks in the areas of system scalability and creating a possible single point of failure.

"This is a good idea for small workgroup LANs, but you couldn't run your corporation on it," said Graham Morrison, project leader of network design and engineering at Blue Cross/Blue Shield of Connecticut in North Haven, a Cabletron shop.

However, at the low end, Morrison said his organization is planning to

Users, page 60

James Daly

Hacking 101

Invitation to disaster. . . . The next time you look at your private branch exchange (PBX) switch, check out a little device called the Rmat (remote maintenance) port. This feature allows your switch vendor to dial into your PBX switch and remotely perform a variety of maintenance and troubleshooting functions. But it also has introduced a dangerous vulnerability to telecommunications systems. Many people leave the Rmat port on all the time. Major dumb move.

The Rmat port is a great back door for hackers, says John Ceraolo, a systems security manager at VNU Operations in Coral Springs, Fla. Check out Ceraolo's lucid description of Rmat dangers in the latest "Computer Security Alert" newsletter from the San Francisco-based Computer Security Institute. In one chilling episode, the system software even *helped* Ceraolo electronically break into his own shop.

His advice: Turn off all your Rmat ports, informing the vendors that they will have to call ahead to gain access. And change all switch passwords as soon as your equipment is installed.

Ceraolo also recommends that security managers change the password on the switch on a regular basis as well as on the termination or resignation of either vendor technical staff or your own staff. You also might want to think about joining your vendor's user group to stay up on tips and tricks.

Says Ceraolo: "You may be surprised at what kind of vulnerabilities exist in your phone switch."

Straight from the horse's mouth. . . . A school for hackers? Not exactly. But if you want to get the straight dope about how those electronic banditos break into your system, well, you might as well ask one.

And that's what you'll get a chance to do Nov. 3 and 4 at the School for Hackers, a seminar sponsored by Omicron, a Mountain Lakes, N.J.-based consortium of Fortune 500 companies interested in improving the use of computers in everyday business.

The event will be hosted by veteran hacker Ian Murphy, who cut his teeth entering the computer systems of places like the White House and Pentagon under the nom de net "Captain Zap." The seminar costs $895 and will be held in Somerset, N.J.

Who needs a Rolls Royce? . . . If I've heard it once, I've heard it a bajillion times: Computer security is too dárned expensive. If you're tired of writing big checks for electronic security packages, you may want to check out <LOCK> from Secure Systems Group International, Inc. in Alpharetta, Ga.

<LOCK> retails for $39 and in quantity can be licensed for as little as $1 a node. It offers everything from access control to program authentication to data encryption. It doesn't have a lot of bells and whistles, but it beats paying upward of $200 or more for a similar package. Says co-designer Winn Schwartau: "We're the Volkswagen of the security business."

Nail down that Mac. . . . Apple Computer equipment is five times more likely to be stolen than PC clones, according to the Stolen Computer Registry, a New York-based clearinghouse for information on stolen computers.

Keep your eyes on the guide. . . . The *TV Guide*, that is. The folks at NBC's *Nightline* have been chasing down quotable folks in the computer security community these past few weeks while putting together a piece on security and privacy in the electronic community. It should air any day now.

Daly is a *Computerworld* West Coast senior correspondent.

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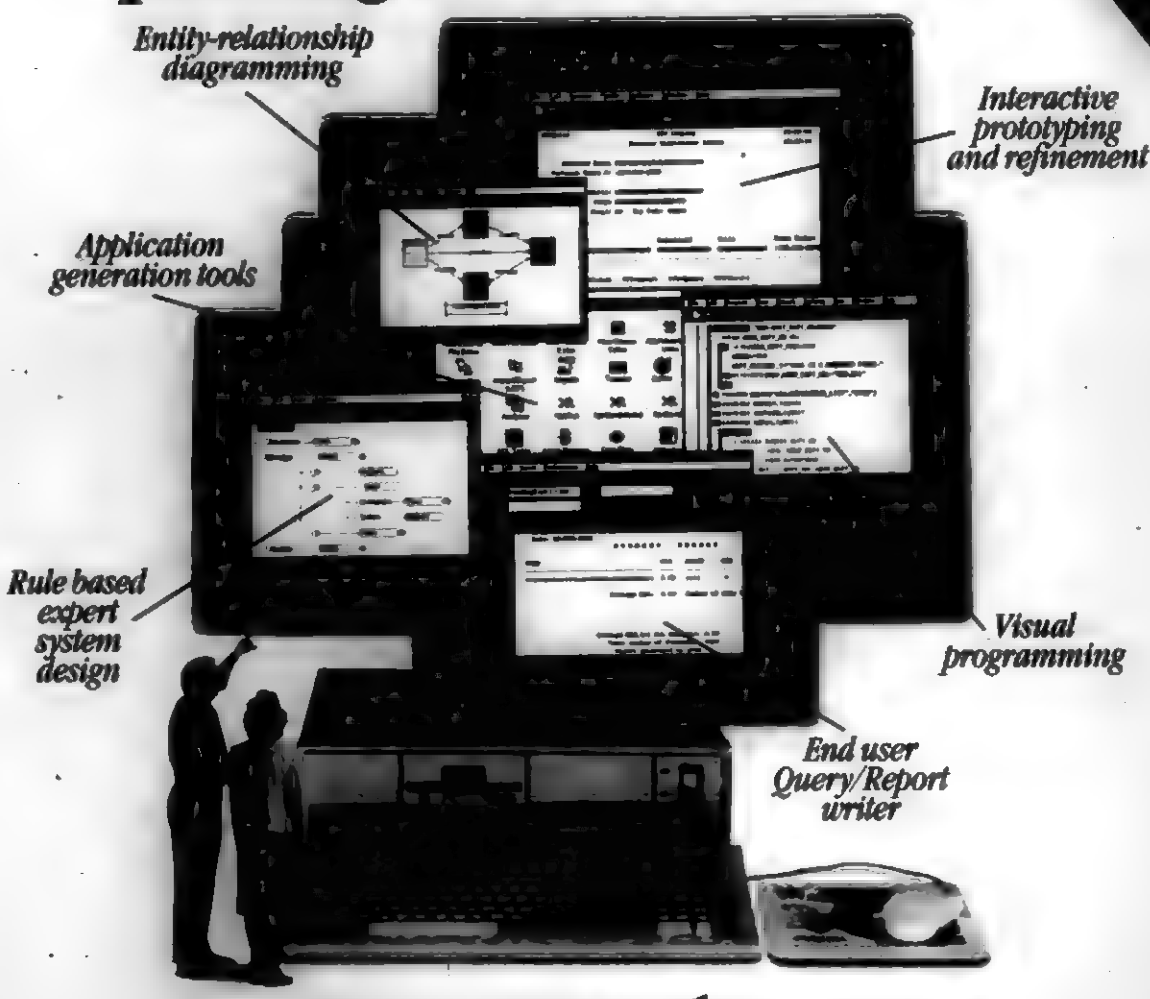

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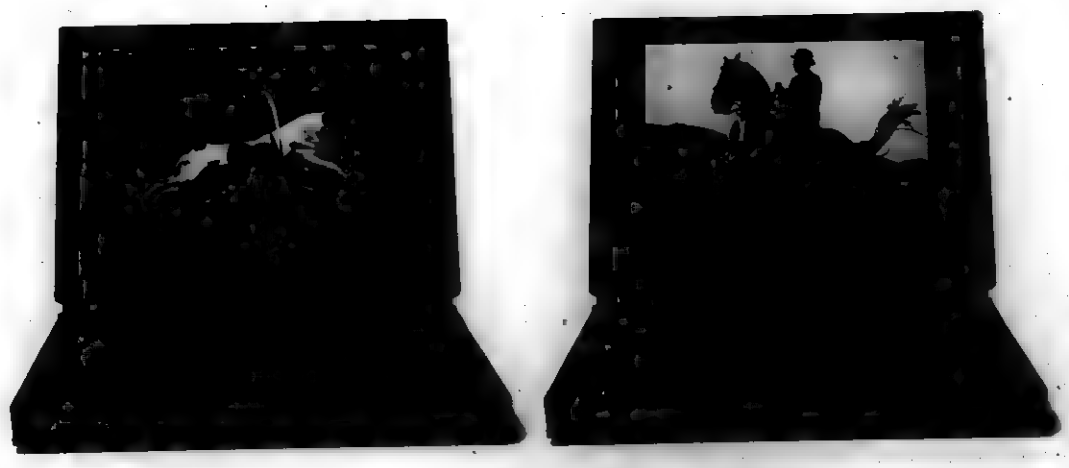
If you're someone on the move



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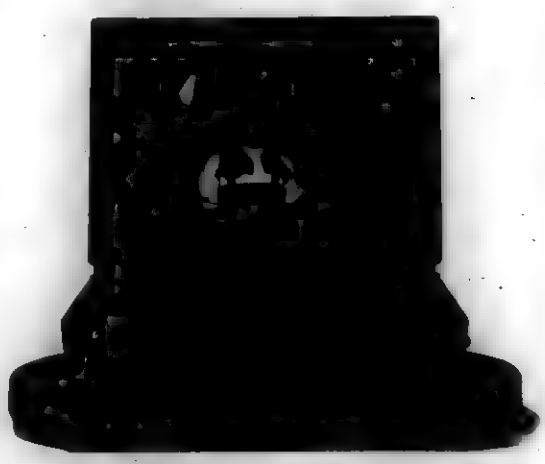

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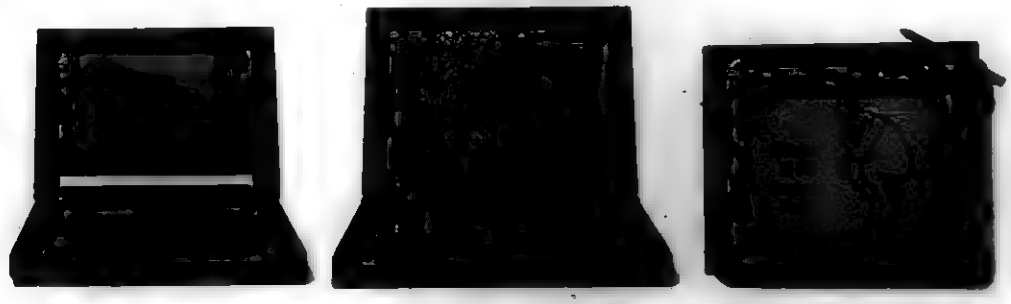

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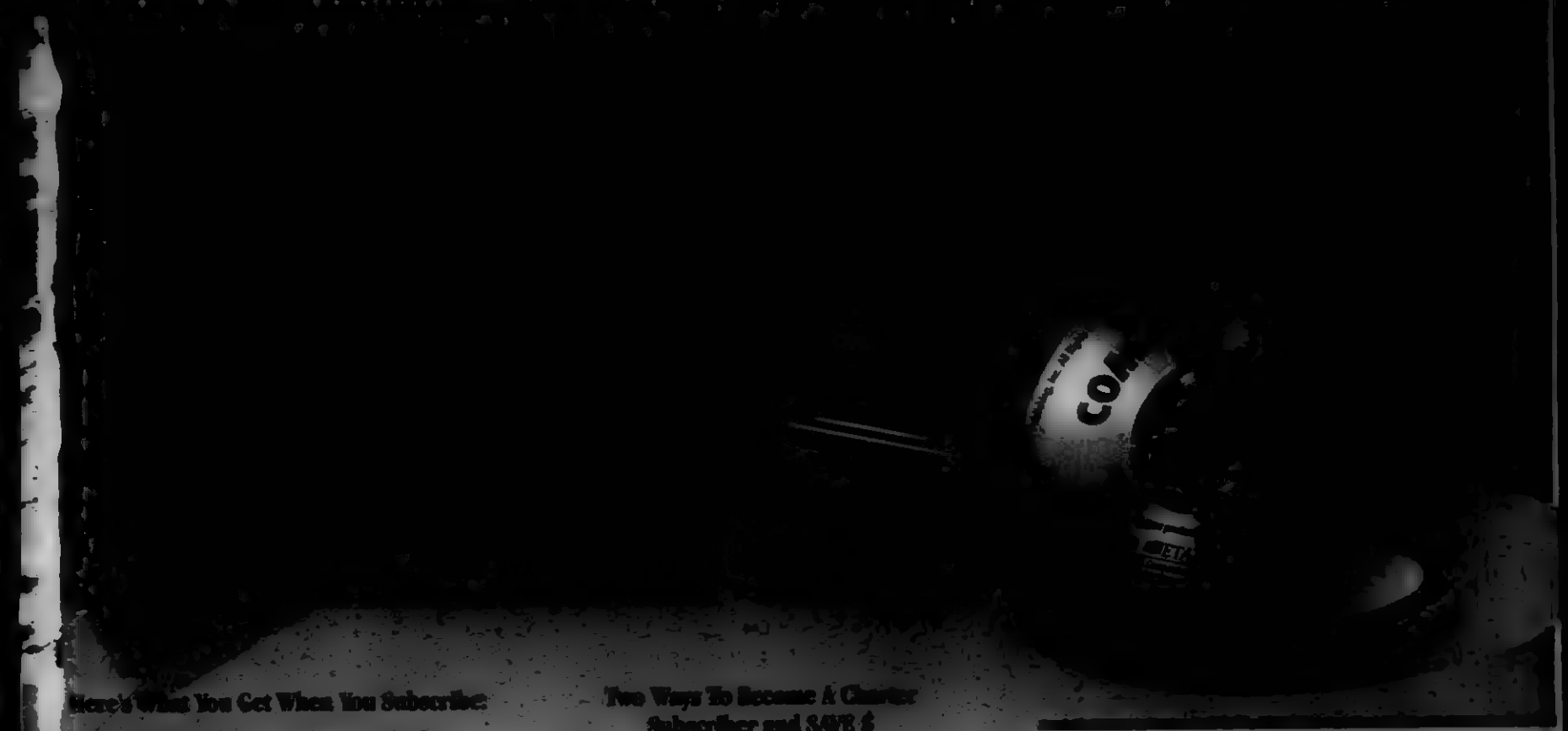

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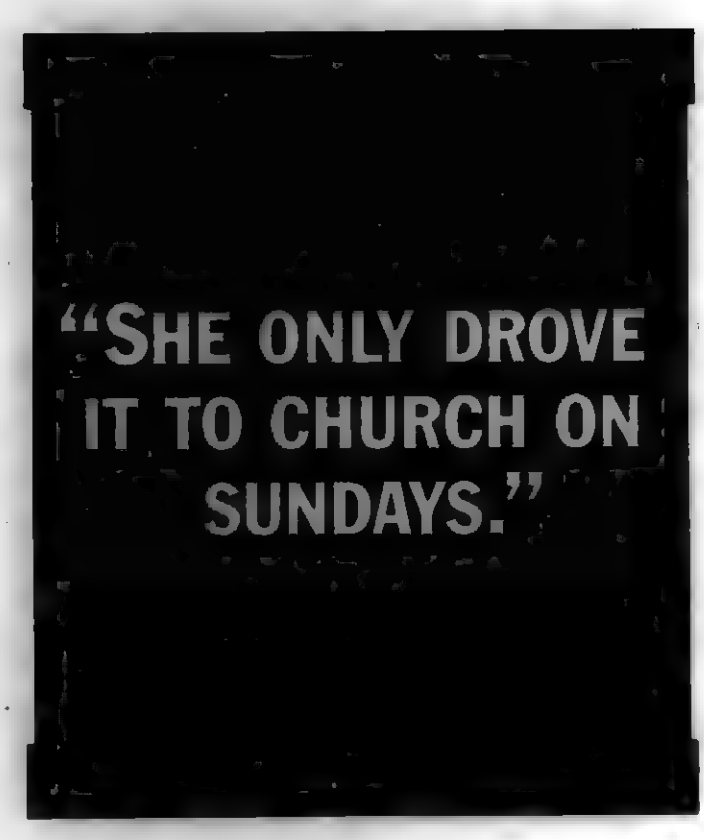

Briefs

Interoperability tested

A dozen vendors said test results for the Open Shortest Path First protocol revealed complete interoperability in local- and wide-area networks among all participants. Key vendors included **3Com Corp.**, **Ascom Timeplex**, **Cisco Systems, Inc.**, **Digital Equipment Corp.**, **IBM**, **Novell, Inc.**, **Proteon, Inc.** and **Wellfleet Communications, Inc.**

Bellcore offers ATM upgrade

Bellcore contributed technical specifications for the carriage of Switched Multimegabit Data Service (SMDS) over Asynchronous Transfer Mode (ATM) networks to an SMDS interest group. SMDS is a public packet-switched, connectionless data service that the telecommunications carriers offer. It is said to be less expensive than dedicated, point-to-point connections. When adopted by vendors, the Bellcore specification should allow customers to use SMDS now and smoothly migrate to ATM when it is more widely accepted.

Cisco training program debuts

Cisco has begun a program to identify individual customers and partners who are network experts and further train them in diagnosing and troubleshooting internetworking problems. The certification course will be limited to high-level engineers and systems analysts. When they complete the course, those people will have direct access to high-level support at Cisco.

Mobil and First Data go X.25

Mobil Oil Credit Corp. and **First Data Resources** will be the first customers to use **MCI Communications Corp.**'s ResponseNet service for transaction-processing applications. The service uses X.25 packet technology, a protocol that efficiently uses network bandwidth to support the bursty and high-volume data patterns of transaction processing.

EC automates taxes

Infonet Services Corp. said European Community member states are exchanging value-added tax information via the company's Virtual Private Data Network Service. Before completely automating the tax collection process in July, 60 million paper import documents were filed each year, Infonet said.

Florida utility picks its network

Florida Power Corp., the second-largest electric utility in the state, has awarded **Network Equipment Technologies, Inc.** a $1 million contract to install a broadband network to connect router and the utility's Synchronous Optical Network rings.

Bell to offer frame relay

Bell Atlantic Corp. said it plans to make its frame-relay, high-speed data service available in most metropolitan areas in the mid-Atlantic region by early fall.

On-line services offer products

The burgeoning on-line services industry has been busy with four services announcing products. **Prodigy Services Co.** in White Plains, N.Y., now has a bulletin board that allows subscribers to ask technical questions of hardware and software manufacturers. **Timeworks, Inc.** and **Gateway 2000, Inc.**, among others, will participate. **World Travel On-line** in New York launched a multimedia travel service that allows subscribers to dial in and access video clips of hundreds of destinations. **America Online, Inc.** in Vienna, Va., said it will offer a graphical user interface for people wanting to use the Internet. **CompuServe, Inc.** in Columbus, Ohio, said it will support Version 2.0 of Novell's Remote MHS.

Scanning scam in New York

Six men were arrested for allegedly scanning New York City airwaves for legitimate cellular phone numbers that they then programmed into unauthorized phones, resulting in millions of dollars of fraud. The Bronx District Attorney announced that investigators had seized $24,000 in cash, 60 cellular phones and computer equipment when they raided apartments used by the suspects to obtain the numbers and program the illegal phones.

Financial networks to merge

The New York Switch Corp., owner of the NYCE network, and NENI Corp., owner of the Yankee 24 network, have signed a letter of intent to merge the two electronic funds transfer (EFT) firms into a super-regional Northeast EFT company that will handle a combined 1.2 billion transactions per year in 24 states.

Xircom introduces modems

CALABASAS, CALIF.

Xircom, Inc. recently introduced a pair of modems designed to provide local and remote LAN connectivity and fax/modem communications for PC users in what the company called a two-in-one package aimed at mobile professionals.

The Xircom CreditCard Ethernet+Modem and Xircom Pocket Ethernet+Modem cost $699, which Xircom claimed is 15% to 25% less expensive than a separate LAN adapter and modem.

The company, based here, said users can fax a document or dial in to a bulletin board service while remaining logged on to a LAN using popular third-party remote LAN applications.

The CreditCard Ethernet+Modem offers Ethernet support in a PCMCIA Release 2.0-compatible card slot.

The pocket modem is available now; the PCMCIA version is scheduled for this fall.

Users ponder PC-in-hub

CONTINUED FROM PAGE 55

use the $6,995 PC module as "another option in our network tool kit." Specifically, he said, the health insurer will use it with an interface for running temporary wireless networks and to house Novell, Inc. SAA Gateway NetWare Loadable Modules, which encapsulate LAN protocols and feed them to IBM host environments.

More security

Blue Cross also intends to use Cabletron's module, called the PCMIM, as a more secure file server. "Remote file servers probably are not on their own [uninterruptible power supply] and are vulnerable to someone walking up and rebooting them," he said.

Filling out the roster

Other players in the PC-in-a-hub market include SynOptics Communications, Inc., Networth and Optical Data Systems, Inc. Prices for the modules range from about $5,000 to $8,000.

Analysts and Cabletron product manager William J. Clark describe PCMIM as the most robust PC-in-a-hub option to date. The module for Cabletron Multi Media Access Centers (MMAC) comprises an 66-MHz Intel Corp. I486DX module.

The PCMIM offers two Extended Industry Standard Architecture (EISA) slots that use one MMAC slot, and it doubles the base and expansion memory of the module from its main competitor, Networth, Inc.

Clark described the PC as a generic, standards-based PC platform that allows users to swap in functions, such as LAN file servers and network interfaces including Asynchronous Transfer Mode and wireless, that are built by third-party vendors for the EISA bus.

Customizable modules

Users, then, could buy a "blank" module and customize it to whatever function they wanted in the hub, rather than wait for Cabletron to develop a module they might require, Clark said. Cabletron will eventually build EISA-compliant network interfaces itself, but the company declined to speculate on what those will be, he noted.

Victor Duchovni, senior systems analyst at Cabletron shop Lehman Brothers in New York — admittedly a Unix bigot — described the concept as opting for a "crippled PC. You save on some physical things like [shared] power supplies and cabling, and the cost is slightly cheaper. But I'd like my servers to stand alone and be more expandable."

On the other hand, Louie Valles, manager of small systems and networks at the University of Texas at El Paso, a PCMIM beta site, said he is excited to bundle his Novell NetWare servers into his MMACs. He cited a performance advantage in the move.

Immediate throughput

"The PCMIM is literally on the backplane of the MMAC chassis, so you get immediate throughput," he explained. "You don't have to go out over an Ethernet" and back into the hub for internetworking, he said.

The bottom line is that "it is convenient to put all this stuff in one box," said Michael Howard, president of Infonetics Research, Inc., a consultancy in San Jose, Calif.

For example, using the board as a distributed management module, where the management system listens and sends information to other stations and does not require its own console and keyboard, "is a good use of the product," he said.

However, "the concept hasn't really taken off yet; it's a strange notion for a lot of people who already have their file servers in place and feel comfortable with having their PCs separate," Howard said.

Ethernet adapter card revs up Sun's SPARCstations

By Lynda Radosevich

DALLAS

Interphase Corp. will introduce later this month an Ethernet adapter card said to greatly improve system performance of Sun Microsystems, Inc.'s SPARCstations.

The card off-loads network protocol stack processing from the CPU of the workstation, according to Greg Iverson, vice president of marketing. The effect is to increase processing speed and system performance of the workstation, which typically is used as a network server, he added.

The Interphase development follows similar coprocessing advancements recently made in Asynchronous Transfer Mode adapters from the likes of Fore Systems, Inc. in Pittsburgh.

The Interphase card will support Sun's Network File System operations, and Interphase will add TCP/IP to the stack so that the card can absorb more network traffic without saturating the CPU.

Separately, Interphase announced that Hewlett-Packard Co. has chosen it to provide Fiber Distributed Data Interface adapters for the HP Apollo 9000 Series 700 workstations.

This is the first product Interphase developed specifically for HP workstations; other products are planned, Iverson said.

"I READ IT FOR THE ARTICLES."

"IT CAN BUILD ANY MISSION-CRITICAL, CLIENT/SERVER APPLICATION."

DME delays

CONTINUED FROM PAGE 55

start-and-stop affair, as industry requirements for the Object Management Group's (OMG) Common Object Request Broker Architecture (Corba) and "hooks" into existing network management products emerged, the OSF said.

"Perhaps we weren't as aggressive and fast as we should have been," conceded Roger S. Gourd, vice president and chief of staff at the OSF, who is directing the development efforts. "But every time we looked around, the industry had changed. We are regrouping with the major [open systems] players and the COSE committee to see what modifications should be made in the code."

The OSF's decision to create a comprehensive architecture for DME may have been too big for quick completion, and DME may lose a window of opportunity, industry analysts said. "I think DME will have little or no impact when it's delivered in 1995," said Paul McGuckin, a Unix analyst at Gartner Group, Inc. in Santa Clara, Calif.

OSF designers said they are reworking the DME framework to comply with the OMG's Corba specification. That requirement meant the OSF had to change plans to standardize on Tivoli Systems, Inc.'s object-oriented framework, which was originally based on non-Corba object specifications. HP and IBM also contributed pieces of their framework technology to DME, analysts said.

In DME's absence, users must select from the existing vendor frameworks for systems management, including IBM's NetView 6000, HP's OpenView, Tivoli Systems' Tivoli Management Environment and Sun Microsystems, Inc.'s Sunnet Manager.

DME component timetable

By Jan. 1, 1994:
- License Management Service.
- PC Services.
- Software Distribution Service.
- Event Services.
- Subsystem Management Service.

Second quarter, 1994:
- Printing Service.

By 1995:
- DME Object Framework, which supports all DME services.

Some user sites are monitoring the standards evolution — but are not ready to commit to a framework. The need for centralized management of sprawling networks will force a decision.

"The need is not so great that we are prepared to jump into the water yet," said Felix Fridman, director of information systems at the Alberta Cancer Board in Edmonton, Alberta, Canada, who is monitoring systems management technology.

The Alberta health group's 600-device enterprise network, built on Sun computers, is being monitored for outages but lacks an integrated framework of systems management tools to control remote servers from a central site, Fridman said.

Site solutions

Other sites have assembled a do-it-yourself portfolio of management packages. Purdue University in West Lafayette, Ind., uses license management and software distribution programs obtained from different sources to manage the hundreds of computers that serve 16,000 end users in its engineering schools.

At Dunkin Donuts of America, Inc. in Randolph, Mass., users have tried Sun's Sunnet Manager but do not use it at all locations.

Shopping for frameworks is already under way at many sites, as users evaluate several vendors' products to see which fits best with their existing enterprise network. DME, they said, will be supported by such frameworks after it becomes available to systems vendors.

The Woods Hole Oceanographic Institute in Woods Hole, Mass., has used Digital's Management Control Center framework, which is now part of Digital's Polycenter product.

But Andrew Maffei, data communications supervisor at the institute, said he plans to evaluate other frameworks noting that Digital has decided to resell IBM's NetView 6000.

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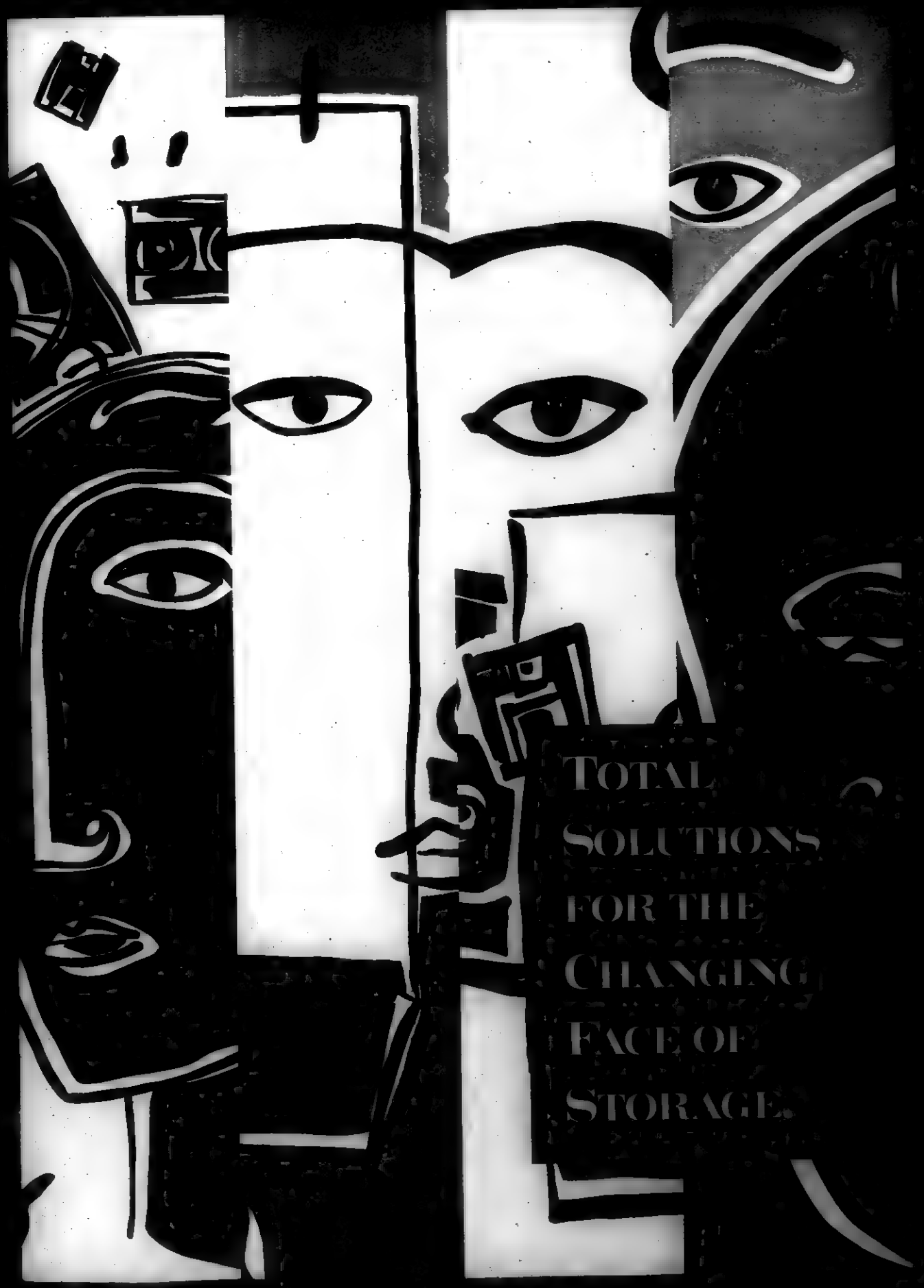
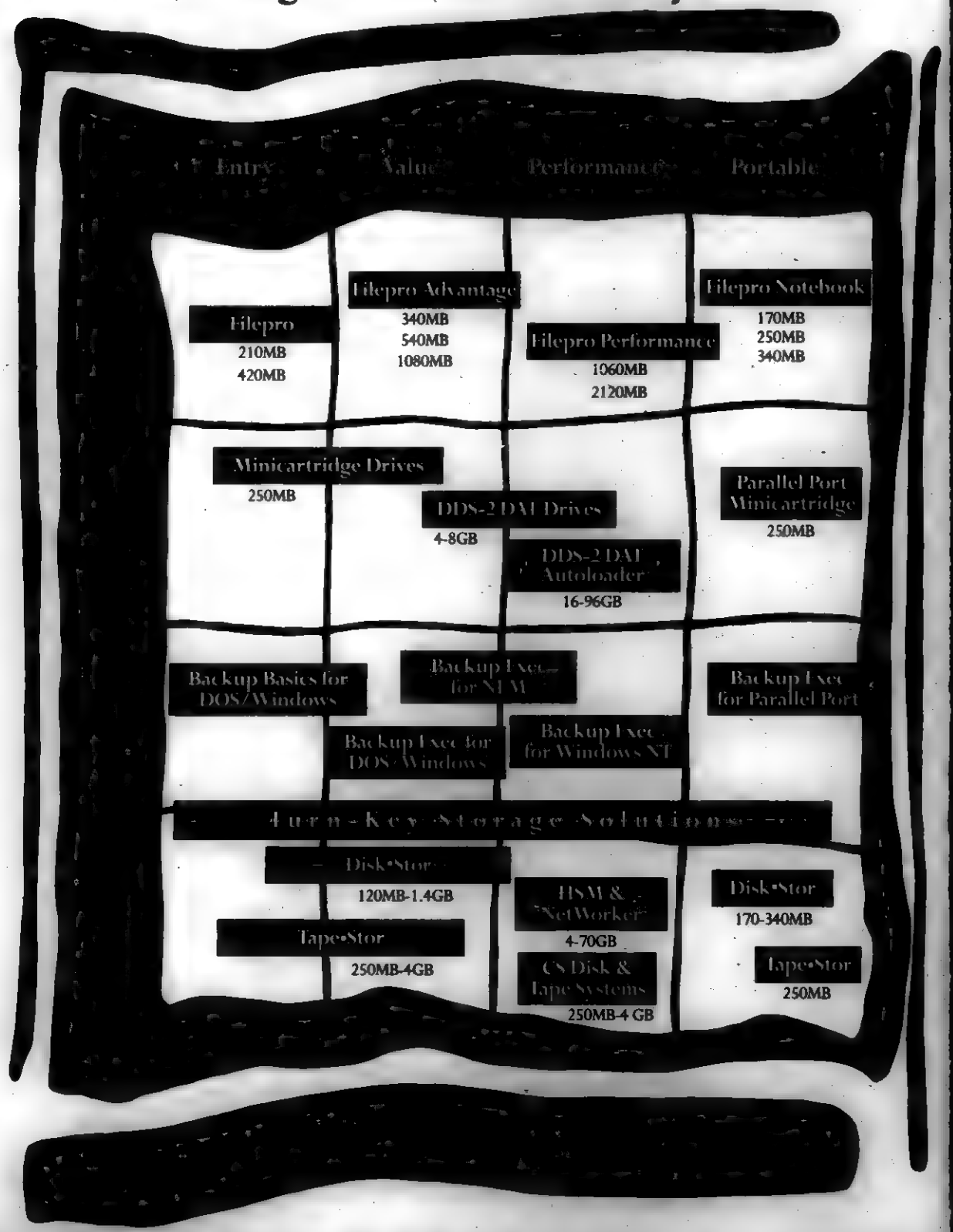


TOTAL
SOLUTIONS
FOR THE
CHANGING
FACE OF
STORAGE

THE NEW CONNER

New storage solutions for every market.



IF YOU HAVE A STORAGE NEED, CONNER HAS A SOLUTION.

There's only one company in the storage industry with the vision to put a new face on storage. Conner—the Storage Solutions Company. And now we are introducing over 25 new products:

- new disk drives
- new tape drives
- new software
- new turn-key systems

Products especially targeted at four distinct computing markets:

- Entry
- Value
- Performance
- Portable

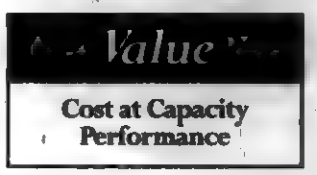
It's a simple principle. Each product is fine tuned for the specific needs of our customers. To provide the right capacity, the best performance—and new standards for reliability—at the right price.

Storage needs are expanding, and only Conner has the disk drives and tape backup systems to provide complete data protection. With easy-to-use software—for all market segments.

Conner—the Storage Solutions Company. With the products, R&D, worldwide manufacturing, distribution and support to deliver new storage solutions to every market— for the changing face of storage.

Entry market

Entry level PCs need plenty of storage for today's powerful software, applications and games. For business or home use, 200 to 400 MB is the right capacity range. With tape backup to protect critical data and easy-to-use software to tie it all together.



Value market

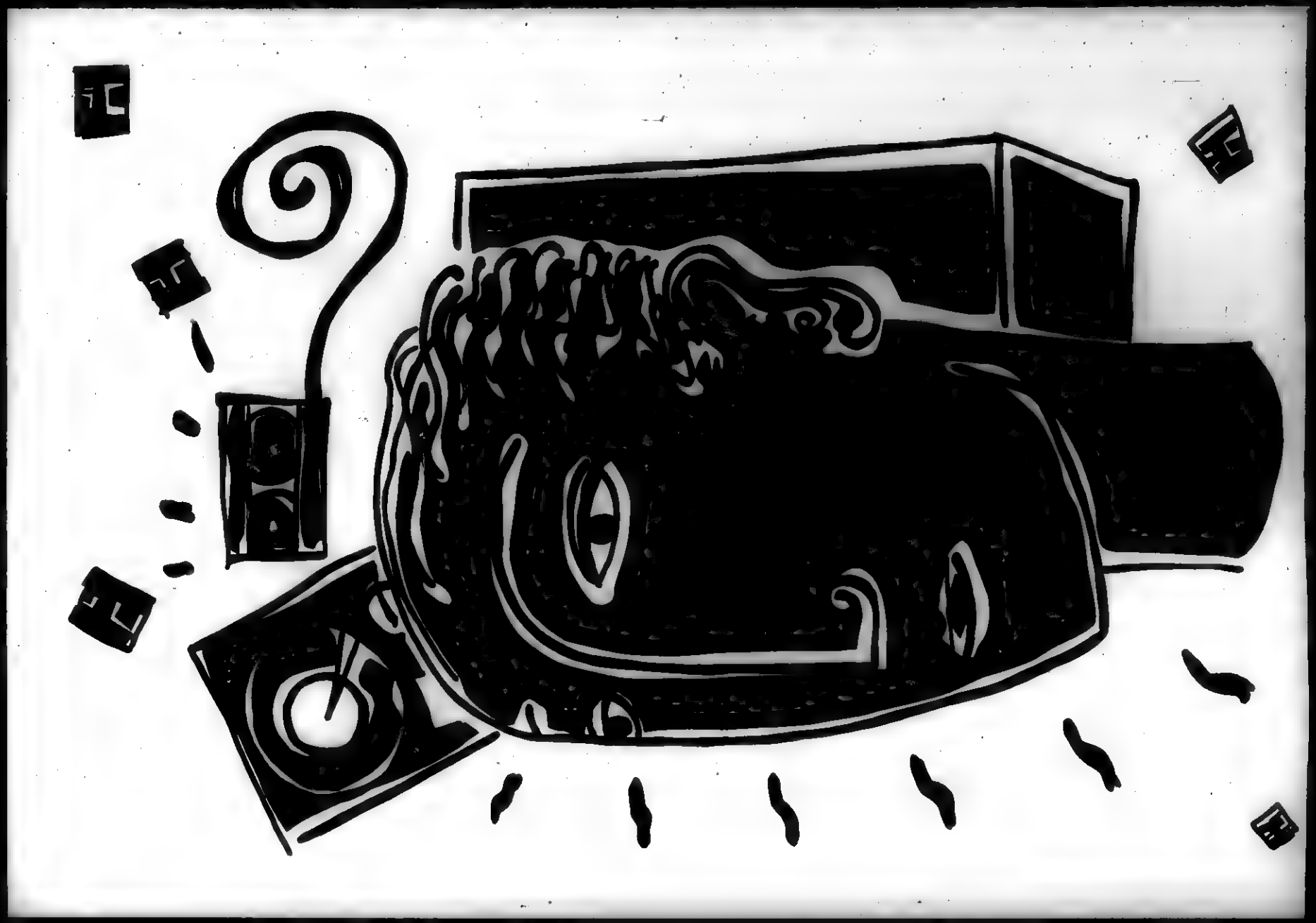
Value systems—including mainstream desktop PC's used for advanced applications, databases and multimedia—need low cost storage, with capacities from 300 to 1000 MB and higher performance. Tape backup for these capacities is essential.

Performance market

Performance systems for high-end business, engineering and multi-user environments need fast access to data and high capacity of 1 GB or more. Plus very large backup capability for mission critical requirements.

Portable market

Portable PCs and notebooks for mobile executives need disk drive capacity of more than 200 MB, with low power, light weight and outstanding shock resistance. And cost effective tape backup systems with fully capable software.



TOTAL SOLUTIONS FOR THE CHANGING FACE OF ENTRY LEVEL STORAGE.

Entry level PCs need plenty of storage for today's powerful software, applications and games. For business or home use, 200 to 400 MB is the right capacity range. With tape backup to protect critical data and easy-to-use software to tie it all together.

Entry market priorities:

- Low Cost
- Capacity
- Performance

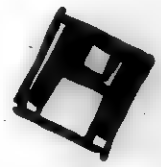
Filepro 210 MB and 420 MB

Conner's new 3.5-inch Filepro 210 MB and Filepro 420 MB are designed to accommodate the growing storage needs of software, applications, data, graphics and games. These entry-priced drives have patented low power techniques for "Green PCs." Their low-profile design and superior performance outdistance older technology.

- fast 14 msec average seek time
- 3600 RPM rotation speed
- low power (3.8 watts idle)
- one-inch-high design
- PC/AT® interface

Disk

Tape



Software

250 MB Minicartridge Drive

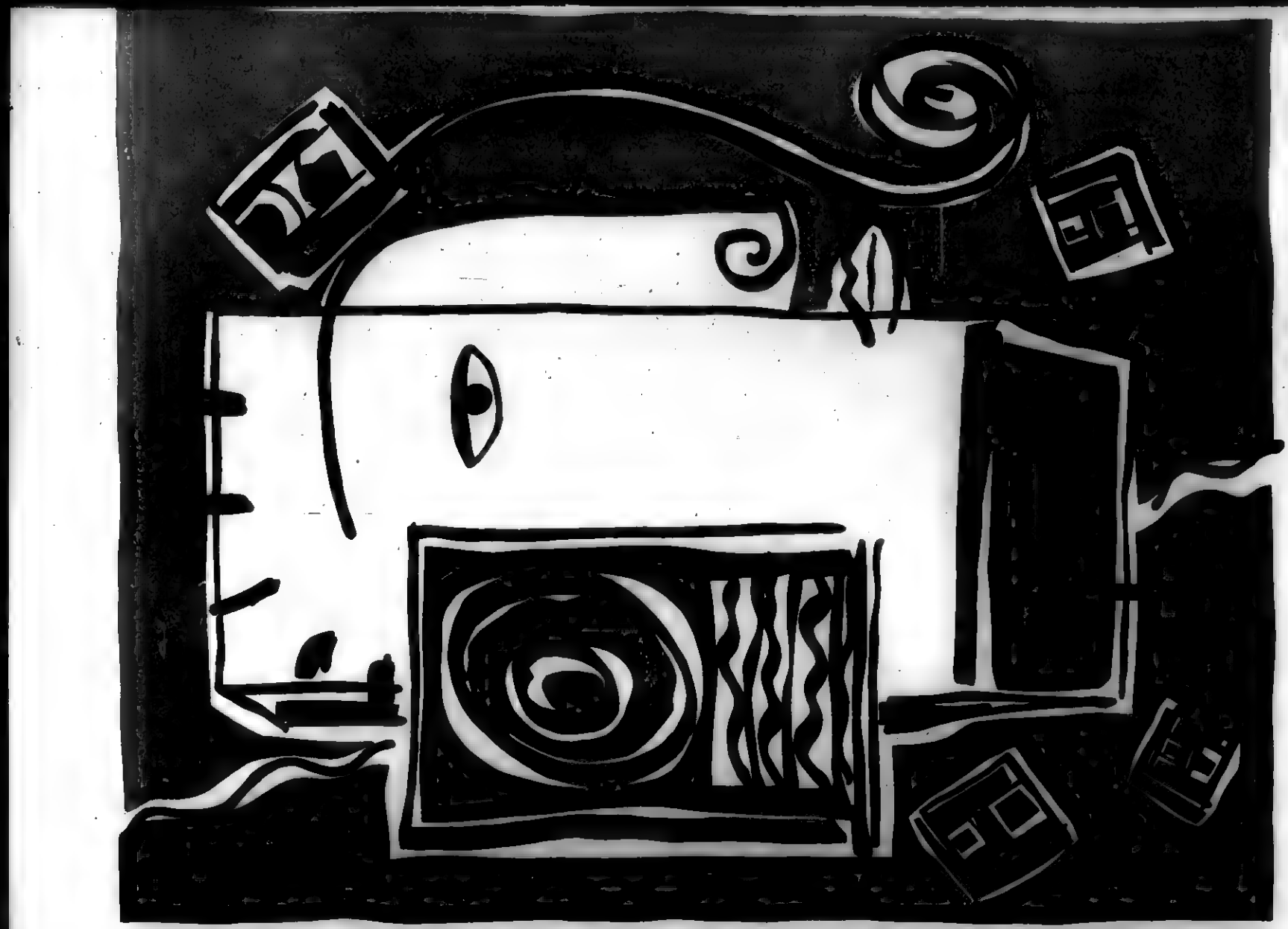
Conner's 250 MB Minicartridge drive is the most versatile and cost effective PC backup solution on the market for today's storage intensive software applications. It's superior design makes installation as simple as plugging the drive directly into the floppy ribbon cable—without the use of adapters or conversion kits.

- one-inch-high design
- backup rate of 9.5 MB per minute
- 250 MB capacity with data compression
- shares floppy interface
- compatible with DOS®, Windows® and UNIX®/XENIX® operating systems

Backup Basics Software

Conner's Backup Basics Software makes your backup tasks easy. It's a two button backup program that lets the busiest operator backup data safely and hassle-free. Without learning another complex software program. All through a simple point and click menu.

- full or differential backup
- data compression for greater capacity on the tape
- backup for Windows and DOS

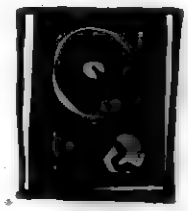


TOTAL SOLUTIONS FOR THE CHANGING FACE OF VALUE-ORIENTED STORAGE.

Value systems—including mainstream desktop PC's used for advanced applications, databases and multimedia— need low cost storage, with capacities from 300 to 1000 MB and higher performance. Tape backup for these capacities is essential.

Value market priorities:

- Cost at Capacity
- Performance



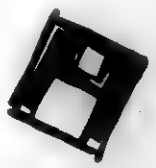
Disk

Filepro Advantage 340 MB, 540 MB and 1080 MB

The Filepro Advantage Series of low-profile 3.5-inch disk drives is ideal for the full-function PC market. With 340 MB, 540 MB and 1080 MB, this powerful family meets the storage needs of business users for advanced applications, networking and multimedia.

Tape

Filepro Advantage	340MB	540MB/1080MB
Average Seek Time	13ms	12ms/10.5ms
Rotation Speed	4011	4500
Buffer	64K	256K
PC/AT Interface	Yes	Yes
SCSI-2 Interface	Yes	Yes



Software

250 MB Minicartridge Drive

Conner's 250MB Minicartridge drive offers a cost effective backup solution for the value market. With a one-inch-high design, it provides 250 MB of capacity. Plus, it's easy to install without adapters or conversion kits.

DDS-2 DAT 4-8 GB Drive

Conner's DDS-2 DAT tape drive combines high capacity, absolute reliability and performance for high speed, stand alone and networked PCs.

- 3.5- and 5.25-inch internal and 3.5-inch external form factors
- DDS, DDS-2 and DDS-DC formats
- 400 KByte/second native transfer rate
- SCSI-2 interface

Backup Exec Software for DOS/Windows

Conner's value-oriented storage management software provides award winning backup solutions for SCSI tape drives whether they are in use on DOS, Windows or Windows NT™ operating environments. Integrating perfectly into these operating systems, with seamless Graphical User Interfaces and full NetWare® compatibility, Backup Exec simplifies backup and restore operations for individual users or network work groups.

TOTAL SOLUTIONS FOR THE CHANGING FACE OF PERFORMANCE STORAGE.

Performance systems for high-end business, engineering and multi-user environments need fast access to data and high capacity of 1 GB or more. Plus very large backup capability for mission critical requirements.

Performance market priorities:

- Performance
- Capacity
- Cost

Disk

Filepro Performance 1060 MB and 2120 MB

The new Filepro Performance 1060 MB and 2120 MB 3.5-inch disk drives deliver the highest performance and capacity for mission critical applications. Like workstations, RISC systems and high-end PCs. Plus, multi-user environments including servers, storage subsystems and mini or main-frame storage.

- fast 9 msec average seek time
- high speed data transfer rate
- fast and flexible SCSI implementation.
- 5400 RPM rotation speed

DDS-2 DAT 4-8 GB

Conner's DDS-2 DAT tape drive combines high capacity, absolute reliability and performance.

- 3.5- and 5.25-inch internal and 3.5-inch external
- 400 KByte/second native transfer rate
- SCSI-2 interface
- DDS-DC data compression

DDS-2 Autoloader

Our DDS-2 Autoloader is ideal for networks that require unattended, high capacity backup devices. It allows easy integration and provides the lowest cost-per-megabyte solution in the industry.

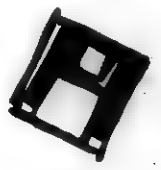
- stores up to 96 GB with compression
- 4 cassette magazine standard format, 12 cassette optional
- 5.25-inch full-height form factor

Tape

Backup Exec Software for NT

Backup Exec for NT is the first full-featured, 32-bit backup application created for Microsoft Windows NT. Conner developed the backup utility included with the Windows NT operating system. Backup Exec offers an easy-to-use, comprehensive data storage solution for Windows NT-based workstations and servers.

- automatic backup
- disk grooming
- E-mail notification
- remote registry support
- concurrent backup to multiple tape drives



Software

Backup Exec Software for NetWare

For performance applications, Conner has created Backup Exec for NetWare. It's a fully-integrated, client server data management solution that's just right for high powered, data intensive systems. Created specifically for Novell systems, Backup Exec for NetWare allows network administrators to control all backup management operations from the file server or a workstation.

TOTAL SOLUTIONS FOR THE CHANGING FACE OF PORTABLE STORAGE.

Portable PCs and notebooks for mobile executives need disk capacity of more than 200 MB, with low power, light weight and outstanding shock resistance. And cost effective tape backup systems with fully capable software.

Portable market priorities:

- •Capacity at Cost
- • Performance

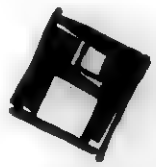
Disk

Filepro Notebook 170 MB , 250 MB and 340 MB

The Filepro Notebook Series of 2.5-inch disk drives meet the demanding needs of today's mobile executive. Featuring capacities from 170 MB to 600 MB (with data compression), their patented low power, low-profile, light weight design is perfect for advanced notebooks and other mobile applications.

Tape

- • 600 MB capacity with compression
- • 0.2 watts power (sleep mode)
- • 200Gs of shock resistance
- • 12 msec average seek time
- • 4500 RPM rotation speed
- • less than 7 ounces
- • PC/AT or SCSI interfaces



Software

Parallel Minicartridge 250 MB Drive

The new Conner Parallel Minicartridge 250 drive is perfectly featured for a wide variety of portable storage applications. Like mobile notebook computing. And for customers looking for a cost effective method to protect valuable data. Our Parallel Minicartridge 250 combines small size, low weight and maximum ease-of-use. Making laptop and desktop system backup easier than ever.

- • plugs into the parallel port
- • requires no special controllers or adapters
- • includes Backup Exec Software

Backup Exec for Parallel Port

When you're on the move, Conner's new Backup Exec for Parallel Port backup software makes protecting valuable notebook PC data as easy as clicking a mouse. It's a full-featured program providing all of the options you want and need from a comprehensive backup program. Its unique combination of robust features and easy graphical interface make it the ideal backup solution for a wide variety of users on the go.

- • schedule automatic backups to run attended or unattended
- • run Windows backups completely in the background
- • select optional levels of data compression

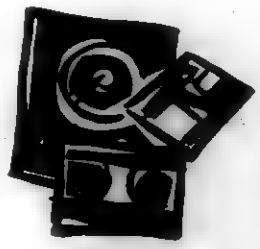
TOTAL SOLUTIONS FOR THE CHANGING FACE OF TURN-KEY STORAGE SYSTEMS.

From basic single-user needs to complex network storage requirements, Conner Storage Systems Group delivers turn-key solutions, coupled with customized service and support. For every user from entry level PCs to enterprise-wide network administrators.

Disk•Stor

Beginning with the Conner Disk•Stor Series. Available through retailers and mass merchandisers, today's Disk•Stor Series offers disk drives with higher performance and capacity for system upgrades, at competitive prices.

- capacities range from 120 MB to 1.4 GB
- bundled with mounting hardware for easy installation



Storage Systems

Tape•Stor

The Tape•Stor Series offers a full range of easy-to-use tape systems for backing up valuable stored data.

- Minicartridge drives—internal or external parallel, 250 MB
- Data Cartridge drives—internal, 250 MB, 525 MB, 1.35 GB
- DAT drives—internal, 2 GB or 4 GB
- Includes DOS and Windows software

NetWorker

Conner NetWorker offers Novell NetWare users a centralized, enterprise-wide backup and recovery product for complex networks.

- increase performance with concurrent backup of multiple clients in parallel
- true "lights out" operation through scheduling, autoloader support, and automated media management
- support for high performance, high capacity devices including DAT, 8mm and DLT drives and autoloaders

HSM

Conner introduces HSM—the first hierarchical storage management system for Novell NetWare.

- automatically migrates inactive network data to less expensive storage
- supports a hierarchy of hard disks, optical jukeboxes and tape libraries
- transparent user and application recall of migrated data

Autoloaders and Jukeboxes

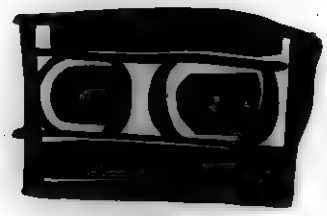
Conner also offers autoloaders and jukeboxes in capacities up to 50 GB—for DAT, DLT and optical network storage.

CS Disk and Tape Systems

Conner offers the industry's widest selection of SCSI tape and hard drive solutions for UNIX workstations and PC UNIX systems.

- capacities from 250 MB to 4 GB
- tested and certified for compatibility
- supported by a dedicated workstation and PC UNIX technical staff
- direct engineering efforts with all major UNIX vendors

Disk



Tape

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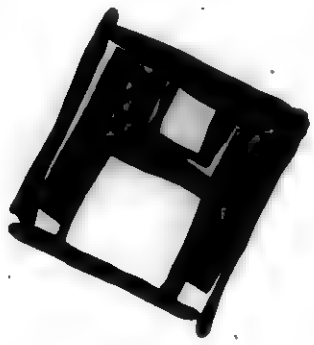
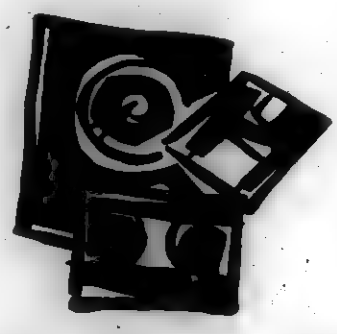
New storage solutions for every market.



Software



Storage Systems

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[redacted]

Peregrine Systems, Inc. has added the Automated Inventory Manager (AIM) module to its Network Automated Problem Applications (NAPA) software.

According to the Carlsbad, Calif., company, NAPA/AIM offers a seamless interface between MVS environments running NetView to the Peregrine Network Management System (PNMS).

NAPA/AIM supplies PNMS with real-time data, providing network administrators with complete inventory configuration data for all NetView-managed SNA devices.

Three other modules monitor network transactions and events, analyze job terminations and automatically open and close trouble tickets based on network alerts.

License fees begin at $11,000 for up to 29 CPUs.

▶ *Peregrine Systems*
(619) 431-2400

Telepartner International has announced Synchrony for the LAN, an Electronic Software Distribution system that automates the entire process of managing software distribution and retrieval on local and distributed LAN workstations.

According to the Farmington, Conn., company, the product delivers enterprisewide automated LAN capabilities, complete reporting and management features, an integrated administration component and Synchrony's client/server architecture.

Entry-level pricing begins at $1,000.

▶ *Telepartner International*
(203) 674-2640

XTree Co. in San Luis Obispo, Calif., has introduced network features for XTreeNet, a Novell, Inc. NetWare-based file manager that allows management of server volumes and disks on local or remote workstations.

Enhancements in Version 3.0 include Oops undelete for NetWare, integrated Zip 2.0 support, multiwindow text editor, file usage mode, file compare and updated file viewers.

XTreeNet 3.0 costs $495. Server extensions are priced at $295 each.

▶ *XTree Co.*
(805) 541-0604

Netlink, Inc. has announced the Frame Relay Access Node (FRAN), a product that improves the performance of SNA transport over frame-relay networks.

Proprietary frame-relay assembler/disassembler products are not required because FRAN uses industry standards such as the Internet Engineering Task Force Requests for Comment 1294 and 1490 to transport SNA traffic on the frame-relay network.

According to the Raleigh, N.C., company, FRAN converts the SNA/SDLC data to a native frame-relay interface and passes traffic over the frame-relay network to the bridge/router or the front-end processor to which it is logically connected.

Additional network devices are not needed.

A base Model One unit costs $3,995, and a fully configured expandable Model Four costs $17,500.

▶ *Netlink*
(919) 878-8812

Logicraft, Inc. has unveiled LanCD, CD-ROM networking software that allows network access to multiple CD-ROM drives.

Up to four different network protocols are supported simultaneously — one IPX/SPX and three NetBIOS. This support enables users with multiple networks, including Novell, Inc.'s NetWare and Banyan Systems, Inc.'s Vines, to simultaneously access CD-ROM applications.

Connectivity to Unix and VMS systems is provided when the product is used in conjunction with 486Ware and OmniWare, Logicraft's PC network servers.

A software package called FastCD that performs fast data searches is also included.

According to the Nashua, N.H., company, administrators can change serve parameters, set up and monitor CD-ROM licensing and view server activity from a remote LanCD client.

Pricing starts at $1,995 for a 100-simultaneous-user license.

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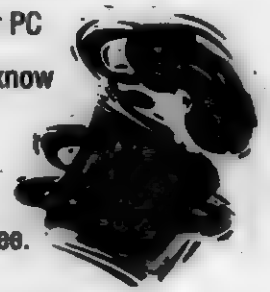

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CPW10413

Digital tries Unix again

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. wants to come in from the commercial Unix cold — again.

Recognizing that users still do not view it as a major commercial Unix vendor despite several recent attempts to forge a new image, Digital is gearing up for another try that will start next week with the introduction of a variety of layered software for its DEC OSF/1 operating system.

While this batch of software will not support key technologies such as symmetric multiprocessing, clustering and network management until 1994, Digital officials said they hope it will give DEC OSF/1 some initial commercial appeal when the system ships later this year (see chart).

Narrow appeal

Right now, DEC OSF/1's commercial capabilities "are rather limited" beyond support for some of the major relational databases and application development tools, acknowledged Mark Silverberg, Digital's commercial Unix marketing manager. As a result, he said, sales of Alpha AXP systems running DEC OSF/1 have been restricted mostly to technical users.

Changing that pattern will require more than just adding new products to the mix, however. "Digital's sales force built a reputation of being unwilling to talk seriously about Unix," said Wes Melling, an analyst at Gartner Group, Inc. in Stamford, Conn. "As long as that continues, they have a fundamental problem."

DEC OSF/1 "is a perfectly fine operating system, but there's an absolute ne-

Digital, *page 69*

Commercial zone

DIGITAL PLANS TO SHIP THE FOLLOWING LAYERED SOFTWARE PACKAGES FOR DEC OSF/1 BY YEAR'S END

[redacted]
Fail-over software that shifts processing to alternate computer in the event of a system crash. Requires dual-ported disk drives.

[redacted]
Distributed systems management tool for managing accounting control, security and other features across multivendor installations.

[redacted]
Backup software for use in restoring data in case of major system or network failure.

[redacted]
Combination of software and an optical jukebox for storing infrequently used data on optical disc drives.

[redacted]
File system with built-in utilities.

[redacted]
System analysis tool for monitoring performance and work load across a network.

Source: Digital Equipment Corp.

Pyramid aims Nile's power at data centers

By Mark Halper
SAN JOSE, CALIF.

Pyramid Technology Corp. is scheduled to power up its charge toward corporate data centers today when it unveils a top-of-the-line system that quadruples the performance maximum of earlier Pyramid products.

The company will tout its new Nile Series NS 150 for quantum advancements not only in throughput but also for what it called fault resilience, although users said they were more impressed with the line's raw power.

Pyramid said failures in individual Nile components, such as memory or bus controllers, will not cause the system to halt as such failures do on other computers.

The fault resilience pitch made little impression on one potential customer who is considering upgrading from the Pyramid MIServer ES line.

"I don't recall them talking about reliability," said Clifford Holtz, vice president of technical support at Anasazi, Inc., a Phoenix provider of computerized reservation services and software that is reviewing the product.

Nonetheless, Holtz noted, "there's a strong possibility that [Nile] is in our future." He said Anasazi will probably undertake a system expansion in 1994.

On the Nile

[redacted]
- processor
- Scales up to 16 processors
- 300-2,000 MIPS
- SPECint92 rating: 92
- 2 T-byte storage capacity; 48-bit memory capacity
- Pricing starts at $450,000

Pyramid claimed Nile CPU performance levels range from 280 MIPS to 2,080 MIPS, depending on processor configuration, compared with a 32- to 768-MIPS range on the ES server line that Pyramid introduced a year ago [CW, Oct. 19, 1992]. The Nile also carries a SPECint92 rating of 92; the ES line scores 26.

The company priced the series starting at $450,000 for a box with 256M bytes of main memory, 10G bytes of storage and 256 users. Pyramid said it plans a 40% price cut for the ES series, which currently costs from $120,000 to $2.2 million.

20 systems out there

Pyramid President John Chen said the company has shipped about 10 units to end users, including Churchill Insurance in the UK. The company has also delivered about 10 systems to business partners, including Electronic Data Systems Corp., Information Builders, Inc. and Oracle Corp., Chen said.

One Pyramid user, G. Heileman Brewing Co. in La-Crosse, Wis., will probably wait for a massively parallel system before upgrading, especially because it only recently moved to an ES model. Pyramid said it has a massively parallel machine under development but declined to elaborate on when it plans to make such a

Pyramid, *page 68*

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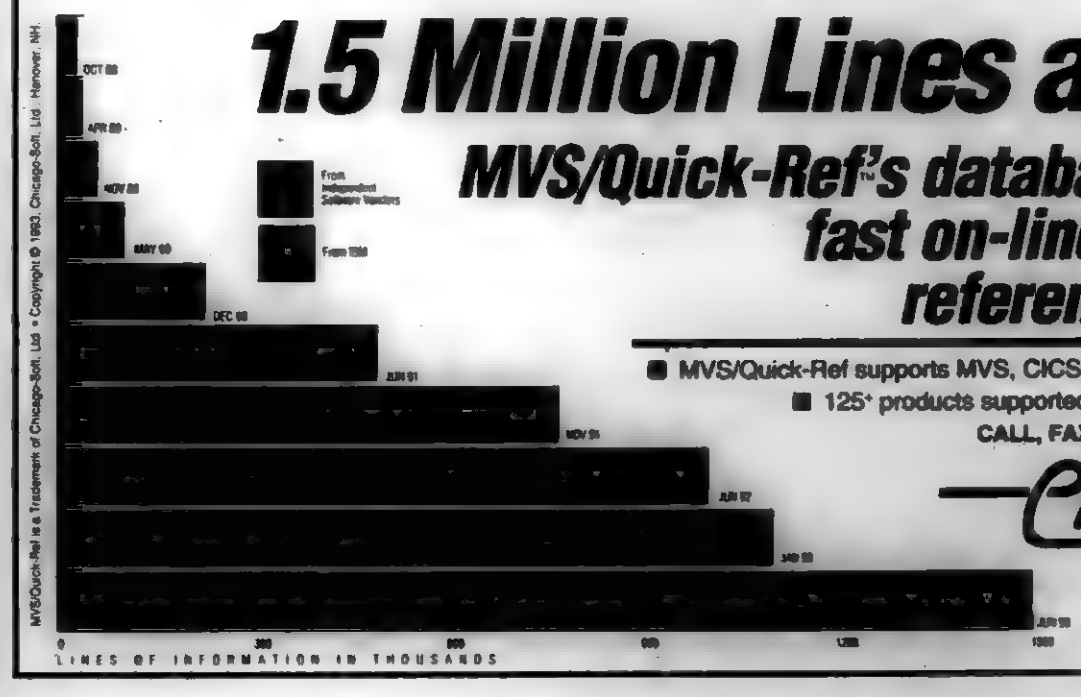

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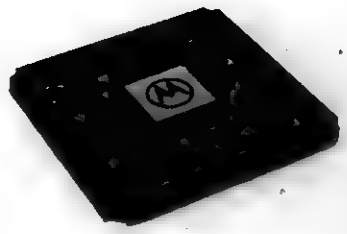

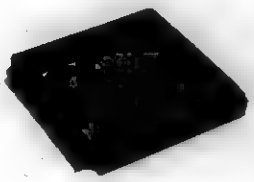

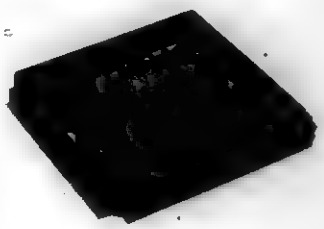

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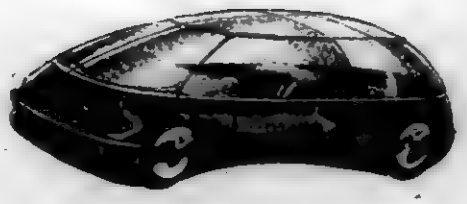

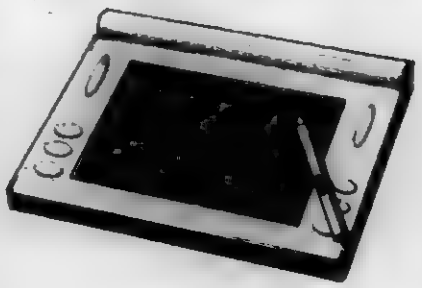

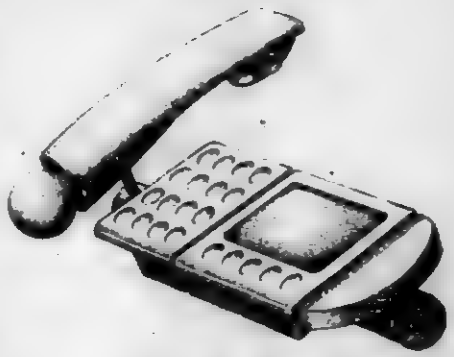

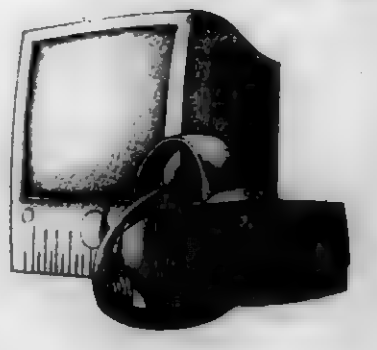

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Pyramid

CONTINUED FROM PAGE 65

product available.

"If we make a quantum leap in processing power, we'll probably go with massively parallel since we're a heavy Oracle user, and Oracle seems very complementary with that type of architecture," said Paul Ricker, Heileman vice president of information systems.

Pyramid President John Chen: *'Unix does have a solution'*

"Massively parallel really does bring you significant processing power," he added. "I suspect we'll go with it, unless, of course, someone comes out with something totally new and less expensive."

Heileman expects to be ready for a system upgrade in about a year, once its ES box hits 60% of capacity, Ricker noted.

Chen said Pyramid will release benchmark ratings from the Transaction Processing Performance Council (TPC) later this year. He said the company has not yet completed the TPC testing process because it has focused instead on partner endeavors, such as the Oracle database initiative.

The Nile series incorporates the 150-MHz R4400 microprocessor; the ES line uses the 32-MHz R3000. Nile scales up to 16 processors through eight boards with two processors each; ES scales to 24 using 12 boards.

Nile houses 12 slots for processor boards, memory cards and for I/O cards supporting up to 18 controllers each.

I/O enhancements contribute to the throughput leap. Pyramid said it doubled the width of its backplane bus to 128 bits, while ramping up bus speed to 25 MHz generating 400M byte/sec. performance. The 64-bit backplane on the older ES series runs at 10 MHz and 80M byte/sec.

It also doubled the number of I/O devices supported, from 36 to 72, but otherwise, I/O bus specifications remain the same, at 32 bits wide and 40M byte/sec.

Storage capacity is 1T byte on the Nile series, compared with 250G bytes on the ES. The system accommodates up to 4G bytes of main memory through four 1G-byte memory boards.

Judson Groshong, director of product marketing at Pyramid, said the Nile series is binary-compatible with the ES series. The company changed some source code on its Unix based DC/OSX operating system in order to take advantage of the R4400. With the changes, Pyramid modified the system's libraries and test and set instructions, Groshong said.

More tools

Pyramid said it is working with database vendors Oracle and Informix Software, Inc. to add database management and system administration features to the Nile series. Such additions could assuage potential data center customers concerned over the dearth of Unix management tools.

"If you compare the Unix world with the proprietary, the proprietary world has a stronger set of features to help data center managers manage their data center," noted Pyramid President John Chen. "Unix does have a solution but needs to be more user-friendly, more robust and reliable."

To that end, Chen said that first Oracle and then Informix will build functions such as backup and restore, network disk management and warm and cold starts into the next newest releases of their databases for the Nile series. Chen said he expects Oracle to complete its development effort before the end of the year.

"We are driven by a contract customer to get Oracle running first," Chen said. He declined to identify the customer, but it is believed to be the Metropolitan Water District in Los Angeles. — *Mark Hall*

CHOOSING THE WORLD'S BIGGEST DATABASE COMPANY MAY SEEM SAFE.

Digital

CONTINUED FROM PAGE 65

cessity that Digital swing people's perceptions 180 degrees," added Chris Christiansen, an analyst at International Data Corp. (IDC) in Framingham, Mass.

Digital did not even rank among the Top 10 vendors of commercial Unix systems priced from $10,000 to $1 million during 1992, according to IDC.

Silverberg agreed that Digital's Unix image is still less than sterling. The sales force has been giving Unix "a lot of resistance because of the perception that we haven't had good products to sell, especially when you match them with what we have on the OpenVMS platform," he said.

Digital hopes the new products and a stepped-up commercial Unix marketing campaign, said by sources to have a budget in the $40 million range, will help on the image front. The company is also putting all sales personnel through a new training program emphasizing DEC OSF/1, Silverberg said.

User reaction to Digital's efforts was mixed. "It's deja vu all over again," said Bob Cloninger, data processing manager at OK Industries, Inc., a poultry processor in Fort Smith, Ark. "I've heard that song and dance from them before. Do they mean it this time?"

Cloninger, who uses VAX 4000 systems with OpenVMS, said he will likely run DEC OSF/1-equipped Alpha AXP hardware on a trial basis. He added, though, that he "would be real reluctant right now to invest heavily in DEC OSF/1."

On the other hand, McCaw Cellular Communications, Inc. in Kirkland, Wash., is a satisfied user of Ultrix, Digital's earlier derivative of Unix, for a customer service application. "We kind of decided that their reputation was maybe not fully deserved," said Wayne Yerigan, McCaw's chief technical architect.

However, Yerigan noted that McCaw remains "a bit wary of DEC OSF/1" because of its lack of a production system track record. The company is testing DEC OSF/1 for possible use on Alpha hardware starting in January, but it is also evaluating Unix systems from Hewlett-Packard Co. and IBM, he added.

One issue is the availability of the third-party, system-level software McCaw uses. Several vendors are holding off on DEC OSF/1 ports until more demand develops for the operating system, Yerigan said.

Tools key

George Kerns, assistant vice president for cellular information management operations at GTE Telecommunications Products and Services in Atlanta, said he also is "open-minded" about using DEC OSF/1 for a client/server point-of-sale project now in the planning stage. However, Kerns noted that the choice would be driven mainly by application development tools, not the system itself.

Digital claims to have about 1,500 applications available for DEC OSF/1 now, and Silverberg said virtually all of the key ones should be in place by year's end.

Judith Hurwitz, president of the Hurwitz Consulting Group, Inc. in Watertown, Mass., said she is "more encouraged than I have been for a while" about the prospects for DEC OSF/1. "They are doing a lot of things right when it comes to Unix technology," she said. "They blew their credibility so many times that people aren't willing to believe in them until they have the technology available."

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Briefs

Sequent corners NASDAQ

The National Association of Securities Dealers (NASD) has signed Sequent Computer Systems, Inc. to a five-year agreement to provide NASD with Unix-based client/server systems and professional services for its corporate operations. In the first year of the contract, valued at $8 million, Sequent will install two clustered, Unix-based Symmetry 2000/700 multiprocessing systems designed to support more than 1,000 users. The new systems are part of NASD's initiative to provide [illegible] systems technology to facilitate [illegible] corporate and [illegible] plans of the NASDAQ stock market.

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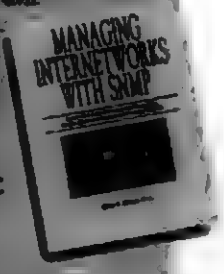

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Funeral home chain buries mainframe

By Ellis Booker

Rest in Peace, ES/9000. Rest in Peace, homegrown software.

The world's largest operator of funeral homes and cemeteries, Service Corp. International, will retire its IBM ES/9000 mainframe early next year and complete a migration to a top-of-the-line IBM AS/400 loaded with a commercial integrated business system.

The downsizing project began last March when the company's cemetery business relocated from San Diego to the corporate office in Houston, according to Vincent Ambriola, managing director of information technology and head of the company's 120-person information systems staff.

Ambriola, who joined Service Corp. in early 1990 from a national jewelry retailer, acknowledged that dropping by the firm's retail outlets is different from walking into a jewelry store. But, he said, "Actually, from a [data processing] point of view, we have the same problems to solve: how to use technology and information better and to see how the business operates."

As befits its somber industry, Service Corp.'s operation is simple. "We don't have major inventory, merchandising or credit requirements... things you might associate with a retail business," Ambriola explained.

Vincent Ambriola *was sold on the midrange*

ON SITE

Service Corp. International
Houston

Challenge: Gain efficiencies from integrated software package and elimination of mainframe overhead.

Technology: IBM AS/400 and Lawson Software financial applications.

Benefits: Expected savings of $4.9 million per year.

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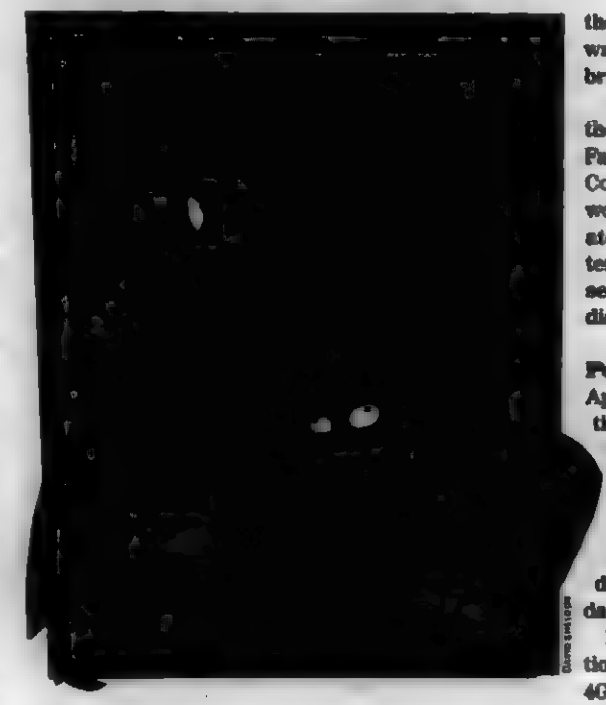
The reason was transaction volume. Service Corp. processes all its transactions on a daily basis and again at the end of the month. The month-end volume of 1.5 million transactions justified the ES/9000, according to Ambriola.

On the other hand, Ambriola was sold on the merits of the midrange platform, specifically its lower maintenance and software costs.

At last, the AS/400 line matured to the point where a cutover was deemed appropriate. Service Corp. is currently porting all its business to an AS/400 F90, a three-processor machine loaded with the maximum — 80G bytes of mirrored disk space.

At the same time, the company revamped its software strategy, electing earlier this year to buy an integrated business package from Lawson Software in Minneapolis.

"Replacing all the software, upgrading the San Diego AS/400 and installing a second AS/400 for development will consume $6.5 million," Ambriola figured. He said he expects a 28-month payback with an annualized savings of $2.8 million.



The mainframe migration in the home office was just one IS project at Service Corp. It took another two-and-a-half years to bring the field "offices" into the computer age.

"We decided to put MS-DOS computers in all the funeral homes and cemeteries," Ambriola said.

In the past, these 850 users had to fill out precise paperwork by hand, including state and federal forms, hospital forms, personal history and, of course, death certificates.

"We anticipated a lot of problems in training, but the PC displaced something they hated worse, which was filling out forms," Ambriola said.

The system was given the code-name Falcon; for Family Assistance Local Computer Operations Network, and currently generates all the forms and determines the prices for services and merchandise.

Point-of-sale

Apart from the unique setting, Falcon is a classic point-of-sale application: The Houston host polls the field-office computers nightly, downloading price updates while fetching sales data from each location.

Recently, using Information Builders, Inc. Focus 4GL, Ambriola's team enhanced the field systems to handle payroll, time and attendance and financial transactions.

Now Ambriola is looking to eliminate paper with imaging technology. In June, Service Corp. displaced its home-office microfiche operation with an IBM imaging product called RDARS and is considering converting its extensive law library to an on-line image database.

In what could be the most visible change for visitors to Service Corp. locations, Ambriola has been working with IBM to devise for funeral homes a multimedia kiosk that would let bereaved families preview different kinds of services and prices.

Reporter's Notebook

A certain buzz has grown customary at the semiannual conferences held by the International Association of Hewlett-Packard Computer Users (Interex), and the conclave held in San Francisco two weeks ago was no exception.

It is hardly news anymore that users are mad as bees that HP operates what has been called an archaic order-fulfillment system that makes doing business with it an onerous task. But it is revealing to learn what HP is doing about the problem.

Within HP's massive order fulfillment undertaking is a corporate statement-by-action that indicates which of the firm's two database programs HP actually thinks more highly of, Allbase/SQL or Image/SQL.

It is hard to pin down an HP executive on this question. Interrogatories on the subject customarily evoke wishy-washy answers lauding Allbase in some instances and Image in others.

But when it comes time for HP to install one or the other to help chairman Lewis Platt achieve one of his "Top 3 goals" — fixing order fulfillment — which database does HP choose?

The winner is Allbase/SQL.

This will be no small database. HP's effort to fix order fulfillment is essentially a corporate downsizing project of a nearly $20 billion business. Key to the project is a migration from an IBM IMS database running under IBM MVS on an IBM 3090 to an HP 3000 Corporate Business System running Allbase/SQL and HP's MPE/IX proprietary operating system with Unix hooks.

The database is one that will house customer information, pricing and contract files.

The MPE/IX system will tie into HP 3000 Unix-based operations that will form the underpinning of an order quotation and configuration system called Conquest [CW, Sept. 27].

Meanwhile, Interex was full of other product news from HP and third parties. HP announced the following:

- As expected, it added a box to the HP 3000 line that tops the performance of all other HP 3000s except for versions in HP's top-of-the-line Corporate Business Systems series [CW, Sept. 13].

The new HP 3000 Series 967/150 supports up to 1,700 simultaneous users, according to the company. The 96-MHz PA-RISC 7100-based system is priced at $138,320 for a version with 64M bytes of memory, a 100-user license, 1G byte of storage and four I/O slots. It costs $164,820 with 12 I/O slots.

- The company said it will release Version 5.0 of MPE/IX in the second quarter of next year.
- HP is easing the software update process for some HP 3000 applications through an "MPE-Express" program that reduces downtime during the update process.
- HP added direct support for Lotus' CC:Mail and Microsoft's Mail clients to its HP 3000.

Third-party announcements included the following:

- Information Builders (IBI) said it is tying its Focus 4GL development software and its Enterprise Data Access (EDA)/SQL access software into Progress Software's Progress relational database management system. IBI also said it is providing EDA/SQL access to Dynamic Information Systems Corp.'s Omnidex Information Management system.
- Speedware Corp. said it will make its Speedware Version 7.02 client/server development environment available for the HP 3000 and IBM RS/6000 during the fourth quarter. Speedware also said it plans a line of financial software called Speedware Financials Release 1.0 that will run initially on the HP 3000 using Allbase. The program will be available by the end of this year, the firm said.
- Sterling Software said it will port its Centran:Basic EDS management software to the HP 3000.
- Wang introduced image-enabling software for the HP 3000's MPE/IX operating system.
- Financial software vendor Multiview Corp. said HP designated it as a VAR.

—*Mark Halper*

IDEAssociates, Inc. has introduced the IDEA Concert communication processor, a product that allows direct Token Ring communication to the IBM AS/400 midrange systems.

IDEA Concert 2.1 combines features needed to join SNA communications and PC LANs.

As a network changes, IDEA Concert can expand to accommodate a low entry point of 16 devices up to a maximum configuration of 84 devices. The IDEA Concert Brouter option enables the processor to support industry-standard IP and IPX routing. IDEA Concert SNA Datastream Management permits SNA protocol traffic to be routed over LAN internetworks, according to the Billerica, Mass., company.

Prices for IDEA Concert communication processors range from $3,820 for 16-device support up to $17,470 for 84-device support.

▶ *IDEAssociates*
(508) 663-6878

Platinum Technology, Inc. has announced the beta release of Log Analyzer, a product designed for analyzing log data sets, bootstrap data sets and image copies.

According to the Oakbrook Terrace, Ill., company, Platinum's Log Analyzer allows database administrators and systems programmers to use information contained in the DB2 log for auditing data changes and monitoring table space recovery information.

The product offers auditing capabilities such as a data manipulation language activity report, an image copy frequency report, a commit frequency report and a rollback activity report.

Other features include the ability to format data changes made to tables that were dropped and recreated and list active and archive log data sets on-line.

Prices range from $16,698 to $111,756.

▶ *Platinum Technology*
(708) 620-5000

Jensen Research Corp. has introduced Side by Side, an IBM Interactive System Productivity Facility-based utility designed for comparing source records.

According to the Oakland, N.J., company, Side by Side lets users compare different files containing source code, screen panels and job control language line by line.

The product has an intuitive, productivity-based interface, and users can see the difference between two files displayed graphically, side by side and in context on an ISPF panel.

The utility works on sequential, partitioned, CA-Librarian or CA-Panvalet data sets.

Side by Side has an introductory price of $2,499 for a permanent license. A one-year license costs $999.

▶ *Jensen Research*
(201) 337-4000

TeamQuest Corp. has announced Release 5.1 of the Capacity Management Facility (CMF) Baseline performance analysis software for Cray Research, Inc.'s Cray X-MP, Cray Y-MP and Cray C90 series systems running the Unicos operating system.

According to the Clear Lake, Iowa, company, CMF Baseline is part of a suite of products that provide historic analysis, real-time monitoring and computer performance modeling across heterogeneous computer architectures.

Prices range from $21,000 to $96,000.

▶ *TeamQuest*
(515) 357-2700

Aris Corp. has introduced Aris Dfrag, a space management utility that defragments database tables.

According to the Seattle company, the product assists Oracle Corp.'s Oracle Database Administrator in managing database space more efficiently.

The software can be used on an assortment of platforms with Version 6 and Oracle 7 relational database management system.

User-supplied configuration parameters enable the software to analyze tables for possible fragmentation. The software then recommends more efficient storage parameters for every fragmented table.

Prices for a single license of Dfrag start at $1,295.

▶ *Aris*
(206) 433-3081

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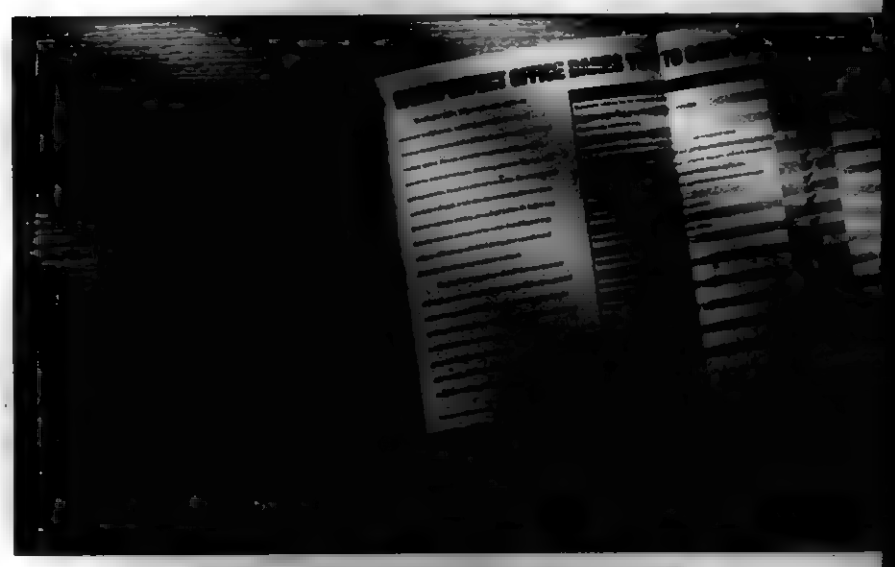

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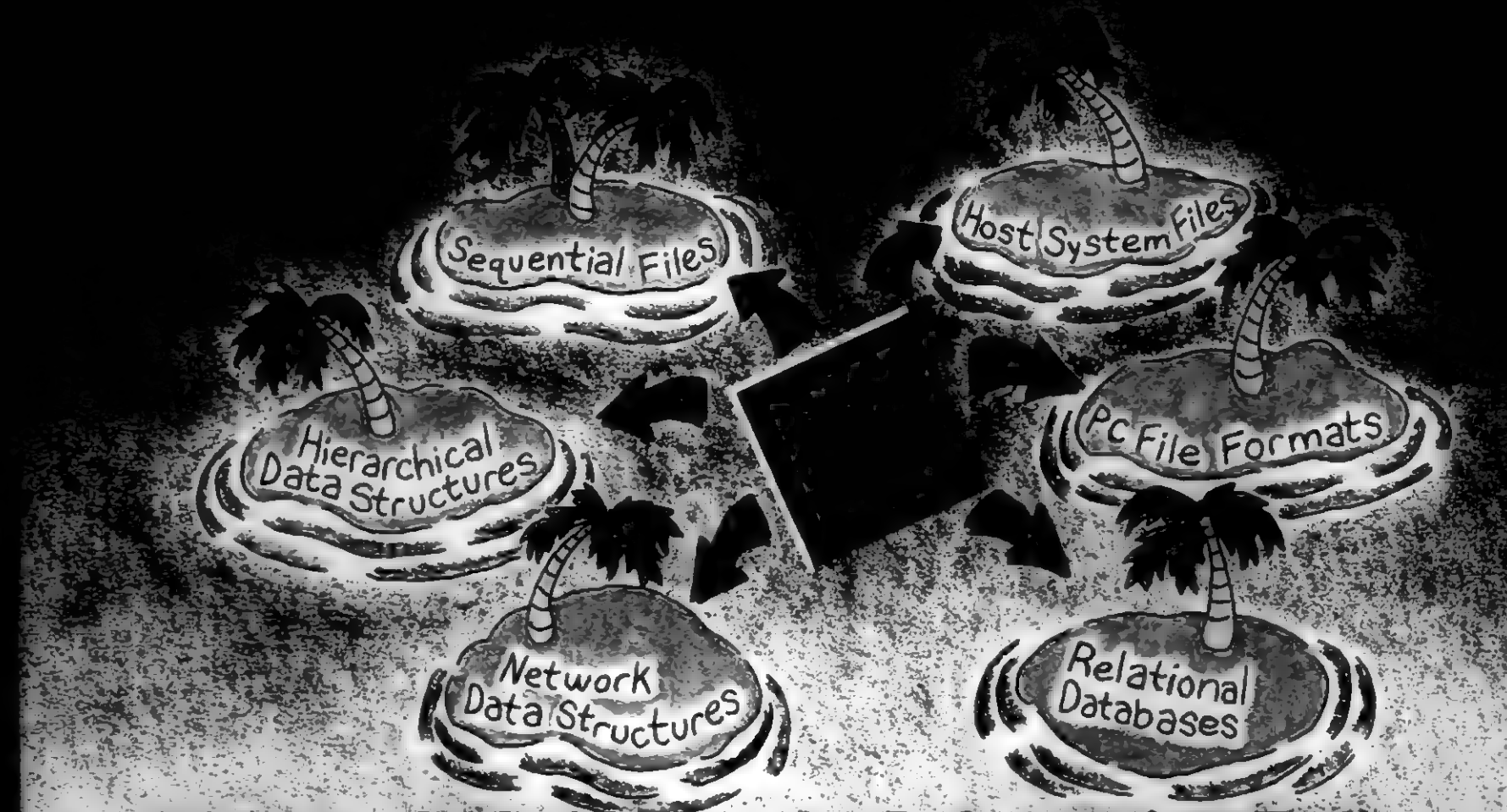
WordPerfect Office



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OMG seeks more user input for Corba spec

Group hopes to strengthen new versions of standard, build customer support

By Melinda-Carol Ballou

Responding both to pressure from its user membership and the need to create a cooperative relationship with the Microsoft Corp. behemoth, the Object Management Group (OMG) will shift the way its object-oriented standard is determined. The goal is to more effectively elicit user input, OMG officials said.

Corporate sites developing distributed applications require standards that are common across vendor offerings, and one key emerging standard is the Common Object Request Broker Architecture (Corba) from the OMG, a consortium of vendors and end users with headquarters in Framingham, Mass.

Backing Corba

While Microsoft has pulled out the stops for Object Linking and Embedding (OLE) 2.0 and Cairo, its strategy for distributed, object-oriented computing, other systems vendors have banded behind the OMG's Corba as a standard for enabling objects to communicate with one another. For instance, Hewlett-Packard Co. [CW, Sept. 27], IBM, Digital Equipment Corp., Sun Microsystems, Inc. and others have released or announced their Corba implementations during the past few months.

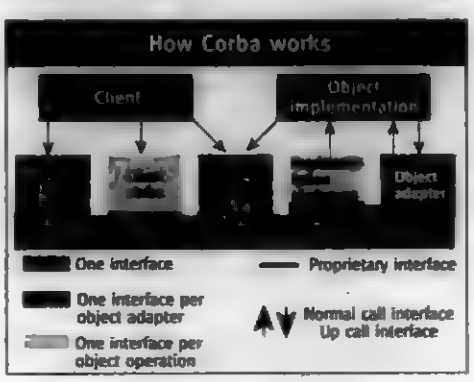
Corba includes a language for describing the interface of an application, called Interface Definition Language, and dynamic and static application programming interfaces (API) for accessing objects across the network. Corba acts as a traffic controller between objects, directing them to allow software on a network to communicate with software elsewhere.

Voting shift

In an effort to better integrate end users into the standards process, the OMG is shifting the way its standard is determined. Until recently, the end-user Special Interest Group (SIG) for the OMG had one vote on the OMG's technical committee. This committee evaluates proposals and then makes its recommendation for a standard to the OMG's board of directors.

The OMG has now established one end-user seat on its board, which votes on the implementation of the standard. The board bases its vote on the recommendation of the technical committee.

In addition, the OMG is expanding end-user involvement so that the entire SIG will evaluate the emerging standard according to purely end-user requirements. This process will probably occur in parallel with the technical committee's work. The end-user SIG's recommendation will be presented to the board and will be given equal consideration with the technical recommendation, OMG officials said. This shift in policy is expected to be finalized in December when the board votes on the proposal.



Users responded enthusiastically to the idea of greater input.

"It would be incredible.... [Full] end-user involvement has been a missing element," said Samir Desai, a member of the technical staff at Bellcore. The OMG standards process has "normally been dominated by vendors. And it's also good for vendors to switch this process. If end users aren't happy, they won't shell out the money, and [vendors] can write all the standards and products they want, but they won't be sold."

Right direction

Nancy Craig, a technical manager at a major financial firm in the Midwest, said her organization sees Corba as a step in the right direction as a standard for distributed computing and looks forward to having input into the standards development process.

"I really want to see it working. Vendors promise a lot, but I want to see how it's implemented," she said. Her organization does not want to be too tightly coupled to Windows environments and is evaluating the Open Software Foundation's Distributed Computing Environment as well as the

OMG, *page 78*

Strategic moves

Novell, Inc. will embed the Corba spec via HyperDesk Corp.'s Distributed Object Management System (DOMS) into a range of Novell operating systems. DOMS is also key to Novell's AppWare strategy.

IBM's Distributed System Object Model currently only runs on OS/2 and AIX, and Sun's Project DOE and HP's ORB Plus only run on Unix operating systems. The Digital and HyperDesk implementations of Corba are set apart from the others by the greater range of operating systems on which they run. These include Windows, Macintosh, Unix and Digital's VMS, among others.

Tools development

Sapiens weds host and client/server

By Melinda-Carol Ballou

Sapiens International Corp. N.V. will combine its host-based tools with client/server tools from SmartStar Corp. to target development across PCs, mainframes, workstations and multiple databases, company officials said.

Known primarily for its PC and host-based rapid application development tools, Sapiens last month began shipping Sapiens Vision for Hewlett-Packard Co.'s HP/UX. Sapiens Vision is an object-oriented tool for rapid development of client/server applications for Unix, Digital Equipment Corp.'s VMS or IBM PCs in a LAN-based environment. Vision was originally developed by SmartStar. Sapiens completed a merger with SmartStar in July.

By the middle of next year, Sapiens officials said they expect to ship an interface between Sapiens' mainframe and PC-based rapid development tools and the Vision products.

How will the interface work? Sapiens Vision applications on the client will request services from Sapiens ES applications on the mainframe by transmitting messages across the network, officials said (see chart). These messages will trigger objects that process data on the mainframe. The results will then be transmitted back to the Vision application on the client. This will enable Vision users to access legacy mainframe data transparently, officials said, and to rapidly develop applications across the enterprise.

Enthusiastic users

Several users were enthusiastic about the potential advantages resulting from the link between the two tools.

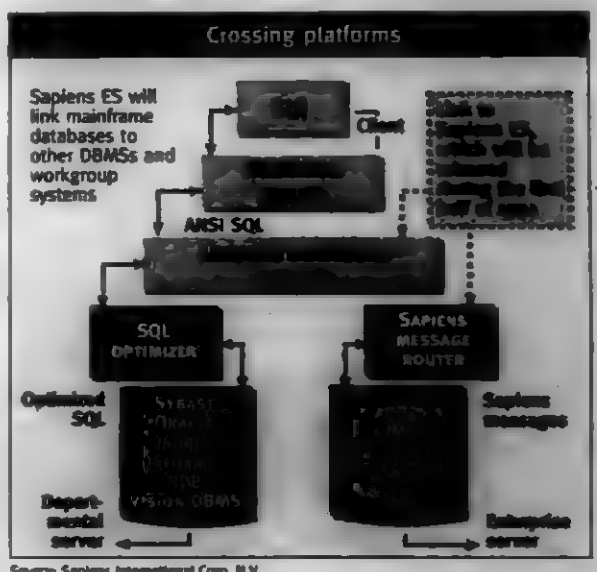
The GE Structured Products Division of General Electric Co. in Mt. Vernon, Ind., currently uses Vision to automate the tracking process for order entry and other records across its manufacturing and business administration departments.

The group uses Digital's Rdb running on a VAX 6000 and an IBM IMS database running on an IBM 3090. Ron Giles, a senior engineer in the group, said he hopes to use the interface between Vision and Sapiens ES tools to program directly to IMS, eliminating the conversion process of downloading and uploading data between Rdb and IMS.

"We would be able to write directly to each database from the client, which makes the application easier to maintain, cleaner and more reliable," Giles said.

The link between the tools will also enable his group to connect its Rdb data to DB2 databases elsewhere at GE and will facilitate a shift to Sybase, Inc.'s SQL Server on the VMS side, he said.

In pricing the requirements for an upcoming project, his group expected cost savings of 30% with Vision. The decrease in programming man-hours is due to the use of business rules rather than procedural programming techniques to develop applications, Giles said.



Source: Sapiens International Corp. N.V.

OMG seeks user input

CONTINUED FROM PAGE 77

OMG's Corba as options.

Currently, the OMG is in the process of establishing standards for low-level services for Corba, such as naming, transactions and persistence services.

Early next year the group will set the standard for interoperability across differing implementations of Corba. Currently, vendors can offer Corba-compliant products that are not interoperable.

Second spec

Dubbed Corba 2, the interoperability spec will change that. Key vendors have committed to supporting Corba 2 as it emerges. IBM, HP and Sun, for instance, are already working on interoperable APIs for Corba across their implementations of the ORB. Products based on Corba 2 specs will not hit the streets until mid-1994 at the earliest, analysts said.

Conspicuously absent from articulating its position on support for Corba was Microsoft. Although Microsoft is a member of the OMG, company officials seem ambivalent about offering relevant technology to the consortium — such as the object interface from OLE — or putting its full weight behind the standard.

Microsoft resumed attending OMG meetings several months ago after a year's hiatus, and sources within Microsoft have said the company may offer portions of OLE for the emerging Corba 2 specification. But Microsoft OMG representative Mark Ryland and others denied that any such decision has been made.

Other industry sources said that Digital will release a bridge between OLE and Corba in January. This could be one likely option for users seeking a link between OLE and Corba [CW, June 21].

Analysts and OMG representatives agreed that customer demand will be the only effective way to pull Microsoft into the Corba fold.

If the OMG's current push to coordinate development of the standard with end-user requirements succeeds, the standards group may have an effective customer lobby for nudging Microsoft into more active support for Corba.

Waiting in the wings

The following Corba implementations are generally available or in early release form:

Digital offers Object Broker, formerly known as ACA Services, and HyperDesk Corp. offers Distributed Object Management System.

IBM offers Distributed System Object Model (DSOM) and System Object Model on OS/2 and will soon offer the products on AIX. Windows clients are under development.

DSOM is used by the Open Doc software architecture from Apple Computer, Inc., IBM, Novell, Inc., WordPerfect Corp. and Borland International, Inc.

Sun offers Project Distributed Object Environment (DOE) in early release form. Both Sun and IBM are targeting Microsoft's future Cairo distributed, object-oriented computing environment with their products. Digital, on the other hand, is focusing on systems integration. HyperDesk is concentrating on LAN-based applications, according to industry analysts.

Hewlett-Packard currently offers Distributed Smalltalk, for which the company just released a new version. HP will also ship ORB Plus as part of an early access program. ORB Plus will be available in January.

Iona Technologies Ltd. launched Orbix earlier this year and will ship its product on Windows NT next week, with Windows support to follow in January.

Other vendors with pending Corba implementations include NCR Corp. and Expersoft Corp.

— Melinda-Carol Ballou

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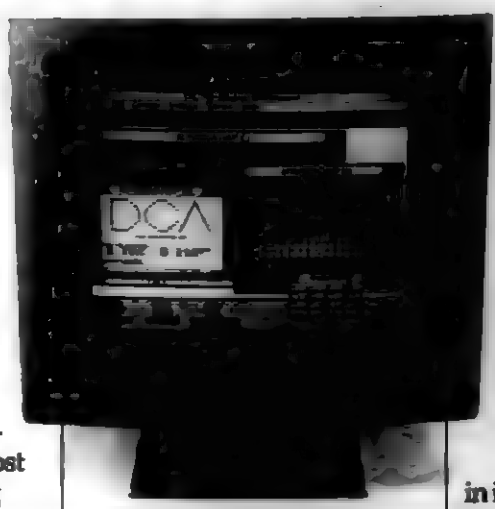

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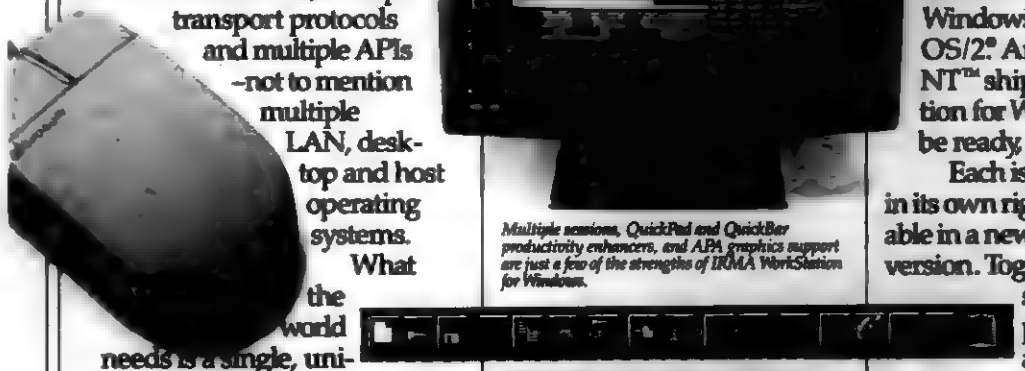

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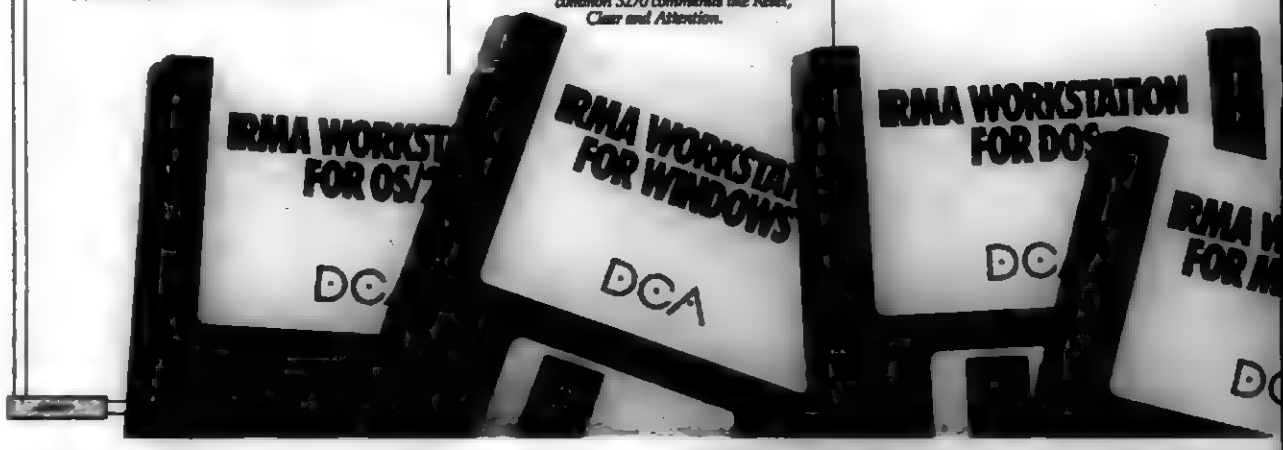


Software AG rolls out options

By Gary H. Anthes
RESTON, VA.

Software AG of North America, Inc. will uncouple its software maintenance pricing from its product license fees and offer multilevel technical support options. This is consistent with the trend in the industry to offer more flexibility and support to users in complex computing environments.

The options greatly expand and codify customer choices, which had been limited to a single no-frills product warranty that promised free technical support for 90 days followed by an optional maintenance agreement for a fixed percentage of the license fee, usually about 15%.

"Customers expected 24 [hour] by seven [day] support, limited access to an electronic service and that was about it," said Michael Davis, director of services marketing and business development.

Now, customers with modest needs may chose a "basic" option that offers support only during normal business hours at a discount off the previous rates. An "extended" option promises coverage around-the-clock, faster response times and a free electronic service package. Though prices will no longer be pegged to license fees, the extended option will average about 15% of the annual fee, said Dennis Privitera, vice president of customer support.

The most demanding users can pick a custom-priced, "mission-critical" option that further shortens promised response time and in essence brings in Software AG as a partner, offering on-site problem-solving, training and consulting.

Davis said the new options are the result of a survey of Software AG customers that showed that budget pressures, new technologies and moves from mainframe to distributed computing have left users feeling more vulnerable and less able to support their total data processing environments.

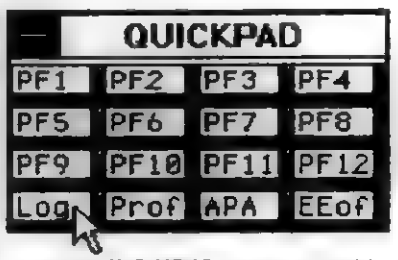
Software AG customer National Gypsum Co. in Charlotte, N.C., has not decided on an option yet but is seeking to strengthen partnerships with strategic vendors as part of a quality management program. "Software AG is definitely one of those vendors," said David Walsh, vice president of information systems.

> **"We may be willing to pay more for support ... if it allows us to lower our total operating cost or improve availability."**
>
> *— David Walsh*
> *National Gypsum*

Walsh said National Gypsum has mission-critical applications, such as order processing and billing, on an IBM 3084 mainframe using Software AG products. "We are looking at the role that our proprietary software can play in supporting planned changes in our business," he said. "We are concerned with a lot of things like portability of code to distributed platforms. The business changes may or may not increase our vulnerability, but to the extent they do, we might want to have available different maintenance options."

"We may be willing to pay more for support if in the long run it allows us to lower our total operating cost or improve availability," Walsh said.

The extended and mission-critical options are available now; the basic service option will be available Jan. 1.



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of the desktop and the networked host/server.

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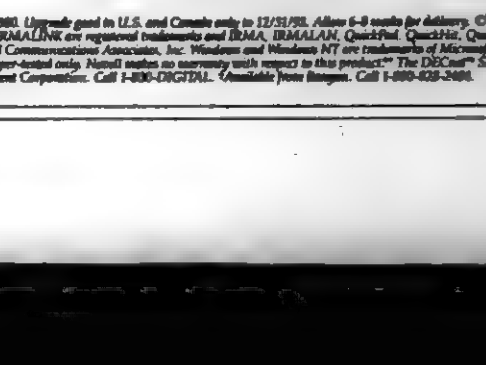
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David B. Ciolkowski

Going with Basic

Requiem aeternam dona eis Domine.

That is the first line of a requiem, a Mass for the dead. I offer it to signify the death of XBase, the generic version of the programming languages descended from Ashton-Tate's original dBase. As an MIS director whose responsibilities include management of application development, I have enacted a moratorium on new development projects in any XBase dialect.

We are a Microsoft shop through and through. Microsoft Office is used by all employees. Access, Visual Basic and Visual C++ are used by the development staff. Programmers are trained in Basic. The only XBase programming happening is maintenance on Fox systems.

In the Microsoft-centric world, Basic is the thread that weaves through all levels of IS. Access Basic is used in the corporate database manager. Visual Basic is used to create robust, stand-alone applications. On the horizon, Visual Basic for Applications will be used as the standard macro language for Microsoft Office. Strategically, XBase does not have a place in this environment.

Two years ago, I would not have dreamed I would be delivering a eulogy for XBase or embracing Basic. I was a supporter of Clipper and spent hours writing Clipper code in my spare time. In my current position as MIS director, it has become increasingly clear that XBase has no future in strategic planning. The following events have galvanized my support for Basic as the standard programming language for IS:

Clipper Version 5.0
Clipper had (and still has) a significant following of consultants who build custom software. Until Version 5.0, it maintained a loose compatibility with XBase. Programmers familiar with XBase dialect could navigate through Clipper to a degree. Then Nantucket decided the object-oriented phenomenon was too important to ignore. It radically changed Clipper's design and added functions.

Borland's purchase of Ashton-Tate
Borland had its own database and programming language, Paradox and PAL, and it wasn't clear how Kahn and Co. would position the flagship XBase product. Borland still has not differentiated dBase for Windows or Paradox for Windows. Nor have they demonstrated any commitment to expanding the use of dBase beyond database applications.

Microsoft's purchase of Fox
"Take that!" said Bill Gates. Microsoft also had plans for its own database and programming language, Access and Access Basic. However, Microsoft's strategy for Basic was significantly more robust than Borland's plans for PAL.

Arago "Quicksilver" bought by Borland
Since purchasing Ashton-Tate, Borland has shown itself to be unconcerned with customers of its newly acquired products by letting Multimate die. The Quicksilver purchase was clearly an attempt by Borland to remove competition. The role of PAL/Paradox vis-a-vis dBase is a concern among Borland customers.

Microsoft's release of Access 1.0
Aside from performance problems on machines with limited resources, Microsoft Access proved to be well-designed. Its programming language, Basic, is an example of Microsoft's commitment to Basic as the language of choice.

By targeting Basic as a database development and comprehensive macro language, Microsoft has ensured that choosing Basic is a good strategic decision. Basic experts will be able to fill many roles within IS. XBase and PAL, good as they are, do not offer the same benefits.

Ciolkowski is director of MIS for Abrams, Beinish Riker, Inc./Colliers International Property Consultants in New York.

Clean up

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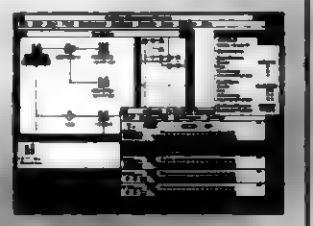

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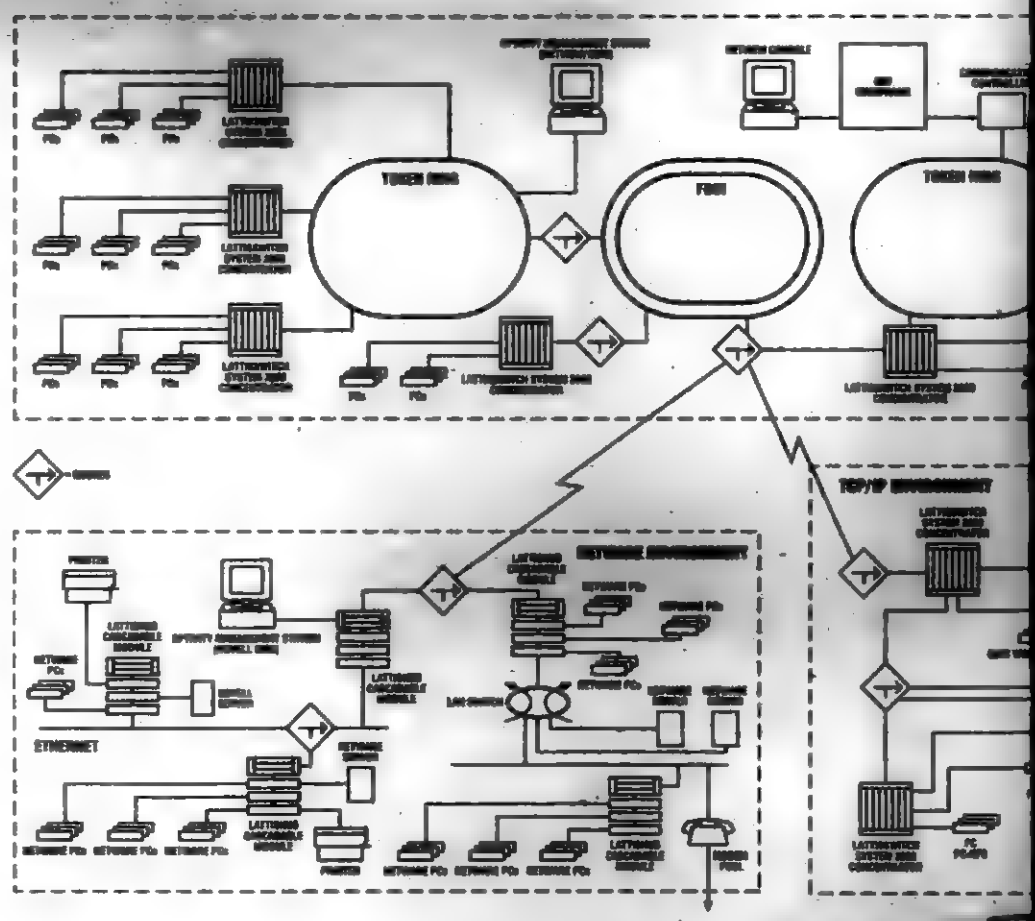

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The Advanced Information Management Software Division of **Texas Instruments, Inc.** has introduced the Graphical Application Facility (Graf) family of products for use with the Information Engineering Facility for Client/Server.

According to the Plano, Texas-based company, Graf lets users interact graphically with application data through real-time views of current information.

Graf is available for Windows and OS/2 2.1 environments.

A stand-alone Graf Development Toolset costs $5,000.

▶ *Texas Instruments*
(214) 995-6611

MicroStrategy, Inc. has announced Version 2.11 of EISToolkit, a development environment for building applications for cross-platform, client/server executive information systems (EIS) and decision support systems.

A programmer can create a graphical EIS that includes database management, graphs and controls, "what if" capabilities and modeling features for information analysis, according to the Wilmington, Del., company.

The product is based on Informix Corp.'s HyperScript fourth-generation language and includes MicroStrategy's proprietary SQL Language Extensions.

For Windows and Macintosh computers, the Designer version costs $1,995; the 10-pack user version costs $7,995. For Unix, the Designer version is priced at $2,495, and the user version 10-pack costs $9,995.

▶ *MicroStrategy*
(202) 427-8800

Interactive Development Environments has introduced Software through Pictures/Information Modeling (STP/IM) on Sun Microsystems, Inc.'s SPARC, Hewlett-Packard Co.'s HP 9000 Series 700 and IBM's RS/6000 workstations.

According to the San Francisco-based company, the product is the first robust Unix information modeling tool set that provides comprehensive support for client/server development.

Conceptual and logical models can be built, and STP/IM groups can generate SQL for relational database management systems and deploy resulting applications on an assortment of platforms.

STP/IM licenses are available for $15,000 per user.

▶ *Interactive Development Environments*
(415) 543-0900

Must Software International has announced that Nomad 3.4, its fourth-generation language (4GL), is now available for SunSoft, Inc.'s Solaris 2.0.

The product is an integrated set of 4GL information management tools designed for developing scalable applications using client/server technology, according to the Norwalk, Conn., company.

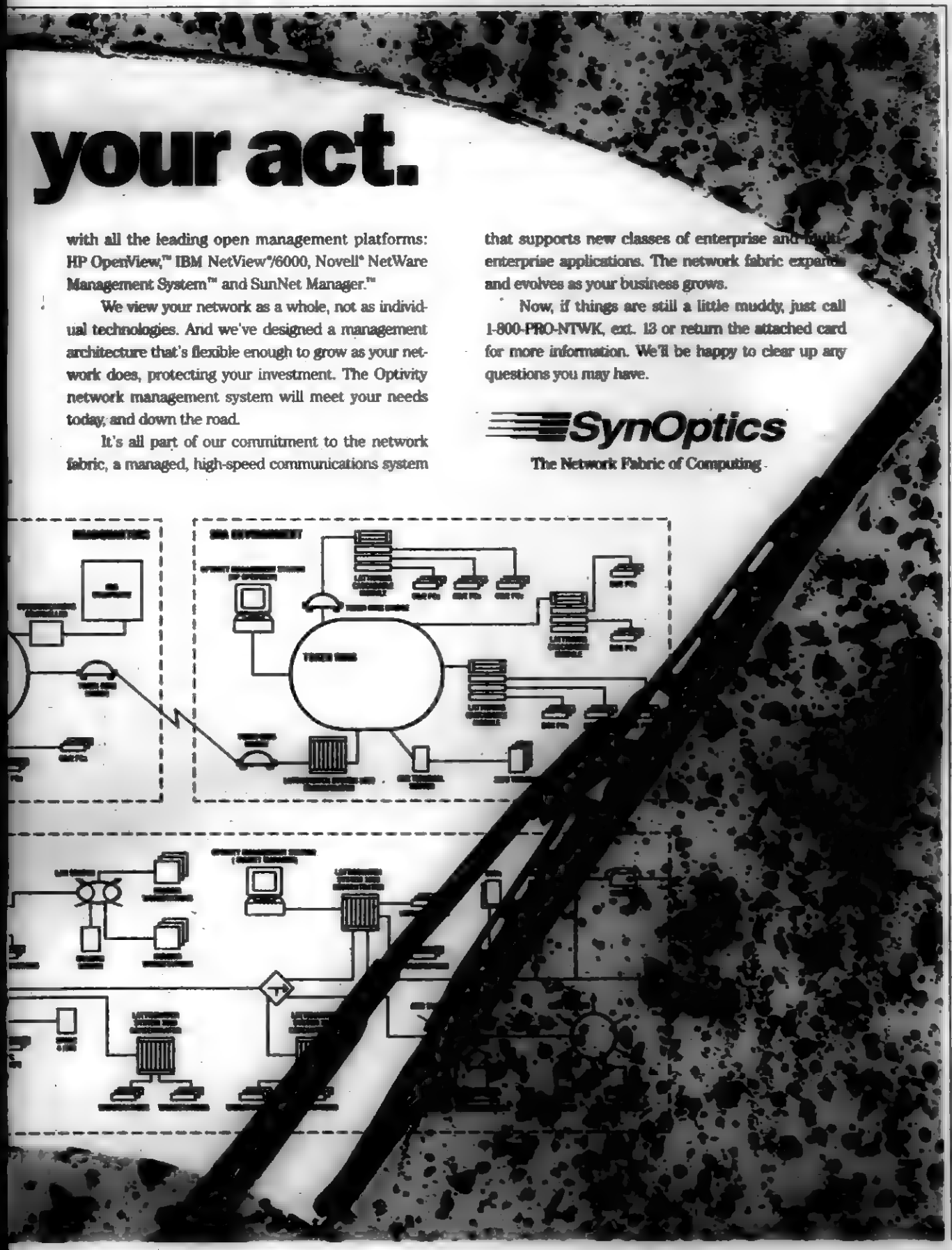
Users will receive reporting and data management facilities, a windowed user interface, procedural language, nonprocedural 4GL, a developer's workbench and a syntax-free reporting front end.

Prices for Nomad 3.4 range from $2,500 for a single-user workstation to $10,500 to $150,000 for multiuser systems.

▶ *Must Software International*
(203) 845-5000

Product Sheet

LogicCraft Corp. has introduced LogicNet Knowledge Interpreter DLL, a macro language designed for use with CyberNet Object Database DLL. The product offers a level of abstraction that maps data types and operations onto the object database system. It supports the use of string and numerical data types, lists and compound expressions. Cost: $200 per copy. LogicCraft, Edmonton, Alberta (403) 435-4049.



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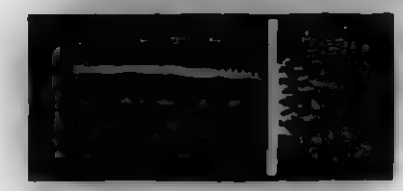

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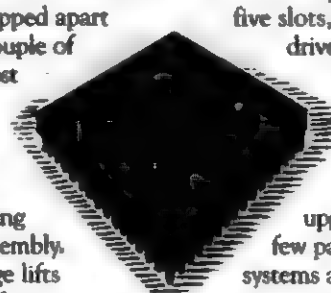

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evasive action

Changing business processes with work-flow systems starts with tracking existing procedures. Unfortunately, many employees would rather cover their tracks.

By Lynda Radosevich

Some employees just don't want you to know how they work. And such workers' penchants can play havoc with business process redesign.

"When you ask questions, they might mislead you. Or they play games, such as being too busy to be interviewed," says Gamile Sakla, an assistant vice president at the First National Bank of Chicago. He's recalling an analysis of customer service employees' work habits conducted prior to the bank's installing a computerized work-flow system.

"Then you cross-examine another person doing the same job, and there's a gap between what they say they are doing and what is happening. The idea is to mislead because they know we're going to change the work flow."

"The idea is to mislead because they know we're going to change the work flow."

Gamile Sakla
First National Bank of Chicago

Horse before the cart

Like First National, any company determined to reap the full benefits of work-flow technologies must accurately analyze how work is accomplished, experts say. Computerized work flow, after all, is the aspect of business process redesign that automates shared work procedures. By documenting those work patterns, the company can spot inefficiencies and reengineer processes before deploying new systems. Like First National, however, many companies find that recalcitrant employees can stymie that analysis.

"Resistance is a big problem" in the initial work-flow analysis stage, says Jim Bear, a senior analyst at New Science Associates, Inc., a consulting firm in Santa Clara, Calif. "It's the same for deploying all new systems, including E-mail, document management and computer-aided design. But work flow has the most extreme impact on working patterns, so it gets the most resistance."

Work patterns are arguably the most personal realm of a corporate culture that resists change, and it's these cultural issues that pose the biggest challenge to managers deploying a work-flow system, says Tom Koulopoulos, president of Delphi Consulting Group, Inc. in Boston.

In Delphi Consulting's 1993 study of 400 companies in Boston, two-thirds of the respondents cited cultural resistance to change and the difficulty of redesigning processes as the major challenges to implementing computerized work flow.

Robert Glass, who publishes *The Software Practitioner* industry journal in State College, Pa., relates the anecdote about a major computer industry company that helped pioneer work flow.

"They held a series of meetings with office staff to define what happens so they could automate it," Glass said. "At the end of the series, one office worker said, 'If our office manager hadn't been present, we would have told you what really happens.'"

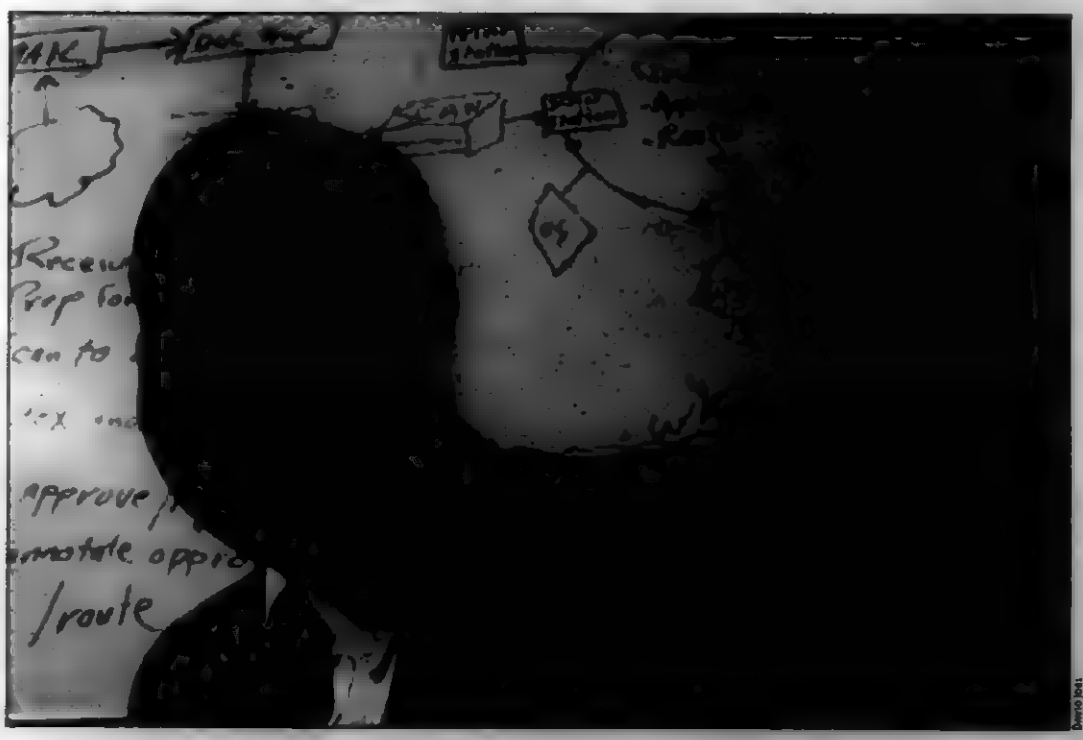
What really happens, experts say, is that employees fear that if they tell their managers what they do, the new process will eliminate their jobs.

Often, they are right.

For example, Empire Blue Cross and Blue Shield of New York, which has suffered well-publicized financial difficulties, recently eliminated 240 positions. Company officials confirm that the layoff was linked in part to an image-enabled work-flow system that automates claims-processing operations.

"Most of your savings come from reducing personnel," says Mike Nieberding, Empire Blue Cross vice president of advanced technologies, emphasizing that the em-

Evasive action, *page 84*



▶ First National Bank of Chicago's Gamile Sakla: *Work-flow analysis met with employee resistance*

Evasive action

CONTINUED FROM PAGE 83

ployees knew job cuts would be accomplished by attrition.

Another reason employees dig in their heels is their conviction that if they share what they know, their importance to the company will vanish, analysts say.

"It depends on the corporate culture. For some, knowledge is power, and they don't want to share what they know," says Brownell Chalstrom, president of Chalstrom Consulting in Oakland, Calif.

"If what got them promoted in the past were individual cowboy approaches and they think that will be taken away, then you have a problem," he says.

> "If what got them promoted in the past were individual cowboy approaches and they think that will be taken away, then you have a problem."
>
> **Brownell Chalstrom**
> **Chalstrom Consulting**

> "It's a tough process to get group consensus without humiliation."
>
> **Mary Schramke**
> **Aetna Life and Casualty**

> "I interviewed seven people in the same positions and got seven different descriptions of what they did."
>
> **Peter Stiles**
> **Advantage Design**

No more multitasking?

Workers can also fear that the impending work-flow system will neutralize or "de-skill" them. Fear of "de-skilling" is more widespread where employees perform many subtasks and the new system threatens to shrink their job to one task, Bear says.

Failure in the preliminary analysis to understand exactly how employees work can lead to a work-flow system that contains the inefficiencies of the original process, experts say. And that result, in turn, can cause information systems managers to resort to a little creative storytelling themselves.

Glass says many IS managers have to lie to their managers because initial estimates for cost, savings and development time aren't met. But evasive action isn't the only obstacle that IS managers may face in trying to assess the work process. The degree to which a company has trouble analyzing how people work has a lot to do with the company's motivation for re-engineering the workplace, experts say.

A common approach to redesigning business processes seeks to reduce the number of steps in a process and then automate the way in which the steps are performed by serially rerouting things. This approach is often coupled to reducing and de-skilling staff, and, Bear says, usually leads to demoralized employees.

Another approach is to augment employees' access to information and use work-flow methods to automate only lower-end administrative tasks after employees have made pertinent decisions.

Figuring out how jobs get done

And just as approaches to business process redesign vary, so do the methods for discovering exactly how people work. Typically, companies interview a representative group of employees about their work methods. After determining how a job is done, they separate the process into small steps, then hunt for redundancies and inefficiencies.

Mary Schramke, project manager at Aetna Life and Casualty Co. in Hartford, Conn., found that the interview method ignored the important relationships between employees.

So, in May 1991, before deploying an image-based claims-processing work-flow system in Aetna's Tewksbury, Mass., office, Schramke and consultants from Digital Equipment Corp. developed teams that crossed job boundaries. The team then had to agree on how a claim was handled from start to finish in a typical day of operation.

"We had many heated discussions about definitions of what something was and how it was done," Schramke recalls. "It's a tough process to get group consensus without humiliation."

To encourage participation, Schramke says, they had to convince the employees that there would be no punishment for telling the truth.

"Within a workgroup we got them to a consensus by figuring out what our business is and who our customers are. We listened to their ideas for change, and they were all full of ideas," she says.

At Bankers Trust Co. in New York, coming to a common definition of work-flow processes was a matter of getting employees to accept certain language conventions from their consultant and work-flow vendor, Action Technologies, Inc. in Alameda, Calif.

"I had a user working with me on the project," says Jeremy Keisman, vice president of global assets technology at Bankers Trust, "and I literally had to physically drag him to meetings. We all had to learn to like Action Technologies' syntax and language and buy into their philosophy. It can be dogmatic."

Completing a task

For example, every piece of work has a "customer" and a "performer." Once a task is performed, the customer must declare satisfaction before the task can be considered completed, Keisman says.

But once employees got used to the language, they cooperated. Even the IS group adopted the customer-and-performer philosophy and began communicating in terms of obtaining satisfaction while working on behalf of customers.

Ultimately, working with employees involved in work-flow analysis requires IS managers to think in ways they are not used to thinking, Keisman says. For instance, "We've always done traditional data processing. None of us had any experience with how you change people and the way they work. I didn't know how little I knew," Keisman says.

Without layoffs as an objective, some

Professional success

CIO survival: Study gives new view

By Allan E. Alter
WASHINGTON

What's the secret of survival for CIOs? Contrary to conventional wisdom, it doesn't matter whether the CIO reports to the CFO or the CEO or sits on the executive board, according to a recent British study.

The report, presented at the Society for Information Management's annual conference here Sept. 21, was conducted by Professor Michael J. Earl, director of the London Business School's Centre for Research in Information Management. Earl looked at 20 surviving and "non-surviving" British chief information officers.

Earl came to other contrarian conclusions: Survivors included CIOs in decentralized corporations and non-information-intensive industries, where CIO turnover is supposedly especially high.

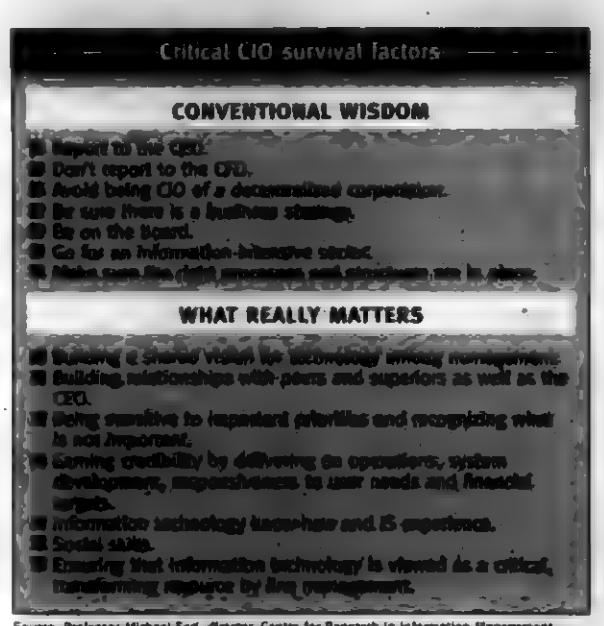
All the information systems executives who came from general management did not survive, Earl said; they lacked the know-how to manage the function and cope with IS issues.

Building a shared information technology vision among all senior executives was the most critical success factor, Earl said. "Non-survivors waited for a vision to appear.... They couldn't get a focus." Survivors found one or two business areas where information technology could add value to the company and persisted in building and sharing the vision of technology's contribution to the business.

Building that vision

Social skills and relationship-building with peers as well as the CEO and other superiors were important to build a shared vision as well as create coalitions, influence perceptions and understand the business.

"I think Earl's critical survival factors are right on," said Bill Heuser Jr., vice president of the Information Services Division of the New York City Transit Authority. "We have to build relationships with our peers. We don't all have the opportunity to have that strong a relationship with the CEO."



Source: Professor Michael Earl, director, Centre for Research in Information Management, London Business School

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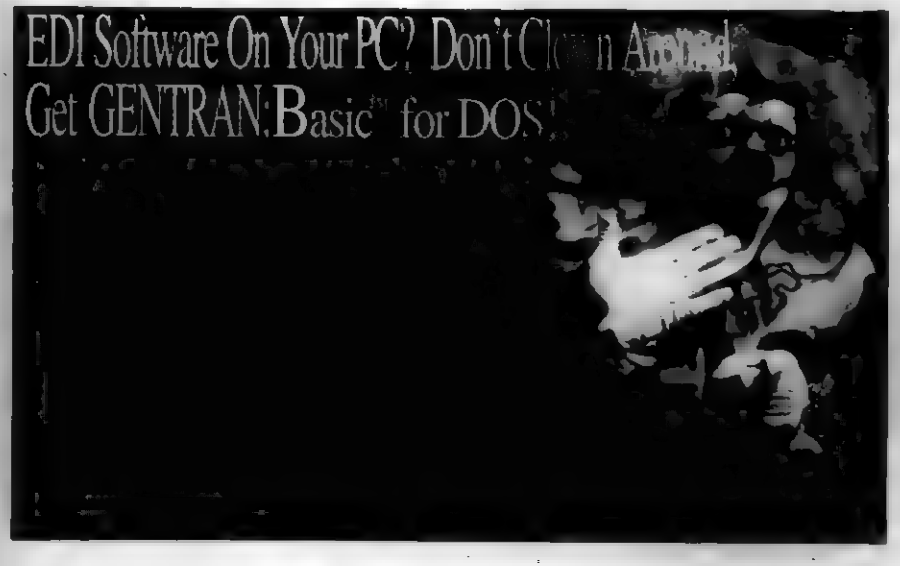

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managers say, the analysis is much easier.

Before doing the up-front analysis, "we made it clear that we were not reducing jobs," says Richard Hieb, executive vice president and chief administrative officer at Western Bank in Medford, Ore.

Western is installing an imaging system from NCR Corp. to track the documents in the mortgage process. The goal is to reduce the amount of paperwork employees must handle with each loan so they can keep up with volumes that are increasing by 35% to 40%.

It wasn't hard to convince employees that their cooperation would lead to an improved work life: The bank is growing and they were feeling frustrated and overwhelmed by the current paper processes. "I met no resistance whatsoever," Hieb says.

Never an easy job

But many managers find that even without employees fearing the ax, it can be difficult to discover how employees do their work.

Peter Stiles, a consultant at Advantage Design, Inc. in Chicago, discovered this recently while assisting KLM Royal Dutch Airlines with a business process redesign.

"I interviewed seven people in the same positions and got seven different descriptions of what they did," Stiles says.

Confusion doesn't always stem from employees' apprehensions or ill will. "It is not that they aren't cooperating," Koulopoulos says, "it's just that it is very complex to understand what people do in a particular process." ■

Intelligence Files

The virtually real office

Rather than bring a touch of home to the office, the Virtuosi project in the UK will bring the office to those who work from home.

The three-year project, due for launch next month by BT with the support of the Department of Trade and Industry, is believed to be the first systematic effort to apply virtual reality to a business environment.

There's no telling what Virtuosi's ultimate impact will be, but it could signal the beginning of the end for expensive corporate headquarters.

Because virtual reality offers the "most intimate and direct method of interacting with a computer, and hence with the users of other computers," BT's Alastair Rogers says, the corporation could cease to exist as a physical entity.

And, in addition to regular staffers, consultants or individuals with specialized skills could link their personal virtual working environments with a corporate environment for the duration of their contracts.

Source: "Teamwork in a virtual office," *Financial Times*, Sept. 3, 1993

Comdata redesign project

Comdata Corp. in Brentwood, Tenn., a provider of electronic funds transfer services to the trucking and gambling industries, is beginning a work-flow re-engineering project in its bank reconciliation department.

The system, which will control the flow of electronic file folders, should enable Comdata employees to find canceled checks in two minutes rather than hours. They will also be able to fax copies of the checks to customers while the customer waits on the phone.

The system will replace microfiche with laser disk storage and mainframe applications with an on-line, client/server based system. Completion is expected within the next six months.

Broadway & Seymour, Inc., a systems integrator based in Charlotte, N.C., will help implement the new system.

Source: Broadway & Seymour, Inc., Charlotte, N.C.

Executive Track

Andersen Consulting has appointed **Terry Neill** managing partner of its worldwide Change Management Services practice. Since 1989, Neill has been managing partner of the UK and Government and Services Division; he replaces Chuck Winslow, who will now concentrate on the change management practice for the Americas. Neill will be based at Andersen's Chicago headquarters, and he will report to Skip Battle, managing partner of market development.

Business long-distance telecommunications specialist **Cable & Wireless, Inc.** in Vienna, Va., has named **Lee Scalzott** to the newly created position of vice president of applications software development. In his new position, Scalzott will be responsible for the development of applications software for network and informations systems. Prior to his appointment at Cable & Wireless, Scalzott was director of technology, resource and production services at MCI Communications Corp.

Shawmut National Corp. has appointed **Alan R. Buffington** executive vice president of Shawmut Bank and Shawmut Bank Connecticut and head of the corporate services group. Prior to joining Shawmut National, Buffington was senior vice president and head of systems for Cigna Corp.'s employee benefits group.

Doug Lewis, Pratt & Whitney vice president of IS since 1988, last month was named the first chief information officer at the **AT&T Network Systems** group in Morristown, N.J. Lewis will report to AT&T CIO Ron Ponder and to Dan Stanzione, the $10 billion telecommunications equipment business group's chief technical officer.

John Collins, vice president of MIS at **Hallmark Cards, Inc.**, will retire in July 1994. **James C. Miller**, formerly vice president of information technology at **James River Corp.** in Richmond, Va., has been tapped to succeed Collins at the Kansas City-based greeting card company.

Miller will hold the title of vice president of information technology; he has held positions in finance and information technology at United Technologies Corp., Upjohn Co. and the former American Can Co. as well as James River.

The New York Times Co. has promoted **Richard H. Gilman** to senior vice president of operations at *The New York Times*. He was previously vice president of systems and technology. Gilman will be responsible for the direction of production, systems and technology for the newspaper. **Raymond E. Douglas**, currently group director/publishing, systems and technology, will succeed Gilman in his previous post.

Calendar

OCT. 17-OCT. 23

OS/2 Professional Interchange Conference. Palm Springs, Calif., Oct. 17-20 — Contact: OS/2 Professional, Rockville, Md. (203) 261-6227.

Sapphire '93. San Diego, Oct. 17-20 — Contact: SAP America, Inc., Philadelphia, Pa. (215) 521-4500.

MathWorks, Inc. Cambridge, Mass., Oct. 18-20 — Contact: Joanne Dawson, The MathWorks, Inc., Natick, Mass. (508) 653-1415.

Technetron '93. Boston, Oct. 18-20 — Contact: United States Society of Wang Users, Chicago, Ill. (708) 852-3888.

Scan-Tech '93. Philadelphia, Oct. 18-21 — Contact: Scan-Tech '93 Registration, Ventura, Calif. (800) 228-1064, ext. 117.

Advanced Application Development Technology Conference and Exposition. Boston, Oct. 18-22 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3890.

C++ World. Dallas, Oct. 18-22 — Contact: SIGS Conferences, New York, N.Y. (212) 274-0640.

The Object Conference and Exposition (Object). Boston, Oct. 18-22 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-0526.

Software World USA. Boston, Oct. 18-22 — Contact: Digital Consulting, Inc. Andover, Mass. (508) 470-3880.

Commercial Applications of Parallel Systems. Austin, Texas, Oct. 19-20 — Contact: MicroElectronics and Computer Technology Corp., Austin, Texas (512) 343-0978.

Developers Conference. Boston, Oct. 19-21 — Contact: Michelle Scott, Natural MicroSystems, Natick, Mass. (508) 650-1365.

Media Summit. New York, Oct. 19-21 — Contact: Debra Lee, Reed Exhibition Cos., Stamford, Conn. (203) 352-8297.

PC Expo. Chicago, Oct. 19-21 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (291) 829-3976.

Capacity Management Forum: "Performance of Networked Systems." San Francisco, Oct. 20-22 — Contact: The Institute for Computer Capacity Management, Inc., Phoenix, Ariz. (602) 997-7374.

OCT. 24-OCT. 30

Information Technology Association of America (ITAA) Management Conference. Seattle, Oct. 24-27 — Contact: ITAA, Arlington, Va. (703) 284-5355.

Wireless and Portable Computing Technical Forum. Burlington, Mass., Oct. 25 — Contact: Franson, Hagerty & Associates, San Jose, Calif. (408) 453-5220.

Geoworks Software Developers Conference. "GEOS: The New Profit Platform." Burlingame, Calif., Oct. 25-26 — Contact: The Bobbe Co., Los Angeles, Calif. (310) 785-0515, ext. 227/233.

Common Desktop Environment Developers Conference. San Jose, Calif., Oct. 26-28 — Contact: Uniforum Association, Santa Clara, Calif. (408) 986-8840.

CD-ROM Expo & Conference. Boston, Oct. 27-29 — Contact: CD-ROM Exposition & Conference, Dedham, Mass. (617) 861-0617.

OCT. 31-NOV. 6

Seventh International Conference on Design for Manufacturability. Orlando, Fla., Oct. 31-Nov. 4 — Contact: Management Roundtable, Boston, Mass. (617) 232-3090.

James Martin World Seminar. Los Angeles, Nov. 1-5 — Contact: Susan Levine, Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

Federal Imaging 1993. Washington, D.C., Nov. 2-3 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

NOV. 7-NOV. 13

Fourth International Conference on Applications of Software Measurement '93. Orlando, Fla., Nov. 7-11 — Contact: Applications of Software Measurement, Jacksonville, Fla. (904) 268-9639.

Share Fall 1993. Long Beach, Calif., Nov. 7-10 — Contact: Share headquarters, Chicago, Ill. (312) 644-6610.

ICCAD '93. International Conference on Computer-Aided Design. Santa Clara, Calif., Nov. 7-11 — Contact: Association for Computer Machinery, New York, N.Y. (212) 869-7440.

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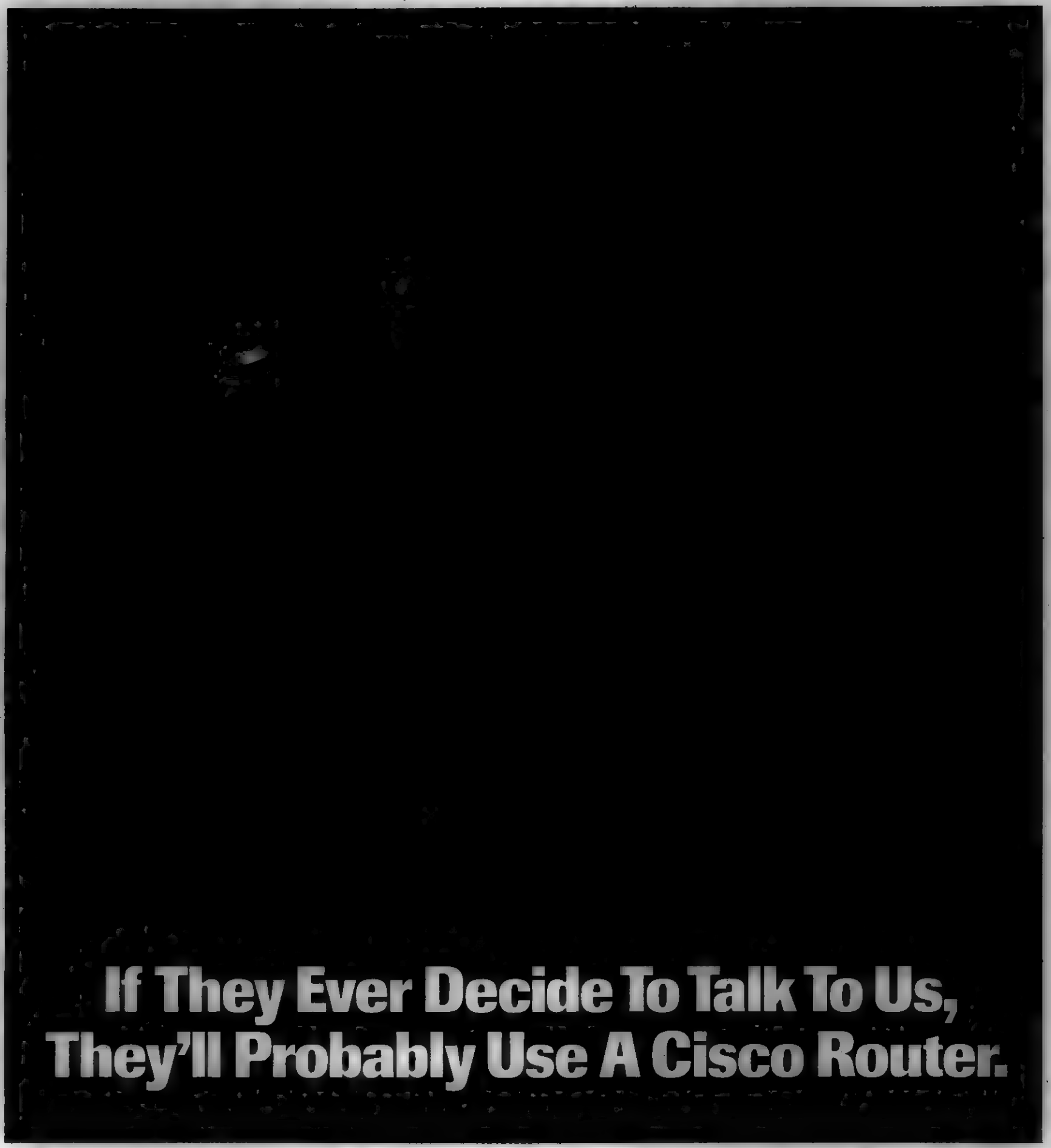

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The CW Guide to LAN Operating Systems

Starting to run your company on LANs brings new complications. Here are answers to 10 common questions technical managers have when dealing with LAN operating systems.

SURVIVAL GUIDE

1. What is required of an "enterprise" network operating system, as opposed to a workgroup network operating system?

An enterprise network operating system needs the following:

•**A scalable, multipurpose name service.** In the past, name services have not scaled well geographically and have supported more than 15,000 users only with difficulty. At the least, users will want the name service to contain data from user profiles, a data dictionary, an application repository and data for resource/network administration.

•**A regulator mechanism** (such as load balancing or reconfiguration tools). Data and applications will be distributed, and they will move over time as the network changes. The network operating system should adapt optimally to these changes.

•**A "dual view" capability.** It should provide the ability to view and administer the network equally well as either one large computer or as a network of distributed data, applications and resources.

•**Virtual storage in a heterogeneous environment.** In other words, data and applications should be available across platforms, suppliers and the enterprise but in a least-cost way such that access is almost instantaneous 98% of the time. — *Wayne Kernochan*

2. How do you see NT Advanced Server fitting into a company whose LANs operate under NetWare, Pathworks, Vines or LAN Server?

NetWare users will first find a place for Microsoft's Windows NT as a client. Novell is in the process of releasing a requestor that will let NT clients use NetWare. This will give users a chance to test the NT waters.

Novell has indicated it will also eventually support NT Advanced Server as a NetWare server, much as it does now for OS/2. One advantage to this is that NetWare running under NT may be more reliable than a standalone server, since it will run as its own task apart from the NT kernel.

It may also be possible, with the right software, to "bridge" two networks, one using Microsoft LAN Manager and another using NetWare. This will allow shops to create new applications using the full capabilities of NT and also share data with the existing network. — *Noah Ross*

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Although Microsoft
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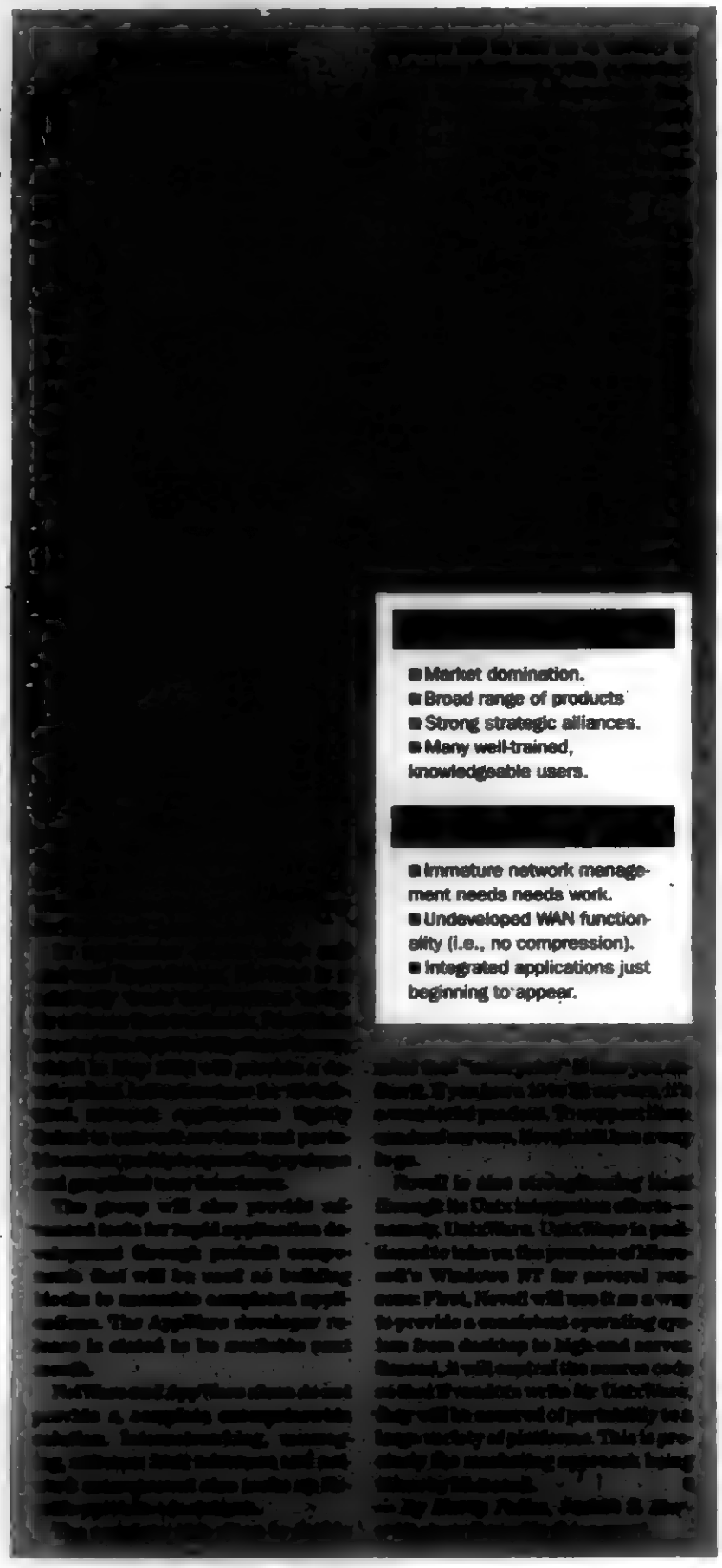
Survival guide

CONTINUED FROM PAGE 89

would like nothing better than to see NT Advanced Server replacing NetWare, it's unlikely that much of that will happen in the next year. It will take about a year for a reasonable selection of NT drivers, connectivity pieces and applications to appear. Secondly, NT's networking function, although impressive for a 1.0 release, is significantly less than NetWare's and is also slower in benchmarks we've seen.

So I think the likely place for NT is as an applications server closely coupled with a made-to-order application (something like a database) that requires too much power for DOS/Windows. — *George Schussel*



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■ Integrated applications just beginning to appear.

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NT Advanced Server must first distinguish itself by being a very good citizen in the heterogeneous corporate network, while outpacing its competition as a workgroup or departmental server. In other words, NT Advanced Server and the accompanying NT-based servers (SNA Server, SQL Server) must be the best at integrating with preexisting enterprise networks such as IBM's Systems Network Architecture.

Coexistence with NetWare will be a bit problematic until Microsoft and Novell stop shooting at each other. NT will not fit with Vines, which was designed as a complete solution. It is a clean fit with Pathworks because of their common LAN Manager heritage. LAN Server and NT working together is possible but not likely. LAN Server is going to offer a number of advanced distributed computing elements not currently supported by NT. — *Michael D. Millikin*

3. What would be a compelling reason to switch from NetWare to another LAN operating system?

Cost is one reason. Conditioned by PC software prices, users are now looking for LAN software installation to be as simple as PC software at $100 per node and scalable indefinitely.

Another reason would be the availability of high-end, and especially administrative, scalability. History has shown that the ability to support large-scale networks requires real-world experience with progressively larger customer implementations. Novell is steadily gaining that experience in the 1,000-user range but has a ways to go. So do most of the LAN operating systems available today.

At present, I don't see interoperability links to enterprise systems, Windows compatibility or robustness as reasons compelling enough (in dollar or strategic terms) to switch. — *Wayne Kernochan*

4. Are there benefits to using the same operating systems on your desktops as on your LAN?

It would be easier for the systems administrator, but the user doesn't get anything out of it.

Some people say Microsoft will begin to more tightly couple NT on the desktop and NT Advanced Server on the back end. I don't see it happening though. What if NT isn't a big splash on the desktop? They'll want NT Advanced Server to be generally available to as many clients as possible. Mixing and matching is part of the attraction of client/server.

Tightly integrated environments represent the old way of doing things. People are buying whatever they want and then struggling to link them up. Because the world is moving to objects, you want to be able to pop out the server when necessary. You couldn't do that if you had a tight coupling between the front and back end. — *John Paig*

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Sure there are benefits. Every additional pairing increases the burden of interoperability.

Whether you are looking at OS/2, Unix or Windows on both the clients and servers, a homogeneous environment is the easiest.

However, it doesn't map to reality. You can keep your workgroup homogeneous (maybe), but the entire enterprise? Forget it. — *Michael D. Millikin*

5. What should you look for in a LAN operating system for your application development purposes?

There are a couple of critical factors.

First, support for a range of application logic distribution mechanisms, such as remote procedure calls, message-passing and transactional conversations.

Second, a distributed object-oriented technology, such as AppWare from Novell, Distributed System Object Model (DSOM) from IBM and sooner or later Cairo from Microsoft. Until creating net-

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COMMENTARY by KEN MACKIN

Beyond the data shuttle

I recently reviewed the most popular LAN operating systems. I filled out feature tables and suitability guides and ran scripts to assess basic functionality. Slowly the thought came to me: LAN operating systems have become a mature technology.

The only place LANs need to grow up is on really big networks, where really big interconnection, maintenance and management issues remain unresolved. For LANs with less than 200 users, the LAN operating systems meet most users' basic data transportation needs.

With so very little to differentiate them, vendor marketing has assumed a greater importance for LAN operating systems in the last year. Recent products seem tied less to meeting real customer needs than to protecting market share with scads of "me-too" products and services.

Novell reaction

Novell's bundling of Message Handling Service with NetWare 3.12, for example, is a direct response to Microsoft's inclusion of mail within its Windows networking products.

I don't mean to single out Novell — a lot of other companies are doing this, too. They're at a crossroads, and they know it.

If building data transportation schemes is not enough, what will network operating systems companies do for revenue?

The answer is application services that use networks thoroughly. Today's operating system infrastructure allows for true network products rather than stand-alone products adapted for network use.

Unfortunately for the vendors, the network applications market is not their sole domain. Take a look at Intel's Smart Network Services. Intel intends to make applications servers fully aware of the state of the network and automatically respond to changes in the condition of that network — making them self-regulating, if you will. If a server hard disk shows signs of failure, for instance, Intel's current backup server — called StoragExpress — already senses the impending failure and automatically backs up the server while it still can.

A defining product

This is the kind of product that will define "the network" down the road. It's the kind of product you should be demanding from your vendors.

The challenge for the network operating system companies will be to capture a piece of this market. In the attempt, they will take on mature and entrenched applications developers.

The battle will be bruising, and some will lose.

But end users and administrators will be victorious because they will have greater confidence that the network will give them reliable and rapid access to the tools they need to do their jobs. ■

Mackin is president of Product Logic, Inc., a network consulting firm in Atlanta.

Survival guide

CONTINUED FROM PAGE 90

works. AppWare and DSOM are the key to the future.

Third, tools that will exploit existing programmer skills, such as Cobol. (Yes, Cobol.) — *Michael D. Milliken*

6. Will single-image networks be attainable within the next few years? By single-image, we mean the ability to log on once and be able to access all resources on the network. — *Frank Monteleone, Nutrasweet Co.*

What I hear in this question is: Can I slap a piece of software everywhere that can get past all the different printing commands, file systems and security mechanisms and merge them into one consistent "computer?" There has been a fundamental problem with the way the industry has chosen to approach this problem.

Because of continual advances in operating system technology, different operating systems and network operating systems are fundamentally different in their approaches to basic resource access. The solution would be to build a network operating system that is the "golden mean" of all the approaches. However,

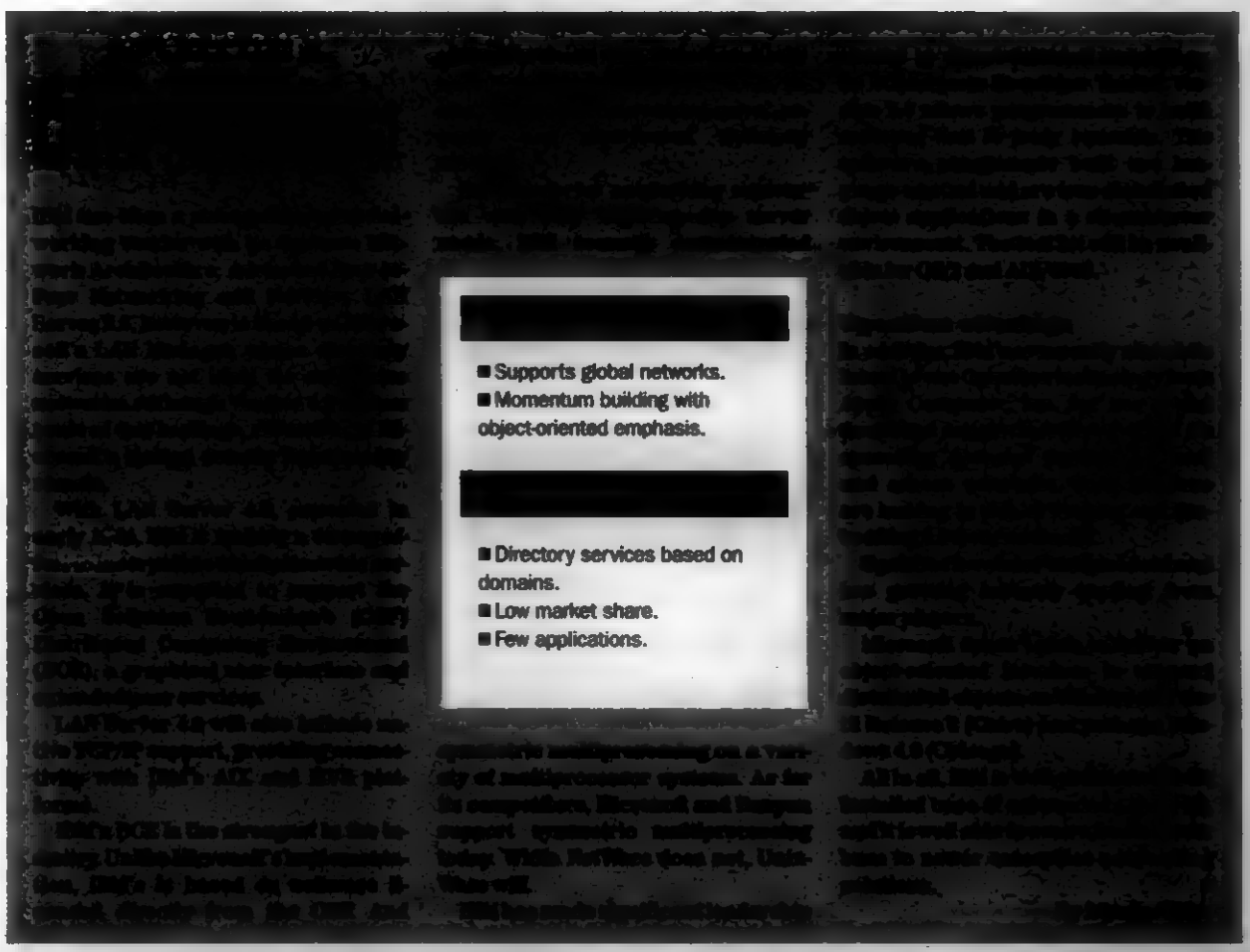
the industry has chosen to bet continually on one operating system (usually Unix) and base its single-image solutions on that. This, in turn, means that translating to other approaches is a major job with often imperfect solutions.

The result is that solutions such as Distributed Computing Environment/Distributed Management Environment are forever chasing a moving target: building in translators to one or more versions of NetWare, Unix, Windows NT, etc. I see no final solution until the industry views this as a problem and adopts a "golden mean" approach to solving it. — *Wayne Kernochan*

7. How many layers of software will we eventually have to manage? Right now I can see up to five or six in our firm. On the other hand, Microsoft is rolling all this functionality into NT, at least conceptually. So the question is, do you see the strata increasing or will there be an all-encompassing software layer? — *Frank Monteleone*

Layers will continue to be the norm. In client/server, different vendors will provide best-of-breed software. Some people are experiencing frustration, that it's costing more than they thought, that it's more integration than planned for, but the pendulum is still not going to swing

Survival guide, *page 95*



[redacted]

- Multiprotocol support.
- Integration of PCs with VAX installed base.

[redacted]

- Performance.
- Waiting for DCE to add directory services.

[redacted]

[redacted]

- Network management applications built into directory services.
- Strong integrated applications.

[redacted]

- Low market presence.
- No low-end, peer-to-peer offering.
- Lacks internetworking capability.

[redacted]

Survival guide

CONTINUED FROM PAGE 93

back to the old way of providing a single monolithic layer of software. — *John Faig*

8. When do you see NT and NetWare working from a common Simple Network Management Protocol (SNMP) management information base (MIB) that can be controlled from a single point? Too many products that claim to embrace the SNMP standard are using a proprietary MIB, often because the standard simply hasn't been set yet. — *Rick Tumborski, Amoco Corp.*

Not soon. Novell just this year anounced native SNMP support. Microsoft and Novell have other areas to agree on besides common MIBs. It would be the end of 1994 at the earliest. — *Michael D. Miltikin*

9. We work in an environment of over 300 NetWare file servers and a variety of other types of servers. NetWare 4.0 addresses many of the user coordination problems we've been fighting, but it is not the total picture yet. We'd like the ability to read our mainframe user security directories to load and update all LAN environments. Ideally, some information, like those with "supervisor" status, would be uploaded to the mainframe for auditing purposes. Will this be possible with NT? — *Rick Tumborski*

There is no automatic way that I know of to coordinate mainframe and network security as suggested by this question. However, I can see no reason why an NT server application could not be written to do this. Of course, a mainframe component would also be required, alongwith a bit of mainframe systems programming.

One aspect of NT that is limited, however, is system administration. In a TCP/IP Unix environment, it is possible to fully maintain and update all system software. Neither Windows NT nor NetWare have this same capability, which makes administration over a wide-area network quite difficult. — *Noah Ross*

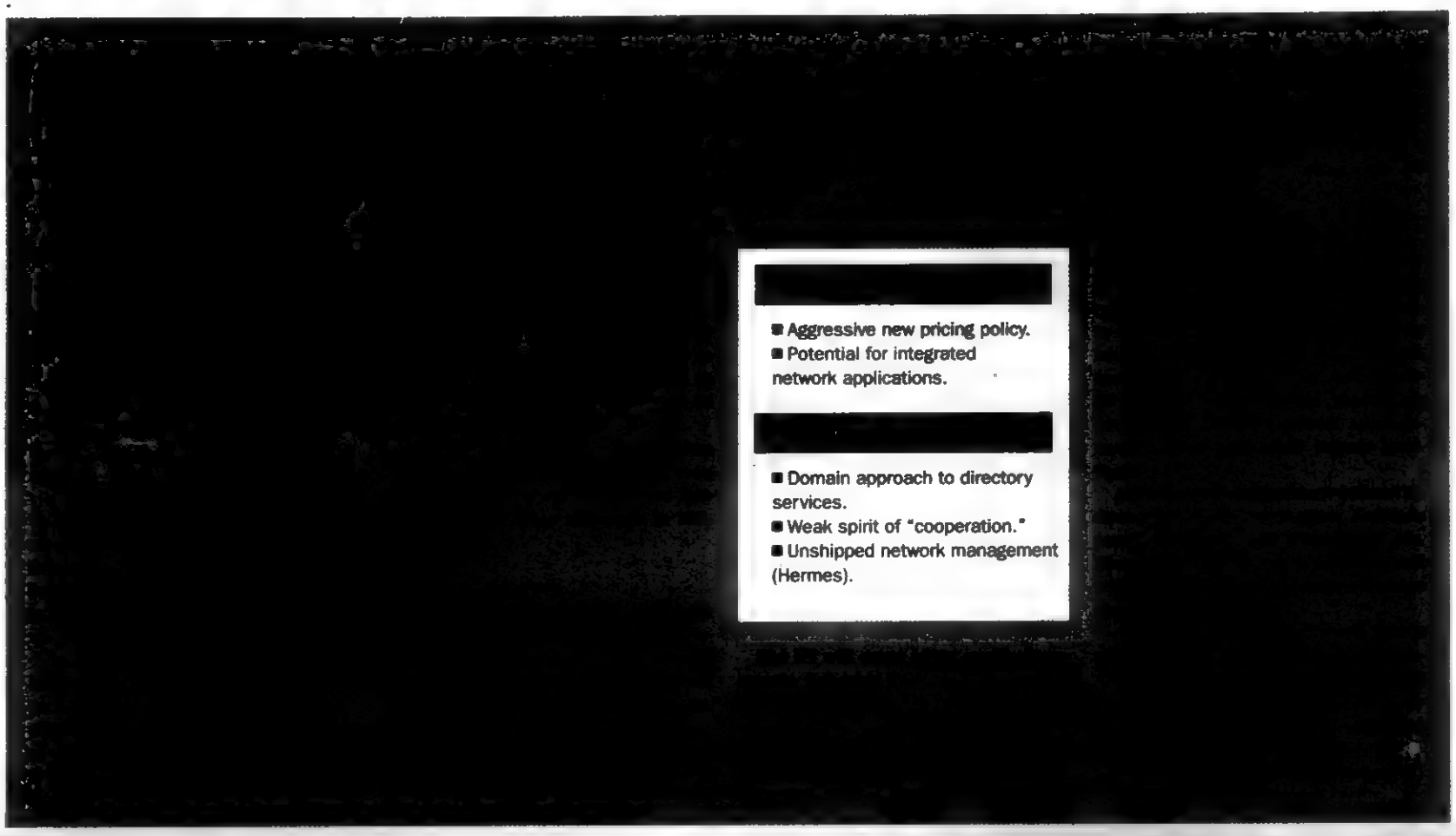
.....

I don't see that happening because NT is squarely positioned at the departmental level. Microsoft is still best at selling a lot of less complex products. With more sophisticated products like NT, companies will demand services and expertise. Microsoft isn't into that high-touch kind of game yet. — *John Faig*

10. We'd like to combine Pathworks and NetWare in the same system. Please explain the major difference between Pathworks and NetWare. We'd like to have everything on one system, but it doesn't seem to be a possibility. — *Anthony Infante, Credit Lyonnais*

Pathworks, like NT, is a peer-to-peer network. Each user is a node on the network that can either be a client or a server. With NetWare, each user is either a client only or a server only. NetWare uses the IPX protocol while Pathworks uses DECnet or TCP/IP.

The Pathworks for DOS-NetWare coexistence product now lets Pathworks run on an IPX network and access NetWare services. Another option is that Pathworks and NetWare can be bridged together by making one PC a gateway that has hardware for both DECnet and NetWare. — *Noah Ross* ■



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COMMENTARY by MARC DODGE

Democracy or enlightened dictatorship?

The network operating system battles are a tabloid's dream come true: Will Microsoft's Windows NT humble Novell's NetWare? Will IBM continue to fumble LAN Server and OS/2? Will the FTC drop-kick Microsoft?

But while this makes for thrilling reading, it overlooks the real issue: With NT's spectacular leap into mediocrity, it is obvious that none of the leading players is going to pre-empt the competition. We are stuck with the lot of them indefinitely.

So, the issue for us, as decision-makers, is not selecting a "winner" in the network operating system "war." The issue is selecting a single system as the corporate standard and making it stick. Everybody hates standards: I attended a panel at NetWorld on corporate standards and their importance. One-third of the audience walked out after the second speaker. I would have walked too — if I hadn't been the moderator.

The hard truth is that only an extreme optimist would believe he could build true client/server applications with the hodgepodge of vendors and products we use today.

Client/server computing will make things really interesting. What will happen when we take all our stand-alone applications for various network operating systems platforms and attempt to interconnect them so we can share data across the company? We will have system integrators with ulcers the size of dinner plates.

Three years ago, I fought this battle in my company. We had 500 LANs using a common network system. After this fine start, an application development group decided it wanted another flavor. They showed with geometric logic and precision that they couldn't live without a different operating system.

They examined everything except the cost of training and supporting the end users. The users happened to outnumber the programmers by 10 to one. With the users' help, we calculated the support costs of a second corporate network operating system as $3.4 million. Guess what? The applications group did not get the new system.

Application development is messy and expensive with multiple systems. However, it is a day at the beach compared with integrated network management. Companies that enforce corporate standards will be the first to provide enterprise management of networks . . . as they watch their competitors flounder.

That is because integrated network management is becoming possible for single-system shops. The democratic shops will be left with brute-force network management for the next half decade.

Each additional network operating system just about doubles the network management problem. As we add more operating systems, we add more products. As the number of pieces spirals out of control, all hope of managing the enterprise network disappears.

"Each additional network operating system just about doubles the network management problem."

Everybody complains about integrated network management. Sorry, but vendors don't have a silver bullet in the works. We have to build our own integrated management, and it starts with controlling the number of pieces to manage.

It is time to cut bait. Companies that continue with mindless development of distributed applications on many platforms have a problem. They are building the first legacy applications of the client/server era. ■

Dodge is a telecommunications manager at a Fortune 500 company.

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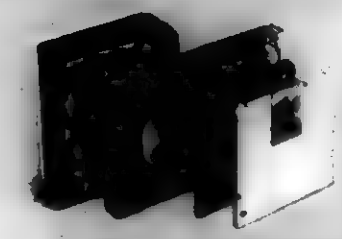

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COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

Banyan's Vines outpoints rivals with strong results in ease of use, support

By Kevin Burden and Michael Sullivan-Trainor

Two significant accomplishments for any vendor are to offer a product that is both easy to use and available on a number of heterogeneous platforms. Based on user ratings in our Buyers' Satisfaction Scorecard of LAN operating systems, Banyan Systems, Inc. has succeeded in both areas with its Vines offering.

With the highest ease-of-use score of the four market-leading products measured, Vines also bested Novell, Inc.'s NetWare, IBM's LAN Server and Microsoft Corp.'s LAN Manager in providing support for a variety of applications.

The results are based on user evaluations of a mixture of versions, with 52% of the NetWare users running Version 3.11 and a minority using NetWare 4.X.

Sixty percent of the Vines users were running Vines 5.5, reflecting the longer period of time that version has been available. The majority of LAN Server users were running Version 3.X, and 66% of the LAN Manager users were running Version 2.X.

Banyan's strategy of diversifying its support in a number of operating system segments, rather than fighting Novell exclusively on its DOS/Windows turf, is apparently paying off. A recent announcement included a strategic relationship with Hewlett-Packard Co. that will allow Vines to be ported to the HP 9000 platform.

NetWare compatibility

Perhaps the most striking Banyan strategic shift was to make Vines Enterprise Network Services available for NetWare. The product, which began shipping on schedule last January, makes Banyan's full line of services available to Novell NetWare users.

NetWare has continued to benefit from the surge of PC shipments and the ever-increasing need for LAN servers. The market grew 46% from 7.8 million nodes in 1991 to 11.4 million in 1992, according to Framingham, Mass.-based International Data Corp. (IDC).

While Banyan maintained a stable share of the market, shipping 750,000 nodes and 20,000 new licenses in 1992, Novell shipped 6.8 million nodes on NetWare and more than 300,000 new server licenses during the same period. IBM added more than 900,000 nodes and nearly 29,000 server installations, while Microsoft shipped more than 500,000 nodes and more than 16,000 servers of LAN Manager.

Though Novell holds the market edge, Banyan also claims superior compatibility with applications through its delivery last year of several server application programming interfaces.

Novell's application integration is done through third-party NetWare Loadable Modules (NLM), which provide only limited access to server statistics. Vines also scored highest in traditional strengths of network management and wide-area network performance.

Novell has improved its remote communications capabilities with its announcement of NetWare Connect at Networking Solutions Expo last month. The new NLM allows both outbound and inbound communications from the increasing number of laptop-equipped employees to be consolidated on a single integrated platform.

Remote-access ratings placed Vines well ahead of NetWare and NetWare well ahead of the other products. LAN Server achieved the lowest rating: 6.1.

In addition to the Top 4 LAN operating systems rivals, a growing number of products are staking out a second tier of peer-to-peer LAN operating systems functions. Chief among these is Artisoft, Inc.'s LANtastic, which claims 20% of the installed base in this arena. The other contenders in the category, according to IDC, include Apple Computer, Inc.'s AppleTalk (18% share) and Novell's NetWare Lite (10% share).

Thirty-two LANtastic users surveyed said they were very satisfied with the product, scoring it a nine on a 10-point scale. While citing its versatility as the major strength, users gave LANtastic a rating of eight or better in ease of use, ease of installation, use of memory, reliability and cost.

Methodology

The survey considered the four market-leading server LAN operating systems and the top peer-to-peer LAN operating system. Response bases of at least 30 users per product were obtained by First Market Research Corp. in Austin, Texas.

Names were supplied by *Computerworld* Database Division. *Computerworld* thanks IDC analysts Lee Doyle and Richard Villars, who contributed to this survey. For further information about how this evaluation was completed, contact Michael Sullivan-Trainor at (800) 343-8474, ext. 229. ■

Banyan's Vines

1992 MARKET SHARE: 7.1%

TOTAL SCORE 74

RESPONSE BASE: 37 USERS

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

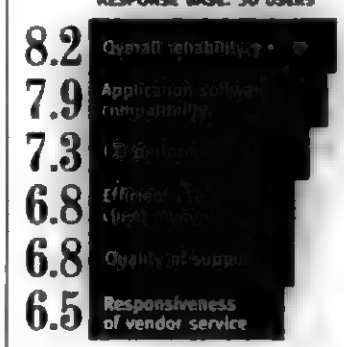
REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Novell's NetWare

1992 MARKET SHARE: 70%

TOTAL SCORE 69

RESPONSE BASE: 50 USERS



RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

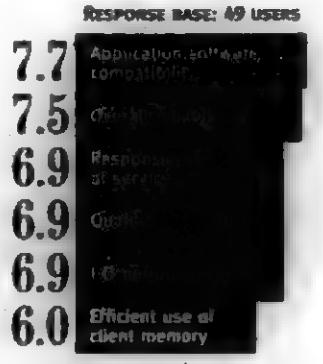
REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

IBM's LAN Server

1992 MARKET SHARE: 3.8%

TOTAL SCORE 66

RESPONSE BASE: 49 USERS



RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Microsoft's LAN Manager

1992 MARKET SHARE: 3.7%

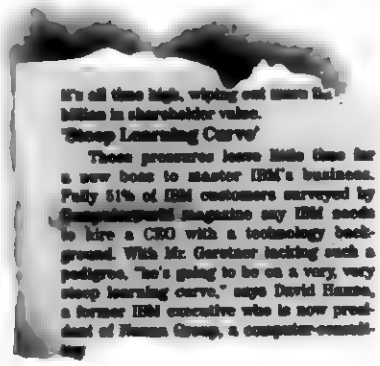
TOTAL SCORE 66

RESPONSE BASE: 50 USERS

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

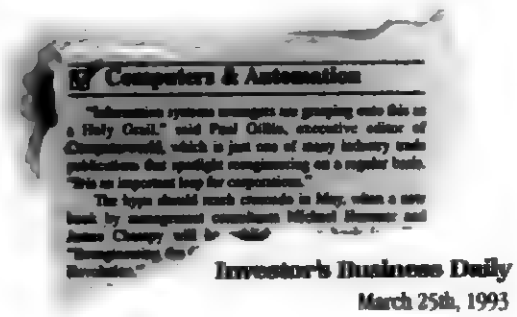


it's all time high, wiping out more than billion in shareholder value.

'Steep Learning Curve'

Those pressures leave little time for a new boss to master IBM's business. Fully 51% of IBM customers surveyed by Computerworld magazine say IBM needs to hire a CEO with a technology background. With Mr. Gerstner lacking such a pedigree, "he's going to be on a very, very steep learning curve," says David Hanna, a former IBM executive who is now president of Human Group, a computer-consulting

THE WALL STREET JOURNAL
March 25th, 1993

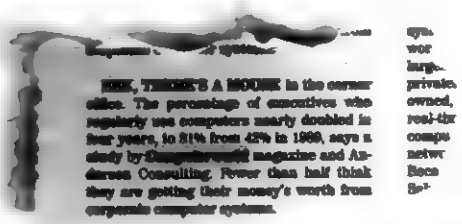


Computers & Automation

"Information systems managers are grasping onto this as a Holy Grail," said Paul Gillin, executive editor of Computerworld, which is just one of many industry trade publications that spotlight reengineering on a regular basis. "It's an important leap for corporations."

The hype should reach crescendo in May, when a new book by management consultants Michael Hammer and James Champy will be [illegible] "Reengineering the Revolution."

Investor's Business Daily
March 25th, 1993



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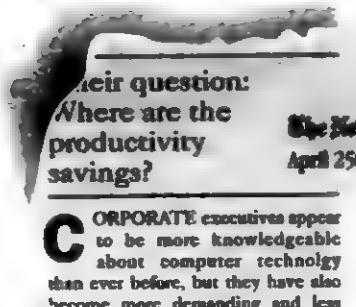
ERE, THERE'S A BOOM in the corner office. The percentage of executives who regularly use computers nearly doubled in four years, to 81% from 42% in 1988, says a study by Computerworld magazine and Andersen Consulting. Fewer than half think they are getting their money's worth from corporate computer systems.

THE WALL STREET JOURNAL
April 20th, 1993



...eir question: Where are the productivity savings?

The New York Times
April 25th, 1993

CORPORATE executives appear to be more knowledgeable about computer technolgy than ever before, but they have also become more demanding and less forgiving, a new survey has found. While they believe information technologies are the key to competitive advantage, they also say that they have not been getting their money's worth.

The survey, conducted by the computer industry newspaper, Computerworld and Andersen Consulting, also found that 81 percent of top executives are personally using computers in their daily jobs, nearly double the percentage reported when the survey was first taken four years ago.

More than 200 chief executives, chief operating officers, and chief financial officers, representing a broad range of businesses, participated in the study, the results of which were published in Computerworld last week. Annual company sales ranged from $250 million to $20 billion.

The New York Times
March 25th, 1993

... CUSTOMERS ...AVE THEIR SAY TOO

■ IBM directors should forget about hiring another salesguy to replace John Akers as CEO. And whoever he is, Aker's successor should fire a whole lot more people. So says a Computerworld survey of executives at 100 companies that spend at least half their computer budgets on IBM products. The participants, who work at the likes of Kmart and Parker Hannifin, a maker of pneumatic and hydraulic components, also said IBM's reorganization into smaller business units should go further. Computerworld, in addition, interviewed various computer industry luminaries, including Steve Jobs. The Next CEO marveled that none of IBM's machines from mainframes to PC's uses the same software. Says Jobs: "IBM's troubles stem from the fact that they approach everything from a hardware strategy, and the Nineties is a software decade."

Not everybody agreed that breaking up is the way for IBM to go. Said Larry Ellison, CEO and co-founder of Oracle, a software company: "This is the

...Inc. Richard is a retired I.B.M. vice president.

A survey of some 100 of I.B.M.'s largest customers by Computerworld magazine found that 51 percent preferred someone with a technical background to be the computer giant's new chief executive, while 36 percent said technical expertise was not essential and 13 percent had no opinion.

But some industry ... say technology ...

...93 FORTUNE 11

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April 5th, 1993

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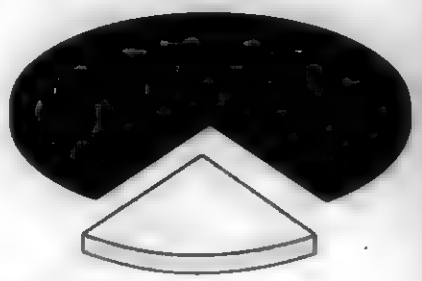

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80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
95. Other_____
(Please Specify)

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21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data/Tele. Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
80. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Educator, Journalists, Librarians, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (check all that apply)

Operating Systems
❑ Solaris (a)
❑ Netware (b)
❑ OS/2 (c)
❑ Unix (d)
❑ Mac OS (e)
❑ Windows NT (f)
❑ DOS Windows (g)

App. Development Tools
❑ CASE (h)
❑ C++ (i)

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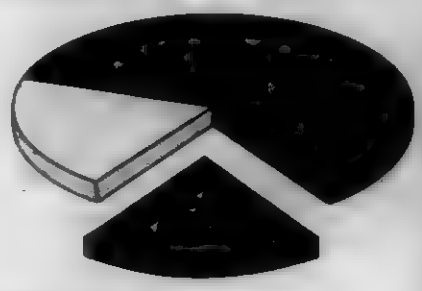

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50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
95. Other_____
(Please Specify)

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❑ OS/2 (c)
❑ Unix (d)
❑ Mac OS (e)
❑ Windows NT (f)
❑ DOS Windows (g)

App. Development Tools
❑ CASE (h)
❑ C++ (i)

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High on ease of use, compatibility; low on innovation, technical support

Windows NT Advanced Server

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ Evaluators experimenting with Microsoft Corp.'s Windows NT Advanced Server said it was easy to install and use in their present environments, but they found few features that aren't duplicated by installed LAN operating systems from other vendors.

■ Microsoft's service and support left something to be desired, and delays in full Novell, Inc. NetWare support are slowing users' ability to implement Advanced Server.

It's been called the "NetWare killer," but the four evaluators participating in this examination of Microsoft's Windows NT Advanced Server didn't think so. They gave it the same rating as a previous Firing Line evaluation of Novell's NetWare 4.0 [CW, April 12].

Released to lengthy and loud hype, Advanced Server was announced in late August on the heels of its parent operating system, Windows NT, and new database, Windows NT SQL Server.

But now is probably not the best time to be releasing a new network operating system. After many years of experience, experimentation and practice, many companies have developed network strategies based around NetWare or, less frequently, Microsoft's LAN Manager or IBM's LAN Server. Clearly, Microsoft will have a tough row to hoe in cracking through the active, long-term strategies of network users.

The evaluators who participated in this examination of Advanced Server were typical of today's networked organization. Representing more than 43,000 networked users, they work at a multinational chemicals firm, a military research lab, a global banking firm and a state government agency.

All had significant practical experience with a variety of network operating systems, including NetWare, LAN Manager, LAN Server, Apple Computer, Inc.'s AppleTalk and a variety of Unix-based TCP/IP systems.

The evaluators had been examining Advanced Server for periods of two weeks to six months, although none had progressed beyond initial evaluation steps. Only the government agency had made a significant enterprise commitment to Advanced Server.

The format for this evaluation was prepared with help from Howard Rubin Associates and Technology Investment Strategies Corp.

Installation

Like the Windows NT operating system, Advanced Server is installed through a setup program and delivered on CD-ROM. That combination eliminates much of the disk swapping that network administrators faced in the past.

The Advanced Server installation program was favorably rated by the evaluators for a number of reasons.

First, it asked the evaluators salient questions throughout the process and properly installed drivers and options for network hardware. The program also handles hard disk issues such as partitions and supports disk striping.

Banking firm: "It takes about an hour to install. We had the technical background with LAN Server. But we couldn't import domain information [from LAN Server]."

Government agency: "If you've installed LAN Manager, it's quite a switch. [The installation program] detects network boards and gives options for protocols. It's really slick."

Reliability

Three evaluators reported minimal catastrophic failures with the release version of Advanced Server, although early beta versions did evidence problems.

The chemical company evaluator said his server had "locked-up" more than once, and he was concerned that this problem might get worse with additional users. The banking evaluator noted problems in connecting LAN Manager 2.2 client systems to the server. The government evaluator said his single crash was not directly traceable to Advanced Server.

Performance

The evaluators had not yet had the opportunity to complete full-scale load testing on Advanced Server. Most performance estimates were derived from small, isolated installations with minimal users.

Performance estimates were therefore based on the perceived execution times of Windows and DOS applications running on the server, as well as print server and file server throughput.

Military lab: "Performance was the same or maybe better than Sun [Microsystems, Inc.] workstations. DOS applications run a little bit slower, but there was no big difference running 16-bit Windows applications."

Banking firm: "We didn't use the NT File System because we wanted compatibility with our current database file systems. Network performance is typically not an issue for us because in client/server applications, you're not loading the network anyway."

Technical support

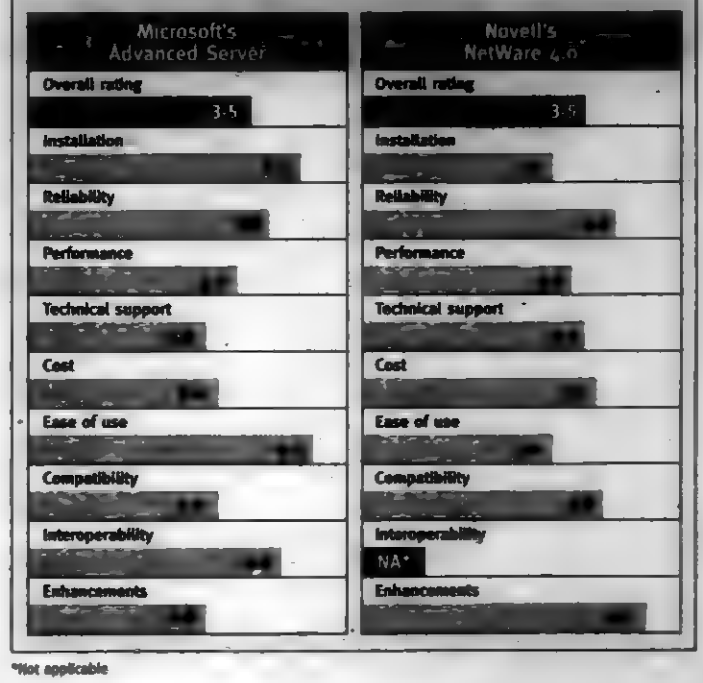
The evaluators said they were not overly impressed with the technical support made available by Microsoft. They said support costs were high, and Microsoft did not deliver good support or documentation to those who hadn't paid for Microsoft support services.

Chemicals firm: "[Technical

Advanced Server, *page 102*

Microsoft's Windows NT Advanced Server

Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users. NetWare 4.0 ratings are based on April 12, 1993 evaluation.



*Not applicable

Microsoft: Support competitive;
Windows NT Advanced Server applications on the way

SITE PROFILES

Evaluation descriptions for users who evaluated Microsoft Windows NT Advanced Server

Chemicals firm	Military lab	Banking firm	Government agency
2 1/2 months	1 month	6 months	6 months
AppleTalk, TCP/IP	NetWare, AppleTalk, TCP/IP	NetWare, AppleTalk, TCP/IP	LAN Manager, NetWare, AppleTalk
Compaq DeskPro	486DX 33-Mhz	NCR 3450 486, Compaq SystemPro, Digital Alpha AXP 150	Compaq SystemPro and DeskPro
Application server, file server	Macintosh services	SQL Server, mainframe gateway	File server, print server
Approximately 600	100 Advanced Servers	Approximately 200	Approximately 800

CONTINUED FROM PAGE 101

support needs] are more than we expected. We had some problems with the trusted domain concept and the registry database. People are going to need [technical] support for it during the first year."

Military lab: "[Microsoft] charges a lot for per-call support. We'll go through CompuServe and read UseNet."

Banking firm: "We have Microsoft primary support, and we are fairly active users. We haven't had to call Microsoft [since] we get as much help from CompuServe as anything else."

Government agency: "The beta-test documentation was better than the release version. If you're without a Microsoft service contract, they don't listen to you."

Cost

For most of the evaluators, Advanced Server costs were not a large issue. Microsoft is now charging $1,495 for an unlimited-use license for Advanced Servers, although prices are slated to rise to $2,995 after February 1994.

Military lab: "It's more expensive right now because of memory and hard drive upgrades, but over time it will be cheaper because we don't have to play with the configurations."

Government agency: "It's the same as any network operating system. It's slightly cheaper than NetWare and about the same as LAN Manager."

Ease of use

Ease of use was rated highly from an administration and configuration point of view. The evaluators found the Advanced Server utilities and tools to be powerful, intuitive and accessible. They said they liked the familiar and intuitive Windows NT user interface.

Military lab: "It is exactly like Windows. You need to learn about domains and workgoups, but the interface is the same. Domains may not work for us, but it makes sense to set up a network that way."

Banking firm: "The interface is familiar; managing access rights is straightforward. It all seemed to work very well compared with LAN Manager or LAN Server."

Compatibility

It was difficult for the evaluators to fully estimate compatibility with existing network applications, as there are few native, 32-bit applications currently available for Advanced Server.

However, all the evaluators had tested network applications written for MS-DOS and MS-Windows and found no significant compatibility issues.

Chemicals firm: "I've gotten comments from our developers that it will be quite a task to move [applications] from OS/2 LAN Manager to NT Advanced Server."

Military lab: "We cannot use any existing networking software under Advanced Server because all those programs use their own drivers."

Banking firm: "Without the ability to test NetWare applications, it's hard to say. We are able to run SQL Server application and OS/2 programs. But there is an issue in terms of integrating it into our [NetWare] environment."

Interoperability

Chemicals firm: "I was looking at options for interoperability, but Advanced Server doesn't look any different than LAN Manager."

Military lab: "Advanced Server has all the protocols built into it for shareware programs like Eudora and Qvpnet. It also has installed services for the Macintosh. Macintosh applications from my system went to the Mac and started running. Advanced Server can work as a Mac file server, and it can definitely work as a Windows or DOS file server."

Enhancements

Surprisingly, the evaluators gave Advanced Server a lower than expected rating for its enhancements over existing network operating system alternatives, such as LAN Manager, LAN Server and NetWare.

They said they liked the inclusion of built-in disk striping, security options and user profiles. Support for TCP/IP and trust relationships between different network domains won kudos. They were not pleased with the current lack of support for the IPX protocol used in NetWare shops, but attributed this to a delay by Novell rather than Microsoft.

Chemicals firm: "As much as it was hyped, we expected something really grand. But there is no directory service, no [Network File System] and no Telnet built into the box. It's a pretty graphical user interface on top of LAN Manager. It has built-in RAID with striping, but nothing that couldn't have been done with LAN Manager for the OS/2 product."

Banking firm: "There are more enhancements in the base operating system [Windows NT] and less in Advanced Server. But I'm happy with it."

Written by senior editor Garry Ray.

PRODUCT EVALUATION COUNCIL

Microsoft responds

▶ **Applications availability:** SQL Server for Windows NT is already shipping. It takes full advantage of Windows NT's scalability. Many other server applications have been announced and will be shipping shortly.

▶ **Advanced Server and existing LANs:** Advanced Server provides benefits both as an application server and file server. As an application server, it delivers the power of a minicomputer operating system combined with the scalability of symmetric multiprocessing and RISC systems, along with the ability to work with systems already in place (e.g., NetWare).

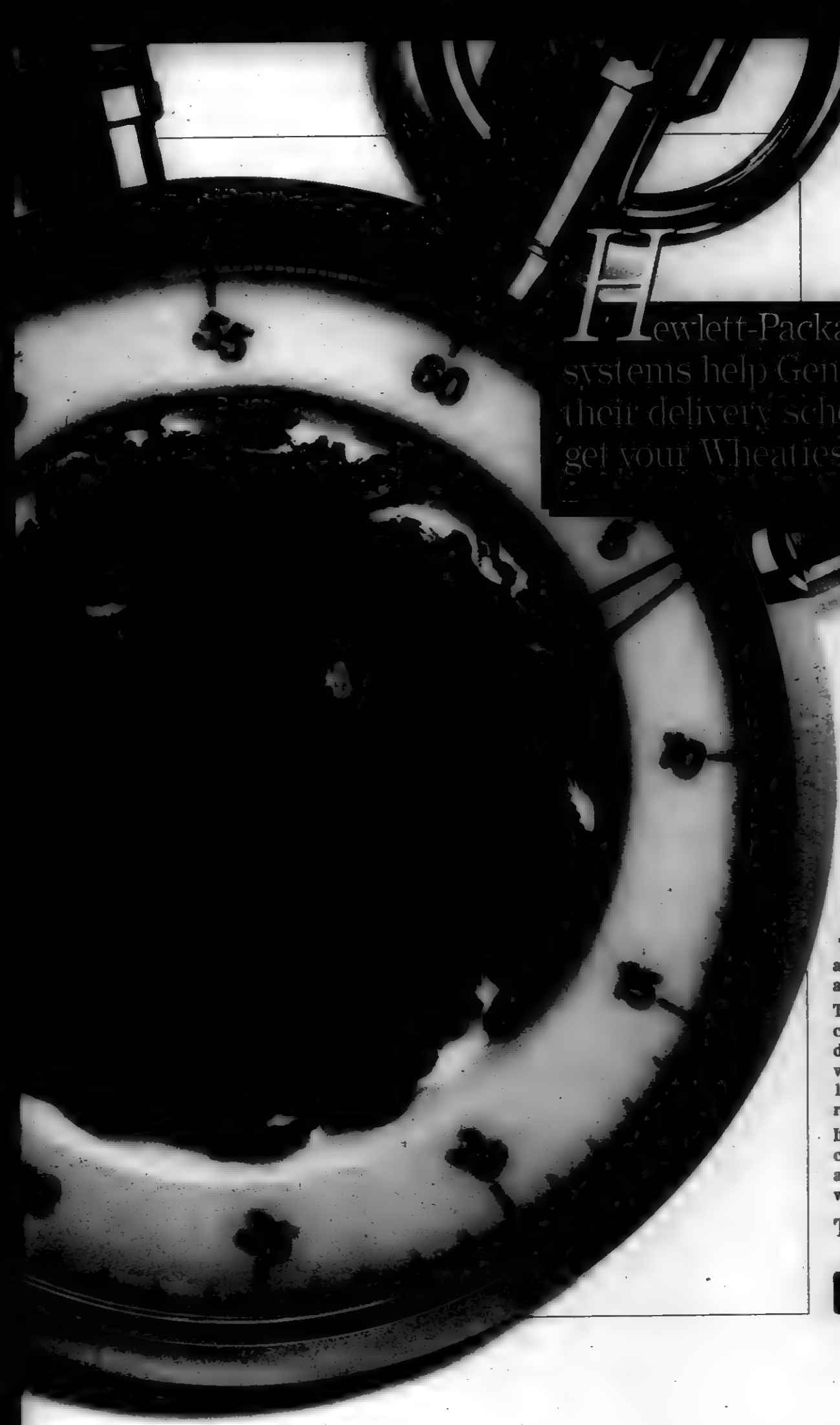
As a file server, the product gives users a single log-on to the enterprise and provides centralized management for administrators, fault-tolerance (including RAID-5) and remote and Macintosh connectivity.

▶ **NetWare Requester:** The Requester will allow Windows NT client systems to more easily access Advanced Server and NetWare.

It will also allow customers to more easily move data back and forth. Advanced Server already has the ability to act as an application server on IPX/SPX networks.

▶ **Technical support:** Microsoft offers competitively priced support. We work with 2,000 Solution Providers to offer third-party support, and we've trained more than 20,000 people on Windows NT and Advanced Server. Microsoft isn't the only source of support. Companies such as Digital Equipment Corp., Hewlett-Packard Co. and NCR Corp. also support Advanced Server.

We offer no-charge 30 days of setup and installation support for Windows NT (scheduled to end June 30, 1994). We have also set up a toll-free fax response system with the most common support issues available at (800) 936-4400. We have put our technical information and software libraries up on Internet (ftp.microsoft.com) as well.



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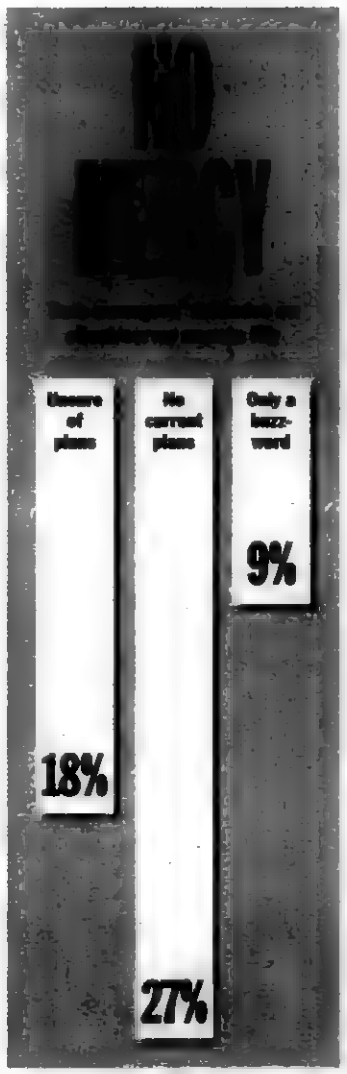
CLIENT/SERVER

Breakdown

BY JOE PANEPINTO

Client/server veterans curse synchronization, scalability and staff problems



Source: International Data Corp. 1993 Global Survey of 858 IS executives in the U.S.

"Folks who went early into client/server development are 'strategically realigning,'" says **Brent Williams**, program director for PC software at International Data Corp. (IDC) in Framingham, Mass. "That means they are in full retreat."

Williams may be exaggerating to make a point, but it is one well taken. The promises of client/server computing — moving processing to where it is most economical, fastest and most flexible — have in the last five years been splashed across headlines, trumpeted at trade shows and hyped in advertisements. Still, 9% of the 858 information systems executives involved in IDC's 1993 Global IT Survey said they believe client/server is a buzzword (see chart at left). Another 45% either have no current client/server plans or are unsure about them.

This reticence is understandable when you listen to survivors' stories. Consultant **Cheryl Currid** talks of a client/server backup job that took 22 hours because of some botched SQL statements. IS chief **David Peach** had trouble keeping Holiday Inns Worldwide's data synchronized in a client/server financial reporting application.

"Discipline" and "planning" — words dear to the heart of every mainframer — need to find their way into client/server efforts, Williams says. "People [have] treated client/server in an emotional way — as a way of escaping the tyrannical discipline of building mainframe applications. They wanted to build code like

Client/server breakdown, *page 110*

Number of TPC-C Benchmarks Published to Date.

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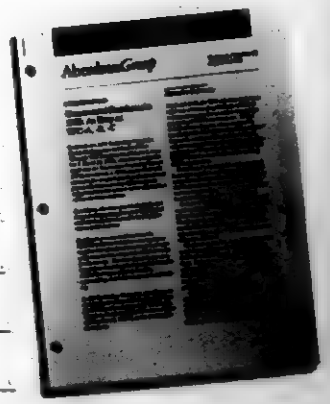

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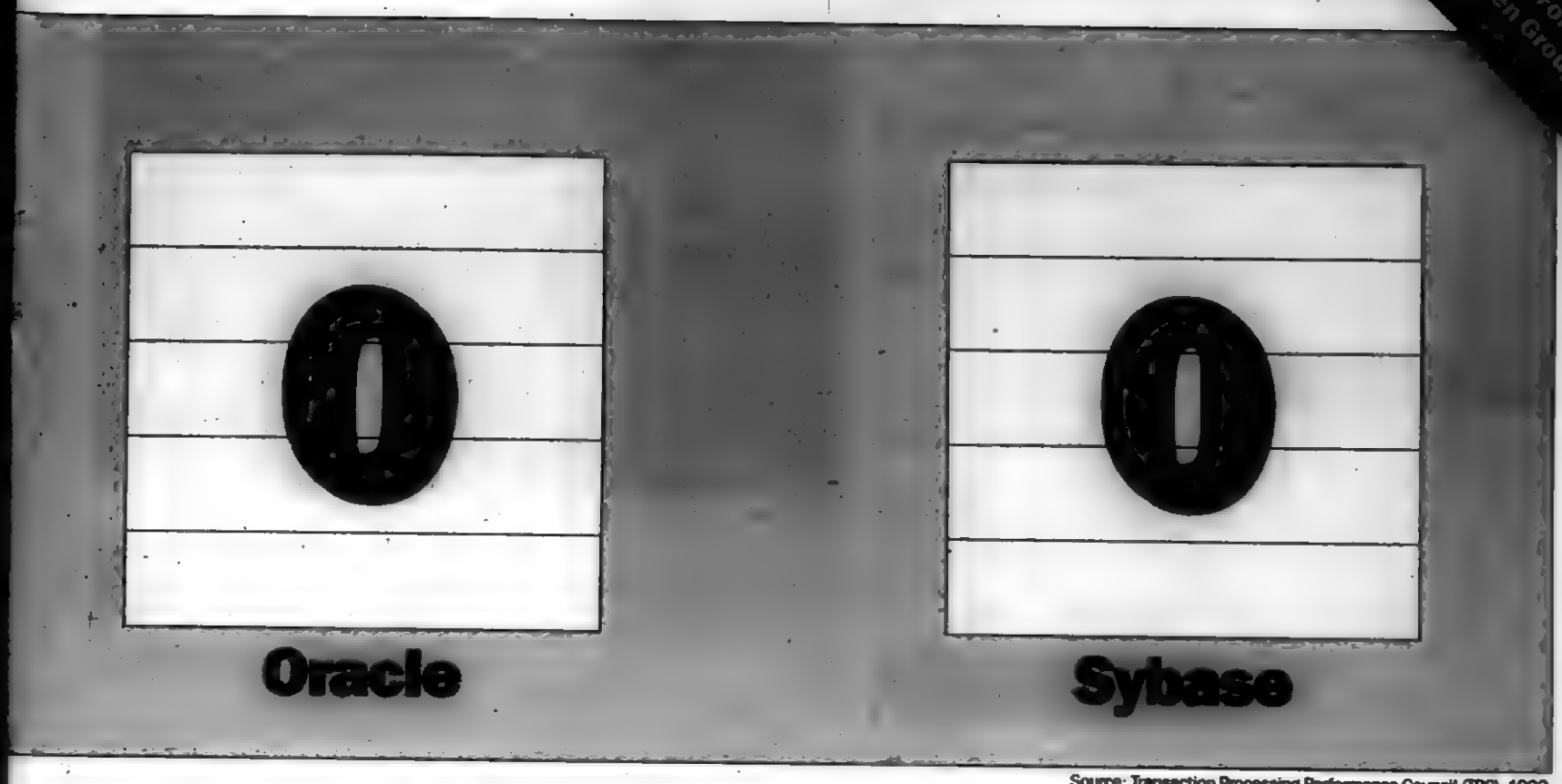

Source: Transaction Processing Performance Council (TPC), 1993.

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CONTINUED FROM PAGE 107

bohemians and just rush right in and hack code."

The unavoidable truth, however, is that building client/server systems that work takes rigor. "You can't just wish it away," Williams says.

What follows are the voices of many client/server veterans — the chief information officers, the systems integrators, the consultants — who talk about the problems and stupid mistakes that can crop up with client/server. Their experiences may help you avoid making mistakes of your own.

Client/server development is supposed to go like this: You embed a few SQL statements in your Cobol application, and there you have it: a client/server application that sends data requests across a network to a remote relational database management system. Wrong.

For one process manufacturing company, which used its Cobol programmer to write embedded SQL statements running against an Oracle Corp. back end, things weren't that pat, says **Cheryl Currid**, president of Currid & Co. in Houston.

"By the time [the programmers] were finished writing the client/server code, they had so messed up the SQL statements that a simple backup job took 22 hours! After a couple of weeks of fooling around with the system, blaming the network, blaming the software, blaming their mothers, they broke down and hired a SQL expert," she says.

"He unscrambled their muddled SQL statements [which were calling for complex multiple joins], cut out all the complex multitable joins and brought processing down to less than an hour."

"A typical [modus operandi] with client/server," says IDC's **Brent Williams**, "is that someone goes out with a 10-screen prototype and tests it with five occasional users, and it looks great. By the time they go into production with a 50-screen application and 200 users, they run into basic performance issues with the database. They pay so much attention to building the GUIs and the SQL statements, they ignore the data modeling and data integrity functions. Failure mode happens after you're committed and far along."

Holiday Inns Worldwide in Atlanta started its pilot client/server project about a year ago, pushing financial reporting data off the mainframe and onto OS/2 servers. "It was an outstanding success as a pilot," says **David Peach**, vice president of finance. "But we decided not to go ahead and implement it."

Why? With Version 1.0 of Dun & Bradstreet Software's SmartStream program, Peach had a tough time keeping financial reporting data on his OS/2 servers in sync with changes to the data on the IBM 3090 host. Changes made to an account on the mainframe were not picked up by the servers.

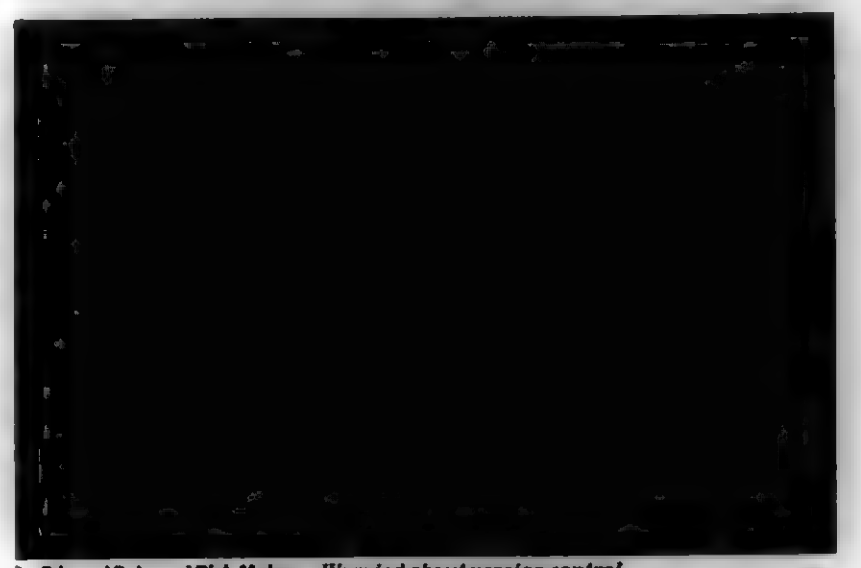
The IS staff had to fax changes back and forth, enter changes manually at the server or scrap copies altogether and download new data from the mainframe. "We would spend three or four days reconciling any changes we made," he says.

Wayland Systems, Inc. was working with one of its clients, an international manufacturing company, on two large client/server pilot projects.

The aim of both projects was to rebuild the company's entire business systems — order entry, pricing, invoicing and transportation — using Powersoft Corp.'s PowerBuilder, says **David Ruble**, Wayland's senior consulting methodologist. Project B was begun when Project A was approximately three quarters finished.

"Project A started out with 20-MHz 386-based PCs, and it was a performance disaster," Ruble says. "We had a fat client application that was doing most of the data processing, and the server was simply slinging data on demand. Everybody on the project joked that the 386s would make good sea anchors.

"For the second project, we decided 33-MHz 486s were the absolute minimum."



▶ **Edward D. Jones' Rich Malone:** *Worried about version control*

"The developers see so much functionality in all the client/server tools that they want to use it all," Ruble says.

For example, developers working on Project A at the international manufacturing company went wild with PowerBuilder, which enabled them to build very complex graphical user interfaces (GUI) with pull-down and pop-up menus, color and graphics.

Without any guidelines, developers created incompatible screen elements for things such as adding a new entry, removing, deleting and closing a window, and exiting and quitting.

IS got things under control by globally defining many of the windows functions and their appearance using PowerBuilder's object-oriented features, including its "ancestor object," a reusable piece of code that contains all of the functionality for an object.

In the midst of Project A, developers created an ancestor object for a window — its size, the method for opening and closing it, its style. They reused that object in Project B.

"Having something simple like that nailed down saved tons of time," Ruble says. "Project B also cost an order of magnitude less because [IS] could reuse lots of the same people, same code and lots of the data model."

Sheila Atre, president of Atre Associates, Inc., recalls a recent incident in which an insurance company cut over mission-critical applications to a client/server system but could not get technicians, who grew up in the LAN and PC world, to accept the seven-day, 24-hour responsibility of keeping the system up.

"These technicians did not grow up in the mainframe environment and were used to problems that could be dealt with the following morning," Atre says. "They were resisting wearing beepers and being on call, and it was very hard for this insurance company to deal with."

THE CLIENT/SERVER

B.S. Meter

Jim Holmes, president of client/server training and consulting company HCS, Inc. in Portland, Ore., learned the hard way that business managers are tired of client/server B.S.

A client had come in to get help implementing client/server technology in its mainframe-centric programming department. Holmes started to talk about the basics of client/server – what the idea was, what the company could expect to gain, etc.

"It was at the point of the presentation where I was telling them client/server was about allocating application processing to the hardware component where it makes the most sense, when a senior manager in the company interrupted me. He said, 'We're doing that now – we have a mainframe for processing and stupid 3270 terminals that can do nothing but accept commands and display information. If we take your definition, we're allocating the appropriate application processing to the hardware components that make the most sense right now. What do we need you for?'

"Before I could answer, he said good-bye and the presentation was over. Period. Apparently he had it up to his eyeballs with client/server this and client/server that and was saying to his underlings through me that he wanted to make sure they were already exploiting what they had before they moved on in a costly new direction."

"In client/server, you can overempower users to the point where they screw up your system," says **A. J. Dennis**, research director of workgroup and end-user computing at Technology Investment Strategies Corp. in Framingham, Mass. "In client/server, the actions of one person can affect the whole system."

Dennis was involved in building a client/server application a few years ago using SQL Server. "We didn't realize that when users made changes to data views, we had to assign new access privileges every time," he says. "Permission to use a particular view would be granted to a group of people, but when changes were made to the view by the user, the old view was [obliterated] and a new one created for which no one had permission."

Rich Malone, partner in charge of information processing at brokerage Edward D. Jones & Co. in St. Louis, is in the midst of a project to cut over 2,400 Edward D. Jones branch offices to client/server computing. The firm wants to reduce the overhead on its IBM mainframes and improve response time so brokers in each office get more up-to-date pricing data.

The company has decided to replace its IBM Series 1 front-end processors with IBM RS/6000s. It also plans to retrofit its satellite data network to run TCP/IP and Ethernet.

But the scope of the brokerage's rollout has Malone worried. Because some client/server products are in early, nonrobust stages, he may need to make changes in operating systems or applications. Updating to a new version of software or applying a bug fix to all clients or servers will be an enormous task.

"You really have to do your homework before you start a client/server rollout of this size because you can be sure the version numbers of software or the hardware configuration may change between the first client installation and the 2,000th," he says. "We've hit a bunch of walls and U turns." Security and data synchronization issues have caused the firm to postpone its selection of an RDBMS, client and server hardware platforms and operating system. ■

Panepinto is a free-lance writer in Amherst, Mass.

CLIENT/SERVER

Ragtime Revue

Because of the number of platforms and applications client/server development affects, companies will likely do the "multivendor ragtime revue" at least once during the course of a project. This ragtime revue, according to TISC's **A. J. Dennis**, is the dance that occurs between an end-user organization and its many vendors when a bug is found in the client/server system.

"If PowerBuilder is blowing up on a particular SQL statement, it may be PowerBuilder, it may be the server, it may be the SQL flavor you're using or it may be the API," Wayland Systems' Ruble says. "There is a lot of fingerpointing."

Because most of the vendors are involved in just one tiny piece of the overall client/server investment, "their motivation to come out and solve every one of your problems is pretty low," Ruble says.

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UNIX PRIMER

Killing runaways

By Joanne Cummings

"Identifying runaways and killing them — that's one of the biggest challenges for us," says Tim Anderson, network administrator at American Safety Razor Co. in Staunton, Va.

No, there's no need to call *America's Most Wanted*. These runaways are processes such as database searches that, due to faulty programming, work themselves into an endless loop within a Unix system. They're one of the most common culprits of system degradation and a force to reckon with if you want to survive in a Unix environment.

Those charged with Unix management say its multitasking feature is one of the reasons it's difficult to troubleshoot.

Unix treats a runaway process like any other task and permits it to loop endlessly, eating up resources without locking the system up as other systems might.

"It's like your car," Anderson says. "It's better if it just quits on you. Everyone knows how hard it is to find an intermittent problem with your car."

Such problems can be detected by performance monitors, says Tom Stoddard, systems programmer at Jet Electronics and Technology, Inc. in Grand Rapids, Mich., but finding the culprit requires a knowledge of basic Unix commands.

"You need to be very familiar with a command called PS, Process Status, including what syntax arguments are available with it," Anderson says. "It can give you more information about what's going on in your operating system than anything else."

Read the manuals

One of the best ways to learn, besides experience, is through reading. "Ninety-nine percent of the time the answer is in the manuals," says Kurt Lanza, systems manager at Inforonics, Inc. in Littleton, Mass. "If you're new to Unix, sit for a couple of hours and go through the manuals page by page, not for comprehension, but to learn where certain things are addressed. That will save you a lot in the long run."

Some of it may be too technical, however, says Kevin Matthew, network administrator for the city of Bremerton, Wash. "For example, to increase the size of the proc table, you have to find the file that sets the size and recompile the operating system," he says. "Somebody new to the environment might not have the confidence to do that."

Fortunately, Unix automates many administrative processes. If novices are confronted with an error message alerting them to increase the table size, they can usually find a program to take care of it, Matthew says.

"On our system, it's called Tuner. It shows you the current configured size and allows you to change it. Then it goes through the steps of recompiling the operating system and putting it out there for you," he says.

Other problems relate to the complexity of Unix's shell scripts. "In Unix, everything runs from a shell," Stoddard says, "which is very much like the command interpreter for DOS. Shell scripts are analogous to a DOS batch file, and sometimes they can be hard to troubleshoot."

"I've designed shell scripts that I've looked back on after about four or five months, and although I wrote them, I have no idea what I'm doing," Matthew says. "With me, troubleshooting is trial and error. I know what the objective is, and I string a couple of utilities together. If I get the desired results, then I store it and leave it alone."

Cummings is a free-lance writer in Marlboro, Mass.

DEMONIC PRINTERS

Printing is not a trivial task in Unix, and it is surprisingly difficult to troubleshoot.

Entire reports disappear

"For example, the print spooler does not know that the printer is off-line. It just prints the job and goes off into the ether somewhere. And that can happen very easily because in Unix, there's no type of acknowledgment that the printer got the job," says Kevin Matthew, network administrator for the city of Bremerton, Wash.

Heavy load conditions

"In most cases, when a printer goes off-line, it sends an X-off to Unix," Matthew says. "Unix listens for it, sees the X-off and tells the print spooler that it's off-line. That works 99% of the time, but if you have a heavy load, the CPU can't get around to see if an X-off happened."

Configuring printers

"We have two or three kinds of printers," says Kurt Lanza, systems manager at Inforonics. "And we had lots of trouble getting them configured properly. One time we just had the baud rate set wrong for the serial port, but it took some time searching through the manuals to realize the problem."

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Bolster Banyan skills

By Leslie Goff

NetWare professionals beware. Banyan Systems, Inc. Vines professionals may be serious contenders for your job as companies continue toward client/server and large Novell, Inc. sites struggle to implement NetWare 4.0, which features some network management capabilities that Vines has had all along.

Vines was designed to connect multiple servers and PCs in a variety of locations. It allows users to manage the network remotely over an array of bridges, routers and gateways via a global naming service called StreetTalk. Because Vines was designed from the outset for enterprisewide networks, any experience working with Vines looks good these days.

"If I needed someone to deal with a wide-area network, I would give preference to a Banyan pro with five years' experience over a Novell pro with five years," says Ted Kull, project manager of a Vines network at Educational Testing Service in Princeton, N.J., and chief information officer of the Association of Banyan Users International (ABUI), based in Chicago.

"It's purely statistical that the majority of Novell LANs are local-area networks with multiple servers, but Banyan LANs are geographically dispersed with multiple servers," he adds.

Heterogeneous expertise

The Banyan professional, the logic goes, is likely to be more knowledgeable about heterogeneous networks. Now that Novell has added global naming services to NetWare in 4.0, new opportunities for Banyan pros could emerge.

"Banyan will definitely maintain its market position and maybe even grow," says Steve Huster, information services manager at Southern Mills, Inc. in Union City, Ga. "Right now the outlook for Banyan pros is as good and probably even better than it's ever been."

Banyan says it has some 3,500 customers servicing 2 million end users. Most of these sites — typically government or military organizations or Fortune 500 companies entrenched in enterprisewide computing — congregate along the East and West coasts, with a smattering of customers in between.

Lou Pryor, chairman of the Information Sciences Department at Garland Community College in Hot Springs, Ark., says there is opportunity in the Houston area (with Texaco Oil) and in Dallas (with American Airlines). Washington and Southern California are also hot spots, says Rand Baldwin, executive director of ABUI. "Banyan has a large installed base in areas where you have a lot of governmental or military activity," he says, adding that the U.S. Marine Corps is one of Banyan's largest users.

Employers' requirements for Vines-related jobs are comprehensive. They include a thorough knowledge of the underlying network topology and all network components, as well as prior experience with platforms and protocols including Macintosh, Unix, mainframes, TCP/IP, SNA, AppleTalk, DECnet and NetWare.

Certified Banyan professionals receive preference, users say. Certification is an intensive two-step process that leads first to the designation Certified Banyan Specialist (CBS) and then Certified Banyan Engineer (CBE). A Banyan spokesman says there are 369 CBSs and 235 CBEs.

"Being a certified Banyan engineer sets you apart because it takes a lot of travel, time and money to come by," says Jacquelyn Bonwell, manager of national network technical support at Computervision Services in Phoenix, a third-party maintenance and training provider. "A lot of companies aren't willing to make that expenditure for employees when in reality, it's probably the best way to make sure your support people can take care of your customers."

Goff is a free-lance writer in New York.

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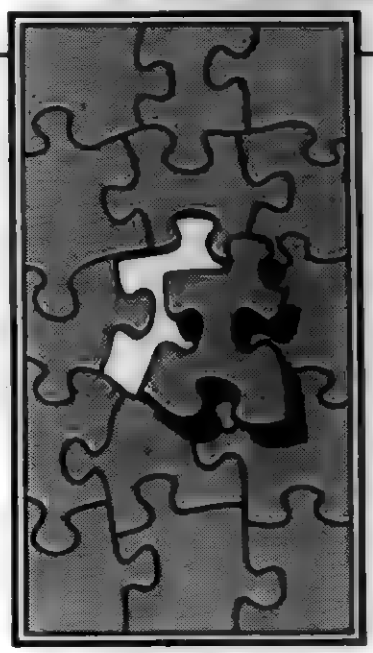

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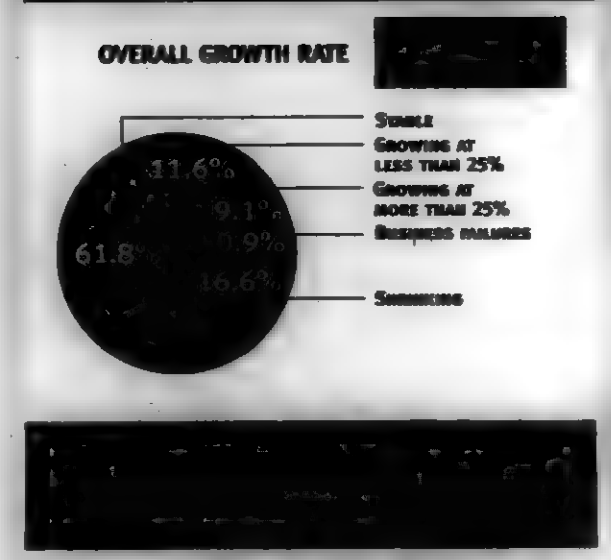

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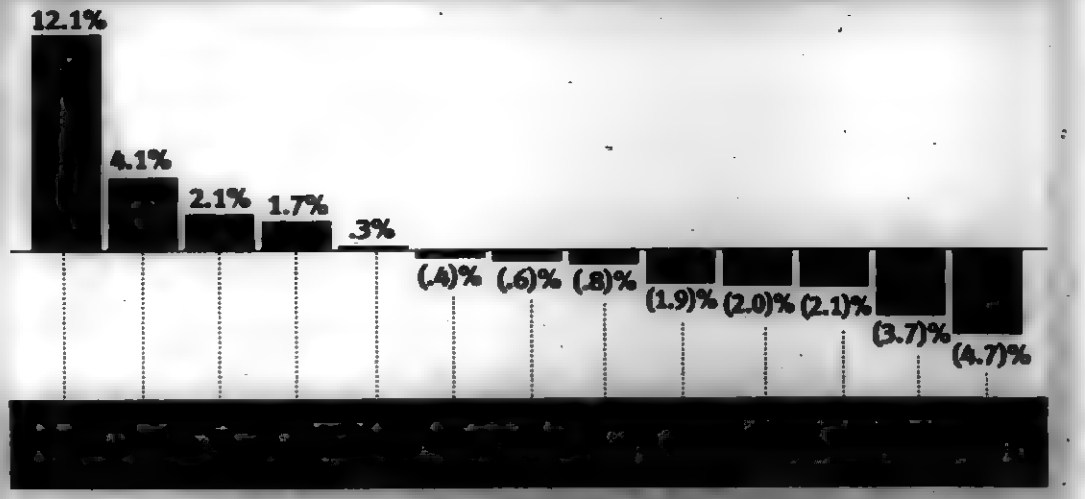

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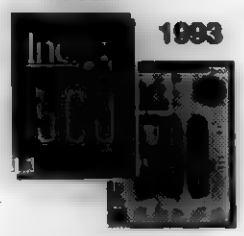

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BEST READ IN INFORMATION SYSTEMS DECISION MAKING STUDY AFTER STUDY

Benchmarking

IS IT RIGHT FOR YOUR OPERATION?

shopper alert!

By Alice Bredin

WHEN CHAMPION International Corp. wanted to know how its data center could run more efficiently, it decided to benchmark its operations. The final analysis showed its laser printing volume was too high for the company's size and recommended an alternative that cut expenses by $250,000.

"Before the year was out, we had saved the money we spent on the study and kept saving," says Tom Walsh, MIS director of network services at the Hamilton, Ohio, paper manufacturer.

It took six weeks to fill out the surveys supplied by Compass America, Inc., the Reston, Va., firm hired for the job. Compass, a management consultancy specializing in information technology benchmarking, analyzed data on approximately 800 different metrics at a cost of $54,000.

There are no figures for the number of companies benchmarking, but experts say the process is gaining ground. "IS is perceived as a cost center, not always a value-added center," says Bill Krenek, senior consultant at the International Benchmark Clearinghouse, a group of 200 organizations that share benchmarking information via a network. "IS departments are looking for a way to turn that around."

Measuring the benefits

Instead of examining the efficiency of information systems infrastructures, companies are measuring the benefits offered by IS. "It used to be, 'How fast do coders code?' Now people want to know how well IS professionals satisfy customers and support business problems," says Kaye MacKenzie, information management and technology quality program manager at Digital Equipment Corp. in Maynard, Mass. According to Krenek, companies most commonly want to benchmark a number of items: how well IS links its strategies to corporate plans; the kinds of measurements used by other IS departments that gauge productivity, such as customer satisfaction and coding speed; application development and support; and migration from mainframes to distributed processing.

SOME BENCHMARKING COMPANIES have databases that contain data from European data centers. While some IS managers feel there is nothing wrong with this data, it may be a concern for your management.

For the past seven years, Xerox Corp. has done most of its own benchmarking. While it has hired third-party benchmarking firms in the past, Sharon Welch, manager of global compute services, says the company learns more from its own studies, which involve sending a team to other companies to observe IS solutions. The same is true for Eastman Kodak Co., which hires consultants to pick companies with the best IS solutions and investigate them on their own, says Jeff Duell, Kodak's technology leader for IS measurement and benchmarking.

When choosing companies for comparison, experts say thoroughness is important. "Have an intern do a periodical search to find companies beyond the usual suspects," says Toby Choate, vice president of information technology consulting at Arthur D. Little, Inc. in Cambridge, Mass. "A lot of the usual suspects have marketing people who market their IT prowess, but these companies may not be doing a lot."

But even with extensive research, you're bound to make mistakes. When Welch began, she says, her biggest mistake was benchmarking just to prove that her department was doing things right. After her first benchmark, she spent a year trying to prove that the data, which showed that some other IS departments were outperforming hers, was wrong.

"Once we started listening, we found out how much we could learn," she says. "Now we don't want to benchmark against a company unless we know they'll blow us away."

Bredin is a free-lance writer in New York.

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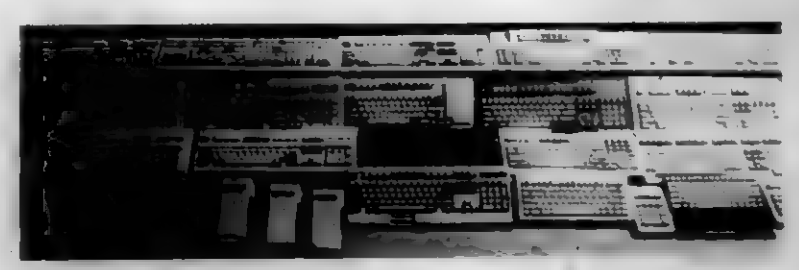

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COMPUTERWORLD
The Newspaper of IS
P.O. Box 2043, Marion, Ohio 43305

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Percent

[illegible]	20.3
[illegible]	20.0
[illegible]	18.9
[illegible]	18.9
[illegible]	14.8
[illegible]	13.6
[illegible]	13.0
[illegible]	13.0

[illegible]	-23.6
[illegible]	-17.4
[illegible]	-17.0
[illegible]	-16.7
[illegible]	-13.6
[illegible]	-12.0
[illegible]	-11.7
[illegible]	-11.0

Dollar

[illegible]	5.13
[illegible]	5.00
[illegible]	4.75
[illegible]	3.75
[illegible]	2.38
[illegible]	2.38
[illegible]	2.00

[illegible]	-9.13
[illegible]	-4.50
[illegible]	-4.50
[illegible]	-4.38
[illegible]	-4.25
[illegible]	-3.75
[illegible]	-3.50
[illegible]	-3.25

[illegible]

Manugistics shines forth

One of the newest rising technology stars on Wall Street is Manugistics Group, Inc. (MANU).

Manugistics went public on Aug. 13. Having picked up Buy recommendations from underwriters Alex. Brown & Sons, Inc. and Robertson, Stephens & Co., the stock jumped as high as 16 last week after its initial public offering at 10.

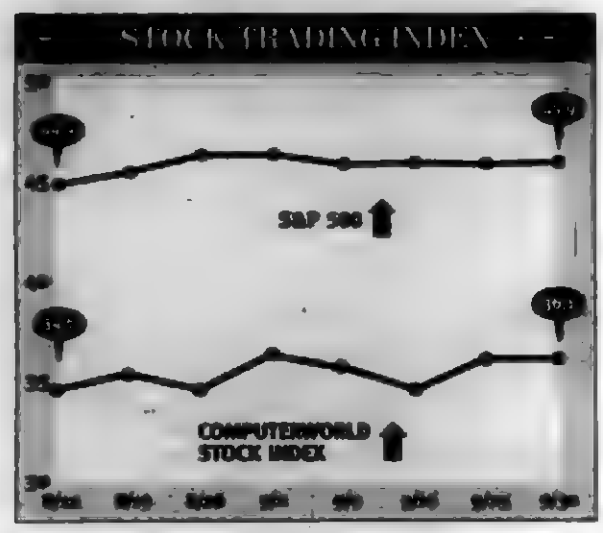
Manugistics creates "supply-chain management" software, which coordinates all aspects of supply chain operation for manufacturers and retailers. The software tracks raw goods acquisition, transportation needs and manufacturing and distribution procedures.

The company is positioned to take advantage of shifting relationships in the retail industry as retailers continue to streamline delivery schedules and put more of the onus of inventory management on the manufacturers.

Manugistics faces competition from software suppliers that offer packages in various segments of the market, including American Software, Inc. (AMSWA) and Marcam Corp. (MCAM). However, no other company offers the same level of enterprisewide integration, according to Robert George, an analyst at Advanced Manufacturing Research, Inc. in Boston.

Other pluses for Manugistics include support for client/server platforms (Unix and OS/2) and mainframes, as well as plenty of room to grow in overseas markets, which currently account for about 15% of the company's revenue.

Manugistics' challenge for the immediate future will be to continue to port its modules to the client/server environment, George said. *—Derek Slater*



Exch	52-Week High	52-Week Low		Oct. 1 3 PM	Wk Net Change	Wk Pct Change
OTC	40.00	15.63	3 COM Corp.	29.75	-0.50	-1.7
NYS	91.13	63.38	American Info Techs Corp.	85.88	0.88	1.0
NYS	65.00	40.63	AT&T	58.75	-0.50	-0.8
OTC	4.06	0.75	Artel Communication Corp.	3.13	0.06	2.0
OTC	24.50	12.50	Banyan Systems Inc.	16.50	-2.38	-12.6
NYS	64.88	44.50	Bell Atlantic Corp.	63.50	1.88	3.0
NYS	62.88	46.75	BellSouth Corp.	60.63	0.38	0.6
NYS	14.75	3.63	Bolt, Beranek & Newman	9.50	-1.00	-9.5
OTC	18.50	9.50	Brooktrout Technology	12.50	0.38	3.1
NYS	119.00	56.63	Cabletron Systems	103.00	-4.50	-4.2
OTC	35.00	6.63	Certigram Communications	32.75	3.38	11.5
OTC	55.50	20.25	Chipcom Corp.	53.38	0.38	0.7
OTC	59.25	24.00	Cisco Systems Inc.	49.25	1.25	2.6
OTC	16.38	5.50	Compression Labs Inc.	14.00	-0.13	-0.9
OTC	36.00	17.00	CrossComm	26.13	-2.13	-7.5
OTC	4.63	1.63	Data Switch Corp.	2.38	0.38	18.8
NYS	19.88	12.38	Digital Comm Assoc.	18.75	-0.25	-1.3
OTC	12.75	3.75	Digital Systems Int'l Inc.	4.00	-0.50	-11.1
OTC	67.88	11.13	DSC Communications	61.25	0.25	0.4
OTC	9.50	4.75	Fibronix Int'l Inc.	6.38	0.63	10.9
OTC	24.00	8.75	Filenet Corp.	14.25	-0.50	-3.4
OTC	6.38	1.50	Gandalf Technologies Inc.	2.75	0.44	18.9
OTC	2.06	0.75	Gateway Communications	0.88	0.06	7.6
NYS	15.75	3.38	General Datacomm Inds.	10.75	-0.75	-6.5
ASE	3.75	2.00	Go Video	2.50	0.00	0.0
NYS	39.00	32.38	GTE Corp.	38.00	-0.25	-0.7
NYS	94.75	63.25	ITT Corp.	93.25	1.38	1.5
OTC	29.88	16.81	MCI Communications Corp.	27.88	0.63	2.3
OTC	6.50	1.50	Microcom Inc.	3.00	0.38	14.3
OTC	24.25	3.50	Netrix Corp.	4.50	0.25	5.9
OTC	19.00	6.50	Network Computing Devices	7.00	-0.25	-3.4
NYS	15.00	5.38	Network Equipment Tech.	7.88	-0.25	-3.1
OTC	20.13	8.00	Network General	13.25	0.63	5.0
OTC	15.75	6.88	Network Systems Corp.	8.25	0.75	10.0
OTC	73.88	8.94	Newbridge Networks Corp.	66.13	-2.75	-4.0
NYS	46.00	21.38	Northern Telecom Ltd.	24.00	-1.00	-4.0
OTC	35.25	17.00	Novell Inc. (L)	18.63	1.13	6.4
NYS	48.88	39.50	Nynex Corp.	46.13	-0.13	-0.3
OTC	30.00	14.50	Octel Communications Corp.	23.50	1.25	5.6
OTC	6.13	3.38	Penril Data Comm Networks	6.25	0.13	3.0
OTC	30.50	12.50	Picturetel Corp.	17.50	-0.50	-2.8
OTC	11.50	3.63	Proteon Inc.	5.63	0.75	15.4
NYS	37.88	17.50	Scientific Atlanta Inc.	34.50	-1.25	-3.5
NYS	47.00	31.75	Southwestern Bell Corp.	43.63	1.75	4.2
NYS	37.38	23.38	Sprint Corp.	37.00	0.13	0.3
OTC	27.00	12.50	Standard Microsystems Corp.	23.00	-0.13	-0.5
OTC	18.50	9.25	Stratacom Inc.	14.00	1.50	12.0
OTC	42.75	12.84	Synoptics Communications	24.25	-0.75	-3.0
OTC	7.25	3.88	Telebit Corp. (H)	7.00	0.38	5.7
OTC	17.88	2.63	Telematics Int'l Inc. (H)	15.38	-0.25	-1.6
OTC	34.75	15.25	US Robotics (H)	34.75	1.25	3.7
NYS	49.25	35.25	US West Inc. (H)	49.25	1.75	3.7
OTC	56.00	19.50	Wellfleet Communications	46.75	-2.00	-4.1
OTC	19.50	7.25	Xircom	17.75	0.75	4.4
OTC	5.56	2.50	Advanced Logic Research	3.25	0.38	13.0
OTC	65.25	22.50	Apple Computer Inc.	22.50	-2.38	-9.5
OTC	24.25	12.75	AST Research Inc.	18.00	-0.13	-0.7
NYS	9.25	2.50	Commodore Int'l	5.25	0.00	0.0
NYS	61.75	31.00	Compaq Computer Corp.	57.63	-1.63	-2.7
OTC	49.88	13.50	Dell Computer Corp.	16.50	-0.38	-2.2
NYS	89.25	50.25	Hewlett Packard Co.	68.75	-0.25	-0.4
NYS	42.63	17.63	Silicon Graphics (H)	42.63	1.88	4.6
OTC	41.00	22.00	Sun Microsystems Inc.	22.00	-4.50	-17.0
NYS	37.75	24.63	Tandy Corp. (H)	37.75	1.38	3.8
OTC	7.00	2.63	Zeos International Ltd.	2.63	-0.25	-8.7
ASE	9.38	4.50	Amdahl Corp.	6.00	0.13	2.1
NYS	8.75	3.63	Convex Computer	5.25	-0.13	-2.3
OTC	6.13	2.25	Cray Computer	4.25	-0.13	-2.9
NYS	30.88	19.00	Cray Research Inc.	24.50	0.75	3.2
NYS	13.88	7.75	Data General Corp.	10.38	1.50	16.9
NYS	49.25	30.38	Digital Equipment Corp.	36.75	-1.63	-4.2
NYS	44.00	28.75	Harris Corp.	42.88	1.00	2.4
NYS	80.38	40.63	IBM	63.13	1.50	3.6
OTC	25.75	5.50	Kendall Square Research	24.00	2.00	9.1
NYS	141.50	83.00	Matsushita Electronics	136.00	1.50	1.1
OTC	23.75	8.25	Netframe	15.63	-0.38	-2.3
OTC	24.25	9.25	Parallan Computer	24.25	3.00	14.1
OTC	23.25	6.00	Pyramid Technology	21.50	1.50	7.5
OTC	24.00	11.25	Sequent Computer Sys.	15.50	0.50	3.3
OTC	5.50	1.38	Sequoia Systems Inc.	2.88	0.38	15.0
NYS	41.25	20.25	Stratus Computer Inc.	24.25	-0.88	-3.5
NYS	16.88	8.50	Tandem Computers Inc.	12.25	0.38	3.2
OTC	23.50	10.63	TriCord Systems	21.00	1.00	5.0
NYS	13.88	7.75	Unisys Corp.	12.13	0.38	3.2
OTC	37.00	12.63	Adobe Systems Inc.	18.50	0.00	0.0
OTC	21.00	10.25	Aldus Corp. (H)	19.50	-0.75	-3.7
OTC	11.25	5.50	American Software Inc.	6.88	-0.25	-3.5
OTC	28.13	9.50	Ask Computer Systems	12.25	0.88	7.7
OTC	56.75	38.75	Autodesk Inc.	44.75	-3.25	-6.8
OTC	7.75	2.50	Bachman Info. Systems	3.38	-0.13	-3.6
OTC	43.00	24.75	BGS Systems Inc. (L)	25.50	0.75	3.0
OTC	84.13	38.75	BMC Software Inc.	58.25	-2.25	-3.7
OTC	28.25	18.00	Boole & Babbage	24.75	-0.13	-0.5
OTC	39.75	12.75	Borland Int'l Inc.	15.00	0.25	1.7
OTC	5.00	2.75	CE Software	3.63	0.13	3.6
ASE	40.25	11.16	Cheyenne Software Inc.	33.00	2.25	7.3
OTC	19.50	8.25	ChipSoft	14.75	1.50	11.3
OTC	8.88	5.63	Cognos Inc.	7.63	0.13	1.7
NYS	33.38	14.50	Computer Associates (H)	32.88	0.38	1.2
NYS	7.00	2.75	Computervision Corp.	3.13	0.13	4.2
OTC	34.25	19.25	Computware Corp.	23.00	0.63	2.8
OTC	14.75	5.75	Comshare Inc.	10.00	0.75	8.1
OTC	32.25	10.75	Corel Corp. (H)	30.50	-0.50	-1.6
OTC	15.25	5.88	Easel Corp.	6.13	-0.13	-2.0
OTC	25.25	12.00	4th Dimension	21.13	0.25	1.2
OTC	19.25	5.25	Frame Technology	7.50	-0.25	-3.2
OTC	17.50	8.00	Group I Software	8.00	-1.50	-15.8
OTC	35.25	14.00	Gupta	15.50	0.50	3.3
OTC	11.50	4.50	Hogan Systems Inc.	11.50	0.00	0.0
OTC	25.75	11.25	IMRS	19.75	2.38	13.7
OTC	44.75	24.75	Information Resources	40.00	0.25	0.6
OTC	27.25	10.50	Informix Corp.	23.63	1.88	8.6
OTC	14.50	8.50	Intergraph Corp.	10.38	0.38	3.8
OTC	13.63	5.88	Interleaf Inc.	6.13	-0.38	-5.8
OTC	16.50	6.75	Intersolv Inc.	9.25	1.00	12.1
OTC	16.00	7.75	Knowledgeware Inc.	11.00	0.25	2.3
OTC	54.75	15.50	Logent Corp.	21.50	0.50	2.4
OTC	46.50	14.75	Lotus Development (H)	45.25	1.50	3.4
OTC	23.00	4.25	MathSoft	6.50	-0.13	-1.9
OTC	23.25	4.50	McAfee Associates	8.13	-0.38	-4.4
OTC	11.63	2.50	Mesa Software	5.50	0.75	15.8
OTC	12.00	5.25	Mentor Graphics	10.63	-0.13	-1.2
OTC	46.00	26.25	Micro Focus	26.88	0.13	0.5
OTC	13.25	4.38	Microgrape Inc.	7.50	-0.25	-3.2
OTC	98.00	70.38	Microsoft Corp.	82.75	2.50	3.1
OTC	60.63	18.63	Oracle Corp. (H)	60.63	1.88	3.2
OTC	40.25	21.50	Parametric Technology	40.25	2.50	6.6
OTC	40.50	22.50	Peoplesoft	36.75	1.75	5.0
OTC	7.13	3.75	Phoenix Technologies	4.00	0.00	0.0
OTC	40.00	22.00	Powersoft	29.25	-0.75	-2.5
OTC	34.00	11.34	Platinum Software (H)	34.00	3.75	12.4
OTC	25.00	8.75	Platinum Technology (L)	10.00	0.75	8.1
OTC	61.50	32.25	Progress Software Corp.	58.50	5.00	9.3
OTC	7.38	2.38	Quarterdeck Office Sys. (L)	2.38	-0.50	-17.4
OTC	32.00	15.75	Rainbow Technologies Inc.	24.00	0.75	3.2
OTC	11.38	4.25	Rasterops	8.63	-0.50	-5.5
OTC	15.25	3.63	Ross Systems	12.88	0.88	7.3
OTC	28.75	9.63	Sapiens Intl. Corp. N.V.	25.25	-1.63	-6.0
OTC	14.50	5.50	Software Publishing Corp.	6.00	-0.25	-4.0
OTC	14.25	2.63	Software Toolworks Inc.	13.38	0.63	4.9
OTC	2.75	0.75	Spinnaker Software	1.56	-0.06	-3.8
OTC	13.75	3.38	State of the Art	9.25	-1.50	-14.0
NYS	24.63	15.00	Sterling Software Inc.	24.25	2.00	9.0
OTC	21.63	8.00	Struct. Dynamics Research	14.00	-1.50	-9.7
OTC	77.50	32.75	Sybase Inc.	65.00	-0.75	-1.1
OTC	20.50	5.88	Symantec Corp. (H)	19.13	-0.88	-4.4
OTC	25.50	10.00	System Software Assoc.	16.25	-0.75	-4.4
OTC	6.38	2.75	Trimeric Corp.	5.25	0.88	20.0
OTC	24.75	11.75	ViewLogic Systems	24.75	1.50	6.5
OTC	23.50	5.50	Walker Interactive Systems	6.63	0.38	6.0
OTC	3.19	1.00	Wordstar	1.19	0.06	5.6
NYS	32.88	10.75	Advanced Micro Devices	25.88	-4.50	-14.8
NYS	28.00	9.75	Analog Devices Inc. (H)	27.00	0.00	0.0
OTC	38.63	10.50	Atmel Corp. (H)	34.63	-3.38	-8.9
OTC	6.25	2.75	Chips and Technologies	3.50	0.13	3.7
OTC	39.75	13.00	Cirrus Logic	32.13	-0.75	-2.3
NYS	16.75	7.88	Cypress Semiconductor Corp.	13.88	1.13	8.8
NYS	19.00	10.38	Dallas Semiconductor	18.88	0.50	2.7
OTC	73.00	30.38	Intel Corp. (H)	73.00	4.75	7.0
NYS	19.25	5.38	LSI Logic Corp.	16.63	-1.13	-6.3
OTC	24.75	11.66	Lattice Semiconductor (H)	22.63	5.13	29.3
NYS	63.63	15.63	Micron Technology (H)	52.88	-9.13	-14.7
NYS	105.13	41.38	Motorola Inc. (H)	100.00	0.63	0.6
NYS	21.75	10.13	National Semiconductor (H)	20.38	-0.25	-1.2
OTC	15.75	6.50	Sierra Semiconductor	8.25	0.38	4.8
OTC	51.75	25.50	SynOptics	47.00	-2.00	-4.1
NYS	84.25	39.00	Texas Instruments	74.50	-4.25	-5.4
OTC	18.88	6.50	VLSI Technology (H)	17.13	-1.13	-6.2
OTC	14.38	3.00	Wafertech (H)	12.13	-1.88	-13.4
ASE	9.63	3.63	Western Digital Corp.	5.13	0.13	2.5
OTC	52.75	14.50	Xilinx (H)	46.75	-0.63	-1.3
OTC	57.50	18.00	Zilog Inc. (H)	35.00	-0.13	-0.4
OTC	24.00	7.88	American Power Conversion	22.00	0.56	2.6
OTC	22.75	15.50	Banctec Inc. (H)	20.75	-1.00	-4.6
OTC	18.00	3.50	Cambex Corp.	4.00	0.00	0.0
ASE	18.38	3.88	Cognitronics Corp.	4.25	0.00	0.0
NYS	25.50	9.00	Conner Peripherals	10.00	-0.25	-2.4
OTC	38.50	15.50	Creative Technologies Inc.	22.00	1.25	6.0
OTC	30.75	8.00	Data Race Inc. (L)	8.00	-2.75	-25.6
ASE	13.25	4.75	Dataram Corp.	9.75	1.25	14.7
NYS	38.00	6.00	EMC Corp. (H)	36.38	-0.25	-0.7
OTC	10.50	5.25	Emulex Corp.	6.63	0.25	3.9
OTC	19.00	13.25	Evans & Sutherland	17.50	0.00	0.0
OTC	20.63	7.50	Exabyte	10.50	0.88	9.1
OTC	34.00	9.13	Intelligent Info. Systems	26.00	0.00	0.0
OTC	8.88	2.50	Iomega Corp.	2.88	-0.13	-4.3
OTC	14.25	5.75	IPL Systems Inc.	7.50	-0.25	-3.2
OTC	24.00	14.25	Komag Inc.	16.25	-0.50	-3.0
OTC	19.63	4.38	Maxtor Corp.	5.13	-0.25	-4.7
OTC	10.00	5.75	Micropolis Corp.	6.75	0.13	1.9
NYS	117.00	97.00	3M Corp	102.75	0.00	0.0
OTC	7.75	4.00	Printronix Inc.	7.25	-0.50	-6.5
NYS	17.25	6.88	QMS Inc.	9.13	-0.13	-1.4
OTC	17.88	9.50	Quantum Corp.	11.50	0.63	5.7
OTC	7.13	3.13	Radius Inc.	3.75	-0.75	-16.7
NYS	16.88	9.13	Recognition Equipment	16.38	0.50	3.1
OTC	13.88	3.75	Rexon Inc.	4.13	0.00	0.0
OTC	22.38	12.00	Seagate Technology	17.50	-1.00	-5.4
NYS	45.00	18.00	Storage Technology	27.25	1.63	6.3
NYS	27.88	17.63	Tektronix Inc.	23.88	-0.50	-2.1
NYS	88.88	70.13	Xerox Corp.	73.38	1.13	1.6
OTC*	23.75*	14.88*	American Mgmt. Systems	17.50	1.00	6.1
NYS	4.75	2.38	Arkcomp Inc.	3.00	0.00	0.0
OTC	23.00	11.00	Analysts Int'l (L)	21.00	0.17	0.8
NYS	56.13	44.63	Auto Data Processing	49.75	-1.38	-2.7
NYS	18.38	13.00	Ceridian Corp. (H)	18.13	0.25	1.4
NYS	17.63	13.13	Comdisco Inc.	17.63	1.75	11.0
OTC	12.50	4.50	Computer Horizons	11.50	1.00	9.5
NYS	94.88	65.88	Computer Sciences (H)	92.00	0.50	0.5
NYS	9.25	6.00	Computer Task Group	7.00	0.00	0.0
NYS	60.50	19.00	CompUSA Inc.	37.38	-3.75	-12.0
OTC	14.25	7.00	Corporate Software	11.38	0.25	2.2
OTC	12.75	6.63	Egghead Discount Software	6.88	-0.13	-1.8
NYS	35.88	26.00	General Motors E (EDS)	28.63	-3.00	-9.5
OTC	25.50	10.50	Inacom Corp.	17.50	1.50	9.4
OTC	23.00	8.13	Intelligent Electronics (H)	23.00	3.00	15.0
OTC	16.50	7.13	Meridel (H)	14.38	-0.75	-5.0
OTC	24.50	5.75	Microage Inc.	24.50	2.50	11.4
OTC	33.50	19.16	Paychex	33.50	1.50	4.7
NYS	87.25	21.63	Policy Management Sys.	26.63	0.00	0.0
NYS	43.63	20.75	Reynolds and Reynolds	40.25	0.63	1.6
OTC	20.00	12.13	SEI Corp. (H)	19.50	1.00	5.4
OTC	24.50	17.50	Shared Medical Systems	24.50	2.00	8.9
OTC	12.63	5.75	SHL Systemhouse	9.63	-0.13	-1.3
OTC	30.75	20.00	Software Spectrum Inc.	25.50	0.25	1.0
OTC	48.75	23.75	Sungard Data Systems	39.00	-0.75	-1.9
NYS	4.38	1.13	Ultimate Corp.	3.38	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

Exec sues Apple

Apple Computer, Inc. is being sued by former Vice President and Secretary Albert A. Eisenstat, 68, who left the company two weeks ago and resigned his board seat. According to Apple, Eisenstat is suing the company and its chief executive officer, Michael Spindler, "in a dispute over compensation related to his departure from the company." Apple said in a statement that the charges are without merit.

McAfee nixes deal

McAfee Associates, Inc. has broken off its acquisition discussions with ButtonWare, Inc., a database developer from Bellevue, Wash. No reason was given for the termination of the planned purchase, which was announced by the Santa Clara, Calif.-based McAfee in July. Despite the setback, McAfee officials said they hope to continue to diversify their product line beyond their current antivirus and utility software offerings.

Northgate woes wax

Northgate Computer Systems, Inc. announced that severe cash-flow problems hurt sales during its third quarter, which ended Sept. 30. That, combined with losses arising from a decision by the company's landlord to call in a $1.5 million letter of credit and terminate a building lease, will lead to a "substantial loss" in the third quarter, according to Northgate. The direct marketer of PCs plans to move to a smaller facility.

SHORT TAKES AST Research, Inc. of Irvine, Calif., sold its 5250 emulation board business for $525,000 to Micro-Integration Corp. of Cumberland, Md. ... Goren Enterprises, Inc. has agreed to buy Applicon, Inc., a CAD/CAM software supplier from Schlumberger Ltd. ... FTP Software, Inc. has filed a registration for an initial public offering.

Router, hub markets mix and merge

By Joanie M. Wexler

Further evidence of consolidation in the networking industry surfaced last week in the form of two acquisitions that pool smart hub and routing technology.

After weeks of rumors, hub market leader SynOptics Communications, Inc. bought high-end router start-up Coral Networks, Inc. in Marlboro, Mass., for $15.2 million. Coral has already been integrated into SynOptics under the SynOptics name.

Meanwhile, router and channel extension equipment maker Network Systems Corp. moved to buy hub company Bytex Corp. for $47 million.

The activity signals a shift toward bundling many diverse communications functions, including cabling, routing and LAN switching, into a single backbone box to accommodate growing, complex corporate networks and to aid the survival of smaller vendors.

SynOptics' purchase of Coral will help infuse cash into the 45-person router company that is perennially in search of financial backing despite its technical advantage of making the most fault-tolerant router on the market.

Stake in the neighborhood

Both SynOptics and Network Systems said they want to maintain an East Coast presence; acquisitions Coral and Bytex will thus remain in their Massachusetts locations.

The timing was impeccable: SynOptics' announcement of a high-end "network center" hub last week was criticized for not sporting integrated routing (see story page 12). SynOptics has now revealed plans to bundle Coral's routing technology "across our entire product line and possibly in a stand-alone product for remote office applications" in 1994, said Bill Lanfri, vice president of technology systems marketing.

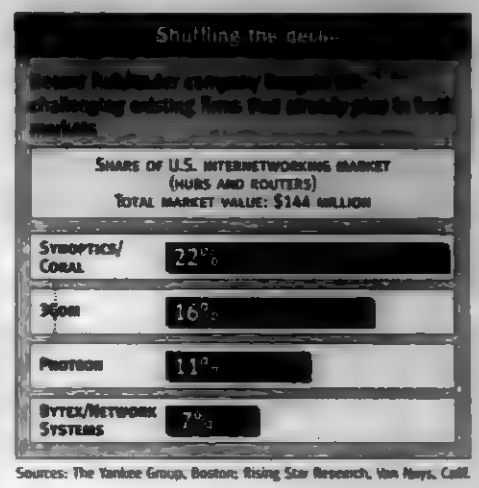
With its Bytex acquisition, Network Systems is also eyeing the backbone market, said Warren Pillsbury, vice president of marketing at Network Systems in Minneapolis. "A high-end intelligent hub is essential to that strategy."

Paul Deninger, managing director at Broadview Associates, L.P., the Fort Lee, N.J., investment banking firm that engineered the Network Systems/Bytex deal, noted, "While people referring to backbones today usually mean networks built on bridges and routers, there is an argument that hubs will become the backbones and routers will be inside them."

While profitable, Network Systems's $2.3 million net income for its fiscal 1993 quarter ended June 30 was a downturn from the $3.7 million figure of the same quarter the previous year. Bytex lost $1.4 million during its three months ended June 30 this year, compared with a net income of $96 million for the same period the previous year.

"Every day, Bytex had to fight the question, 'Are you going to be around tomorrow?'" said Deninger — a situation that makes it almost impossible for a vendor to rebound.

However, Bytex President Art Carr said now "customers will have greater assurance of the financial viability of Bytex." He said the merger of the two firms' largely direct distribution channels should also help each gain sales momentum.



Sources: The Yankee Group, Boston; Rising Star Research, Van Nuys, Calif.

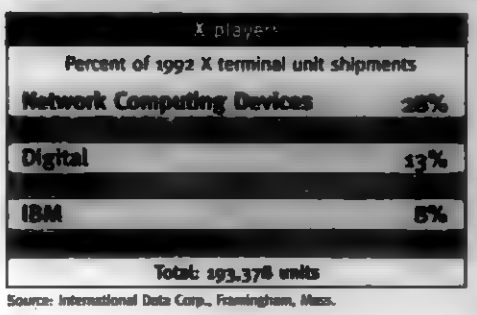
X market gains speed

By Jean S. Bozman

The X terminal market is heating up, with competing product announcements from Hewlett-Packard Co., IBM, and Tektronix, Inc. in recent weeks that set new price/performance levels.

The flurry of activity caps a year of rising X terminal shipments, industry analysts said, driven by lower costs and the need for centralized management of Unix applications.

Increased competition in the U.S. market stems, in part, from slow sales in Europe this year, said Eileen O'Brien, director of the terminals program at International Data Corp. in Framingham, Mass. However, the potential for an overheated market still exists. "The pricing of the components will come down," she said, "but it could reach the point where vendors cannot make money, and all they'll be doing is buying market share."



Source: International Data Corp., Framingham, Mass.

Users and analysts noted an interest in using X terminals as a way to reduce the cost of computing. "It's the distributed version of the IBM 3270," said Judith Hurwitz, president of the Hurwitz Consulting Group in Watertown, Mass. "People don't want to put an [Intel] 486 or a workstation on everybody's desktop." Analysts also noted vendor support for both Microsoft Corp.'s Windows NT and Unix applications, allowing users to access Windows NT and Unix servers simultaneously and to transfer data between them.

X terminals are becoming a larger fraction of the total population of desktop devices at many sites, some users reported. "Workstations still outnumber X terminals by 10 to 1, but the ratio of X terminals to workstations is increasing," said Mark Anderson, a computer scientist at Argonne National Laboratory in Argonne, Ill., near Chicago.

And, since X terminals display applications that are running on centralized servers, they also simplify information systems tasks, users said. "They are easier to manage [than workstations], and they do not have significant license or support costs associated with them because the software is on the server," Anderson said. Meanwhile, intense competition between vendors has reduced the differences between vendors' products in terms of specific features, he said.

Several vendors made announcements this fall:

- Hewlett-Packard Co. replaced its entire X terminal line with a line of Envizex terminals that support multimedia applications. HP will sell users terminals, ranging in price from $1,995 to $4,995 and provide trade-in credits for old ones.
- Tektronix is expected to announce this week a new line of low-end X terminals, called the TekXpress XP100 Series, with prices that range from $1,395 to $4,695, depending on monitor size and configuration.
- IBM announced the Model 140 series of X terminals at the Unix Expo conference in New York, overlapping with the low-end Model 130 and complementing the high-end Model 150 line, analysts said. Prices for the Model 140 line range from $2,800 to $4,800 based on display size and features.

Wysiwyg

What were You doing 10 years ago TODAY?

IN 1983

Other facts...

- Scott McNealy was just about to take over as president of Sun Microsystems, Inc. The company released a 32-bit engineering-oriented workstation/processor based on Motorola's 68000 microprocessor.
- The AT&T monopoly was reaching the end of its life.
- IBM shipped 800,000 PCs.
- Users spent $200 million on micro-mainframe connection hardware and software.

...and events

I was in charge of our microprocessors at Intel. We were busily working with IBM on developing the 286-based PC AT and had started developing the 32-bit Intel 386 microprocessor. Our projections for the 386 microprocessor were to sell over 1 million during its lifetime. We exceeded projections and sold more than 1 million in one month.

David House
Senior Vice President/Corporate Strategy
Intel Corp., Santa Clara, Calif.

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The 5th Wave *by* Rich Tennant

"WE SHOULD HAVE THIS FIXED IN VERSION 2."

Inside Lines

Playing it safe

Sources close to IBM late last week said Big Blue has decided not to make a grandiose rollout of its eagerly anticipated Parallel Server in mid-October. Instead, IBM plans to meet privately with large customers to describe the product and its capabilities, along with pricing and availability. One source who requested anonymity said IBM's change of heart does not in any way reflect development delays for the parallel server. In fact, the machine is ready and was demonstrated at a conference IBM held last week in Phoenix for CEOs, though it's still not clear when the system will ship. The source said IBM has not yet completed analyzing the size and scope of performance workloads that the machine can handle.

Expect a full house

The House Subcommittee on Economic and Commercial Law has tentatively scheduled a hearing on Oct. 13 to look into some of the competitive practices among major players in the computer industry. However, sources said the subcommittee has specifically requested testimony on Novell and Microsoft, which own prodigious market shares in the operating system and network operating system markets, respectively. Sources said the questions regarding the quasi-monopoly positions of both companies will be discussed. The subcommittee has jurisdiction over matters of antitrust, bankruptcy, commercial law and economic regulation. Spokespeople for both Microsoft and Novell said they were not aware of the tentatively scheduled meeting or its agenda.

Closing the loop

Novell will announce the back end, or NetWare server component, of its NetWare Connect remote LAN access product this week, through its partner Cytrix. The small company sells software that allows a range of clients to run applications entirely on a 486 server, either from the LAN or from the road. The two companies will provide remote software that runs on NetWare Connect and lets users on the road run jobs on a NetWare server.

Next Step for NCR?

NCR will soon announce plans to run Next Computer's NextStep operating system on its NCR System 3000 servers. An NCR executive said the move would be a boon for NCR System 3000 users who have expressed interest in the object-oriented operating environment. One such user is Chrysler Financial, a division of Chrysler Corp., which recently rolled out 113 NCR 3445 servers in its credit branches across the U.S. and Canada. Since Chrysler's Goldstar Technology PCs currently run NextStep, sources said the auto maker's financial services division would like to extend the operating environment to its server.

Does the label say "Unix inside"?

SunSoft President Ed Zander says Unix analysts unfairly labeled him a major force of resistance to a plan to let the X/Open Co. put a trademark on Novell's Unix System V brand name [CW, Sept. 27]. But Zander made clear last week that he would rather have the X/Open trademark on SunSoft's Solaris software say Unix and not Novell's UnixWare label. "That box will say 'Unix inside,'" he said. "My goal with Solaris is to beat UnixWare." Zander said he has conferred with Kazwal Rekhi, executive vice president of Novell's Unix Systems Group, and now believes a resolution to the X/Open trademark issue will come soon.

Although Lotus currently has no plans to offer a runtime version of Notes, Jeff Papows, vice president of the Notes division, said the company will offer a runtime version of the Notebook application development environment it plans to deliver next year. This will allow sites to build applications that can then be distributed at a lower cost on multiple nodes running Notes. While this won't reduce the actual cost of Notes itself, it should reduce the cost of application development in Notes. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 70537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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Elapsed Time	CPU Time	EXCPs	Job Cost
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COMPUTERWORLD

Document control to join software suites

By Michael Vizard

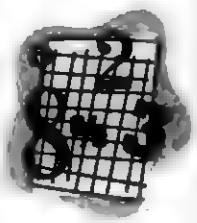
Three major providers of workgroup applications are readying plans to target document management in the race to provide a full suite of products for collaborative computing.

But the approaches that Microsoft Corp., Lotus Development Corp. and WordPerfect Corp. will take toward providing support for document management systems will differ as much as their individual approaches to groupware.

The need for document management is driven by the increasing complexity of PC applications software. Since applications are no longer discrete entities, users are integrating and sharing with one another data that has been created across a large number of applications.

"We think there is a need for a document management product, and we're hearing a lot of requests

Document control, *page 16*



Growing up
The entire workgroup applications market, including basic E-mail, is expected to reach $1.3 billion by 1996.
Document management, which accounted for about $52 million, or 15%, of the workgroup applications market in 1992, is expected to be valued at more than $400 million by 1996, according to International Data Corp.

IBM attacks backlog

PC Co. to take custom approach to filling customer orders

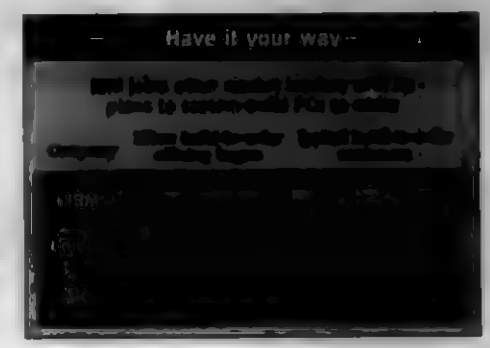
By Michael Fitzgerald and Ed Scannell
RALEIGH, N.C.

Months behind schedule, the IBM PC Co. last week finally put some muscle behind its build-to-order strategy in a move that could make a dent in some of its delivery problems.

PC Co. officials confirmed that the company's PC Direct unit would begin preinstalling operating systems and 27 applications under its Soft Select program. In combination with a recently installed custom hardware manufacturing capability, PC Co. officials said they can now truly build systems to order through PC Direct.

Next week the company will announce that it is using a new ordering system based on a software program from Trilogy Development Group to better streamline its build-to-order operations. The software gives IBM a more efficient way to mix and match products based on factors such as availability, functionality and price.

Analysts said an effectively executed, broad-based, build-to-order strategy would help IBM sharply reduce its backlogs, which have begun to damage the PC Co.'s sales growth [CW, Oct. 4]. Build-to-order would require the PC Co. to have just-in-time inventory management, electronic links to suppliers and other infrastructure changes.



At the launch of the PC Co. last September, company officials said they hoped to have an effective build-to-order business in place no later than May. The new approach would allow the company to better compete for the business it was losing in large chunks to aggressive companies such as Dell Computer Corp., which forged the concept of build-to-order.

Bruce Claflin, president of PC Co. Americas, said that although PC Direct is not targeted at large corporate users, the PC Co. will expand the program broadly to include Premium Partners, resellers and retail channels. He declined to specify dates.

While IBM and other major ven-

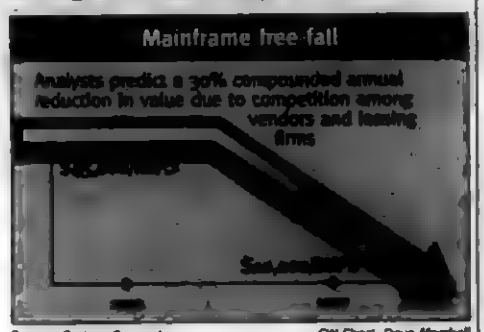
IBM, *page 7*

More mainframe blues

ICC stalked by leasing woes?

By Johanna Ambrosio
STAMFORD, CONN.

IBM Credit Corp. President Harry Kavetas' disclosure last week that he plans to resign at year's end is overshadowed by the cloud of uncertainty already looming over IBM's leasing subsidiary.



A large portion of ICC's portfolio, as with most lessors, comprises IBM mainframes. But the mainframe industry is weakening: Fewer machines are being shipped, and prices for new machines are falling faster than ever before (see chart).

The resulting conditions are wreaking havoc with the so-called residual value of the machines at the end of the lease period.

Some industry watchers said ICC may have to take a huge write-off within a couple of years to compensate for its policy of being the low bidder on many leases. As prices keep falling, leases signed several years ago become worth less and less, and profits become harder to eke out when machines are returned to ICC for resale.

"They have exposures, and there are problems coming," said Bob Djurdjevic, president of An-

ICC, *page 8*

Apple can't beat 'em, will sell Windows apps

By James Daly
CUPERTINO, CALIF.

Apple Computer, Inc. is likely to startle longtime Macintosh users early next year when it begins selling CD-based software for Microsoft Corp.'s archrival Windows.

Apple will down a major hunk of humble pie with the launch of its Software Dispatch program, which will offer both Macintosh and Windows applications. But the economic allure of the rapidly growing Windows market has proved too great.

"We're not living with blinders on," said Scott Schnell, general manager of Software Dispatch, a new business unit within Apple that could announce its first CD as early as this week. "Selling Windows software will be a tremendously good business for us to be in."

Software Dispatch is also an effort by Apple to take advantage of a new way of selling CD-ROM-based software applications to corporate America. Once per quarter, corporate software shoppers will be sent a CD that contains anywhere from 50 to 100 titles. Applications for the PowerPC platform will be featured as they become available next year.

Each program is encrypted, except for a

Apple, *page 16*

Apple is working with resellers to slip the Software Dispatch disk into the centers of Macintoshes that ship with a CD-ROM. If a customer buys an application discovered on the disk, the reseller gets a cut of the profits.

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October 11, 1993

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■ **Microsoft** fires back in the spreadsheet wars with Version 5.0 of **Excel**, which features task automation and better 3-D analysis. *Page 4*

■ **X/Open** is expected to announce this week that it will certify an industry-standard "Unix" brand name, bringing more unity to the Unix world. *Page 4*

■ **Wal-Mart** promoted its CIO to a new position: president of the $55 billion company's international division. *Page 6*

■ **Freeport-McMoRan** and **ISSC** are replacing their mainframe-intensive outsourcing deal with a contract emphasizing labor costs, as Freeport moves to Unix. *Page 6*

■ **Digital** will bid for the low-end groupware market this week with a shrink-wrapped version of its LinkWorks product. *Page 8*

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■ **Extending LANs to remote users** and getting control of resulting increases in bandwidth use is a major theme at **Networld '93**. *Page 12*

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DESKTOP COMPUTING

■ It may be true that **IBM** delivered a "better DOS than DOS," but the company faces an uphill fight luring users from MS-DOS to its own **PC-DOS**. *Page 35*

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■ A bandwidth barrier may be falling by the wayside with the announcement of **20M bit/sec. wireless LAN technology**. *Page 41*

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■ The terms alone can be overwhelming for managers trying to get into **wireless messaging**. *Page 51*

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■ It took longer than some users wanted for IBM to reveal its plans for a client/server-based **ImagePlus** package, although those users say the delivery schedule fits in well with their implementation plans. *Page 63*

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■ **Early users of Oracle** development tools are happy, but product overhauls have caused several specific concerns. *Page 69*

MANAGEMENT

■ **Downsizing**, rightsizing and career-shifting make it very important that IS and human resources departments breach old walls and find ways to **retrain employees**. *Page 81*

■ **Chicago IS executives** are finding strength in numbers through a group that collectively lobbies vendors for better service, features and prices. *Page 84*

IN DEPTH

■ **In the world of wireless networking**, nothing can scuttle mission-critical production work faster than inadequate radio frequency coverage and poor bridges between wired and wireless machines. *Page 89*

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■ **Treat relational databases** as a bunch of files to ease the transition from a flat-file mindset, experts say. *Page 92*

MARKETPLACE

■ **Visual development tools** are all the rage but have their limitations. *Page 101*

shopper alert!

COMMENTARY

■ As businesses collect more and more data on their customers, the demand for something to process all that information should drive the market for **commercial parallel processors**, Charles Babcock says. *Page 6*

■ **The software industry** has a responsibility to ensure that its products are reliable, Steve Epstein argues. *Page 33*.

■ **Esther Dyson says Taligent** gives users the gift of choice by separating features such as networking and applications from the operating system. *Page 33*

■ **The bickering between Microsoft** and **Novell** over NetWare support in Windows NT is a lose-lose proposition for customers, Elisabeth Horwitt argues. *Page 41*

■ **IBM** is passing up a big opportunity by ignoring its small to medium-size **mainframe customers**, Johanna Ambrosio says. *Page 63*

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Executive Briefing

Microsoft may not be loved, but it continues to be the 500-pound gorilla of the desktop. Apple is reportedly prepared to start selling Windows software, reasoning that the market is too big to pass up. *Page 1* **IBM is running into problems selling PC-DOS 6.1 on the MS-DOS-dominated desktop.** *Page 35* **And Microsoft itself is turning up the heat in suite sales by providing more flexible installation options and custom support.** *Page 10.*

The Novell/Microsoft battle continues to vex users, however. Microsoft dodged questions last week on its plans to support NetWare from its Hermes system management platform. *Page 15* And the refusal of the two vendors to cooperate on NT-to-NetWare integration is giving users a pain in the LAN. *Page 41*

There were plenty of new products at Networld '93, including LAN management offerings from IBM, Novell, Hewlett-Packard and Digital. *Page 14* Hub makers continue to stuff more functionality into their boxes. Network will offer a built-in PC and 100M bit/sec. Ethernet support in its Series 6000. *Page 12* And electronic-mail vendors are breaking their products into client and server pieces, offering users more choice. *Page 38* Wireless networking pioneers are discovering problems with interference *(Page 89)* and just keeping up with the terminology. *Page 51*

The mainframe leasing field is wrestling with plummeting residuals and lessor instability. The pending resignation of ICC's president will only further confuse things. *Page 1* And why isn't IBM paying more attention to low-end and midrange mainframe customers who need a place to go, Johanna Ambrosio asks. *Page 63*

Major groupware vendors are planning to add document management features to their products, but they don't agree on how to do it. *Page 1* It took a while, but IBM finally details plans for a client/server ImagePlus. Most of the pieces should be delivered next year. *Page 63*

Computer-based training is drawing new attention as business changes raise retraining pressure. But a lot of IS departments don't work well enough with the human resources organizations that coordinate skills development. *Page 81*

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Excel upgrade adds agents

By Michael Vizard
REDMOND, WASH.

Microsoft Corp. plans to deliver in December an upgrade of its Excel spreadsheet that will include agents that automate tasks and significantly improve support for three-dimensional analysis.

But whether Excel 5.0 will be able to thwart Lotus Development Corp.'s attempt to challenge Microsoft's dominance in the Windows spreadsheet arena with 1-2-3 Version 4.01 for Windows remains to be seen. Excel will also attempt to deflect Borland International, Inc.'s bid to gain market share with a $50 offer for Quattro Pro 5.0.

The offerings from the three companies appear to have strengths in different areas, so the determining factor may come down to a combination of installed base pull and ease of use.

In fact, industry analysts suggested that individual features are no longer as important as technology additions designed to simplify the use of a given spreadsheet. They also predicted that vendors will be more likely to focus on bundling ready-made application templates into their spreadsheets to enhance user productivity.

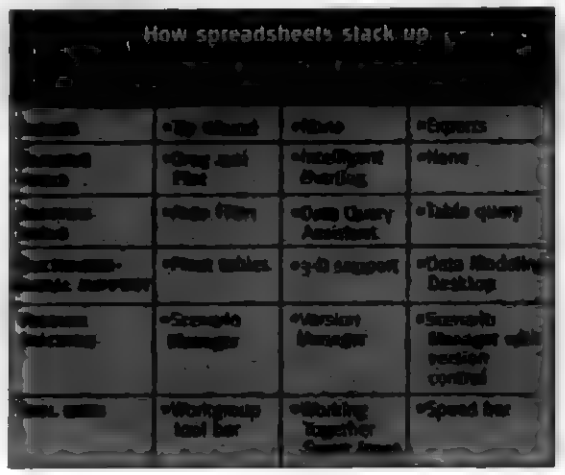
For example, Microsoft is expected to use the version of Visual Basic currently deployed in Excel to create application templates for vertical markets.

Vendors "have to provide capabilities beyond just macros. They won't do it immediately, but it is the next logical step," said Krystyna Pilistowicz, an industry analyst at Dataquest, Inc. in San Jose, Calif.

That is because the features war is winding down, said Daniel Gasteiger, editor of the "Spreadsheet Consultant" newsletter in Cambridge, Mass. "The battle will now be fought along the lines of instant productivity."

Short term, however, spreadsheet vendors are focused on agents that automate previously complicated tasks.

In Excel 5.0 these agents take the form of tools such as "Tip Wizards," which advise users on how to better perform a repetitive task; an AutoFilter capability that provides a one-step method for browsing through a list of worksheet data; and automatic subtotals for performing calculations. Also included is the ability to more easily update a chart.



In contrast, Borland has already deployed agents, called "experts," to automate tasks in Quattro Pro, and Lotus is evaluating its agent technology strategy.

While making spreadsheets easier to use as part of a long-term effort to bundle in ready-made applications is a major focus of the Big 3 spreadsheet providers, the features war is not entirely over.

For example, in Excel 5.0, Microsoft has moved to improve Excel's 3-D analysis capability, an area in which Lotus and Borland have reportedly excelled.

"Microsoft is becoming a lot more competitive in the 3-D arena. Historically, they've been a big loser here because they had a horrible 3-D implementation," Gasteiger said.

To address this issue, Microsoft has added PivotTables, which allow users to analyze data across multiple worksheets simply by dragging and dropping on any range of data. That feature has been well-received by Excel beta users [CW, Oct. 4].

Users loyal to Lotus

But 1-2-3 users maintain that Lotus still has a better 3-D implementation.

"We think that 1-2-3 is a true 3-D spreadsheet, while the workbooks in Excel are what I call a pseudo 3-D implementation based on linking workbooks," said Stacy Kenworthy, technical director at the executive planning services division of Alexander & Alexander, Inc., a consulting firm in Atlanta.

However, while Microsoft has an advantage with Visual Basic, Application Edition, Lotus still has a compelling suite strategy [CW, Oct. 4].

"Lotus' products looked like they were designed together, whereas Office looks like applications that were bundled together," Gasteiger said.

Meanwhile, the company most likely to be hurt by Microsoft's assault in the spreadsheet arena is Borland. "If anybody is in a bad spot, it's Borland. They're a scrappy company that does great stuff, but I haven't heard of people moving to Quattro Pro en masse," Gasteiger said.

"And I don't believe that an alliance with WordPerfect is going to prove to be a compelling suite strategy," he added.

Nevertheless, Borland's spreadsheet technology continues to be well-received by its installed base, and the company has made significant strides in terms of sharing data across applications using its Object Exchange facility.

Unix brand deal approved

By Jean S. Bozman

After weeks of negotiation with Common Open Software Environment (COSE) members and others, Novell, Inc. and X/Open Co. are expected to announce an agreement today that will confer Novell's "Unix" trademark on X/Open. The agreement will allow X/Open to certify industry-standard Unix operating systems based on a common set of X/Open application programming interfaces (API).

Both parties confirmed last week that they will schedule an international videoconference to announce that a unified Unix will be built on X/Open's Spec 1170, a common set of 1,170 APIs unveiled last month [CW, Sept. 6].

X/Open

The Spec 1170 standard will become the single specification that vendors can enhance in their own Unix implementations, Novell said.

"The reality is that we are passing over to X/Open the trademark, and that trademark is going to become the name for compliance with Spec 1170," explained Larry Lytle, a spokesman for Novell's Unix Systems Group. As the APIs change over time, the process will be managed and administered by X/Open. Vendors will still be required to prove their compliance with test suites. "We [at Novell] will roll out technology to keep on track with that, as will other vendors," he added.

The delay in X/Open's announcement that it will "brand" Unix — expected at September's Unix Expo in New York — allowed Novell time to negotiate with Unix rivals Sun Microsystems, Inc. and The Santa Cruz Operation.

The transfer of the Unix trademark from Novell to X/Open will take place immediately, said Don McGovern, vice president of strategic relations and business development at Novell, who worked on the X/Open agreement. "X/Open will own it," he said. "They will be the only entity in the world that can sublicense the Unix trademark."

Vendors will have the option of calling their operating system "Unix" instead of a vendor-specific name — such as IBM's AIX or Hewlett-Packard Co.'s HP/UX — if they license the X/Open Unix trademark, Lytle said. Novell will continue to sell its Unix System Group's System V operating system source code likely under the name of UnixWare, which is a Novell-specific implementation of the Spec 1170 APIs, Lytle said.

X/Open's significance

Some analysts said X/Open's Spec 1170 APIs are far more significant than any branding of Novell's Unix trademark could be.

"If the API stuff holds together, that's the most important piece, along with IBM, HP and Sun agreeing to go along with it. The rubber meets the road when these guys ship an operating system that really observes all these APIs," said Neal Hill, a Unix analyst at Forrester Research, Inc. in Cambridge, Mass.

Large user sites may find that X/Open's branding will help with volume purchases, said Jerry L. Johnson, standards analyst at the state of Texas' Department of Information Resources in Austin. Listing X/Open's Spec 1170 as a requirement on bids for the state's 250 agencies will help to ensure compatibility, Johnson said.

Retraction

On July 26, *Computerworld* published an In Depth article titled "Beyond decision support." Written by the staff at Codd and Date, Inc., the article proposed 12 rules by which users could evaluate analytical processing tools. Included in the article was a chart furnished by the Codd group at *Computerworld*'s request, listing the products of five vendors and their degree of compliance with Codd's 12 rules.

At the time the article was prepared, the *Computerworld* staff did not know that it was part of a white paper paid for by Arbor Software, Inc. Arbor's product, Essbase, scored a perfect 12 out of 12 in compliance with Codd's rules in our chart. By contrast, no other vendor scored better than half that.

Computerworld has a long-standing policy not to use data culled from research underwritten by a single vendor and should not have published the chart.

In addition, the Codd group assured *Computerworld* that the information on the other vendors was obtained directly from company spokesmen. After Pilot Software objected to the data published on its product and insisted that it had never been contacted by the Codd group, *Computerworld* asked the Codd group about this discrepancy. After several weeks of trying unsuccessfully to determine with whom the Codd group had spoken, we have no reason to believe that Pilot was contacted.

We therefore assume the information supplied to us about Pilot and possibly about the other vendors listed in the chart may be flawed and should be disregarded, as should the entire chart.

— Bill Laberis, editor in chief

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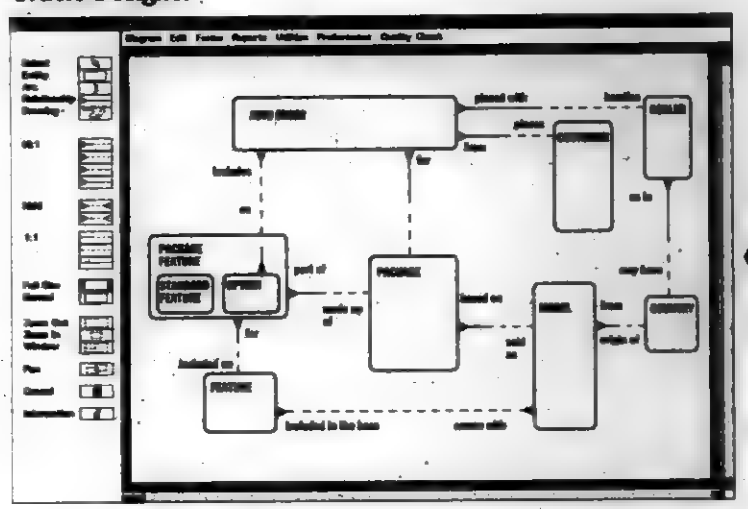

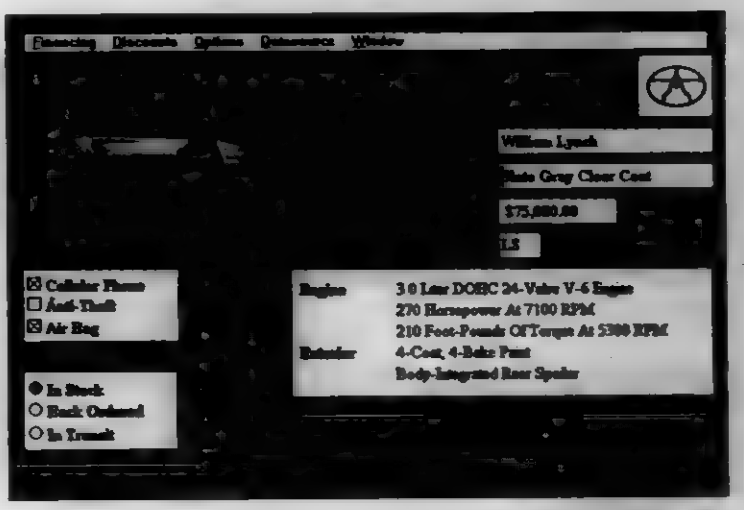

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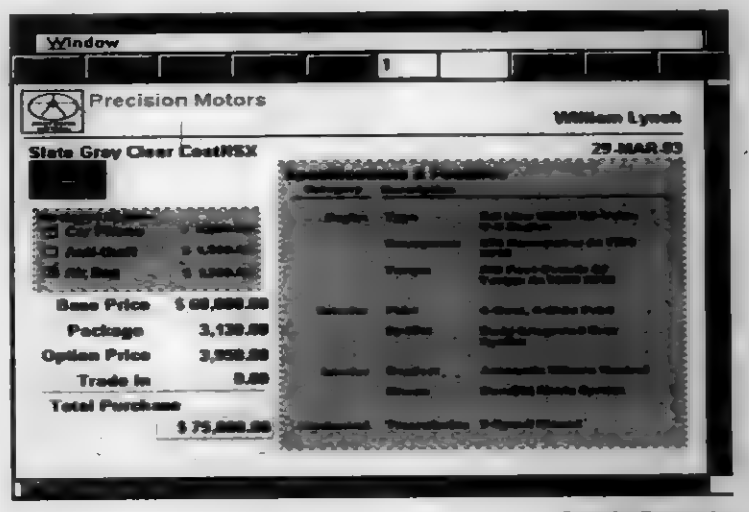

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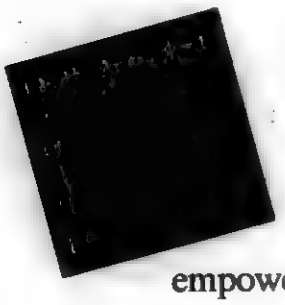

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Parallel processing seeks business role

Parallel processing has had little impact on corporate information systems, but even so, there are good reasons for IS executives to keep an eye on developments in the field.

Technology advances keep hinting at the prospect that one day parallel processing will emerge as a replacement for the mainframe, a cheap form of concentrated power. This won't happen tomorrow. Parallel processors are expensive, and when business tasks are only somewhat able to take advantage of them, the expense of a processor tends to paralyze the chief financial officer, and old-fashioned sequential processing has to fill the bill.

Nevertheless, there is a distinct possibility that the nature of the business challenge is changing and taking on a greater degree of parallelization.

As John Mucci, vice president of business supercomputing at Thinking Machines, notes, businesses with millions of customers are storing data on those customers faster than they can figure out what to do with it. The introduction of point-of-sale computers in department stores, automobile showrooms and clothing stores is supplying a wealth of information about buying patterns, if the businesses can find a way to analyze it.

Searching for patterns in large volumes of customer data is a prime use for parallel processing.

Charles Babcock

Because pattern analysis involves common sets of data, frequently in multiple databases, it lends itself to a lengthy parallel processing inquiry that would take days or weeks to run, even on an IBM mainframe.

Epsilon Data Management in Burlington, Mass., a subsidiary of American Express, has addressed this task. Epsilon has written pattern-seeking software that can import data from standard mainframe databases and process it in a parallel system.

One firm that acknowledges using Epsilon services is Lotus. I am not privy to how Lotus makes use of pattern-seeking, but it seems to me that a company with millions of 1-2-3 spreadsheet customers would want to know which ones were buying Notes or CC:Mail and what buying patterns the purchasers of the broadest part of the product line have in common.

In January 1992, Epsilon purchased a 64-processor Thinking Machines CM-5 and used it to develop a system to work with American Express' IBM mainframes in its Phoenix data center.

Gartner Group researchers and authorities in the supercomputing field have followed this deployment and concluded that American Express wanted the capability to conduct ad hoc queries against its huge databases to see what customer information lay hidden in them.

Although the exact nature of these queries isn't known, the researchers believe American Express wanted to run what-if simulations against customer data to try to predict trends.

In a more immediate sense, it wanted to comb its data to see if it could identify the 2% of customers most likely to drop their American Express credit cards within a few months. By identifying this group, it could sort out those it wished to keep and launch special appeals their way in a direct attempt to retain them.

Once the value of such parallel processing applications is revealed, many businesses are likely to think of ways they can mine and use the information in their own databases, creating a greater need for parallel processor skills.

Parallel processors are also likely to decrease in price as they take advantage of the many mass-produced parts now on the market. A Thinking Machines CM-5 already uses three: SPARC logic chips, IBM 3.5-in. disk drives and standard 4M- and 16M-bit RAMs.

So at some point in the foreseeable future, parallel processing is likely to appear on the list of resources IS must manage and use.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Outsourcing gains energy

Freeport, ISSC resize pact as host dependency declines

By Mark Halper
NEW ORLEANS

In a drastic switch of price mechanisms from one based on CPU cycles to one that measures labor, Integrated Systems Solutions Corp. (ISSC) and its client Freeport-McMoRan, Inc. last week reworked their outsourcing contract to help Freeport migrate to a Hewlett-Packard Co. Unix platform.

Starting in January, ISSC and Freeport will replace a 10-year hybrid mainframe/client deal, valued at an estimated $100 million, with a full client/server contract over five years. The revised contract will represent "substantial cost reductions" over the current mainframe arrangement at headquarters, said Mike Arnold, chief information officer at the New Orleans mining and energy firm.

Role switch

The transfer of Freeport McMoRan's processing from an ISSC data center in Lexington, Ky., to client/server systems in Freeport's New Orleans home office entails the assignment of 30 ISSC staffers or subcontractors with the following skill sets

[illegible]	
Network manager	1
[illegible]	1
PC/LAN support	7
Data center operators	20

Functions:
- Job Scheduling
- Help desk
- Print distribution
- System administration

Source: Freeport McMoRan, Inc.

An ISSC spokesman characterized the new deal as "labor-oriented" and said the two parties lowered its value through changes in terms as well as duration. Neither Arnold nor the spokesman would state the new price.

The new contract will invoke charges based on ISSC labor fees for operating Freeport's incoming HP 9000 Model 890 as well as an Digital Equipment Corp. VAX 4300 that Freeport has been running on its own. In addition, Freeport will pay ISSC labor for PC and LAN support — which ISSC may subcontract to Freeport's current LAN support provider, Computerland Corp. — and database administration and network management.

In shifting to a labor formula, Freeport and ISSC are providing a solution to an outsourcing puzzle: How do outsourcers accustomed to charging for processing units work out equitable pricing schemes in a client/server world where their efforts are less processing-intensive and more service-oriented [CW, Aug. 2]?

Arnold noted that because "there was no model out there," devising a new pricing scheme was difficult. "We spent some time with ISSC management assessing alternative ways we could structure this agreement that would meet variables if we grow or shrink, and also give an element of predictability to them," Arnold recalled.

Although ISSC has worked out a new price formula at Freeport, there is no guarantee that it has developed a stencil for other client/server deals.

"We're not prepared at this time to make any offical comments on our pricing strategy," the spokesman said.

Compared with the relatively "straightforward" process of measuring glass house performance, quantifying distributed computing is "a bigger target because you have to look for hidden costs of support," noted Len Bergstrom, president of Real Decisions Corp., a Darien, Conn., consulting company.

According to Arnold, Freeport negotiated a fee for "transition services," in which the company pays ISSC for mainframe operations it continues to provide until Freeport completes its move to client/server computing in July 1994.

Freeport accelerated its client/server plans last January after it gave up control of its mainframe-dependent fertilizer subsidiary, Agrico Chemical Co., to a joint venture with International Minerals Corp. in Chicago.

Wal-Mart CIO to head new international unit

By Thomas Hoffman
BENTONVILLE, ARK.

Bobby L. Martin, whose nine-year reign as executive vice president and chief information officer at Wal-Mart Stores, Inc. was highlighted by his clever orchestration of technology deployment, was rewarded with a recent promotion to president and chief executive officer of Wal-Mart International, a newly formed division.

Martin will charter the $55 billion retailer's expansion overseas, including ventures into Puerto Rico and Mexico. Martin was succeeded by Randall Mott, who has assumed the mantle of vice president and CIO, up from his former position of vice president of systems development.

Under Martin, the retailer was among the first to adopt Unix across its enterprise, implement massively parallel databases and use satellite communications to link each store to headquarters.

Martin's promotion outside of the glass house is still rare among CIOs, though notable exceptions include Arthur F. Ryan, president and chief operating officer at The Chase Manhattan Bank NA, and Eugene B. Shanks, president of Bankers Trust Co., said Joseph Ziskin, senior manager at the center for information technology and strategy at Ernst & Young in Boston.

"You don't see too many CIOs moving in that direction, but a lot of it has to do with the company's view of technology and what has been accomplished there," Ziskin said.

Ziskin praised Wal-Mart for its visionary approach and for the business acumen of its information systems staff, whom he said he regards as retailers first and technologists second.

Martin, who came to Wal-Mart in 1982 after a stint at Dillard's Department Stores, Inc. in Little Rock, Ark., said Wal-Mart International will focus first on expansion opportunities in Mexico.

IBM attacks backlog

CONTINUED FROM PAGE 1

dors such as Compaq Computer Corp. have long produced special configurations for a few extremely large customers, they are only now trying to make this service more generally available. The PC Co. appears poised to make up for its tardy foray into build-to-order.

Step right up! Name your configuration!

Build-to-order means users specify exactly the configuration and software they want on their machine, rather than selecting from a specific set of choices offered by the company. "It's the difference between fast food and your own private chef," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

The impact will be felt immediately by smaller customers with specific requirements. It is unclear when large customers will benefit from the program, as IBM officials said they had not set a date for rolling the program out to large customers.

One large user said the move was an encouraging sign from the PC Co.

"While they do have a certain procurement problem, given where the PC Co. has been and where it is now, it's pretty amazing how they've turned things around," said Bob Holmes, computer technology research analyst at Southern California Gas Co. in Los Angeles.

Ready to go

Ted DellaVecchia, manager of information technology for the PC Co.'s customer fulfillment operations, said the PC Co. now has in place "the central nervous system to what we'll build upon in the future."

DellaVecchia said IBM is working on an electronic data interchange interface to its suppliers and has reached the stage where it has designed its system and is working to qualify its suppliers.

He also said the PC Co. is studying what impact a broad build-to-order strategy would have on various aspects of its business, including the sales force, manufacturing and financial performance. When these impacts are figured in, the company will roll out the broader strategy, but until then, "we haven't been given a date to shoot for," he said.

Conservatism faulted

Analysts said overly conservative unit projections for 1993 and inflexible, long-term contracts with components suppliers may have left the PC Co. unable to easily respond to increased user demands.

"They took a relatively conservative approach to their manufacturing capacity right from the start of the PC Co., and it is coming back to haunt them time and again," said Richard Zwetchkenbaum, research manager for PC hardware at International Data Corp. in Framingham, Mass. "So, naturally, this would have an impact on their build-to-order business."

When it launched its first products last fall, the PC Co. determined that its business would not increase by even 50%, despite a miserable 1992. This was too conservative for its own good, Zwetchkenbaum said.

"If they were more entrepreneurial and had a better sense of the market, they could have secured a larger opportunity," he said.

Meanwhile, the PC Co. Americas announced internally that Barry Eveland has been named vice president of fulfillment, Claflin said. Claflin said part of Eveland's responsibility will be to accelerate a build-to-order strategy for the PC Co.

"We are going to develop competency at building and shipping what customers want . . . and we are focusing on our total cycle time," Claflin said. "[Eveland's] measure of success is getting [product] to customers when they want it, where they want it and how they want it."

To keep some PC Co. customers happy, things will have to stay the same.

"We still like it that we can get the finite models — it's easier for ordering," said Bruce L. Linker, vice president of information services at a large financial services company.

Linker said his company had opted not to purchase machines from NCR Corp. in part because NCR configures PCs on a strictly build-to-order basis.

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	--AF		458	2	33540			6285	2	5988	0.045	50	0	90	15	58	5.9	0
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News Shorts

House to examine competitiveness

The House Subcommittee on Economic and Commercial Law has scheduled a public hearing Wednesday looking into competitive practices in the computer industry (CW, Oct. 4). While the purpose of the hearing is to discuss a broad range of market segments, the subcommittee will pay particular note to the operating systems market. The subcommittee is doing some "field research to see if it should do some further meddling" involving the competition among various operating system vendors, a source familiar with the proceedings said. Representing Microsoft Corp. will be William Neukom, vice president of law and corporate affairs. Ray Noorda, Novell, Inc.'s chairman, was scheduled to appear, but a company spokeswoman said he would not. Appearing at the hearing will be executives from Dell Computer Corp. and Cyrix, Inc.

Dell recalls subnotebooks

Dell suffered another setback in the notebook market, when late last week it recalled 17,000 of its 320SLi and 325SLi subnotebooks to replace a capacitor that could crack, causing an overheating problem. Dell said three systems had been returned because of the overheating problem. The company was unable to replicate the problem in its labs, but decided to recall the models anyway. Dell said it expected the recall to cost between $1.5 million and $2 million. Customers can call (800) 847-4171 to arrange for repairs.

Ami Pro price breaks from Lotus

Looking to bolster its share in the word processing market, Lotus Development Corp. is allowing sites to upgrade 25% of their installed base — up to 50 users — to Ami Pro 3.01 at no charge through the end of this month. Lotus has also launched a Smart Buy bundle, which includes Ami Pro, Intuit, Inc.'s Quicken 3.0 for Windows and a coupon for a free copy of ChipSoft, Inc.'s Turbo Tax, priced at $495. A competitive upgrade version of this deal is priced at $129.

Thrifty-ness pays off for ISSC

Los Angeles-based retail drug store chain Thrifty Corp. has signed a deal to outsource its information systems to IBM's Integrated Systems Solutions Corp. (ISSC). The 10-year, $100 million agreement calls for ISSC to migrate Thrifty from an aging IBM 3090 Model 500E to multiple AS/400 boxes. ISSC said the "vast majority" of Thrifty IS personnel will join ISSC.

NMS gets remote diagnostics

Novell last week announced NetWare Management System (NMS) Version 2.0, which supports Remote Monitoring-compatible LAN diagnostics on distributed NetWare Loadable Modules. A LANalyzer Agent sits on NetWare 3.x and 4.x servers, collects statistics and can then report them to a central NMS Windows console. LANalyzer Agent is priced at $1,495 for a single-interface version and is available now. NMS 2.0 is priced at $2,495 and is available now.

SHORT TAKES The SQL Access Group, which sets standards for accessing data in relational databases, elected a new chairman. Jon Deutsch, a technical director at Information Builders, Inc., replaced Digital Equipment Corp. engineer Jeff Balboni as head of SQL Access. . . . The networking community got a major boost toward worldwide inter-LAN connectivity last week when long-distance carrier WilTel extended its frame-relay service to Europe — to London and Frankfurt and eventually to Tokyo.

More news shorts, *page 16*

Digital to launch groupware effort

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. this week will introduce a shrink-wrapped groupware package positioned as underlying software for building applications that will incorporate mail, work-flow, document management and other functions.

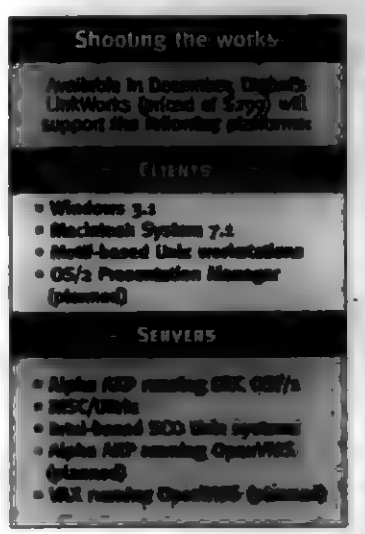
The object-oriented LinkWorks package will be the centerpiece of the wide-ranging rollout aimed at shining up Digital's image as an open client/server vendor.

LinkWorks, developed for Digital by an Austrian firm, has been sold since early 1992 by Digital's European services organization under the name Objectworks. One of six "software frameworks" that Digital is now emphasizing, LinkWorks is being marketed as a tool for integrating various applications across workgroups in an attempt to differentiate it from Lotus Development Corp.'s Notes.

Ann Palermo, an analyst at International Data Corp. in Framingham, Mass., agreed that LinkWorks and Notes "solve different types of problems." She added, however, that the two will probably compete for some purchases.

LinkWorks received good marks from Palermo and others, but some said an initial lack of shrink-wrapped support for non-Digital servers beyond Intel Corp.-based systems running The Santa Cruz Operation, Inc.'s SCO Unix could hurt sales in multivendor environments.

LinkWorks can be bought for use with IBM's and Hewlett-Packard Co.'s Unix systems, but only by contracting with the Digital Consulting unit to implement the software, Digital said. Packaged support is not available.



Wes Melling, an analyst at the Gartner Group, Inc. in Stamford, Conn., said that approach "is just absolutely contrary to the whole notion of open systems."

Bank of Montreal is implementing LinkWorks in its corporate banking department through a consulting deal with Digital and has had good results in reducing the time it takes to prepare credit applications, said Michael Frow, vice president of credit at the bank's U.S. operations in Chicago.

Frow noted, however, that multivendor support is "very necessary" for a product like LinkWorks. "You don't have time to go and reinvent all of your systems, especially when you've built things up on a departmental basis," he said.

Dilip Phadke, LinkWorks group marketing manager, said the LinkWorks group is trying to get service contracts priced so that users "don't pay a penalty because they're running it on HP," but that is still being negotiated with Digital Consulting.

Shrink-wrapped versions for IBM and HP may be added, "depending on how many we sell," Phadke said.

ICC woes

CONTINUED FROM PAGE 1

next Research in Phoenix. "But they have been able to mask a great deal of the losses because they have been able to write a lot of new business to compensate."

ICC is not engaged in anything illegal, he added: "It's just that they and everyone else take advantage of an idiotic accounting system."

Rules from national accounting bodies stipulate when a company can put a financial transaction toward the bottom line vs. when it must write it off, but these rules are not always clear-cut. They get even hazier when, as in ICC's case, a parent company is involved through which some of these transactions flow.

Not everyone believes ICC is headed for a fall. Robert Shafer, an analyst at Meta Group, Inc. in Westport, Conn., said, "I don't think there are going to be any ugly surprises at ICC. These guys have been very conservative about what gets on their books."

Plus, he pointed out, ICC's financial track record has been very strong, with returns on investment in the 20% range vs. returns half that for most other lessors.

But there are other problems. Unlike most lessors, ICC handles mostly IBM gear, and this limits the unit's ability to grow its business. An ICC spokesman said more than 90% of its portfolio is IBM gear.

On Jan. 1, Kavetas will be succeeded by ICC Vice President James J. Forese. He, like Kavetas, could not be reached for comment.

Also, some clients said they perceive ICC as much less flexible and accommodating than competitors.

"Even if ICC is cheaper going in, it's less expensive in the long run to go with someone else," said John DeGroat, data center manager at Pier 1 Imports in Fort Worth, Texas. If DeGroat wants to change terms in the middle of the lease, for example, "the others will work with me and IBM won't."

As a result, he has more than 20 contracts with El Camino Resources Ltd., a leasing concern in Northridge, Calif., and only two with ICC.

Passed over?
Harry Kavetas, a 32-year IBMer, is seeking a job elsewhere because he was passed over for promotion to higher levels of the company, according to reports. In May, IBM Chairman Louis Gerstner named Chrysler Corp. executive Jerome York as chief financial officer. Kavetas reports to York.

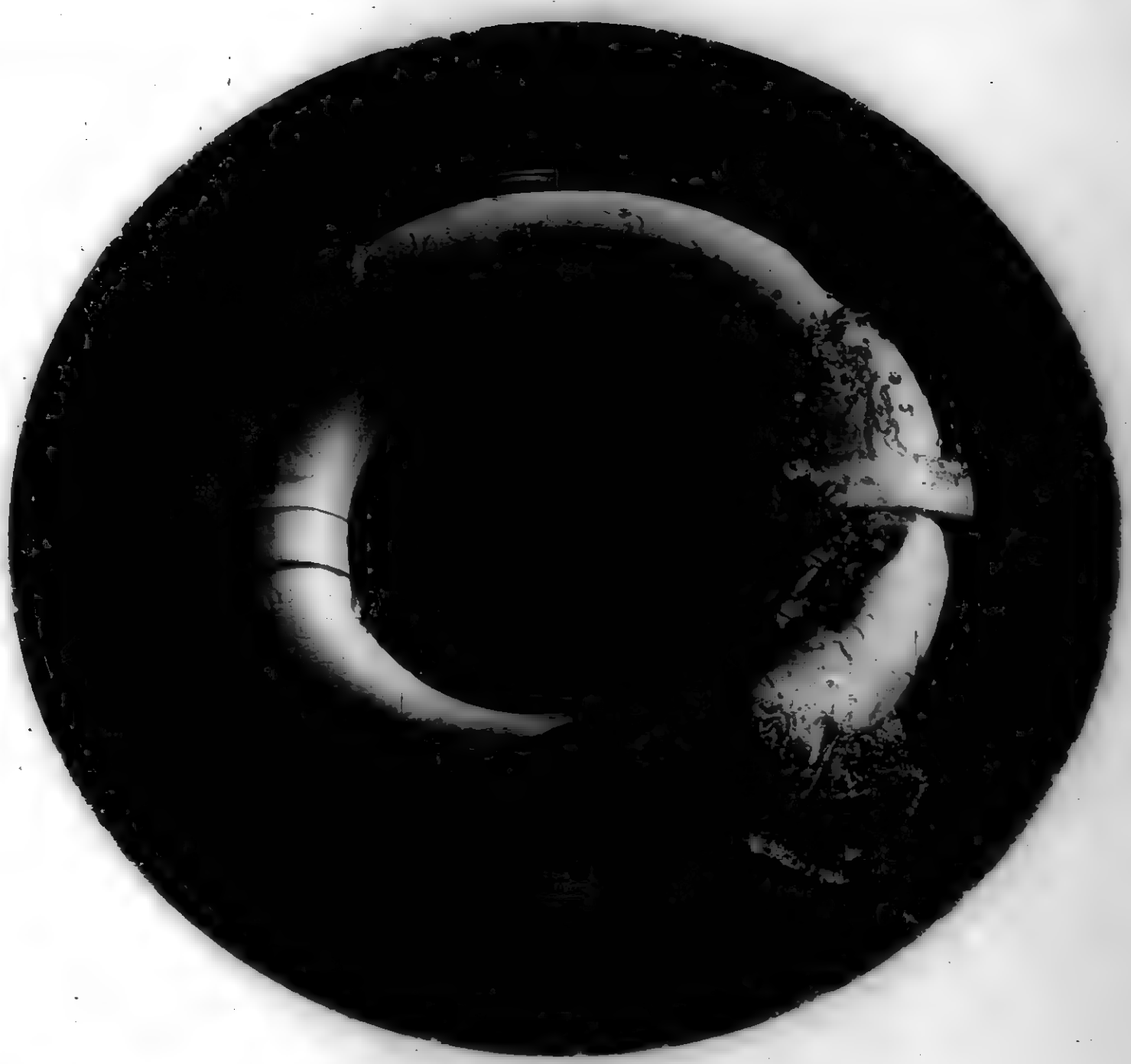
The ICC spokesman responded, "It's hard to deal in perceptions. We believe our lease management program and contract provide customers industry-leading flexibility." For example, he said, ICC will allow customers to upgrade a leased processor and have that box financed from any other, non-ICC source.

As a result — and given IBM Chairman Louis V. Gerstner's vow to do whatever is necessary to clean up IBM's bottom line — some would not be surprised to see something that would have been unheard of even a year ago: a dramatic reduction in the nature of its leasing program.

Some said they believe the cracks have already started forming in ICC's walls. The still-profitable unit has taken $35 million in residual value write-downs since the fourth quarter of 1991, and more than $60 million since 1988.

For the most recent quarter, ended June 30, ICC took a $12 million charge to reduce its work force by about 15%, or 170 people out of the 1,200 employed, through a voluntary program.

ICC revenue for the quarter was $50.6 million, down 4% compared with the second quarter of 1992. Net earnings were $108.8 million, down 1.6% from the year-earlier period.



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Microsoft to tackle Office support

By Michael Vizard
REDMOND, WASH.,

Microsoft Corp. will detail later this month a custom installation option for Microsoft Office and set up a support line dedicated to the suite.

The single support line is intended to resolve technical problems associated with running applications in the suite, which includes the Word word processor, Excel spreadsheet, PowerPoint presentation graphics package and electronic-mail client software. A separate edition adds the Access database.

Meanwhile, Microsoft will give information systems managers the ability to create their own subset of Office for deployment across multiple desktops by stripping out some features from applications and automatically replicating that implementation across multiple desktops.

"We're trying to make it easy for IS managers not to have to get everything but the kitchen sink, so now they can customize the suite and replicate it across their site," said Mark Kroese, group product manager for Office.

Office already includes a minimum installation option. For example, the suite edition of Office that includes Access requires a minimum of 25M bytes of storage; a typical installation option requires about 45M to 50M bytes; and a maximum installation option for the full suite, which includes every piece of code associated with all the applications in the suite, requires 62M bytes.

Gain control

Kroese acknowledged that Microsoft, along with other suite providers, has been criticized for the growing physical requirements of suites. The custom option is an attempt to help resolve those issues by giving IS control over the application features it wishes to employ, he said.

"We don't think anybody will be loading the full installation suite [installation] anymore," Kroese said.

In addition to this effort, Microsoft is continuing its campaign to share modules across applications.

Delivery details

While Microsoft Corp. will launch Office 4.0 this month, the actual delivery schedule for the major component upgrades is staggered. For example, Word 6.0 is due within 30 days, Excel 5.0 is due in September, and PowerPoint 3.0 is due about 30 days thereafter. People who purchase Microsoft Office 4.0 in the meantime will receive free upgrades to Excel and PowerPoint.

For instance, there is only one spell checker and one charting module that all the applications in the suite share, as opposed to each application's having its own implementation.

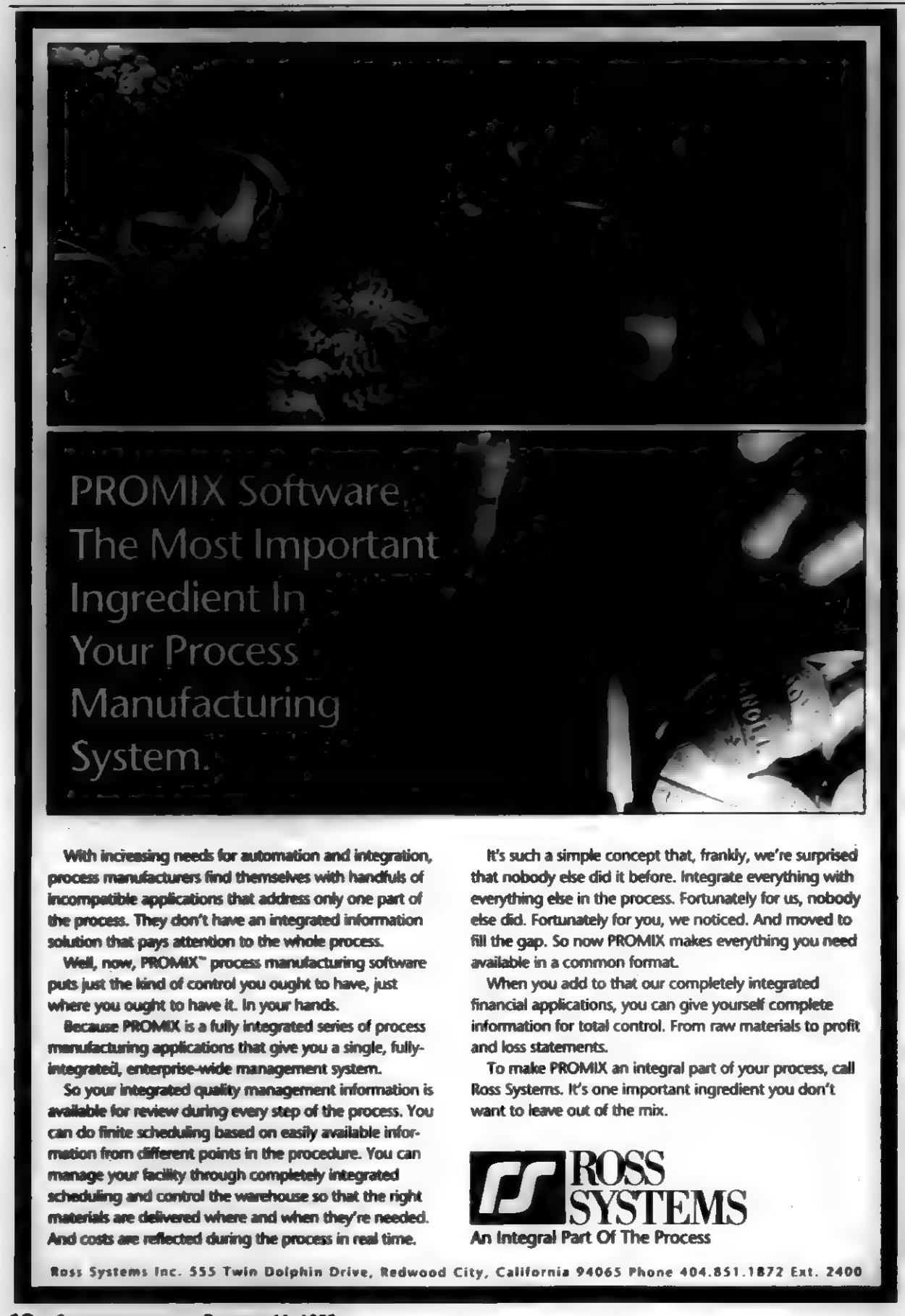
In terms of customization and shared code, Lotus Development Corp. is pursuing a similar course with its SmartSuite offering, which consists of the 1-2-3 spreadsheet, Ami Pro word processor, Freelance Graphics presentation manager, Approach database and Organizer personal information manager, a company spokesman said.

Like Office, SmartSuite has a maximum installation of 62M bytes and a minimum installation of 27M bytes.

In contrast, Borland International, Inc.'s suite offering, which consists of the Paradox database and Quattro Pro spreadsheet as well as WordPerfect Corp.'s namesake word processing software, requires a minimum of 8M bytes.

Despite the growing hardware requirements to support suites caused by the expanding list of features in applications, IS managers reported that the benefits of suites outweigh additional hardware costs.

"If you're not buying a suite today, you're crazy. The benefit of Windows is the ability to have integrated applications and to create complex documents," said Stacy Meyers, a staff analyst at South Florida Water Management, Inc. in West Palm Beach, Fla.



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GSA Contract Number GS00K93AGS6403.

Networth to push envelope with fast hubs

By Joanie M. Wexler
DALLAS

The game is officially afoot among smart hub vendors with next-generation architectures.

While SynOptics Communications, Inc. demonstrated its just-launched high-end System 5000 [CW, Oct. 4] on the Networld show floor, competitor Networth, Inc. ran a behind-the-scenes prototype of its counter-attack Series 6000, which it said it will announce in late November.

The hub, which will contain multiple high-speed LAN backplanes, including those that support emerging and sometimes controversial 100M bit/sec. Ethernet technology, will also add a high-end PC dubbed the Network Services Engine (NSE) to modules supported by the company's Series 4000 hub, company officials said.

Stepping up
Networth said it will carry over communications NLMs announced at the show for the 4000's NAE to the 6000. The NLMs include Novell's multiprotocol routing schemes, NetWare for SAA LAN-to-host connectivity software and dial-up WAN connections.

The NSE is a more powerful and versatile take on the concept of Networth's NetWare Application Engine (NAE), a 486-based PC module for the 4000 that runs Novell, Inc. NetWare Loadable Modules only, Networth said.

The Series 6000's NSE PC is not a module but an integrated "drawer" that frees up two of the hub's slots for network connections, explained Terry Klein, vice president of sales. It is 486-based, like the NAE, but has heavy-duty performance, memory and storage enhancements (see box at left).

The enhancements make the PC-in-a-hub more attractive to Networth customer Darwin Collins, network administrator at the Dallas Area Rapid Transit (DART) authority. DART had no interest in the NAE because the module was not robust enough as a server for the authority's needs, Collins said.

Bundling benefits

However, Collins said he likes the idea of bundling a server and a T1 bridge with his hubs for several reasons: integrated server and hub management, security and space savings in wiring closets, redundant power supplies for servers because of resource-sharing with the hub and a savings on PC network interface cards, which are not necessary with the PC/hub combination.

The communications services supported in the NSE will not be limited to NetWare, which also appeals to DART. This is because political infighting at DART, which supports 800 networked users across 15 hubs and runs a mixed bag of mainframes, minicomputers, Unix workstations and LANs, has barred internetworking from "being dependent on the Novell group," he explained.

Currently, DART uses Alantec Corp. PowerHubs for heavy-duty routing among multiple Ethernet and Fiber Distributed Data Interface (FDDI) segments, but Collins said he would likely integrate this function at emerging smaller construction sites where the "$25,000 to $30,000" price tag of each Alantec box "would be impractical."

Third parties

Networth is looking at developing its own internetworking offerings to run in the NSE, such as bridging, routing and LAN switching, Klein said; however, those options will not be available at announcement time. In addition, products from third parties that have developed to XT/AT bus, Extended Industry Standard Architecture (EISA)and local bus PC standards would be candidates for the 6000, he said.

A goal for the Series 6000 will be to accommodate 10 separate 100M bit/sec. Ethernets, for which specifications are to be released immediately before the Networth announcement in November, said Michael Smith, Networth's director of product marketing.

Ethernet is a sore point with many industry observers, who are disappointed that the IEEE standards group caved in to two technology camps and is developing two separate standards.

The exact number of backplanes, including those supporting Asynchronous Transfer Mode and FDDI LANs, will depend on those specs, Smith said. All the new high-speed backplanes will be added on top of the one Token Ring and five Ethernet backplanes supported in the Series 4000 hub today, he said.

Remote user pleas reach vendor ears

By Joanie M. Wexler
DALLAS

Companies looking to extend the reach of their LANs to mobile, remote and telecommuting users found throngs of vendors eager to accommodate them on the Networld '93 show floor last week.

Remote connectivity products and corresponding gear for conserving wide-area network bandwidth use were heavily in evidence, a sign that organizations are feeling the networking impact of client/server and otherwise distributed computing.

Several firms pushed what are known as "remote access" wares, intended to tie far-flung users to their home LANs in a way that gives them access to the resources they would have if they were local. New vendors got into the act, including IBM with two offerings from separate business units [CW, Oct. 4]. Meanwhile, players such as Cayman Systems, Inc., at one time focused on niche user-populations, branched out to embrace the enterprise with support of multiple LAN protocols.

Most of the remote access products now support several protocols and PC types and include plans for Point-to-Point Protocol, software that allows interoperability among products across WAN links. These are laundry-list features required for enterprise networking, said Charlie Robbins, director of communications research at Aberdeen Group, a Boston consultancy.

But the other half of the equation is the WAN bandwidth that increasing numbers of remote connections are eating up. "Because line costs are still an issue, people want to get more out of their 56K bit/sec. circuits" rather than upgrading to faster and pricier links, Robbins said (see chart).

Indeed, users did seem reluctant to upgrade: First Madison Bank FSB was visiting Newport Systems Solutions, Inc.'s booth to check out the latest version of its T1 multiprotocol routing WAN compression software. This is because the bank is looking to get more out of its 56K link between LANs at its headquarters here and a regional site in Houston rather than upgrading, said Brian Kirkwood, a PC support analyst with network responsibility.

In gear

Private network operators bank largely on affordable 56K bit/sec. links, particularly as compression advances give them a bigger bang for the buck

PROJECTED PERCENT OF INSTALLED PRIVATE BANDWIDTH BY SPEED

Year	Up to 19.2K bit/sec.	56K bit/sec.	T1 1.5M bit/sec.	T3 45M bit/sec.
1993	30%	44%	20%	6%
1995	12%	50%	25%	13%
1997	8%	38%	36%	18%

SURVEY BASE: 300 FIRMS OF $20 MILLION AND MORE

Source: Dataquest, Inc., San Jose, Calif.

Show attendee Cynthia Mitchell, a software analyst at Argonne National Laboratory near Chicago who runs the government facility's four-city nationwide network, said she was looking at compression for speed and response-time gains to accommodate users accustomed to comparatively faster LANs.

Vendors such as Micom Communications Corp., Multi-Tech Systems, Inc., Newport Systems and Novell, Inc. sought to ease some of these WAN bandwidth limitations with sophisticated compression, filtering and protocol prioritization schemes they have built into their WAN interface products.

Debbie Greenhauw, network systems programmer at S&A Restaurant Corp. here, said she is already using Micom's compression-oriented NetRunner to cram host data, LAN, fax and voice traffic on a 56K link from here to Dayton, Ohio. She said she is saving about $20,000 per year compared with a configuration that uses separate voice lines.

Micom introduced a version of NetRunner at the show that extends this capability from point-to-point-only links to multipoint configurations.

Other evidence of bandwidth conservation was a new version of Retix's router software that supports Internet Protocol and Novell IPX protocols over public dial-up Integrated Services Digital Networks (ISDN). It uses a scheme that pares down chatty IPX traffic to keep ISDN traffic loads under the typical four-hour-a-day crossover point where it is more cost-effective to install private links.

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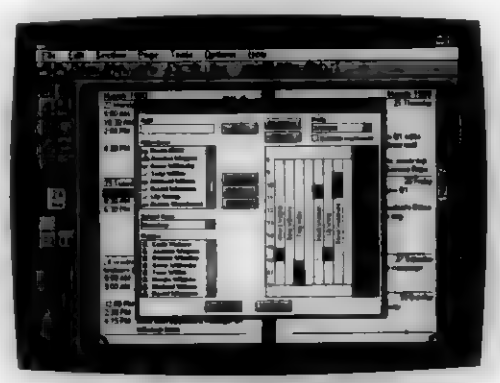

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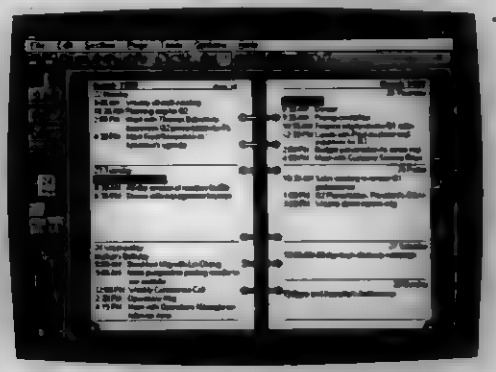

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Novell brings out AppWare development aids

But will they back up claims?

By Elisabeth Horwitt
DALLAS

Novell, Inc. officially released its AppWare client/server application development suite last week to a horde of corporate and third-party developers who said the product seems too good to be true — but who would very much like to become true believers.

Adding a big dollop of credibility to Novell's effort, Gupta Corp., WordPerfect Corp. and Borland International, Inc. announced AppWare products last week (see box).

Announced last spring, AppWare consists of the Visual AppBuilder graphical-based development front end; AppWare Loadable Modules (ALM) that are linked into a finished application; and the AppWare Foundation, which Novell claims will finally screen developers from the underlying incompatibilities and complexities of various client and network operating systems.

Crucial step

"Someone has to make that first step toward providing a way to develop applications with one set of [portable] tools that will work across different [client and server] platforms," said Gary Mazzaferro, manager of software development at Exabyte Corp.

Perhaps a more serious issue is whether Novell can deliver. "I will

be humbled" if Novell can meet its promises for multiclient support on AppWare Foundation next year, said Jim Allchin, Microsoft Corp.'s vice president of advanced systems. "Their list is amazing. It's hard to make a generic [application development environment] if you want to maintain the look and feel of each client."

AppWare is slated to support a wide variety of clients, including Microsoft's Windows and Windows NT; and services such as global directory from Novell, Banyan Systems, Inc. and potentially other vendors.

Infrastructure needed

AppWare looked "real hot" this time around as a way to boost a flagging client/server market, said Jamie Lewis, president of The Burton Group, a Salt Lake City consulting firm. "Networking sales are slowing because the applications are too hard to build; an infrastructure [across various client/server environments] is badly needed."

Microsoft is addressing this problem but only from the Windows side, Lewis said.

Joe Vaughan, a programmer and analyst at American Airlines, said he hoped AppWare would make it easier to write Windows applications that access NetWare services. Right now, the job requires dealing with two complex sets of application programming interfaces (API), he added.

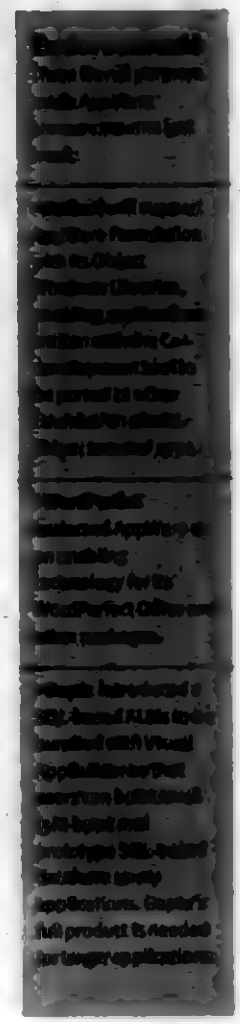
Of particular interest to several developers and users was Novell's announcement of a directory services ALM, which will support the NetWare 4.01 directory services and eventually Windows NT and Banyan services as well.

American Airlines is interested in incorporating the directory ALM into applications that would automatically route user requests to the right resource area — for example, when ordering cable from the physical plant, Vaughan said.

Furthermore, AppWare's client-independent application building blocks and object-oriented programming should allow users to "develop these new applications more efficiently and change forms more easily as groups and their needs change," Vaughan said.

AppWare will have ALMs for electronic mail; SQL querying of several types of databases, including Gupta's; Oracle Corp.'s imaging, calendaring, reporting and messaging on the Macintosh; document management; and multimedia in this month's shipment, Novell said.

Upcoming ALMs, which will roll out through May, will include reporting and messaging on Windows, network management, telephony and a Tuxedo transaction-processing monitor for critical database applications.



Tools for client/server management unveiled en masse

By Elisabeth Horwitt
DALLAS

LAN administrators accustomed to begging for client/server systems management tools were bemused last week when IBM, Novell, Inc. and Hewlett-Packard Co. announced ways to manage a variety of clients and servers.

Such products are long overdue, said David Cearley, vice president of Meta Group, Inc. A recent study by the Westport, Conn., research firm found that 70% of the life cycle cost for client/server systems is in administration, managing and training.

Client/server fit

The job now facing many network administrators is figuring out how to fit client/server management within the network management hierarchy.

"I am confused by so many products out there. So far we have nothing, and we're worried about overkill or underkill," said Karen Jones, a computer specialist at the Naval Surface Warfare Center. Jones said she is looking for a NetWare management system to bolster her staff, which recently went from 10 to five people.

Managing managers

These leading vendors are taking different approaches to distributed systems management

	IBM's LAN NetView	HP's OpenView	Novell's NDMS
	[illegible]	Modems, attached PCs, internetworking devices, other SNMP-compatible products	[illegible]
	[illegible]	Controlled on Unix	Distributed NMS
	[illegible]	Application can be integrated with range of HP software for enterprise management	In-depth management of NetWare and Unixware
	[illegible]	Client: $6,750 Server: $7,750	NMP
	[illegible]	Client: Dec. 1, server: Feb. 1, 1994	In three to six months

* Not available

Products announced last week, which tackle the client/server management dilemma from several angles, included the following:

- IBM announced LAN NetView, an OS/2-based distributed platform for managing Windows, OS/2 and DOS clients; IBM LAN Server 3.0; NetWare; DB2/2; database servers; as well as LAN and PC hardware.
- Novell announced NetWare Distributed Management Services (NDMS), a distributed version of its NMS platform that is said to manage NetWare servers, clients and the networks that connect them on NetWare Loadable Modules.

Air Canada is looking forward to the distributed version of NMS because "we don't want one central point" where all management data is collected, said John Shortall, LAN project architect for the airline.

- HP announced its OpenView Node Manager for NetWare, developed by partner Peregrine Systems, Inc. The software is said to enable the OpenView user to monitor performance statistics, including CPU and memory use, on a NetWare server, and to track software and hardware configurations on NetWare clients.

Both IBM and Novell said their respective systems were designed primarily to manage client/server systems and LANs, but they could also be used as enterprise management systems.

IBM is positioning LAN NetView both as a domain manager that reports up to NetView/6000 and NetView enterprise management systems; and also as a manager of "good-size enterprises" in its own right, a company spokesman said.

Enterprise, domain manager

Novell said NDMS will be able to act both as an enterprise manager and as a domain manager for a Unix-based enterprise management system but declined to say when or what systems it will support.

LAN administrators are in the midst of sorting all this out so they can make their buying decisions.

"We have looked at NMS, and it has a long way to go" as an enterprise management system, said Alain Pasche, head of LAN services for Union Bank of Switzerland. "Now we are trying to pull it all under an SNMP umbrella, such as SunNet Manager." The bank might use NMS for system and server management "but not for the internetwork."

Hermes to manage Microsoft only

By Elisabeth Horwitt
DALLAS

Microsoft Corp. made it clear last week that its Hermes framework, due out in the first half of next year, initially will manage just Microsoft systems, leaving "foreign systems" and networks that link clients and servers out in the cold.

Instead of embracing those foreign systems, Microsoft will leave it up to its partners, 23 of which were announced at a briefing here last week, to integrate Hermes with their own management of LANs, internetworking devices and other vendors' clients and network operating systems, Microsoft spokesmen said.

This differentiates Hermes, which is Microsoft's centralized desktop management software, from Novell, Inc.'s NetWare Distributed Management System (NDMS), also announced last week (see story page 14).

NetWare and more

NDMS, while primarily aimed at NetWare installations, will also have the scalability and functionality needed to manage other aspects of enterprise client/server installations, such as LANs and routers, Novell said. The firm said it plans to make NDMS available in three to 12 months.

In contrast, the Windows NT-based Hermes will provide consistent management environment services across NT, Windows, Windows for Workgroups and DOS systems, spokesmen said. Services will include configuration, problem management, software distribution and security management.

Like NDMS, Hermes will provide management on distributed nodes — in this case, NT servers — which will perform on systems within their local network domain. Statistics collected over time will be stored in local SQL databases that will be correlated across Hermes management nodes, Microsoft spokesmen said.

Microsoft is working with leading enterprise management vendors, such as Hewlett-Packard Co., Digital Equipment Corp. and Computer Associates International, Inc., to allow their enterprise management systems to manage Microsoft systems by accessing Hermes services.

Companies such as Visisoft, SynOptics Communications, Inc. and Tally Systems Corp. will integrate Hermes' management with their own specialized software. For example, Microcom, Inc.'s LANlord, which does real-time management of NetWare servers, will also manage Windows NT servers via Hermes, a Microcom spokesman said.

Union Bank of Switzerland "has been waiting desperately for Hermes" for its software metering and updating in particular, said Alain Pasche, head of LAN services for the Zurich bank.

However, the bank was disappointed with a prerelease version of Hermes, which apparently could not automatically distribute different software configurations to different workstations from an NT server, Pasche said. As a result, Pasche's group spent time developing its own desktop management software.

Vendors form support alliance

Fourteen major vendors last week pledged mutual technical support in the form of a Technical Support Alliance Network (TSANet) through which they will share information to help resolve multivendor support issues.

Announced at Networld '93, the alliance includes 3Com Corp., Lotus Development Corp., Apple Computer, Inc., Banyan Systems, Inc., Hewlett-Packard Co., IBM, Compaq Computer Corp., The Santa Cruz Operation, SynOptics Communications, Inc. and Novell, Inc.

"The definitive benefactor from the alliance is going to be the end user, who will see faster response times. And companies will start seeing the cost of support going down," promised Dennis Smeltzer, executive director of TSANet.

—Michael Vizard

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News Shorts

IBM to reveal client/server aids

IBM will announce tomorrow three client/server development tools. VisualAge, which helps developers create applications by combining objects on-screen, is the only one of the three available immediately. It comes in both individual and team versions. The other two packages — HighPoint, an applications generator that runs on both host and PC platforms, and ReDiscovery, which allows developers to make a PC object out of Cobol code on a mainframe — will be delivered within the next year or so.

Four dealers hit with piracy charges

Washington-based Business Software Alliance last week filed lawsuits against four PC dealers for allegedly loading customers' hard disks with copyrighted software (such as Windows) without licenses. The dealers sued for copyright infringement were LS Technology Corp. in Parsippany, N.J.; Micro Experts in Solon, Ohio; PC Importers in North Canton, Ohio; and Mayberry Systems in Belleville, Ill.

KnowledgeWare unwraps tools plans

KnowledgeWare, Inc. last week announced the company's licensing of R&O GmbH's Rochade repository as expected [CW, Sept. 13], as well as three products that extend the company's Application Development Workbench (ADW) to target high-end client/server development, company officials said. The ADW/Workgroup Coordinator offers concurrent access to multiuser ADW encyclopedias to synchronize data and to support workgroups in LAN-based environments. The ADW/Workgroup Manager, to ship in early 1994, will offer change management, security and impact analysis for multiple encyclopedias. Those multiple encyclopedias will then be able to be stored in the Rochade repository, officials said.

Faster Ethernet makes strides

Progress with full-duplex Ethernet switching was in evidence on the Networld '93 show floor last week: IBM, Compaq Computer Corp. and switch maker Kalpana, Inc. said they have successfully tested their gear running in harmony. The development was the first fruit of an interoperability consortium headed by hub vendor Cabletron Systems, Inc. and also announced last week. Compaq also said its NetFlex family of 32-bit Ethernet adapters will be upgradable to full duplex with a software driver change.

New TI chips

Texas Instruments, Inc. re-entered the microprocessor market last Friday, announcing the 486SXLC and 486SXL, eight 486SX-class chips built around a core developed by Cyrix Corp. TI is offering both 5V and 3.3V versions in four clock speeds: 20/40 MHz, 33 MHz, 25/50 MHz and 40 MHz. The new processors will come in two sizes, one for notebooks and the other for subnotebooks.

SHORT TAKES Digital Equipment Corp.'s storage business unit last week reduced prices by up to 34% on its end-user disk and tape drives. . . . CompuAdd Computer Corp. said it has reached an informal agreement with its creditors that could end its Chapter 11 protection as early as Nov. 4. . . . Forms software company Delrina Corp. in Toronto will make its debut in the communications market this week with the announcement of its Communications Suite. The software suite comprises $179 Windows-based fax/modem software that contains terminal emulation software for accessing proprietary IBM and Digital host computers and other features such as data compression and virus-checking.

Apple will sell Windows apps

CONTINUED FROM PAGE 1

small guided tour of some of the piece's most salient features. If a user decides he cannot live without a particular piece of software, he dials a toll-free number and charges the application to his credit card. He is then given a code to unlock and download the application onto his hard drive.

The disks will employ an encryption technique developed by Rainbow Technologies, Inc. Apple has devised a de-encryption algorithm that is specific to each CD so the secret code cannot be passed along.

Users can then negotiate a purchase price based on how many copies of the software their organizations will use.

November ship date

More than 10,000 Macintosh-based CDs are expected to ship in early November, with a similar Windows-specific Software Dispatch release slated for early next year, Apple officials said.

Because Apple is shipping a relatively small number of CDs, some analysts said they think that, at least initially, Software Dispatch is little more than a token gesture.

"They're trying to tell the Windows community that the Macintosh can coexist," said Lee Levitt, an analyst at International Data Corp. in Framingham, Mass.

But even a half-step toward cross-platform awareness was good news for users. "This is a great move for Apple because they are finally accepting the fact that every device on the desktop is not going to be a Mac," said Robert Anderson, a senior analyst at A. O. Smith Automotive Products Co. in Milwaukee. "We live in a cross-platform world. There's no getting around that."

Although Apple sometimes has a rocky relationship with its resellers, Schnell said Software Dispatch should not hurt sales at retail outlets such as CompUSA because the Cupertino, Calif., company is trying to include them in its plans.

But Levitt said he smells a rat. "I would say that resellers like CompUSA might be getting the short end of the stick," he said.

Some resellers are buying into the concept — to a degree.

A CD sampler service akin to Software Dispatch is scheduled to be offered this month by Apple resellers Multiple Zones International, Inc. and Instant Access International.

Their CD, however, will be limited to the Macintosh platform.

A good portion of Apple's early disks will be devoted to lesser-known firms such as Aladdin Systems, which produces the StuffIt data compression utility for Macintoshes, or Intuit, Inc.'s Quicken, a money management application for both Windows-based and Macintosh machines.

Big guns missing

However, some of the biggest guns in the Macintosh developer community — companies such as Microsoft and WordPerfect Corp. — will not be represented in the initial Software Dispatch release. Microsoft said it was unable to respond in time to meet Apple's initial deadline but hopes to be involved with future releases.

Analysts offered a warning about the efficiency.

"The big players are needed to pull through the smaller players," said Doug Kass, a principal analyst at The Viewpoint Group in Santa Cruz, Calif. "The typical user has confidence that if the big players are in there, the smaller players are OK. If they don't get the big players, the whole program might not make it."

The first issue will include its share of notables, however, including Adobe Systems, Inc., MacroMedia, Inc., Fractal Design Corp., Claris Corp. and Symantec Corp.

Document control

CONTINUED FROM PAGE 1

for it from our customers. We're trying to understand what the specific customer need is," said Mark Kroese, general product manager for Microsoft Office.

Short of an outright acquisition, Microsoft is expected to sign alliances with existing providers of document management systems — including SoftSolutions Technology Corp. in Orem, Utah, PC DOCs, Inc. in Tallahassee, Fla., and Saros Corp. in Bellevue, Wash. — in order to closely integrate its server technology with their document management system services.

This integration of services will be further enhanced by more tightly linking PC applications with document-oriented middleware services, according to Mike Kennewick, vice president of marketing at Saros.

Meanwhile, Lotus sources said the company intends to enhance the ability of its Notes offering to provide robust document management system services that other companies will take advantage of.

WordPerfect will announce a personal information manager this month that will include some document management capabilities. Later, this effort will be expanded to provide a full-blown document management system effort, a company spokesman said.

"There is a realization that work flow, text retrieval and document management are tools that will be needed on all desktops. The big vendors are seeing that these areas will generate a significant amount of revenue each year and that there is money to be made here," said Carl Frappaolo, executive vice president at the Delphi Consulting Group in Boston.

Using leverage

In general, Microsoft is expected to leverage existing document management system technology on top of Microsoft Office, while WordPerfect is expected to deliver a system that will leverage its namesake word processor and WordPerfect Office electronic-mail system.

Lotus, on the other hand, is expected to position Notes as a back-end server for third-party document management systems by including more sophisticated routing, rules and agents in the Notes server, sources said.

"There's a big split between loose document management systems and some of the sophisticated ones already out there. Notes has versioning, but it's nothing like the check-in, check-out capabilities in robust document management systems," said Brownell Chalstrom, president of Chalstrom Consulting, Inc. in Oakland, Calif.

"Our products focus on cross-application, while a WordPerfect offering is going to focus on WordPerfect documents," said Rhonda Shill, marketing manager for SoftSolutions.

"For us the biggest problem has been educating the market, so this may actually help us," Shill said.

However, Frappaolo noted that to be taken seriously in this market, the big PC companies will have to support applications from different vendors.

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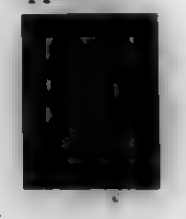

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Work-flow tools tap SQL databases, Notes

By Michael Vizard
ALAMEDA, CALIF

After almost three years of development, Action Technologies, Inc. (ATI) last week delivered its suite of work-flow analysis and development tools for SQL databases from Sybase, Inc. and Microsoft Corp.

Support for other SQL databases is due in the first quarter of 1994, and a Lotus Development Corp. Notes-compatible version of ATI's ActionWorkflow System software is in beta testing, with delivery expected before the end of the year.

ATI provides four components in its ActionWorkflow System to help information systems managers redesign business processes. These include:

- ActionWorkflow Manager, which actually monitors and tracks each transaction made during a work-flow process.
- ActionWorkflow Analyst, a graphical tool for creating work-flow processes.
- ActionWorkflow Application Builder, an application generator that shields developers from working with products such as Microsoft's Visual Basic or the Notes macro language.
- A set of client libraries, which can be used to link third-party applications to the ATI system.

While the ATI system is said to provide some of the most sophisticated tools for re-engineering work flow, independent consultants note that adopting ATI requires businesses to philosophically adopt ATI's work-flow methodology.

"For a lot of companies this can prove to be a rather expensive adventure, costing tens of thousands of dollars," said Randal Zahora, president of Workgroup Productivity Corp., a consultancy in Oak Brook, Ill.

However, some companies willing to undertake the expense said the ATI software has provided substantial benefits.

For example, Bankers Trust Co. in New York has been using a noncommercial release of the ATI software running on top of Notes 2.1 in a customer service application that logs inquiries and forwards information to the appropriate decision-maker.

"People are still making the decisions, but when they do, action is automatic. Rather than just faxing information around, they are sending collections of data, including text and images," said Jeremy Keisman, the bank's vice president of global assets technology.

Combination approach

Other companies are taking a middle-of-the-road approach that combines the underlying ATI technology with a work-flow approach developed by Quality Decision Management, Inc. in North Andover, Mass.

For example, Synetics Corp., a consulting firm in Wakefield, Mass., is adopting Quality Decision's software to help track Notes projects across multiple customers. According to project manager David Greene, Synetics opted for Quality Decision because it provides a more flexible methodology on top of the ATI transaction tracking technology.

"It takes a lot of programming to exchange information between Notes databases in a work-flow model. Quality Decision simplifies this by funneling tasks into the appropriate Notes mailbox," Greene said.

Pricing for the ATI software, which runs on OS/2 servers and Windows clients, is $6,000 for the ActionWorkflow Manager, $1,495 for the ActionWorkflow Application Builder and $495 for the ActionWorkflow Analyst. The client libraries are available for $2,000, which is an unlimited-use license.

A Microsoft Windows NT implementation is due in the fourth quarter, with Unix support slated for the first quarter.

Staff writer Lynda Radosevich contributed to this report.

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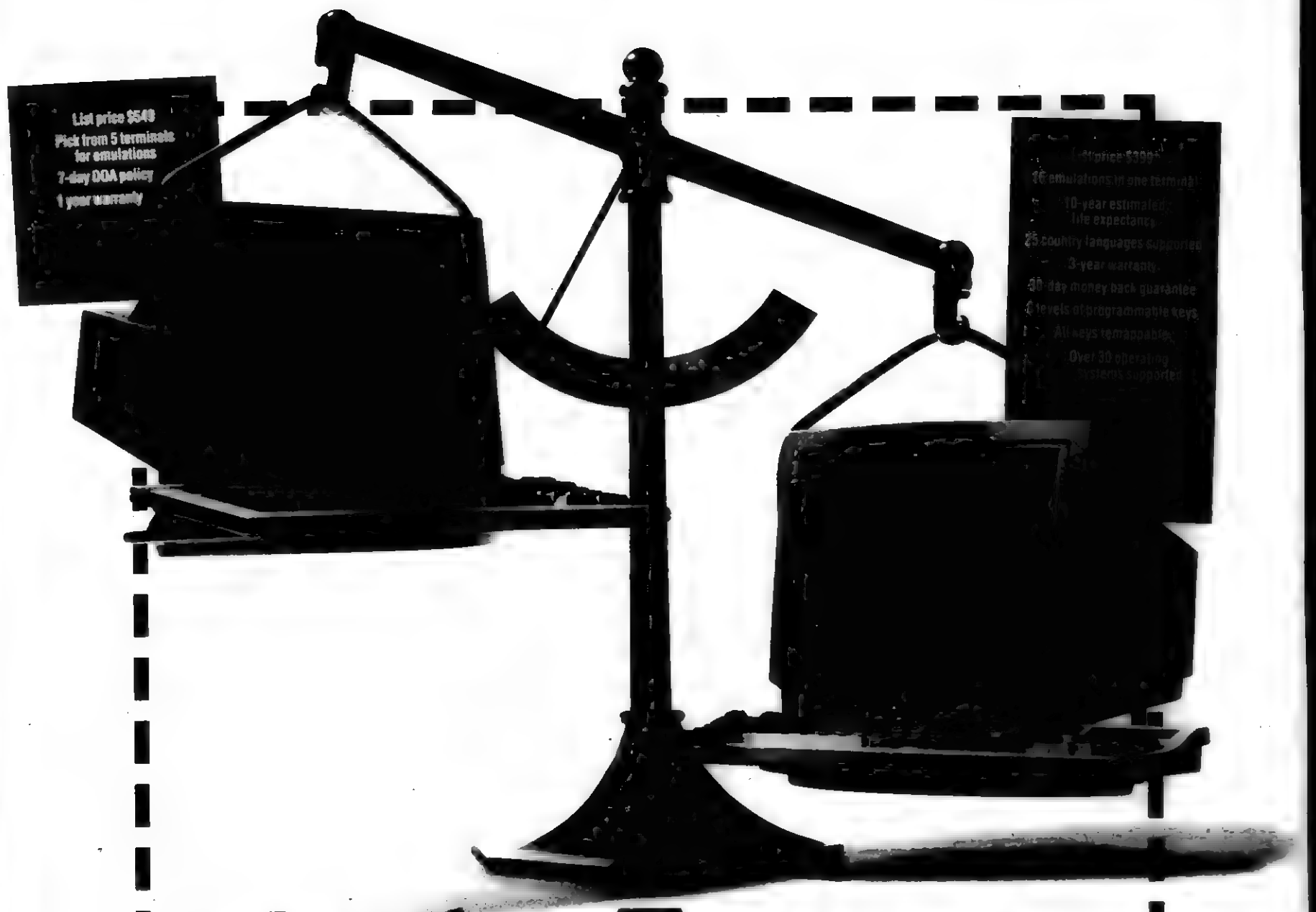

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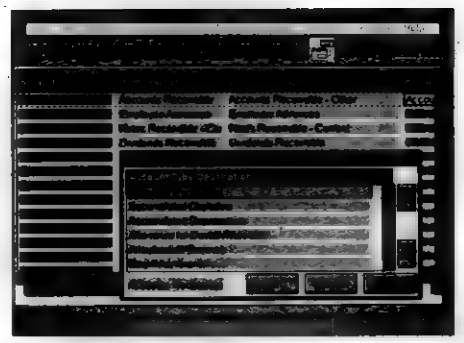

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ASK Group takes OpenRoad into object race

By Kim S. Nash
SAN FRANCISCO

In its first major object-oriented thrust, The ASK Group, Inc. last week unveiled an update to its 4-year-old ASK/Windows 4GL development tool set.

Although the move leapfrogs ASK over competitors such as Oracle Corp., the announcement is the latest from database vendors trying to stake claims in the object-oriented arena. Sybase, Inc., for example, outlined its object-oriented strategy in August, including plans to build an object-oriented repository and tools for multimedia applications [CW, Aug. 16].

However, ASK did break ground by promising to deliver versions of its tools for rival databases from Oracle and Sybase "before they have their own comparable tools out," a spokeswoman said. ASK plans to deliver the products during the next six to nine months, she said.

The tools are part of an overarching object-oriented plan dubbed OpenRoad, which ASK Chairman Pier Carlo Falotti outlined last week. The primary pieces of OpenRoad include the following:

▶ASK/Windows 4GL Release 3.0, a fourth-generation language that previously required ASK's Ingres database but is said to work with Oracle, Sybase and other database management systems. Also, Release 3.0 will sport object-oriented capabilities, such as support for class libraries, ASK said.

▶A model-based code generator designed to let users code business rules into software development for smoother change management.

▶Consulting services to help users outline and build new applications using the object-oriented products.

Details on two products, code-named Ruby and Amethyst and sketched out for user group attendees in May, were scant. Although Falotti did not provide features or ship schedules specific for those tools, they will be part of OpenRoad, a source close to the company confirmed. Still under development, Ruby is a graphical report writer, and Amethyst is a graphical user interface-based code generator. An official announcement is expected by mid-1994, the source said.

The new products "fulfill a lot of long-standing user requests," said Kitty Weaver, president of the North American Ingres User Association.

The waiting game

Association members have long wanted strong object-oriented utilities from ASK because such tools from independent software makers do not work well with the Ingres database, Weaver said.

Plus, fewer third-party tools exist for Ingres because the Ingres database lacks the market strength of Oracle or Sybase, she noted. Ingres ranked fourth in worldwide Unix relational database sales for 1992, with about 9% of a $2 billion market, according to research firm International Data Corp.

However, not all Ingres users were as eager, focused instead on other technologies. "Interest in object-oriented is not as high right now as [it is for] managing all our databases and client/server systems," said Jim Bullock, MIS development manager at Cellular One. The mobile phone company recently installed Ingres databases connecting three locations in upstate New York.

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E-mail breakup may give users more choices

Mix-and-match mail components will work if vendors provide support and ensure interoperability

By Lynda Radosevich

The crack-up of LAN-based electronic mail is under way, and that could mean more choice and more control for users.

Several recent announcements combined with strategy changes at vendors such as Lotus Development Corp., Microsoft Corp., Novell, Inc. and Apple Computer, Inc. will break LAN E-mail into client and server pieces that users can mix and match, regardless of vendor.

This will give information systems managers more choices for E-mail "back-end" services and let managers and end users purchase the client with the features they like best. It also deviates from the model currently used by E-mail market leaders Lotus' CC:Mail and Microsoft Mail.

For example, to use Lotus' or Microsoft's message, store or directory services, users must also purchase those companies' mail interfaces.

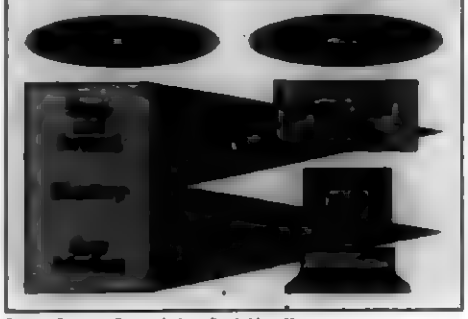
Feature frenzy

At a messaging forum two weeks ago, roughly 60 participants — including users from large organizations — said they want to purchase E-mail based on an application's features and not have to simultaneously choose all underlying features, said Nine Burns, president of the conference's hosting company Creative Networks, Inc. in Palo Alto, Calif.

But those users said they want to have a messaging infrastructure that will support more than messaging. First vendors must endorse standard application programming interfaces (API) for messaging applications such as calendaring, scheduling and work flow. And that is not necessarily going to happen. "If you talk to Microsoft, they support MAPI. Period. They are pushing their own solution and not cooperating," Burns said.

Unbundling E-mail

Users can now mix and match different vendors' E-mail back-end services and mail clients



Source: Forrester Research, Inc., Cambridge, Mass.

In fact, users and analysts contacted last week had several reservations. Among them were whether vendors will agree to standards, provide multivendor support and ensure interoperability.

"I'm cynical about how well vendors that offer both pieces will actually support an open system," said Ray Pratt, an IS administrator at Buckbee Mears, a division of BMC Industries Inc. in Cortland, N.Y.

Mail parties

Vendors such as Novell and Hewlett-Packard Co. have a land in this separate back-end/front-end market because their products already support a variety of vendors' clients. Neither, however, figures highly in corporate E-mail market shares.

As part of its AOCE announcement, Apple also outlined plans for PowerShare Collaboration Servers, which provide store-and-forward messaging services for AppleTalk networks. The servers will come with messaging software and APIs that let other vendors' client applications operate using Gateway Automation software, and Apple has said it plans to...

Among the developments enabling the separation of E-mail components is Microsoft's plan to include a fleshed out version of its Microsoft Application Programming Interface (MAPI) in Windows 4.0, which is expected to ship around mid-1994.

"Full MAPI will give other vendors the exact same abilities to the messaging back end as we have," said Tom Evslin, general manager of workgroup strategy marketing at Microsoft.

APIs fast approaching

Also, Lotus will ship a full set of APIs to CC:Mail some time after the "Sequoia" version of the CC:Mail server ships in the next 12 to 18 months, according to Larry Crume, vice president of Lotus' mobile computing division.

Those APIs will allow competitors to write competing mail clients that fully use CC:Mail. The upcoming Lotus Communications Server, a separate client/server messaging server due in 12 to 18 months, also will fully support competing clients, according to Lotus.

Other evidence supporting a move in this direction includes Apple's announcement last week of its Open Collaboration Environment (AOCE), which has a messaging component that will let other vendors' clients use Apple's messaging infrastructure [CW, Oct. 4]; and Novell's announcement last week that its Message Handling Service will directly support Microsoft Mail.

Fault-tolerant market

Stratus swings layoff ax to trim costs

By Craig Stedman
MARLBORO, MASS.

■ Stratus Computer, Inc. last week said it is laying off 160 employees, 6% of its work force. The layoffs come as Stratus experiences a decline in earnings due to lower revenue growth and profit margins on its fault-tolerant computers.

The company said it will take a $3.5 million charge in the just-finished third quarter to cover severance payments. That will further reduce profits for the period, which were already expected to be down from last year's third quarter (see chart).

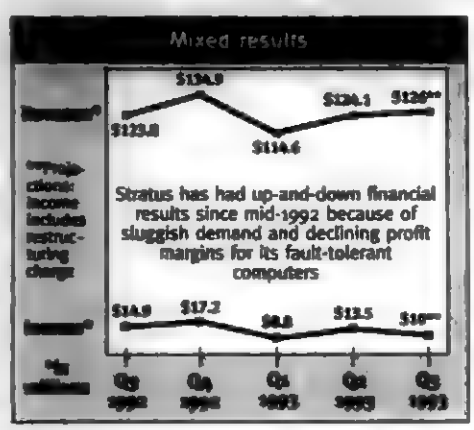
80 lose jobs now

Stratus let 80 manufacturing and engineering workers go last week and said it would eliminate 80 more jobs by the end of the year. The reduction is the second in three months for Stratus, which cut 39 jobs in July as part of a manufacturing plant consolidation.

According to analysts, improving reliability of general-purpose hardware has reduced demand for the more expensive fault-tolerant systems sold by both Stratus and archrival Tandem Computers, Inc., which is in the midst of a major restructuring itself (see box).

Stratus is "having a tough time right now," said Richard Schreiber, president of ATB Associates, Inc., a Wellesley, Mass., consulting firm. "Their market segment is shifting on them and forcing them to drive their prices down, and margins are falling as a result."

Mixed results



Stratus has had up-and-down financial results since mid-1992 because of sluggish demand and declining profit margins for its fault-tolerant computers

Slow second half

Revenue in the first half was up 5% over 1992 levels, but Stratus has indicated that second-half business will be below earlier expectations. As a result, the company said, 1993 profits are likely to be "slightly" below 1992's $56.9 million.

That does not sit well with William Foster, Stratus president and chief executive officer. "We're a company that's always been focused on being very profitable," Foster said. With hardware prices falling, he added, Stratus is "trying to be more efficient."

The layoffs are "totally disconnected" from a program started earlier this year that targets software company acquisitions as part of an effort to diversify operations, Foster said. Stratus plans to spend up to $100 million on acquisitions, but Foster noted that it has $170 million on hand and only needs about $50 million to fund its current operations on an ongoing basis.

Foster said he is looking for revenue to increase 8% to 12% in 1994 as Unix shipments pick up and sales decline for Unix resellers IBM and Ing. C. Olivetti & Co. He insisted that Stratus' business remains "good" in comparison with other vendors.

William Milton Jr., a financial analyst at Brown Brothers Harriman in New York City, agreed. "Obviously their revenue growth has slowed, but they're in pretty good shape relative to others in the industry," including Tandem, Milton said. "Foster is a meticulous planner."

Rival reductions

Tandem is also in a downsizing mode because of sluggish revenue growth and declining profit margins for fault-tolerant computers

TANDEM

- 1,600 to 1,800 employees (15% of work force) to be let go by mid-1994
- 5% salary cut and benefit reductions imposed in July
- Replaced CEO of Unix-versus-Guardian subsidiary
- Replaced head of European operations
- Overseas facility consolidations being planned
- $452 million restructuring charge taken in quarter ended June 30

Stratus' CEO and President William Foster: *With hardware prices falling, 'Stratus is trying to be more efficient'*

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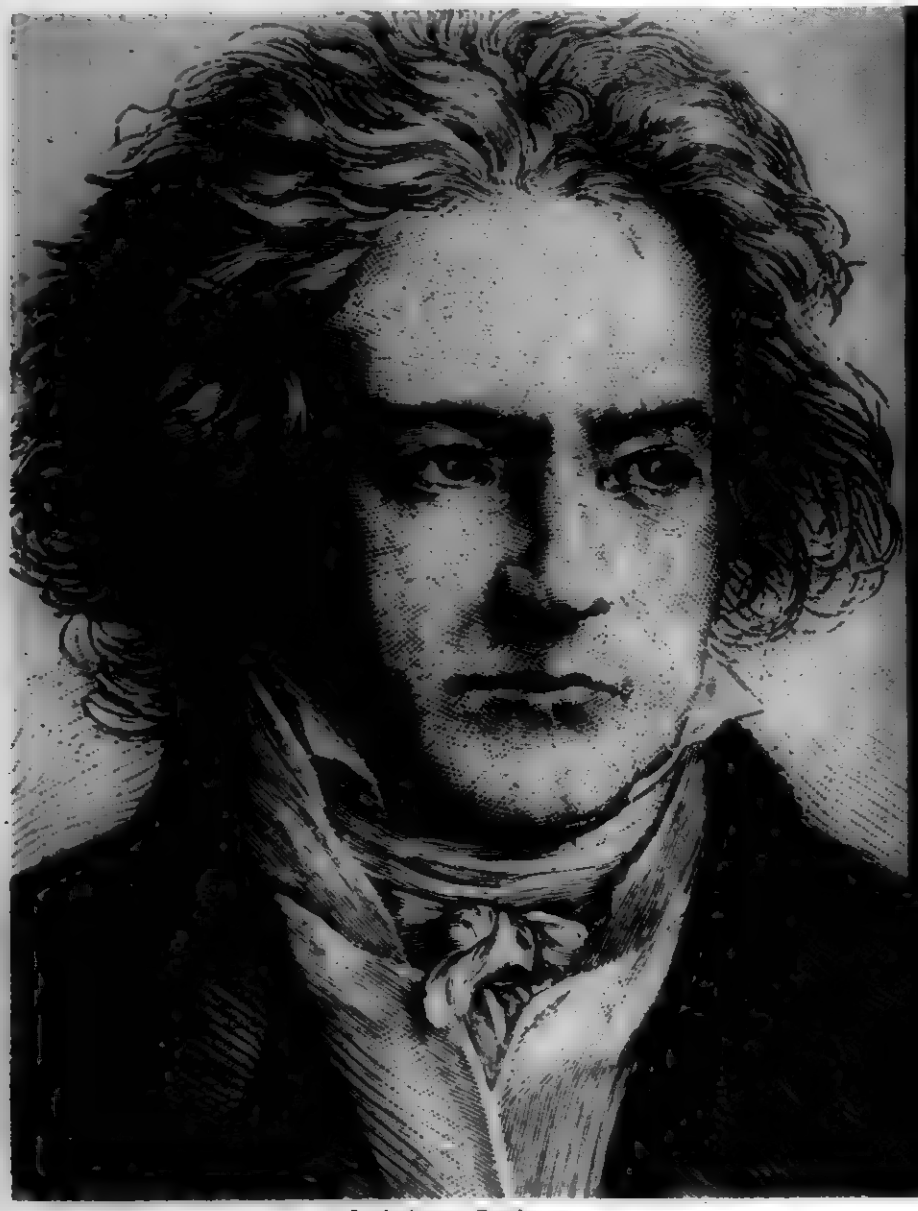

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C/S B.S.

For some time now I've used this space to strongly advocate the very slow and easy path to downsizing and client/server computing.

In addition, I've taken that message on the road, speaking at various user group meetings and at times causing the host vendor representatives to cringe as I related some emerging client/server disaster stories.

I also predicted (and certainly was not the first person to do so) that there would be a short-lived but deflative uptick in demand for mainframe MIPS. This would result from users coming to the stark realization that mission-critical computing on small, cheap hardware platforms is extraordinarily difficult at its best and suicidal at its worst.

Lately, when delivering this message in person, I notice a bit more smugness on the faces of many in the audience. They sort of sit back with arms folded across their chests, wryly smiling as if to say, "Yeah, I know what you're talking about. Got the scar tissue to prove it."

Afterward, in conversations over coffee, they find solace and comradery, if not commiseration, in one another. Either they've been through some downsizing project that panned out a whole lot less than planned or know of someone close to them who has.

Through it all, a new reality has quietly emerged. When was the last time you heard someone talk about the impending death of the mainframe and not get hooted off the dais? Can you recall any big-time client/server vendors announcing the unplugging of their big iron recently? And is it just me or does it appear that the time line for functional object-oriented database technology keeps on getting nudged further and further out?

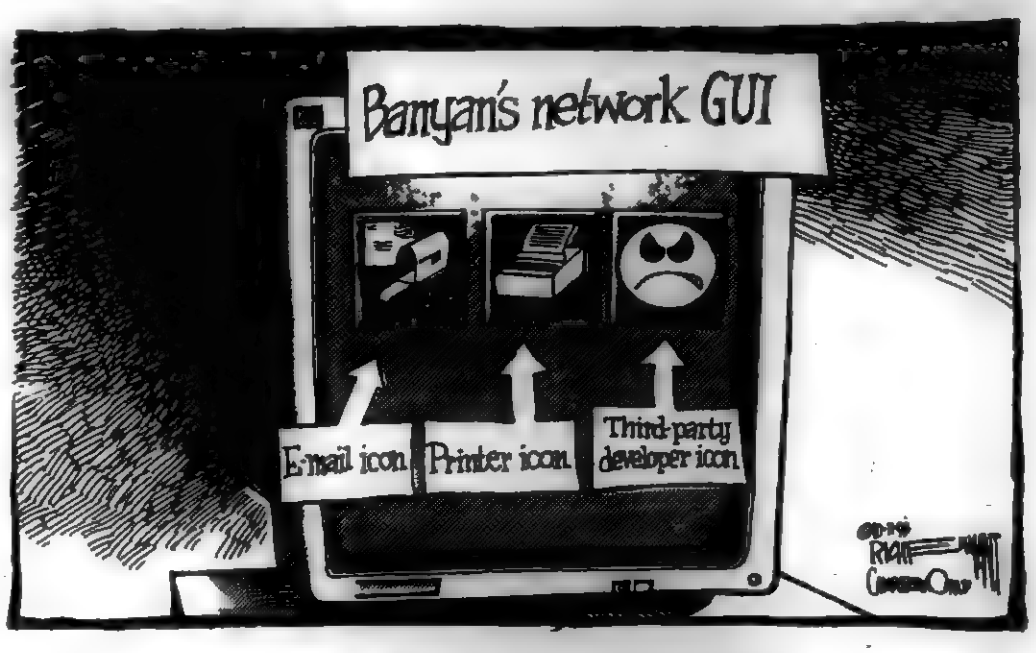
Users are finding all sorts of "surprises" in their client/server projects, the same way a toddler's diaper presents surprises to parents at inopportune times. Users who gushed at the early results of client/server pilot projects often find that the more full-blown implementations falter badly. Updates to larger hosts are chronically unreliable. Lacking the beauty of data orchestration built into a mainframe, client/server database performance is often poor by comparison.

Perhaps the worst part is that when the doo-doo hits the fan and things start to go wrong, it's almost impossible to get any of the umpteen vendors involved to accept responsibility. Often, the truth is that there's no way of knowing whose product is at fault, and it's just as difficult to know in advance how products will interact with one another in a multivendor environment.

Yes, client/server will happen. So will object programming, richer implementations of SQL databases and aggressive downsizing. And any users who refuse to stay current with the waves of change will be swamped by them. Only it seems users are shifting their expectations toward a new reality spawned by hard lessons that indicate there is no magic bullet in computing, not by a long shot.

Bill Laberis

Bill Laberis, *Editor in chief*



Losing data out the 'Windows'

After reading "Help, Windows is driving me nuts!" [CW, Sept. 13] I really had to give a little chuckle. I don't know why this article should be such a surprise to the public. I am not on any kind of network but run Windows 3.1 on my 486 66-MHz with 16M bytes of memory and a 340M-byte hard drive, and I have this problem all the time. I have tried everything from a temporary swap file to a permanent swap file.

What I don't understand is why any business would trust putting Windows on a network or stand-alone. It is the most unstable software that can be put on a computer. Unless you save your work every two or three minutes, you can almost guarantee losing it. good-bye.

The advantages of Windows far outweigh DOS in that you can use all your TrueType fonts and open several windows at once without closing and saving an application, but you also have to take the chance that you will get that lovely little message on your screen that casually says, "You have just lost everything!"

Pat Riesner
Irvington, N.Y.

Seize the moment

The article "Doomsday" [CW, Sept. 6] was depressing. The depression comes not from the billions of dollars and years of effort forecast to meet the year 2000, but in its implicit prediction of status quo in the coming years.

We can infer from the forecast that there will be no improvements that reflect the continued plummeting of costs. The doomsday forecast is based on the assumption that there will be no information breakthroughs, no application language developments that will enable us to free ourselves of the stranglehold of obsolete languages and antiquated legacy systems.

Indeed, opportunities abound for new data formats and structures, new application development approaches and new computer functionality in these coming years.

If we fail to seize these opportunities, we deserve the "doomsday" consequences. The costs of these missed opportunities will not be limited to just changing date formats; they will make [writer] Peter De Jager's numbers look like just the tip of the iceberg.

Robert C. Kendall
Principal
Oswego Road Group
Hopewell Junction, N.Y.

RPC thread argument is moot

Franco Vitaliano's column "Get the message?" [CW, Sept. 13] contains one factual error that invalidates his entire argument. He tries to argue that the use of remote procedure calls (RPC) causes one to "lock two or more pieces of a distributed application together in a long-distance embrace."

He goes on to say that "Distributed Computing Environment (DCE) RPC threads do not get around this because most implementations of Unix cannot handle more than one RPC thread at a time. . . ."

Mr. Vitaliano is misinformed. With DCE threads, as with many other (Unix-supported) thread packages, multiple concurrent activities, including RPCs, are supported. It is true that some thread packages do not extend their support for concurrency to applications doing network I/O, but this is not the case with DCE threads.

Thus, using DCE RPC, one thread may place an RPC to a server, while the remaining threads in the application go about doing other work. If there is a good argument for why "network message-passing systems" have advantages over RPC, it has yet to appear on the pages of *Computerworld*.

Thomas W. Doeppner Jr.
Associate Professor
Department of Computer Science
Brown University
Providence, R.I.

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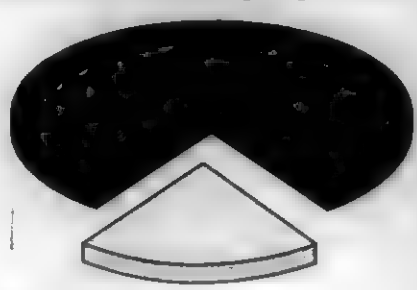

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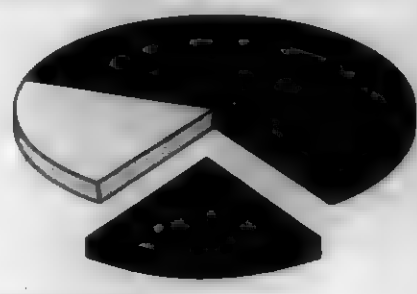

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Taming wild software country

Steve A. Epstein

Nobody in Dodge liked to be told what to do, but Matt Dillon was needed every week to protect the citizens from bad guys. Software engineering is a field rife with gunslinger geniuses, in all flavors and sizes, who are creating software at a dizzying pace. And we could use some authority to keep an eye on what they are doing.

What developers do and how they do it is a matter of concern to all of us in one way or another. The software they write not only implements procedures for accounting and human resources departments, but controls the operation of trains, airplanes, ski lifts, chemical plants, nuclear plants, space vehicles and cars.

The software engineering industry has some responsibility to assure the safe and proper operation of its products. The last decade has seen considerable progress in quality management and development methods. However, the effectiveness of these methods can be judged only by comparing measurements of the situation before and after. The answer to the question, "How safe is this piece of code?" must be better than, "We feel the code is very safe."

It's understandable that safeguards are still lacking. Software engineering is a young discipline, maybe 30 years old, and all its methods are not yet in place. When civil engineering was 30 years old, building codes and standards had not yet been invented. And lots of buildings

Paul Dickson

probably fell down.

This isn't a situation that can be allowed to persist, however. The stakes are too serious. Everyone has tales of programs gone wrong — ones that gave good customers bad credit ratings, lost a day's work, caused the loss of telephone service to a major city or just didn't work quite the way one expected. Some piece of software, somewhere in the world, is doing something screwy right now. Bugs are endemic.

The answer is to begin by implementing techniques from the disciplines of software reliability, software system safety and software risk analysis, including measurement of failure rates over the life cycle of the software, software hazard analysis, software fault tree analysis and representation of uncertainty with probabilities. The results of these analyses should be clear, concise, reviewable, documented and quantified.

Licensing of software engineers may also be part of the answer. We require other engineers to publicly demonstrate competence in their fields. In fact, most states require hairdressers to be licensed. What about the development team that writes the control programs for high-speed elevators? Shouldn't the public be assured of their competence? Shouldn't an industry-standard safety review be available?

Esther Dyson, in her previous column [CW, Sept. 13], worried that too many processes will become petrified as a result of regulation, that "certified functionality" will become a selling point of software.

Sadly, if left totally to the marketplace, certified functionality will not appear as a feature of software. Safety assurance will not be perceived as a "value-added" without pressure from some sector.

Let's hope that the pressure doesn't come from disasters and lawsuits, but from the software engineering industry itself.

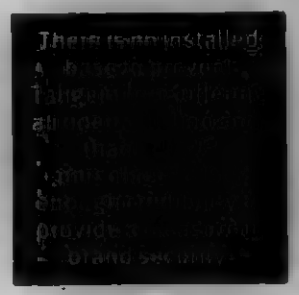
Epstein, a senior scientific associate at Safety Factor Associates in San Diego, is currently engaged in a risk analysis for the software for the NASA space shuttle main engines.

Hide the operating system, deliver value

OPEN MIND *by* Esther Dyson

Calling Taligent an operating system and trying to compare it to Microsoft's forthcoming all-object operating system, Cairo, misses the point. Taligent's real value-added is *above* the operating system.

In the beginning, the idea *was* to build a full-scale, totally new operating system, which would be object-oriented from the kernel up. And that description, of course, is a match for Cairo, which, like Taligent, is expected in 1995. But, sometime earlier this year, Taligent changed its strategy and separated its efforts into four parts: a small operating system kernel; a set of object-oriented operating system services; what Taligent calls the application programming model; and a set of development tools.



Taligent will now offer its own optional operating system, but the major part of its work — the application programming model — will be available for any of several operating systems, ranging from IBM's own OS/2 and OS/400 and Apple's System 7 to Unix and, quite possibly, Windows NT. In the new model, the operating system is hidden from developers and users. Most developers would work on Taligent's generic, extensible application model and get a free choice of operating systems.

Reversing the practice, employed by Microsoft and others, of bringing application functions, such as E-mail transport, into the operating system, Taligent moves them back out, not into applications, but into object modules. Taligent's real value lies here in its own cross-platform facilities, implemented as objects that provide services.

Of course, this is not a new concept. Indeed, it's what Steve Jobs should have done after leaving Apple instead of opting to sell an operating system on top of hardware. Why bother to make hardware — or an operating system kernel, for that matter — when other vendors are willing to sell these things at commodity prices? Taligent could do just fine selling the value-added on top of other companies' hardware and operating systems.

Since it is starting more or less from scratch, Taligent has the freedom to redesign the house from the ground up. While technically Microsoft also started Cairo from scratch, that product had to fit into Microsoft's well-established (to say the least) business infrastructure. In the business world, Microsoft owns the current model and stands to lose by the new one.

The challenge for Taligent is on the commercial side. People don't buy Microsoft products because of technical interoperability (which they take for granted) but because of the brand name. Customers claim they want openness, but they also want the security a brand name provides.

Taligent is one of a few with a good shot at overcoming that catch-22. There is no installed base to prevent Taligent from offering an open solution and, thanks to its parentage (IBM and Apple), it has enough marketplace credibility to provide a measure of brand security.

If Taligent is successful, people will complain that they are forced to buy applications built around Taligent's standard. But that's the sort of problem Taligent President Joe Guglielmi would love to have.

Dyson is editor of "Release 1.0," and "Rel-East," newsletters on new technology and new computer markets in Eastern Europe.

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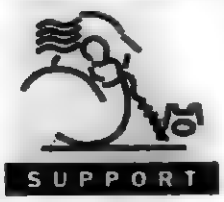
Borland looks for Advantage in support

By Michael Vizard
SCOTTS VALLEY, CALIF.

Seeking to make itself more attractive to information systems departments, Borland International, Inc. recently unveiled its Borland Advantage program, which seeks to codify many of the under-the-table policies employed by software vendors into a standard license.

Advantage, the latest move in the ongoing battle over licensing options among PC software vendors, seeks to differentiate Borland from its rivals by factoring an average-use estimate into its standard site license packages, while also factoring in the amount of Borland software already installed at the site.



In contrast, Microsoft Corp., Lotus Development Corp. and WordPerfect Corp. all offer roughly equivalent volume and site licensing deals, but each of these programs requires IS directors to haggle with vendors to achieve the equivalent of the deals spelled out in the standard Borland contracts.

For example, the state of Texas worked with Lotus, even though it does not have a minimum purchase requirement and does not factor installed base into its standard contracts. This gives the state the top-tier site license deal based on its buying potential, according to Larry Lehmann, fiscal director. Lehmann has purchasing authority for more than 140,000 PCs.

Same wavelength

But working with Borland to achieve that same goal was easier, Lehmann said.

"Borland understood our situation in government vs. the commercial sector right away and walked in with flexible terms. With other companies, we would have to negotiate through three or four layers of management to get the same deals," Lehmann said.

"This will be a whole new concept for a lot of companies. We're very, very thrilled about this program," said Dave Newhouse, a microcomputer specialist at the Federal Deposit Insurance Corp. in Arlington, Va.

The Volume Licensing portion of the Advantage program allows a site purchasing more than 500 units of Borland software valued at $10,000 to qualify for discounts. To qualify, sites can include their installed base of licenses in addition to the licenses they are about to purchase. In addition, Borland will include installed copies of WordPerfect's word processing software as part of this program through Dec. 31.

As a result of Advantage, which will be available through both resellers and Borland, IS

Borland, *page 38*

It's a DOS eat DOS world

By Ed Scannell

While IBM's Personal Software Products group arguably delivered a better DOS than DOS in June with its Version 6.1, the product still faces a hard uphill run to escape niche status.

With the ink just dry on its divorce settlement with Microsoft Corp., Personal Software Products now faces the task of developing and, more importantly, marketing DOS on its own. In the past 12 years, the latter responsibility was largely taken care of by now-archrival Microsoft. IBM needed to worry only about providing PC-DOS for its captive base of hardware users.

But now Personal Software Products officials are faced with the unenviable task of persuading hardware manufacturers to dump their long-standing relationships with Microsoft and sign bundling deals with IBM.

Tough road ahead

Placing PC-DOS 6.1 in the same category as Novell, Inc.'s implementation of DOS, Jeff Tarter, editor of "The Soft Letter" in Watertown, Mass., said, "They need to get out there and aggressively cut some deals. It is not going to be easy."

While Personal Software Products has signed OEM deals for PC-DOS 6.1 with a handful of second-tier clone makers in Europe and Japan, it has signed only one in the U.S. with Orientech, Inc., a small West Coast maker of systems and peripherals.

One of the factors that swayed Orientech toward PC-DOS 6.1 was that IBM lets the company bundle DOS not just with systems but with peripherals such as hard drives, said Robert Ho, a senior technical consultant at Orientech.

But based on the strength of what they believe are the superior features of PC-DOS 6.1, and what users say are bugs and shoddy design of some features in MS-DOS 6.0, Personal Software Products officials said they think they can tear a couple of major OEMs away from Microsoft.

"A lot of customers took note of the way [MS-DOS 6.0] went out," said Wally Casey, director of marketing for Personal Software Products, referring to those users who lost data due to what users claimed were either bugs or poor design of the product's compression and SmartDrive features. "How comfortable will they be when things like DOS 7.0 get delivered?"

While PC-DOS 6.1's user base is minuscule compared with MS-DOS', most of those customers appear steadfastly loyal. They said the product is much more stable than when MS-DOS 6.0 was released, and they said they like its full-featured, built-in utilities such as the Backup and Scheduler.

"With the utilities they have bundled in, this is much more of a DOS users' DOS. It is also a lot cleaner and a little smaller than Microsoft's," said Jim Forney, a beta user and consultant in Brick, N.J.

With Microsoft pushing Windows more than DOS — its upcoming Chicago product will be Windows with built-in DOS functions — some users said they think IBM is doing the right

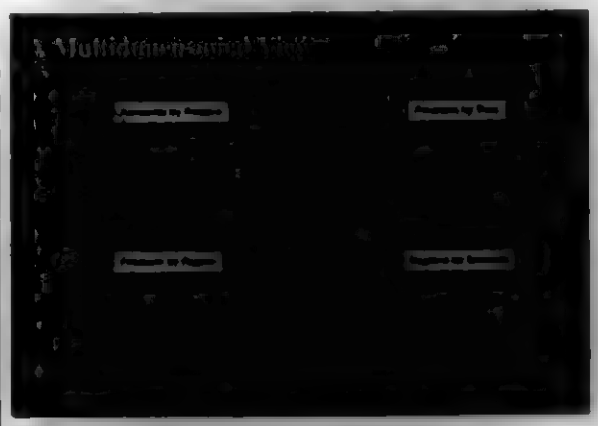
DOS, *page 36*

Arbor bolsters tool for spreadsheet users

By Michael Vizard
SANTA CLARA, CALIF.

Arbor Software Corp. is in the process of delivering Version 3.0 of its Essbase database, which is specifically tailored to allow multiple Microsoft Corp. Excel and Lotus Development Corp. 1-2-3 spreadsheet users to access the same data.

Essbase consists of a proprietary database architecture that can reside on either an OS/2 or Windows NT server.



Arbor Software's Essbase allows spreadsheet users to perform multidimensional analysis of data

Spreadsheet users can then access and analyze data stored in that database, which can consist of up to 17 trillion data blocks, using standard spreadsheet commands. Once accessed, Essbase data is then displayed in a multidimensional context in either Excel or 1-2-3 spreadsheet cells running on Windows, DOS or Macintosh systems.

Flexibility is key

"We went with Essbase, as opposed to a database like Paradox, because we didn't want to have to learn a whole new language. We can access data using the standard Excel commands," said Tony Regan, controller at Kaneb Services, Inc., an oil and gas service company in Dallas.

Kaneb currently uses Essbase as a tool for rolling up spreadsheet data from subsidiaries in 10 countries. In addition, flat-file data from an IBM AS/400 system is also loaded into Essbase for analysis.

"For us, Essbase is a lot more flexible and easy to set up," Regan said.

With Version 3.0, Arbor has added easier-to-use data structure tools that make easier-to-define relationships among data, create scripts and assign multiuser access security levels. In addition, Arbor has added support for an IBM SQL interface that will allow users to import data from 20 different PC and SQL databases into Essbase. Other enhancements include 30 additional macro commands, support for Excel running on a Macintosh and TCP/IP.

Pricing for Essbase starts at $35,000 for a five-concurrent-user license.

DOS eat DOS

CONTINUED FROM PAGE 35

thing in pushing a DOS solution to the tens of millions of users who still have not gravitated to Windows.

"With Microsoft going away from DOS and toward Windows, there is a huge DOS base out there that will be more willing to listen to IBM," said one beta user who requested anonymity.

How much longer that DOS base stays huge remains to be seen. Microsoft claims that close to 70% of all PCs shipping in the U.S. are bundled with Windows and that 82% of users upgrading to MS-DOS 6.0 use Windows.

Learn from others' mistakes

Although Microsoft has never admitted to any major bugs that resulted in data loss, it recently issued a widespread beta release of its MS-DOS 6.2 that added several new features to MS-DOS 6.0's DoubleSpace compression utility and SmartDrive feature.

Watching the difficulties Microsoft experienced with users and the DoubleSpace compression utility, IBM held off bundling such a utility with PC-DOS 6.1 until it could do further testing.

The company expects to make Adstor, Inc.'s SuperStor Pro compression utility available free to registered PC-DOS 6.1 users later this month.

Personal Software Products officials said they hope to give PC-DOS a more distinct advantage over MS-DOS with a version of its object-oriented Workplace Shell interface sometime early next year. Microsoft is not expected to have a similar update to Windows 3.1 until it ships its 32-bit version of Windows, code-named Chicago, in mid-1994.

Workplace Shell for DOS

IBM is working on the DOS version of the WorkPlace Shell with a five-person start-up in upstate New York called Paper Software, Inc.

The company, headed by ex-IBMer Mike McCue, who worked on OS/2, delivered Sidebar 2.01 earlier this summer, giving PC-DOS users a preview of what the DOS version of the Workplace Shell will look like.

Sidebar, designed as a Windows shell, takes up only 280K bytes of code compared with the multiple megabytes of code that compose the OS/2 version of the Workplace Shell.

"We had a design goal to strike a balance between Macintosh-like foldering and DOS-like file management and to do it in a form factor that makes good use of screen real estate," McCue said.

While Microsoft is already promoting Chicago, IBM has so far remained quiet about what it might do in terms of coming up with a competitor. PC-DOS 7.0 will be the first DOS product IBM has created without any technical help from Microsoft.

"Actually, there is a DOS 7.0 competitor we are working on. It is called OS/2," Casey quipped. "It is already 32-bit and multitasking."

Kodak offers warehouse for stock photos

Eastman Kodak Co. in Rochester, N.Y., has announced the Kodak Picture Exchange, an electronic warehouse for stock photography.

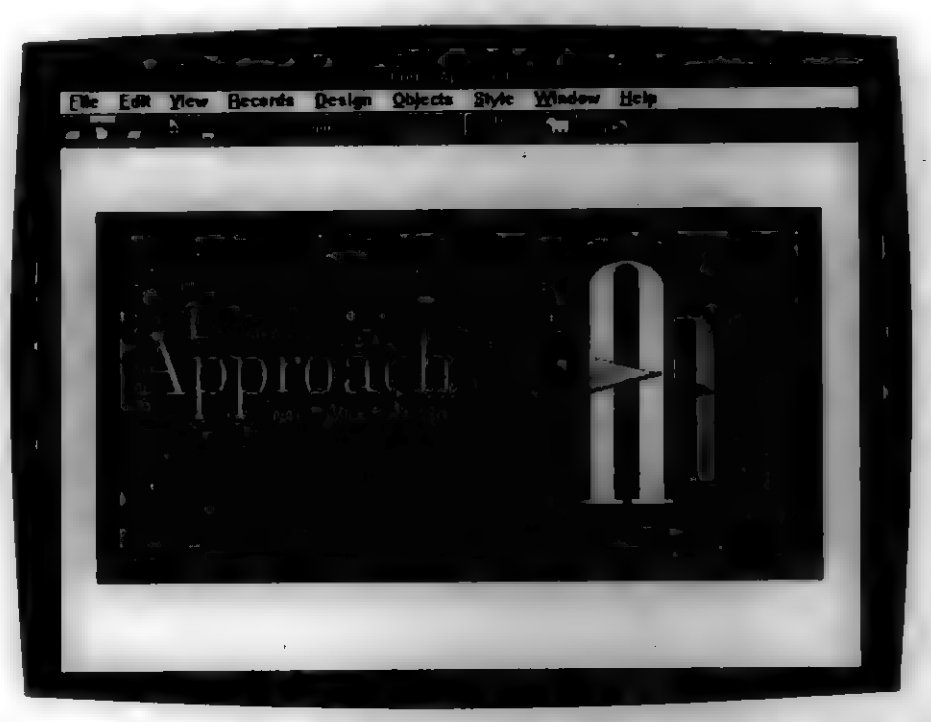
Intended primarily for image-intensive businesses that make extensive use of stock photography, the Kodak Picture Exchange provides 24-hour dial-up access to a library that contains approximately 100,000 images.

Users can browse through photos on-line and download electronic proofs for $9 per image. If the photo is accepted, the user must then negotiate a separate contract with the stock agency.

The $300 enrollment fee supports up to five user identifications. Software kits start at $360 each, and on-line access charges are $35 per hour.

According to a Kodak official, the costs of using the service can be significantly less than photo agency research fees, which typically run $75 to $100 per search per agency.

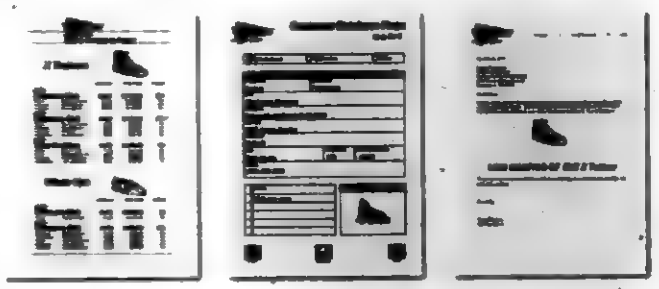
Some 14 photo stock agencies have reportedly signed on to the Kodak Picture Exchange.



AT 9 A.M. HE DIDN'T KNOW HOW TO WORK WITH A DATABASE.

When Don Glor came to work on the morning of September 15th he'd never used a database before. Two hours later he'd developed his first application – it looks like a fire truck: actually it's a customized inventory and billing management system for the South County Fire Department, San Mateo County, CA.

Don was using Lotus® Approach™ – the only database designed for fire fighters. And lawyers and doctors and business people. And anyone who isn't necessarily a computer expert.



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This will surprise anyone who has tried to work with databases like Paradox® or Access®. According to Don, "I tried Access and shelved it. It was just too difficult to get a handle on." That's not surprising considering the 543 page supplemental language reference for programmers Don would've had to pore through. Which looks like light reading next to Paradox's 1300 pages of programming instruction.

The difference is that their products were not designed for general business users.

With Approach you have database power that really is accessible, and you work in one of four familiar, desktop items – reports, forms, mailing labels or form letters – that look and work just like you expect them to, to help you be productive right out of the box.

Approach has won over 25 major industry awards and accolades.

PCMCIA standard starting to spread its wings

By Michael Fitzgerald

Users holding their breath to see the developing PCMCIA standard stabilize can exhale now. A couple of recent developments show the standard really will happen, albeit not until sometime next year.

Included among the developments are the following:

•Microsoft Corp. licensed SystemSoft Corp.'s CardSoft product and said it would build PCMCIA support into future versions of its Windows operating environment, including At Work for Mobile Companions, which is due out next year.

•Five hard drive makers — IBM, Maxtor Corp., Seagate Technology Corp., SunDisk Corp. and Toshiba Corp. — completed a much-delayed agreement to ensure that their PCMCIA hard drives will be compatible with one another and with the PC Card AT-Attachment standard. Microsoft said its At Work software will also support the standard.

•Toshiba America Information Systems, Inc. said it was shipping Toshiba Card Manager, its implementation of the PCMCIA Socket and Card Services standards. All of Toshiba's PCMCIA-capable portables will now ship with Card Manager.

"The PCMCIA cards still aren't compatible enough. You've only got about a 70% recognition rate on cards, and that's still caveat emptor," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

Users contacted said they had largely standardized on single brands to avoid this problem but said that in the future, the prospect of having PCMCIA drives on both portables and desktops will make interoperability more important.

Power hog

"I could perceive somebody saying [PCMCIA] is how we'll exchange data between the desktop and portable world," said Joe Barrett, lead technical analyst at Whirlpool Corp. Barrett said his users found the power drain PCMCIA cards a rude awakening.

Microsoft's decision to build CardSoft into its operating system will also help advance its Plug-and-Play desktop initiative, according to Paul J. Sereiko, director of product marketing at SystemSoft in Natick, Mass.

"This means that PCI, IBA and PCMCIA cards will all tie together in a single box," Sereiko said.

Despite the major developments of recent weeks, the road for PCMCIA may not be smoothed over. Many cards and systems were shipped before standards were in place, Sereiko said, however, that things "are getting better, not worse."

Also, the hard drive initiative looks to exclude some players. "The IBM/SunDisk/Toshiba alliance doesn't seem so open to me. They've locked the door and ... that's not the way you develop a standard," said Jim Miller, president and chief executive officer of MiniStor Peripherals, Inc., a pioneer in PCMCIA hard drives.

Name calling

The unwieldy PCMCIA acronym, which stands for Personal Computer Memory Card International Association, or People Can't Memorize Computer Industry Acronyms, according to Andy Seybold, editor-in-chief of the "Outlook on Mobile Computing," may soon go away. Sources said the name will be changed in part because the standard has evolved far beyond memory cards.

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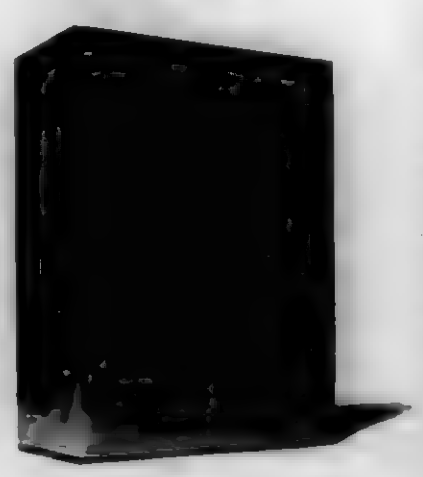

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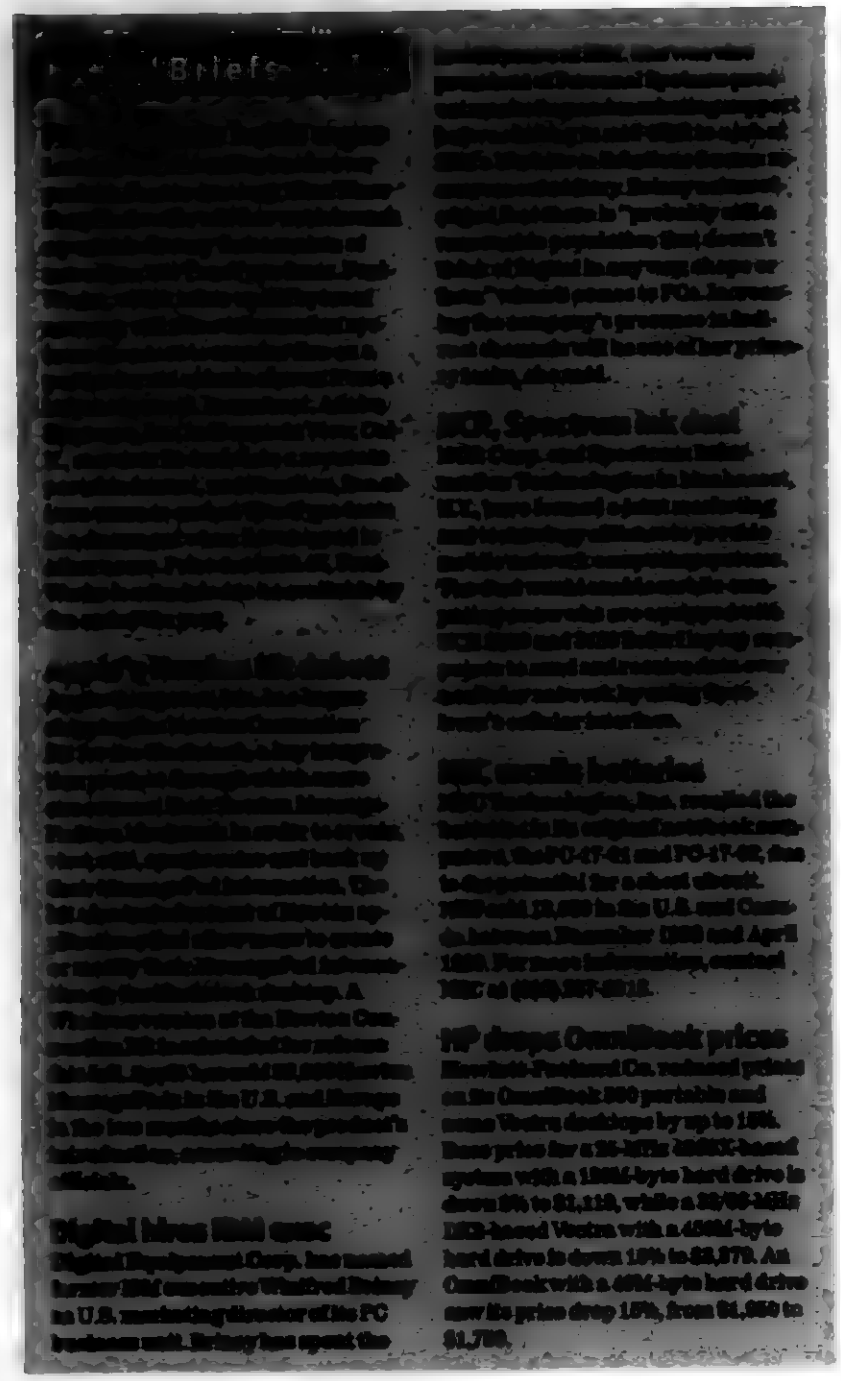
Briefs

Lotus signs integration pact

By Michael Vizard
CAMBRIDGE, MASS.

In a move that is expected to signify a general trend in the personal information software arena, Lotus Development Corp. has signed a pact with Cognitive Technology Corp. in Larkspur, Calif., under which it will integrate its Organizer personal information manager (PIM) with a business card reader developed by Cognitive.

Called the Business Card Reader, the Cognitive offering consists of a database that has been linked to a variety of optical character recognition scanners. Once a business card is scanned into the Cognitive database, users of Lotus' Organizer software will be able to integrate that information with data stored in their PIMs.

In general, users said they expect to see business card readers integrated with a variety of PIM packages.

"I expect to see the people who make business card readers to support a variety of PIM packages," said Jim Wainwright, a programmer at C. J. Segerstrom & Sons, Inc., a real estate holding company in Costa Mesa, Calif.

In addition to Organizer, the Business Card Reader supports Borland International, Inc.'s Paradox and dBase file formats, and cards can be scanned either individually or in groups of up to eight. Each Business Card Reader can accommodate up to 32,000 business cards, which can be scanned in black and white, grayscale or color.

Pricing for Business Card Reader, which is compatible with more than 60 scanners, is $99. It is available on Windows, with a Macintosh implementation due early next year.

C-Cube offers MPEG standard

By Michael Fitzgerald
MILPITAS, CALIF.

C-Cube Microsystems last week announced its VideoRISC Compression Architecture, designed to set standards for real-time digital video compression and decompression in Motion Picture Experts Group (MPEG) format.

Real-time video compression and decompression will enable certain applications, including the ability to receive shows from satellites through boxes that sit atop televisions. These "set-top" devices may be used for a variety of other applications, including data transfer and multimedia applications.

Observers said the C-Cube introduction was important because it combined image compression and decompression in one format and is programmable.

"[Programmability] is good because if MPEG changes, all that needs to be done is to have new code downloaded on the chip," said Jake Richter, president of Panacea, Inc. in Londonderry, N.H.

C-Cube also released two implementations of VCA, the CLM4600 Broadcast MPEG 2 Video Encoder and the CLM4500 Consumer MPEG 1 Video Encoder.

Borland

CONTINUED FROM PAGE 35

shops will be able to purchase a copy of dBase IV, which lists for $795, for $350 instead if they order between 500 and 1,500 units. That price drops to $180 per unit for 5,001 to 7,500 units. On the street, dBase IV has an average price range of $500 to $525, said Greg Joy, Borland director of sales strategy.

The second offering under Advantage is a Maintenance program that provides automatic upgrades. IS shops can opt to cover part or all of their installed base under this program. The minimum order to qualify is $10,000.

The third offering is a Site License program, which can be based on the total number of PCs or software use. This model calls for Borland to confer with the customer on how often people are actually using a software package and then factor that into a concurrent-user pricing scheme.

"The usage pricing is what we're looking forward to. With 28 field offices and five buildings spread out through the Washington area, we don't really know exactly who is using what software when," Newhouse said.

"Under this program, Borland is letting us count dBase and Paradox licenses as single units. All the big software vendors have a corporate licensing program, but Borland is showing a willingness to work with me on licensing issues," he added.

To qualify for this program, an IS shop must have 1,000 licenses installed as well as a minimum order of $50,000.

Software

Micrografx, Inc. has announced SnapGrafx, automated business graphics software.

According to the Richardson, Texas, company, the product was designed to provide an easy way to produce and use business graphics.

SnapGrafx creates business graphics for spreadsheets, documents, slide shows and overheads with its automated features. Users can automatically size, shape, position and align business graphics with SnapPage, SnapShapes and SnapLines features.

A template gallery provides 20 commonly used business graphic types including comparison, time line, organizational, Venn and pyramid. A chart type from the gallery offers 300 more shapes.

SnapGrafx costs $295; however, the company is offering a special introductory price of $99 through Dec. 31.

▶ *Micrografx*
(214) 234-1769

Insignia Solutions, Inc. has introduced SoftWindows for Unix systems, a cross-platform compatibility product.

According to the Mountain View, Calif., company, SoftWindows provides Unix workstation users with the ability to run virtually any Windows application or utility at 486 PC performance levels.

The product offers full MS-DOS and Windows compatibility as well as built-in network support.

Features include host graphics speed and display quality, full support for Digital Equipment Corp.'s Object Linking and Embedding and Dynamic Data Exchange among Windows applications.

A single-user license of SoftWindows costs $549.

▶ *Insignia Solutions*
(415) 694-7600

Delrina Corp. has introduced Delrina FormFlow, forms processing software designed for developing forms-based work-flow automation solutions.

According to the San Jose, Calif., company, Delrina FormFlow unites electronic-mail capabilities with links to popular desktop and SQL databases. A built-in Basic-like, high-level language called the Intelligent Forms Language allows the product to customize form applications.

Delrina FormFlow can be used for both administrative and line-of-business applications.

Delrina FormFlow is available for 5, 10, 25 and 50 users. A 10-user pack costs $1,840.

▶ *Delrina*
(408) 363-2345

Learn PC and Lotus Development Corp. have introduced the Using Lotus Notes 3.0 Video Training Series.

According to Minneapolis-based Learn PC, the series provides self-paced instruction on the complete set of Notes features. Three personal guidebooks, three one-hour videotapes and two practice disks are included.

The product was created for both beginners and experienced users.

Total user training to proficiency is estimated to be between five and six hours.

The cost of the three-course series is $995. Individual courses are available for $395, and an additional 10 guidebook/disk set option costs $300.

▶ *Learn PC*
(612) 930-0330

The MathWorks, Inc. has announced the Matlab Image Processing Toolbox, a product that provides advanced image processing functionality and robust numeric computation in an integrated environment, according to the Natick, Mass., company.

The Toolbox is based on Matlab's visualization and computational tools and allows users to manipulate, visualize and analyze images and two-dimensional signals. Matlab can be used for applications that include medical diagnostics, astronomy, industrial inspection, laboratory data analysis, electronics design and remote sensing.

The Image Processing Toolbox requires Matlab and the Signal Processing Toolbox.

Pricing begins at $695 for single-user microcomputer copies.

▶ *The MathWorks*
(508) 653-1415

Intex Solutions, Inc. has introduced the Tax Solver.

According to the Needham, Mass., company, Tax Solver is a program that lets users examine the effect of any tax-saving strategy within a DOS or Windows spreadsheet.

Tax Solver employs the file linking, graphics and "what if" capabilities found in Microsoft Corp.'s Excel and Lotus Development Corp.'s 1-2-3, providing users with an assortment of ways to search for saving taxes.

One hundred and forty-seven Internal Revenue Service-approved forms and schedules are provided.

Individual, business and professional modules are available.

Prices range from $59 to $495.

▶ *Intex Solutions*
(617) 449-6222

Hardware

Zenith Data Systems has added six models to its Z-Note line of notebook PCs.

The Z-Note+ notebooks offer advanced color video technology, 25-MHz and 33-MHz Intel Corp. I486SL microprocessors and increased hard disk capacity, the Buffalo Grove, Ill., company said.

Features include preloaded network software, a high-speed communications port, power management, simplified desktop connections, security and a 200M-byte hard drive.

Notepoint, a portable two-button, Microsoft Corp. Mouse-compatible pointing device, is standard with all of the models.

Prices range from $2,599 to $4,599.

▶ *Zenith Data Systems*
(708) 808-5000

Product shorts

ViaCrypt has announced ViaCrypt PGP, a high-security public key message encryption program designed to protect electronic-mail and data files. Transmitted messages or exchanged files are secured against unauthorized readers, and the program provides digital signatures, data compression and key management. Cost: $199.95 for a DOS single-user license, $599 for a five-user license and $1,649.95 for a 20-user license. ViaCrypt, Phoenix (602) 944-0773.... **Focus Systems, Inc.** has introduced LitePro 550, an LCD projector for portable, plug-and-play presentation of audio, computer graphics and video images. The product integrates a full-color, active-matrix display, projection optics, light source and audio system and is compatible with most PC and Macintosh computers. Cost: $8,999. In Focus Systems, Tualatin, Ore. (503) 692-4968.

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- Do you use program interfaces such as HLLAPI, APPC/LU6.2, and LUA/LU0?
- How do you manage your network? How will you distribute programs, files, and data to your remote UNIX systems?
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Elisabeth Horwitt

Foolish feud

Just how difficult is it for two rivals to cooperate for the benefit of their customers?

Novell and Microsoft recently broke off their alliance to codevelop a NetWare redirector for Microsoft's Windows NT. Microsoft instigated the break by announcing it would provide its own redirector because Novell was taking too long to bring out a full-function, general-release version of the codeveloped product. Users were expressing impatience with the ongoing absence of a full-function redirector, according to Microsoft.

A prerelease version of Novell's redirector has been available on CompuServe for months now; however, it still lacks a few major capabilities, as Novell spokesmen admitted (CW, Sept. 27).

What will users gain from buying Microsoft's product? A few months at most, Novell says.

Petty fight

This falling out between the two vendors "is stupid," says Louis Kahn, chief of network operations at the National Immunization Program in Atlanta. "They need to work together; they need each other."

Having two vendors to choose from is likely to mean reduced options, Kahn says. "I wager Microsoft will support the NT environment better than Novell, and Novell will be better at interfacing with NetWare. For users, it's a catch-22."

Microsoft's redirector supports print and file services on NetWare 3.11 and NetWare 4.01 services through bindery emulation, a spokeswoman says. Novell's redirector lacks support for key Microsoft clients within NT, including Windows, Winsockets and DOS.

Novell says most of those features, with the possible exception of virtual DOS support, will be in the initial release. The company

. . Horwitt, *page 44*

Wireless LAN barriers fall

By Lynda Radosevich

A development in wireless LAN technology announced at Networld '93 may smash that technology's current bandwidth limitations, and several other recent developments point to the momentum wireless LANs are gaining.

"This wireless stuff is really beginning to catch fire, but we are at the very beginning of the stage here, like PCs were in the 1970s," said Craig J. Mathias, principal at Farpoint Group, a consulting firm in Ashland, Mass.

Canadian start-up developer WI-LAN, Inc. in Calgary, Alberta, said it will deliver in the first quarter of 1994 wireless adapters that support an aggregate data transmission speed of 20M bit/sec. for computers using up to 1.5M bit/sec. of bandwidth each. The adapters use Ethernet-compatible frames and can interoperate with Ethernets, according to the company. Current wireless LAN products require users to share a maximum of 5.7M bit/sec. (CW, Sept. 13).

While analysts and users briefed on the technology said it is technically feasible, they believe it will be difficult to deliver. "I'm dying to see it," Mathias said.

Increased bandwith

If successful, the WI-LAN wireless will address a major wireless LAN shortcoming: limited bandwidth.

"Up until this point we've had to put up with a little less bandwidth as a trade-off for using wireless," said Capt. Todd Pittman, a senior project engineer at the U.S. Air Force's Command Control Communications and Computer Agency in Scott Air Force Base, Ill. "As we continue ongoing wireless LAN research, we will look at this because of the high speed."

WI-LAN's adapters will use a form of direct-sequence spread-spectrum technology called "code division multiple access," which assigns a code to all bits, scrambles and combines individual bits into a string of bits, transmits encoded strings over a broad spectrum and reassembles them via a receiver. This is necessary because it helps reduce interference in the 902- to 928-MHz frequency range in which WI-LAN operates — an unlicensed space with interference from cordless phones and other devices. Instead of sending information over one channel, WI-LAN will send it over multiple channels simultaneously.

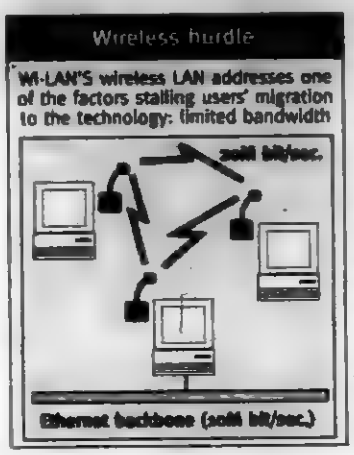
"It's kind of like stringing multiple wires to a single user rather than one wire," Mathias said.

The Air Force is interested in wireless networks for deployable LANs that can be set up in the U.S. and shipped abroad with a division, Pittman said. For that application, the 2.4- to 2.483-GHz range is best because most governments allow radio use there.

WI-LAN plans to move to that range shortly after shipping its original product in the first quarter of next year, according to Hatim Zaghloul, WI-LAN co-inventor.

However, more than speed, Pittman said distance was his biggest concern. At an operating range of 300 unencumbered feet, the WI-LAN wireless likely does not reach far enough for Air Force applications, which need ranges of 700 feet and up.

WI-LAN will cost $1,495 per adapter. Other product specifics include a transmission speed of 20M bit/sec., a radius of 90 obstructed feet or 300 unobstructed feet, compatibility with the Ethernet protocol, a frequency range of 902 to 928 MHz and patented encryption.



Other announcements

•Meanwhile, San Jose, Calif., start-up Wireless Access, Inc. recently announced a wireless PCMCIA card for Hewlett-Packard Co.'s HP 100LX and Tandy Corp.'s Z-Series. The adapter will sell through distributors such as SkyTel and MobileComm in January for around $400.

•Proxim, Inc. and Raytheon Co. have announced joint development of an integrated circuit said to reduce power consumption and size requirements and increase transmission ranges for wireless PCMCIA-based networking products.

•Fujitsu Personal Systems, Inc. said it will employ Proxim's wireless technology in PadPlus RF, a pen-based device used for data collection in warehouse inventory tracking and field sales force automation. The device combines the radio transmitter and wireless adapter to increase mobility.

•Da Vinci Systems, Inc. announced at Networld a partnership with RAM Mobile Data and Business Networks Ltd. to provide wireless messaging for Novell, Inc. Message Handling Service users.

Unix servers speed emergency response

By Thomas Hoffman
MINNEAPOLIS

Until recently, the computer-aided dispatch systems used by the city of Minneapolis' Emergency Communications Center (ECC) could initiate a response to a fire within 30 to 60 seconds. Although those response times were acceptable, improvements were needed to enable the police and fire departments to react faster to emergencies, where lost seconds can mean lost lives.

Starting last June, the ECC began replacing its overburdened AT&T 3B2 minicomputer-based computer-aided dispatching systems with a set of NCR Corp. 3550 Unix-based servers that has since slashed the time it takes to launch a fire response to less than 20 seconds, according to Patti Wallin, the ECC's technical systems manager.

"The new technologies that we have implemented have shaved significant chunks of time off the alerting phases," said Jeff Nelson, assistant director at the ECC. Plus, he said, the older 3B2 minis crashed frequently, resulting in extended periods of downtime, which has since been resolved by replacing the minis with more reliable NCR servers. "Now the only downtime we have is scheduled," Nelson said.

ON SITE

City of Minneapolis

Challenge: To speed emergency response.

Technology: Replaced AT&T 3B2 minis and Oracle RDBMS with NCR 3550 Unix servers and Informix Online RDBMS.

Results: Reduced the response time to a fire to less than 20 seconds from 30 to 60 seconds.

Contributing to the delayed emergency responses were the disk I/O bottlenecks that were strangling the performance of the AT&T 3B2 minis, according to Kevin Herrboldt, a network software engineer at the ECC. Herrboldt said the 3B2 minis, which ran under the Unix V Release 3 operating system, typically ran six to eight jobs on the load queue, or twice as many jobs as they were designed to handle.

Furthermore, retrieval and transmission of historical information from the Oracle Corp. Version 6.034 relational database management system was slow. Because Oracle 6 is a cross-platform database, its data structure was not native to Unix under the 3B2s

Unix servers, *page 45*

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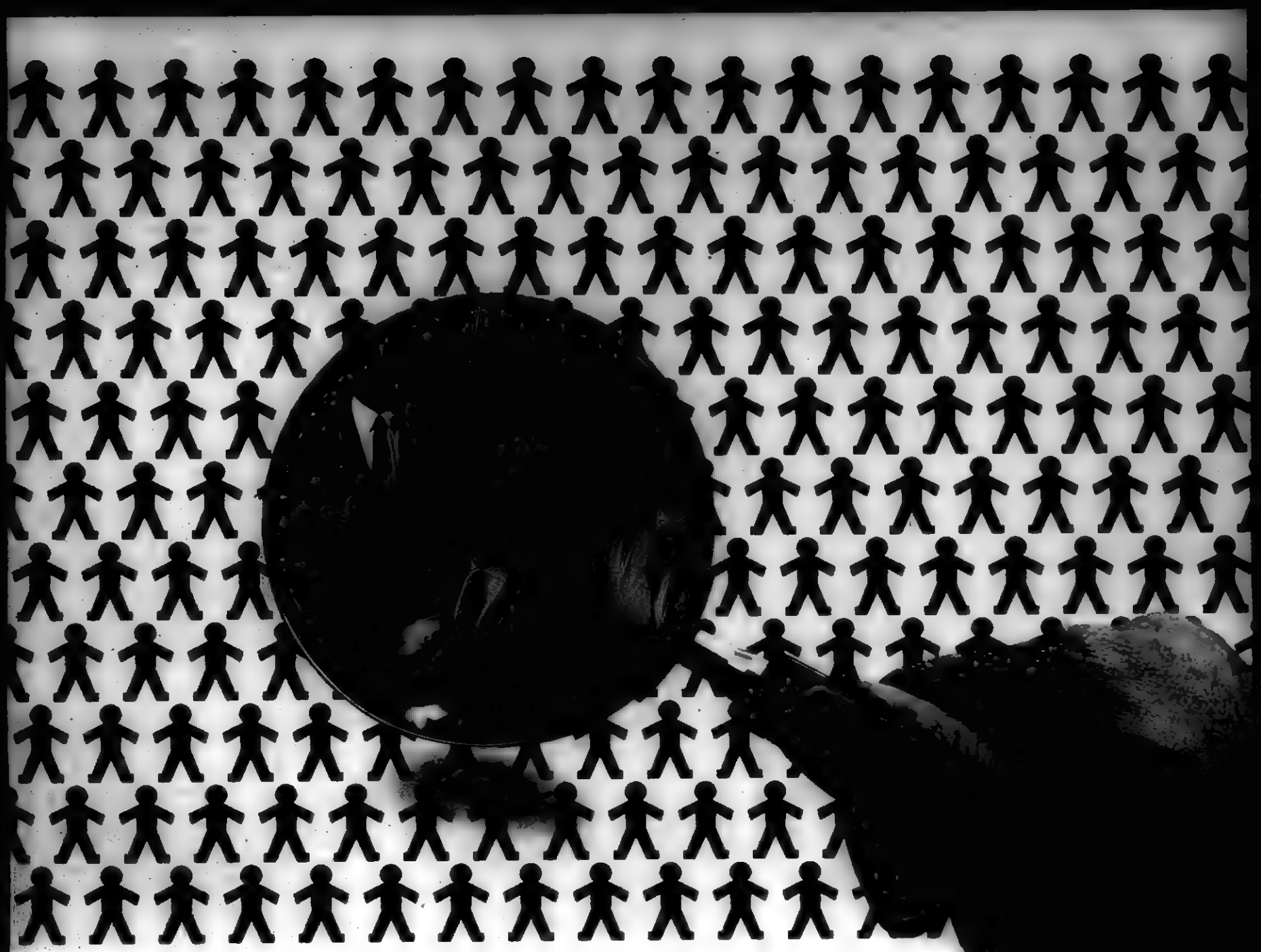

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Put a sentry on your LAN

By James Daly

In the unending buzz of most corporate workplaces, interruptions that call users away from their desks or offices are common. And many people do not always stop to secure their data or turn off their machines before departing.

That is a big problem for network security administrators. Not only are shared resources tied up unnecessarily, but open files are also left vulnerable to anyone who happens to be strolling by. That could spell big problems as LANs grow in size and complexity.

Netinc. in Houston is promising relief from this administrative nightmare with NetSentry, an application designed to guard Novell, Inc. NetWare LANs from unauthorized use in both DOS and Windows applications.

LAN administrators can automatically log out idle workstations or configure NetSentry to blank a PC screen after a period of inactivity. The user is then required to re-enter his NetWare password to resume.

Network administrators said they are forever hounding users to log out when they leave their workstations. Not only is this a smart move securitywise, but it also frees up network resources and software licenses. At first glance, the easy way to accomplish this might be to simply log out inactive workstations.

But that could mean trouble. Mike Avery, a network analyst at Texas' Department of Human Services in Austin who helps manage 650 file servers with 12,000 workstations, said this causes big problems because database files are left open with transactions in an undetermined state.

"We can't back up open files, so in the past, we've had to blow these users out of the water to do a backup, which always annoys them," Avery said.

Don't touch that button

Further, LANs sometimes have applications (such as those performing real-time data acquisition) that should never be shut down. Other applications, such as accounting programs, require user intervention. And then there is the question of saving your job: One never wants to log off the boss.

However, this must be arranged in a flexible manner so that a shutdown is orderly. Open files must be closed and applications terminated properly, said John Toney, vice president of technical development at Netinc.

NetSentry uses a single text file for administration. The file defines users, groups, node addresses and applications that should never be logged out and can list the keystrokes or series of steps required to shut down individual applications.

Users can also configure NetSentry to automatically run alternate programs after the workstation is logged out. That way, formerly idle PCs can be used to automatically launch tasks such as tape backups, security audits and periodic LAN maintenance chores, Toney said.

NetSentry requires Novell NetWare 2.10 or greater. The cost is $395 per file server for unlimited users.

Horwitt

CONTINUED FROM PAGE 41

also promises that its redirector, when it finally comes out, will support "all the advanced services, like packet burst, and our new security and authentication mechanism."

With the breakup of the alliance, the two rivals have regressed to petty insults. Microsoft accuses Novell of holding up the works. Novell, in return, claims that its delays were due to Microsoft's repeated changing of the NT kernel and implies that Microsoft did not freely provide it with information about those changes.

This is not the only instance of these two vendors failing to achieve synergy and thereby hurting their customers. They continue to bicker about how Microsoft will license from Novell the code it needs to link the next version of Windows for Workgroups to NetWare.

It's not that the two companies are generally uncooperative; both have reputations for working well with partners and for being aggressive about generating third-party support, as evidenced by the bevy of partner announcements each made at Networld last week.

As a result of this fracas, however, users lose their chance to gain a product for linking NT clients to NetWare servers that is based on the two vendors' unique fields of expertise. Microsoft and Novell also lose because easy mixing and matching of their respective platforms would give them the opportunity to capture each others' customers.

In fact, in a situation like this, everyone loses.

There's still a chance for reconciliation. Word is, the technical staffs from the two companies worked together quite amicably. How about it, guys?

Horwitt is a *Computerworld* senior editor, networking.

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Unix servers

CONTINUED FROM PAGE 41

and thus suffered performance hits, Herrboldt said. The Oracle database housed historical information that the ECC would relay to its emergency response units, such as whether explosive materials were located at a fire site. The ECC transmitted the historical backgrounders through a radio-based communications network to more than 240 police, fire and rescue vehicles equipped with Electricom Automation mobile data terminals.

Replacement parts

The ECC tackled its I/O problems with three sets of replacement technologies. The agency started by replacing three AT&T 3B2 machines with speedier NCR 3550 servers that are configured with two NCR 6298 disk array subsystems to ease storage constraints caused by bandwidth.

Since replacing the computer-aided dispatch mini in June, the ECC has begun implementing an NCR 3550 to replace the 3B2 that processes messages to its remote emergency units. That system should be fully operational by the third quarter of 1994, according to Herrboldt. The ECC has already replaced the computer-aided dispatch backup machine with another NCR 3550 server.

The ECC also replaced the Oracle database with an Informix Software, Inc. Online 5.0 RDBMS which, unlike the Oracle system, runs native on Unix, thereby providing the agency with improved database performance on its new Unix V Release 4 operating system, Herrboldt said. In addition, he said the Informix database is easier for the ECC's three-person technical staff to maintain.

Even though the additional storage systems have had no visible effect on system performance, Herrboldt said they have already proved their worth.

"One of the biggest impacts we've had is in the retention of information, so we're able to keep more historical information available to police and fire units than we were able to before," Herrboldt said.

The new equipment, including hardware, database licenses and porting costs for the dispatching applications, has set the agency back $1.3 million. But these costs will be partly defrayed by a reduction in hardware maintenance.

The agency had been doling out $68,000 per year in hardware maintenance for the three AT&T minis. Now, hardware maintenance has been cut to $38,000, a $30,000 savings, for the three NCR servers and the two disk subsystems.

Briefs

SPARC chip partners

Sun Microsystems Computer Corp. said it has expanded its partnership with Texas Instruments, Inc. in Dallas to build the next generation of SPARC RISC processors. TI will now be more closely involved in the development and manufacture of the 64-bit UltraSPARC-1 chip, which is expected to have performance levels of at least 200 SPECint 92. Sun also unveiled an early-access program that will give systems vendors their first look at UltraSPARC prototypes in November. TI has shipped about 300,000 of the roughly 1 million SPARC chips installed worldwide, Sun said.

Antivirus on the server

With the increasing reliance on servers as keepers of mission-critical data, McAfee Associates, Inc. recently beefed up its Netshield antivirus software for Novell, Inc.'s NetWare file servers. Version 1.5 now detects 2,017 known file server viruses and includes added performance and systems management features, such as improved scanning speed and a redesigned interface, according to McAfee. The software costs $495 and includes two years of free updates.

Databases for NT

Pest Software Corp. and XDB Systems, Inc. recently announced Microsoft Corp. Windows NT versions of their object-oriented databases. Pest said it plans to ship its product by the fourth quarter of 1993; XDB promised first-quarter 1994 delivery.

Printing partner

Fujitsu Computer Products of America in San Jose, Calif., recently introduced a 300 dot/in. printer for workgroups that need to output ordinary documents and scanned images. The PrintPartner 10i Imaging Printer is rated at 10 page/min. and uses onboard image compression technology that automatically detects and decompresses image files such as TIFF Group 3 and 4. Because decompression occurs at the printer, network bottlenecks are avoided, Fujitsu said. The printer costs $2,650. Fujitsu will also offer through October a complementary copy of TextBridge, a Windows-based optical character recognition product from Xerox Imaging Systems, to buyers of its ScanPartner 10 scanner.

petition.

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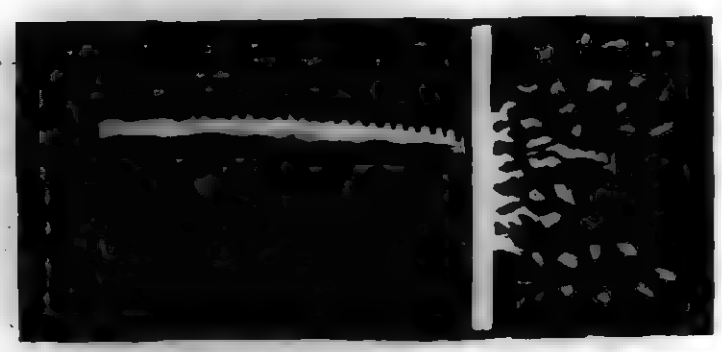

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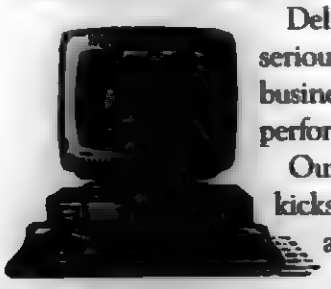

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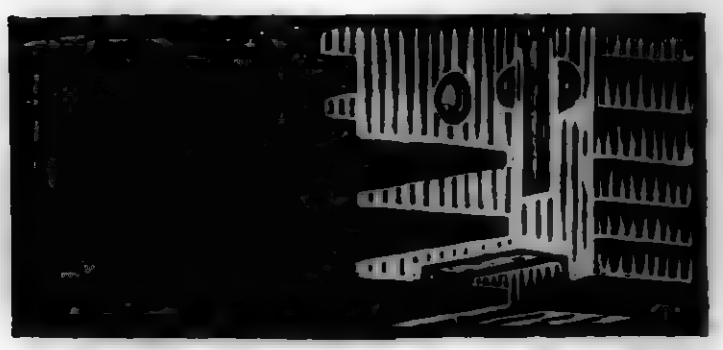

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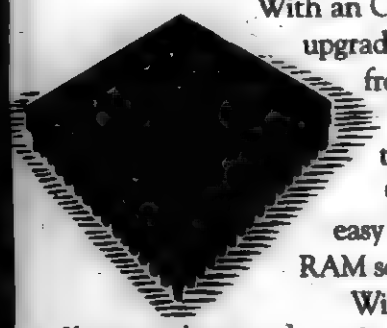

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AST courts small workgroup market

By Stephen P. Klett Jr.
IRVINE, CALIF.

In a bid to stake a claim in the Novell, Inc. NetWare-based segment of the server market, AST Research, Inc. last month unveiled a server family aimed at small workgroups of 50 PCs or less.

Premmia MTE targets a large base of potential customers; market research firm International Data Corp. (IDC) estimated that 65% of LANs in the U.S. are based on NetWare. AST's server offerings previously consisted of midrange and high-end machines.

"AST's price points are less than those of Compaq, but it has work to do in the systems management area, one analyst said.

"With Premmia, AST has become much more aggressive in the server market, effectively filling out its product line," said Susan Frankle, an analyst at IDC in Framingham, Mass.

Premmia MTE ships with either a 33-MHz Intel Corp. 1486DX or 66-MHz 486DX2 microprocessor, six Extended Industry Standard Architecture (EISA) expansion slots, six drive bays, 8M bytes of RAM, an integrated drive electronics adapter, 200-W power supply and two serial ports for roughly $2,000.

The following features are available as options: fast SCSI-2 adapter; 128K, 256K or 512K bytes of cache; up to 128M bytes of RAM and a Pentium upgrade slated for February.

AST also announced a midrange version of Premmia, called the Premmia SE, with 11 drive bays, eight EISA expansion slots and optional support for up to four SCSI-2 controllers. Prices start at $2,329.

In conjunction with the Premmia unveiling, the company announced Pentium availability for its Manhattan superserver. The symmetric multiprocessing machine supports up to five Pentium processors and is positioned as a minicomputer alternative or application server for Fortune 1,000 firms.

Manhattan houses up to 448M bytes of error correction code memory and eight EISA adapters. It offers redundant power supplies and supports RAID Levels 0, 1, 5 and 6 internally. Pricing starts at $26,999. Existing Manhattan customers can upgrade to Pentium by adding a processor board for approximately $5,000.

While AST's price points are less than those of Compaq Computer Corp., Frankle said AST has work to do in the systems management area. "AST's machines don't have all the bells and whistles that Compaq's do, such as system management features and redundant hardware components," she said.

Beefed-up systems management offerings such as remote management and automatic reboot will be available in February 1994, said Maciek Brezeski, product manager for AST's server line.

Brezeski said he expects Pentium to spark Manhattan's sales, which have not been quite as brisk as expected since it started shipping in January.

Elco Thermoplastics, Inc. has not been waiting for Pentium with bated breath, but it is intrigued by the upgrade offering, according to Michael Person, a controller at the Mishawaka, Ind., firm.

A leading supplier of injection-molded plastic parts for the automotive industry, Elco purchased a three-processor Manhattan to run its mission-critical manufacturing operations last April. The server replaced a uniprocessor machine from Compaq that "was 96% maxed out," Person said. "Manhattan's biggest benefit has been speed," he added. "We've seen a performance increase already of 80%, and it is logical to assume Pentium would add to this figure."

Briefs

Oracle picks NCR

Database management software vendor Oracle Corp. has awarded NCR Corp. a $3.5 million contract to install NCR System 3000 workstations and servers at each of Oracle's 23 major field offices in the U.S. The NCR systems will be used for demonstrations, prototyping and training for all Oracle products, including the Oracle 7 Cooperative Server database, Cooperative Development Environment and Oracle applications. In return, Oracle will provide copies of these products for use in NCR's U.S. demonstration centers.

Sun milestone

Sun Microsystems, Inc. said this month that it had shipped its 1 millionth computer, a SPARCstation 10 workstation, at its Milpitas, Calif., factory.

The workstation was presented to Fujitsu Ltd. Chief Executive Officer Tadashi Sekizawa, whose firm makes many of the SPARC RISC processor chips used in Sun's system products.

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Innovus, Inc. has announced that Legato System, Inc.'s NetWorker software will be available for Hewlett-Packard Co.'s HP 9000 PA-RISC servers.

NetWorker for HP 9000 provides networkwide backup and recovery services for multivendor networks.

Hamilton, Ontario-based Innovus claimed that Legato NetWorker is the only enterprisewide software application that protects files on popular desktop systems and network servers when a file is damaged or destroyed.

Support is provided for a range of Unix clients including HP/UX, The Santa Cruz Operation's Unix, IBM's AIX for RS/6000 and DOS.

Available next month, NetWorker for HP 9000 will start at $2,000.

▶ *Innovus*
(905) 529-8117

AimTech Corp. has announced a development agreement with IBM under which AimTech's IconAuthor will support IBM's RS/6000 workstations.

According to the Nashua, N.H.-based company, the agreement enables nonprogramming multimedia users to produce interactive multimedia applications that combine graphics, text, animation, audio and video.

The authoring tool has an icon-based visual programming environment that lets IBM users create interactive productions for an assortment of applications including performance support systems, computer-based training and interactive business presentations.

A single-user license of IconAuthor 5.0 costs $10,000. A four-user license costs $30,000, and a 10-user license costs $60,000.

▶ *AimTech*
(603) 883-0220

Breakaway Software has introduced Picus, a system administration tool.

According to the San Francisco company, Picus handles day-to-day management of Unix servers and/or clients.

Picus has a layered client/server approach. Each layer is responsible for providing one phase of acquiring, preparing and presenting data. Picus also employs a Daemon-based messaging system that lets users monitor activities throughout the network.

Picus consists of eight modules that are accessed from the menu bar. These modules include user management, security, watchdog capabilities, networking and managing large networks, pool configuration and integrity enforcement, configuration and customization, teletypewriter processes and archive capabilities, according to the company.

The stand-alone version of Picus costs $1,995; the network version costs $3,995.

▶ *Breakaway Software*
(415) 969-3800

Network Specialists, Inc. has announced Balance, a Novell, Inc. NetWare Loadable Module designed to increase server performance and provide fault tolerance for NetWare v3.11 and 4.0 server environments.

Balance eliminates I/O bottlenecks by providing load balancing for incoming and outgoing IPX, Apple Computer, Inc.'s AppleTalk and TCP/IP traffic. The product also increases server use by accelerating the amount of packetized data from Macintosh-layer devices to a server, according to the Lyndhurst, N.J., company.

Balance costs $1,695.

▶ *Network Specialists*
(201) 804-8400

UniPress Software, Inc. has announced LAN Manager for Unix (LMU) for Sun Microsystems, Inc. workstations.

The Edison, N.J., company has ported LMU 2.2 to Sun, enabling Sun workstations to act as servers for PC client applications on DOS, Windows, Windows for Workgroups, Windows NT and OS/2 platforms.

From any of these platforms, users can access large Sun disks and fast Unix printers on the LAN Manager network.

LMU for Sun supports NetBIOS over TCP/IP or NetBEUI for either the standard Sun Ethernet board or the optional Sun Token Ring board.

Unix features such as seamless access to the Network File System, the Andrew File System and the Remote File System are provided.

LMU for Sun is priced at $2,995 for a 48-user server, $4,995 for a 128-user server and $7,995 for an unlimited-user license server.

▶ *UniPress Software*
(908) 287-2100

Qualcomm, Inc. has introduced The Eudora by Qualcomm software, an electronic-mail program that provides full-function interoperability between PCs and Macintosh systems across TCP/IP networks without specialized E-mail servers and gateways.

Features include message filtering and double-click attachment lines. According to the San Diego company, the Macintosh version supports Apple Computer, Inc.'s AppleEvent and offers a drag-and-drop attachment. The PC-compatible version provides Multiple Document Interface support.

Per-unit pricing for The Eudora by Qualcomm software is $50 for one to nine users. Volume discounts are available.

▶ *Qualcomm*
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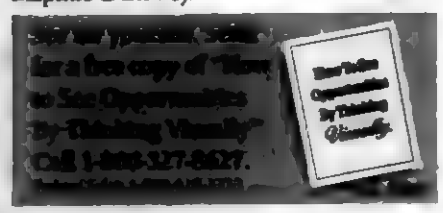

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Moving toward a wireless infrastructure

By Joanie M. Wexler

closer look: Wireless networks

Terms such as CDPD and PCS have started competing with packet radio, paging and other wireless schemes from the likes of Ardis, RAM Mobile Data, Motorola Embarc and SkyTel for user mind share. The emergence of these technologies is rendering network planning a near-Herculean task for companies trying to sort out the trade-offs of the various methods of communicating through the air.

There is good news, though: Most analysts agree that the multiple wireless transport methods, each with its own "home" in the radio-frequency spectrum (see graphic), will eventually merge into one large wireless infrastructure.

That infrastructure — like today's crisscross of circuit-switched, packet switching and other wired network schemes — will depend on end-user devices that sport multiple interface protocols for accessing different networks. These devices will also eventually have the intelligence to know which network service to automatically access given the application.

"Devices will start coming in 1996 that will work with different media and switch from one service to another," said Roberta Wiggins, research director of wireless mobile communications at The Yankee Group in Boston.

Progress is already under way: AT&T's Hobbit chip set will begin combining wireless, wired and fax capabilities in 1994. Motorola, Inc. is also said to be working on chips that support both RAM Mobile Data's and Ardis' proprietary packet radio protocols, as well as the emerging Cellular Digital Packet Data (CDPD) protocol, though Motorola declined to comment on such activities.

Similarly, IBM's General Manager of Networking Systems Ellen Hancock said at the Interop '93 trade show in August that IBM would soon offer protocol-specific PCMCIA adapters for the various network services. The idea would be for users to swap these in and out of their laptops as the application dictated.

Douglas Fields, vice president of telecommunications at United Parcel Service, Inc. — today the world's biggest user of packet-over-cellular technology — said he thinks the inherent limitations of spectrum for wireless networks will be "a big-time stimulus for transmission efficiency through new coding and compression technologies." Put another way, Fields said he does not believe users will readily adapt to two kinds of networks: one local and high-speed, another wide-area, wireless and slow. "People will demand the same level of performance from all phases of their communications," he said.

Meanwhile, gateway services exist today in the form of RadioMail software, which serves to map Ardis protocols to the RAM Mobile Data network and vice versa, and Motorola's Mobile Networks Integration (MNI) technology, announced last April. In one form, the "open" MNI architecture is software residing in a central database that does protocol conversion.

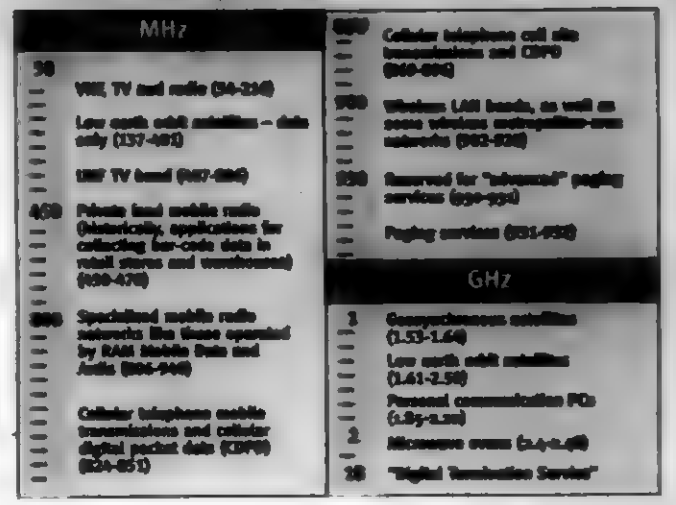
However, DataComm Research Co. in Wilmette, Ill., sees a problem with multiprotocol, chip-based schemes. "It's very easy for them to talk about two-in-one or three-in-one [products] but making these things work and interoperate is much tougher than vendors let on," President Ira Brodsky said. At a minimum, multiprotocol devices will be expensive to start, he said.

Some analysts said they believe personal communications services (PCS) stand the largest chance of be-

Wireless, page 54

Changing channels

Bandwidth spectrum allocations for major mobile uses



Source: DataComm Research Co., Wilmette, Ill.

Alphabet soup

The following is a glossary of wireless networking technologies and their general targeted applications:

▶ **CDPD (Cellular Digital Packet Data).** An emerging technology that transmits data over cellular networks by inserting data packets into unused voice channels. Its main use is likely to be for short, bursty transactions, such as mobile credit-card authorizations.

Status: No users other than those in trial mode today. Half of the McCaw Cellular Communications, Inc. network is slated for some CDPD channels by year's end; McCaw plans for its entire network to have some CDPD channels by second-quarter 1994. Service availability is slated for year-end 1994 from Ameritech Corp., GTE Mobile and Bell Atlantic Corp.

▶ **Circuit-switched cellular.** Uses today's cellular network to transfer connection-oriented data via a cellular modem, much in the way users transmit data over today's analog-wired networks via digital-to-analog modems. Main use will be for sending long files and faxes.

Status: In use but faces inherent connection unreliability and, like all cellular services, is expensive.

▶ **Mobile satellite service.** Voice and messaging-oriented technology targeted at places without an existing wired infrastructure. The problem with using it for data is the propagation delays associated with satellite.

Status: In use.

▶ **Packet radio.** Connection-oriented service akin to wired public-packet switching but based on radio-frequency technology. It is intended for mobile terminal applications.

Status: In limited use by subscribers of Ardis and RAM Mobile Data networks. Users report varying degrees of reliability.

▶ **Paging.** One-way data messaging and broadcast technology. The majority of applications relies on small message transmission. Main vendors are Motorola Embarc and SkyTel. The Federal Communications Commission has, however, opened spectrum for future two-way paging services, due to arrive at the end of 1994.

Status: Mature.

▶ **PCS (personal communications services).** Individualized voice and data messaging service, based on the concept of large numbers of ubiquitous microcells that require minimal battery power and thus allow for smaller portable devices.

Status: Embryonic. FCC only last month announced its plan for allocating thin slices of spectrum in the 2-GHz range to potential service providers. The auction is to take place next May.

▶ **SMR (specialized mobile radio).** Voice-only technology in which equipment can only be operated in a vehicle.

Status: Mature.

▶ **ESMR (enhanced mobile radio).** Adds data to SMR and allows its use with portable systems.

Status: First network expected in 1994.

Sources: Computerworld, The Yankee Group, CIMI Corp.

Small potatoes

Consultancy CIMI Corp. predicts that the number of cellular network subscribers running data today is less than 1%.

Speed samplings

A packet radio service user sending five pages each day for a 20-day work month would pay $62 to $111, depending on the carrier

Transmission times and list costs

	Delivery time		Price
Sentence (100 bytes)	1-3 sec.	2-3 sec.	$0.15
One page (1,500 bytes)	9-10 sec.	6-20 sec.	$.20-$.30
Five pages (7,500 bytes)	40-50 sec.	30-40 sec.	$.80-$1.20

*Prices do not include $25/month per-user service fee
**Range reflects different rates depending on time of day

Source: RAM Mobile Data; Ardis

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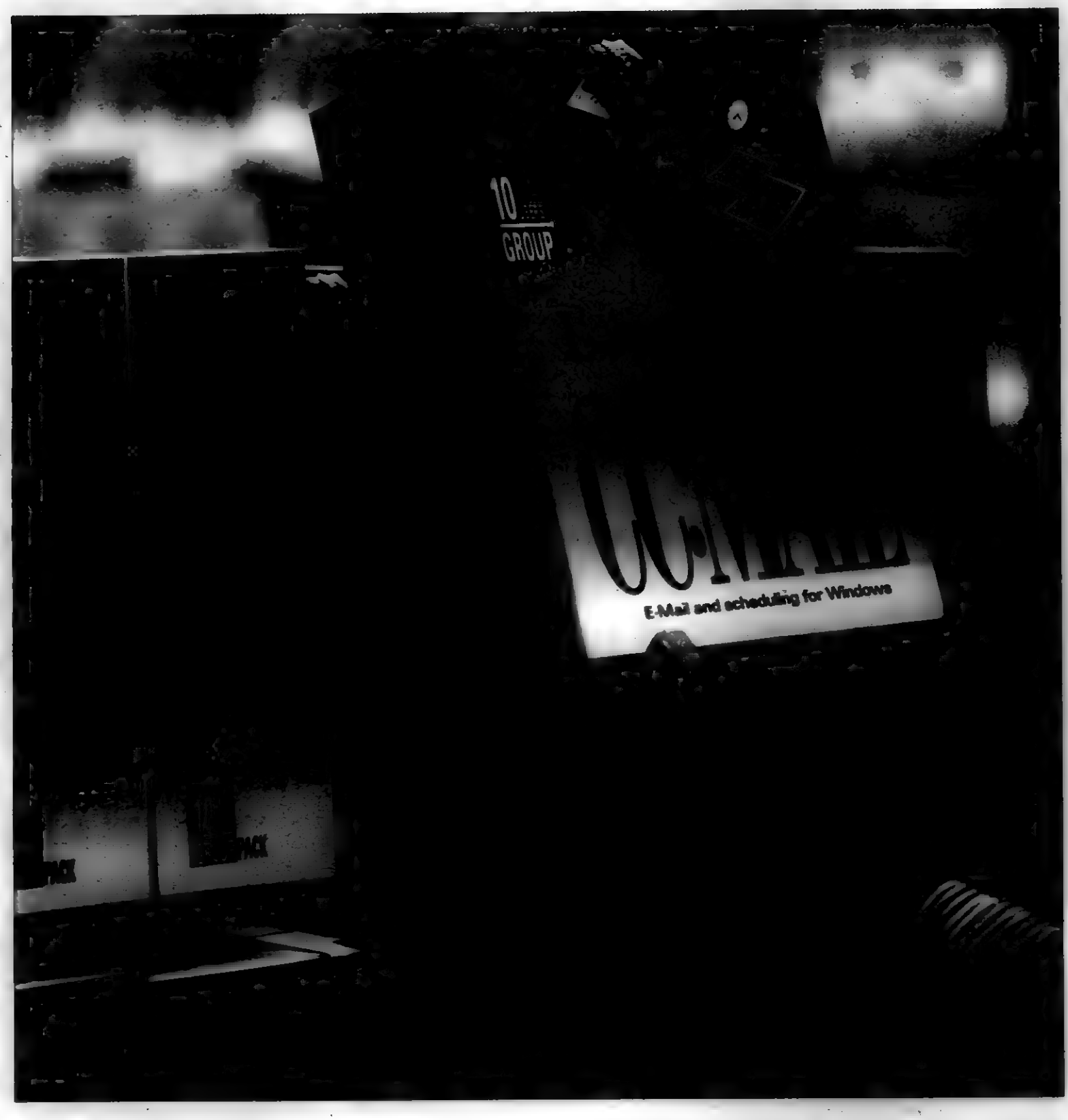

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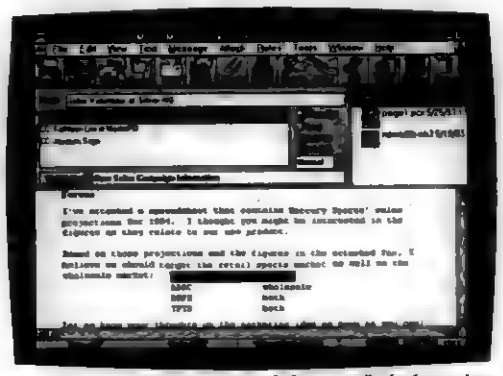

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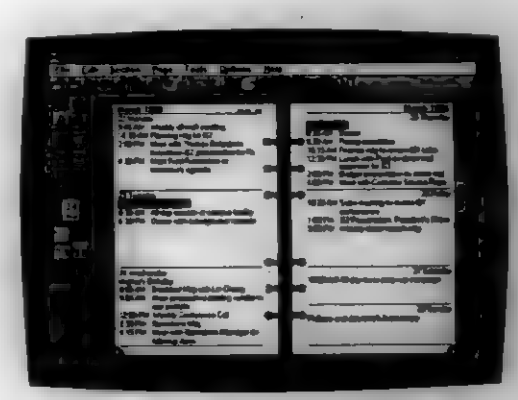

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Banyan adds distribution tools

By Elisabeth Horwitt
WESTBORO, MASS.

Banyan Systems, Inc. last week announced its Enterprise Data Distribution (EDD) strategy that will allow users to distribute and collect all types of data across heterogeneous network operating systems and client/server environments.

Novell, Inc. and Microsoft Corp. are in the process of rolling out products that enable users to automatically distribute software and updates across enterprise client/server systems. Indeed, Novell rolled out its Network Navigator NetWare Loadable Module for software distribution at last week's Networld '93. And Microsoft has announced plans to provide similar capabilities for its Windows NT Advanced Server through the upcoming Hermes network management system.

Task automation

However, Banyan is taking a much broader tack with EDD, according to Drew Wolff, senior product manager. Scheduled to roll out in mid-1994, the product aims to lower enterprise client/server administration costs by automating the following tasks:

- Distribution of data or software across multiple servers and clients. For example, a server could be programmed to automatically distribute a software update across the enterprise overnight. The product will support "chained distribution," in which the file or software update is sent to one server at a site that updates its own clients and then sends the file on to the other servers at that location, Wolff said. This can save customers significantly on bandwidth compared with the traditional method of sending the same update to each server at a given location over long-distance dial-up lines.
- Collection of data from multiple disks at remote sites and consolidation on a central server. This is particularly useful to retail chains and service companies that need to regularly collect data about their outlets' daily business operations.

"When EDD becomes available to distribute software to the desktop, it will solve our major problem of ensuring that all desktops are more or less equal" in terms of what they are running, said Marek Dziedzic, an information systems analyst at Stentor Canadian Network Management in Ottawa. "That would be a great help because we would no longer depend on local administrators" to implement new releases and updates, he added.

EDD will be fully integrated with other Banyan enterprise network services, such as StreetTalk III global directory, Intelligent Messaging, Security and Banyan's upcoming graphical user interface-based network management services, Wolff said.

Integration with Intelligent Messaging will be an added benefit for EDD because it will enable the service to "move data only when the network was not busy," Dziedzic said.

In addition, Banyan will use EDD as a "building block" for future applications. Possibilities include electronic distribution of Banyan software via the service and EDD services for remote laptops and telecommuting users, Wolff said. For example, when the user plugs in the laptop after a trip, "the service automatically figures out where the data [coming in from the laptop] goes," he said.

Banyan will roll EDD out across its three major network service platforms, Wolff said. Support for Enterprise Network Services and native Vines will be in the initial release, with Vines for Unix likely to appear in a subsequent release. Pricing was not available.

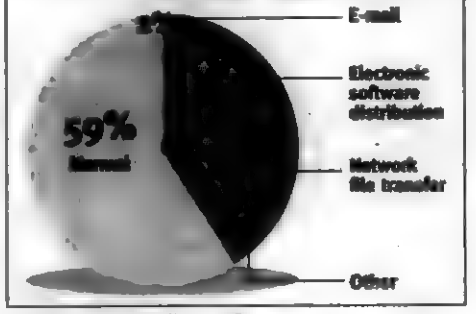
The initial release will support server-to-server distribution and collection of data. Users can initiate EDD services from the various client systems supported by Banyan services; however, distribution of data to and collection of data from client disks will wait for a later release.

Networld note

IBM and Banyan announced a formalized in-house product certification program last week. The program calls for IBM to operate a facility in Boca Raton, Fla., to test and ensure that Banyan services run on new IBM hardware platforms. In addition, Banyan announced new LAN adapter and router certification programs for its services.

Open field

VARIOUS VENDORS, INCLUDING BANYAN, ARE AIMING FOR A DATA DISTRIBUTION SECTOR THAT IS STILL LARGELY MANUAL



Source: Meta Group, Inc., Westport, Conn.

Wireless

CONTINUED FROM PAGE 51

coming pervasive — though largely for voice — because its underlying technology allows ubiquitous service along with small, unburdensome user equipment (see "Alphabet Soup" page 51).

PCS also suffers from "market inertia," said Daniel Briere, president of TeleChoice, Inc., a consulting firm in Verona, N.J. He said PCS will not be widely available for two to three years.

"Even by the time of the FCC auction" for PCS spectrum in May 1994, "millions of people will have cellular phones and thousands of people will have cellular modems," Briere said. PCS would mean displacing all that gear, he pointed out.

On CDPD, for which Version 1.0 of the protocol specification was released in July, Thomas Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J., said, "I don't believe its bandwidth would be sufficient for laptop applications, and the delay associated with it is also likely to be too high."

Nolle said he was skeptical about the potential of the other technologies as well.

Senior editor Ellis Booker contributed to this article.

Up in the air

Early users of wireless technology report the following goals and experiences:

- **CDPD.** While there are no official CDPD users today, UPS uses CDPD-like packet-data-over-cellular networks to the tune of 510,000 to 520,000 calls per day.

A custom solution involving 55 cellular carriers and its own private terrestrial packet network, UPS' TotalTrack allows 50,000 UPS personnel in the field to communicate package and signature information back to the company's data center in Mahwah, N.J. Two-way messaging applications, allowing trucks to send and receive other sorts of messages — such as the directions to a customer location — are also in the works.

According to Douglas Fields, vice president of telecommunications, UPS is watching the commercial plans for CDPD carefully and could switch to this network with little more than some software modifications.

Fields is unabashedly bullish about the future of wireless data. "Within five years, we'll see the same applications that are on the terrestrial wired network deployed on a broad scale on wireless networks," he said.

The variety of wireless solutions — CDPD, packet radio, paging and satellite — will remain, Fields said. He said he believes different types of networks (some optimized for reliability, others for low cost) will mean "many of the players in the race today will be at the finish line."

- **Packet radio.** ADP Automotive Claims Services in San Ramon, Calif., has been struggling to find a wireless link as the icing on the cake for its pen-based mobile application for claims adjusters. An innovative laptop application that allows adjusters to drill down into the anatomy of a car schematic to get repair costs, correspond in real time with host databases and cut checks on the spot requires a packet-based wireless service to make the application as convenient as possible, said Gerhard Blendstrup, senior vice president.

However, the company's trials with the Ardis network have hit snags with unpredictable delays and insufficient geographical coverage that discourage adjusters from using wireless technology. ADP is now testing the RAM Mobile Data network but has officially put the wireless component on hold until the technology is more mature, Blendstrup said.

The General Services Administration, Region 3 in Philadelphia had a more positive experience during a beta test of a wireless packet network this summer. In the test, RAM Mobile Data's network was integrated with the federal agency's CC:Mail electronic-mail application.

"It fit in perfectly with our remote users," said Bill Horst, chief of communications at the operations branch.

Horst valued the transparency of the application: "If you're at your desk in the building sending E-mail to someone else, you've no idea where they are. . . . That's the way it should be." Messages were routed back and forth between wireless users and those on the home-office LAN. No extra addressing was needed to send E-mail to remote users.

- **Paging.** Some organizations are finding one-way paging to be a more timely and economical alternative to faxing. For example, Ethos Corp., a software maker in Boulder, Colo., recently began bundling the Embarc paging protocol into its commercial mortgage processing software so that financial firms can electronically deliver mortgage rates to nearly 2,000 brokers every day. Brent Jones, director of technical operations at Ethos, estimated these firms spend nearly $30,000 per month for faxing via a service bureau.

"Our initial estimate is that these companies would spend $10,000 or under by disseminating information via Embarc instead," he said.

More importantly, he said, files broadcast across the Embarc network can be downloaded as data that can be manipulated — a capability that could save brokers an hour and a half each day.

— Ellis Booker and Joanie M. Wexler

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Communications link

Information highway paved to the Midwest

By Ellis Booker

Now that the Clinton administration is paving the way for its information highway, the burden falls on state governments to figure out how to build crucial statewide networks.

That issue was one highlight of the first Midwest Summit on Information and Technology in Indianapolis, featuring a roundtable with the governors of Indiana and Ohio and senior telecommunications officials, users, a regulator and a consumer advocate.

Role undefined

The roundtable also underscored the fact that state government's role in promoting the Clinton administration's information highway initiative has yet to be fully articulated.

Among other questions, the group wrestled with whether private or public funds should be used to create statewide networks and how to ensure universal access for all constituents in the state.

The group also addressed the question of how geographic regions such as the Midwest can differentiate themselves via their computer and network infrastructure, even as business activity is increasingly distributed, thanks to those same technologies.

"Money and ideas move quickly . . . but infrastructure is regional, as is the work force," said Indiana Governor Evan Bayh. Bayh suggested that decisions about where to locate a business will increasingly be dictated by the caliber of the local work force and that educational and training technologies available in a region are vital.

Picking up on this theme, Chicago-based Ameritech Corp. announced at the summit its commitment of $2.6 million in two years to support a regional initiative to link schools to on-line resources.

The "Learning Village" project will connect a total of 50 schools in Illinois, Indiana, Michigan and Ohio to databases, electronic newsletters and the Internet. Teachers and administrators in the four states will also be able to access more than 500 projects and lesson plans that are organized by grade level and subject.

Asked how state government should promote information technology, both Bayh and Ohio Governor George V. Voinovich argued that government should not pick "winners and losers." They suggested instead that the government act as a catalyst for private industry's research and development efforts in the region by encouraging partnerships and projects.

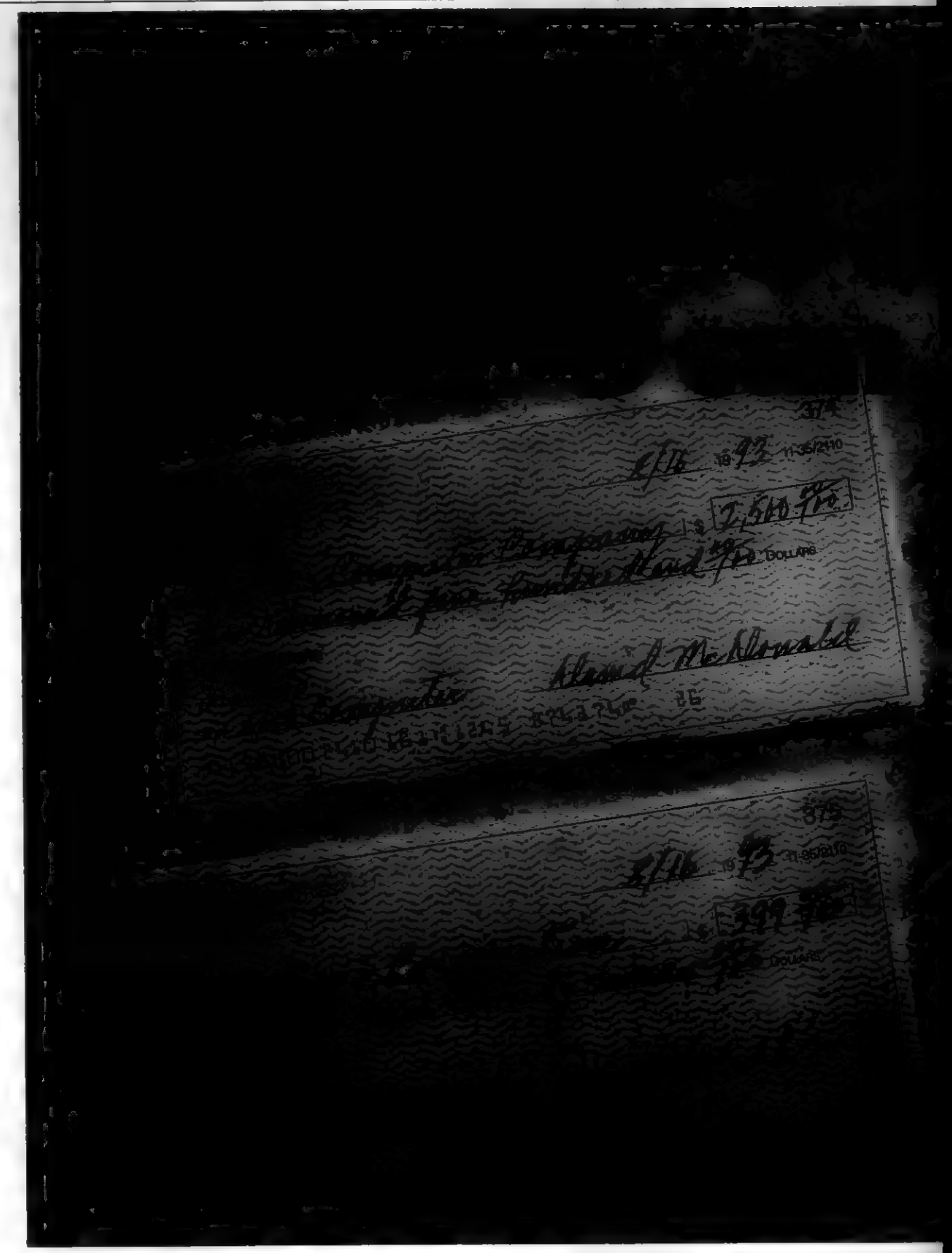
Focus is on outcomes

For instance, rather than dictate the specific kinds of technologies that should be installed in Indiana's high schools, "we can set world-class standards, focus on outcomes," Bayh said. The choice of which technologies to use to accomplish these goals would be left up to committees, schools and perhaps individual teachers, he said.

Government can also act as a clearinghouse for available technologies, Voinovich said. But others on the panel said the pace of technology and the marketplace would make this role unworkable.

The two-day Midwest Summit included approximately 20 technology demonstrations from computer hardware vendors, carriers, universities and integrators specializing in educational and health care applications.

> **"Money and ideas move quickly . . . but infrastructure is regional, as is the work force."**
>
> *—Indiana Governor Evan Bayh*



InterConnections, Inc. has announced Version 3.0 of its Terminal Emulation Services (TES).

According to the Bellevue, Wash., company, TES allows PC users on a Novell, Inc. NetWare LAN to log on to Digital Equipment Corp.'s VAX minicomputers and run VMS applications.

The product consists of two components: the host software, a driver on the VAX that coordinates TES communications between the LAN and VMS; and the client software, a terminate and stay resident program on the LAN workstation that provides a virtual connection to the VAX.

Key to this release is its ability to provide multiple live Windows sessions.

TES license agreements begin at $1,000 for five users. An unlimited license starts at $2,000.

▶ *InterConnections*
(206) 881-5773

Relay Technology, Inc. has introduced Relay/PC Gold for Windows 6.0, communications software.

According to the Vienna, Va., company, this release adds support for the TCP/IP open networking protocol and expanded Windows support, with updated ease-of-use and data transfer features.

The product provides comprehensive connectivity to stand-alone or LAN-based PCs, bulletin boards, on-line information services, midrange systems and mainframes.

Relay/PC Gold for Windows features file and data transfer; 3270 emulation for accessing MVS, VM and VSE applications; and forms of terminal emulation for PCs interfacing to other hosts.

Support is included for TCP/IP connections through Microsoft Corp., Novell, Inc., Ungermann-Bass, Inc. and file-transfer protocol stacks.

A single copy costs $399.

▶ *Relay Technology*
(703) 506-0500

Digital Communications Associates, Inc. has announced the implementation of the second phase of its Universal Communications Architecture and introduced QuickApp for Windows 1.1.

According to the Alpharetta, Ga., company, QuickApp for Windows 1.1 is a point-and-click communications middleware development tool that insulates corporate developers from the complexities of standard communication application programming interfaces.

The product creates a "navigational map" of the host application that is stored on a PC file. The file enables users to identify input fields and data and to navigate to host application screens and host data fields.

Key features include support for Microsoft Corp.'s Visual C++ and Powersoft Corp.'s PowerBuilder.

QuickApp for Windows 1.1 costs $995.

▶ *Digital Communications Associates*
(404) 442-4000

Crystal Point, Inc. has introduced Outside View 3.0 for Windows, its PC-to-host connectivity product.

Outside View for Windows now features support for both asynchronous and IBM mainframe connectivity.

According to the Bothell, Wash., company, Outside View 3.0 for Windows also includes CommBasic, the first Basic macro language to be embedded in a PC connectivity program.

Additionally, the product has a TN3270 feature that gives Windows users access to IBM 3270 mainframe applications and data across TCP/IP networks.

Remote communication features, such as an automatic dialer, log-on macros and a phone directory, are also provided.

The product costs $349.

▶ *Crystal Point*
(206) 487-3656

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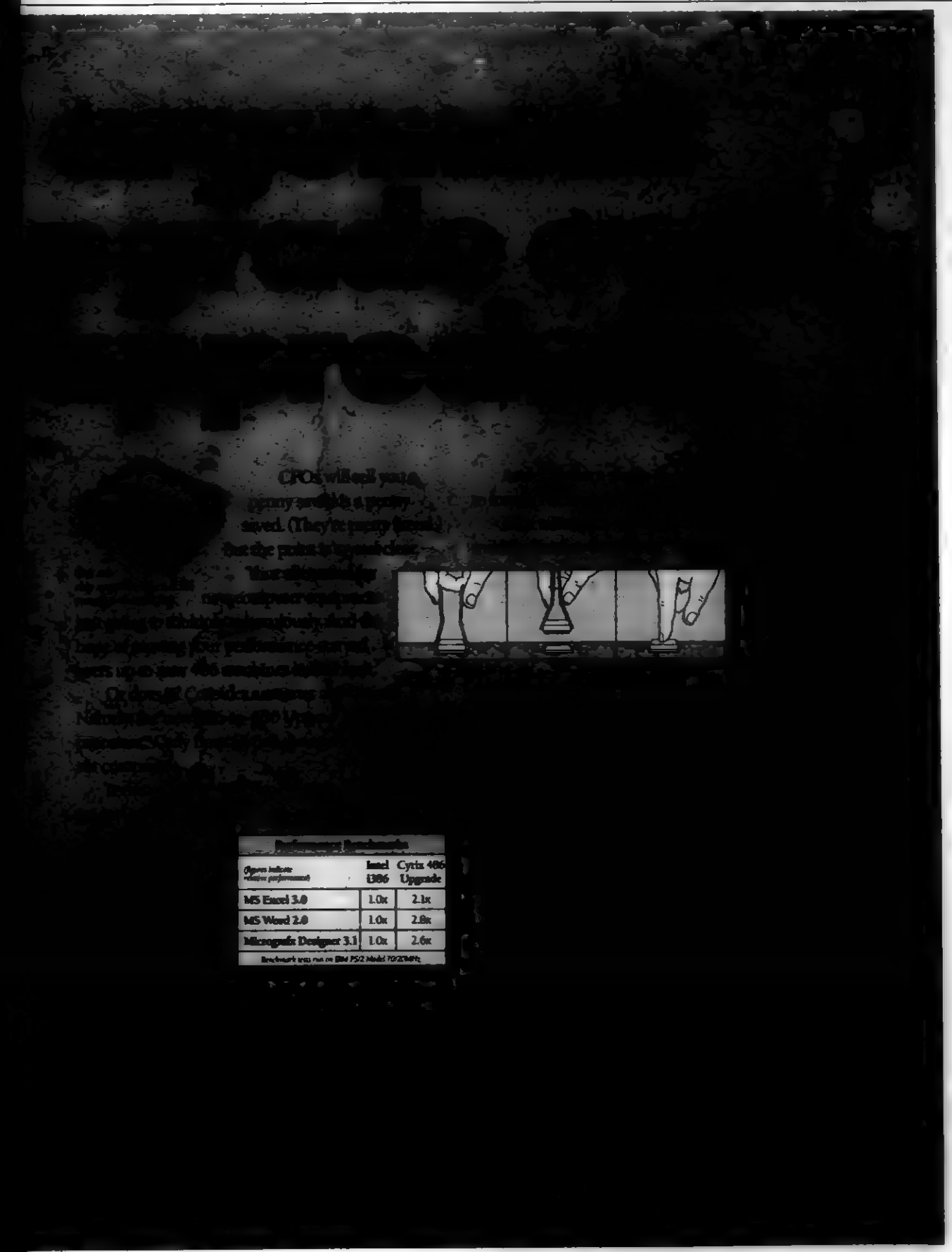

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IBM unfurls ImagePlus client/server plans

HP/UX, Solaris and Windows among non-IBM platforms targeted

By Thomas Hoffman
NEW YORK

IBM used the recent Imaging Expo '93 trade show as a launching pad to announce the long-awaited client/server strategy for its flagship ImagePlus/2 and ImagePlus Image and Records Management (IRM) document storage and retrieval software.

In addition to scheduled ports of ImagePlus/2 to its MVS, OS/400, AIX and OS/2 operating environments in the next six to 12 months, IBM plans to deliver client versions of the imaging software to competitive platforms such as Windows 3.1. Server ports to Unix environments supported by Hewlett-Packard Co. and Sun Microsystems Computer Corp. could arrive by late 1994.

Although IBM customers complained that the vendor's client/server direction for ImagePlus/2 took too long to surface, several prospective ImagePlus users said the 1994 delivery dates dovetail with their plans to implement imaging systems.

"IBM should have laid out its plans for AIX and other environments further back," said Dick Kane, a department head for technical infrastructure and support at ITT Hartford Life Cos. However, Kane said he expects to evaluate IBM's ImagePlus/2 offerings for its version of the Unix System V Release 4 operating system.

ImagePlus/2, already available on IBM's OS/2 2.0 server platform, is scheduled to be ported to a server version of the MVS mainframe environment sometime in the first half of 1994. Server ports to its OS/400 and AIX environments will follow later next year, according to Ronald L. Hankinson, director of IBM's ImagePlus systems development.

IBM also plans to deliver a client version of ImagePlus/2 for its OS/2 2.0 operating system by early next year, to be followed shortly by a Windows port because of strong customer demand for a desktop version.

"The market tells us that a Windows 3.1 [version of ImagePlus/2] is an absolute requirement," Hankinson said.

Expecting positive reaction

Analysts anticipate positive user reaction to the ImagePlus/2 ports.

"The real sweet spot we hear from clients is IBM's plans for Windows client and Unix server ports," noted Mike Howard, a vice president and service director in the office information systems group at Gartner Group, Inc. in Stamford, Conn.

IBM's plans to port ImagePlus/2 and IRM to its AIX environment should make it easier for the vendor to complete follow-on ports to HP's HP/UX and Sun's Solaris Unix platforms, said Scott McCready, principal at IDC/Avante Technology, a Framingham, Mass., market research firm that specializes in imaging and work-flow

ImagePlus/2, *page 66*

Johanna Ambrosio

Blue blues

By ignoring the small to medium-size mainframe customers, IBM is blowing a huge opportunity. These accounts often don't even know who their IBM salespeople are at this point. As a result, they wind up dealing with other vendors for peripherals, workstations and assorted gear.

More important, when these customers are ready to swap out their 4381 or 3090 for a new computer setup (read: client/server), they have absolutely no reason to go with IBM. Any loyalty that may have built up over the years has been completely shattered.

Consider the following examples of former IBM customers who have, for various reasons, chosen other suppliers. Although some of the people asked to remain unidentified, they all are real.

. . . . . .

"At one time, we had everything IBM," says Frank Monteleone, information technology director at NutraSweet Co. in Deerfield, Ill. "Now, you look around, and we don't have anything with their name on it. Microsoft has more of an impact on my day-to-day life than IBM."

. . . . . .

A pharmaceutical company in New Jersey brought XL Datacomp gear into its all-IBM shop because at first the IS director couldn't even get the local IBM branch to bid on the $15 million contract. "It took me three or four tries, but I finally got them to respond," he recalls. "They sent a proposal when all the other vendors sent their top regional people. And their proposal was 20% to 30% higher than the others."

While he would have paid a small premium to avoid the complexity of having to manage multiple suppliers, this man says, "I just couldn't justify that price to my management."

. . . . . .

"I couldn't even tell you the name of my IBM sales rep, but at one time we were the largest IBM customer in Akron," said William Eager, president and CEO of FBOC Services Division, the IS branch of First Bancorp of Ohio. He bought his most recent storage devices from Storage Technology Corp. "We'd be happy to talk to IBM about their storage gear, but no one's been in to see me for about three years."

Ambrosio, *page 64*

DEC extends OSF/1 functions

By Craig Stedman and Jean S. Bozman
MAYNARD, MASS.

A key component of Digital Equipment Corp.'s wide-ranging product introduction tomorrow will be Version 2.0 of the DEC OSF/1 operating system, which Digital said will include full support for running Unix System V Release 4 applications and system management utilities.

Due to ship in January, DEC OSF/1 2.0 also provides C2-level security and an integrated Open Software Foundation (OSF) Motif Version 1.2 user interface, according to Digital officials. It will also be the base release on which upcoming symmetric multiprocessing (SMP) and clustering capabilities will be layered.

Limited shipments of an SMP version of DEC OSF/1 are scheduled to start in February, with general availability expected next July, Digital said. Clustering functionality that goes beyond the workstation farms now supported by DEC OSF/1 will also be added beginning in 1994 (see chart).

Big cog in the wheel

With Digital holding steady as one of the OSF/1 kernel's few adherents at this point, the company acknowledges that the Unix System V Release 4 support being added in DEC OSF/1 2.0 is an important cog in its renewed attempt to shed its standing as a commercial Unix also-ran [CW, Oct. 4].

"For users or programmers that are used to System V, and system managers as well, this will solve that," while enabling them to take advantage of DEC OSF/1's 64-bit structure, said Andrew Feit, marketing manager for Digital's workstations and servers group.

Digital already provides System V Release 3.2 compliance in the current DEC OSF/1 1.3 release, which began shipping in July. The Unix System V Release 4 features will extend that to full conformance at the application, management utility and user interface look-and-feel levels, Feit and other executives indicated.

The Unix System V Release 4 environment is supported through a so-called "habitat mechanism" that allows alternate sets of application programming interfaces to reside on top of the OSF/1 kernel. Most Unix System V Release 4 applications should run under DEC OSF/1 2.0 after being recompiled without any code changes required, Digital said.

Judith Hurwitz, president of Hurwitz Consulting Group, Inc. in Watertown, Mass., said the Unix System V Release 4 compliance should make concerns about DEC OSF/1's compatibility with Unix releases from other vendors "a nonissue." And some users said they see the

DEC OSF/1, *page 64*

Cluster delivery time line

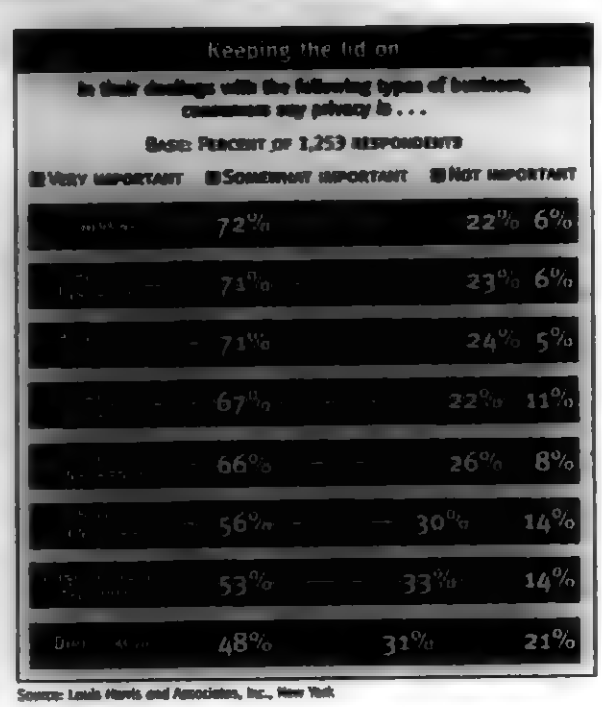
Records privacy concerns grab citizens attention

By Mitch Betts
WASHINGTON

The latest national opinion poll on the privacy of consumer records is a wake-up call for American businesses: Consumers said they are much more likely to patronize businesses with policies that safeguard the privacy of sensitive information.

The survey conducted by Louis Harris and Associates, Inc. found that, for the first time, the majority of adults in the U.S. (53%) are "very concerned" about the confidentiality of their records.

The poll results indicate that "privacy is now a front-burner issue" for American consumers and will influence their purchasing habits, said Humphrey Taylor, chief executive officer of Louis Harris and Associates in New York.



Source: Louis Harris and Associates, Inc., New York

Money and health matters

A follow-up poll showed that Americans expect their financial and medical records to get the most protection. Consumers ranked banks, health insurers, hospitals and credit-card companies as businesses needing strict privacy codes.

The message is that companies can gain a competitive edge by developing and advertising privacy-sensitive policies, according to Alan F. Westin, a privacy expert at Columbia University in New York. Westin directed the study and published the results recently in a newsletter, "Privacy and American Business," in Hackensack, N.J.

Some companies, such as Pacific Bell in San Francisco, have already received the message and developed information privacy guidelines. Likewise, Bob Chiarmonte, vice president for information systems at Ron Corp., a Reston, Va., company that develops home shopping and other interactive television services, said his firm will keep consumer information confidential and just pass along the orders to retailers.

Privacy advocates have long argued that companies should adopt a "code of fair information practices" that promises to allow consumers to see and correct their records and prohibits the release or sale of consumer data to third parties unless the consumer agrees.

The challenge is to reconcile that advice with another hot business trend: the collection of consumer and lifestyle data for the purpose of narrowly targeting consumers in marketing campaigns.

Good timing

The poll also comes at a time when the Clinton administration is grappling with the privacy issue in a variety of contexts, including the electronic medical records envisioned for health care reform [CW, Aug. 9]. Moreover, buried in the White House's "reinventing government" report is a line recommending creation of a federal Privacy Protection Board to issue privacy guidelines.

Meanwhile, the Internal Revenue Service has responded to reports of employee snooping in tax records by creating the post of privacy advocate [CW, Aug. 9]. Whoever fills the executive-level job, which is expected to pay $92,900 to $107,300, will investigate privacy problems and incorporate privacy principles into the agency's massive computer modernization project.

DEC OSF/1 2.0

CONTINUED FROM PAGE 63

capability as a positive move for Digital, at least image-wise.

"I would be hard-pressed to tell you about a business situation that I need that for right now, but at the philosophical level of things, it's good news," said Frank Brake, director of international operations for technology business development at Newport News Shipbuilding and Drydock Co. in Newport News, Va.

"That's a step in the right direction," agreed George Reid, MIS director at Sanford C. Bernstein & Co. in New York. However, he added that when it comes to the Unix market, "the issue on the DEC side is whether the train has already left the station."

Bernstein, which has about 200 workstations running under Digital's earlier Ultrix derivative of Unix, plans to standardize on Microsoft Corp.'s Windows NT operating system on the desktop, Reid said. The company "looked very eagerly" at DEC OSF/1 in the past, but now that Digital is getting the necessary functionality in place, NT provides a better alternative, he added.

Useful but limited

Wes Melling, an analyst at Gartner Group, Inc. in Stamford, Conn., said DEC OSF/1 2.0 and accompanying layered software being introduced this week should start making the operating system useful for commercial applications. But the new capabilities will not "cover the gamut of everything people are looking for," Melling added. "We don't think they get to parity [with other Unix vendors] with this announcement."

Digital's Unix push also comes too late for Mohamed Ellozy, director of research information services at the Dana-Farber Cancer Institute in Boston. The institute, an Ultrix user that also has Sun Microsystems, Inc. hardware, will "almost certainly" become an all-Sun shop over time, he said.

Ellozy said he is satisfied with Digital's products and customer service, but its previous arm's-length embraces of Unix have left him wary of doing business with the company. "The gyrations of the past few years have turned us off very substantially," he said.

SMP and clustering are also key technologies for making DEC OSF/1 useful in commercial environments, according to both Digital and analysts. Support for six-way multiprocessing should be in place by mid-1994, while cluster functionality will be added in the next three years, the company said.

Mark Silverberg, Digital's commercial Unix marketing manager, said he hopes in 1994 "to get to the point where we're recognized as competitive in Unix clustering." But DEC OSF/1 will not fully match the company's OpenVMS clustering capabilities until 1996, he added.

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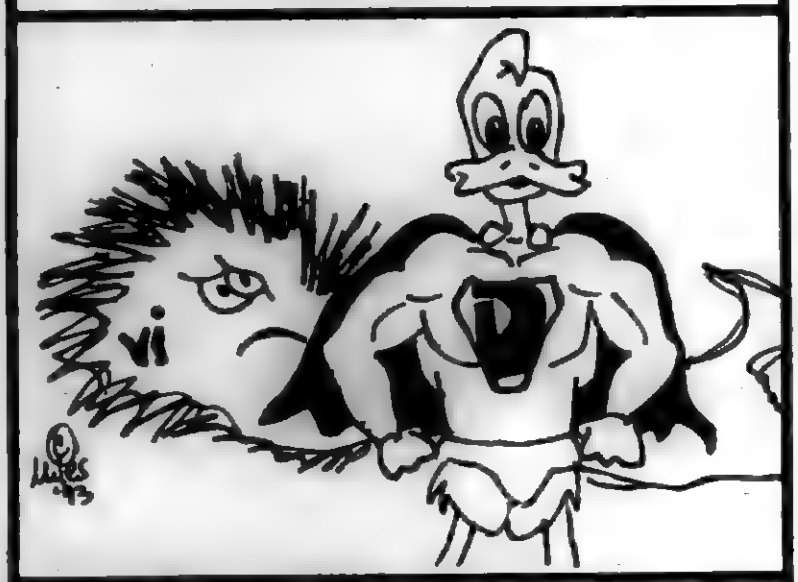

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Ambrosio

CONTINUED FROM PAGE 63

The list could go on. A California life insurance company put out a $50 million bid that IBM did not respond to, although the IS director hoped it would. A California manufacturing concern is installing Hewlett-Packard computers as its client/server direction because it did not know what IBM's most recent story was.

"Look," one IS director says. "If IBM came right out and said they don't want my business because I'm too small for them, I could understand that as a business decision, and I would live with it. But they keep putting out mixed signals about their intentions for this market."

True, these customers are not Citicorp or American Airlines, but they're not exactly mom-and-pop corner delis, either. These IS executives are realistic businesspeople, and they don't want IBM representatives to live at their sites. Still, a sales call once a quarter should not be too much to ask.

Ambrosio is a *Computerworld* senior editor, systems and software. Her MCI Mail address is 599-8003.

Survey shows rightsizing right on

By Gary H. Anthes

Three quarters of Fortune 1,000 information systems managers surveyed recently said they are "rightsizing" their IS infrastructure or planning to do so, and of that 75%, the majority said cost reduction was the driving factor.

However, of those respondents who said they had no plan to rightsize, the majority cited lack of cost justification as the main reason.

That apparent contradiction came to light in a survey of 105 companies in a cross-section of U.S. industry by Market Vision, Inc. in Dunedin, Fla.

Market Vision defined "rightsizing" as any combination of "downsizing, smartsizing and other industry buzzwords." In essence, it referred to the selection of new computing standards and architectures in response to new technology, budget pressures, changing business or other forces.

Asked how they expected to save money through rightsizing, they most often cited a reduction in development and maintenance backlogs (see chart above).

Asked about the downside, respondents most often cited the need to retrain staff (see chart at left).

Half the rightsizers said they would re-engineer the business processes underlying their applications as part of the move to new platforms. Twenty-eight percent said they would rewrite the applications, and 21% said they would port the old code as is.

The lack of unanimity on how rightsizing would affect costs was explained in part by how IS managers felt it would affect various parts of their shops. For example, 59% said rightsizing would reduce the maintenance backlog, but 9% said it would increase the backlog.

Market Vision sent a strong message to its clients, who include many major software vendors. Almost three quarters of survey respondents said vendors do not yet offer enough tools to help implement a rightsizing strategy.

Ever changing

What important changes have you seen or expect to see as a result of your rightsizing strategy?

Reduced development backlog	60%
Reduced maintenance backlog	59%
Reduced software budget	59%
Reduced downtime	47%
Reduced staff	46%
Increased software budget	26%
Increased downtime	12%
Increased staff	12%

Response base: 105 companies (multiple responses allowed)

Downside

What are some of the negative consequences of rightsizing?

Retraining staff	14%
Adjusting to change	13%
Network complexity	12%
Financial issues	11%
Decentralized control	11%

Response base: 105 companies (multiple responses allowed)

Source: Market Vision, Inc., Clearwater, Fla.

ImagePlus plan unfurled

CONTINUED FROM PAGE 63

systems. McCready said IBM should be able to tap into vertical markets where HP/UX and Solaris systems have gained strong footholds such as on manufacturing shop floors (HP/UX) and at pharmaceutical and brokerage firms (Solaris).

And while McCready agreed that IBM should address OS/2 client ports first, a Windows-based port is a logical follow-on, he said.

"You can argue all you want about the technical superiority of OS/2 vs. Windows, but the market is saying 'Windows,'" McCready said.

Still, the initial ImagePlus/2 ports are intended for IBM environments, and users at several large IBM shops have expressed interest in them. For example, CSX Technology, Inc. in Jacksonville, Fla., plans to evaluate an MVS server and OS/2 client ImagePlus/2 combination that would help it store and retrieve personnel records and invoices used for shipping once the software becomes available next year, said Douglas E. Underhill, assistant vice president of technical planning at the technology arm of the rail transportation firm.

But before Underhill assesses the package, he wants further details from IBM about how the vendor plans to tackle compression issues for the direct-access storage devices needed to handle the high-bandwidth images that CSX Technology would likely create with the software.

"We, like other firms, are looking at escaping paper, but we've recognized that when you stop using paper, you have to be able to store and recreate documents easily," Underhill said.

Imaging Expo '93

Work-flow aids lead way

By Ellis Booker

Optika Imaging Systems, Inc. in Colorado Springs recently led the charge among document imaging vendors that beefed up work-flow offerings at the Imaging Expo show.

Optika announced enhancements to its PowerFlow work-flow management software. Chief among the improvements are a business modeling component that allows programmers or end users to graphically design and automate work-flow steps.

Many software categories, from electronic mail to stand-alone utilities, are adding work-flow features. But "imaging companies are much farther ahead since they've had a work-flow market, with users who can tell what they're looking for," said Bruce Silver, vice president at market research firm BIS Strategic Decisions in Norwell, Mass.

Simple work-flow products merely route and track documents between work queues. More sophisticated systems, he said, are beginning to act as integration hubs, passing data among different applications in the background and then presenting users with the results in a standard format.

Optika's software comprises PowerFlow Builder, a graphical design tool; PowerFlow Manager, a graphical user interface-based administrative tool; and PowerFlow Workplace, a graphical desktop running under Windows.

The software will begin shipping in the fourth quarter, with a suggested list price of $9,995 for a five-user system. Multiuser configurations of 50, 100, 250 and up will also be available and priced accordingly, Optika said.

Other document imaging vendors introduced the following products:

- **Intrafed, Inc.**, a systems integrator in Bethesda, Md., **Excaliber Technologies Corp.** in McLean, Va., and **Calera Recognition Systems, Inc.** in Sunnyvale, Calif., introduced a high-volume, turnkey production imaging system called Ieworks, capable of producing 10,000 pages per day. Prices will start at $129,900.
- **Image Business Systems Corp.** in New York announced support for OS/2 and NCD X Window System terminal desktops.
- **Sigma Imaging Systems, Inc.** in New York announced the integration of its OmniDesk imaging software with Notes.
- **Laser Data, Inc.** in Tyngsboro, Mass., showed the DocuData and DocuFlow work-flow software, built on top of an ActionWorkflow System from Action Technologies, Inc. in Alameda, Calif. Laser Data will also resell the Action Technology product directly.
- **IBM** demonstrated its homegrown work-flow system, FlowMark, showing the integration between the work-flow product and IBM imaging products.
- **IBM and Excalibur** announced a cooperative software agreement under which IBM will distribute Excalibur's client/server PicTex/EFS document imaging software for IBM's RS/6000 platform.

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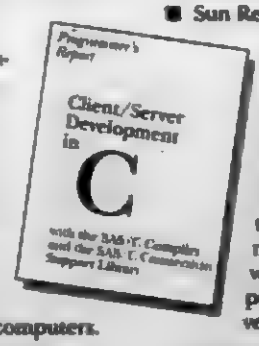

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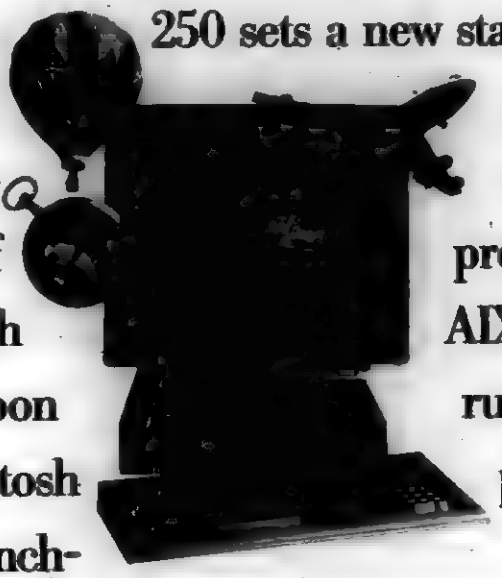

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DEC 300L	$7,920	45.9	$173
IBM 990	$147,800	126.0	$1,173
HP 160	$136,530	82.0	$1,665
DEC 4000/610	$131,728	94.6	$1,392

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Briefs

Clinton honors innovators

President Clinton awarded Kenneth H. Olsen, founder and former president of **Digital Equipment Corp.**, a National Medal of Technology "for his contributions to the development and use of computer technology and for his entrepreneurial contribution to American business." A medal also went to Amos E. Joel, a retired engineer from **AT&T Bell Laboratories** who was a pioneer in telecommunications switching technology.

Xerox may outsource IS

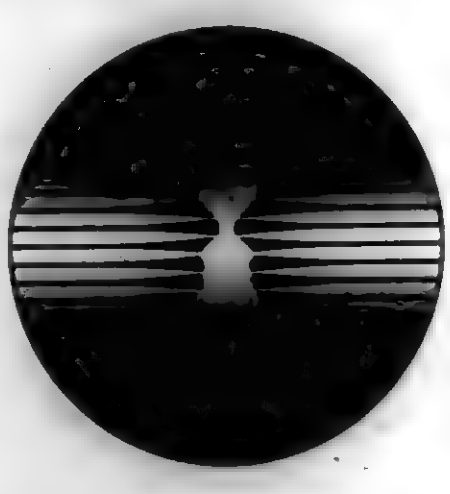
Xerox Corp. recently confirmed the long-standing rumor that it is considering outsourcing some or all of its information technology. The $18 billion company said it recently sent requests for proposals to four vendors but declined to identify them. A spokesman said Xerox will take "several months" to make a decision and that the company may decide to keep operations in-house. Xerox, which lost $1.02 billion in the year ending Dec. 31, 1992, said outsourcing could help it save money, leverage technology and free management for core tasks. The company has about 3,500 information systems employees worldwide. The spokesman said it is too early to determine how an outsourcing deal would affect the firm.

Digital unit goes Far East

Digital's storage business unit plans to establish a manufacturing plant in Indonesia that will make thin-film heads for disk drives. The 100,000-sq-ft facility is scheduled to begin volume production in mid-1994, Digital said. The company, which will use the heads in its own disk drives and also market them to other drive vendors, wants to expand storage manufacturing into the Far East to take advantage of lower cost structures and wages there.

Credit-card unit sold

First Financial Management Corp., an Atlanta information services firm, has signed a pact to acquire **Brown-Forman Enterprises**, a merchant credit-card processing unit of Brown-Forman Corp. in Louisville, Ky. Terms of the agreement were not disclosed.



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Briefs

BMC Software, Inc. has announced Version 2.3.07 of Data Packer for DB2, a hardware compression emulation product.

According to the Sugar Land, Texas, company, the product enhances a customer's ability to adopt hardware compression across the enterprise by making it possible to exploit and emulate the hardware compression to be provided in IBM's ES/9000 Models 9021 and 9121 mainframe computers.

This release also gives CPUs that have not been upgraded the ability to compress and expand hardware-compressed data.

An assortment of compression techniques is included.

Data Packer for DB2 is priced by CPU level, starting at $8,000 for a perpetual license.

▶ *BMC Software*
(713) 240-8800

Convex Computer Corp. has introduced the DataSeries line of data management products.

Consisting of hardware, software, robotic tape systems and support services, the DataSeries is based on Hewlett-Packard Co.'s Apollo 9000 Series 700 workstations at the low end. For high-throughput, high-capacity applications, DataSeries is based on Convex's C Series systems, according to the Richardson, Texas, company.

Hierarchical storage management software that transparently moves data between disk and robotic tape is included.

Pricing is from $150,000 to $5 million.

▶ *Convex Computer*
(214) 497-4000

BGS Systems, Inc. has introduced its Best/1 for Unix software.

According to the Waltham, Mass., company, Best/1 for Unix offers facilities to centralize the performance and capacity management functions in distributed environments.

Best/1 for Unix integrates with the BGS Performance Assurance framework to provide capabilities such as projecting future requirements, tracking long-term performance, solving day-to-day performance problems and reporting to management and users on past, present and future performance to support recommendations and justify expenditures, according to the company.

An enterprise with 50 workstations and servers can license Best/1 for Unix for approximately $1,000 per node.

▶ *BGS Systems*
(617) 891-0000

Four Season Software has announced a graphical version of 4S-Report, a report writer for end users and application developers.

According to the Edison, N.J., company, the product can generate queries and create complex, professional reports that run on MS-DOS, Unix (including OSF/1) and VMS.

Users can create reports that access an assortment of databases, including those from Oracle Corp., Sybase, Inc., Informix Corp. and Teradata Corp., as well as C-ISAM, Cobol and ASCII files.

Key features include interactive WYSIWYG creation of reports, point-and-pick data dictionary fields for placement on reports; point-and-pick application of selection criteria; context-sensitive, pop-up help at every level; and reports designed as sets of modular, linked blocks.

Pricing for 4S-Report ranges from $300 to $37,000, depending on the platform and operating system.

▶ *Four Season Software*
(908) 248-8667

Product shorts

Chi/Cor Information Management, Inc. has announced the Deduction Management System, a software tool designed for IBM's AS/400. The software tracks invoice deductions and automates follow-up procedures. Users can identify internal errors, shipping problems, seasonal trends and customers who abuse write-off policies. Cost: $9,500 to $75,000. Chi/Cor Information Management, Chicago (312) 322-0150. . . . **Lattice, Inc.** has introduced Lattice Client Server Remote, an AS/400 database access utility that lets PC applications dial into an AS/400 and directly access records and files. The product eliminates the need for terminal emulation, protocol converters, PC support and ASCII workstation controllers. Cost: starts at $150. Lattice, Downers Grove, Ill. (708) 769-4060.

Bank vaults into world of objects

Tools spell success in distributed application project

By Tim Grantham

Building distributed applications with object-oriented development tools is not for the faint-hearted. Yet it is probably the only way reliable, maintainable distributed applications can be built, said Amarjeet Garewal, vice president and senior systems architect at BankAmerica Corp.

Three years ago, Garewal began investigating how Bank of America, with a data operation based in Concord, Calif., could manage the configuration of its California Data Network, an SNA network connecting numerous IBM mainframes, 25,000 IBM PCs and 1,500 OS/2 LANs at more than 1,000 sites across the state.

In addition to managing the network configuration, the bank needed a way to manage the complex, highly dynamic configuration of software on each network node.

Speaking in Toronto at the recent Executive Symposium on Object Technology, Garewal said the management system had to minimize its demands on each branch's limited bandwidth by being a truly distributed application.

Such an application could use IBM's Systems Application Architecture Advanced Peer-to-Peer Networking protocol to provide program-to-program communications across the network, and it should be created using object technology.

Garewal chose Smalltalk as the implementation language, rejecting C++ partly because he believed it made it too easy for programmers to write non-object-oriented code.

The only Smalltalk tool available on OS/2 in January 1991 was one offered by Digitalk, Inc. in Los Angeles. Garewal bought a copy and found that it provided good performance, incremental compilation and portability across platforms and required no runtime license fee.

Winning corporate approval for a project dependent on tools with little track record was complicated by the fact that conventional methods for determining return on investment were unavailable, Garewal said. To win their trust, Garewal promised to demonstrate working prototypes to senior management every month.

Smalltalk is at the core of the Network Configuration Facility

Garewal did not bother looking for object technology experts for his development team. Instead he focused on those candidates who could adapt quickly to change, who had experi-

Bank, *page 76*

Oracle's CDE draws praise, suggestions

Users offer ideas for improving tool set

By Kim S. Nash
REDWOOD SHORES, CALIF.

Oracle Corp., now in full production with its Cooperative Development Environment (CDE) tool set, is winning praise from early CDE users and attendees at the recent International Oracle Users Week, who noted the steps Oracle has taken to make the tools more usable, such as supporting Windows.

But parts of the 14-product CDE set still need work, the users said.

CDE is a set of application development aids, in production since late August, that range from report writers to code generators to a computer-aided software engineering (CASE) repository. Some of the tools existed before Oracle invented the CDE moniker last year, while others, such as OracleBook, have been created since then.

The item that should top Oracle's "to do" list, users said, is assuring customers that CDE products have been thoroughly tested against Oracle 6 — not just the Oracle 7 database.

"We've been working on this issue for a few months now but have seen no definitive Oracle response," said Michael Abbey, chairman of Affinity, a special interest group of major Oracle database, applications and CDE users.

"Telling customers to upgrade to Oracle 7 is not a solution," Abbey said, because "a lot of us aren't ready to move to 7 as quickly as we're ready to use CDE." Cost is an issue; so is the time it takes to convert databases and applications to the newer version, he said.

Nevertheless, CDE may force Oracle 7 upgrades at some shops. "We do have a beta copy of CDE tools right now, which is part of the reason we want to move to 7," said Dave Heck, manager of the information engineering services unit

Oracle, *page 72*

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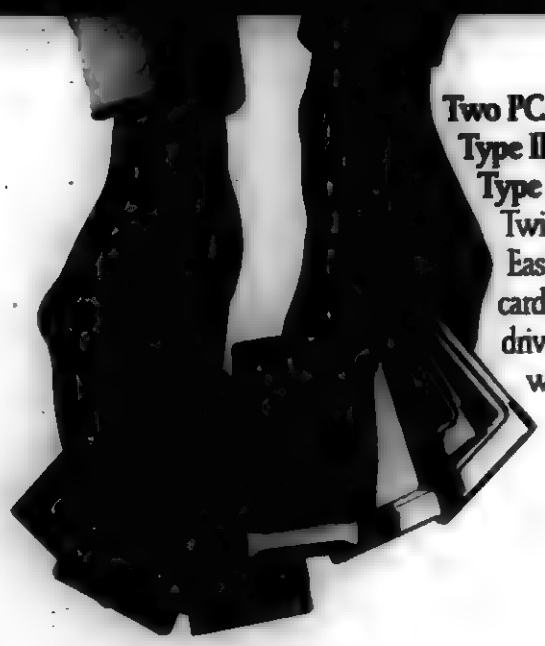

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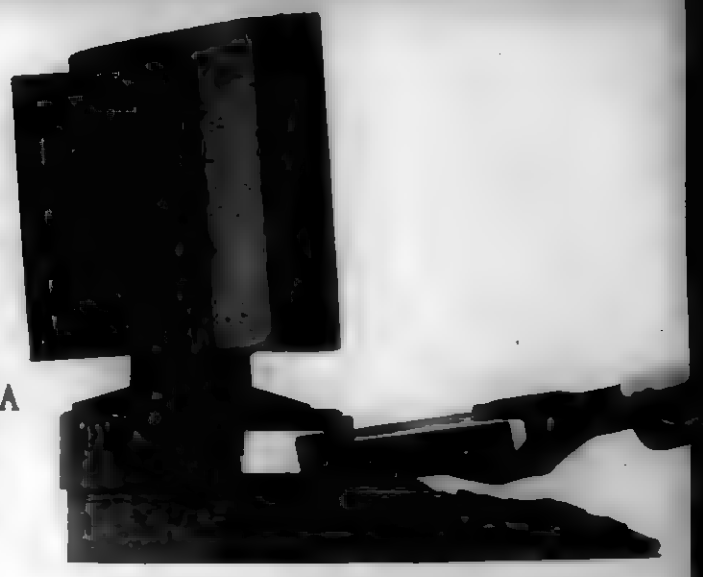

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Apple's AOCE gets nod

Plans to incorporate technology under way

By James Daly
CUPERTINO, CALIF.

Apple Computer, Inc. received a vote of confidence for its long-awaited Apple Open Collaboration Environment (AOCE) last week as nearly three dozen third-party software developers announced products designed to take advantage of the nature of the newly introduced technology.

AOCE is a set of application programming interfaces that promise to tie together the strands of voice mail, fax, electronic mail and remote paging into an integrated communications fabric.

Developers, particularly those showcasing speech recognition technologies, had a lot to talk about. Articulate Systems, Inc., for instance, is readying a release of PowerSecretary, a speech dictation system with which users can prompt their Macintoshes to perform mundane administrative tasks such as sending faxes and retrieving E-mail.

Milpitas, Calif.-based Octel Communications Corp. demonstrated a gateway that allows users to visually display, access and manage voice and fax messages stored in an Octel voice processing system from a Macintosh.

Useful Software Corp. in Danvers, Mass., was promoting its similar $260 Useful Voice Processor E-mail system, while CTM Development in Geneva, unveiled Voice-Access, which offers remote retrieval and delivery of pager messages.

Coming soon

Apple will dribble out most key portions of AOCE in the next six months. PowerTalk, the new collaboration software, will be available immediately with System 7 Pro, a $149 system software release with communication features geared toward heavily networked corporate Macintosh users. However, the $999 PowerShare Collaboration Server package, which centralizes management of the AOCE services, will not ship until at least December.

Another entry was presented by Axion in Sunnyvale, Calif., which showcased its IMail video-mail software application. When coupled with the ISpy desktop color video/still picture camera and the IMovie capture board, photogenic users can send video E-mail to each other.

Free RAM?

System 7 Pro still requires at least 5M bytes of RAM, said product manager Andy Leuta. Apple is exploring promotional deals that would give users free RAM upgrades if they opted for the Pro package.

On the networking side, Caravelle Networks Corp. in Nepean, Ontario, brought out Networks, a network monitoring application. Networks keeps tabs on devices and services on a network and then uses pocket pagers, E-mail, graphics and audible alarms to alert network managers of problems. Networks will cost $995.

Digital Equipment Corp. announced that it will incorporate AOCE technology into its TeamLinks for Macintosh family of products. Digital will use AOCE to provide transparent X.400 message transport and, later on, X.500 directory services to Macintosh mail-capable applications that use AOCE.

Ex Machina, Inc. displayed Notify for PowerTalk, a $149 wireless messaging gateway that allows a PowerTalk-savvy application to send full-text messages to a pocket pager, PowerBook portable or Newton MessagePad.

RSA Data Security, Inc. announced that it has embedded its patented Public Key Cryptosystem encryption technology in System 7 Pro. RSA Digital Signature also allows users of System 7 Pro to verify the author of a given electronic document and verify that a document has not been tampered with.

Real-time news

Mainstream Data, Inc. in Salt Lake City released a PowerTalk gateway for Mainstream Newscast, an information service that delivers real-time news to Macintoshes via FM radio and satellite.

Other vendors unveiling products included Aladdin Systems, which announced its $129 Stuffit Deluxe compression package, and CE Software, Inc., which showcased its QuickMail applications.

Microsoft Corp., Banyan Systems, Inc. and GE Information Services also voiced approval for PowerTalk without unveiling specific products. Microsoft said it will include support for PowerTalk and System 7 Pro in future versions of Excel, Word, Powerpoint and Works.

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I certify that the statements made by me above are correct and complete.

Pat Walker,
Traffic Manager

Oracle

CONTINUED FROM PAGE 69

at Nationwide Life Insurance Co. in Columbus, Ohio.

Meanwhile, Oracle pleased users such as Mark Farnham, president of the Oracle Applications User Group, by recognizing, as he noted, that PCs exist in the application development shop. After it announced CDE, Oracle realized it had failed to provide graphical desktop tools comparable to products such as Gupta Corp.'s SQL Windows, Microsoft Corp.'s Visual Basic or Powersoft Corp.'s PowerBuilder.

So before going full production with CDE two months ago, Oracle switched gears: It would ship a complete set of CDE products for Windows before those for its bread-and-butter Unix operating system.

More than 34% — $281 million — of Oracle's total fiscal 1993 license revenue came from development tools.

PC-oriented

Windows editions of CDE offerings "show that Oracle is moving with us into a more PC-oriented development environment," said Farnham, who is also a database architect at Burlington Coat Factory in Lebanon, N.H.

Users might want to pay attention to changes in Forms 4.0, a code generator and linchpin of CDE. For example, Oracle's makeover of Forms into a graphical tool that is itself capable of creating graphical applications means that developers have a longer learning curve in front of them, according to Timo Siniranta, an analyst in Oracle's worldwide technical support group for tools.

Siniranta advised users to triple typical development time allotments for initial Forms 4.0 projects.

Conversions continue

That warning has not scared off users such as James Bennett, vice president of technology at First National Bank of Chicago. The bank is in the midst of converting applications generated with SQL Forms 3.0 to Forms 4.0. Bennett is working on a customer information system that, when complete, will host 600 to 700 users.

"This might sound corny, but CDE is fun to work with," Bennett said, adding that he has experimented with working imaging functions into applications built with CDE products.

No matter what Oracle may do to improve CDE, no vendor can provide for every user's every need, according to Brad Stokes, a database analyst at Syntex, a pharmaceuticals firm in San Francisco.

Syntex uses CDE tools to build applications and also to house companywide business information. Products such as Oracle CASE Dictionary help ensure the company meets rules handed down by the Food and Drug Administration.

Although Syntex is pleased with reports generated with the product, custom queries using extensions to Oracle's SQL are still needed because of the intricate nature of FDA regulations, according to Stokes.

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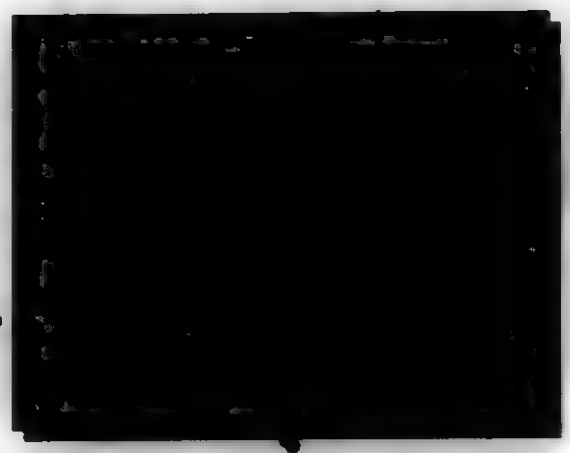

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CONTINUED FROM PAGE 69

ence with more than one language, who had a conceptual grasp of every aspect of the bank's network and who were willing to work 12-hour days for the duration of the project.

Two were assigned to develop the required Smalltalk representation objects; one looked after the graphical user interface; one produced all the CICS Cobol II code needed to manage transactions and configuration data; and one took responsibility for testing and end-user liaison activities. Garewal acted as chief architect and brought in a mentor for the team, a senior technologist from Digitalk whom he paid $10,000 a week for eight weeks, spread over the six months of the planning and initial development.

The team used no formal methodology for analysis and design and instead developed an iterative development methodology of its own.

It began development in earnest in June 1991. By the end of that year, it had the development infrastructure in place and had defined the problem domain. The next six months saw end users testing a series of ever-more refined development prototypes, a process that produced more than 600 changes in the user interface.

By September 1992, the development documentation had been created, and production system deployment began in October. By the end of November 1992, fewer than a dozen operators were using the new Network Configuration Facility (NCF) to manage the configuration of the entire network.

Not just object-oriented

The NCF architecture required an object persistency manager, which the team created using IBM DB2 and the OS/2 Database Manager. Garewal expressed little patience for those who insist that only an object-oriented database management system has the speed to support object technology applications.

"There is no business problem," he declared, "that cannot be modeled using either a relational database or an object-oriented database."

The team also had to create several other management tools from scratch: object schema, relational schema and object life-cycle management tools were all developed using Smalltalk, while unit-of-work management tools were created using Smalltalk and CICS.

Garewal cautioned other corporate developers approaching object technology to expect high costs for training and tools and a six-month learning curve. He warned of a shortage of tools suitable for team development, managing object life cycles and testing and performance analysis. And the tools that are available, he said, come with inadequate documentation and example code.

On the positive side, he said object-oriented programming systems enabled his developers to create a closer representation of the business problem, reuse prototype code, more quickly develop complex functions and perform simultaneous analysis and development.

Garewal said he was also pleased to discover that the Cobol II code required to link his back-end legacy systems with the Smalltalk-developed components proved easy to write and change.

Grantham is a free-lance writer in Paris, Ontario.

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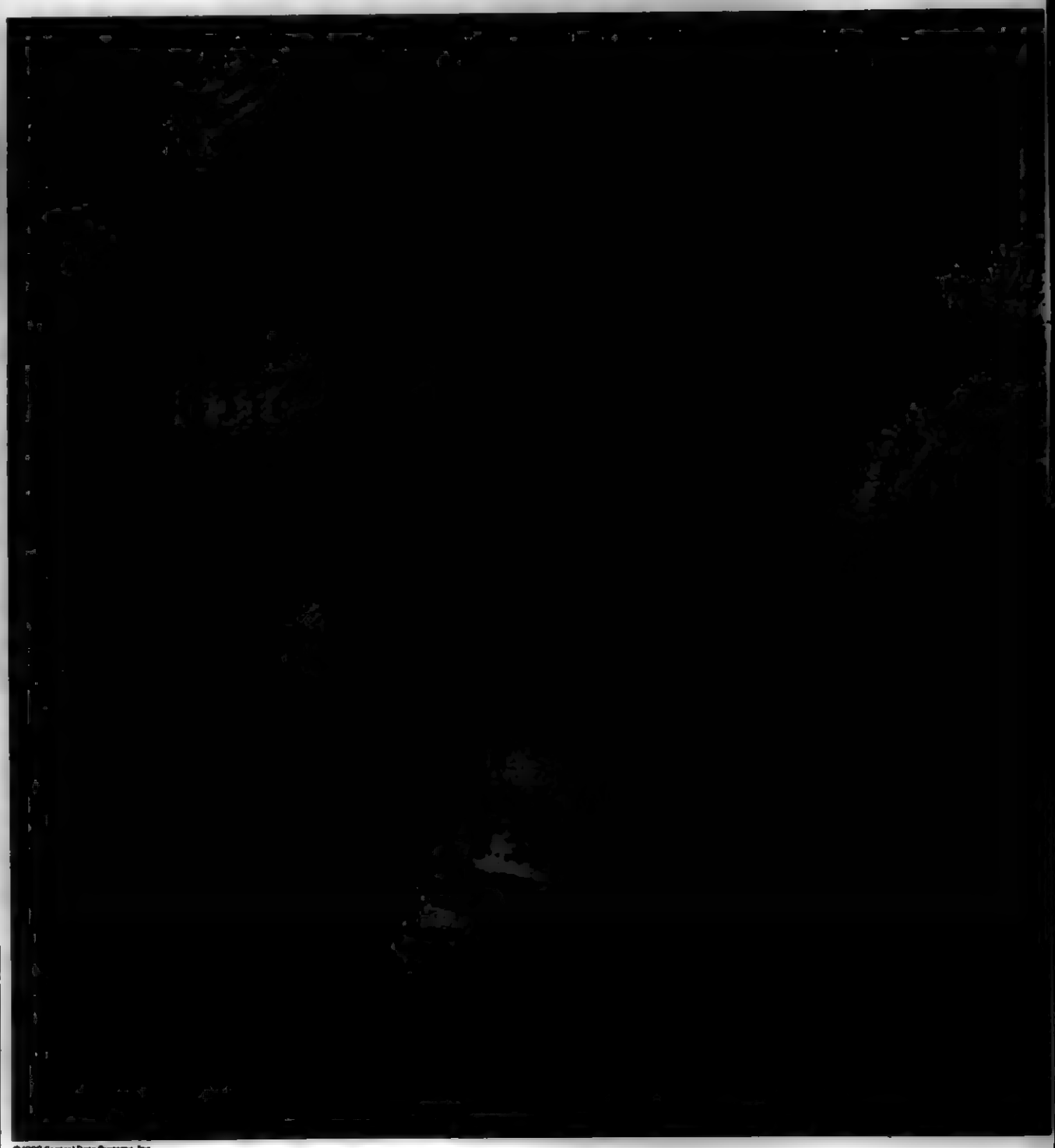

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AutoTester, Inc. has announced AutoTester 2.0, an advanced testing and verification tool for the Windows operating system.

According to the Dallas company, the product was designed to solve the complex problems associated with testing graphical user interface applications, including test synchronization, advanced control querying and manipulation and dynamic window placement and positioning.

Word processing-type editing of tests including features such as cut/copy/paste, find/replace and adjustable fonts are provided with the software.

AutoTester 2.0 costs $5,000 per workstation.

▶ *AutoTester*
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V. I. Corp. has introduced DataViews 9.5, a programming tool created for building graphics to monitor and control real-time processes.

This release features Motif Object Dynamics, a software tool that enables Open Software Foundation Motif developers to seamlessly integrate animated graphics into Motif interfaces.

Users can also construct fully animated interfaces for analyzing, visualizing and regulating real-time financial, industrial or scientific processes.

By eliminating the need for complex coding, the product can reduce development time by up to 80%, according to the Northampton, Mass., company.

A development license for the Unix version of DataViews 9.5 costs $17,700. Pricing for the Windows NT version will be announced during the first quarter of 1994.

▶ *V.I. Corp.*
(413) 586-4144

NobleNet, Inc. has announced RPCware, an addition to the company's remote procedure call (RPC) middleware tools.

According to the Southboro, Mass., company, the RPC compiler generates client and server code for RPCs that can be compiled as Novell, Inc. NetWare Loadable Modules, UnixWare C language executables and DOS/Windows Dynamic Link Libraries.

RPCware uses the transport-independent RPC supported by Novell for both TCP/IP and SPX/IPX protocols.

RPCware is compatible with the earlier versions of RPC supported by Sun Microsystems, Inc.'s Network File System.

Prices range from $295 to $4,995.

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Wonderware Corp. has announced a series of products and performance enhancements for its NetDDE connectivity software family.

A suite of software development kits is being offered that enable Unix users to add Dynamic Data Exchange (DDE) and NetDDE capabilities to applications running in the most popular Unix operating system versions, facilitating the exchange of data with other operating environments such as Windows and Digital Equipment Corp.'s VAX/VMS, according to the Irvine, Calif., company.

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Progress Software Corp. has announced the Progress Version 7 developer's version.

The product is a cross-platform application development environment. It is based on the Progress fourth-generation language (4GL), designed for rapidly developing and deploying mission-critical applications across client/server, host-based and mixed computing environments, according to the Bedford, Mass., company.

Capabilities include graphical and event-driven extensions to the 4GL, an enhanced DataServer architecture and performance-related enhancements to the Progress relational database management system.

Progress Version 7 is priced by separate component or in bundled packages. Prices range from $250 to $36,120.

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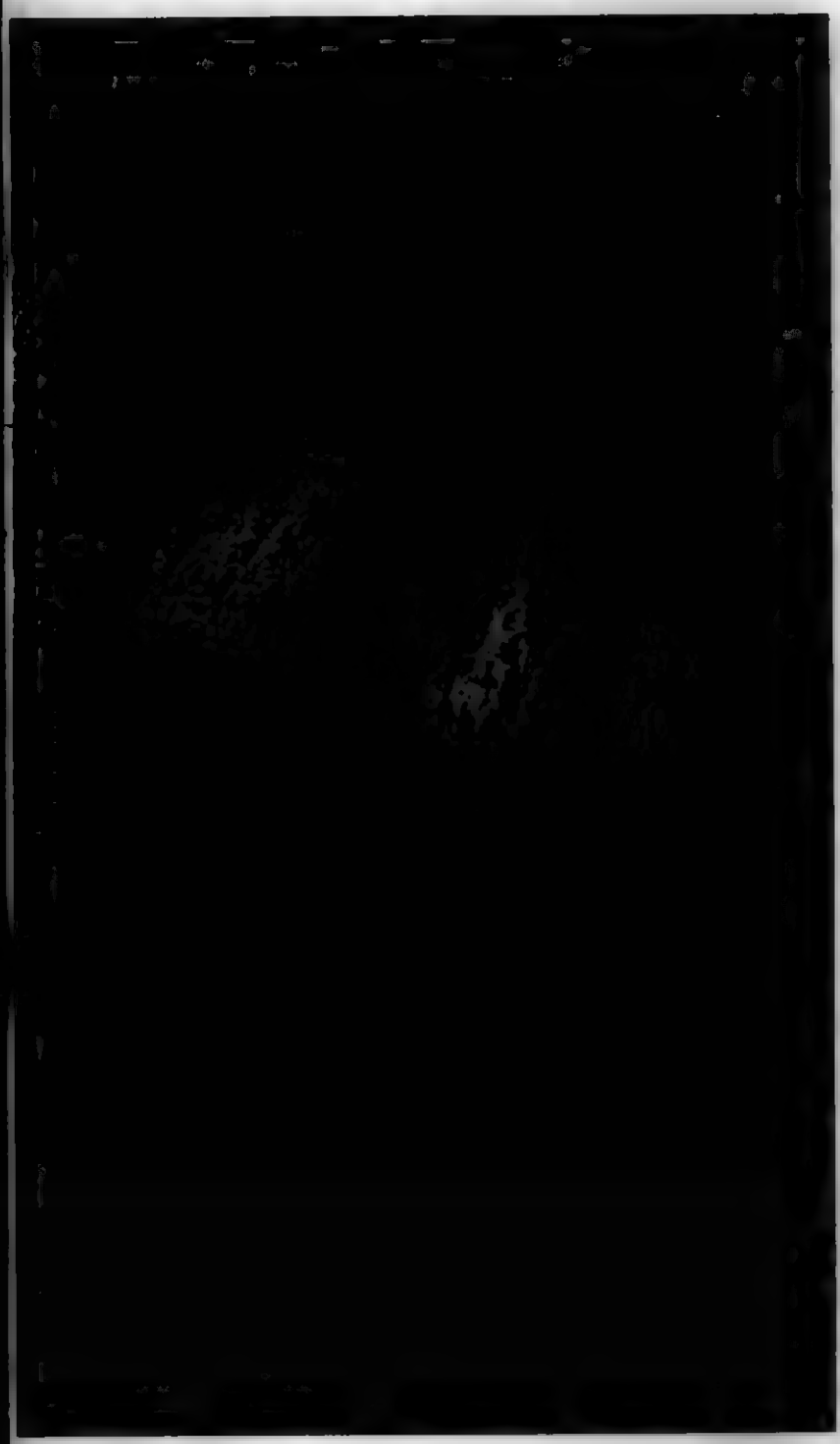

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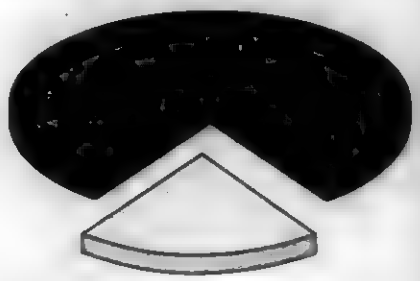

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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
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12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Educator, Journalists, Librarians, Students
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3. Do you use, evaluate, specify, recommend, purchase: (check all that apply)

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❑ Netware (b)
❑ OS/2 (c)
❑ Unix (d)
❑ Mac OS (e)
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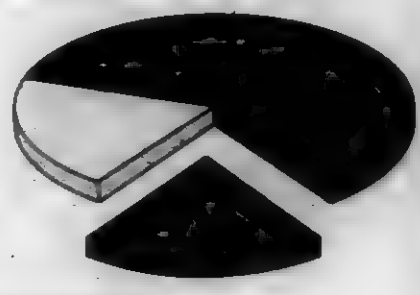

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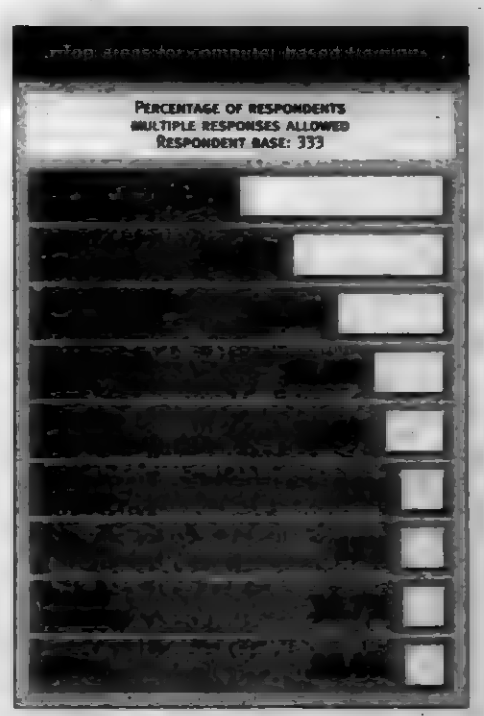
Training on thin ice

As corporate training goes high-tech, coordination between IS and human resources departments becomes critical. But the walls between them are still rarely breached.

Do workers have the skills they'll need tomorrow? That question, once academic, has become profoundly important with the downsizing, rightsizing and career-shifting that have torn through the economy over the last few years. According to the American Society for Training and Development in Alexandria, Va., U.S. companies spend $30 billion, or 1.5% of payroll, on employee training annually.

Using the computer screen as a vehicle for training workers is not new. Computer-based training (CBT) has been around for well over a decade and is available on platforms ranging from standalone PCs to mainframes. Until now, however, CBT's use has been relatively narrow: It is used primarily to teach people about computers and software, not how to perform their jobs better or refine

Training, *page 82*



Source: SB Communications, Hingham, Mass.

▶ Union Carbide's Ted Smith: *HR now manages instructor-led courses in software*

Training

CONTINUED FROM PAGE 81

general-purpose business skills.

But many observers say that's about to change, both because firms are desperate for faster ways to teach workers new jobs and problem-solving skills and because of technological improvements — multimedia computing in particular (see story page 84).

IS challenges

This broader definition of CBT presents the information systems group — in many cases the de facto owner of CBT for computer-skills instruction — with several important managerial challenges:

- How should it coordinate with the human resources (HR)/training department or the business units requiring computer-based training?
- Who owns this high-tech training?
- Who authorizes capital investments in hardware and the software needed to develop and support it?
- Is the help desk, typically run by the IS shop, part of the training operation?
- What are the roles of the departments or business units that CBT will benefit?

Even today it can be difficult to tell where training leaves off and an IS function picks up. Take the case of the help desk.

"To what extent does the help desk become a training organization?" asks Ellen Kitzis, vice president at Dataquest, Inc.'s Worldwide Services Group in Framingham, Mass. Who ought to call the shots, she asks, if HR takes responsibility for classroom-based PC training but users call IS when they get into trouble?

The best examples of coordinated IS/HR efforts are found in "businesses that have recently gone through business process re-engineering," Kitzis says. In these cases, training is not seen as something separate from information systems but is "tied to a larger change effort in the organization."

For example, IDS Financial Services, Inc. in Minneapolis is re-thinking its business processes with an eye toward providing its customer support agents with "electronic performance support" that will dramatically reduce the time spent training employees.

"Previously we spent 12 hours on instruction for agents doing money transfers to IDS accounts," remarks Betty Mackay, director of service operations training at the American Express Co. subsidiary. Mackay notes that a bank transfer is a four-minute task, but because of its complexity required hours of classroom instruction and a full month of practice.

Mackay says she expects the new customer service interface — implemented on a Macintosh platform and featuring multimedia, a rules database and artificial intelligence components — will reduce training to between 30 and 60 minutes of practice. IDS could ultimately have 800 to 1,000 users on this system or others like it, she said.

"We assumed the underlying systems would stay the same, but we wanted to change the interface so that people could understand it easily," says Mackay, who worked on the project with members of IDS' IS group and staffers with a background in instructional design.

Significantly, Mackay is a trainer with the business unit, not with IDS' IS or HR departments. To some, Mackay typifies the trend of authority over training's increasingly moving out of the hands of either the IS or HR department.

"The business units themselves are taking on the responsibility, using HR and IS as advisers," says Don Arnoudese, vice president at CSC Index, Inc. in Cambridge, Mass.

As corporations re-engineer and move to a "process model" of work — in which activities cross departmental boundaries — training will be incorporated into a larger picture, he says.

"Process owners" within the business units, he says, will consult with IS for technical know-how and with HR/training for coursework design.

But business unit or departmental responsibility for training remains the exception and not the rule. Few firms have any formal coordination among the three parties.

Better coordination between IS and HR might, for instance, allow the help desk to feed the HR department information about subjects that users are confused about, which in turn would bring HR to modify the content or emphasis of its computer classes.

For busy schedules

More typical is the situation at Union Carbide Corp. in Danbury, Conn., where for the past three years the IS department has had province over CBT courses on Microsoft Corp.'s Windows, Excel and Word for Windows — all company standards.

"We have CBT mostly for people who don't have the time in the office for more formal training," says Ted Smith, manager of systems development. Instructor-led courses in software, once coordinated by IS, are now managed by outsourced trainers, who are managed by an education group in the HR department.

"We participated in the transfer about a year ago, and we evaluated the outsourcer," Smith says. He adds that the IS department is also considering a separate group to handle technical skills development for its staff.

Elsewhere, mutual suspicions may hamper the chance for improved coordi-

Training, *page 84*

Why Johnny can't train

Computer-based training has its limits, but multimedia may transcend them

The blush is off the rose with computer-based training (CBT), which the industry heralded as an ideal, general-purpose teaching tool in the 1980s.

"Last year only 18% [of survey respondents] were using it to teach nontechnical skills," says Jack Gordon, editor of Minneapolis-based *Training Magazine*.

The reason, according to some, is that some kinds of instruction are not suitable for self-study.

"Self-study, like CBT or video, is an effective way to build knowledge but not skill," says training consultant Dennis J. Kravetz. To teach someone golf, he says, one could have someone watch golf. "But you won't become a competent golfer unless you get a golf club in your hand."

Don Arnoudese, vice president at CSC Index in Cambridge, Mass., agrees. "There's still nothing like sweating together in the same room," he says, referring to teaching management concepts, which he contends will never be reduced to a software program.

That could change as multimedia computing comes to the desktop, enabling video and audio training material to be incorporated into the working life.

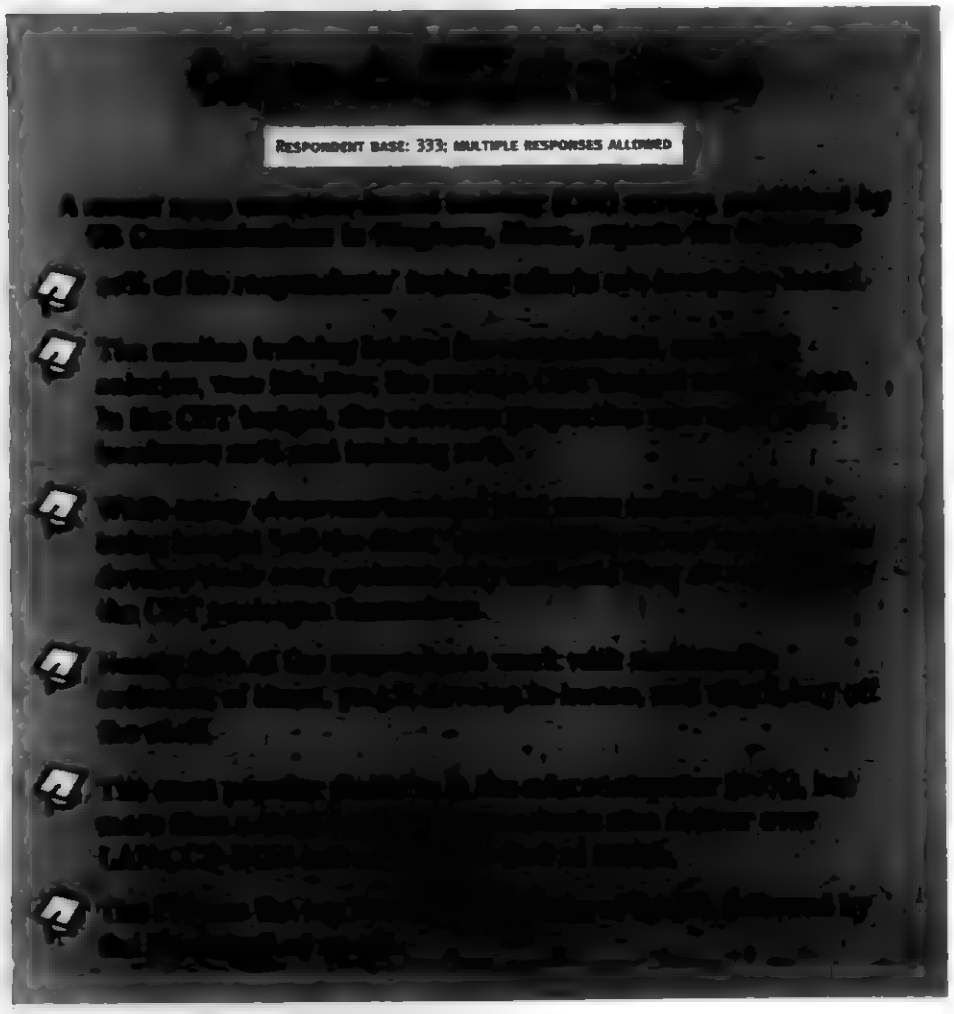
One of the most bullish proponents of this future is Gloria Gery, an independent consultant in Tolland, Mass. The key, she says, will be multimedia implemented through the use of object-oriented programming techniques.

"The object database could be reused across applications, including training," she says. In other words, training would no longer be a separate application but would be wedded into the work application itself.

Gery insists that well-designed software — either custom or commercial packages — can teach users everything they need to know.

"Training is now largely compensatory for badly designed applications," she says.

— Ellis Booker



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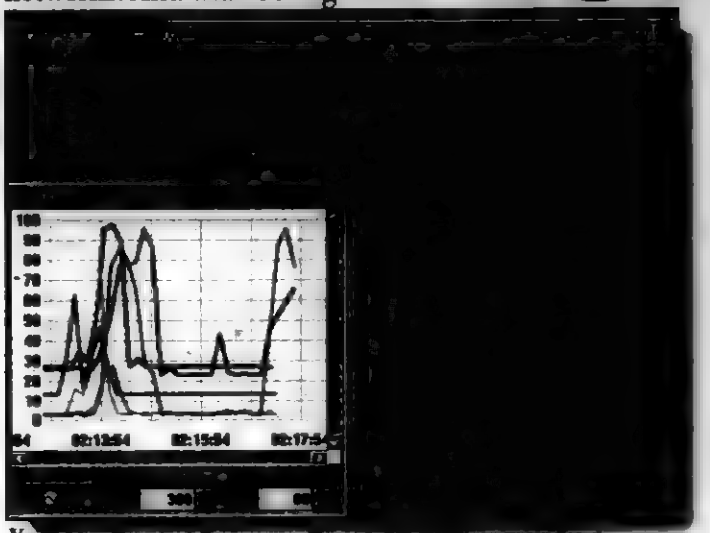

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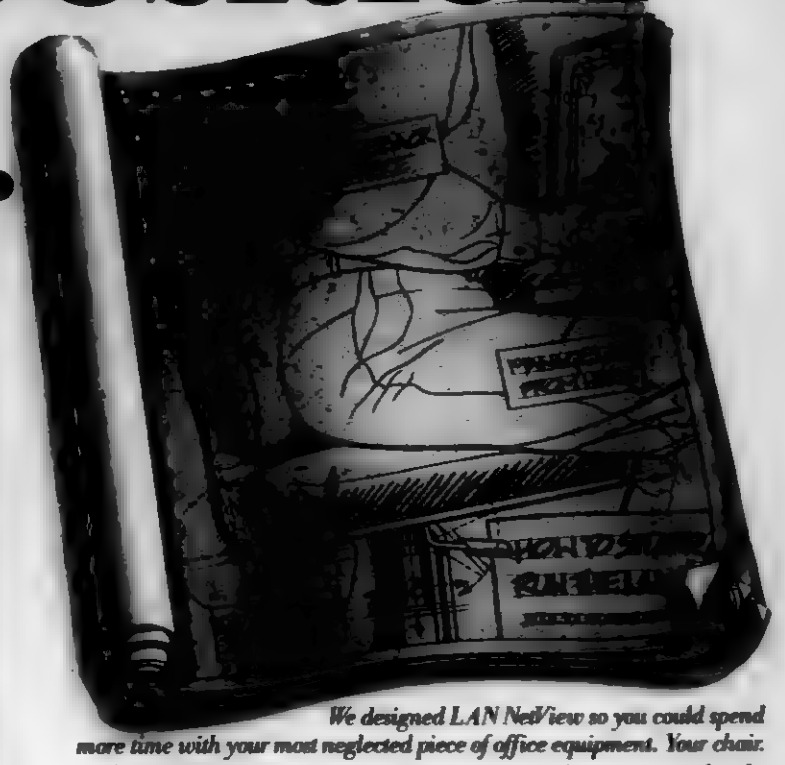

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IBM

Chicago IS group

From one executive . . . to another

By Ellis Booker

When the heavy hitters from in and around Chicago's information systems community gather quarterly to hear a vendor presentation, they are almost always promised a good show.

That is because the Chicago Research & Planning Group (CRPG), composed of more than 100 of the Midwest's top IS executives, insists on hearing from chief executive officers and chairmen. Period.

"[In 1991] we brought in Jack Kuehler from IBM, and it was a very refreshing presentation," said Frank Diaz, president of Kemper Service Co. in Chicago. "He was a technologist talking about his firm, not a marketeer." Diaz, a founding CRPG member, added that the IBM president fielded some "tough" questions.

Not all vendor CEOs have felt comfortable meeting a hundred or so high-level IS executives on their own turf. Attendees at Charles Wang's presentation last year recalled that the Computer Associates International, Inc. leader became a bit rattled under the questioning before settling down into a decent dialogue.

Still, many vendors want to go through this trial. This year the group has heard presentations from the following: Microsoft Corp.'s Bill Gates; Apple Computer, Inc.'s John Sculley; NetFrame System, Inc.'s Carlton G. Amdahl; and EMC, Inc.'s Dick Egan.

"So many firms want their CEOs to talk to us that we have gone to a luncheon format in addition to the quarterly meetings," said CRPG Executive Director Richard G. Arns.

Incorporated in 1991, the CRPG has a membership roster that reads like a "Who's Who" of Midwest IS departments. The group's founding members, who began talking in 1989, were Warren Ousley, at the time president of LaSalle National Service Co.; Peter Miller, corporate senior vice president of First National Bank of Chicago; and Diaz.

Another example of the group's chutzpah is the fact that, unlike broad-based professional organizations like the Society for Information Management, CRPG is exclusively an executive club.

"We're building a 'commodity exchange' for information transfer."

Richard G. Arns
Chicago Research & Planning Group

In fact, the CRPG is one example of the increasingly vocal and powerful local user groups that have sprung up in recent years [CW, June 7]. These groups have emerged as the pace of technological change in business has accelerated, and as open systems and distributed computing have cracked the market hegemony of firms such as IBM and Digital Equipment Corp.

Like these other groups, the CRPG does attempt to use its collective numbers to lobby vendors for better service, features and prices.

In addition, the Chicago group is explicitly dedicated to helping members avoid mistakes by sharing experiences.

"We're sharing [technical] classes we do in-house," said Peter Miller, corporate senior vice president at First National Bank of Chicago. The group's so-called Education Training Consortium offers more than 100 courses at member sites.

Member 'database'

But the consortium is just the first phase in the CRPG's ambitious educational initiative, according to Arns, who is now engaged in an innovative project that will collect the requirements (and real-world experiences) of CRPG members and make them available to academia, vendors and other parties.

"We're building a 'commodity exchange' for information transfer that will link users, universities and vendors," said Arns, who hopes to have an on-line database supporting the project within a year.

All its activity has put the CRPG on the map.

"Oh, we have had a lot of requests from out of town to join," Diaz confirmed. "But we intentionally want to keep it here. That was a front-end decision."

For Diaz and others, this rule is not elitist as much as it is practical: To fulfill the group's mandate of providing an informal place to network and exchange ideas and approaches, the members ought to be in close proximity.

"We're not out to build an empire," Miller agreed.

Training

CONTINUED FROM PAGE 82

nation between the HR and IS departments. IS may feel HR professionals don't have the know-how to train workers on computers; HR might think the IS staff doesn't know how to teach. In fact, tensions between the two groups predate the widescale deployment of networked PCs or the more recent interest in multimedia for training, those in the field point out.

"It began when interactive laser disc came on the scene," says Chuck Gorman, president and chief executive officer of Learn PC, Inc. in Minneapolis. The interactive laser disc has been used as a skills-development tool — generally as an adjunct to classroom instruction — for eight or nine years. "That started the question, 'Who owns and manages this?' "

More teamwork

Although the HR and IS departments are minimally coordinated today, in the future they will work together on a range of projects, predicts Dennis J. Kravetz, a training consultant in Rolling Meadows, Ill.

"What HR can contribute is [knowledge about] how adults learn, how to structure training, curriculum and courses," he says. Coupled with the IS department's contribution — an understanding of what a particular hardware/software combination can provide — the result can be "really outstanding" products," Kravetz says.

Take the case of ITT Hartford Insurance in Hartford, Conn., which has developed and deployed a "proof of concept" electronic performance support system, a client/server application that includes reference, training demos and expert-system-like coaching to property analysis underwriters. A proof-of concept system is defined as one that may not necessarily be pursued as a production application.

"We wanted to see if it was technically possible to do it and if it was worth doing," said Celia Duke-Moran, an education consultant in ITT Hartford's HR department. "The answer was yes to both questions."

Broad-based participation

Even more striking than the pilot application, which eventually will be rolled out to some 4,500 users in 44 offices, is the fact that the team who built it included representatives from the business unit, the IS group and the training department.

"We were successful because application developers brought us in at the beginning, not at the end," Duke-Moran says. She contends that if handled properly, such systems will not territorially threaten the training department.

"Training is never going to go away," she says. "But I think trainers will be relieved that some portion can be brought to the desktop. It makes their role clearer." ■

Calendar

OCT. 24-OCT. 30

Information Technology Association of America (ITAA) Management Conference. Seattle, Oct. 24-27 — Contact: ITAA, Arlington, Va. (703) 284-5355.

The Seybold Executive Forum. Hancock, Mass., Oct. 24-26 — Contact: Patricia Seybold Group, Boston, Mass. (617) 742-5200, ext. 115.

Wireless and Portable Computing Technical Forum. Burlington, Mass., Oct. 25 — Contact: Frances, Hagerty & Associates, San Jose, Calif. (408) 453-5220.

Geoworks Software Developers Conference. "GEOS: The New Profit Platform." Burlingame, Calif., Oct. 25-26 — Contact: The Bohle Co., Los Angeles, Calif. (310) 785-0515, ext. 227/233.

EDI Show. Dallas, Oct. 26-27 — Contact: EDI 2000, Dallas, Texas. (214) 475-1836.

Common Desktop Environment Developers Conference. San Jose, Calif., Oct. 26-28 — Contact: Uniforum Association, Santa Clara, Calif. (408) 986-8840.

CD-ROM Expo & Conference. Boston, Oct. 27-29 — Contact: CD-ROM Exposition & Conference, Dedham, Mass. (617) 361-0617.

Symposium on Computer Applications in Medical Care. Washington, Oct. 30-Nov. 3 — Contact: American Medical Informatics Association, Bethesda, Md. (301) 657-1296.

OCT. 31-NOV. 6

Seventh International Conference on Design for Manufacturability. Orlando, Fla., Oct. 31-Nov. 4 — Contact: Management Roundtable, Boston, Mass. (617) 232-8080.

James Martin World Seminar. Los Angeles, Nov. 1-5 — Contact: Susan Levine, Extended Intelligence, Inc., Chicago, Ill. (312) 346-7090.

AMR's Seventh Annual Executive Conference. "Customer-Oriented Manufacturing: Uniting Operations and Information Systems Strategies for Competitive Dominance." Boston, Nov. 2-3 — Contact: Advanced Manufacturing Research, Inc., Boston, Mass. (617) 542-6600.

Federal Imaging 1993. Washington, Nov. 2-3 — Contact: National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

Client Server Workshop. Los Angeles, Nov. 2-4 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

E-mail World Conference & Exposition. Santa Clara, Calif., Nov. 2-4 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Unix Perspectives: The Conference for Enterprise Solutions. Dallas, Nov. 2-4 — Contact: Unix Perspectives, Andover, Mass. (508) 470-0526.

NOV. 7-NOV. 13

Fourth International Conference on Applications of Software Measurement '93. Orlando, Fla., Nov. 7-11 — Contact: Applications of Software Measurement, Jacksonville, Fla. (904) 268-8639.

ICCAD '93. International Conference on Computer-Aided Design (ICCAD). Santa Clara, Calif., Nov. 7-11 — Contact: Association for Computer Machinery, New York, N.Y. (212) 869-7440.

First Annual Pan Am EDI Users Conference and Exhibit. Orlando, Fla., Nov. 8-10 — Contact: EDIA/EDICC Pan Am, Conference Registrar, Alexandria, Va. (703) 838-8042.

"It was taking us ten days to get price quotes in a market where prices changed hourly."

– Chevron Canada

"Our client, TRW, found that getting information for project planning was simply too slow."

– NetBase Corporation

"Teachers were spending more time on reports than on teaching."

– National Computer Systems

"We had multiple systems from two companies, all with different looks, all taking data and processing it in a different way."

– Chemical Bank's Geoserve® Group

"Despite automation, drafting was still a paper intensive process."

– Aetna Life and Casualty

"There was no easy way to get critical ticketing information to the PCs on agents' desks."

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These days, accurate pricing information on 300 products can be accessed online by 200 users. Price and tax adjustments can be handled many times faster, and paper-handling costs have been cut in half.

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Aerospace giant TRW approached NetBase, a Microsoft Solution Provider, to help it manage its projects more efficiently. The problem: Getting project data from the mainframes was expensive and slow.

NetBase used Microsoft Visual Basic to build a multiuser system with a graphical front end, and the Microsoft FoxPro® database for real-time reporting. The result: Mainframe expenses were cut by 40%, and TRW's profitability is up 20%.

"Schools applied technology to cut administrative costs."

The education division of National Computer Systems (NCS®) had been handed a classroom problem: In public school systems around the country, teachers were still managing reports by hand, and losing instruction time.

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"Now our managers get a unified, consistent view of the enterprise. Instantly."

After a 1992 merger, Chemical Bank's Geoserve Group found itself with multiple computer systems.

Geoserve created harmony by combining the Microsoft Access' database and SQL Server through ODBC, a database access technology, to generate reports based on customer revenue and product data.

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Aetna produced up to 6,000 booklets a year, each outlining a benefits plan for a different corporate customer. The problem: They used dead-end text processing and document management systems to do it.

The solution was an integrated document management system built around Microsoft Visual C++ and Word for Windows", plus a front end created with Microsoft Visual Basic.

As a result, Aetna has cut the time required to draft new booklets by more than 115 hours a week, while improving the final product.

"Agents can grab data, work with it, and use it to give customers better service."

In 1992, Air France's ticketing data was in a holding pattern, stuck inside a proprietary database that ran on mid-range equipment.

The airline, in partnership with MediaServ, a Microsoft Solution Provider, rightsized to a system with Windows NT, SQL Server for Windows NT, Visual Basic, Visual C++, and Microsoft Access.

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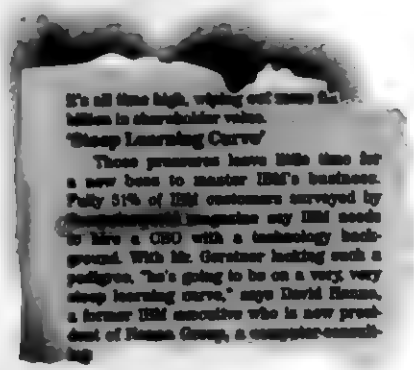

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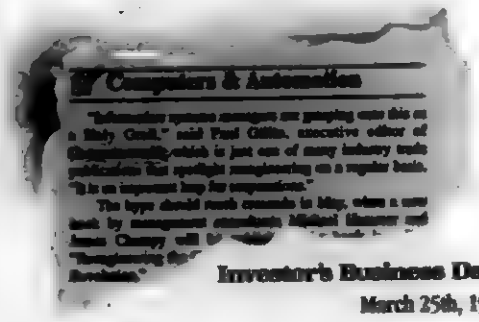

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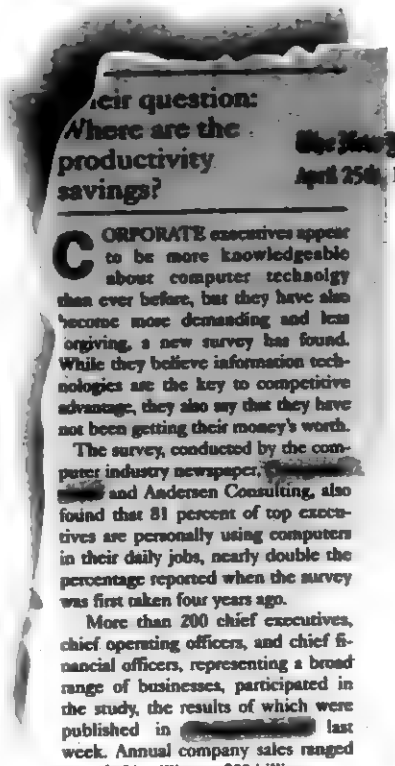

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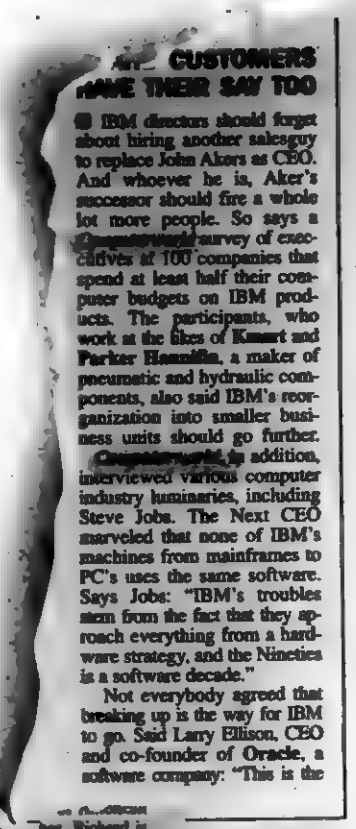

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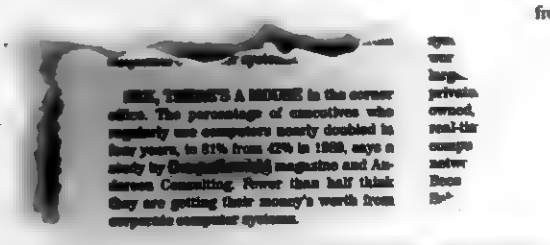

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The Newspaper of IS

out of SIGHT out of MIND [out of LUCK]

Some mission-critical wireless LANs get neglected because they are tucked away on the operations side of the business

BY KEVIN R. SHARP

The crowd parts as the stranger walks through a packed Kmart, his hand groping for the sleek, shiny gun on his hip. He raises it, aims — and fires.

But there are no shrieks or bloody corpses, and there will be no day-after headlines about a disgruntled employee on a shooting spree. That's because this stranger is a Kmart staffer who is checking the inventory status of waffle irons. The "gun" he is using is a wireless Symbol Technologies, Inc. data terminal with an alphanumeric keyboard, small display, laser bar-code scanner and radio unit. It's a handheld computer with a pistol grip.

In less than 7 seconds, information makes the 100,000-mile round-trip from that Kmart store to a Teradata Corp. machine at Kmart Corp. headquarters in Troy, Mich., touching 11 computing devices and eight networks along the way. In the end, the employee knows whether he has a match between what's on hand and what's on order.

"When operations and merchandising determine that it is good for someone standing in the store to know a certain thing, the architecture enables that to happen."
Dave Carlson
Senior vice president,
Corporate information systems
Kmart

Kmart employees are part of a quiet revolution going on in back offices, on production floors and out in the field. Users are moving short bursts of mission-critical data over wireless networks to and from a host computer.

The most important weapon in the revolution? Transaction-processing wireless networks that use radio frequency communication to support the minute-by-minute processes by which corporations earn their revenue.

Out of sight, *page 90*

CONTINUED FROM PAGE 89

These networks literally place a company's information resources in the hands and on the fork lifts of production workers.

But information systems managers traditionally haven't paid enough attention to issues in this area. That's because transaction-processing RF LANs aren't part of the sexy, high-profile world of corporate information and decision-support technology. Instead, they support the down-and-dirty world of operations, commonly the purview of all those "manufacturing types."

More startling still is that some IS groups view RF as a form of black magic; with network topologies different from wired setups, the whole area has become shrouded in mystery.

Let's smash the mystery to bits.

"When a customer walks into a dealership, if you can't get him a part, he is going to go someplace else. We make the commitment to ship the part anywhere in the U.S. in 24 hours. What drove us to [RF technology] is dynamic updates."
Roger Valentine
Operations analyst
Chrysler

In a mission-critical environment, temporary interruptions in processing are taboo. Reliability and availability are paramount. To a firm such as Chrysler Corp. — where workers in a 1 million-sq-ft parts warehouse scan about 50,000 bar codes a day — a slowdown or interruption at that pace means customers won't get a part in 24 hours.

And the pressure of severe just-in-time (JIT) shipment constraints adds fuel to the fire. At Collins and Aikman Corp., a $1.3 billion textile manufacturing company that supplies carmakers, JIT shipments have to be sequenced in the right order on a pallet and the right order on a truck. Employees use RF devices as they load a truck and gather information the company uses to generate shipping papers and electronic data interchange advance shipping notices.

"Without an RF transaction-processing network, you'd have to write [JIT sequences] down and take them back into the office. The truck would be waiting. In the automotive industry, you don't make anybody wait around."
Harry Sanders
Manager, manufacturing systems
Collins and Aikman

Communication reliability requires adequate RF coverage throughout an active work area, typically provided by some combination of RF controllers broadcasting through one or more antennae. Some types of RF networks, known as narrow band, support a few dozen users per frequency and cover about 1 million square feet indoors. Other systems, namely spread-spectrum systems, support 100 or more users and cover about 100,000 square feet indoors per cell (see story below).

Chrysler achieves transparency for its workers in its 1 million-sq-ft distribution center by having four in-building RFs. It has 31 RF terminals and two base radios attached to each frequency. Cable connects base radios to a controller. The base radios have the intelligence to switch the handheld units automatically to the nearest base. Workers, who typically have had little exposure to computers, worry only about the job at hand, not about file transfer.

"The operators never know which of the bases they are talking to."
Roger Valentine
Chrysler

Using a transaction-processing wireless LAN requires more than just a good solid communications channel, however: It must interact with the wired world.

Other wireless configurations, such as wireless desktop nodes, directly replace standard wire. Therefore, most software operating across a wired network will interact with the wireless node without modification. The rest of the network sometimes does not know a particular node is connected without a wire.

Transaction-processing LANs, on the other hand, don't behave at all like wireless desktop LANs. The interface is not transparent, so the IS staff consciously needs to make the interface happen.

A network bridge is needed to move data between wired and wireless domains. The bridge uses a proprietary scripting language to develop transactions.

The transaction developers need to consider the limited display size of the RF terminals when deciding how to present information. The language needs to extract and format user data. The data must be transferred to a wired network application program, which can then distribute it to other applications on the wired network, if desired.

Some wireless transaction-processing networks get around the proprietary scripting problem by offering terminal emulation. In this case, the network RF terminals might look like a collection of 3270 terminals. Any application program written for a 3270 environment theoretically works without modification.

However, except for one machine I know about (not yet on the market), wireless terminals never provide a full-screen display. If screens originally written for full-screen 3270 terminals are sent to limited-display wireless terminals without modification, the user must scroll the display around to see the entire screen. Such scrolling slows things down for users needing hands-free movement.

Also, it may take many more screens to accomplish a transaction on a wireless terminal than on a full-screen one. For instance, entering an operator ID, product designation, serial number, quantity and bill of lading reference number — a one-screen job on a 3270 — turns into a three-screen job in an RF network environment.

If transactions are executed from wired 3270s, any change to the wired screens must be translated to the wireless applications and vice versa.

"As you change the transactions running on the RF network, you open up the whole issue of whether the changes will cause problems on the wired side."
Harry Sanders
Collins and Aikman

Most IS shops choose to rewrite the screens so data remains the same, but users get information a little at a time within the constraints of the display. Some RF networks perform this translation in the controller; some require modification in the host application.

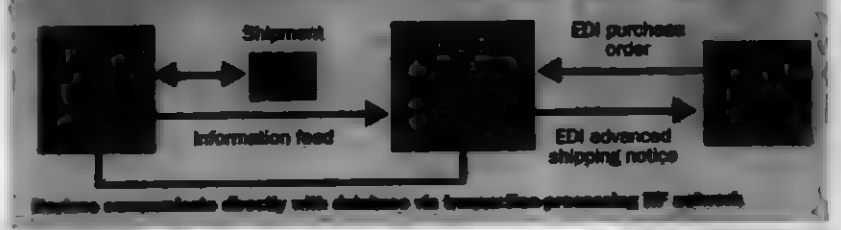
Either way, someone still has to perform the conversions manually, and someone must make sure the small screen version is kept up to date.

Unlike most corporate networks, transaction-processing RF networks serve users whose primary jobs do not include computer work. The value of these networks comes from their ability to deliver data from corporate information infrastructures directly to people creating value in the company. The challenge for IS managers is to design and maintain the network so people can concentrate on their jobs, not the computer system.

Sharp is a data communications and automatic identification consultant in Tucson, Ariz., and a technical editor at *ID Systems* magazine.

MISSION-CRITICAL WIRELESS IN ACTION

COLLINS AND AIKMAN



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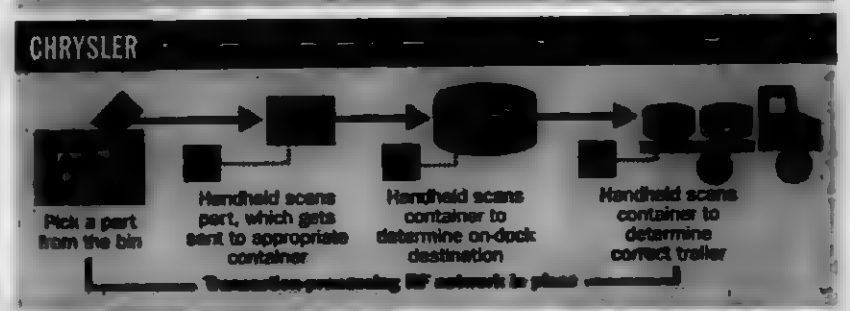

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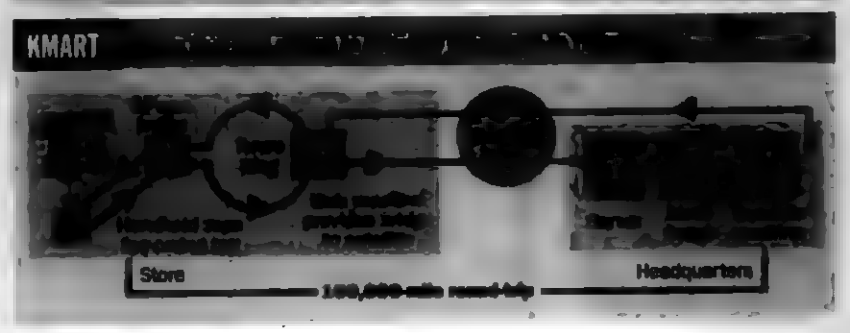

Sources: Collins and Aikman Corp., Chrysler Corp., Kmart Corp.

Users' choice

Types of transaction-processing RF networks:

Narrow band
- Need Federal Communications Commission license.
- 25-KHz-wide spectrum allocation; up to 9.6K bit/sec. throughput.
- Radios offer up to 2 watts of power; transmitting 1 mile in the open or about 1 million square feet inside.
- Interference protection in theory because FCC license reserves frequency exclusively for installed network.

Spread spectrum
- No FCC license needed.
- Half-watt units provide coverage of 250 to 500 feet per cell. Kmart, for instance, averages between two and three cells per store.
- Overcomes noise by transmitting at high data rates. Each message bit transmitted many times; even if some bits don't get through, error-correction algorithms ensure transparency.

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Making the switch

Advice on working with relational databases for flat-file types

By David Baum

THE SWITCH FROM working with flat files to working with relational databases mirrors a larger movement now taking place. Many organizations are introducing powerful new processors to supplement their mainframe systems, from low-end PCs to powerful Unix workstations. These processors find their way as facilitators of client/server applications, and increasingly, that spells one thing: relational databases.

When Cobol was developed, programming languages had to have everything in them to make a monolithic application, including data management and data access functions, says John Bradley, vice president of Liant Software Corp. in Framingham, Mass.

Today, the database portion and the user interface portion are separate from the business rules, or application logic. It isn't the application's prerogative to decide how data is stored.

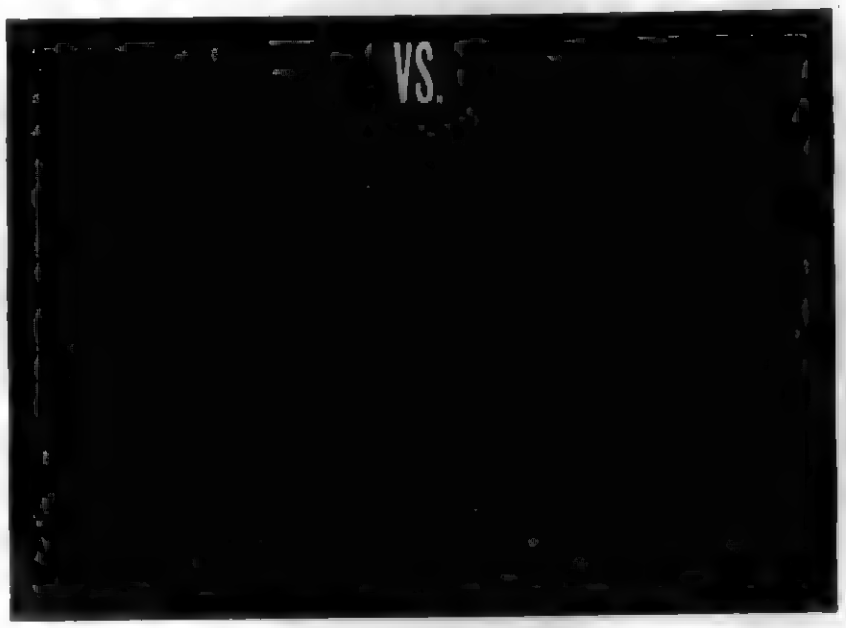
"Cobol programmers are used to writing custom programs to retrieve data, and they bring this procedural mind-set to database querying and reporting," says Anu Shukla, director of worldwide marketing at Uniface Corp. in Alameda, Calif. "They have to start looking at problems in a relational fashion, which requires a different level of abstraction. Business problems must be analyzed in terms of the relationships of events."

While flat-file databases store, organize and retrieve information from one file at a time, relational databases store data in two-dimensional tables. Programs take data from several tables at once, relating information through links established by a column or field.

Ken Fleming, president of Suite Software in Anaheim, Calif., says the main issue for flat-file programmers is making the mental shift that working with relational databases requires.

With flat files, relationships among files are managed by the applications themselves, and programmers must code for data management functions such as referential integrity, commit and rollback. But in the relational world, this work is handled by the database engine.

"The mistake programmers make is in bringing a flat-file mind-set to working



with relational databases," Fleming explains. "Instead of treating the relational database as a database, they treat it as a bunch of files. But the relational engines take care of referential integrity and other complex data management functions. Programmers don't have to burden applications with these tasks if they use the engines properly."

Application development actually gets simpler once programmers understand how to use the relational databases. To properly build a relational application, there is typically some kind of modeling scheme used to establish the entities and relationships of the database. A single entity has multiple relations represented by data in tables. Relationships among files are established with foreign keys and views, which exist apart from any application's use of these files.

"Most Cobol programmers think of data as something they own and must be responsible for," Fleming adds. "But that's the database administrator's job. Application programmers should be focused on the business functionality of each application, not on how and where the data is maintained."

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.

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LAYOFF SURVIVORS

By Joe Panepinto

While many IS managers and consultants dance gingerly around the topic of staff reductions, the IS personnel who remain find themselves in the far less genteel situation of shoveling out from under a mountain of new responsibilities.

In fact, from a career perspective, it may be more worthwhile to be one of the first employees released in any kind of a cutback because it gives the IS professional a head start on picking up new career skills and canvassing local companies for job opportunities, says Allen Davis, president of The New Professional Group, Inc., a management consultancy in Amherst, Mass.

Too often, employees who remain at companies discover the cuts were made haphazardly and find themselves in a position where there is too much to do and too little time in which to do it.

A recent New Professional Group survey of 200 managers and professionals in the microelectronics industry found that nearly half believed corporate downsizing means a reduction in head count, not work load. The result for IS managers and others in newly "streamlined" companies is little, if any, time for training on new career-enhancing technologies.

Maintaining a dying system

"Generally, the people who are left behind too often are left to tend and maintain a dying, outdated system. They may be drawing a paycheck, but they are not really building any career capital," Davis says.

Leroy Comstock, data processing manager at Reynolds Metals Co. in Louisville, Ky., for instance, has seen his department shrink from 12 people to four, while the number of users he supports has skyrocketed. In the early 1980s, when the data processing staff was still about a dozen people, Comstock supported five dumb terminals on an IBM 4331 system. Today, with one-third the staff, Comstock's department supports 400 user profiles, 45 printers and more than 150 dumb terminals on a network with an IBM System/36 and an AS/400. At the same time, the data processing group has picked up new responsibilities for a mobile radio frequency network that supports PCs on forklifts in the warehouses.

"We're always putting out fires, so it is really hard to cross-train people on different systems because you can't spare them from their area of specialty," Comstock says.

Obviously, the career key for employees remaining in downsized IS departments is to get additional training. However, it is equally obvious that not all training is created equal.

> **"During the downsizing, we cut out a lot of redundancy. As a result, a lot of good people left who wouldn't normally have been cut because the situation was just too unstable for them."**
>
> Kevin Smith, Burlington Air Express, Irvine, Calif.

A year ago, a systems project leader at a recently downsized California process manufacturing company told *Computerworld* the best way to stay ahead of the budget ax was to stay as current as possible with technology: "Anything new that comes along I volunteer for," he said at that time. Well, it's a year later, and he hasn't really had the chance to stay current.

"From a personal perspective, in regard to career growth, I'm learning a new software package and gaining skills there," he says. "But the training is strictly applicable to this software package and to the mainframe."

That is not to say there isn't a silver lining to being spared the budget ax. Those who remain after the downsizing of IS departments sometimes have an opportunity to expand the breadth of their technical expertise. However, with the press of immediate responsibilities, employees run the risk of being a mile wide in terms of technical skills and only an inch deep.

Juggling jobs

"I find you have more jobs on your plate, so you have to address them more efficiently," says Kevin Smith, a project manager at Burlington Air Express in Irvine, Calif.

In the last year, Burlington has cut its IS department by almost 50% — from a high of 180 employees to about 100. Senior technical managers have begun doing more hands-on technical work such as writing procedures to gather network management statistics, and the hierarchy has been flattened. To help remaining employees keep up with new duties, Burlington has had many on-site training programs.

"I definitely think we are doing more training internally," says Smith, who receives virtually all of his training while on the job. "I wouldn't say it's a big change, but it is occurring."

Panepinto is a free-lance writer in Amherst, Mass.

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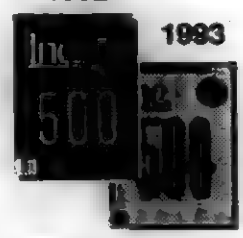

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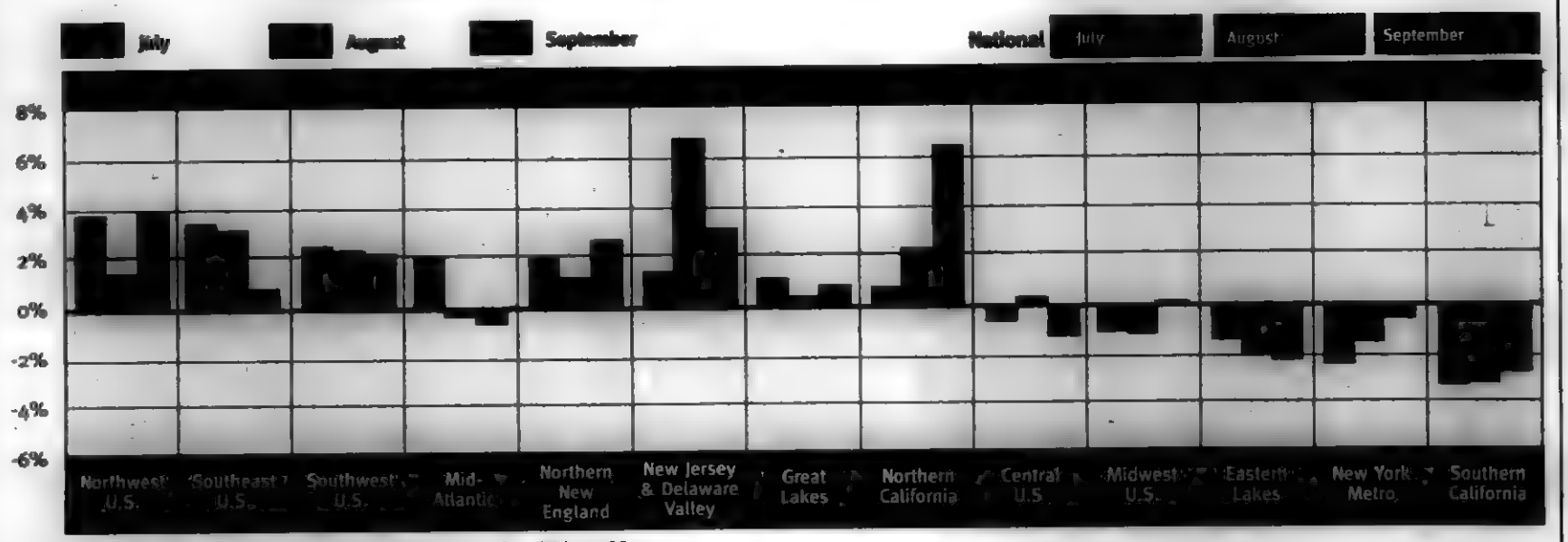

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SYSTEMS ANALYST (REF. #80000) to consult with clients to ascertain & define their business needs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: design & develop an integrated networking sys supporting various network protocols in UNIX SVR4 MP environment. Responsibilities incl developing software's device drivers in a multiprocessor (MP) environment & debugging the kernel; designing UNIX IPC, realtime sys & UNIX extensions using U 6000/7000/8000/S46 series in UNIX SVR 4 MP Environment; TCP/IP, SNA, X-25, FLORA, BAF, PRIMUS & PLLAPI. ED & EXP: Bachelor's in Comp Sc., Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 5 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: In whole or in part, developing apps on real time sys; & using Network Protocols, device drivers & UNIX internals. $34,000/yr. 40 hrs/wk.

PROGRAMMER ANALYST (REF. #72888) to consult with clients to ascertain & define their business needs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys incl maintenance, testing & enhancement of an integrated software sys. Responsibilities include performing analysis & design for enhancement, maintaining the sys with online troubleshooting, meeting with users to gather info & proposing test cases for testing. The team, support provided will be for enhancement and maintenance of the welfare sys using IMS DB/DC on IBM 3090 using IBM 3090, MVS/ESA, IMS DB/DC, TELON, CLISTS, TSO & JCL. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp after training in the related occupation in lieu of the req ed & exp. REL EXP: In whole or in part, exp sys design, preparation of test cases, sys testing & troubleshooting and using IBM 3090, MVS/ESA, IMS DB/DC, TSO & JCL. $34,000/yr. 40 hrs/wk.

PROJECT LEADER (REF. #74888) to consult with clients to ascertain & define their business needs or problem areas & utilize tech expertise to provide solutions to clients, needs, incl analyzing, designing, developing & implementing comp s/ware for clients, EDP sys. Duties incl: design & develop a large Integrated Production Planning & control sys for a manufacturing company. Provide sys implementation support & extensive user training. Study the existing sys on IBM mainframe under OS/MVSE, VM/CMS written in COBOL. Lead a team of developers & programmers in analysis, design & development of the sys using Yourdon methodology & Yourdon Tool Kit, INFORMIX 4GL 4.1 & INFORMIX STAR 5.0 RDBMS under UNIX 4.3 operating sys. Develop Communication Control programs. Provide post-development sys support. Design & develop training material. Provide user training. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: In whole or in part, development of integrated production planning & control sys for manufacturing; user training; & using UNIX operating sys, Yourdon Methodology & Tool Kit; INFORMIX, RDBMS & COBOL. $34,000/yr. 40 hrs/wk.

SOFTWARE ENGINEER (REF. # 78883) to consult with clients to ascertain & define their business needs or problem areas & utilize tech expertise to provide solutions to clients, needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: design & development of object oriented programs to implement data compression algorithms, using PL/AS, REXX, VM/ESA & IBM-3090; design & development of utilities for storage management of IBM 3390X DASD's using ISPF, PL/X, TSO, JCL, CLIST, MVS/ESA; & app development using DB2, CICS, CSP, PL/I. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: In whole or in part, design & development of object oriented programs to implement data compression algorithms & utilities for storage management of IBM 3390X DASD's; & using PL/AS, REXX, VM/ESA, & IBM-3090, ISPF, PL/X, TSO, JCL, CLIST, MVS/ESA PL/I & CSP. $40,000/yr. 40 hrs/wk.

SYSTEMS ANALYST (REF. #77888) to consult with clients to ascertain & define their business needs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP Sys. Duties incl: analysis, design & development of a financial automation sys; identifying business reqs; designing an object-oriented sys & implementing it using C++ on the IBM PS/2. Duties require the use of IBM PS/2, AIX, C, Microsoft C++ & Windows or Presentation manager graphical user interface. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 2 yrs of college ed plus 3 yrs of exp in the job offered or in the related occupation in lieu of the required ed & exp. REL EXP: In whole or in part, s/ware development on IBM 386 or 486; & using C, Microsoft C++ & Windows or Presentation Manager graphical user interface. $34,000/yr. 40 hrs/wk.

PROGRAMMER ANALYST (REF. #68888) to write & develop comp programming for clients' EDP sys, and a State Welfare sys. Duties incl: maintenance of the Benefit Issuance Module of the welfare sys, & writing, coding & user ed for new programs for Child Support Enforcement module of the welfare sys using IBM 3090 mainframe, PC/AT, TELON, COBOL, IMS DB/DC, JCL, CLIST, MVS/ESA BRACKETS, MS-WORD & PRO-KIT. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: In whole or in part, exp dsgng, developing, testing & implementing IBM 3090 & PC/AT, MVS/ESA, TELON, COBOL, IMS, JCL, CLIST, BRACKETS & MS-WORD. $40,000/yr. 40 hrs/wk.

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For the above positions, please forward/fax your resume in confidence to: (703) 486-4901, MCI Telecommunications, Systems Engineering Group, Bill Humbert, Dept. 0305/081, **Indicate Appropriate Response Code,** 601 South 12th Street, Arlington, VA 22202.

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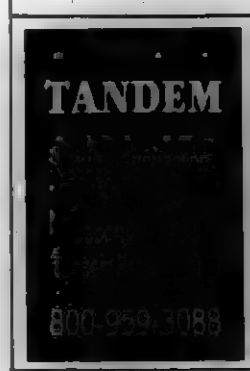

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"To generate sales for Across the Boards, a communications toolkit for developing cooperative applications, and pcMAINFRAME, a generalized micro-to-mainframe file transfer system, cfSOFTWARE has been advertising in *Computerworld Direct Response Cards* almost from the very start. Now, based on our past success, we've also started to advertise pc2POWER, our newest file transfer system. Since all of our products facilitate mainframe-to-micro communication, we need to reach IS managers and technical support professionals on the mainframe side as well as end users on the PC side. That's why *Computerworld Direct Response Cards*, with their large audience of buyers most apt to need our products, are one of our primary advertising vehicles.

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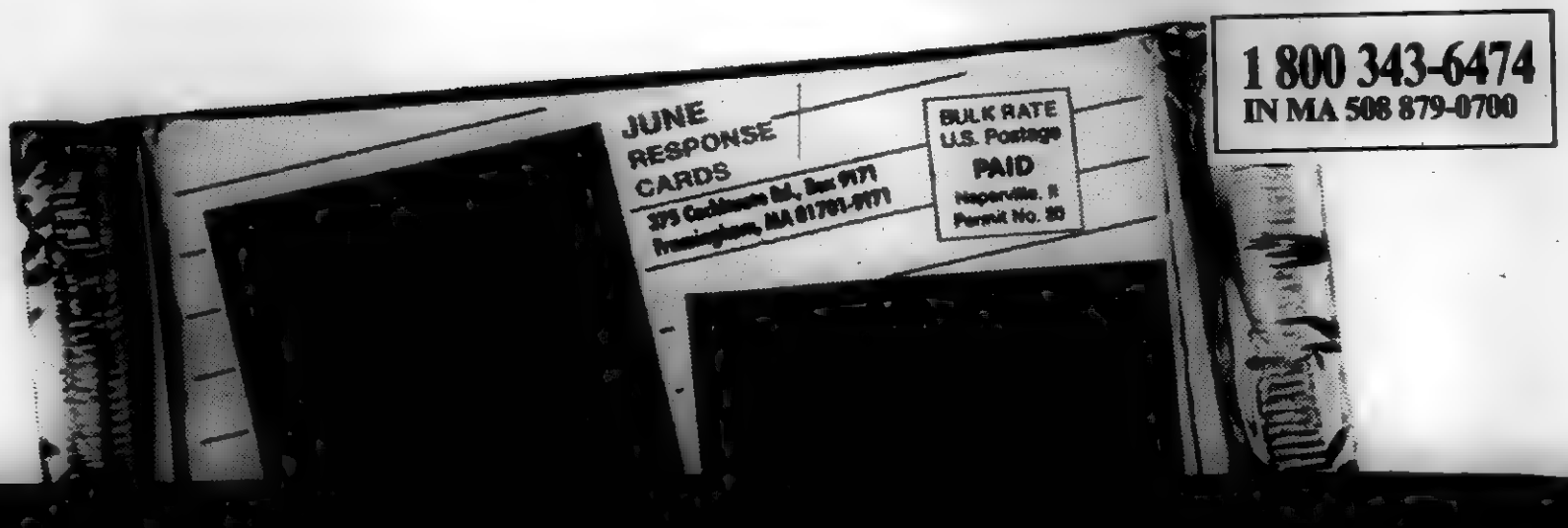

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shopper alert!

By David Baum

Visual development tools are catching on like wildfire as people look for quicker ways to get backlogged applications into production. They create beautiful graphical user interfaces (GUI), and their fast development cycles and short learning curves make them good for tactical development projects. But those tools do have limitations, which the vendors don't always mention. In a recent poll, software developers offered the following first-hand observations on just when these tools are appropriate and when a more comprehensive application development environment is required.

. . . the applications aren't portable.'

■ Most visual development tools were designed to create and deploy applications on Macintoshes and PCs. In many cases this is adequate, but as a department expands, the applications created might not go along for the ride.

"Development tools that work only with Windows can limit an organization with a diverse information enterprise," says Paul Ameden, a systems analyst at Kodak's Office Imaging Division in Rochester, N.Y. His advice? For key applications, it is better to use a cross-platform tool.

At the high end of the tools market, for example, a product such as Uniface from Uniface Corp. enables the same application to be deployed on platforms running Windows, the Open Software Foundation's Motif, Sun Microsystems, Inc.'s Open Look, IBM's Presentation Manager and character-mode systems simultaneously. The price for this complexity is that it may be overkill for simple applications.

. . . the software offers only limited SQL compliance.'

■ "Many of the simpler visual development products force you to write code for all relational database transactions," says Keith Therrien, a software architect at Arkwright Mutual Insurance Co. in Waltham, Mass. This is not a problem in a simple application that accesses a few database tables, he adds. However, it can get extremely time-consuming for relational applications, where 50 or 100 tables might be involved, with numerous joins among them.

Most development tools support SQL, but they differ widely in their implementations. Ralph Dunlap, a project manager at Georgia-Pacific Corp. in Atlanta, spells out the problem.

"Unless you have tried it, you can't appreciate the effort required to create applications that include both graphical user interfaces and SQL database processing. Just to create a simple invoice application that allows for a one-to-many relationship with standard SQL operations, even with a visual development tool, is a three-week programming task." For applications that must access complex relational database structures, it's better to use development tools optimized for a relational environment.

. . . the tools make little or no provision for high-level analysis and design.'

■ Haste makes waste, and if you create an application with no regard to established corporate data models, you'll pay for it in extra maintenance.

"It's great to have the ability to quickly throw together an application, but are you enabling users simply to build bad applications faster?" asks Ray Stanley, senior consultant at Miles Burke Associates in Scottsdale, Ariz. "How do you ensure that these objects represent the integrated views required by the business and that you are building a reusable asset?"

This is a common complaint about many visual development products. Lacking intimate connections to front-end computer-aided software engineering tools, there is often no provision for a true analysis of business requirements. Simple applications have their place, but developers such as Stanley stress the importance of working from a data model for mission-critical systems, in which all objects and attributes have been carefully defined.

Another caution: Some visual development tools can use a logical data model as the foundation for applications, but developers must type in the data definitions, which can be time-consuming.

. . . I have to write third-generation language code for all the business logic.'

■ Visual development products have enjoyed a nice ride on the GUI wave, but as application developers know, creating the GUI portion of an application is just the start. Once the interface is in place, you must connect it to the database and create the database-access logic.

Most visual development tools and GUI builders generate code for the user interface shell, but customization of that interface must be done manually, explains Todd Powell, senior systems analyst at TransAlta Utilities Corp. in Calgary, Alberta. "Even simple things that you probably take for granted if you have used a fourth-generation language, such as edit masks for a field, typically have to be manually programmed," Powell says.

. . . the software isn't really object-oriented.'

■ Visual development tools often claim to be object-oriented but are often merely object-like. "They are visual, or GUI, products, but they fail to meet any of the standard criteria for OOP languages, such as encapsulation, inheritance or polymorphism," says Colin Davies, a programmer in Simi Valley, Calif. Programmers who want a true taste of what it's like to work with objects are better served by a language such as Digitalk, Inc.'s Smalltalk, he adds.

Others agree. "A lot of the new tool sets lean toward object orientation, but they aren't really object-oriented at all," says David Booty, a project leader at Paradigm Management, Inc. in Dallas. The foundation of object-oriented processing is inheritance, he continues. A true object-oriented environment can create reusable, encapsulated code units that are extendable. At runtime, each code unit or object dynamically inherits the set of attributes that makes it unique, without recompilation or relinking.

When evaluating what tools to use for a particular project, most developers ask themselves two things: how much coding will I have to do, and will the resulting system be viable over the long term? If you can accomplish your objectives with a visual development product, then go to it, but don't be seduced into attempting too much with one of these products. You might bite off more than you can chew.

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.

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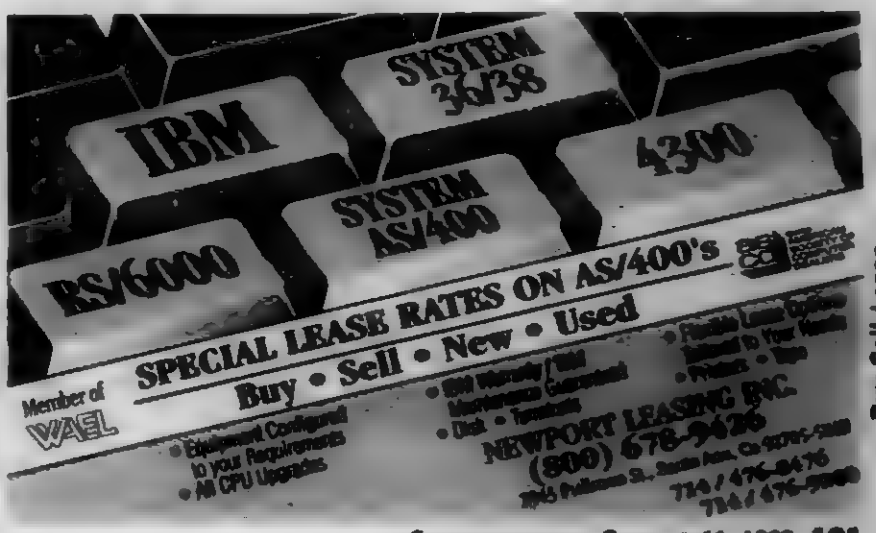

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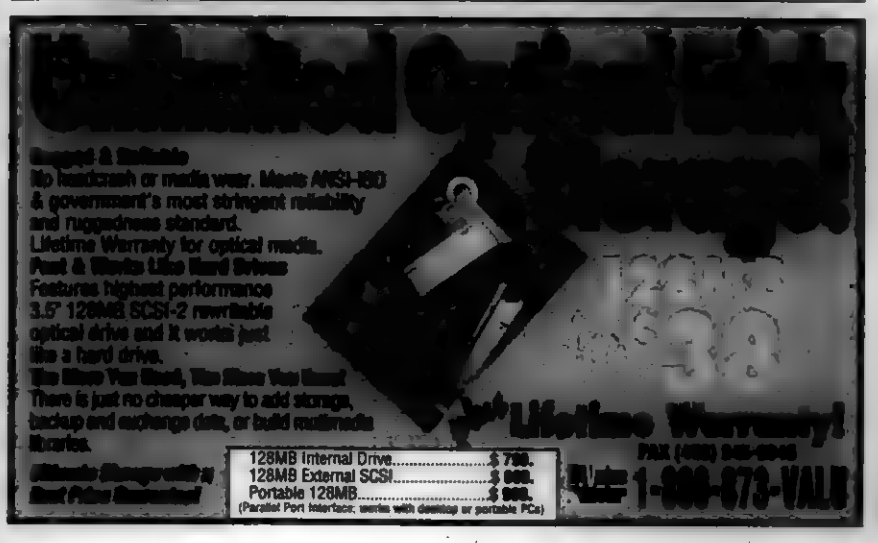

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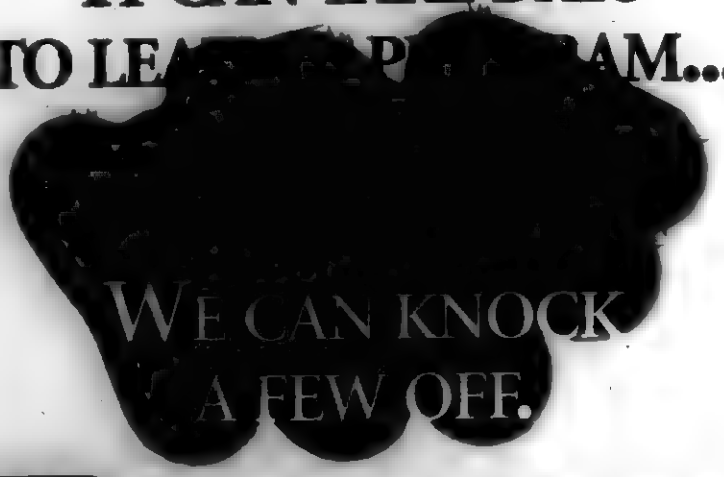

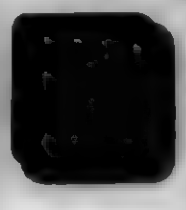

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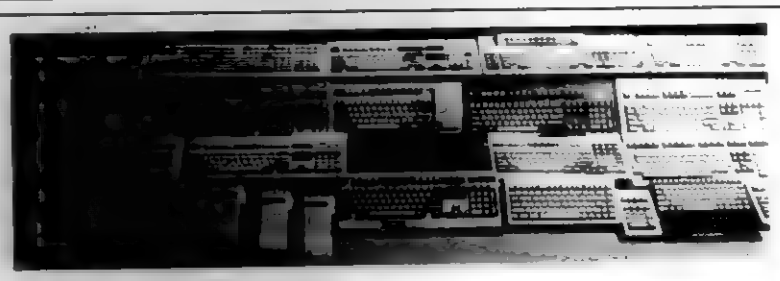

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Percent

[illegible] Inc.	31.8
Walker Interactive Systems	17.8
MMS	16.5
Sequoia Systems Inc.	13.8
Logicon Corp.	11.6
Microdyne Inc. (O)	11.2
Canal Corp. (O)	11.1
State of the Art	10.9

Dollar

[illegible] Inc.	3.50
Comp Corp. (O)	3.38
MMS	3.25
Standard Data Software (O)	3.00
Microdyne Inc. (O)	2.75
Logicon Corp.	2.00
Motorola Electronics	2.00
Symbol Computer Inc.	1.88

Losers

Percent

Pyramid Technology	-29.1
Advanced Micro Devices	-21.9
Micro Focus	-20.9
Renaissance Software	-16.0
Dallas Semiconductor	-15.2
Abbott Corp.	-14.6
Edmark Software Research	-13.5
System Software Assoc.	-13.1

Dollar

Evolution Systems	-8.50
Texas Instruments	-6.25
Pyramid Technology	-6.25
Micro Focus	-5.63
Advanced Micro Devices	-5.50
Compcom Corp.	-4.88
Micron Technology	-4.88
Information Resources	-4.63

[redacted]

Pyramid rebuilt?

Pyramid Technology Corp. (PYRD) has made great strides this year, but it is not completely out of the woods yet.

Last Thursday, the company announced that its earnings will fall short of analysts' expectations for its fourth fiscal quarter, which ended Sept. 30. Investors punished Pyramid's stock with a 5½-point drop on Thursday.

Pyramid, a San Jose, Calif., maker of Unix database server systems, will nonetheless post a profit for fiscal 1993 after losing $1.78 per share the previous year. Through the first three quarters of fiscal 1993, Pyramid earned 42 cents per share, or just more than $5 million, on revenue of about $173 million; fourth-quarter earnings per share should be on the order of 25 cents.

Pyramid blamed its fourth-quarter shortfall on the continuing weak economies in Europe and Japan. Smith Barney Shearson, Inc. analyst Shao Wang noted in a Sept. 29 report that past earnings problems may have sprung from Pyramid's attempts to cover too much ground. Pyramid appears to have refocused itself on the vertical markets where it has expertise, he said.

Kemper Securities, Inc. Vice President Joseph Payne said he also thinks Pyramid is on the right track. "It looks like an accident, not a [long-term] fundamental dislocation," Payne said about the earnings shortfall.

The company manufactures symmetric multiprocessing servers that can be clustered to support more than 10,000 concurrent users. Pyramid recently started shipping new high-end Unix systems, called the Nile Series, priced upward of $300,000, which analysts said should begin to drive earnings growth for the next year or more.

—Derek Slater

Changing Fortunes

Prior to Thursday's drop-off, Pyramid Technology Corp. was one of the best performers among large systems vendors during the past year

Company	Price 10/2/92	Price 10/2/93	Change
[illegible]	7⅞	24	210%
[illegible]	8⅛	21¼	158%
[illegible]	8½	12⅛	43%
[illegible]	18½	12⅝	18%
[illegible]	25	24½	(2%)
[illegible]	36⅞	24⅛	(34%)

Exch	52-Week High	52-Week Low	[redacted]	Oct. 8 3 PM	Wk Net Change	Wk Pct Change
[redacted]						
OTC	40.00	17.63	3 COM CORP.	29.63	-0.13	-0.4
NYS	91.13	63.38	AMERICAN INFO TECHS CORP.	84.13	-1.75	-2.0
NYS	65.00	41.00	AT&T	57.63	-1.13	-1.9
OTC	4.06	0.75	ANTEL COMMUNICATION CORP.	3.25	0.13	4.0
OTC	24.50	12.50	BANYAN SYSTEMS INC.	17.50	1.00	6.1
NYS	64.88	44.50	BELL ATLANTIC CORP.	60.38	-3.13	-4.9
NYS	62.88	46.75	BELLSOUTH CORP.	59.63	-1.00	-1.6
NYS	14.75	3.63	BOLT, BERANEK & NEWMAN	9.50	0.00	0.0
OTC	18.50	9.50	BROOKTROUT TECHNOLOGY	12.75	0.25	2.0
NYS	119.00	62.75	CABLETRON SYSTEMS	92.38	-10.63	-10.3
OTC	35.00	7.00	CENTURAM COMMUNICATIONS	34.25	1.50	4.6
OTC	55.50	20.25	CHIPCOM CORP.	47.63	-5.75	-10.8
OTC	59.25	24.00	CISCO SYSTEMS INC.	45.00	-4.25	-8.6
OTC	16.38	6.00	COMPRESSION LABS INC.	14.75	0.75	5.4
OTC	36.00	20.75	CROSSCOMM	24.75	-1.38	-5.3
OTC	4.63	1.63	DATA SWITCH CORP.	2.25	-0.13	-5.3
NYS	19.88	12.38	DIGITAL COMM. ASSOC.	18.75	0.00	0.0
OTC	12.75	3.75	DIGITAL SYSTEMS INT'L INC.	4.50	0.50	12.5
OTC	67.88	12.00	DSC COMMUNICATIONS	57.63	-3.63	-5.9
OTC	9.50	4.75	FIBRONICS INT'L INC.	5.75	-0.63	-9.8
OTC	24.00	8.75	FILENET CORP.	14.00	-0.25	-1.8
OTC	4.38	1.50	GANDALF TECHNOLOGIES INC.	2.72	-0.03	-1.1
OTC	2.06	0.75	GATEWAY COMMUNICATIONS	0.81	-0.06	-7.1
NYS	15.75	3.75	GENERAL DATACOMM INDS.	10.25	-0.50	-4.7
ASE	3.75	2.00	GO VIDEO	2.56	0.06	2.5
NYS	39.00	32.88	GTE CORP.	38.25	0.25	0.7
NYS	94.75	64.50	ITT CORP.	92.25	-1.00	-1.1
OTC	29.88	16.81	MCI COMMUNICATIONS CORP.	27.75	-0.13	-0.4
OTC	6.50	1.50	MICROCOM INC.	3.13	0.13	4.2
OTC	24.25	3.50	NETRIX CORP.	4.75	0.25	5.6
OTC	19.00	6.50	NETWORK COMPUTING DEVICES	6.50	-0.50	-7.1
NYS	15.00	5.38	NETWORK EQUIPMENT TECH.	8.25	0.38	4.8
OTC	20.13	8.00	NETWORK GENERAL	12.50	-0.75	-5.7
OTC	15.75	6.88	NETWORK SYSTEMS CORP.	7.88	-0.38	-4.5
OTC	73.88	10.13	NEWBRIDGE NETWORKS CORP.	67.25	1.13	1.7
NYS	46.00	21.38	NORTHERN TELECOM LTD.	24.38	0.38	1.6
OTC	35.25	17.00	NOVELL INC.	18.38	-0.25	-1.3
NYS	48.88	39.50	NYNEX CORP.	44.63	-1.50	-3.3
OTC	30.00	14.50	OCTEL COMMUNICATIONS CORP.	24.00	0.50	2.1
OTC	6.13	3.38	PEIRIL DATA COMM NETWORKS	4.38	0.13	2.9
OTC	30.50	13.00	PICTURETEL CORP.	17.50	0.00	0.0
OTC	11.50	3.63	PROTEON INC.	5.63	0.00	0.0
NYS	37.88	17.75	SCIENTIFIC ATLANTA INC.	33.50	-1.00	-2.9
NYS	47.00	31.75	SOUTHWESTERN BELL CORP.	41.50	-2.13	-4.9
NYS	37.50	23.38	SPRINT CORP. (H)	37.13	0.13	0.3
OTC	27.00	12.50	STANDARD MICROSYSTEMS CORP.	23.88	0.88	3.8
OTC	18.50	9.25	STRATACOM INC.	14.00	0.00	0.0
OTC	42.75	17.09	SYNOPTICS COMMUNICATIONS	21.50	-2.75	-11.3
OTC	7.25	2.88	TELEBIT CORP.	7.00	0.00	0.0
OTC	17.88	2.88	TELEMATICS INT'L INC.	14.38	-1.00	-6.5
OTC	35.25	15.25	US ROBOTICS (H)	32.75	-2.00	-5.8
NYS	50.25	35.25	US WEST INC. (H)	49.13	-0.13	-0.3
OTC	56.00	22.25	WELLFLEET COMMUNICATIONS	43.00	-3.75	-8.0
OTC	19.50	7.25	XYLOGICS	17.00	0.75	4.2
[redacted]						
OTC	5.56	2.50	ADVANCED LOGIC RESEARCH	3.25	0.00	0.0
OTC	65.25	22.00	APPLE COMPUTER INC. (L)	23.00	0.50	2.2
OTC	24.25	12.75	AST RESEARCH INC.	17.00	-1.00	-5.6
NYS	9.25	2.50	COMMODORE INT'L	3.38	0.13	3.8
NYS	61.75	35.75	COMPAQ COMPUTER CORP.	57.63	0.00	0.0
OTC	49.88	13.50	DELL COMPUTER CORP.	16.38	-0.13	-0.8
NYS	89.25	50.25	HEWLETT PACKARD CO.	67.75	-1.00	-1.5
NYS	45.13	18.38	SILICON GRAPHICS (H)	40.25	-2.38	-5.6
OTC	41.00	21.63	SUN MICROSYSTEMS INC. (L)	21.75	-0.25	-1.1
NYS	38.88	24.63	TANDY CORP. (H)	38.88	1.13	3.0
OTC	7.00	2.50	ZEOS INTERNATIONAL LTD. (L)	2.63	0.00	0.0
[redacted]						
ASE	8.75	4.50	AMDAHL CORP.	5.88	-0.13	-2.1
NYS	8.75	3.63	CONVEX COMPUTER	5.50	0.25	4.8
OTC	6.13	2.25	CRAY COMPUTER	4.00	-0.25	-5.9
NYS	30.88	19.00	CRAY RESEARCH INC.	24.13	-0.38	-1.5
NYS	13.88	7.75	DATA GENERAL CORP.	10.13	-0.25	-2.4
NYS	49.25	30.38	DIGITAL EQUIPMENT CORP.	38.00	1.25	3.4
NYS	44.00	30.13	HARRIS CORP.	41.88	-1.00	-2.3
NYS	80.00	40.63	IBM	44.00	0.88	2.0
OTC	25.75	6.25	KENDALL SQUARE RESEARCH	21.00	-3.00	-12.5
NYS	141.50	83.00	MATSUSHITA ELECTRONICS	137.00	1.00	0.7
OTC	23.75	8.75	NETFRAME	14.75	-0.88	-5.6
OTC	25.00	9.25	PARAMAX COMPUTER (H)	21.50	-2.75	-11.3
OTC	23.25	6.75	PYRAMID TECHNOLOGY	15.50	-6.00	-27.9
OTC	24.00	11.25	SEQUENT COMPUTER SYS.	15.25	-0.25	-1.6
OTC	5.50	1.38	SEQUOIA SYSTEMS INC.	2.94	0.06	2.2
NYS	41.25	20.25	STRATUS COMPUTER INC.	26.50	2.25	9.3
NYS	16.88	8.50	TANDEM COMPUTERS INC.	12.75	0.50	4.1
OTC	23.50	10.63	TRICORD SYSTEMS	20.50	-0.50	-2.4
NYS	13.88	8.00	UNISYS CORP.	12.13	0.00	0.0
[redacted]						
OTC	37.00	12.63	ADOBE SYSTEMS INC.	19.50	1.00	5.4
OTC	21.00	11.50	ALDUS CORP.	18.88	-0.63	-3.2
OTC	11.25	5.50	AMERICAN SOFTWARE INC.	6.75	-0.13	-1.8
OTC	28.13	9.50	ASK COMPUTER SYSTEMS	14.13	1.88	15.3
OTC	56.75	38.75	AUTODESK INC.	44.50	-0.25	-0.6
OTC	7.75	2.50	BACHMAN INFO. SYSTEMS	3.38	0.00	0.0
OTC	43.00	24.00	BGS SYSTEMS INC. (L)	25.50	0.00	0.0
OTC	84.13	38.75	BMC SOFTWARE INC.	57.25	-1.00	-1.7
OTC	28.25	18.00	BOOLE & BABBAGE	24.50	-0.25	-1.0
OTC	35.00	12.75	BORLAND INT'L INC.	16.00	1.00	6.7
OTC	5.00	2.75	CE SOFTWARE	3.88	0.25	6.9
ASE	40.25	13.38	CHEYENNE SOFTWARE INC.	32.75	-0.25	-0.8
OTC	19.50	8.25	CHIPSOFT	14.50	-0.25	-1.7
OTC	8.88	5.63	COGNOS INC.	8.38	0.75	9.8
NYS	34.00	15.63	COMPUTER ASSOCIATES (H)	34.00	1.13	3.4
NYS	7.00	2.75	COMPUTERVISION CORP.	3.00	-0.13	-4.0
OTC	34.25	19.25	COMPUWARE CORP.	23.50	0.50	2.2
OTC	14.75	5.75	COMSHARE INC.	11.50	1.50	15.0
OTC	33.88	10.75	COREL CORP. (H)	33.88	3.38	11.1
OTC	15.25	5.00	EASEL CORP.	6.25	0.13	2.0
OTC	25.25	14.00	4TH DIMENSION	22.88	1.75	8.3
OTC	19.25	5.25	FRAME TECHNOLOGY	7.50	0.00	0.0
OTC	17.50	8.00	GROUP I SOFTWARE	8.00	0.00	0.0
OTC	35.25	14.00	GUPTA	16.25	0.75	4.8
OTC	12.00	4.63	HOGAN SYSTEMS INC. (H)	11.25	-0.25	-2.2
OTC	25.75	11.25	HNRS	22.75	3.00	15.2
OTC	44.75	25.50	INFORMATION RESOURCES	36.50	-3.50	-8.8
OTC	27.25	12.00	INFORMIX CORP.	21.75	-1.88	-7.9
OTC	14.50	8.50	INTERGRAPH CORP.	10.00	-0.38	-3.6

Exch	52-Week High	52-Week Low	[redacted]	Oct. 8 3 PM	Wk Net Change	Wk Pct Change
OTC	13.63	4.88	INTERLEAF INC. (L)	5.50	-0.63	-10.2
OTC	16.50	4.75	INTERSOLV INC.	9.25	0.00	0.0
OTC	16.00	7.75	KNOWLEDGEWARE INC.	14.25	3.25	29.5
OTC	54.75	15.50	LEGENT CORP.	24.00	2.50	11.6
OTC	68.25	14.75	LOTUS DEVELOPMENT (H)	46.38	1.13	2.5
OTC	23.00	4.25	MATHSOFT	5.88	-0.63	-9.6
OTC	23.25	4.50	MCAFEE ASSOCIATES	8.25	0.13	1.5
OTC	11.63	2.50	MECA SOFTWARE	5.13	-0.38	-6.8
OTC	12.00	5.63	MENTOR GRAPHICS	10.13	-0.50	-4.7
OTC	46.00	24.50	MICRO FOCUS	24.50	-2.38	-8.8
OTC	13.25	4.38	MICROGRAFX INC.	7.63	0.13	1.7
OTC	98.00	70.38	MICROSOFT CORP.	84.13	1.38	1.7
OTC	64.13	18.88	ORACLE CORP. (H)	58.50	-2.13	-3.5
OTC	41.75	22.50	PARAMETRIC TECHNOLOGY (H)	40.00	-0.25	-0.6
OTC	40.50	22.50	PEOPLESOFT	36.38	-0.38	-1.0
OTC	7.13	3.75	PHOENIX TECHNOLOGIES	4.25	0.25	6.3
OTC	40.00	22.00	POWERSOFT	26.50	-2.75	-9.4
OTC	34.25	11.34	PLATINUM SOFTWARE (H)	29.75	-4.25	-12.5
OTC	25.00	8.75	PLATINUM TECHNOLOGY	9.75	-0.25	-2.5
OTC	61.50	32.25	PROGRESS SOFTWARE CORP.	58.25	-0.25	-0.4
OTC	7.38	2.16	QUARTERDECK OFFICE SYS. (L)	2.16	-0.22	-9.2
OTC	32.00	15.75	RAINBOW TECHNOLOGIES INC.	24.00	0.00	0.0
OTC	11.38	4.25	RASTEROPS	8.13	-0.50	-5.8
OTC	15.25	3.63	ROSS SYSTEMS	13.00	0.13	1.0
OTC	28.75	9.88	SAPIENS INTL. CORP. N.V.	29.75	0.50	2.0
OTC	14.50	5.50	SOFTWARE PUBLISHING CORP.	6.25	0.25	4.2
OTC	14.50	2.63	SOFTWARE TOOLWORKS INC.	14.50	1.13	8.4
OTC	2.75	0.75	SPINNAKER SOFTWARE	1.31	-0.25	-16.0
OTC	13.75	3.63	STATE OF THE ART	9.75	0.50	5.4
NYS	24.88	17.63	STERLING SOFTWARE INC. (H)	24.88	0.63	2.6
OTC	21.63	8.25	STRUCT. DYNAMICS RESEARCH	13.38	-0.63	-4.5
OTC	77.50	35.00	SYBASE INC.	64.00	-1.00	-1.5
OTC	20.50	6.38	SYMANTEC CORP.	19.88	0.75	3.9
OTC	25.50	10.00	SYSTEM SOFTWARE ASSOC.	14.75	-1.50	-9.2
OTC	6.38	2.75	TRIDENT CORP.	5.50	0.25	4.8
OTC	26.50	13.25	VIEWLOGIC SYSTEMS (H)	23.38	-1.38	-5.6
OTC	23.50	5.50	WALKER INTERACTIVE SYSTEMS	7.75	1.13	17.0
OTC	3.19	1.00	WORDSTAR	1.09	-0.09	-7.9
[redacted]						
NYS	32.88	12.25	ADVANCED MICRO DEVICES	20.75	-5.13	-19.8
NYS	28.00	10.00	ANALOG DEVICES INC.	25.00	-2.00	-7.4
OTC	38.63	11.88	ATMEL CORP.	35.13	0.50	1.4
OTC	6.25	2.75	CHIPS AND TECHNOLOGIES	4.88	-0.63	-11.4
OTC	39.75	13.00	CIRRUS LOGIC	31.75	-0.38	-1.2
NYS	16.75	7.88	CYPRESS SEMICONDUCTOR CORP.	13.50	-0.38	-2.7
NYS	19.00	11.13	DALLAS SEMICONDUCTOR	17.00	-1.88	-9.9
OTC	24.50	21.13	INTEL CORP. (H)	68.75	-4.25	-5.8
NYS	19.25	6.00	LSI LOGIC CORP.	15.00	-1.63	-9.8
OTC	26.75	11.46	LATTICE SEMICONDUCTOR	22.38	-0.25	-1.1
NYS	63.63	15.88	MICRON TECHNOLOGY	47.63	-5.25	-9.9
NYS	105.13	44.38	MOTOROLA INC.	96.75	-3.25	-3.3
NYS	21.75	10.13	NATIONAL SEMICONDUCTOR	18.13	-2.25	-11.0
OTC	15.75	6.50	SIERRA SEMICONDUCTOR	7.63	-0.63	-7.6
OTC	51.75	25.75	SYSOPSYS	45.50	-1.50	-3.2
NYS	84.25	44.00	TEXAS INSTRUMENTS	68.25	-6.25	-8.4
OTC	18.88	6.50	VLSI TECHNOLOGY	15.75	-1.38	-8.0
OTC	14.38	3.00	WEITEK	12.13	0.00	0.0
ASE	9.63	3.63	WESTERN DIGITAL CORP.	5.13	0.00	0.0
OTC	54.50	14.50	XILINX (H)	45.38	-1.38	-2.9
OTC	37.50	18.00	ZILOG INC.	34.88	-0.13	-0.4
[redacted]						
OTC	24.75	7.88	AMERICAN POWER CONVERSION (H)	21.13	-0.88	-4.0
OTC	22.75	15.50	BANCTEC INC.	20.75	0.00	0.0
OTC	18.00	3.50	CAMBEX CORP.	4.25	0.25	6.3
ASE	18.38	3.88	COGNITRONICS CORP.	4.13	-0.13	-2.9
NYS	25.50	9.00	COMPUTER PERIPHERALS	9.50	-0.50	-5.0
OTC	38.50	16.50	CREATIVE TECHNOLOGIES INC.	21.00	-1.00	-4.5
OTC	30.75	8.50	DATA RACE INC. (L)	7.25	-0.75	-9.4
ASE	13.25	5.50	DATARAM CORP.	9.38	-0.38	-3.8
NYS	38.00	6.75	EMC CORP.	34.38	-2.00	-5.5
OTC	10.50	5.25	EMULEX CORP.	6.88	0.25	3.8
OTC	19.00	14.00	EVANS & SUTHERLAND	17.00	-0.50	-2.9
OTC	20.63	7.50	EXABYTE	10.50	0.00	0.0
OTC	34.00	9.25	INTELLIGENT INFO. SYSTEMS	26.50	0.50	1.9
OTC	8.88	2.50	IOMEGA CORP.	2.75	-0.13	-4.3
OTC	14.25	5.75	KPL SYSTEMS INC.	8.00	0.50	6.7
OTC	24.00	14.25	KOMAG INC.	15.00	-1.25	-7.7
OTC	19.63	4.38	MAXTOR CORP.	4.63	-0.50	-9.8
OTC	10.00	5.75	MICROPOLIS CORP.	6.50	-0.25	-3.7
NYS	117.00	97.25	3M CORP.	103.75	1.00	1.0
OTC	7.75	4.00	PRINTRONIX INC.	7.25	0.00	0.0
NYS	17.25	7.38	QMS INC.	9.00	-0.13	-1.4
OTC	17.88	9.50	QUANTUM CORP.	10.75	-0.75	-6.5
OTC	7.13	3.13	RADIUS INC.	3.75	0.00	0.0
NYS	16.88	9.25	RECOGNITION EQUIPMENT	16.75	0.38	2.3
OTC	13.88	3.75	REXON INC.	3.88	-0.25	-6.1
OTC	22.38	12.13	SEAGATE TECHNOLOGY	17.38	-0.13	-0.7
NYS	45.00	18.00	STORAGE TECHNOLOGY	26.75	-0.50	-1.8
NYS	27.88	17.63	TEKTRONIX INC.	23.00	-0.88	-3.7
NYS	88.88	70.13	XEROX CORP.	72.13	-1.25	-1.7
[redacted]						
OTC	23.75	14.88	AMERICAN MGMT. SYSTEMS	18.00	0.50	2.9
NYS	4.75	2.38	ANACOMP INC.	2.88	-0.13	-4.2
OTC	23.84	11.84	ANALYSTS INT'L (H)	21.00	0.00	0.0
NYS	56.13	45.13	AUTO DATA PROCESSING	50.63	0.88	1.8
NYS	19.50	13.00	CERIDIAN CORP. (H)	19.50	1.38	7.8
NYS	17.75	13.13	COMPDISCO INC. (H)	17.00	-0.63	-3.5
OTC	12.88	4.50	COMPUTER HORIZONS	12.88	1.38	12.0
NYS	94.88	66.00	COMPUTER SCIENCES	90.75	-1.25	-1.4
NYS	9.25	6.00	COMPUTER TASK GROUP	6.88	-0.13	-1.8
NYS	48.50	19.00	COMPUSA INC.	26.88	-0.50	-1.8
OTC	14.25	7.00	CORPORATE SOFTWARE	11.50	0.13	1.1
OTC	12.75	6.63	EGGHEAD DISCOUNT SOFTWARE	7.00	0.13	1.8
NYS	35.88	26.00	GENERAL MOTORS E (EDS)	28.50	-0.13	-0.4
OTC	25.50	10.75	MACOM CORP.	18.00	0.50	2.9
OTC	24.13	8.13	INTELLIGENT ELECTRONICS (H)	23.25	0.25	1.1
OTC	16.50	7.38	MEDISIS	15.00	0.63	4.3
OTC	27.50	5.75	MICROAGE INC. (H)	27.50	3.00	12.2
OTC	34.75	20.34	PAYCHEX (H)	33.25	-0.25	-0.7
NYS	87.25	23.63	POLICY MANAGEMENT SYS.	23.88	-2.75	-10.3
NYS	43.63	20.75	REYNOLDS AND REYNOLDS	40.00	-0.25	-0.6
OTC	20.75	12.13	SEI CORP. (H)	20.75	1.25	6.4
OTC	25.13	17.50	SHARED MEDICAL SYSTEMS (H)	24.63	0.13	0.5
OTC	12.63	5.25	SHL SYSTEMHOUSE	9.38	-0.25	-2.6
OTC	30.75	20.00	SOFTWARE SPECTRUM INC.	24.00	-1.50	-5.9
OTC	42.75	26.25	SUNGARD DATA SYSTEMS (H)	42.00	3.00	7.7
NYS	4.38	1.13	ULTIMATE CORP.	3.38	0.00	0.0

KEY: (H) = NEW ANNUAL HIGH REACHED IN PERIOD (L) = NEW ANNUAL LOW REACHED IN PERIOD

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Briefs

Microsoft buys code

Microsoft Corp. beefed up its efforts to combat Novell, Inc.'s NetWare with its recent acquisition of both code and several programmers from Webcorp., maker of a peer-to-peer operating system. Microsoft has already incorporated some of the capabilities of Webcorp.'s technology into its NetWare Requester for Windows NT and will move that product into beta testing in the next few weeks.

Iomega plans layoffs

Iomega Corp. said it plans to cut fewer than 100 employees in nondirect labor positions in the next few weeks. The layoffs follow a recent 25% price cut on select products and are part of an overall expense reduction plan. The Roy, Utah, firm employs approximately 1,100.

SHORT TAKES Paul Allen, a co-founder of both Microsoft and Asymetrix Corp., has paid $17.5 million for a stake in Metricom, Inc. The Los Gatos, Calif., firm's technology sends wireless electronic mail.... IBM has agreed to sell back a roughly 5% stake in Hogan Systems, Inc. to that company. IBM purchased the stake in September 1990; details of both transactions were not disclosed.... Joel Appelbaum has resigned as president and chief executive officer of Novell's Unixel division.... Network Computing Devices, Inc. has named Judith Estrin, 36, president and CEO. She succeeds her husband, William Carrico, 43, who remains as chairman.... AST Research, Inc. has an expanded credit line of $225 million.... Legent Corp. has elected Mario Morino to its board. A former company executive, he remains a "significant" shareholder.... MCI Communications Corp. has consolidated its U.S. operations and set up a new business unit overseeing international business.

Vendors seek patents as copyright suits grow

By Mitch Betts
NEW YORK

Faced with a confusing mixture of court rulings on software copyrights, computer lawyers are coming up with increasingly creative ways to get more protection for vendors' intellectual property rights.

Speakers at the recent 14th annual Computer Law Institute in New York said they expect to see an acceleration of the trend toward supplementing copyright protection with software-related patents, which give the holder 17 years of monopoly rights.

David Bender, a partner at White & Case in New York, said there are an estimated 16,000 patents for software-related inventions. The litigation that will test their mettle has already begun, he added.

One of the biggest cases goes to trial in December. Stac Electronics, Inc. is suing Microsoft Corp. for patent infringement over the data-compression utility in DOS 6.0.

The disadvantages to patents are their expense and the fact that they take about two years to wind their way through the U.S. Patent and Trademark Office. In addition, experts said patent applicants must meet high standards when proving their invention's novelty — it cannot be something obvious or "as old as the hills."

Is it truly novel?

On the other hand, a patent provides very powerful and broad protection for a truly novel invention. Bender said that if the first computerized spreadsheet had been patented, for example, that would have precluded all subsequent computerized spreadsheets.

The big problem now is that many existing patents are probably invalid, attorneys said, due to poorly trained examiners and the lack of a database of technical literature on the "prior art." That problem may be temporary, however, because the industry is funding a Software Patent Institute in Ann Arbor, Mich., to develop a database to help patent office examiners.

Bender said he expects to see more software patents filed as a result of several court decisions that nibble away at the scope of copyright protection for software, such as the 1992 case of Computer Associates International, Inc. v. Altai, Inc.

Because the courts are not speaking with a unified voice on software copyrights, some attorneys are urging their high-tech clients to consider not only patents but also an even more creative approach called "trade dress."

Trade dress is a category of trademark law that covers the total appearance of a product, including its color, size, shape, texture and graphics. Classic examples include the shape of a ketchup bottle, the pink color of fiberglass insulation and the colorful decor of a Mexican restaurant.

Presumably, trade dress could extend to the "look and feel" of a software product's graphical user interface. "Trade dress is another potential weapon for protecting software," said Allen R. Grogan, a partner at Blanc Williams Johnston & Kronstadt in Los Angeles.

There is little or no case law testing the use of trade dress for software, Grogan said, but "the attitude is: Try it and see if it works."

Trade dress could also be used to protect the look and feel of a computer-generated report or form. In the 1992 case of Computer Care v. Service Systems Enterprises, Inc., the U.S. Court of Appeals in Chicago stopped a competitor from copying the format of a firm's computer-generated reports and letters to car owners.

Examples of patented GUIs

Holder	Title
AT&T Bell Laboratories #4,555,775	"Dynamic generation and overlaying of graphic windows...."
IBM #5,121,477	"System for interactively creating action bar pull-down windows...."
Next, Inc. #5,146,556	"System and method for managing graphic images"
IBM #5,179,656	"Three-dimensional directional pointer icon"
IBM #5,179,700	"User interface customization apparatus"

Source: U.S. Patent and Trademark Office, Washington

Borland sees profitable quarter

By Michael Vizard

Despite the freezing of Quattro Pro spreadsheet sales this past quarter in anticipation of the release of Quattro Pro 5.0, Borland International, Inc. last week said it expects to report its third consecutive quarterly profit later this month.

Although Borland has shipped about 15,000 copies of Quattro Pro 5.0 since its introduction last month, a company spokesman said that overall revenue for the quarter will be down from the previous quarter due to costs associated with an exchange program for resellers holding earlier copies of Quattro Pro that might violate copyrights owned by Lotus Development Corp. [CW, Aug. 30].

Borland is expected to incur a charge of anywhere from $10 million to $100 million as a result of losing a copyright infringment battle with Lotus. That case is now under appeal.

In its last quarter, Borland reported $6.2 million in net revenue on sales of $123.4 million. In the previous quarter, it reported a $5.1 million net on sales of $117.1 million. Last December, the company reported a $61.3 million loss on sales of $104.3 million.

Point/counterpoint

The Computer Law Institute featured a lively debate between the software industry's two warring camps: the "copyists" and the "maximum protectionists."

Arguing on the copyist side was Peter M. C. Choy, deputy general counsel at Sun Microsystems, Inc. in Mountain View, Calif. He claimed reverse-engineering and "interim copying" of software is necessary so competitors can find ways to make their software compatible with products that are de facto standards.

Choy further asserted that software is more utilitarian than literary works and therefore should get "thin" copyright protection to promote interoperable systems, rather than the interests of monopolists. "Open systems are like heaven. Everybody wants to be there, but nobody wants to die to get there," Choy said.

Protectionist Victor Siber, senior corporate counsel at IBM in Stamford, Conn., argued that compatibility is a business strategy, not part of copyright law. The copyists are merely "free riders" who want to imitate successful and innovative competitors, he said.

"What's going on here is really a war between those who believe the industry will flourish if they protect innovation and those with less creativity who want to allow loopholes for imitation," said another protectionist, Henry B. Gutman, a partner at O'Sullivan Graev & Karabell in New York and lead counsel for Lotus Development Corp. He has represented Lotus in a series of successful copyright infringement lawsuits. — *Mitch Betts*

Wysiwyg

What driving your car would be like if operating systems ran it:

Windows: You'd get into your car and drive to the store very slowly because a freight train is attached to the back of your car.

Windows NT: You'd get into your car and write a letter that says, "Go to the store." Then you'd get out of the car and mail the letter to your dashboard.

OS/2: After fueling up with 6,000 gallons of gas, you'd get into the car and drive to the store with a motorcycle escort and marching band in procession. Halfway there, the car would blow up.

Taligent: You'd walk to the store with Ricardo Montalban, who tells you how wonderful it will be when he can fly you to the store in his jet.

EUROFACTS

Number of Americans who have used a computer
79%

Number of Europeans
70%

Number of Americans who have sent a fax
43%

Number of Europeans
33%

Number of Americans comfortable using a computer
54%

Number of Europeans
30%

Base: 2,100 Europeans and U.S. customer data
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The 5th Wave *by* Rich Tennant

Inside Lines

The publishers

While rumors abound that Apple CEO Gilbert Amelio is trying to sell Electronic Arts Inc., a more likely development is that IDG will sell magazine titles. Word is that Pat Flynn, Texas, entrepreneur has put his subscription lists and Computerworld units on the block. IDG is in the process of selling off divisions and is laying off employees—[illegible] Flynn would be interested. The pair don't come with just quite a head count of 11,000, despite a report [illegible].

It's not our fault

[illegible]

The best defense...

Intel last week unveiled an agenda on PowerPC and other RISC chips that was clearly designed as a press briefing. The briefing, essentially an effort to refute Motorola's massive ad campaign for PowerPC, was supposedly called due to the number of press requests about Intel's position on PowerPC, but only one reporter asked a question at the interesting video briefing. Intel's Dave House, senior vice president of corporate strategies, spent more than an hour counting down on the theme "RISC = Proprietary," with all its internal evils. Last time we checked, popular did not mean open, Dave.

At your service

Look for Microsoft to soon unveil a directory service that would provide applications with transparent connectivity to resources around the enterprise and will interoperate with Novell and Banyan directory services. The service will also feature a Kerberos-compliant security system that will be a "quantum leap" over what's already available, one company says.

Close to you

Global wireless satellite network service provider Inmarsat plans to open up a user-based pricing option for its IsatLAN family of LAN-interconnect-oriented services targeted at telecommuters and remote network users, according to a source close to the company. Inmarsat also plans to help fill the current dearth of international frame-relay services with an offering in January, the source said. In the first half of next year, the company will focus on bringing its services closer to the desktop with moves that could include ISDN adapters and services.

The word is getting out

WordPerfect is getting ready to expand its PC application base. The company plans to launch later this month its first personal information manager and will bring out a Works for Windows package, tentatively called Small Office Suite.

HP responded to charges last week that it is paying rank-and-file of India who come to the U.S. below-market wages as contract programmers. The charges, which surfaced on CEO Watch, were amplified on Tuesday with a suit filed in a California superior court by Californians for Population Stabilization. The suit argues that the hiring practice drives down wages for U.S. workers. An HP spokeswoman said 175 Indian residents are doing contract programming, staying in the U.S. an average of 18 months. HP paid Indian contracting services about $30,000 per programmer. HP only recently found out that the Indian programmers were not receiving the full $30,000 because body shops were taking a cut, she said, and the contracts expire Oct. 31. Phone, fax or Compuserve News Editor Alan Alper with news tips at (508) 879-0700, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 620-7865.

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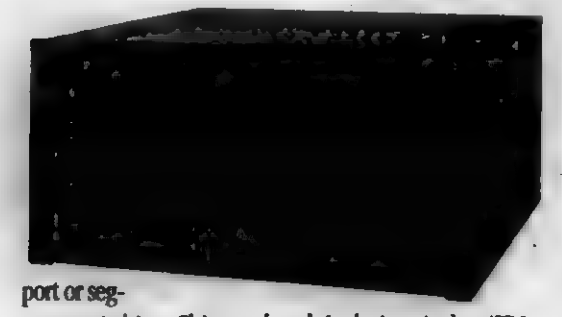

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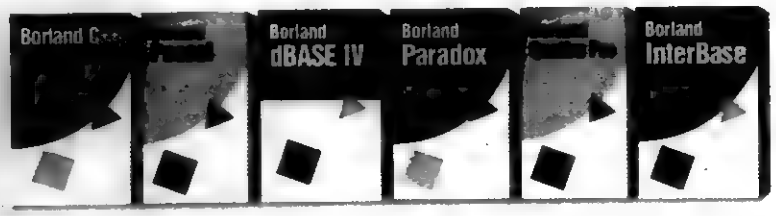

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COMPUTERWORLD

States to plug in EDI

EDS offers net service for tax automation

By Lynda Radosevich
WASHINGTON

Taxes are never good news, but for corporate taxpayers and state revenue departments, a new electronic data interchange network promises to simplify the job of filing returns.

The Federation of Tax Administrators, a nonprofit organization representing all 50 states, expects to finalize by Oct. 29 a contract with Electronic Data Systems Corp. for EDI value-added network services.

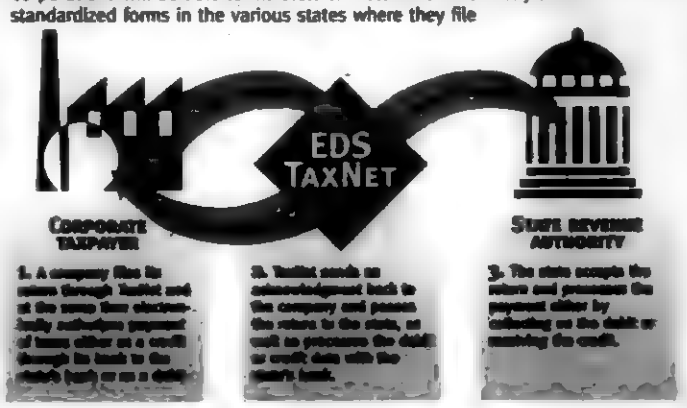
A new division of the FTA, called TaxNet Government Communication Corp., was created to operate the service, which will allow corporations to electronically file most types of tax forms with participating states. The service, called TaxNet, uses standard EDI transaction sets approved last year by the American National Standards Institute's X.12 committee.

The value of the contract is unclear because payment to EDS will depend on the amount of traffic generated by the state agencies, according to EDS and the FTA. An FTA spokesman said it would be

EDI net, *page 28*

A taxing network

Corporations will be able to file state tax returns electronically and use standardized forms in the various states where they file



1. A company files its return through TaxNet and at the same time electronically authorizes payment of taxes either as a credit through its bank to the state's bank or as a debit.

2. TaxNet sends an acknowledgment back to the company and passes the return to the state, as well as processes the debit or credit data with the state's bank.

3. The state accepts the return and processes the payment either by collecting on the debit or crediting the credit.

Microsoft plans database unity

By Michael Vizard
LAKE BUENA VISTA, FLA.

■ Microsoft Corp. last week outlined a long-term plan for unifying its diverse database engines and creating an object repository intended to simplify application development.

Details of the repository architecture, along with the actual components of the unified database, are still being worked out at Microsoft.

However, the company's initial focus will be to unify its various database architectures by combining elements of its database engines into a single entity that will support XBase, Visual Basic and the C and C++ languages (see chart page 14).

"... wants applications to run on any database, regardless of the language in which they were created."

Currently, Microsoft supports three database engines: FoxPro, which is a dBase clone; Access, which supports Visual Basic; and SQL Server, which is a relational database based on an engine supplied by Sybase, Inc.

Driving the effort to unify its engines is the fact that IS organizations are going to require architectures that will allow their applications to run on any database, regardless of the language in which they were created.

For example, Kenneth Sipos, a real estate specialist who develops XBase applications for a geographic information system used by the city of Philadelphia, noted that his managers need to be able to run his applications on the mainframe systems that are used in other departments. "Microsoft has to unify its database engines," Sipos said.

On top of the common engine, Microsoft is expected to deploy a repository, tentatively referred to as a data object model, that will essentially provide the basis for managing the sea of objects that developers will use to create applications for the Cairo object-oriented operating system due in 1995.

"We're pretty close to making a decision on getting into the repository business. It pretty much looks like we will," said Roger Heinen, Mi-

Microsoft, *page 14*

PC nets gain control

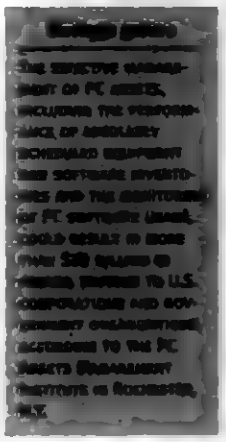
By Elisabeth Horwitt and Lynda Radosevich

Management of networked PCs is expected to take a giant step forward this week, as leading vendors demonstrate the first products to support the Desktop Management Interface standard.

Formulated by the Desktop Management Task Force, with final code being distributed this week, DMI is said to standardize how various desktop systems, and their hardware and software components, make status and configuration information available to popular network management platforms and applications.

Vendors that are taking part in this week's

DMI, *page 12*



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Sculley exits Apple; multimedia in future?

By Michael Fitzgerald and James Daly
CUPERTINO, CALIF.

John Sculley's 10-year odyssey at Apple Computer, Inc. ended anticlimactically last week when the man who became the company's visionary did the expected and resigned.

John Sculley *resigned amid pressures from Apple's board*

Sculley was replaced as Apple chairman by longtime board member A. C. (Mike) Markkula, who sources said had led a June move to strip Sculley of his responsibilities as chief executive officer and give them to Michael Spindler [CW, June 21].

Sculley operated largely as a figurehead through the summer, even taking a regularly scheduled sabbatical. He could not be reached for comment.

Sculley's departure came one day after Apple reported record fiscal fourth-quarter revenue but a steep profit drop. It also followed the resignation of Robert Puette, who had headed Apple's beleaguered U.S. organization since 1990.

"This is a changing of the guard, and it's probably healthy for Apple," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif. "John was a lame duck, and Spindler didn't need his shadow."

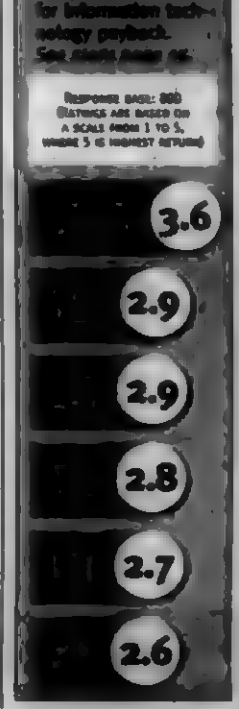
What Sculley will do now is unclear. Industry watchers speculated that the evangelical Sculley

Sculley, *page 15*

Low return on investment

Executives surveyed by Andersen Consulting give low ratings for information technology payback. See story page 46

Response base: 800 Ratings are based on a scale from 1 to 5, where 5 is highest return



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October 18, 1993

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■**Fall PC lines** show only glimpses of new technology. *Page 6*

■**Apple** launches a full range of new **Macintoshes**. Question is, are buyers already confused by the selection? *Page 6*

■**TI** offers migration tools and process re-engineering products to ease the way into **client/server**. *Page 8*

■**IBM**'s Software Solutions division unleashes a barrage of products, but, at least in terms of **client/server** offerings, it's a new kid on a crowded block. *Page 8*

■**Amdahl** will announce **layoffs**, along with its third quarterly **loss** of the year and the decision to halt in-house development on two **SPARC-based machines**. *Page 10*

DESKTOP COMPUTING

■When **Apple**'s first **PowerPC-based** Macintosh arrives in March, few applications will be ready to exploit its RISC performance. *Page 35*

WORKGROUP COMPUTING

■**Mass migration** of **messaging vendors** to **object technology** promises simpler reconfiguration and easy movement of compound documents. *Page 55*

ENTERPRISE NETWORKING

■Competitors in the shipping industry put aside their differences to create a **standard EDI interface** for customers. *Page 69*

Management: *At furniture retailer Ikea, IS director Kerry Ruhl has to maintain a delicate balance between servicing the customer and keeping prices low.* *Page 107*

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■A lot of firms talk big but deliver little in terms of **customer service**. Often the problem is badly conceived information systems. *Page 107*

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■**Minorities** are still struggling in the information systems field, according to a recent *Computerworld* survey. And minority males have it particularly hard. *Page 135*

CW GUIDE

■**Windows PC databases** are gaining ground as front-end development tools, especially for workgroups. *Page 117* **Buyers' Scorecard:** Users of **Borland**'s Paradox and **Microsoft**'s Access and FoxPro rate them about equal. *Page 128* **Firing Line:** Lotus' Approach is easy to use, but it lags on query and reporting, according to users. *Page 133*

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■**Rapid application development** requires a mental balance between planning and spontaneity. *Page 142*

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COMMENTARY

■A commitment to **protect customers' private data** is a competitive advantage waiting to be plucked, writes **Bill Laberis**. *Page 32*

■**Start talking tough to your vendors**, suggests **Ted Krum**. Otherwise they'll keep feeding you gee-whiz confections. *Page 33*

■**The PowerPC** won't make your life any easier, predicts **John Gantz**. In fact, it will probably multiply your development headaches. *Page 33*

■**IBM**'s **RS/6000** may be the platform to finally fulfill the company's Future System dreams, says **Jean Bozman**. *Page 55*

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Executive Briefing

Demonstrable payback is an elusive thing. Andersen Consulting says the vast majority of senior executives in a recent survey were not convinced that technology investments were paying off as well as they should be. Manufacturing and distribution logistics were areas of particular weakness. *Page 15*

Customer service is another field in which **IS** isn't winning a lot of medals. Despite the very loud and pervasive buzz about customer satisfaction, few businesses are actually delivering great service. And much of the blame is being laid at the feet of IS. *Page 107* **GTE** aims to be an exception. That company's Telephone Operations group says it has achieved a **20% to 30% productivity improvement** from re-engineering its customer service system and migrating it to a client/server environment. *Page 85*

Client/server is no panacea, particularly when it comes to monetary measures. For one thing, you'll probably have more **expenses to justify**. According to **Gartner Group** analysts, this architecture often costs one-and-a-half times as much as a mainframe-centric one. The biggest "gotchas" are in service, support and administration. *Page 38*

Management of networked PCs should get easier now that products are starting to emerge to support the **Desktop Management Interface standard**, which effectively allows network administration to drill down to desktop level by standardizing status and configuration reporting methods across desktop systems. *Page 1*

Other remedies are emerging for **administrative headaches** with distributed systems. **Microsoft** and the **OSF** are both promising **distribution managers** to help IS managers organize and administer open systems applications across enterprises. *Page 85*

Nomadic Systems is tackling the integration of portable and desktop data with a new Windows utility called SmartSync. *Page 35*

Is there enough of a **future for OS/2** to build a career on? One survey says no, but user group growth suggests demand will grow. *Page 147* **IBM** recently signed several deals for the sale of more than 100,000 packages. *Page 20*

EDI milestone: Clothier **Syms Corp.** has combined EDI and E-mail systems using X.400 networks. Analysts believe this is how voice, data and video traffic will be consolidated. *Page 69*

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OS/2 to soon get Windows emulation

By Ed Scannell

IBM's Personal Software Products (PSP) group is expected to announce a full-functioned version of OS/2 at Comdex/Fall '93 next month that lets users seamlessly integrate OS/2 on top of copies of DOS and Windows running on Intel Corp. machines.

Alternately called Ferengi or Product X by sources close to IBM, the product is a version of OS/2 that purports to save information systems time by allowing OS/2 to be plopped onto existing code and by seamlessly integrating OS/2 functionality into Config.sys and Autoexec.bat files in Windows and DOS. In short, it saves IS from having to wipe disks and rebuild its configurations when adding OS/2 to its desktop mix [CW, Sept. 13].

The Ferengi effort is not an attempt to reverse-engineer Windows. Instead, IBM has figured out a way to tweak the major executables within Windows.

With Ferengi, PSP hopes to free itself from the significant royalty payments it must make to Microsoft Corp. for each copy of OS/2 it sells. IBM and Microsoft made their final code source code swap on Sept. 16, following the expiration of their licensing agreement.

An IBM spokesman declined to comment specifically on the project. He added, however, that it is PSP's intent to "target Windows users and to make their investment in moving to OS/2 as painless and risk-free as possible."

Ferengi's future

Depending on the degree of OS/2's future success, Ferengi could add up to substantial savings for IBM. Currently, PSP pays Microsoft approximately $20 for every copy of OS/2 it sells. PSP is approaching sales of 3 million units of the OS/2 2.X series, mostly through its Box line, to individuals and smaller companies.

The product will be sold as a separate shrink-wrapped package priced at $49, according to several beta testers and those familiar with the company's marketing plans. This compares to $149 for OS/2 2.1, which does not provide the seamless integration offered by Ferengi. As such, some observers fear IBM could undercut its own pricing structure.

Some of the reasoning behind Ferengi's aggressive pricing is the growing user interest in 32-bit operating systems that has resulted from the heavy marketing efforts for OS/2 and Microsoft's Chicago, sources close to IBM said. With Chicago not expected until the middle to end of next year, IBM sees a chance to capitalize on the opportunity.

Ferengi is still in beta, but PSP is hoping to make it widely available before the end of the year. Doing so would give IBM a minimum window of about six months to beat Chicago to the punch.

"A lot of users we talk to who want 32 bits on the desktop are not willing to wait for Chicago," said one source close to IBM. "And if they don't like [Ferengi], it is real easy to remove and only costs you 50 bucks to take a look."

That could account for OS/2's corporate sales momentum. In the last six weeks alone, PSP has signed corporate licensing deals for about 180,000 copies with a handful of large insurance companies and banks (see story page 20).

While developers who have seen beta copies of the code are happy with its performance in running existing Windows and DOS applications, some wondered if the product's proposed $49 price tag might hamper sales of OS/2 2.1, which is sold through dealers for more than $100. "I don't think IBM would be stupid enough to let [Ferengi] hurt existing sales, but the way things stand now, that might happen," one third-party developer said.

The Ferengi code is only intended for DOS and Windows running on Intel-based PCs.

NT to pick up the pace

Next iteration will run Windows applications more quickly

By Ed Scannell
BELLEVUE, WASH.

Microsoft Corp. officials last week confirmed that the next update of Windows NT will enable faster performance of existing Windows applications, an enhancement that tops the wish list of many corporate users.

Some users over the last month have complained that Windows NT is running standard Windows applications markedly more slowly compared with running them under Windows 3.1. They also noted that OS/2 2.1 in many cases also runs those same applications faster in a window than can Windows NT.

Quick fix

Microsoft last week released over CompuServe and the Internet its first series of bug fixes for Windows NT. The fixes offered cures for 96 "minor fixes," mostly addressing problems caused by obscure hardware/software combinations some customers have put together. Microsoft will release quarterly fixes for NT users over the electronic bulletin boards accumulated from individual fixes made by Microsoft's Hot Fix teams.

One fix at a time

In general, Microsoft could have focused more on NT's performance in the initial release, but that would have meant sacrificing some degree of reliability. "The next release will address performance goals. We did not want to give up better control over crashing for [additional] speed," said Mosbe Dunie, director of Windows NT Program. He indicated that the next update most likely would be in the first half of 1994.

In that update, Microsoft wants to significantly improve NT's speed through routine optimization of the operating system's code — without having to remove any vital features, Dunie said.

The company is now working with more advanced development utilities that can better monitor memory usage by determining where code can be better swapped in and out of memory, while also making more efficient use of CPU cycles.

Another goal for the next release is support for transferring data from DoubleSpace drives to Windows NT drives, a feature some believe is important for more smoothly integrating users into client/server applications. Being able to easily shuttle the data between DOS and NT will help facilitate the implementation of a client/server application. IBM must resolve the same problem with PC DOS 6.1's Adstor compression program and OS/2 2.1.

Other features slated for addition to NT include better account lockout capabilities and support for plotter drivers.

Cairo comes first

While Microsoft will issue a "point" release of NT in the next few months, it does not anticipate releasing a full integer release before Cairo, the next generation of NT, some time in 1995.

Cairo is expected to have all the same major underpinnings as NT, Dunie said, including the same kernel, 32-bit graphics engine and network connections. Perhaps the only major difference will be the user interface, which should look very similar to that of Chicago, the company's 32-bit version of Windows for the desktop.

Despite recent speculation on the topic, Dunie stressed there would not be a "lite" version of Windows NT that would require much less main memory and disk storage than the current version's 12M to 16M bytes of RAM.

"Chicago will do a pretty good job being an 'NT Lite,' " Dunie explained.

Lotus enjoys fruits of upgrade cycle

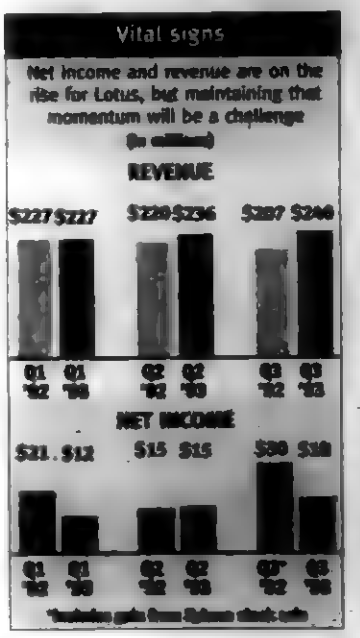
By Michael Vizard
CAMBRIDGE, MASS.

■ Lotus Development Corp. last week announced substantially improved financial results for its third quarter due to a combined increase in spreadsheet, suite and Notes sales.

For its third quarter ended Oct. 2, Lotus reported a net profit of $18.3 million, an increase of 150% over the comparable period last year, when it earned $7.3 million from operations. Sale of its investment in Sybase, Inc. stock brought Lotus' earnings to $30 million for that period a year ago. Revenue in the latest quarter grew 16% to $240.1 million.

Welcome surprise

While Lotus' improved revenue picture was expected in the wake of the release of 1-2-3 4.0 for Windows and a renewed emphasis on SmartSuite, the company's net income increase took analysts by surprise.



"They seem to be getting some higher margins off of volume deals, some contribution from higher margin products like Notes, and they incurred less taxes this year," noted Peter Rogers, a securities analyst at Robertson, Stephens & Co. in San Francisco.

Rogers said Lotus' immediate future looks bright, but whether Lotus will be able to maintain momentum once the 1-2-3 upgrade cycle peters out and Microsoft Corp. gets back in the market with Office 4.0 remains to be seen.

Not biggest breadwinner

In the meantime, Rogers said he expects Lotus to continue to push Notes but added that Notes is still a relatively small percentage of Lotus' business. According to Lotus executives, communications products will contribute about $250 million in revenue this fiscal year, with Notes and CC:Mail contributing roughly equal portions.

Lotus estimates that it will have 260,000 Notes seats installed by the end of this year at about 2,500 companies. It also expects to have 1.8 million CC:Mail seats installed in the same time period. This compares with an installed base of 133,000 Notes seats and 1.09 million CC:Mail seats in 1992.

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News Shorts

Congress debates Microsoft case

Committee members and witnesses at a U.S. House of Representatives hearing last week avoided tackling head-on issues surrounding the U.S. Department of Justice's antitrust probe of Microsoft Corp. Most agreed that Microsoft does dominate the desktop operating system market, but several pointed out that a company's market dominance does not mean it engages in unfair competitive practices. "Just because an industry is fast-moving and complex does not mean it is immune from antitrust ... problems," said Rep. Jack Brooks (D-Texas). "Nor does it mean that the market would necessarily be served by the replacement of one dominant industry monolith with a number of smaller companies."

Rumba, anyone?

Wall Data, Inc. in Redmond, Wash., announced last week that it will support IBM's Advanced Peer-to-Peer Networking End Node protocol in its Rumba series of DOS/Windows-based micro-to-mainframe software products, starting with Rumba Office. Rumba Office is said to be the first product to give users access to multiple applications on multiple IBM mainframes and AS/400s, as well as on Digital Equipment Corp. VAX/Unix hosts, from a single Windows interface.

Borland, Microsoft at PC Expo

Borland International, Inc. will announce this week at PC Expo in Chicago that dBase IV for Unix is shipping. At that time, Borland will also announce that Version 2.0 of its dBase Compiler for DOS, which compiles and distributes applications that are twice as fast as dBase IV applications, is also available. Meanwhile, Microsoft Corp. is expected to ship a Unix version of FoxPro in the first half of 1994.

Cornering the high-end display market

Motif, Inc., a joint venture between Motorola, Inc. and In-Focus Systems, Inc., has begun business as the only high-capacity, flat-panel display maker in North America. Paul Gulick, the venture's co-chief executive officer, said the Wilsonville, Ore., company will focus its new active-addressing color technology on displays no larger than 5 by 7 inches, meaning that the new plant and technology will not ease supply problems in the color notebook market. Gulick did say that some established passive-matrix display vendors will likely purchase integrated circuits from the new venture, leading to better, cheaper color notebook displays late next year.

Unix does Windows

The Santa Cruz Operation's IXI Corp. subsidiary announced a user interface that makes Unix applications look like Windows applications. The new Win-tif software marks a shift in IXI's traditional Unix interface business. Win-tif will be available in the first quarter. Pricing was not announced.

SHORT TAKES James A. Unruh, chairman and chief executive officer at Unisys Corp., told attendees at last week's user group conference in Minneapolis that the computer maker will announce its ninth consecutive profitable quarter in the next two weeks. Unruh also pointed out that Unisys is one of the finalists vying for the coveted Malcolm Baldrige National Quality Award, which will be announced this week.... The Software Publishers Association has teamed up with nonprofit organization Gifts in Kind America to encourage companies to donate software to community organizations.

More news shorts, *page 16*

Pentium-based PCs wait off-stage

By Michael Fitzgerald

Vendors will bring to market a cornucopia of PCs in the next month that will offer a glimpse into the future. Debuting will be several new Pentium-based systems that use the Peripheral Component Interconnect (PCI) local bus.

The new PC lines, highlighted by products from the IBM PC Co., Compaq Computer Corp. and Dell Computer Corp. in the next three weeks, will set the stage for 1994, in part because Intel Corp. has missed target dates for new versions of its I486.

The PC Co. will begin this fusillade today by introducing a PS/ValuePoint that combines Pentium and PCI. The 60-MHz Pentium-based system comes standard with 16M bytes of RAM, is expandable to 128M bytes and has a 424M- or 527M-byte hard drive.

The system features a radically redesigned architecture centered on a 64-bit data path that takes advantage of Pentium's 64-bit memory bus, which means that twice the information can flow between main memory and the processor.

Various models of the ValuePoint line will gain multimedia and energy conservation features, including some models designed to be AS/400 nodes.

Dell is expected to combine Pentium and PCI in its new low-end Dimension V, which will be unwrapped in a Nov. 15 Comdex/Fall '93 announcement. Sources said Dell will follow that with the first of a new line of desktops called OmniPlex. Next year will bring a new line of servers that combine Pentium and PCI, including a new tower server called the TE, for Tower EISA, and a follow-on to its XE/4000 server, sources said. Dell declined comment.

Compaq, meanwhile, will stick with its Q-Vision graphics bus for its upcoming Pentium products. Pentium is expected to appear as part of a Nov. 1 announcement unveiling the DeskPro/XE and phasing out the DeskPro/I.

Analysts downplayed the announcements, saying Intel cannot ship enough Pentiums now to have a major impact on the market.

"PCI is the big wave in graphics over the next year, but this will be significant when Pentium is shipping more," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

Hot boxes

Leading PC makers' new fall line of high-powered PCs

Company	Product	Clock speed	Chip	Ships
	Dimension V		Pentium	Mid-November
	DeskPro XE		Pentium	Early November
	PS/ValuePoint		Pentium	Now

Apple seeks rebound with new crop of machines

By James Daly
CUPERTINO, CALIF.

Apple Computer, Inc. hopes to offset last week's mixed financial report this Thursday when it fires off its biggest product launch of the year. This week's harvest should yield a bumper crop of Macintoshes ranging from high-end Quadras to portable Duos and Performas.

"It's important for Apple to get back a full head of steam," said Richard Zwetchkenbaum, a research manager at International Data Corp. in Framingham, Mass. "Like most vendors, they rely heavily on the fourth quarter to make their year. This will start them off with a bang."

The announcements, the latest in a long tradition of October product launches for Apple, will slightly reorganize the Macintosh product line and continue its demarcation into four areas: the PowerBook for mobile users, Quadra for business, Performa for home and LC for education.

The new additions could backfire for Apple if they serve to further confuse users about the Macintosh product line. Many already consider it congested, with little distinction among some models.

"It's sometimes hard to figure where one model ends and the other begins," said Brian Connes, manager of the information center at DHL Airways, Inc. in Redwood City, Calif. "But I suppose it's the nature of the beast because if you put out products only once a year, you're considered behind the times."

Others say Apple has taken it too far. "There are so many models it's just ridiculous," said Mike Bailey, a systems integrator at Lockheed Missiles and Space Co. in Sunnyvale, Calif. "It's a total marketing exercise."

The Duo additions, however, were welcomed by many users. Macintosh users fell in love with the concept of the Duo, which was widely hailed when it was introduced a year ago. The Duo is a portable PowerBook that can be inserted into a desktop station to offer both the power of a desktop PC and the flexibility of a notebook system. But in many ways it has not lived up to expectations.

Like many Apple models, the Duo was bedeviled by an early shortage. And its docking mechanism was not available in quantity for two months after the product launch. "It was a bit of a slow start," admitted Peter Fletcher, worldwide product manager at Apple's portables division.

Still, the portables could represent a big growth area for Apple. In a recent survey of 160 technical users by the Business Research Group in Newton, Mass., more than 40% of the respondents said they use their portable computers on a daily basis.

Apple has given what Zwetchkenbaum called "a midlife kicker" to the Duo line through the addition of the crisper active-matrix displays. With the new Duos, Apple is also expected to address some of the the battery life problems of its PowerBook portables.

Apple is also expected to add seven models to its Performa line priced from $999 to $1,800.

October harvest

Examples of Apple's new line of PCs and docking station systems

Quadra 605	25-MHz 68LC040	4M BYTES OF RAM 80M-BYTE DISK DRIVE INCLUDES MONITOR	$1,499
Duo 250	33-MHz 030	4M BYTES OF RAM 120M-BYTE DISK DRIVE ACTIVE-MATRIX GRAY-SCALE SCREEN	$2,600

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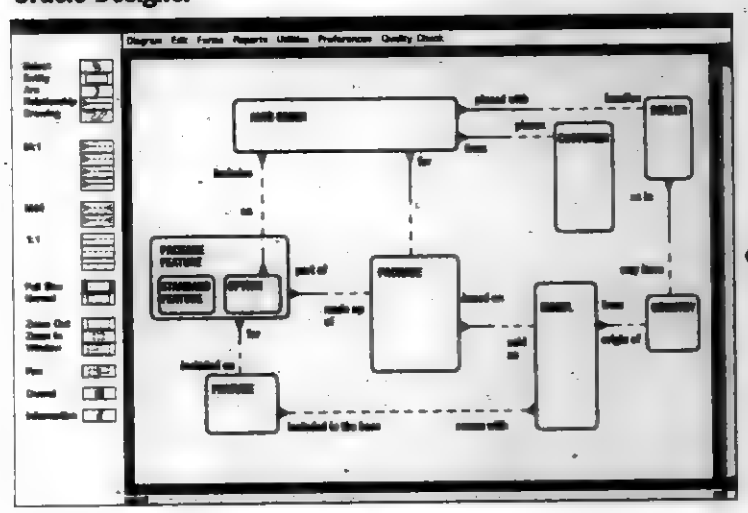

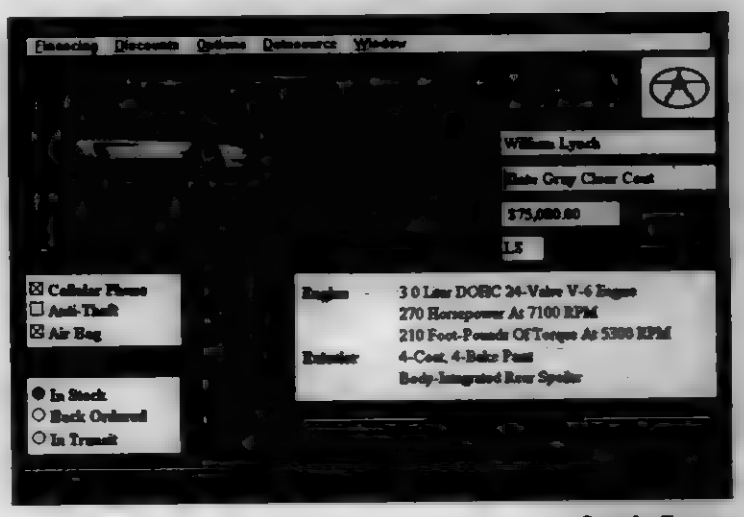

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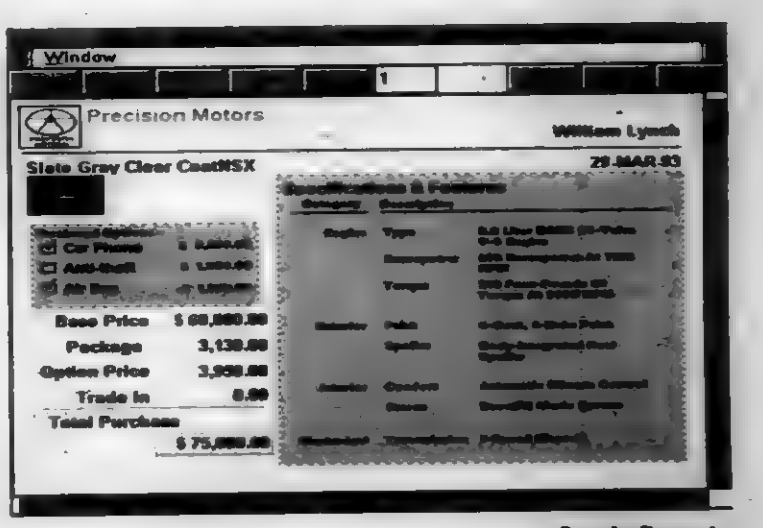

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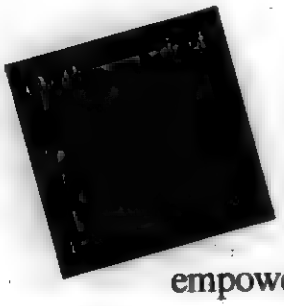

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TI tools will keep legacy systems going

Mainframe components continue to run during client/server transition

By Melinda-Carol Ballou
BOSTON

■ Seeking to address the needs of corporate developers burdened by decades of legacy code, Texas Instruments, Inc. will this week demonstrate a tool that lets programmers modify and keep existing programs running as they migrate to client/server systems.

The tool, called Current Systems Modification (CSM), will perform an impact analysis about the consequences of changes to the code and will then generate the updated Cobol code. TI, which co-developed the tool with Price Waterhouse, will demonstrate it here at CASE World. CSM began shipping earlier this month.

To find related pieces of code, CSM requires an analyzer tool — Current Systems Analysis (CSA), which stores the data in a dictionary. CSM then acts as a scalpel for the removal of relevant chunks of important code and pastes in subroutines to give the old program access to required functions after they have been removed. In this way, the legacy programs can continue operating as developers make the transition to a new architecture.

One module fits all

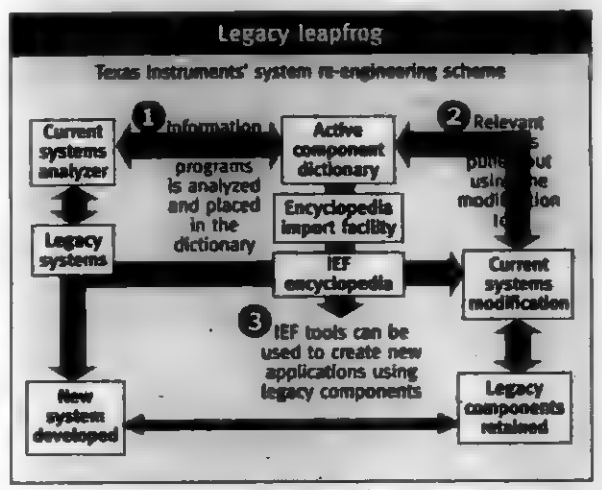
One large health insurance company was able to pull together 2,000 disparate programs related to claims reconciliation, for instance, and centralize them in a single module.

Tool time

- CSM is shipping now and is priced at $140,000.
- CSA is priced at $40,000 and runs under MVS, MVS/XA, VS/ESA, CICS and TSO/ISPF mainframes.
- TI also offers business re-engineering products to assist organizations in documenting, modeling and analyzing their business processes, as well as a Business Process Engineering methodology.

For developers migrating to client/server or contemplating the arrival of object-oriented operating environments, these sorts of tools may prove to be lifesavers, according to users and analysts, because they will allow users to keep the business running and to access key legacy functions as they make the shift.

Wayne Anderson, director of San Francisco MIS at United Airlines, is in the process of migrating 82 systems that support United's aircraft maintenance. "We have hundreds of millions of lines of code, and we can't lose that investment," Anderson said. "We have to get literally from here to there. ... This is a tremendous thorn in our side."



Check it out

Anderson's organization is already using TI's Information Engineering Facility (IEF), a computer-aided software engineering tool kit, and is interested in checking out CSM.

Industry analysts agreed about the need for such transition tools.

"You need a transition architecture in order to move to your target environment, and you have to be able to do that while getting your existing business done," said Jim Sinur, analyst at Gartner Group, Inc., a Stamford, Conn., consulting firm.

"Assuming that it works as advertised, the approach that TI is using will allow you to keep your existing components running while you make the transition, and when you're done, you should end up with reusable components," Sinur explained.

In addition to CSM and CSA, an encyclopedia input facility will move pieces of the code to IEF for co-development.

IBM fields tools for client/server game

By Johanna Ambrosio
WHITE PLAINS, N.Y.

IBM's first significant foray into the client/server tools market, accomplished last week via its announcement of a visual programming package, met with mixed reactions.

Although it is necessary for IBM to offer client/server tools — and some users and analysts said that the company's new VisualAge package is a well-architected beginning step — it is the new kid on a crowded block. Further, unlike some of the existing PC tool players, IBM's name is not synonymous with the client/server market in many shops.

> IBM is "not even on my radar screen when I think client/server."
>
> — *Frank Monteleone, NutraSweet Co.*

One of the crowd

Frank Monteleone, information technology director at NutraSweet Co. in Deerfield, Ill., said that although client/server is a strategic direction for his company, he does not think of IBM in that light.

"They're not even on my radar scope when I think client/server," Monteleone said. "To me, they're just another contender."

Many vendors are going after the market for corporate client/server tools, including established computer-aided software engineering suppliers such as Texas Instruments, Inc. and KnowledgeWare, Inc.; fourth-generation language purveyor Cognos Corp.; database vendor Oracle Corp.; and start-ups including Dynasty Technologies, Inc. (see story page 95).

Crowded or not, IBM is wading forward. "We want to place IBM firmly in support of creating open client/server applications," said Jon Hemming, IBM's manager of market strategy. He pointed out that VisualAge, as well as some of the other IBM tools yet to come (see story at right), were designed from the ground up for the client/server world, as opposed to being extensions of existing mainframe products.

Hemming added that IBM is still working on its long-promised LAN repository, the basis of which will be Object Design, Inc.'s object-oriented database. "We remain committed to providing better cross-tool integration," he said.

For now, however, C. F. Wong, database administrator at the Bank of Montreal and a VisualAge beta tester for about three months, said the product is "quite robust and extensible, and the architecture is solid." The bank is using VisualAge to test object-oriented programming techniques; no production applications have been scheduled yet.

Large-scale forte

Judith Hurwitz, president of Hurwitz Consulting in Watertown, Mass., said IBM has a shot at this emerging market.

"If they play this right, they could have a critical role. They understand better than anybody how to do large-scale, mission-critical development," she said.

Others are not so sure. Rich Finkelstein, president of consultancy Performance Computing, Inc. in Chicago, said IBM lacks direction in this market. "The individual tools look interesting, but there's a ton of products coming out from all the different divisions with no coherent strategy," he said.

Equally important, Finkelstein added, is the fact that the IBM sales force is not well-trained in how to sell these new tools.

A look at the roster

IBM's Software Solutions Division — formerly known as Programming Systems — introduced more than 20 new packages last week [CW, Oct. 11].

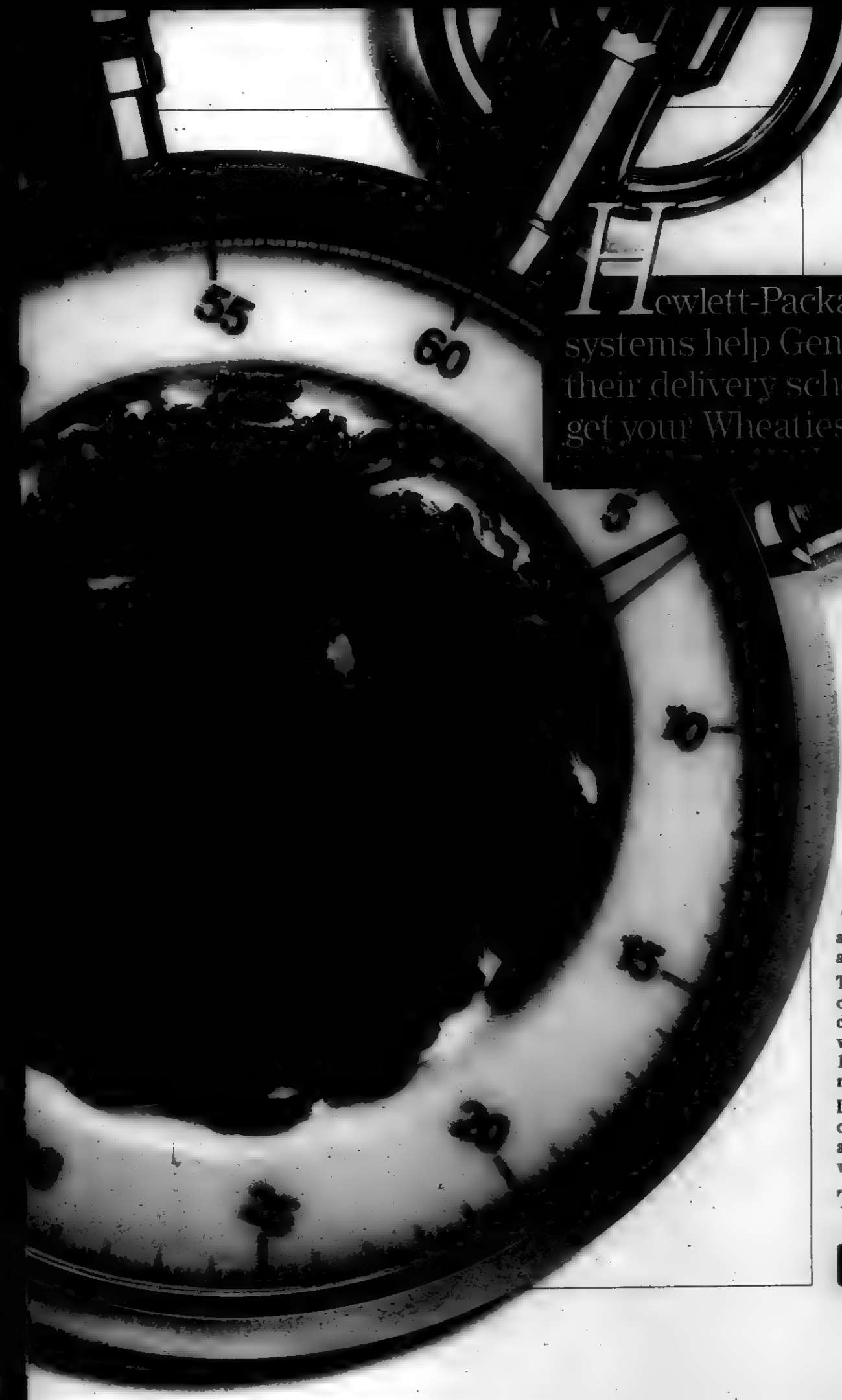
Among them are the following:

- VisualAge, an object-oriented visual programming tool that allows developers to design and deploy applications by putting icons together on a screen. The first versions, available within the next six months, will run under OS/2 and Windows, followed by AIX and other, non-IBM platforms. Prices are $7,500 for the single-user version and $5,000 for the team version.
- HighPoint, an application generator that runs on both the host and PC platforms, and ReDiscovery, a tool that helps developers reuse existing Cobol code as an object on the PC. Both products will be available within a year and will follow the VisualAge platform schedule.
- IMS Client/Server for Windows provides a way to access mainframe IMS applications from a Windows-equipped PC.
- Database Version 1.2 helps manage multiple databases.

As expected, IBM also announced additions to its Information Warehouse family of products [CW, Aug. 9]. These include DataGuide — an on-line catalog of information that is available in the warehouse — and new data replication products.

Finally, IBM said its DB2/6000 database management system, announced in March, will ship next month.

— *Johanna Ambrosio*



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Amdahl to continue restructuring

Further layoffs expected in response to anticipated third-quarter loss

By Jean S. Bozman
SUNNYVALE, CALIF.

Anticipating a third consecutive quarterly loss, Amdahl Corp. plans later this month to reveal additional cost-cutting moves, including a decision to halt development of two SPARC-based Unix machines, a company spokesman confirmed last week.

The $2.5 billion, IBM-compatible mainframe firm has reduced its work force by about 2,000 during the past 12 months [CW, April 26] and last week said it may announce further layoffs. The anticipated third-quarter loss, which would include a significant write-off, is expected to exceed the second quarter's $23.6 million loss, Amdahl said.

Amdahl's continuing woes relate, in part, to IBM's aggressive mainframe discounting, a prolonged European recession and an ongoing shift in its strategy to buy rather than build components.

The decision to end development of SPARC-based machines, however, will not impact Amdahl's effort to build a SPARC parallel processor with Sun Microsystems, Inc., according to Sun and Amdahl sources.

Although restructuring details have not been disclosed, analysts speculated that Amdahl's in-house SPARC development efforts were getting too costly — possibly hitting more than $100 million.

"I see them eliminating their Unix hardware group and taking a write-off," noted John B. Jones Jr., a vice president of technology research at Salomon Brothers, Inc. in San Francisco.

Last month, Sun and Amdahl agreed to codevelop an industrial-strength version of SunSoft, Inc.'s Solaris operating system for Sun's SPARC-based Unix clustered processors. Amdahl is expected to transfer expertise gained from its 11-year-old UTS mainframe Unix product and has agreed to resell Sun's SPARCserver 1000 and SPARCcenter 2000.

Reacting to the market

Amdahl's anticipated restructuring is yet another attempt to bring its business model in line with reduced profitability in the mainframe market, analysts said. "Amdahl played up being a hardware company, while the industry kept shifting its asset structure to software and services," said Bob Djurdjevic, president of Annex Research in Phoenix. "They, like IBM, hung on to the same model of success they enjoyed in the past, hoping it would last forever."

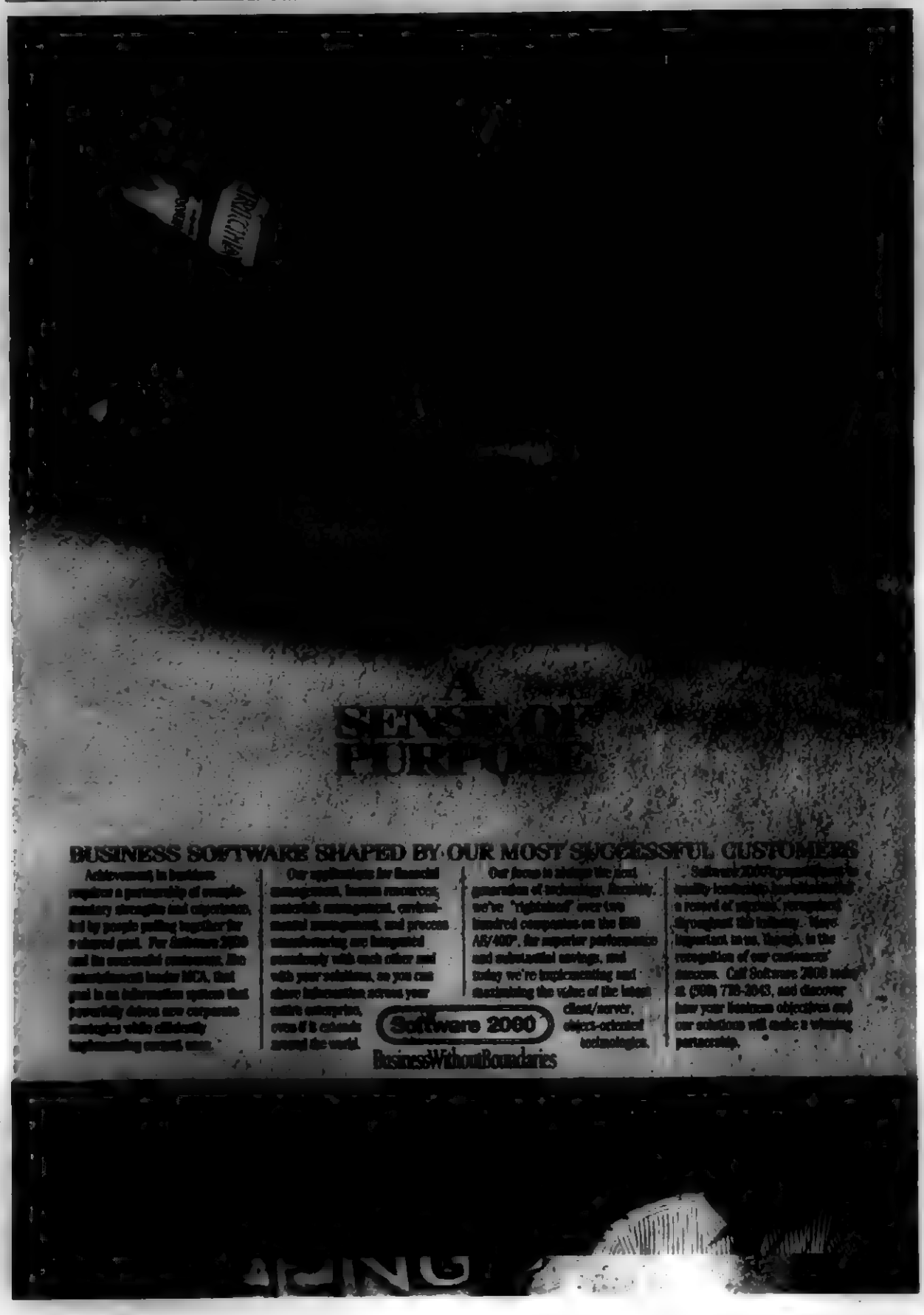
Meanwhile, Amdahl has to match IBM's anticipated announcement of CMOS-based mainframes, which will ship in 1994. Amdahl will therefore have to rely more heavily on off-the-shelf component parts, such as CMOS and RISC chips, as building blocks for the new systems, users and analysts agreed.

"I'd say Amdahl has to position themselves to provide the MIPS in a commodity marketplace at the lowest possible cost," said Bob Gauthier, a capacity planner at Lucky Stores, Inc., a grocery chain in Dublin, Calif., that has 350G bytes of Amdahl disk drive capacity.

Many users at large Amdahl sites seemed sympathetic. "We see it as a good sign that they are responding to the changed realities [of the mainframe market], just as IBM has," said George Sekely, president of CSX Technology, Inc. in Jacksonville, Fla., which runs a seven-processor Amdahl 5995M machine.

A stronger focus

Amdahl posted losses of $263 million in the first half of 1993, including $177 million in restructuring charges and write-offs. The Amdahl that emerges after the restructuring effort will be smaller — with fewer than 7,400 employees worldwide — and more focused on building high-performance IBM-compatible mainframes and providing integration services.



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Novell transfers Unix trademark to X/Open

By Jean S. Bozman

TRENTON, N.J.

Unix users were heartened by Novell, Inc.'s transfer last week of the Unix trademark to X/Open Co., a move designed to certify open systems conformity through the use of a common set of 1,170 application programming interfaces (API). But some users were concerned that incompatibilities among Unix operating systems could persist because vendors will be allowed to innovate above and below the API layer.

Indeed, the new rules of the road for Unix will not erase the various "flavors" of Unix, which make IBM's AIX different from Sun's Solaris, for example [CW, Oct. 11]. "The name Unix will now mean standards conformance," explained X/Open spokesman Jeff Hansen. "Those products are going to be compatible; they're not going to be identical."

Not until next year

But a second catch is that X/Open's Spec 1170 APIs will not be in place until late 1994. That means there will be an "interim" period until X/Open completes a Spec 1170 test suite, vendors confirmed.

And during this period, vendors' operating systems must comply with several standards: the Unix System V Interface Definition (SVID) Releases 2 or 3; XPG 3 or XPG 4; and source code from Unix System Laboratories, Inc. (USL)'s Unix System 5.3 or Unix System 5.4, X/Open said.

"We expect that it will be late 1994 when X/Open has all the test suites and will be able to validate conformance to the [Unix] brand through testing," said Bill Filip, president of IBM's Advanced Workstations and Systems unit in Somers, N.Y.

And even when the standard API layer comes to life, vendors will be able to replace their present Unix "kernels" with microkernels below the API layer and can later add object-oriented utilities over the standard Unix APIs.

Compatibility can be relative, some users noted. "Any move toward standardization is a help," said Randy Robinson, manager of network information services at the NASA Ames Research Center near Mountain View, Calif., "but any change also raises the question of the compatibility and portability of existing [application] code."

X/Open

Even if Unix standards were to converge, Robinson said he is concerned that older applications — of which he has many — may have to be modified to run under the new-and-improved Unix operating system.

More APIs needed

"The issue is, what's more important, the definition of the 1,170 APIs or the transfer of the Unix trademark?" asked Ted Hanss, director of the Center for Information Technology Integration, an applied research center at the University of Michigan in Ann Arbor, where he builds Unix systems. "I think the 1,170 APIs have got to grow to 2,170 because things will keep on growing. To keep portability, they'll have to keep stretching the agreement."

For example, he noted, Hewlett-Packard Co.'s HP/UX has about 4,000 APIs.

However, X/Open has promised to manage the process of enhancing the API set, according to Geoff Morris, the consortium's chief executive officer. "What we're trying to do, as fast as possible, is get to a coherent, consistent, tested position in the marketplace where Spec 1170 governs the Unix trademark," Morris said.

Still, the common API specification will allow programmers to "write to" the same set of system calls. "You can layer over all those differences in the operating systems, which makes users happy," said Rebel Browne, a former USL executive who is now strategic marketing director at OpenVision, a Unix systems management software firm in Pleasanton, Calif.

Once a vendor's code is certified to be Unix-compliant, that firm will pay X/Open an as-yet undetermined license fee based on the volume of their Unix product sales.

Users also said they are more interested in a new ease of portability for Unix applications and in the prospect of lowered prices than in the political battles that stalled the Novell-X/Open agreement for weeks [CW, Sept. 27].

Many users are clearly optimistic that the Unix trademark will simplify the purchase of packaged applications. "We can expect lower costs and better portability, interoperability and scalability," said Robert Chew, section chief of advanced information technologies at EG&G, Inc., a federal contractor for the Department of Transportation in Cambridge, Mass.

The new Unix specifications may affect software vendors first, allowing them to port applications to various flavors of Unix more easily, some users said.

"It'll probably have a trickle-down effect," said Jim Stikeleather, director of systems development at Kash n' Karry Food Stores, Inc. in Tampa., Fla., which has dozens of Sun Microsystems, Inc. servers. "The third-party developers can reduce their development staff and lower their prices, or add more features and functions to the software."

DMI

CONTINUED FROM PAGE 1

demonstration in San Francisco, and that have committed to implementing DMI in their products, include Novell, Inc., Digital Equipment Corp., Hewlett-Packard Co., IBM, Intel Corp., Microsoft Corp., SunConnect and SynOptics Communications, Inc.

"To date, this is the most thoughtful and cooperative effort to solving desktop management issues I have seen," said Timothy Poley, executive director of the Personal Computer Assets Management Institute, a user organization in Rochester, N.Y. "Financial managers are waking up to realize they don't have a handle on their PC assets."

For example, because of poor tracking, last year U.S. corporations spent as much as $1.7 billion purchasing software they already owned, according to Poley.

Delaying the battle

DMI has already forestalled protocol wars among HP and other printer vendors, said Craig Burton, principal at the Burton Group, Inc. in Salt Lake City. In May, the vendors were at odds over a standard bidirectional printing protocol that, among other things, will allow printers to inform users when paper is out. Two weeks ago, the vendors announced that they had resolved their differences using DMI. "This moved network printing ahead by at least a couple of years," Burton said.

A key part of DMI is the Management Information File (MIF), a database of relevant status and configuration information generated by each hardware and software component, peripheral and PC.

Source: Desktop Management Task Force

DMI-compliant management applications running on a management console, such as HP's OpenView, can then gather that information from the desktop system to do inventory management, accounting or real-time diagnostics.

For example, Novell will demonstrate this week its NetWare Management System Version 2.0 retrieving MIF information using the Simple Network Management Protocol agent that comes with Novell's NetWare agent at the desktop, said Steve Dauber, Novell's network management product manager. "We're taking responsibility for [DMI-compliant applications] being able to retrieve information from NetWare desktops."

Still to come at an undisclosed date is DMI support at the NMS console, which will allow management applications to process the MIF data, Dauber said. The initial NMS 2.0 release will only be able to display MIF data generically.

Novell will also incorporate the DMTF standard into the inventory management service that will be part of its upcoming NetWare Distributed Management System (NDMS), Dauber said. NDMS is slated for release in the next three to 12 months [CW, Oct. 11].

Microsoft Corp. will also demonstrate DMI support for its Hermes desktop management system this week. Hermes will be "DMI-enabled" when it ships sometime in the first half of 1994, a Microsoft spokesman said. In addition, Microsoft will incorporate DMI MIF support into its DOS, Windows and Windows NT desktop products sometime after DMI moves out of beta testing and Microsoft has tested the interface, he added.

On the device side, LAN vendors, including 3Com Corp., Standard Microsystems Corp., Intel Corp., IBM and Eagle Computer, Inc., will demonstrate DMI in their adapters. They have agreed to send a common set of adapter-specific information to the MIF.

Left out of the party

One user concern is that existing devices will not be able to participate in the DMI-compliant applications. "We would never be able to retrofit an installation," said Michael Tucker, state systems integrator at the Office of the State Controller in Raleigh, N.C.

However, Intel will demonstrate a retrofit program that will enable users to scan their existing, non-DMI compliant desktop hardware and software and load the information into an MIF, an Intel spokesman said.

Intel plans to make all of its networking products DMI-compliant in their next major releases, most of which will be released in the second quarter of 1994, he added.

A DMI-compliant version of Intel's LANdesk network management platform is due out in the same time frame.

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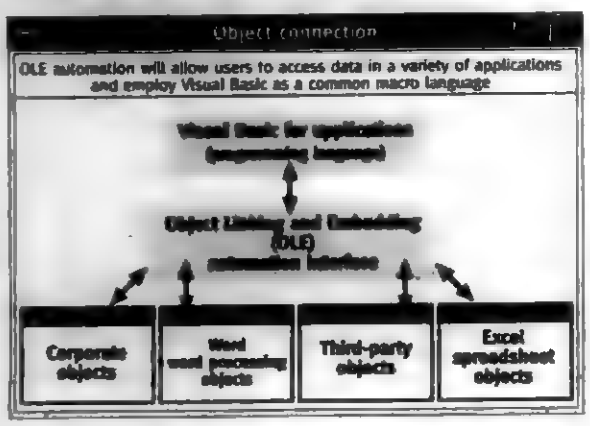
Microsoft to tear down PC app walls

Gates to expound on vision of borderless application use at Office 4.0 debut

By Michael Vizard
NEW YORK

Microsoft Corp. Chairman Bill Gates will this week use the launch of Office 4.0 to articulate a vision of PC applications where the walls between applications will no longer effectively exist.

Using Version 2.0 of Microsoft's Object Linking and Embedding (OLE) interface, Gates will demonstrate the ability to work directly with an Excel spreadsheet from within a Word document, thereby heralding a forthcoming generation of PC applications that were designed to simplify the creation of compound documents.



But while information systems directors generally applaud the direction Microsoft is taking, they noted that Gates' vision is still in the early stages of deployment.

"We're desperately waiting for more applications to take advantage of OLE 2.0," said Peter Pollack, director of technology at ShowTime Network, Inc., a subsidiary of Viacom Corp. in New York that intends to integrate off-the-shelf applications with custom applications it builds. "A lot of the functions we need in our applications are already in other products. So why reinvent the wheel when you can use OLE to integrate them?" Pollack asked.

Slim pickings

In fact, the only OLE 2.0 application available from Microsoft next week will be Word 6.0 (see story page 35). Two other members of the suite, Excel 6.0 and PowerPoint 4.0, will arrive with OLE 2.0 support by year's end, but the majority of applications from Microsoft and third parties, including Lotus Development Corp. and Borland International, Inc., will not support OLE 2.0 until next year.

Corporate developers, meanwhile, are still waiting for Microsoft to deliver a more robust set of tools for working with OLE 2.0, which is expected to begin with support for OLE 2.0 in the form of Microsoft's Foundation Class Libraries later this year. This will give developers a set of prepackaged OLE applications that they can tailor for their specific applications.

> While IS directors generally applaud the direction Microsoft is taking, they noted that Gates' vision is still in the early stages.

"It will be pretty hard for developers to come up with a better set of OLE 2.0 applications on their own nickel," said Roger Heinen, Microsoft senior vice president at the database and development tools division. All Microsoft tools will support OLE 2.0 within a year, according to Heinen.

To facilitate application integration, Microsoft will also announce this week that it has added a Microsoft Office Manager (MOM) facility to Office. MOM will function essentially as a program manager or "home base" for end users as they navigate through Microsoft and third-party applications integrated with the suite using OLE 2.0.

At least one beta user of Excel 5.0 and Word 6.0 reported that he has already made significant progress in terms of integrating Excel and Word with custom applications using OLE 2.0.

"OLE 2.0 will have a substantial impact in terms of taking integration to a whole new level," said Roy Wetterstrom, a managing partner at Micro Modeling Associates, Inc., an Office 4.0 beta site in New York that has created more than 200 applications for Fortune 1,000 companies.

End-user view

From the end user's perspective, Wetterstrom said OLE's support for in-place editing will allow for the creation of compound documents through the integration of Word and Excel objects.

"From within Excel, you'll be able to call up Word and use the full power of a word processor from within your spreadsheet. This will make publishing reports much easier," he said.

Wetterstrom added that developers will be able to link applications by working directly with the object associated with Visual Basic, which will serve as a common macro language across Microsoft applications. "You won't have to work with arcane [Dynamic Data Exchange] protocols," he said.

Microsoft plans database unity

CONTINUED FROM PAGE 1

crosoft's senior vice president at the database and development tools division.

He added that the project would be implemented in conjunction with the company's forthcoming Cairo object-oriented operating system.

Application developers will require an object-oriented repository to give them a tool for managing and tracking objects used to create applications for object-oriented systems, noted Curt Monash, president of Monash Information Services, Inc. in New York.

According to Heinen, Microsoft's repository will sit on top of the company's unified database engine, the elements of which will become more object-oriented as the company moves toward Cairo. The need for Microsoft to present a more cohesive database strategy, coupled with the need to give developers a development system that will simplify working with object-oriented programming, is expected to make these efforts a top priority.

What's ahead

FoxPro development projects for the next 12 months:
- Object-oriented language extensions.
- Open Database Connectivity support.
- Unix implementation.
- Support for Microsoft distributed query processor.
- Enhanced SQL support, including updates and outer joins.
- Developer-oriented wizards.
- Support for mixed data types.

Object-oriented

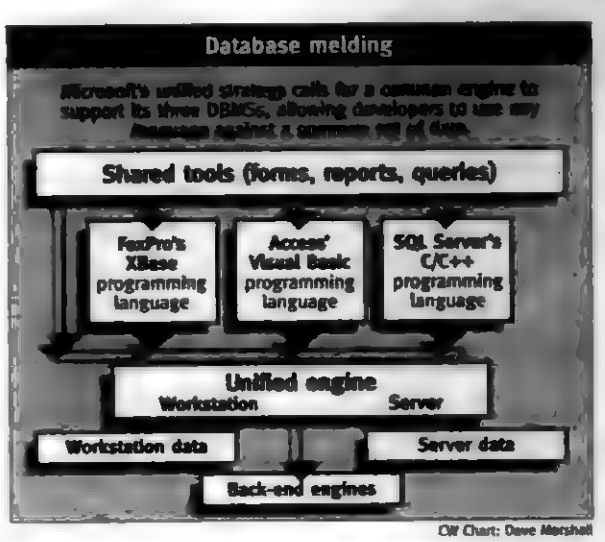
According to Monash, most existing repositories, such as the one marketed by Intersolv, Inc., are already based on an object-oriented database.

As such, he said he expects Microsoft and other vendors to adopt object-oriented databases as they move to object-oriented programming models.

Once Microsoft builds its unified engine, each language will be optimized for a particular set of services in the engine, according to Roger McAniff, general manager at Microsoft's Fox business unit.

As such, Visual Basic's primary use will be to develop Windows applications; FoxPro will serve as the tool for creating large-scale PC database applications; and C/C++ will be used for creating the objects that will be manipulated by Visual Basic, XBase and other higher-level languages.

To enhance FoxPro's role in this effort, during the next 12 months Microsoft will concentrate on adding support for event-driven programming to FoxPro, link the XBase implementation in FoxPro to Version 2.0 of the Object Linking and Embedding interface and add object-oriented extensions to its XBase language, according to David Fulton, Microsoft's vice president for database products (see box far left).



CW Chart: Dave Marshall

FoxPro add-ins

Last week Microsoft added five workgroup extensions to FoxPro in the form of support for Messaging Application Programming Interface and Schedule+, which developers will use to distribute updates of FoxPro applications.

Competitors' plans

In contrast, Borland International, Inc. is deploying dBase IV for Windows in the first half of next year with a similar set of features, including object-oriented extensions to its XBase language [CW, Oct. 4].

Thus far, Borland has not deployed a dBase for Windows offering, while Microsoft has been marketing what is essentially a port of its FoxPro for DOS implementation running on top of Windows.

Also competing in the XBase market is Computer Associates International, Inc. in Icelandia, N.Y., which markets the Clipper database.

See the CW Guide to PC Databases, which begins on page 117.

Executives: Where's the IS payback?

By Joseph Maglitta

Bad news, information systems managers: There is an 80% chance your boss and peers think you and your information technology ought to be delivering more oomph.

An Andersen Consulting survey of 800 senior executives from 220 Fortune 1,000 firms released last week found surprisingly low satisfaction with returns on corporate technology investments, especially among manufacturing heads and financial executives (see chart page 1). Overall, a staggering 81% of those polled ranked their organization's payback on technology spending as "minimal" or "average."

What's IT worth?

The results once again bring into the spotlight the existential question haunting every organization that uses computers: Is the roughly $200 billion spent yearly on information technology and services worth it?

"How serious is it? If [executives] stay at their present satisfaction level, it will start to get serious," said Jon Lower, senior product manager at Andersen Consulting. "They're not necessarily throwing out [information technology] or going outside to outsource. But they want better control of their assets."

Andrew McKenna, senior vice president of information services for Atlanta-based Home Depot, Inc., was one of the lucky ones. When a key multimillion-dollar order-and-payment system delivered subpar performance and had to be shut down in a matter of weeks, IS had to face dissatisfied corporate management.

"We had a very straightforward conversation," McKenna said. "We told them we screwed up and that we'd fix it." Two and a half years later, the new version of the IBM ES/9000-based system serves 230 Home Depot stores.

Observers cited several major reasons for the much lower payoffs reported in the Andersen report.

A big factor is that benefits are seldom quick, noted Barry Weintrob, chief financial officer at The Port Authority of New York and New Jersey. "You don't see results the next day. It takes retraining of people, customers and suppliers" before benefits can accrue, Weintrob said.

Moreover, payoffs are notably hard to measure, added several other executives, including Jerry Kanter, executive director of Babson College's Center for Information Management Studies in Wellesley, Mass.

Sculley

CONTINUED FROM PAGE 1

most likely will wind up with an education software outfit or one of the new interactive media ventures that are forming left and right.

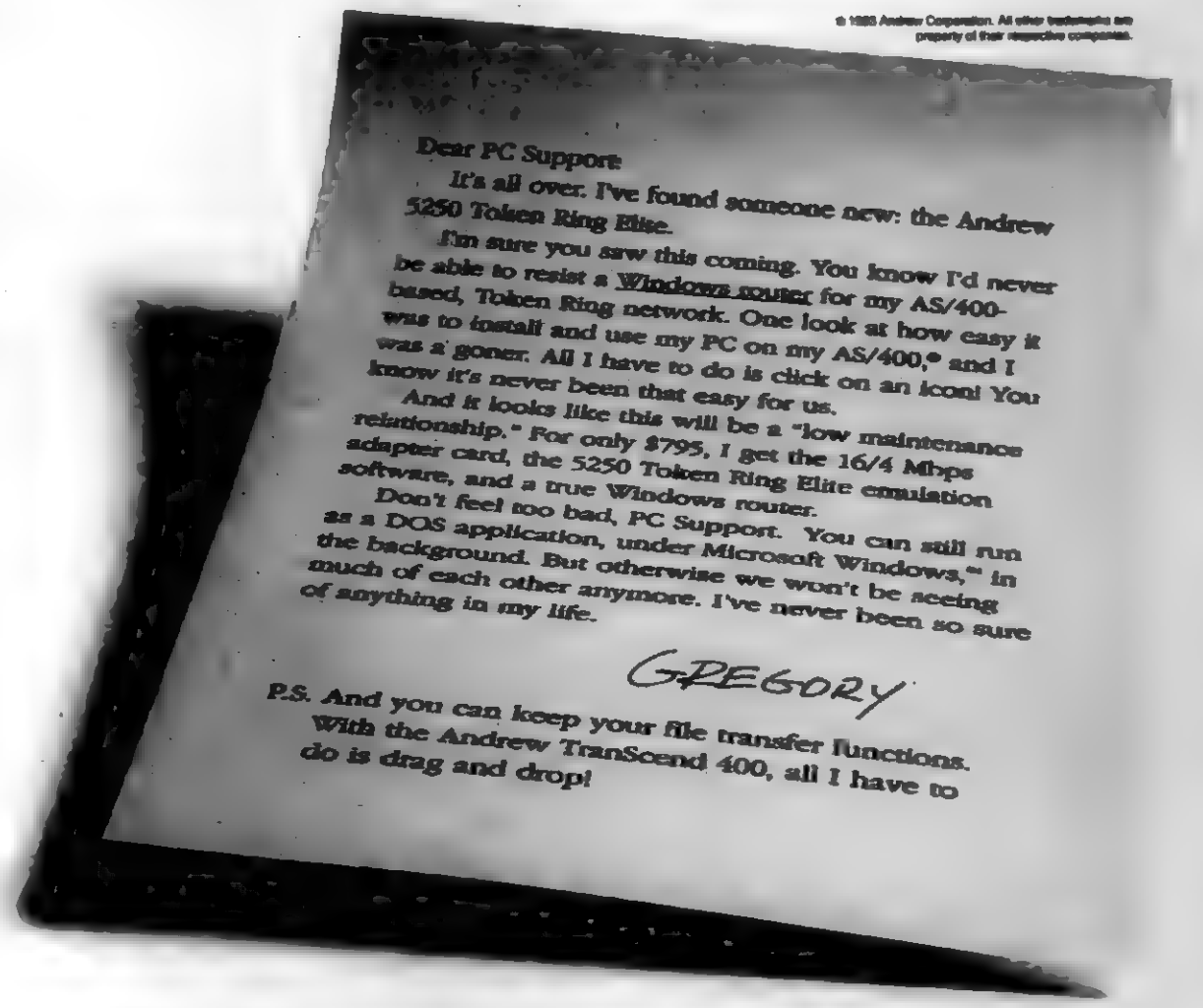
"John is interested in the ground where the computer, entertainment and television industries come together," said Pieter Hartsook, who publishes the Macintosh-specific "The Hartsook Letter" in Alameda, Calif. "I think that's where you'll see him wind up."

Although Puette officially left "to pursue other interests," he has come under heat in recent months for lapses in leadership and product strategy (see story page 6). Puette could not be reached for comment.

Puette's responsibilities were assumed by Ian Diery, executive vice president of Apple's Personal Computer Division.

Meanwhile, Apple's fourth-quarter profit was $2.7 million, better than analyst expectations but still a 97% drop from the year-earlier period. Revenue rose 21% from the year-earlier period, to $2.14 billion. Apple attributed the huge profit decline to a "significant" reduction in gross margins, which were 25.7% during the fourth quarter vs. 42.7% in the year-earlier period.

Separately, Apple's downtrodden stock rose $4 following word of Sculley's departure and was trading at 27½ at midday Friday.



News Shorts

Polycenter tools get flat pricing

Digital Equipment Corp. last week shifted more of its Polycenter system and network management software to a flat-pricing model where license fees cost the same no matter what system is being used. The move from tiered pricing tied to specific hardware will lead to price increases for software on MicroVAX machines — up to 449.5% in one case — but pricing on higher-end machines is generally being reduced.

Sun reports increased revenue, profits

Sun Microsystems, Inc. reported first-quarter revenue of $960.5 million, up 12% from the same period one year ago. Net income was $16.6 million vs. $4.8 million the year earlier. At the same time, the company said its head count had dropped to 12,700, down about 550 from the end of the fourth quarter. Sun chairman Scott McNealy and other top executives also took a pay cut and a reduction in bonuses.

Thrift chooses Sequent system

Thrift Drug, Inc., a Pittsburgh-based subsidiary of JC Penney Co., is building a decision-support system valued at more than $1 million. Sequent Computer Systems, Inc. will provide equipment and system integration services. In addition to a Sequent Symmetry 2000 Model 750, Thrift will install 160G bytes of disk storage, an Oracle Corp. database and Microsoft Corp.'s Windows PC clients. The Unix-based Sequent machine will use database extracts from the drug retailer's central mainframe, Thrift executives said.

Legent shows off new architecture

Legent Corp. last week announced a broad strategy for bridging host-based and client/server systems through a suite of systems management products, middleware, application programming interfaces and development tool kits. Cross-Platform Environment (Xpe) pulls together under one architecture a number of initiatives begun in the past three years and is said to provide improved resource management, software development and distribution, troubleshooting, backup and recovery and user administration across heterogeneous environments. The announcement was prompted in part by a spate of bad news last summer that sent Legent's stock price tumbling and prompted users and analysts to charge the company with failing to keep them fully informed of its plans [CW, July 19].

Object standard to be revamped

The Object Management Group (OMG) announced two requests for proposals that will mean major additions to the group's Common Object Request Broker Architecture (Corba) specification. Corba is a standard that allows objects to communicate. The new areas will address ways to help determine issues such as which objects are available in any given system; interoperability; and communications initialization. The OMG will only consider commercially available technologies, and replies must be in by Dec. 8.

SHORT TAKES Citibank NA and Lawrence Livermore National Laboratory will collaborate on a three-year project to study advanced computing and communications. . . . AT&T will today introduce its next-generation Hobbit 92020 chip family. The new lower-power, higher-performance Hobbits feature different levels of integration and will begin shipping in the first quarter of 1994. . . . Microsoft last week said it will ship Object Linking and Embedding 2.0 support for the Microsoft Foundation Classes (MFC) in December. MFC provides class libraries that streamline the arcane process of Windows development.

Telco, cable pact has IS angle

Bell Atlantic/TCI deal could pave way to 'information highway'

By Ellis Booker

Last week's proposed merger between Bell Atlantic Corp. and the world's biggest cable operator, Tele-Communications, Inc., could hasten the delivery of video dial tone, wide-area multimedia services and other pieces of the "information highway" to U.S. corporations.

Even if the merged company initially targets consumer services, as many expect, it will have an important downstream effect on business users, despite the fact that many office parks and downtown areas already have access to a variety of high-speed local and long-distance networks.

The right mix

Industry analysts and phone companies alike have argued over the years that the wide-scale deployment of broadband technologies in the U.S. will only occur if entertainment and "infotainment" interactive services are part of the mix. Business applications for such networks, while important, are not enough to fund their creation.

"In order to fully deploy broadband [networks] to the curb, to support things like telecommuting, you need the economic justification," said Steven A. Taylor, president of Distributed Networking Associates, a consultancy in Greensboro, N.C. That justification, he said, comes from entertainment services such as digital on-demand video.

Once this broadband infrastructure is in place, Taylor said, business services are likely to follow. "Most people in business make telephone calls from home, and we'd feel very hampered if we couldn't," he said.

Taylor and others suggested that this infrastructure will be a boon to home-based businesses and telecommuters by allowing them to link up with a LAN interconnection at 10M bit/sec., for instance.

A Bell Atlantic spokesman agreed. "Once you have that [network] in place, it's all ones and zeroes, whether it's a movie, a video game or a database access."

Virtually all the biggest network providers have seen the same opportunity. Thus, the proposed Bell Atlantic/Tele-Communications deal is just the latest and largest pairing of a networking and entertainment delivery company.

Up-and-comer

Connecting broadband nets to homes could also have an impact on business by giving it a new and powerful way to deliver information and products to customers. According to Insight Research Corp. in Livingston, N.J., total revenue for all types of cable television services is $20 billion today, and it will grow 6.6% to $28 billion by 1998.

By comparison, Insight forecasts that interactive services will grow more than twice as fast, from $900 million today to $1.8 billion by 1998, a 15% annual growth rate.

"But no one has written a strategic game plan to take advantage of a broadband, national network," Insight President Robert Rosenberg said.

Meanwhile, Bell Atlantic's letter of intent for Tele-Communications — the value of the deal could exceed $20 billion — must be reviewed by regulators and the courts. The deal is not expected to be concluded until the second half of 1994.

IBM makes multimedia push

By James Daly

IBM hopes to lessen the cost of bringing multimedia to the masses early next year when it ships software that provides multiple streams of video, audio and animation to the desktop across a client/server network.

The Ultimedia Server software package, which will be demonstrated at next month's Comdex/Fall '93, will allow OS/2 client applications to store and retrieve multimedia data from the RS/6000 family of servers, according to IBM marketing manager Karl LaWall. Windows and Macintosh clients will also be demonstrated.

IBM said the Ultimedia Server/6000 package would have a number of business applications, including training and video mail. Away from the office, multimedia could serve up opportunities in such areas as video-on-demand, movies-on-demand and networked multimedia kiosks.

The Oregon Employment Division, for instance, has a pilot in place that allows residents to step up to a kiosk in a shopping center and make queries about new job openings or learn how to file for unemployment compensation.

A rising star

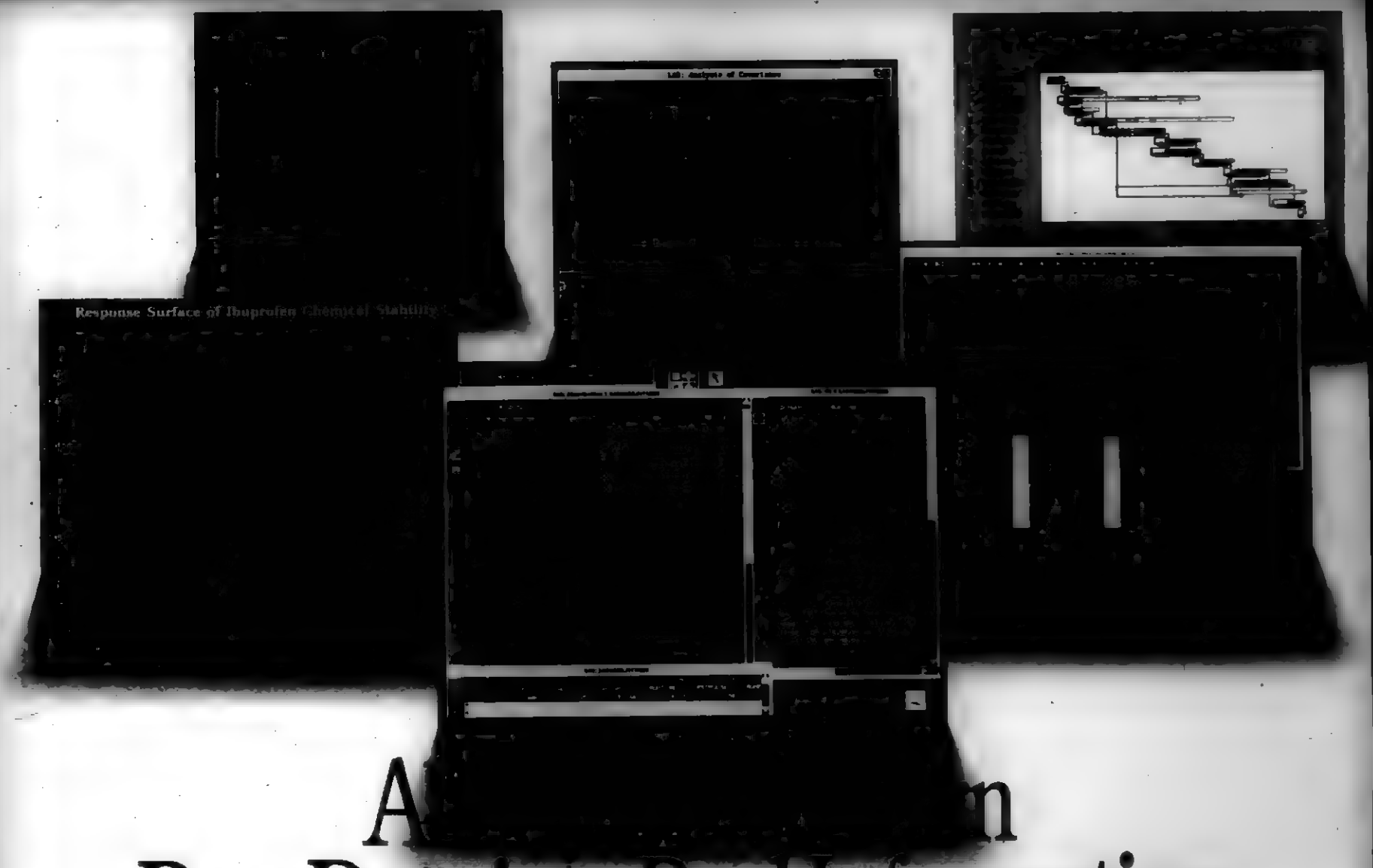
Multimedia-based training programs are also in place at companies such as Caterpillar, Inc. as well as at pharmaceuticals maker Burroughs Wellcome Co.'s Greenville, N.C., manufacturing facility.

Although multimedia makes tremendous demands on any computer, OS/2's combination of a 32-bit operating system and preemptive multitasking make it an ideal environment for multimedia.

OS/2 PC clients can access the server-based media as if it were stored in their own workstation, yet receive the benefit of the massive storage of the RS/6000 server.

The server package may also help soften the price of upgrading many machines with multimedia capabilities. "By keeping all this in a central server you minimize the cost," said Steve DeJarnett, networking futures architect for Ultimedia Server. In addition, all the major operating systems now include multimedia hooks.

Prices have not yet been established for the Ultimedia Server package, but IBM officials said it would likely cost approximately $10,000.



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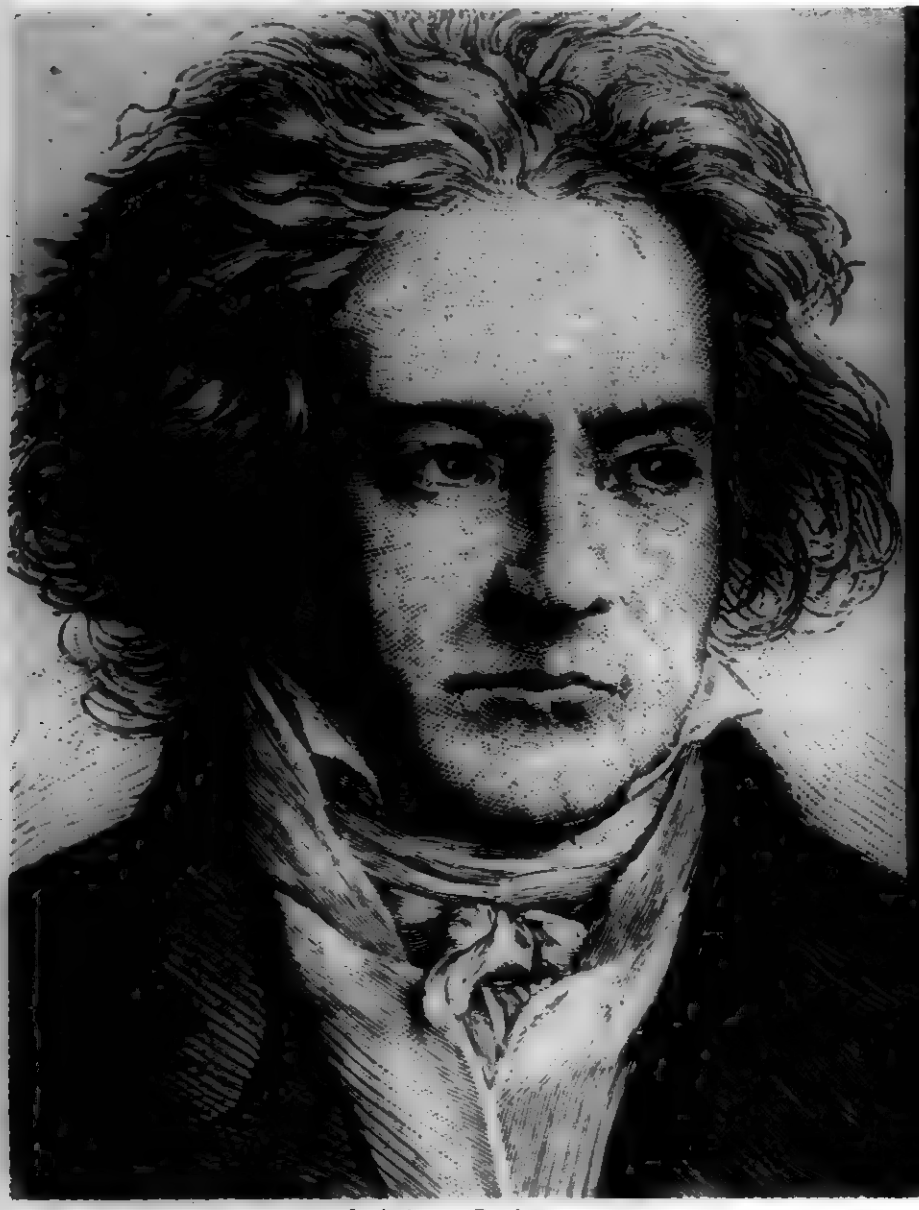

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OS/2 garners sales at NT's expense

By Ed Scannell

The religious zeal of IBM's Personal Software Products may finally be converting some corporate agnostics to OS/2. The firm recently signed deals resulting in the sale of more than 100,000 packages.

During the last six years IBM has found itself sledding uphill against an avalanche of DOS and Windows sales by archrival Microsoft Corp. Then many corporate users complained either about OS/2's lack of technical capabilities or the dearth of third-party software-compatible products.

But as many large corporate accounts near the end of their months-long testing and evaluation cycle — and find they like what they see of the mission-critical applications developed under OS/2 2.1 — they are beginning to deploy the operating system in a big way.

Ironically, the availability of OS/2's biggest threat is also enabling some accounts to make the jump to OS/2. The release of Microsoft's Windows NT means that information systems organizations can now hold it up for direct comparison to OS/2 2.1 and IBM's LAN Server 3.0.

"What is helping IBM is that users can touch, feel and smell [Windows] NT. And they are seeing that [it] has some nice stuff, but it doesn't run all Windows and DOS applications and doesn't run them as fast," said Bob Holmes, manager of evaluation technology at Southern California Gas Co.

Leading the list of corporate accounts that have recently thrown in their lot with OS/2 are Allstate Insurance Co., which will deploy 60,000 copies over three years; Westinghouse, Inc., which signed a deal for 10,000 copies; and State Farm Insurance Co., which signed up for 5,000 copies, sources close to those deals claimed.

Southern California Gas' Bob Holmes: *NT doesn't run Windows and DOS applications as fast*

Recent agreements for smaller quantities of the products have been signed with Fireman's Fund Insurance (2,500 copies) and The Chase Manhattan Bank NA (1,000 copies), sources said.

Spokespeople for IBM and the named customers declined comment.

Besides Personal Software Products' Microsoft-like missionary fervor, several corporate accounts were swayed by the stability and more complete feature set of OS/2 2.1, the availability of many more application development tools and a conviction that OS/2 can integrate desktop and mainframe applications reliably.

Particularly appealing to several corporate accounts is OS/2 2.1's ability to smoothly integrate internally developed applications in situations involving multiple communications sessions among desktop and host systems.

"There are companies like the Bank of Scotland building applications in the next six months that must maintain three or four communications sessions on, say, mainframes, Sybase servers and local OS/2 servers all at once," said Neal Hill, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Even if IBM is able to sustain this momentum, it still has a long road to travel before building respectable market share against Windows 3.1, Windows NT and now Windows for Workgroups 3.11, which Microsoft is positioning as the successor on the desktop to Windows 3.1 [CW, Oct. 4].

From a marketing standpoint, OS/2 is also being hurt by a lack of OEM bundling deals and a rich enough variety of fully compatible applications from the top 10 or 15 application developers.

And while Personal Software Products has signed deals with Compaq Computer Corp. and AST Research, Inc. to optionally preload OS/2 with their respective systems, the number of users asking for it has been small, according to sources at several manufacturers.

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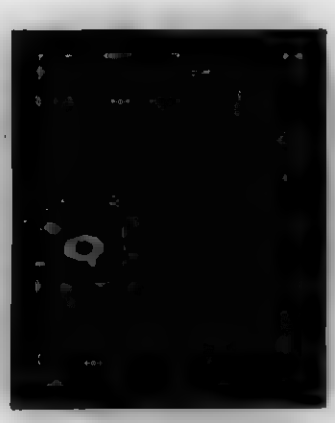

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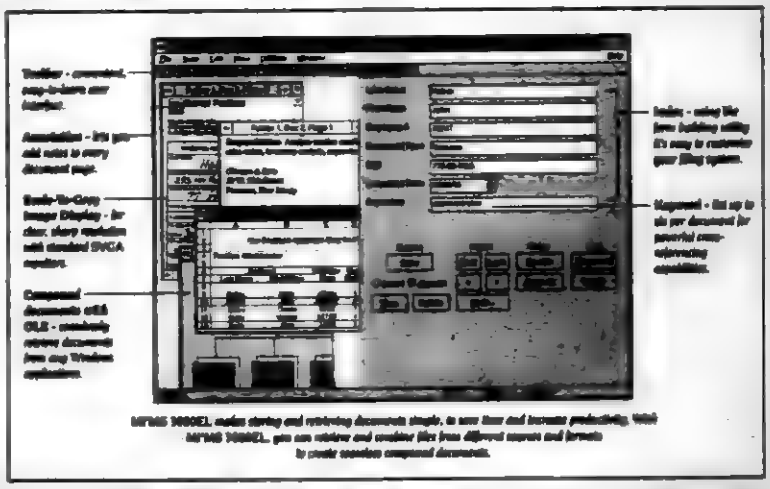

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Trapped In The Body Of This Tiny Ser

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Still, no network's perfect. In the unlikely event problems occur, our server exhibits remarkable tolerance. Every ProLiant includes Compaq-designed hot-pluggable drives. ProLiant Models 2000 and 4000 come standard with advanced error-correcting memory and off-line backup processor features (whereby the server reboots automatically to a second processor). And, most notably, the Compaq Smart SCSI Array Controller together with the ProLiant Storage System ensures mission-critical data integrity. Should a network problem bring the server down, the Rapid Recovery Systems of the ProLiant are designed to bring it back up.

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Network Interface	Up to 12 High-Speed Channels; NetFlex 2 with Packet Blaster Technology Standard		
Standard Disk Controller	Integrated Fast SCSI-2 and Smart SCSI Array Controller (selected models)		
Storage Capacity	550MB–112GB Internal/external	1050MB–140GB Internal/external	1050MB–140GB Internal/external
Typical Usage	Departmental network services—primarily NetWare	Departmental network application services—NetWare, NT and Unix	Application services for preemptive downsizing—NT and Unix
Transaction Rating	50–150 TPS	200–300 TPS	300–400 TPS
Estimated Starting Street Price‡	$6,000	$8,900	$13,900
Server Dependability and Availability			
Management	Second-generation Compaq Insight Manager (standard) combines with innovative hardware design to constantly monitor, assess and report server health and performance		
Fault Prevention	Insight Manager alerts you to server status changes in over 800 component parameters, allowing proactive server management backed by 3-Year Pre-Failure Warranty		
Fault Tolerance	Standard support for RAID levels 1,4,5; hot-pluggable drives; on-line spare drive; off-line backup processor§; advanced ECC RAM§		
Fault Recovery	Standard rapid recovery services automatically return server to full operational status even in the event of a critical subsystem failure		
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System Warranty	Free Three-Year, On-Site Limited Warranty		
Pre-Failure Warranty	Three-Year, On-Site Warranty replacement of designated components that fall below preestablished thresholds		
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Technical Support	Toll-free, 7 x 24 technical phone support from Compaq engineers		
CompaqCare System Partners	Highly trained, dedicated, third-party professionals who provide systems maintenance and comprehensive technical support		
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Digital puts off Windows NT products

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. has postponed plans to introduce by year's end Alpha AXP-based PCs and low-end servers running Microsoft Corp.'s Windows NT operating system and incorporating the Peripheral Component Interconnect (PCI) bus. The company is now looking at late winter/early spring launches.

Digital executives said they decided to bypass the original DECchip 21064 microprocessor in the new PCI systems and wait for the lower-cost 21066, which began sampling last month and is scheduled to go into volume production in the first quarter of 1994.

The move is being taken by analysts as a sign that Digital is throttling back a bit on NT activities while that operating system remains in its infancy.

"Digital is in a mode now where they need shippable products that they can generate revenue on," said Charlie Robbins, an analyst at the Aberdeen Group consulting firm in Boston. "It's hard to be NT-driven when you're dealing with a product that's still moving around."

Selling failures

Jesse Lipcon, vice president of Digital's Windows NT program, said the promise of the Windows 4.0 operating system may be dampening early enthusiasm for NT. But he added that Windows 4.0 should help in the long run by pushing software developers to use higher-level Windows APIs supported by NT.

William Milton Jr., a securities analyst at Brown Brothers Harriman & Co. in New York, said Digital executives talked about Windows NT "only in terms of the longer-term outlook" at a recent corporate strategy briefing.

Even so, Digital last week insisted that it is not backing off its commitment to Windows NT in any way. However, Jesse Lipcon, vice president of the company's Windows NT program, noted that NT-related revenue is not expected to be "a significant part of Digital's mix" until its 1996 fiscal year, which starts in July 1995.

Coming this fall

The firm's Alpha-based NT product line currently consists of the DECpc AXP 150 deskside system, which starts at $6,795. Digital had said in May that a low-profile desktop machine and a second deskside model, both equipped with the PCI bus, would be introduced this fall.

Server versions were supposed to perform in the class of the company's DEC 3000 systems for DEC OSF/1 and OpenVMS.

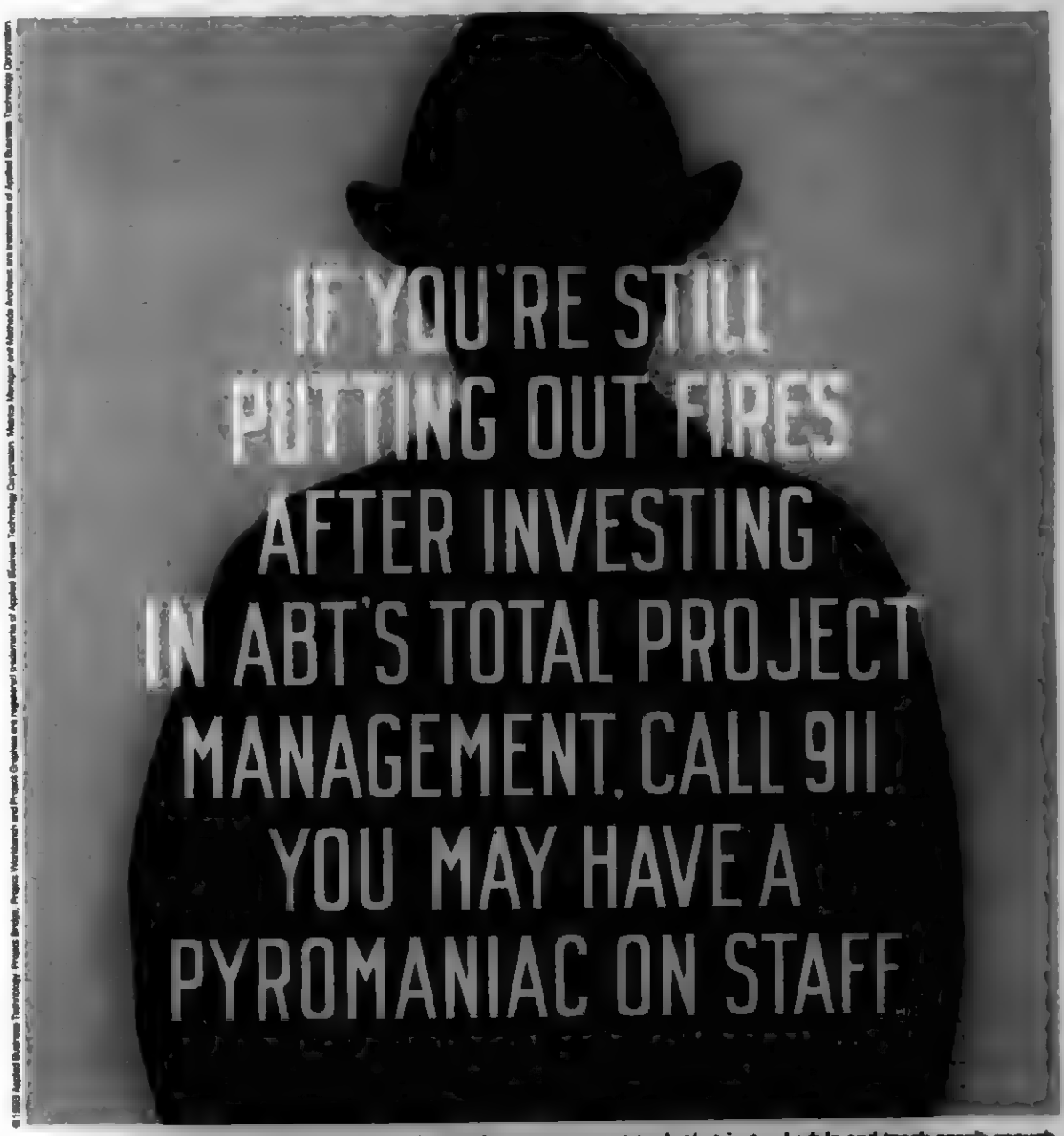
But William Demmer, vice president of the Computer Systems Group, said the plans were changed to take advantage of the 21066's lower cost and its built-in PCI interface.

Dennis Schneider, director of Windows NT marketing for Digital, said 21066-based NT systems are likely to be demonstrated at Comdex/Fall '93 next month but will not ship for another three to four months. The company is "studying" a price cut on the DECpc AXP 150 as a result of the change in shipment plans, he added.

The Windows NT servers, due out in six to nine months, are expected to support up to four processors and go up at least to the DEC 4000 hardware level. Digital executives said Windows NT support should be extended across the full Alpha AXP line within 12 to 15 months.

Raymond Sasso, chief information officer at J. R. Simplot Co., a frozen potato processor in Boise, Idaho, said he was hoping Digital would "be a lot more aggressive" in pushing NT systems. J. R. Simplot wants to be able to start moving to Alpha-based Windows NT servers next year, "but whether those expectations will be met remains to be seen," Sasso said.

However, Alan Connolly, senior network specialist at Pacific Gas & Electric Co. in San Francisco, said NT is not robust or mature enough to be considered "for anything serious" beyond the desktop at this point.



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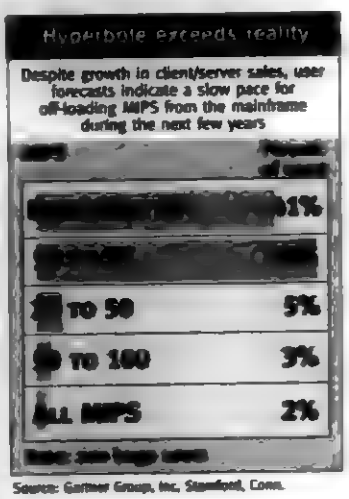
Client/server costs more than expected

LAN servers yield benefits, but expense reduction is not one of them

By Johanna Ambrosio
ORLANDO, FLA.

If you are thinking of ditching your mainframe and moving to LAN servers to save money, think again. By the time you are finished, the exercise will probably wind up costing you as much as 50% more than if you had left things alone.

This was one of the main messages coming out of the recent Gartner Group Symposium, the Stamford, Conn., consulting firm's annual customer conference. Some 1,200 attendees packed in to hear Gartner Group, Inc.'s prognostications, among them that it is OK to "just say no" to client/server computing. Gartner Group has been cautioning its clients on client/server for more than a year now.



Source: Gartner Group, Inc., Stamford, Conn.

"We estimate that client/server costs 150% of a mainframe-centric architecture," said Michael Braude, Gartner Group's senior vice president. "Change is not necessarily progress, and it's up to you whether you jump or not."

Hidden costs

There are benefits to adopting a client/server architecture — most especially increased flexibility and improved functionality. But even though the hardware and software client/server components are less expensive than their mainframe equivalents, the real "gotcha" is in service, support and administration.

For example, with data center automation, a few experts can support several thousand mainframe users — not the case in client/server computing. For every 35 users on a client/server system, Gartner Group figures a company needs one support person — at a cost that can run three times higher than the price of the hardware and software. In the past 10 years, Gartner estimates that users have spent more than $400 billion on desktop hardware and software and another $1.6 trillion on support and administration for those systems.

With mainframe computing, the largest costs are associated with the equipment itself, but these costs are written off over the course of the application's five-year life span. In contrast, the largest client/server costs are for the people needed — and those costs do not decrease over time, unlike those for equipment.

The issue of the price tags in client/server computing struck chords with many attendees, as well as with others who are in the trenches trying to make the whole thing work. "It is a myth that client/server is a panacea for all your ills," said Anish Mathai, managing director at Banker's Trust Co. in New York. "The start-up costs are higher."

Household Financial's Susan Swanson: *Company is 'happy' with the application*

The price you pay

When you add up the total cost of computing over five years, client/server applications cost 54% more than a comparable mainframe-based system, according to the Gartner Group. The largest cost component is support.

Sometimes other costs arise, as they did for Household Financial Network in Northbrook, Ill. The company's client/server funds-tracking application is implemented on three servers running Oracle Corp.'s database management system, with some 50 Intel Corp. 386-based clients attached.

Adding horsepower

Now, however, the company is planning to upgrade to 486-based PCs "to really do it right," said Susan Swanson, business systems consultant. "When we first started deploying this two-and-a-half years ago, the 486 just wasn't there. Now we need the additional horsepower" to accommodate the features that Household has added to the software.

Despite this, she said, the company is "happy" with the choices it has made and with the application.

Instead of moving to client/server because, as Braude said, "your organization is forcing you into it," other analysts suggested allowing the application to guide the platform. Factors to consider include how much processing will need to take place at the mainframe vs. just grabbing some data occasionally and doing the bulk of the crunching at the user's desktop, and how many users will need to be on the system.

Costs or not, many firms are committed to the client/server way of life. "The cost surveys may be accurate, but they do not reflect the range of features and functions I'm able to offer users on the new systems," said A. D. Wasyliw, director of North American production services at Kellogg Co. in Battle Creek, Mich. "Client/server really provides added value, at a cost."

States to tap EDI tax network

CONTINUED FROM PAGE 1

"in the millions" and declined further comment because details of the contract are still under negotiation.

However, states collectively receive a rough total of 325 million tax returns of all types per year, and there is the potential for as many as 3.6 billion EDI transactions per year among banks, taxpayers and state revenue agencies. As a result, the value of the contract could be "huge," said Jonathan Lyon, administrator of TaxNet.

The advantages for participating states and corporations include the traditional EDI goodies, such as reduced costs associated with handling and mailing paper forms and reduced errors caused by rekeying information.

Mirror, mirror

While state governments are preparing to receive EDI-based tax forms, a parallel effort is under way at the federal level. The IRS recently called for a public consortium to help determine the characteristics of a federal EDI tax-filing network.

Standard forms

Additionally, corporate taxpayers can expect to receive more timely returns and electronic notices that the tax return has been received. For software preparers, the standardized format means they will not have to use different paper forms or software for every state in which they file taxes.

While 33 states either allow or mandate electronic tax payments, and Florida and Texas allow some electronic filing, TaxNet is unique because it will let corporations send all their state tax information to a central site using standard forms, Lyon said. TaxNet also allows corporations to attach payment authorization to the electronic forms.

Two states, South Carolina and Nebraska, plan to begin using TaxNet Jan. 1. Others, including Colorado, Minnesota, New Mexico, North Dakota and Oklahoma, plan to join in sometime next year, Lyon said.

Users contacted said the TaxNet state tax filing services could be logical additions to their EDI infrastructures.

"We use EDI with our customers for items such as freight billing, and customers pay their bills via electronic funds transfer, so we already recognize the benefit of EDI," said Ron Edwards, vice president at Builders Transport, Inc., a truckload transportation company based in Camden, S.C., with roughly 2,400 employees.

"Most large companies already implement EDI, so to implement another form would require a trivial amount of effort," agreed Steve Glagow, director of the messaging service at BIS Strategic Decisions in Norwell, Mass.

Outstanding concerns

What remains to be worked out is whether TaxNet should use encryption technology and, if so, which technology to use. Another outstanding issue is how to resolve digital requirements. One option is using digital signatures. The Internal Revenue Service is considering Digital Signature Standard (DDS) for use in federal tax returns, and when DDS is adopted, it would make sense for the state governments to use the standard as well, Lyon said.

A temporary measure that states use is to require corporations' tax officers to file a paper-based signature with the state each filing year, according to Bob Barr, vice president of electronic services at Chipsoft, Inc. in San Diego. Barr is one of the authors of the original FTA request for proposals.

Despite these drawbacks, interest in the EDI tax filing is said to be high. For example, in South Carolina, more than 70 corporations showed up for a seminar held recently by the Department of Revenue to gauge interest, said Terry Garber, manager of technical service at the department.

In January, South Carolina will begin using TaxNet with about 100 of its largest companies. The department will use its IBM 3090 mainframe for batch jobs and will use a dial-up line access, the TaxNet VAN. From there, the state will download returns from an EDI mailbox maintained at EDS. Initially, the state will also let EDS provide the translation services, Garber said.

"EDI will allow our tax agents to concentrate on more important things than spelling errors," Garber said. She predicted that the state will expand the service to smaller businesses and individuals at an unspecified date.

Ultimately, the added convenience of electronic tax filing may be a requirement, not an option. In Minnesota, this already is the case. As of January 1, 1994, businesses who pay more than $120,000 per year and file a no-remit return will be required by law to file electronically using EDI, fax or Touch-Tone telephones, Lyon said.

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Private insurers

The other night I was at home enduring what most would probably consider one of the painful necessities of modern life — I was meeting with an insurance salesman. He was a perfect gentleman, well informed, etc. But it's just not something most people enjoy doing.

Anyway, he was in the middle of comparing my existing auto insurance policies with those his company could offer when he told me that my current insurer had apparently miscalculated the safe driver credits I had coming to me. The fewer accidents or moving violations you have in Massachusetts, the more credits you accumulate and the smaller your premiums.

"Says here you're a Level 13 and you should really be an 11," he said. "You haven't had any accidents or speeding tickets since . . ."

Hey, how the heck do you know that stuff, I asked him. After all, I'd just met him for the first time since speaking with him on the phone. He shifted a little uncomfortably and said, "Well, to tell you the truth, we just pulled your records down off the computer."

Oh. *The* computer. I recalled the ritual of going to confession when I was younger and telling the priest all my sins. I had to because we were taught there was a supernatural being who knew everything about us, so why lie. Today, apparently, there is *The* computer.

Don't get me wrong, I'm glad the agent did his homework and eventually quoted me a lower premium. But I sure felt uncomfortable at the ease with which someone accessed records I thought were between me and the commonwealth of Massachusetts.

So it shouldn't come as any big surprise that a recent Harris Poll found a majority of adults in the U.S. "very concerned" about confidentiality of computerized records [CW, Oct. 11]. Privacy, Harris found, is a front-burner issue today.

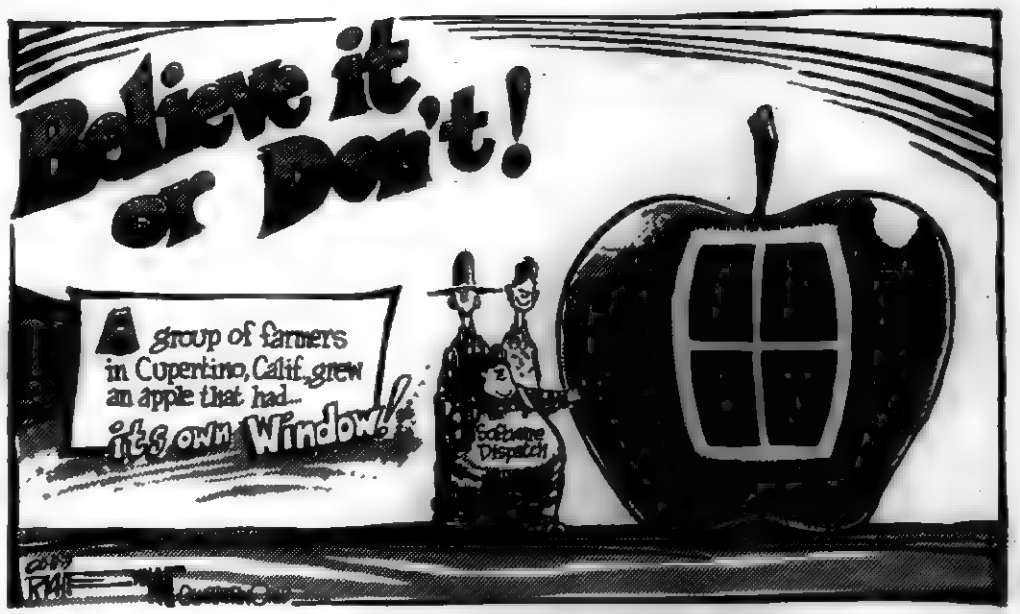
Data privacy is by no means a new issue. For years, various groups have railed in the halls of Congress against the lack of controls on computerized records. Nothing much has happened, largely because it simply has not been economically expedient to control access to and use of computerized data. Until now.

Because what the Harris poll showed further is that Americans are getting so fed up that they are voting with their wallets, showing a greater willingness to patronize businesses that have adopted policies to safeguard computerized records to some degree.

This is a window of opportunity for IS to fulfill a standing request from corporate management: Make the company more competitive. Take the lead role in demonstrating that data can be protected in a way that makes the consumer feel comfortable. Privacy rights have been deeply branded into the American psyche. Why not turn an emotion-laden issue to your company's advantage, and ultimately, to your own advantage as well?

Bill Laberis

Bill Laberis, *Editor in chief*



Don't forget SAS

I enjoyed reading your roundup of executive information systems (EIS) vendors' efforts to add SQL interfaces to their products ["EIS vendors adopt SQL to push client/server," CW, Sept. 27].

As you might expect, though, I was disappointed that SAS Institute was omitted from the discussion.

International Data Corp.'s own 1992 EIS Survey, published in August 1993, said, "SAS [software] was the second most commonly cited provider of EIS navigational tools. This ranking is impressive considering that SAS/EIS [software] was not commercially available at the time of this study . . ."

The survey goes on to state that "IDC suspects that these results reflect a combination of [SAS Institute's] traditional strength in the area of data access and reporting and a broad perception by users of what constitutes an EIS. Early signs are that SAS/EIS [software] will do well, particularly within SAS [Institute's] vast customer base consisting of more than 25,000 sites worldwide."

SAS Institute's strong showing in this survey comes as no surprise when one considers that the two major "enhancements" desired by EIS users (and identified in the survey) are cross-platform support (portability, connectivity and interoperability) and data access/integration.

Both enhancements have been hallmarks of the SAS System for many, many years.

W.E. Swain
SAS Institute
Cary, N.C.

The real pitchmen for client/server

Mr. Gillin in his recent editorial "Valley of dearth" [CW, Sept. 27] stated that "Users are being sold a bill of goods on client/server." I absolutely agree.

Gillin, for the most part, points his finger at hardware and software vendors. To a great extent he may be correct, but vendors are supplying technology to address specific components of the client/server model and many of them provide strong solutions. The problem is that no one vendor supplies a complete solution for today's client/server needs.

Personally, I point my finger at the trade publications. They have run screaming to client/server because it sells.

At no time did they take a step back and identify the pitfalls that existed; communications issues, scale concerns or even the need to consider security and integrity issues within a distributed environment.

As a vendor, it is our goal to provide strong technical solutions to our customers, and a majority of us do.

As the conscience of the industry, however, it is your responsibility to inform and enlighten these same individuals. Unfortunately it is evident that you have badly missed the mark. A bill of goods has definitely been sold on client/server, but it was generally sold through subscriptions to the computer press.

Michael Croxton
Softlab, Inc.
Atlanta

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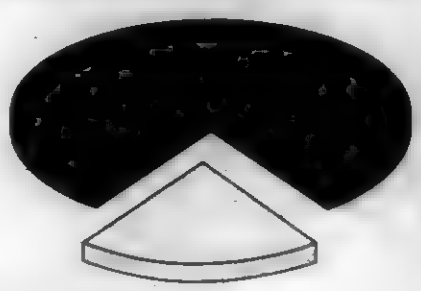

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❑ OS/2	(c)	❑ DOS Windows	(g)
❑ Unix	(d)		

App. Development Tools

❑ CASE	(h)		
❑ C++	(i)		

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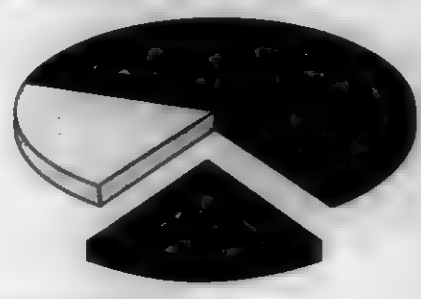

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Forget the diet of high-tech confections

Ted Krum

If your vendors appear distracted by personal digital assistants, multimedia or other tasty, high-tech confections, it's a good time to remind them that conventional commercial applications remain the meat and potatoes of their industry.

Younger vendors looking to knock the stumbling giants, IBM and Digital, into the second tier will not do so by stuffing RISC processors into our pockets, TVs and automobiles. Success will belong to those who win the loyalty of ordinary commercial users by solving their everyday problems and plugging the gaping holes in commercial desktop systems.

Enterprises desperately need to integrate information from sources scattered throughout their organizations, yet PC and workstation users still have no convenient way of exchanging data with preexisting mainframes or on-line data services. Current methods of interaction — terminal emulation and swapping flat ASCII data files — are a terrible drain on productivity. Even the few interface translation tools currently available for common mainframe environments simply provide a framework for extensive extra development.

Among homogeneous systems, methods for automating routine data flow still come up short. Good tools for work-flow management and version control are very scarce.

Major software firms do an admirable job of integrating the latest operating environment features into generic word processing, spreadsheet and presentation programs. Commercial computing, however, also relies heavily on software from lower-volume, industry-specific value-added resellers. These developers lack the resources to capitalize on new software technologies so their products have gained little in added productivity value during the past decade. Client/server and workgroup applications need to be as easy to assemble as Lego blocks before they can make a measurable impact on commercial productivity.

The challenge of absorbing software innovations also extends into more basic areas. For example, most of us still have to live without GUIs and PostScript-style printing for some portion of our work.

Young programmers with the training to write C++ code to complex APIs tend to flock to the major software houses, which put them to work on high-volume, horizontal applications. Vertically oriented commercial software development therefore remains the province of an older generation of programmers who have never had a chance to upgrade their skills. As demand for even more complex distributed applications grows, this generation gap will grow into a chasm between vendor and customer priorities. To use the words of one commercial developer, "You could make a fortune selling Cobol Windows and [DCE] for DOS."

Unix ideologues might maintain that none of these problems would exist in a world of open standards. Unfortunately, this is like saying that Balkan warfare has no place in the new world order; it's a platitude that ignores uncomfortable realities. The computer industry will not be able to sustain double-digit growth unless it expends the effort to drag along its installed base.

The next time your vendor wants to drop in to talk about the information superhighway, tell him to get his priorities straight.

Krum is a senior research analyst at RCB International in Stamford, Conn. He has worked as a developer and consultant for 11 years. He can be reached by E-mail at Tedkrum@aol.com.

PowerPC: Another chip choice won't help

FIRE WATCH *by* John Gantz

If you're thinking the PowerPC will make your life easier, forget it.

In the short run, customers have little to gain as Motorola (and IBM and Apple) take on the Intel microprocessor hegemony. In the long run, you could even lose some ground, unless you have a well thought-out strategy for deploying multiple platform architectures.

That's not to say that some competition wouldn't be helpful. A strong challenge forced Intel to cut prices on its 1486 line by 60% in May 1992; that action produced a fourth-quarter PC price war and the re-engineering of Compaq's PC line, which led to the rejuvenation of the IBM PC Co.

But, it wasn't competition from Digital's Alpha, Hewlett-Packard's Precision Architecture or Mips Technologies, Inc.'s R4000 that drove Intel to cut its prices the last time. It was competition from 80386 clone vendors. And another challenge from that quarter — companies such as Advanced Micro Devices and Cyrix — is a lot more likely to be beneficial than one that involves alternative architectures.

It's true that the PowerPC chip poses the most serious competition Intel has faced yet from a RISC architecture. Early versions are already being positioned: the 601 as a straight Pentium knockoff; the 603 for portable devices; and the 604 and 620 for server and workstation products. And the PowerPC has already shown up in products announced by Apple's and IBM's workstation divisions. The hitch is that customers don't really care all that much about the chips. They care about what software runs on what processor.

Unless Microsoft puts Windows, Chicago and Windows NT onto the PowerPC, Motorola's market share won't change a smidgen, even if PowerPC is 40% faster than Pentium, as claimed. Of course, Motorola and IBM might be able to engineer into the PowerPC some of that DOS, Windows and derivative technology to which IBM still has access. Then it would be an Intel clone wouldn't it? And the Intel clone market is already crowded. Either way, Intel isn't likely to feel enough of an impact to offer any big bargains on Pentium.

What you're likely to see over time is most of the major PC vendors — IBM, Compaq, AST, Dell — sticking to Intel and second-tier players and workstation vendors, including IBM, offering some PowerPC products. If Motorola is successful, you'll eventually find variants of Windows, Windows NT, Workplace OS and Unix running on both PowerPC and Intel chips. That means, over time, you'll find yourself, for one reason or another, developing for Windows on Intel, Windows NT on Pentium, Windows on Macintosh and so on . . . and the tangle of device drivers, buses, accelerators and development tools and libraries they entail.

It's my guess that any financial advantage you might realize from the extra power of PowerPC over Pentium in one environment, or Pentium over PowerPC in another, will be easily outweighed by the hidden costs of developing for multiple, albeit whiz-bang platforms. We're talking lengthier product evaluations, dedicated staff time sorting out technologies, multiple beta tests and developing multiple GUIs, etc.

In fact, I wouldn't be surprised if, three years hence, we look back on the growing competition in microprocessors much the same way we now look at airline deregulation — as a development we could have done without. (See related story page 35.)

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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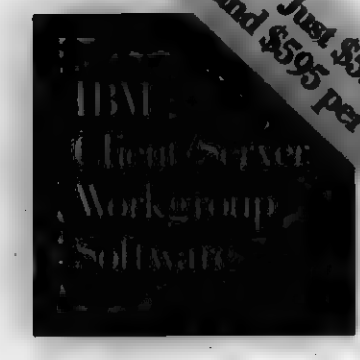

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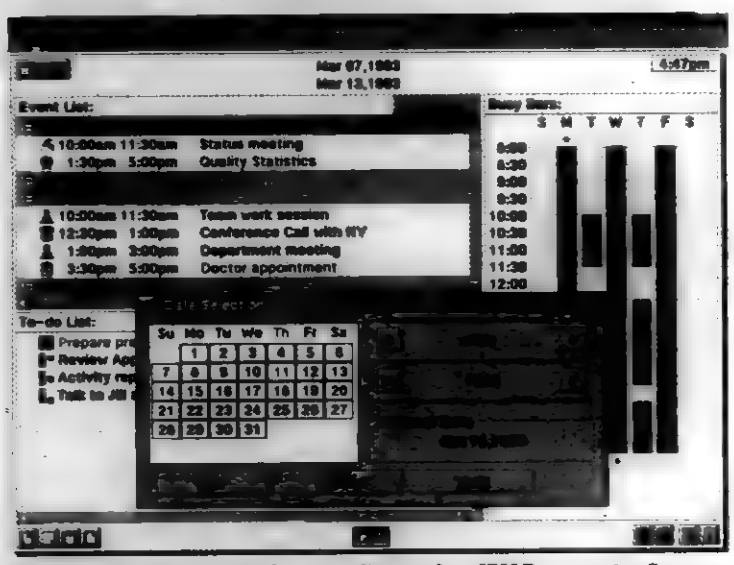

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Apple pickings slim on apps

By James Daly
CUPERTINO, CALIF.

Although Apple Computer, Inc. is working with hundreds of software developers to build applications for its upcoming PowerPC-based machines, do not expect many to take immediate advantage of the speedy RISC chip. Fewer than a dozen native applications are expected to be available when the first PowerPC-based Macintosh ships in March.

Apple officials said that today's Macintosh applications should run without modification on PowerPC, but the real advantages of the technology will be with applications that exploit the RISC performance. Older applications employing emulation code could run as much as 75% slower than those running native PowerPC code — akin to driving a sports car with a speed regulator.

"There could be a pretty big difference," said Apple spokesperson Betty Taylor. "But native applications should really fly."

Three months before the January launch of the first PowerPC-based Macintosh, only 11 vendors have committed to providing native applications: Adobe Systems, Inc., Acius, Inc., Aldus Corp., Claris Corp., Deneba Software, Frame Technology Corp., Insignia Solutions, Inc., Microsoft Corp., Quark, Inc., Specular International and WordPerfect Corp.

Some users are willing to give Apple more time. "Obviously, we'd like to see as many native apps as possible," said Mike Bailey, a systems integrator at Lockheed Missiles and Space Co. in Sunnyvale, Calif. "But if they're not out right away, I'd expect to see many more coming" by the end of 1994.

Apple is lobbying furiously to increase developer support for PowerPC. "There's still a lot to be determined," said Steven Eskenazi, an analyst at research house Alex. Brown & Sons, Inc. in New York. "Most of the hard-core development work gets done in the last three to six months, so there's still a lot of race to be run."

Side by side

	1994	1995	1996
RISC 601 (low-end/midrange)	70	1,900	1,744
RISC 604 (high-end desktop)	100	275	525
RISC 620 (high-end servers, workstations)	55	350	530
RISC 603 (low-cost portables)	0	250	644
Total Apple RISC CPU shipments	225	2,775	3,473

Source: "The Hartsook Letter," Alameda, Calif. CW Chart: Dave Marshall

But for many companies, it comes down to wait-and-see economics.

"It's a matter of resources, not a lack of desire," said Mike

Apple, *page 40*

Microsoft counters with Word 6.0

By Michael Vizard
NEW YORK

■ Microsoft Corp. this week plans to lead its overall drive to deliver its next generation of applications for its Office suite with the announcement of Version 6.0 of its Word word processing package.

Slated to become available about two weeks after the release of Version 6.0 of WordPerfect Corp.'s namesake word processing software, which shipped earlier this month, the latest version of Word is expected to up the ante in the hotly contested war of words between the two leading providers of word processing software.

Initial reaction to the latest version of Word among beta testers has been generally positive, which may serve to make it difficult for WordPerfect to regain market share it lost to Microsoft after its initial faulty thrust into the Windows arena last year.

"Everything on my wish list was taken care of, and everything seems to work," said John Woller, a technical writer at Indus Group, Inc., a utility software manufacturer in San Francisco.

"The nice thing is that it's not a jarring change; it's a smooth transition," added Daniel Willis, a lead analyst at 3M Co. in St. Paul, Minn.

Word up

Currently, there are more than 10 million users of Word worldwide, including more than 1 million users who have switched from WordPerfect. In addition, Microsoft noted that more than 40% of Word sales come through its suite offering.

Sticking with Word

Even users who had previously switched from WordPerfect's word processing package to Microsoft Word are reporting that they are still not inclined to return.

"No matter what we did, we figured that we were facing a major learning curve leaving WordPerfect on DOS, so when we looked at other Microsoft products like Excel, PowerPoint and FoxPro, we decided to go for the whole suite," said Mark Flannery, information systems manager at MBS, Inc., a seed company in Ames, Iowa.

A key feature of Word 6.0 is a set of agents that automate specific tasks, including an AutoCorrect agent that automatically corrects misspelled words without requiring a user to employ a spellchecker directly.

Also, an AutoFormat agent formats a document according to 20 format styles located in a style directory, and an AutoSelect feature allows users to select text starting from the middle of a word.

Wizards and other features

Also included are Wizards that interactively guide users through the creation of a document, support for electronic forms and full support for Version 2.0 of the Object Linking and Embedding interface, which was designed to allow Word to seamlessly integrate data with other Windows applications.

In addition, Word 6.0 includes a multiple-page view that allows users to preview a document, an AutoTable Format agent, customizable tool bars and menus and support for an Undo command.

Word 6.0 also adds improved WordPerfect conversion facilities, which are intended to help facilitate migration to Word. But whether the use of the facility — along with proactive agents and tight integration with other Microsoft applications — will be enough to keep the word processing momentum running in favor of Microsoft in the face of largely loyal WordPerfect customers remains to be seen.

PC data sharing made easier

By Michael Fitzgerald
MOUNTAIN VIEW, CALIF.

Increased use of notebook computing has made keeping files up to date between desktops and portables a dicey issue for corporate users. Nomadic Systems, Inc. recently addressed this problem by shipping SmartSync, a Windows utility that synchronizes files and provides for the sharing of data across multiple PCs.

Users contacted said they liked SmartSync's ability to ensure that files on both corporate desktops and notebooks in the field have the same data.

Features are smarter, too

Nomadic's SmartSync includes features such as security password protection; a Conflict Manager to resolve situations in which, for example, a file has been changed on two PCs between synchronization; and RemoteCopy, which allows users to remotely replicate files from one PC to another.

SmartSync runs on Windows 3.1 in enhanced mode, requires 4M bytes of RAM and 4M bytes of hard disk and costs $169.95 per copy.

"This whole file synchronization issue is a key need in the mobile computing environment," said Bruce Stephen, director of PC hardware and pricing research at International Data Corp. in Framingham, Mass.

"It's an ingenious little utility that actually solves a big problem for us," said Joel Diamond, a SmartSync beta tester and technical director at the Windows User Group Network (Wugnet) in Media, Pa.

"No single individual at Wugnet works on one project where all the files are his domain, and this little utility allows us to make files transferable and update them seamlessly," Diamond said.

Chuck Stegman, an analyst at Dataquest, Inc. in San Jose, Calif., credited Nomadic with developing "a sophisticated piece of technology wonderfully hidden behind a straightforward interface."

Synchronization is key

Enrique Crespo, manager of corporate sales systems at The Torrington Co. in Torrington, Conn., said many users now have both desktops and notebooks, and SmartSync may ease data management issues.

It is a significant time-stealer to have to figure out where the latest version of a particular file happens to be, he said.

Crespo added that previous synchronization efforts for PCs have been "cumbersome" and that he would like to get the same kind of software synchronization on his notebooks that he has on Apple Computer, Inc.'s Newton.

Look for synchronization to become a hot item. Microsoft Corp., for one, is known to be working on incorporating data reconciliation and synchronization in its coming At Work for Mobile Companions operating system.

Jeffrey Henning

Apple on the rebound

Looking at Apple's recent history, many information systems managers are concerned about the company's financial stability and long-term prospects.

Their concern is understandable, given Apple's record, which includes product abandonment, haphazard price cuts, uncertain delivery timetables, poor forecasting and layoffs.

Although some customers remain optimistic that Apple will emerge from its travails leaner and more competitive, others worry that it might be headed for the same downhill slide as Commodore.

I don't think the reality is likely to be quite that drastic. Like Commodore, Apple has a proprietary standard in an increasingly open systems world. Unlike Commodore, which dropped from No. 3 in the U.S. PC business in the late 1970s to No. 32 last year, Apple plans to convert its systems software to run on an open platform, the PowerPC, which will be available from multiple vendors.

Different from Compaq

On the other hand, Apple will not enjoy the kind of rebound that Compaq has seen. True, Apple's position is similar to the one Compaq was in 16 months ago, when it priced its systems too high relative to the rest of the market and had to begin cutting prices. Apple, however, won't be able to build revenue by taking business away from smaller vendors, as Compaq did. Apple has a harder sell into new accounts, since its systems are islands at most sites.

Apple will eventually stabilize, but with smaller market share and a reduced role. The company's transition to openness puts it in the slow lane of the PC business; Compaq, AST and Dell are all in the passing lane as they benefit from the decline of no-name clone vendors. Compaq will pass Apple in the U.S. PC business next year, and AST might pass Apple within three years.

Thrown from the castle

Furthermore, Apple will no longer have its own kingdom but instead will rule over a grand duchy in the PowerPC realm. IS managers who have not purchased from Apple in the past will feel more comfortable doing so since PowerPC systems will be available from a few other vendors and because Apple will develop attractive PC hardware and software extensions for Windows. Those who have already committed to the Macintosh will continue to have a healthy upgrade path, as the Mac slowly migrates to the PowerPC architecture.

How reduced a role Apple will wind up occupying depends on the ability of its new management team to prepare the company to compete in an open systems market. Apple needs to reduce its product families and provide better information about planned products. It needs to make fewer, but more modular, base systems.

Streamlining in this way would make it easier for users to upgrade (thereby minimizing fears of obsolescence) and would enable Apple to manufacture to meet demand.

Apple should also encourage IBM to sell PowerPC systems running Macintosh Application Services to large businesses.

IBM, the epitome of serious computing, has an understanding of large accounts unmatched by Apple and can help grow the overall market for Macintosh compatibles, even at the risk of lost sales of Apple hardware. After all, it is better to have a smaller share of a large pie than a smaller pie.

Henning is a senior industry analyst at BIS Strategic Decisions in Norwell, Mass.

Research made easy with census data

Wessex puts U.S. Census' short form on CD-ROM; asking price: $95

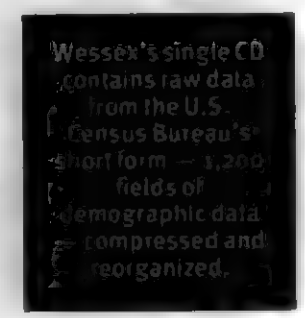
By Ellis Booker

How many Eskimo children under the age of 6 live in Oklahoma City? Now answers to this and other demographic puzzles can be researched inexpensively with a product from Wessex in Winnetka, Ill.

"We feel we have a new paradigm for viewing large amounts of data," said Wessex founder and President Scott Elliott.

Last fall Wessex introduced its first product, Pro/Filer Demographics CD, which contains all the raw data from the U.S. Census Bureau's "short form," the Summary Tape File 1A (STF1A).

Although users have been able to get this data directly from the federal government — the bureau sells a version of the STF1A file on 16 CD-ROMs — its $1,600 price tag has been prohibitive to smaller companies, Elliott said.



Deluge of data

By comparison, Wessex's single CD contains the STF1A's 1,200 fields of demographic data — compressed and reorganized — as well as software for navigating this statistical gold mine with English-language menus, all for just $95.

"We use [Wessex's] compressed data 50 times more often because it's accessible and easy to use," said John Ball, director of marketing at The Quaker Oats Co. in Chicago.

In the past, Quaker Oats had used the data on the Census Bureau's CD-ROMs, which Ball said comes in an arcane database format and requires reference to a 45-page manual. "Most marketing people don't have the skill set needed to manually try and sort this out," he said, adding that the company often farmed out this job to outsiders at "significant" expense. "With Pro/Filer, you can do a simple sort in five to 10 minutes," Ball said.

Another enthusiastic user of the CD is Mark Burnett, president of Burnett Direct, Inc., a Southfield, Mich., list broker and direct-mail marketing consultancy.

"Prior to Wessex, who the hell could afford it?" asked Burnett, who uses the demographic data to "calibrate" list selections from other commercially available databases.

Burnett uses the output of the Wessex system as fodder for both relational database programs and a PC-based geographic information system (GIS) mapping tool from MapInfo Corp. in Troy, N.Y.

In the case of the query about Eskimo children, for instance, a street map of Oklahoma City could be color-coded to present the results.

Marketing tool

Quaker Oats also uses MapInfo to visualize the Census Bureau data. For instance, marketing department demographers can draw perimeter maps around designated "concentrations" of target consumers, basing the placement of billboards or the broadcast of radio campaigns on these regions.

"It's the availability of this kind of data that is fueling the growth in mapping software," said Bruce Jenkins, vice president of Daratech, Inc., a market research firm in Cambridge, Mass.

Daratech estimated that GIS software revenue topped $387 million last year, a 19% jump over 1991.

"One of the big bottlenecks to GIS has been the lack of usable, off-the-shelf data," Jenkins said, adding that in the past, this meant that GIS implementations added up to "large-scale, custom affairs."

Pro/Filer produces tables in both delimited ASCII and Boriand International, Inc.'s dBase III formats and works with a variety of mapping softwares.

Mapping tools, too

Separately, Wessex sells US Streets and US Boundaries, data products also on CD-ROM that work with mapping products from MapInfo, AutoCAD, Inc. in Sausalito, Calif., and, as of this month, Environmental Systems Research Institute, Inc. in Redlands, Calif.

This month, Wessex began selling its second demographic product: a four CD-ROM set containing the 40G bytes of data from the Census Bureau's "long form," the STF3A. The new package costs $395, and individual disks are priced at $95.

Geography lesson

Surveys indicate the top technology project for many local governments' information systems shops is the creation of a GIS, or a land information system.

Maps have always been a key tool for government because virtually all the data they manage or oversee — taxes, zoning, school districts, streets and sanitation, public safety — is tied in some way to geography.

Here and there, work is under way to link these discrete systems into governmentwide systems (within cities and municipalities and between state and local governments). These become graphical front ends for all sorts of information.

"There is widespread interest in GIS as an integrating technology," says Ed Crane, a GIS consultant at M. J. Harden Associates, Inc. in Kansas City, Mo., and immediate past president of the Washington-based Urban and Regional Information Systems Association.

According to GIS market research firm Daratech, Inc. in Cambridge, Mass., state and local governments spent $204 million on GIS in 1992. The total GIS market that year was $309 million.

Among those that have taken the plunge is San Diego County, which has countywide crime statistics for all police departments in the county and is working to share this information with systems maintained by municipal departments.

"Data sharing between county and municipal governments is not that prevalent now, but it's coming along more and more through GIS," said Wilpen L. Gorr, professor of public policy and MIS at the Heinz School of Public Policy and Management at Carnegie Mellon University in Pittsburgh. — *Ellis Booker*

Low-cost multimedia may become norm

By Michael Fitzgerald

A sudden influx of products suggests that multimedia features such as CD-ROM and sound chips are becoming inexpensive enough that they will soon become a standard feature on notebooks, though perhaps not widely used for a while.

Both hardware and software products are rolling out with multimedia features, all targeted at stand-alone, presentation-oriented uses. Among them are the following:

•**Gold Disk, Inc.** will today announce its Astound multimedia presentation package for the Windows operating environment. With Astound, Gold Disk is trying to break new ground by combining a typical presentation tool with multimedia capabilities.

The program can build presentations ranging from basic bar charts to advanced full-motion and sound extravaganzas. Currently in beta testing, Astound for Windows will cost $129 for the first 90 days when it becomes generally available at Comdex/Fall '93 next month. The price will then jump to $399.

Panasonic's CD laptop *has a built-in CD-ROM drive and a 10.4-in. active-matrix color screen*

•**Panasonic Communications and Systems Co.** recently introduced its CF-V21P, a family of notebooks with a built-in CD-ROM drive and a 10.4-in. active-matrix color screen.

•**Start-up Inex Technologies, Inc.** in Santa Clara, Calif., recently unveiled the Inex 4000 family, which has built-in Business Audio and an ESS488 sound chip.

The Inex products use the 25-MHz 486SX and also support up to a 200M-byte hard disk and 20M bytes of RAM. Prices will range from $2,195 for a monochrome version to $3,895 for an active-matrix color version.

At Comdex, Inex will introduce a cellular data/fax modem option and support for 10Base-T and 3270 emulation, as well as models based on faster chips.

The Gold Disk, Panasonic and Inex announcements follow on the heels of the IBM PC Co.'s new ThinkPad 750 family [CW, Sept. 20], which offers multimedia features in a mainstream notebook.

"As you get more and more PCs based on the standard 486 architecture that can handle these new data types, [multimedia] is just going to become a standard feature," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif.

Some users said feature ubiquity will play a role.

"We've avoided putting multimedia into [our applications] because of marketplace limitations, but if the features were more prevalent, that would certainly drive it," said Chad Pearce, vice president of systems at Godwins Booke & Dickenson, a benefits consultancy in Philadelphia.

He said that while selling benefits products with a multimedia twist has thus far elicited little interest from clients, using multimedia as a sales presentation tool could make sense.

Users have time to mull over multimedia applications: Panasonic released its CF-V21P in part to take advantage of the PC Co.'s terrible backlogs, but it will not be able to ship its own 10.4-in. active-matrix color version until next month. The company also will not ship the CD-ROM-equipped model until January 1994.

Some models are available. Panasonic has a 25-MHz 486SX-based monochrome notebook that weighs 5.7 pounds. It will support up to a 200M-byte hard drive and 20M bytes of RAM. Pricing ranges from $2,549 to $4,299; the CD-ROM is $499.

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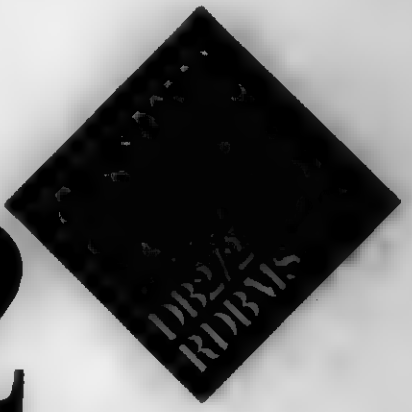

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IBM 990	$147,800	126.0	$1,173
HP 160	$136,530	82.0	$1,665
DEC 4000/610	$131,728	94.6	$1,392

Power for a new age.

IBM

IBM announces upgraded AntiVirus

DOS, OS/2 and Windows will now be protected

By James Daly
YORKTOWN HEIGHTS, N.Y.

IBM has announced an enhanced version of its AntiVirus package, which provides a defense against virus attacks in DOS, OS/2 and Windows environments.

IBM AntiVirus 1.03 now probes for, recognizes and disinfects more than 2,000 common and uncommon viruses that may exist in memory or on hard disks, floppy and LAN network drives.

The company has also added a new integrity checking feature that reportedly distinguishes activity typical of a virus, such as attempts to conceal its action from the user. The enhancement was designed to eliminate the pesky false alarms that can invade some antivirus products.

An administrative interface that provides custom virus control is available by contract from IBM AntiVirus services. Using the feature, an administrator can enforce organizationwide use of AntiVirus or ensure central incident management by receiving reports of any virus activity.

The package can also be customized to take specific actions, such as sending messages over the LAN, when a virus is found. This is made possible by protocol-independent LAN support, IBM officials said.

AntiVirus is available for $29.95.

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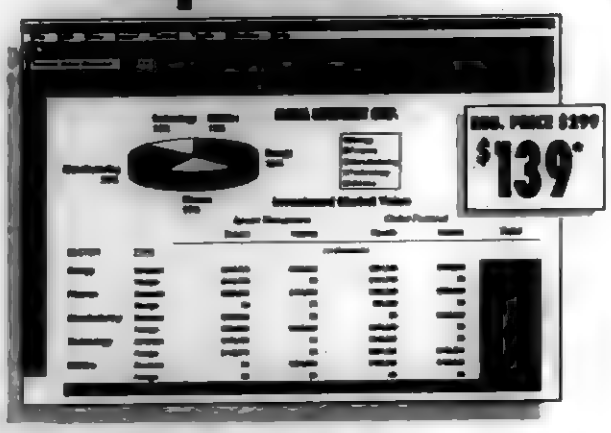

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OS/2 word processor hits Windows

By Michael Vizard

DeScribe, Inc. last week delivered 16-bit and 32-bit implementations of its namesake word processor for Windows, making the company the only provider of word processing software that runs native on both Windows and OS/2 platforms.

Previously, DeScribe offered 16-bit and 32-bit implementations of its word processing software on OS/2 and a 16-bit Windows implementation. With Release 4.0, the platforms supported now include Microsoft Corp.'s Windows NT and Windows for Workgroups. All the platforms previously supported by DeScribe are in sync with Release 4.0.

According to Allan Katzen, president of DeScribe, key features in Release 4.0 include an improved text import capability, which allows DeScribe to interact with other applications, as well as the ability for DeScribe to run as a subapplication under any custom application manager.

Priced at $495, the Windows version of DeScribe is available now and includes a free upgrade to the next major release of DeScribe.

The Windows NT version of DeScribe is also priced at $495 as part of an early release program through which DeScribe will deliver updates to support the still evolving Windows NT operating system free of charge.

Apple pickings slim

CONTINUED FROM PAGE 35

Hopkins, president of Full Moon Software, Inc. in San Jose, Calif. "We have to concentrate on the here and now and sell to the installed base. In the long run, the PowerPC will be the only game in town, and then we'll be over there."

Apple announced the adoption of the PowerPC RISC chip as part of the Apple/IBM/Motorola, Inc. technology alliance formed in October 1991.

What is the performance trade-off? It depends on what sort of applications you run. Number-crunching applications should run at the speed of a 25-MHz, 68030-based Macintosh IICI.

A less computationally demanding application, such as a word processing package, should perform at the speed of the high-end Quadra 900, which runs a 25-MHz, 68040-based microprocessor. "Native applications should run anywhere from three to five times faster," Taylor said.

Four of them
Apple, IBM and Motorola are working on four versions of the PowerPC simultaneously, including the one for the initial midrange and high-end Macintoshes and the 620, designed for a full 64-bit architecture.

Microsoft product manager Don Pickens said the company is planning to bring out native PowerPC applications of Word and Excel by the first half of the year. "They were the easiest to do," Pickens said. He added that there is "a whole lot of other work going on" to get Microsoft's complete Macintosh applications suite over to the PowerPC.

Over at WordPerfect, engineers use EcoLogic's Flashport porting tool to port WordPerfect's Assembly code over to C. "The plan is to have WordPerfect 3.0 to run native on the PowerPC around the time it is available," said spokesman Dave Teran. "That's the plan, anyway."

Apple officials said that customers' current investments in Macintosh applications software will be preserved.

"Apple's chief goal is to retain a high degree of compatibility with existing Macintosh applications," Taylor said.

Apple will continue to offer 680x0-based Macintosh systems well after the initial introduction of Macintosh on PowerPC. The company also intends to offer upgrades to PowerPC for the Macintosh Centris 610, 650 and 660AV computers, Macintosh IIVX and IIVI, Performa 600 and Quadra 800 and 840AV systems.

DayStar Digital will also provide upgrade cards.

Meanwhile, Apple is also optimizing parts of System 7 to achieve better performance on the PowerPC processors. For example, many Macintosh applications spend most of their time calling procedures from the Macintosh Toolbox, a set of system software modules designed to handle common tasks. Apple has modified the Toolbox procedures that take the most computation power (such as QuickDraw routines for on-screen graphics) to take advantage of RISC speed.

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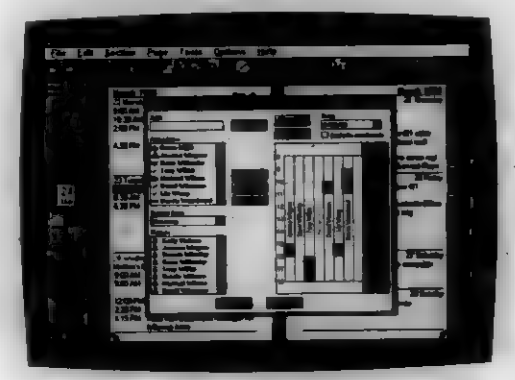

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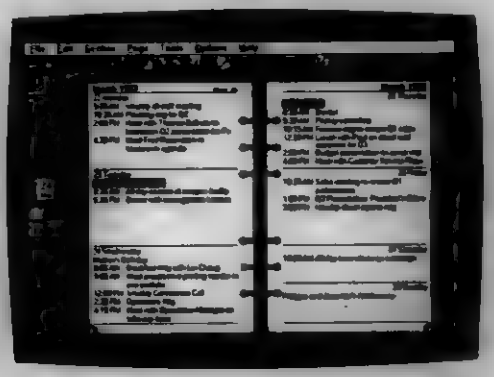

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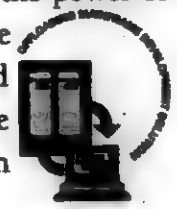

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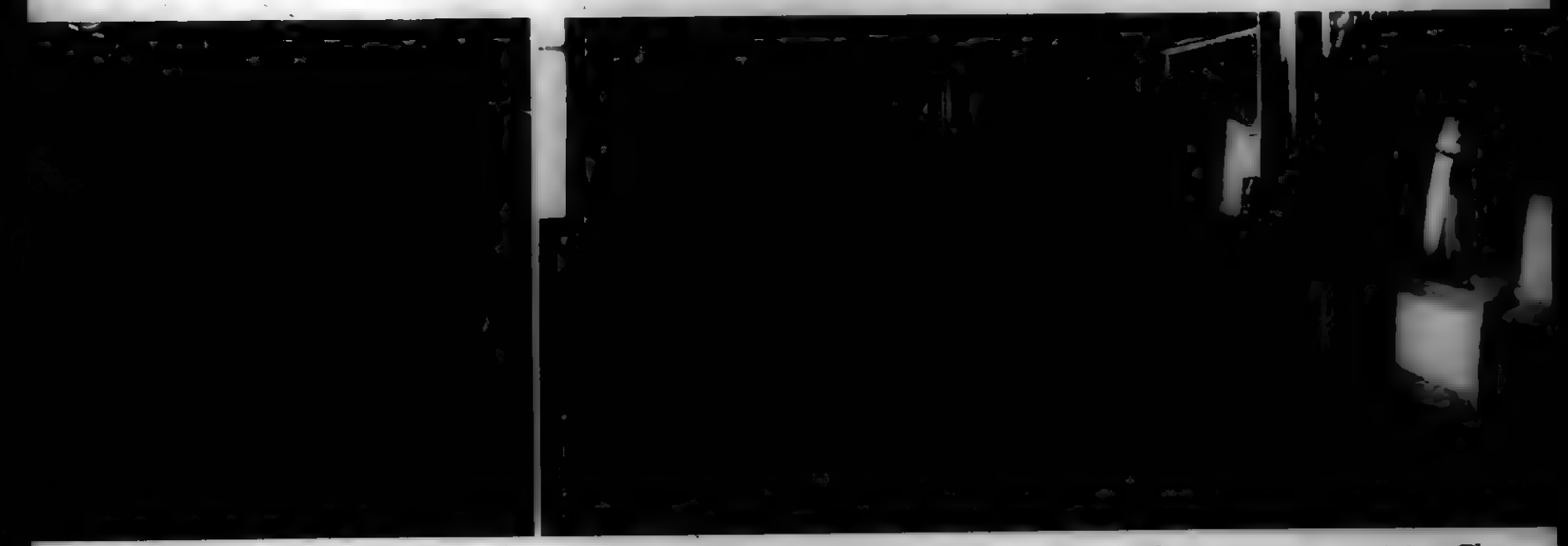

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Interleaf to move to easier, standard GUI

By Michael Vizard
WALTHAM, MASS.

Interleaf, Inc. has announced plans to incorporate The Open Software Foundation's Motif and Microsoft Corp.'s Windows as the graphical user interfaces (GUI) for Version 6.0 of its publishing system.

Currently, the Interleaf publishing system has a proprietary GUI that many users have said is difficult to learn.

"You have to remember that when we designed our GUI, there wasn't anything like a standard graphical interface yet," said David Weinberger, an Interleaf marketing fellow.

User reaction to Interleaf's plans to move to a standard graphical environment was generally positive. "With Motif, the usability has been significantly improved, and there's a new on-line help system that authors will find very useful. I expect to deploy the Motif version next year," said Richard Maxwell, manager of document information systems at Northern Telecom, Inc. in Nashville.

According to Maxwell, novice users often found the previous GUI somewhat intimidating. "It had a higher learning curve than other products, but once users became sophisticated, they became more productive using it. Other products have a lower learning curve, but when you try to do more sophisticated things, you run into roadblocks," he said.

Following support for Motif, Interleaf plans to add support for Windows, which will launch the company into more mainstream markets.

To accomplish that effort, Interleaf intends to expose the object technology used to create the Interleaf systems, which are written in LISP, to PC applications such as word processors.

The Motif implementation will be available this quarter; the Windows implementation is slated for first-quarter 1994.

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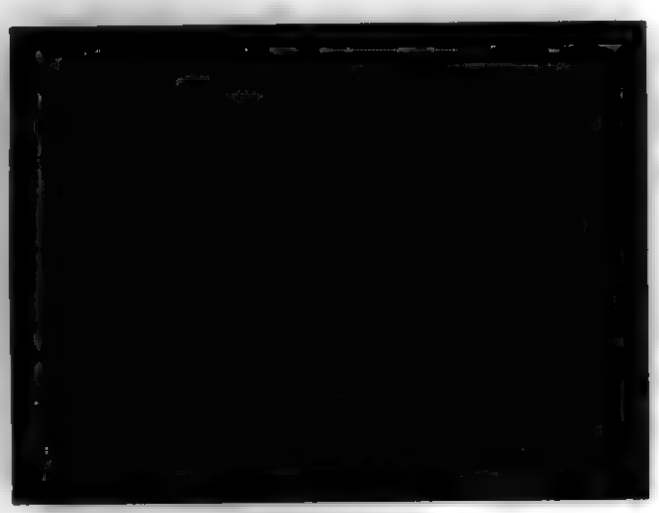

Hair loss *occurs as users complain the system is costing them time, not saving it.*

Bags under eyes *take shape from long hours spent attempting to connect your wireless network and LAN.*

Bill Jones, MIS, age 38

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Central support to reduce costs

By Michael Vizard
DALLAS

Software suppliers are finally making a concerted effort to cooperate on multivendor support issues. The reason: the skyrocketing cost of supporting customers who cannot pinpoint which vendor is responsible for a particular problem.

To help alleviate this, 14 major hardware, software and LAN suppliers earlier this month pledged to provide one another with mutual technical support in the form of a Technical Support Alliance Network (TSANet).

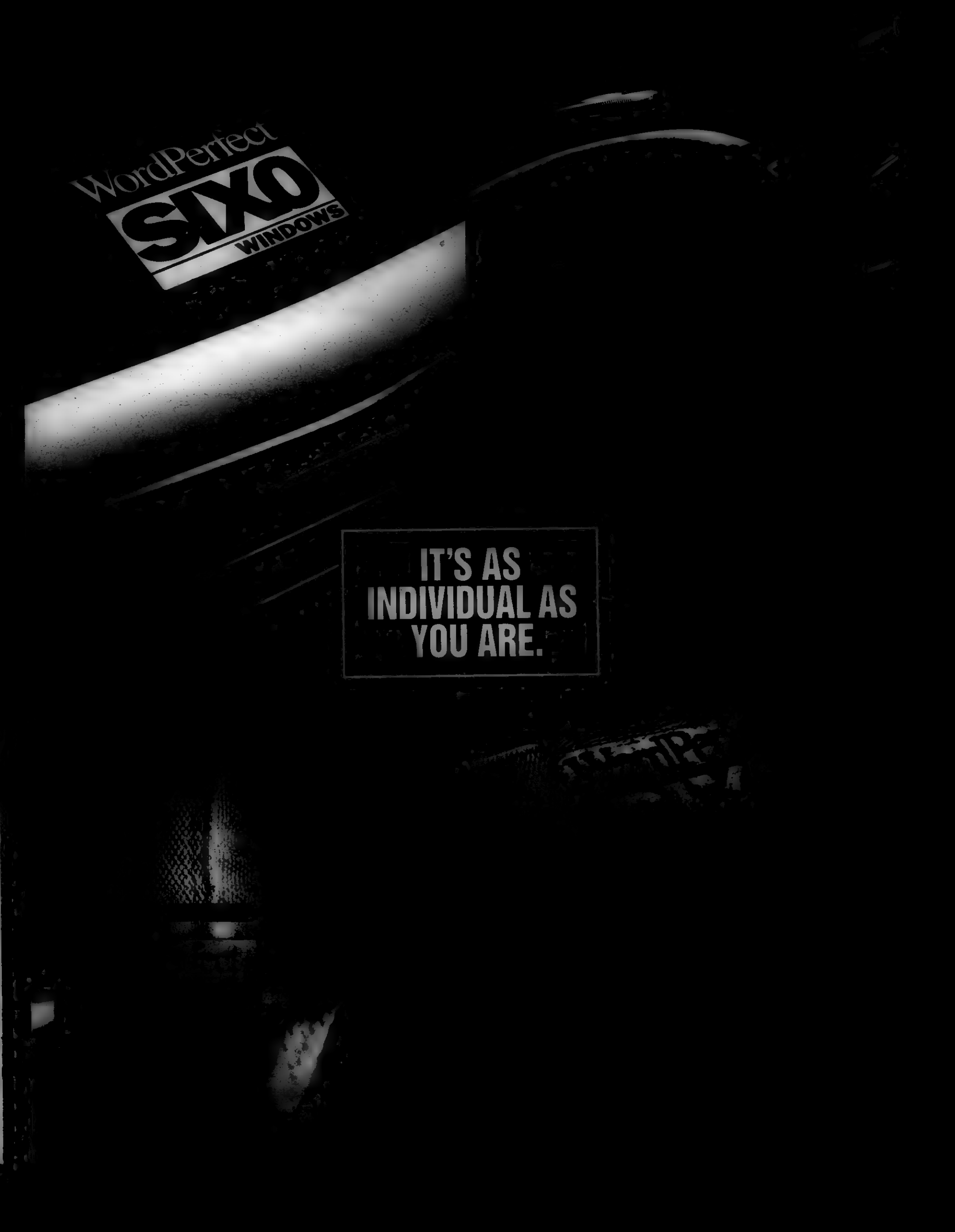
The alliance includes 3Com Corp., Lotus Development Corp., Apple Computer, Inc., Banyan Systems, Inc., Hewlett-Packard Co., IBM, NetFrame Systems, Inc., Compaq Computer Corp., The Santa Cruz Operation, SynOptics Communications, Inc., Standard Microsystems, Inc., Tricord Systems, Inc., Wall Data, Inc. and Novell, Inc.

"Pinpointing hardware problems is easy, but software is much more difficult. It's important to have these vendors, particularly Novell, involved," said Wayne Dunn, a board member for the Microcomputer Managers Association.

On the software vendor side, the cost of providing technical support is overwhelming. "They've seen a 37% increase in the volume of calls over the last year, and call lengths are up 17%," said Bob Johnson, an industry analyst at Dataquest, Inc. in Framingham, Mass.

In fact, a report from the "Soft Letter" newsletter in Watertown, Mass., found that the median cost of software support is about 6% of revenue for PC companies and that the average cost of answering a technical support call is $3 a minute.

To help reduce these costs, TSANet will set up a central database in Overland Park, Kan., to serve as a resource for help desks. The database will be based on the Notes groupware environment, with each vendor having a Notes implementation at its support site.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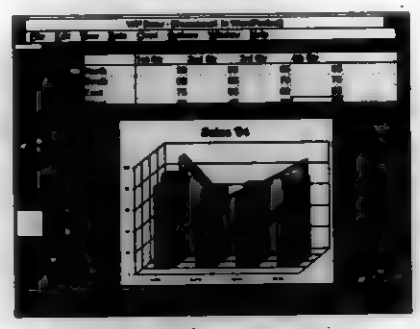

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Software

WordPerfect Corp. has introduced WordPerfect 3.0 for Macintosh, a word processing product.

WordPerfect 3.0 enhancements include an equation editor, drag-and-drop text, document preview in Open Dialog, ruler bars, button bars and tables.

From the button bar, users can access Grammatik 5 and WordPerfect Office 4.0.

Features are compatible with updated versions of WordPerfect on other platforms. Support for Apple Computer, Inc.'s System 7 Pro is provided.

According to the Orem, Utah, company, the product runs on any Macintosh with a hard drive. Requirements include 2M bytes (System 6.0.7 or higher) or 4M bytes (System 7) of RAM.

WordPerfect 3.0 for Macintosh costs $495.

▶ *WordPerfect*
(801) 225-5000

Shapeware Corp. has announced Visio 2.0, a drag-and-drop drawing program.

Visio 2.0 features context-sensitive pop-up menus, optional stencil views (including icons-only view), double-click actions, dynamic distribution and a tool bar. Improved SmartShapes stencils designed for business and technical users are also included.

Extensive support for Microsoft Corp.'s Object Linking and Embedding (OLE) Version 2.0 is provided, including in-place visual editing, drag and drop across applications and OLE Automation, according to the Seattle company.

Visio 2.0 is available at a special suggested price of $129. The price will return to $299 on Jan. 1.

▶ *Shapeware*
(206) 467-6723

Hardware

Packard Bell, Inc. has introduced a line of notebook computers that includes a subnotebook and a color and monochrome notebook.

According to the Chatsworth, Calif., company, all the portables feature advanced power-saving management that lengthens battery life up to six hours on some models. The models have PCMCIA Type II slots for connection to an assortment of peripherals such as fax/modems and network adapters.

The Statesman notebooks are 200M-byte, 486-based portables that feature support for an optional numeric coprocessor and an integrated "J" mouse pointing device. The Statesman is available with either a color or monochrome display.

The Diplomat is a 170M-byte monochrome subnotebook that weighs 3.9 pounds, including its battery. This 486-based computer offers an LCD status panel and a front-mounted, detachable, two-button trackball.

For power-saving capabilities, the line meets U.S. Environmental Protection Agency "Energy Star" standards.

Prices start at $1,500.

▶ *Packard Bell*
(818) 886-2008

Canon Computer Systems, Inc. has introduced the BJC-600, a Bubble Jet printer.

The 9.9-pound desktop printer produces color on plain paper at a resolution of 360 dots per inch.

According to the Costa Mesa, Calif., company, the BJC-600's four print head system delivers throughput faster than other ink-jet products because of the 64 nozzles dedicated to each color (cyan, magenta, yellow and black).

The printer has a compact footprint that measures 13.7 inches wide, 7.6 inches deep and 6.8 inches high.

The BJC-600 ships with Windows 3.0 and 3.1 drivers and 20 scalable TrueType fonts. It costs $719.

▶ *Canon Computer Systems*
(714) 438-3000

Product short

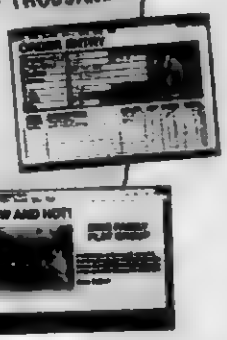
Aurum Software, Inc. has introduced SalesTrak for Windows, a sales automation application for notebook PCs. It features an activity manager, forecasting capabilities, notepad and literature fulfillment. Cost: $1,595 for a single-user license. Aurum Software, Santa Clara, Calif. (408) 562-6370.

RemoteWare and the SEMINAR you couldn't afford to have missed

THE VERY MOMENT AN EXPERT WAS EXPLAINING THE COST- AND SANITY-SAVING BENEFITS OF REMOTEWARE-CREATED AUTOMATED WORKFLOW SYSTEMS TO A ROOMFUL OF HIS FELLOW CLIENT/SERVER AFICIONADOS [redacted] was sitting

in a tiny center seat, in coach, staring blankly at a fly nimbly exploring the OXYGEN PANEL above him. It had come down to a scheduling conflict. One more FREE product seminar, half-day, inevitably bad deli sandwiches... potato chips that had gotten too close to the kosher dills and gone soggy.

Or this junket to clean up yet another set of branch communication difficulties in Opelika, St. Louis, and San Antone. So the picture of this fly on the ceiling RUBBING ITS FRONT LEGS TOGETHER with an ominous delight didn't have the significance for him it might have had he seen that MEANWHILE, BACK AT THE SEMINAR THE REMOTEWARE FOLKS WERE SPINNING COLORFUL TALES OF SUCCESSFULLY-IMPLEMENTED FIELD COMMUNICATIONS SYSTEMS, HOLDING CHARLIE'S TECHNO-PEERS FROM COMPETING COMPANIES CAPTIVE WITH THE PROMISE OF THOUSANDS OF FULLY-AUTOMATED, EASY-TO-MANAGE AND UNATTENDED DIAL-UP COMM SESSIONS, AND RIVETING ACCOUNTS OF REAL COMPANIES WITH HUNDREDS OF MOBILE CORPORATE LAPTOPS AND REMOTE BRANCH OFFICES USING CENTRALLY-CREATED AND MANAGED ELECTRONIC FORMS, DOCUMENTS, AND REPORTS, ALL LINKED TO CENTRAL SYSTEMS AND DATABASES, AND ALL NEATLY SUPPORTED BY INTEGRAL ELECTRONIC SOFTWARE DISTRIBUTION CAPABILITIES!



So these were the things Charlie was missing: solutions to the very problems that had made this one more night away from home a necessity. That, and what actually turned out to be a delicious RemoteWare lunch of pasta salad, FRENCH BAGUETTES with prosciutto and mozzarella, and fresh strawberries.

But what did he know?

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Memory ☐4MB ☐8MB ☐16MB ☐32MB ☐64MB

Hard disk ☐170MB ☐240MB ☐340MB ☐440MB

EISA DESKTOP (8x6)

Processor ☐486DX2, 66 MHz ☐Pentium, 60 MHz

Memory ☐8MB ☐16MB ☐32MB ☐64MB

Hard disk ☐170MB ☐240MB ☐340MB ☐440MB ☐540MB SCSI-2*

EISA TOWER (8x12)

Processor ☐486DX2, 66 MHz ☐Pentium, 60 MHz

Memory ☐8MB ☐16MB ☐32MB ☐64MB ☐Other ____MB

Hard disk ☐170MB ☐240MB ☐340MB ☐440MB ☐540MB SCSI-2

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Accounting ☐Quicken

Spreadsheet ☐Microsoft Excel® ☐Lotus 1-2-3 ☐Quattro Pro

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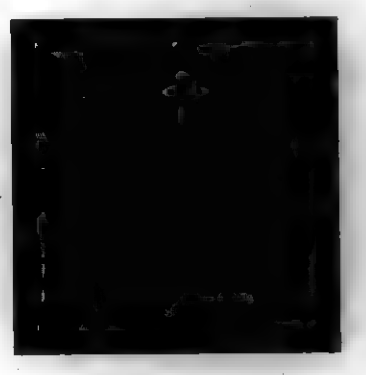

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- MS-DOS 6.0, Windows 3.1, mouse

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LOTUS 1-2-3 RELEASE 4 RATED #1. CAN MICROSOFT BEAT A STRAIGHT FLUSH?

Every year Lotus® Microsoft® and the others go head-to-head in reviews by the top industry publications. So far, this year, the results are resounding. And redundant.

Lotus 1-2-3® Release 4, Ami Pro® 3.01, Freelance Graphics® 2.01, Approach™ 2.1 and Organizer™ 1.1 are collecting honors for setting new standards in power and usability. With scores that are setting new records in their categories.

In a matter of months **1-2-3 Release 4** has already been acknowledged by reviewers and users as the spreadsheet of choice and the way of the future. It earned the highest Windows™ spreadsheet score ever by *InfoWorld*. And more recently, an independent usability study showed that 67% of Microsoft Excel 4.0 users tested say they would prefer to be using the new 1-2-3 Release 4 for Windows.*

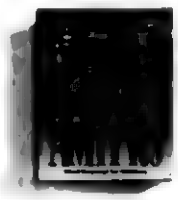
Ami Pro 3.01 word processor is our Cinderella story. For years, it's been ranked above both Word and WordPerfect® by reviewers, but many users had been reticent to make the switch. Now that's changed. *PC/Computing* has rated Ami Pro ahead of WordPerfect 5.2 in 8 out of 8 categories. And users by the hundreds of thousands are discovering it's a better fit.

Freelance Graphics 2.01 presentation graphics software is once again outshowing Microsoft PowerPoint® and Harvard Graphics. In *InfoWorld*, Freelance dominated the #2 finisher by the largest margin ever. In *Software Digest*, it earned a five star rating vs. three stars for PowerPoint and

InfoWorld Windows Spreadsheet Ratings:

1-2-3 Release 4 (8/93)	7.8
Excel Release 4.0 (10/92)	6.9
Quattro Pro Release 1.0 (10/92)	6.5

"Approach is a big, big winner." PC WEEK 6/28/93



PC/Computing Word Processor Scores 8/93:

Lotus Ami Pro 3.0	92.0
Microsoft Word for Windows 2.0c	82.2
WordPerfect 6.0 for DOS	73.6
WordPerfect 5.2 for Windows	73.4

"Organizer is one of the most appealing Windows applications yet." PC WEEK 9/93

PC/Computing Presentation Graphics for Windows Scores 9/93:

Freelance Graphics Version 2.0	90.9
Harvard Graphics Version 2.0	88.6
Persuasion Version 2.1	74.8
PowerPoint Version 3.0	83.6
WordPerfect Presentations Version 2.0	86.8

Harvard Graphics. In *PC/Computing* it scored an "awesome 98.9 out of 100."

Lotus Approach, the first full-powered relational database designed from the ground up for general business users like us, has already earned over 25 major industry awards, including the 1993 *Windows Magazine* Reader's Choice Award and Best Buys from both *Corporate Computing* and *PC/World*.

And **Lotus Organizer**, the award-winning personal information manager, is widely acknowledged as the best product of its kind for the Windows platform. With a Reader's Choice Award from *Byte Magazine* and a Win Award from *Windows Magazine*, Organizer completes the set.

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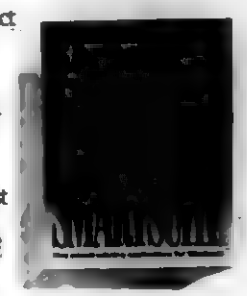
Visit your Lotus Authorized Reseller or call **1-800-TRADE UP, ext. 9122*** to buy any one of these Windows applications. Or to get the best of all worlds in one box, you can upgrade from any Lotus or competitive product to **SmartSuite™ 2.1** for just $299.** Until 12/31/93.



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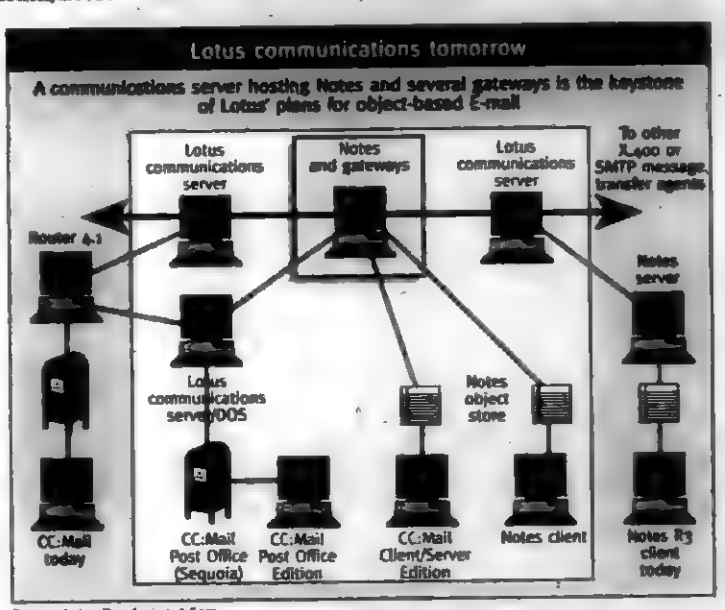
Messaging vendors race to object nirvana

By Michael Vizard and Lynda Radosevich

Eyeing the next generation of electronic-mail systems, messaging vendors are out of the gate in a race to provide messaging systems that leverage object database technology.

For example, earlier this month, Lotus Development Corp. announced a plan to merge its CC:Mail and Notes Mail architectures using the Notes object database as its back-end server [CW, Sept. 27].

Also, Microsoft Corp. is working on what it calls the Electronic Messaging Server (EMS), which will run on top of its Windows NT operating system. The EMS server, which is due in the second quarter of next year, is based on an object database that is similar to the foundation of Lotus Notes.



Source: Lotus Development Corp.

More on the way

Meanwhile, WordPerfect Corp.'s Office 4.0, released in June, already uses object-oriented database technology on the back end. And the company plans to add a graphical user interface for administrators, starting with an Open Software Foundation Motif version in the first quarter of next year. A Macintosh version is to follow in the second quarter, along with a Windows version at an unspecified date.

Lotus currently holds a lead over both Microsoft and WordPerfect in terms of familiarity with object technology because of the Notes workgroup software, but the company still has to integrate CC:Mail front ends with Notes (see chart).

Microsoft is focusing on using its Messaging Application Programming Interface clients as front ends to EMS. However, Microsoft has said that EMS will not be available on any server besides NT, while Lotus and WordPerfect are pursuing heterogeneous server strategies.

For information systems directors, the advent of object technology results in simplified administration of E-mail systems: the ability to add more intelligent rules to systems and improve performance.

"IS needs to be watching this trend to make sure their vendors have a good plan," said David Ferris, president of Ferris Networks, Inc., a consulting firm in San Francisco.

"We'll probably see beta implementations of these architectures in the next year, with full deployment within two to three years," he predicted.

One of the benefits of Office is that administrators can move users complete with their messages, appointments and tasks. That includes moving users to or from all supported platforms, according to Paul Smart, director of WordPerfect Office development.

In terms of performance, Ferris said object databases will allow sites to move away from dumb-file systems that require the E-mail clients to process all messages.

"Now, I have to know that I built a document with a word processor, put in a spreadsheet file and linked some graphics. If I move the files around via E-mail, those links are broken," said Charlie Stoner, a computing services analyst at the Fluid Systems Division of Allied Signal Aerospace in Tempe, Ariz.

"With object technology on a mail server, I can send you a compound document and it has all the information to operate, including fonts, graphics and so on," Stoner explained.

Automation agents

In addition to improved performance, Ferris said IS managers can look forward to putting intelligent agents on object servers that will automate tasks.

"For example, if you're on vacation, you can route your messages to another user. Today, you'd have to leave your PC on to do that, which is impractical," Ferris said.

Finally, IS directors can also look forward to simplified administration because an object database should make it easier for them to reconfigure an E-mail system.

Gregg Smith, president of Applied Intelligence Group, Inc., a systems integrator in Alexandria, Va., said the administration functions in Office 4.0 let him create post office domains that span physical boundaries.

"You could take an office in New York and one in Miami and create a domain called 'East.' Then users in that domain could send and receive [messaging objects] as if they were local users," Smith said.

Jean S. Bozman

Impossible dream?

There once was a dream in the IBM mainframe world, a dream about a Future System.

The Future System was to be just as powerful as IBM's MVS-based machines but made out of different components. For a time in the 1980s, the dreamers inside IBM thought they would build it out of IBM's midrange System/3Xs, making the alternative mainframe a 48-bit wonder that ran a proprietary operating system.

That was not the way things turned out. The AS/400 was built in Rochester, Minn., as the successor to the System/38, and it was the foundation of a multibillion-dollar, packaged software applications business. The AS/400 was a great commercial success, but not the dragon slayer that the Future System was supposed to be.

Now it appears that IBM's RS/6000 and its components could be positioned to inherit the Future System mantle for Unix users. If IBM executives at the Advanced Workstations and Systems Group in Austin, Texas, are right, the Power chip will be the building block for a "palmtop-to-teraflops" architecture spanning desktop to supercomputer platforms.

Scalable Unix

At the heart of this Unix strategy will be a single, scalable operating system: IBM's AIX flavor of Unix [CW, Aug. 30]. IBM is not alone in envisioning scalable Unix systems; Digital, Sun and HP have expressed similar notions about constructing sizable multiprocessors and clustered processors from the building blocks of RISC workstation components. They have varying timetables but similar goals.

However, IBM appears to be closer to doing it alone than the others. From chip foundry to manufacturing plant loading dock, IBM has all

Bozman, *page 63*

Bandwidth management crunch attacks local nets

By Joanie M. Wexler
DALLAS

While the emerging era of the remote user has information systems staffs worrying even more than usual about affordably squeezing adequate network throughput out of skinny telecommunications links, bandwidth management is also rearing its head on the LAN—once considered the land of free, unlimited network capacity.

Hype rolled

A dearth of ATM products were present at the Interop '93 show—a refreshing change to many who said they felt overhyped on a technology that has not really arrived.

This has been the observation of many users, including several who visited switching hub vendor booths at the recent Networld '93 show and witnessed new life breathed into existing LANs.

For example, Scott Stubbs, systems engineer at a marketing division of outsourcer Electronic Data Systems Corp. that serves the Dallas Infomart technology exhibition center, is looking for networks fast enough to house video databases and deliver customized multimedia demonstrations to visitors.

For example, a video goal would be to show drop-in visitors how a given technology would im-

Bandwidth, *page 60*

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Bank service firm rewrites check system

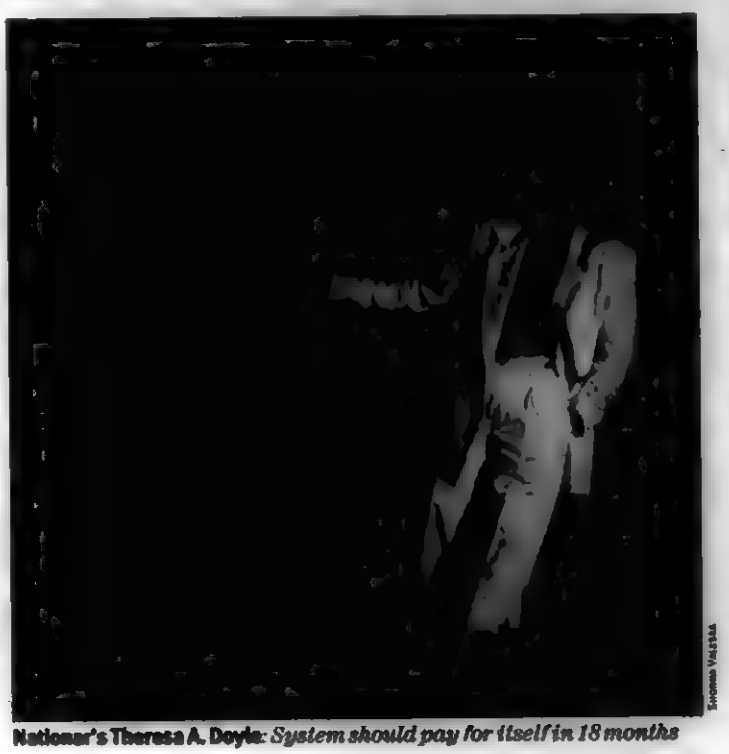
By Michael Fitzgerald
WOODBURY, N.Y.

Tucked under a plain table in a corner of Nationar's data center here sits the future.

The little table shelters two Compaq Computer Corp. ProSignia 4/66 servers connected to two Storage Dimensions, Inc. LanStor boxes with more than 8G bytes worth of storage. This is the gear that will allow Nationar, a New York bank service bureau with some $2 billion in assets, to stick its toe in the client/server waters in an attempt to improve customer service.

"We're going to bring PCs to these people and allow them to be more responsive to customers," said Theresa A. Doyle, vice president of end-user computing at Nationar. The chance to bring client/server to Nationar recently attracted Doyle from a job as vice president of information services at a New York financial services firm.

Her first step, begun soon after she arrived in May, has been to automate the firm's customer services division. The task involves creating new applications and coordinating them with several current unrelated applications, such as New York-based MicroBank Software, Inc.'s StoreFiche microfiche storage application, into a new system.



Nationar's Theresa A. Doyle: *System should pay for itself in 18 months*

Easier check retrieval

Doyle's goal with the system is to reduce the amount of time a customer service representative spends hassling with the current microfiche records. Nationar has long machines here that process thousands of checks per minute, each one photographed and microfiched, to be viewed on an Eastman Kodak Co.'s Document Imaging Terminal.

The digital images are then stored in a physical warehouse, and customer requests spark a game of "track that check" that can be painfully slow, particularly if a tape has been misplaced.

Bringing the images on-line should make them easy to retrieve, Doyle said.

Currently, Nationar programmers are working with developers from MicroBank to write interfaces that will connect various mainframe-based MicroBank software packages, such as those supporting case-action histories and accounting information, with the LAN.

Nationar has integrated its MicroBank software with photo-retrieval software from Antinori Software, Inc. in Atlanta running on IBM's OS/2 2.1. This connects to the Kodak terminals and allows for quick retrieval of checks.

The company is installing AST Research, Inc. Premmia 4/66 and Bravo 4/66 PCs on customer service desks and attaching them to a Novell, Inc. NetWare LAN running a ProSignia server. The other ProSignia will handle the mainframe interface via a Digital Communications Associates, Inc. IrmaLAN connector.

Doyle estimated that the project, which will cost less than $1 million to deploy, will pay for itself in 18 months through efficiencies allowing fewer employees to handle workloads. She expects the project to go live in December.

"This is going to make us a lot better at what we do, and give us some information that wasn't readily available to us before," said Robert Agtialoro, Nationar's manager of account services. He said representatives should be able to go from handling 145 checks per day to 315.

The project is "absolutely worth the expense. If you know what it takes to be successful, then you have to move toward it, rather than worrying about what it costs," Agtialoro said.

For the moment, unplugging the mainframes is not a goal, Doyle said. "We're doing distributed processing. We're not rewriting the mainframe information; we're just bringing it down and getting it out where it's useful," she said.

Over time, Doyle said she expects to add a messaging system that will give the customer service representatives the ability to send check images over an electronic-mail network.

Plans are also in place to connect the Woodbury LAN with Nationar's two offices in downtown New York, as well as those in Buffalo and Utica, N.Y., and Danbury, Conn. A site in Plainview, N.Y., will be folded into the Woodbury site.

Eventually, customers may also gain access to the system.

Eagle adapters trade certification for price

By Lynda Radosevich
SAN JOSE, CALIF.

Hoping to compete with third-tier vendor pricing and halt declines in its market share, Eagle Technology, Inc. recently dropped the cost and the Novell, Inc.-certified label on a new line of Ethernet adapters.

Called the Eagle line, the products are meant to appeal to price-conscious information systems managers with a taste for Novell networks but who are willing to forego the red, "Yes, it runs with NetWare" packaging.

List prices start at $89 for a single 16-bit XT/AT-bus 10Base-T adapter and range to $189 for a 32-bit Extended Industry Standard Architecture (EISA) interface. Pricing drops with volume purchases.

Industry observers said that while Eagle's close association with Novell — which codeveloped Eagle's NE3200 line — was a boon in the past, the corresponding higher price tag for Novell certification and packaging was hurting the company in the commodity Ethernet adapter market.

However, Eagle will continue to develop its Novell certified line of Ethernet adapters aimed at high-end machines, said David Du Puy, vice president of product programs at Eagle.

Other recent Eagle announcements include the following:

- A $234, 32-bit EISA Ethernet adapter codeveloped with Novell, aimed at 486-based desktop PCs and light-load servers and featuring a shared-memory technique for faster throughput.
- A $599 wide-area network adapter for connecting NetWare networks over frame-relay links via the recently announced frame-relay interface within Novell's MultiProtocol Router software that runs on NetWare servers.
- Ethernet adapters for portable computers with PCMCIA Version 2 slots. The interface card prices start at $299 per card.

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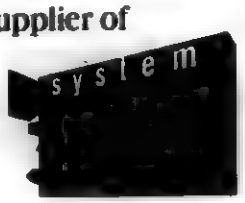

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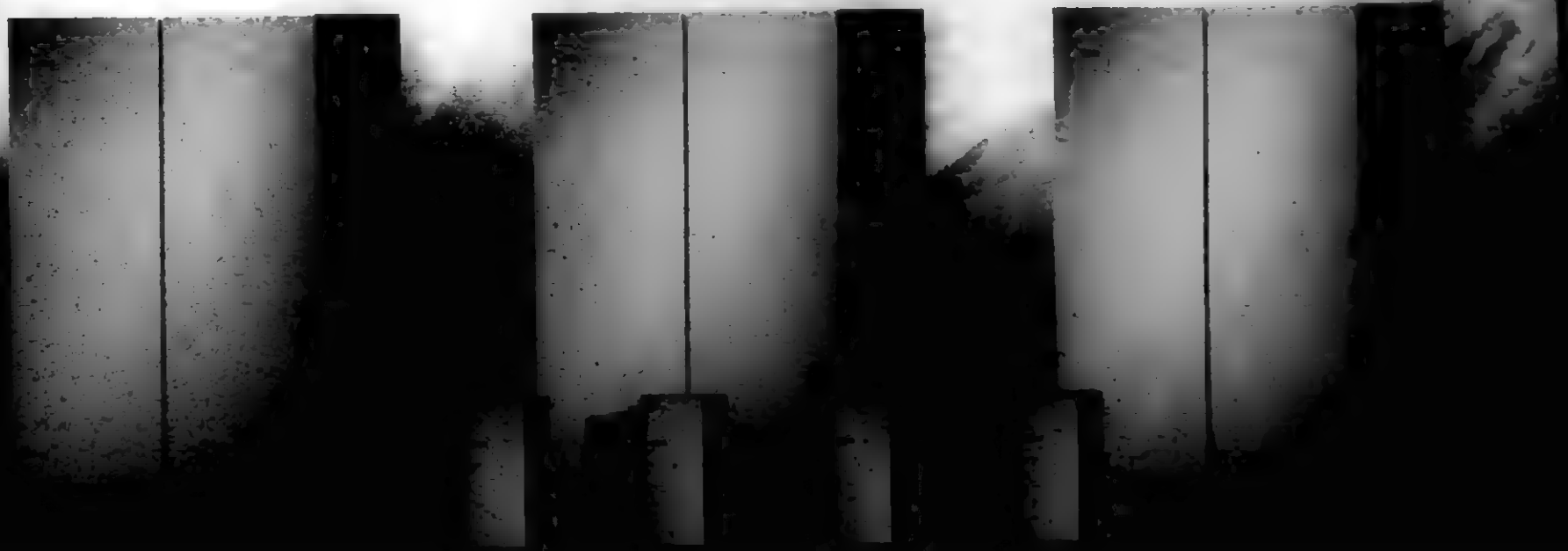

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NCR announces OS2-to-NT migration service

Users express different opinions on prospect of changing server platforms

By Thomas Hoffman
DAYTON, OHIO

■ NCR Corp. recently unfurled a migration service for customers seeking to port their IBM OS/2 applications to the Microsoft Corp. Windows NT platform.

Though NCR said many customers — particularly those in banking and retailing — have expressed interest in moving from OS/2 to NT, users and analysts expressed mixed views on the program. Many consider OS/2 a more stable and feature-rich operating environment than the nascent NT.

"We wouldn't go from OS/2 to NT right now because [OS/2 currently] has more robustness than NT," said M. Lewis Temares, chief information officer at the University of Miami, which has been testing NT for several months. Temares, like other users, said he is waiting for NT to mature before integrating it into the university's enterprise.

The migration service, aimed primarily at users of NCR's Intel Corp.-based System 3000 servers, will likely be a tough sell to ardent OS/2 shops, such as Federal Kemper Insurance Co. in Decatur, Ill. Keith Seivers, vice president and corporate treasurer at Federal Kemper, said his company has been committed to OS/2 since March 1992 to run its policy services system.

One stop with IBM

Besides, Seivers said, his company has historically experienced problems whenever it has tried to integrate non-IBM software into its enterprise, and it prefers to do one-stop shopping with IBM for its operating systems, databases and hardware.

"We like to get all our platform products from one vendor. It makes problem resolutions about 800 times easier," Seivers said.

Nevertheless, NCR insists that many of its own customers want to take advantage of Microsoft's symmetric multiprocessing capabilities, which OS/2 currently does not support.

"A lot of the customer feedback we've received is that they'd like someone to take project management responsibility for this migration, especially since users are reaching the maximum potential of these [OS/2 uniprocessor] environments," said Mark Hurd, a vice president of marketing for NCR's server products.

Jim Ducatelli, an information systems manager responsible for software implementation at JC Penney Co. in Dallas, said the retailer is planning to migrate its OS/2 applications to NT on its own.

NT interest

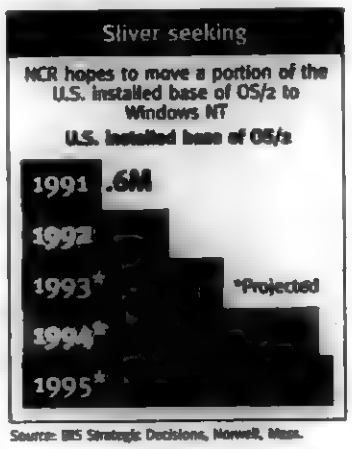
The NCR migration program will initially target users of the 50,000-plus OS/2 servers being used worldwide to take advantage of NT's systems management, multiprocessor support and security features, according to Peter Kastner, a vice president at Aberdeen Group, a Boston-based market research firm.

"Our research shows that there's a strong interest in NT by Fortune 1,000 companies, especially where OS/2 was the underlying operating system for a specific database or as an application preparation package for something like Lotus Notes," Kastner said.

NCR's deep presence among large corporate customers should help lend further credibility to NT, an area in which Microsoft is attempting to position the product but has had scant prior experience, according to David Card, director of the systems research group at International Data Corp. in Framingham, Mass.

One early customer of the OS/2-to-Windows NT migration service is Commonwealth Bank of Australia, which NCR has provided with migration support for the past few months.

Hurd said NCR has also provided the service to a handful of other U.S.-based banks, though he would not disclose their identities.



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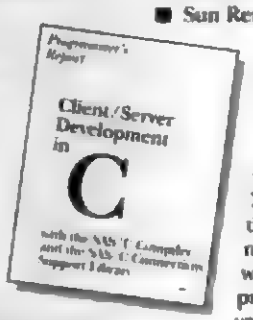

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Bandwidth management crunch attacks local nets

CONTINUED FROM PAGE 55

pact, say, a vertical market, such as manufacturing, he said.

However, "bandwidth is our main challenge. Finding a cost-effective way to deliver multimedia is impossible today," he said, noting that "ATM is too expensive." ATM, or Asynchronous Transfer Mode, is an emerging high-speed switching scheme optimized for combining voice, data and video.

Lure of switching hubs

Situations like Stubbs' drew Networld crowds to check out switching hubs, which let companies use existing technology to dedicate a full LAN's worth of bandwidth to a single resource, such as a server. Attendees clustered around Kalpana, Inc.'s demonstrations of full-duplex Ethernet, for example, which allows simultaneous transmissions in two directions, doubling potential throughput to 20M bit/sec.

Recent progress with that technology has, for the moment, catapulted it ahead of potentially competing schemes such as 100M bit/sec. Ethernet and Token Ring networking. An interoperability consortium, announced at the show by Cabletron Systems, Inc., yielded fruit in the form of a reported successful interoperability test among Kalpana, IBM and Compaq Computer Corp. full-duplex gear.

Also, Compaq said its NetFlex Ethernet adapters will be upgradable to full-duplex in early 1994. This means companies with those adapters already installed would not have to reinvest in adapter cards to use the technology.

These moves make full-duplex Ethernet a "practical tactical" choice because it is looking easy and inexpensive to leverage it, said Michael Howard, president of Infonetics Research, Inc., a consulting firm in San Jose, Calif.

Graphics-oriented applications are bandwidth-demanding.

"The killer application of the future is here today, and it's called Windows," said Larry Blair, Kalpana vice president of marketing.

"You can take just five PCs all running [Microsoft Corp.'s] PowerPoint at the same time and see 60% to 70% utilization on an Ethernet," Blair said. These loads strain the network.

In fact, Herbert Teague, president of Application Software, Inc., a data services time-share company in Birmingham, Ala., said he is suffering two throughput limitations today: the collision orientation of his shared Ethernets and the size of his PC server buses.

On the LAN side, he said, the Ethernet has "gotten bottlenecked because of Windows and other graphics applications." But, he said, switching hubs would "seem to solve the network side of the problem."

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THE POWER OF IMAGINATION.

Cellular One takes systems on the road

By Kim S. Nash
ALBANY, N.Y.

Cellular One has built a client/server customer service and billing system based on The ASK Group, Inc.'s Ingres database and Hewlett-Packard Co. Unix hardware. The impetus: to prepare the mobile phone company administratively to enter paging, long-distance calling and other new communications services.

As the Federal Communications Commission and sister agencies lean toward relaxing tariffs and laws that currently make paging, interactive television and other communications "products" off-limits to some providers, Cellular One is getting hungry. But the firm had to first overhaul its billing system to juggle many new kinds of customer records resulting from its entrance to new communications areas.

"We knew we were looking at a lot of opportunities that we didn't know how to handle, that our existing computer systems wouldn't be able to handle," said Richard Goldstein, a vice president at Associated Communications, Inc., Cellular One's parent company. Goldstein helps set Cellular One business strategy.

Goldstein wanted a customer care system that showed sales agents and marketing staff how often, when and for how long mobile phone users made and received calls. But views into such user-defined information were impossible with the company's IBM 3090-based application, said Jim Bullock, Cellular One's MIS development manager.

ON SITE

Cellular One
Albany, N.Y.

Challenge: Convert a mainframe-based customer service/billing system to Unix while making sure the system can accommodate new business areas.

Technology: HP 9000 Series 800 Unix workstations and server; Ingres databases.

Benefits: Customer service agents can access data stored in relational databases to make more targeted sales pitches and more quickly resolve customer problems.

"We wanted to get away from having the IS department the keeper of the data," Bullock said. "Our attitude was, 'Let's give the data to the thinkers in the company.'"

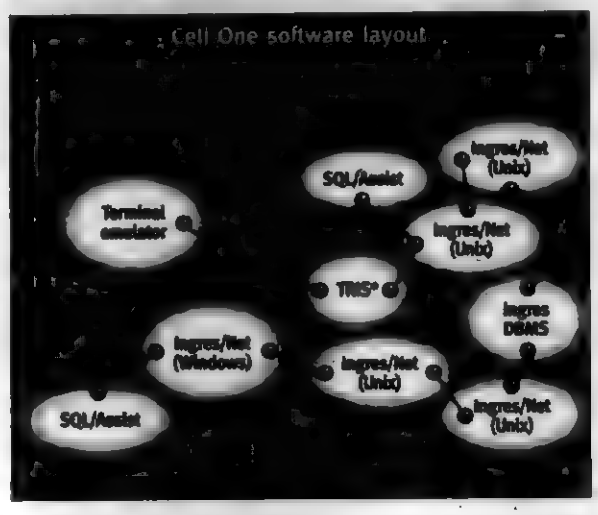
Bullock also knew what he did not want: people glue. The firm's previous billing system had workers faxing, mailing and carrying forms around because the computer systems in each department could not talk with one another.

Hence Cellular One's decision about two years ago to throw out flat-file and hierarchical databases for Unix-based Ingres software running on HP 9000 Series 800 servers. The company built Telecommunications Records and Information System (TRIS).

Cellular One plans to go after several new business opportunities, including paging services, traveling wireless voice mail, personal communications services (PCS) and long-distance calling. TRIS was designed to keep track of all customer data associated with these services when — and if — Cellular One offers them.

The company has dipped a toe into a couple of these areas. It created a PCS division this month. Plus, Cellular One claims to be the first cellular provider in New York to beta test a program giving subscribers unlimited free local cellular phone use within three quarters of a mile of home.

One of the first major muscle flexes TRIS has demonstrated is a program called Choice Plans. Based on the number of calls a subscriber makes and receives each month and the types of calls they are, Cellular One agents offer him extended options.



The previous customer information system — which ran on IBM 3090 mainframes — kept that kind of data virtually hidden from sales and marketing staffs, Bullock explained. Work-

This will rock the com

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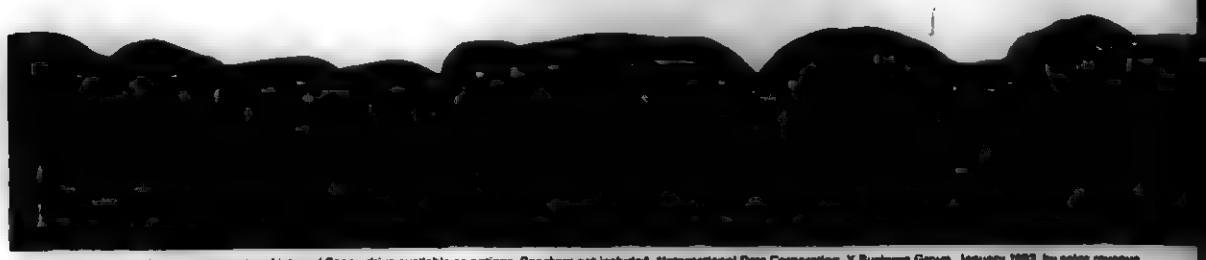

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ers could not study cross-referenced views of customer data because existing mainframe systems could not respond to queries that called for tying together pieces of information in various databases or tables.

"We were sitting on a source of revenue," Goldstein said.

Cellular One may not be smart to build its billing system in-house, said Herschel Shosteck, president of Herschel Shosteck Associates, a consulting firm in Silver Spring, Md. "The difficulties involved are so horrendous; this could be a misallocation of resources," he said.

Cellular One officials declined to specify how much TRIS has cost, but Shosteck was surprised that this branch of Cellular One, which serves upper New York, has committed what is surely a pretty penny to software development in the face of declining industry profit margins.

For its part, Cellular One sees TRIS as an investment in the future. Off-the-shelf billing systems that integrate wireless and cable subscription services do not exist yet, Bullock said.

"The fact that companies like us can get into these services now at all is completely new. The software doesn't exist to support it yet."

But the move to client/server has traded off the ability to process huge numbers of massive transactions — about 100 hours' worth per week — for the ability to do "more creative" ad hoc decision-making, Bullock and Goldstein agreed. In other words, workers on HP's Vectra PCs can now get customer data without going through IS (see chart), but the system is sometimes "chokingly slow," Bullock said.

Bozman

CONTINUED FROM PAGE 55

the in-house capability to make the Future System dream come true with AIX.

If it does not come true, the dream will have been undone by marketing, not technology: IBM has traditionally positioned its workstations and Unix servers as scientific calculation machines on a separate track from commercial online transaction processing (OLTP) mainframes.

Some analysts said they believe powerful Unix and MVS servers will stay that way — separate but equal — giving users more choices.

"In general, they're looking at different sets of problems," said John Morrell, who manages Unix systems research at International Data Corp., a research firm in Framingham, Mass. Having bigger Unix machines, he said, "gives IBM a greater arsenal" to solve a user's problem.

"They're doing parallel processing not to take away the entire mainframe market, but because they recognize that certain customers need this type of computing," he said.

As more applications get stripped off the traditional mainframe for cost reasons, more functionality will be placed in large Unix servers. And that has some users thinking about alternatives.

Alternative moves ahead?

However, as more applications get stripped off the traditional mainframe for cost reasons, more functionality will be placed in large Unix servers. And that has some large IBM users, including banks, thinking about alternative Unix parallel processors for their data centers by the late 1990s.

IBM executives do not rule out an eventual switchover to Unix-alternative mainframes for users who no longer require System 390-specific applications, such as the IMS database.

"I think you have to look at the Power architecture and AIX as an evolving set of technologies that will span from palmtops to teraflops over time," said Bill Filip, president of IBM's Advanced Workstations and Systems business unit in Somers, N.Y. "Mainframes are going to evolve, too, but the gap [between System 390 and Unix machines] will be narrower and narrower."

One Gartner Group scenario is that many of the alternative mainframes will eventually be Unix servers, including AT&T/NCR, HP and Sequent machines. Until now, certain system pieces have been missing, which kept Unix from measuring up to mainframes.

"It's a capacity issue, but it's also a functionality issue," said Gartner analyst Paul McGuckin. But, in terms of systems management utilities, he said, "this is the year when they will catch up with the proprietary servers."

Given the company it keeps in the Unix-industry vendor groups and its plans for scalable Unix machines, IBM must consider that technology alone does not dictate separate tracks for commercial and scientific computers. Technology just dictates faster and more cost-effective data processing. Beyond hardware, the rest of the computing platform comprises systems software and applications.

This means it is ultimately up to users to decide whether RISC/Unix machines will become viable mainframe alternatives in the late 1990s.

Bozman is *Computerworld*'s senior West Coast editor.

petition.

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Tricord announces a suite of servers

By Stephen P. Klett Jr.
MINNEAPOLIS

Tricord Systems, Inc. recently fired a product barrage aimed at rounding out its line of enterprise servers, boosting disk I/O and improving fault tolerance.

Topping the announcements were two additions to the firm's PowerFrame server family: the entry-level Model 20 and high-end ES4000.

Positioned as a workgroup or small departmental server, the $9,900-and-up Model 20 includes one Intel Corp. I486DX2 66-MHz CPU, 16M bytes of main memory, a single 425M-byte SCSI-2 disk drive, an eight-slot Extended XT/AT bus and support for redundant arrays of inexpensive disks Levels 0, 1 and 5. The server is Intel Pentium-upgradable.

With competitors such as AST Research, Inc., Compaq Computer Corp. and IBM announcing low-end servers, Tricord's introduction of an entry-level machine is critical if it wants to capture a share of a potentially lucrative market.

"There is a lot of market potential for $10,000 to $15,000 servers that don't necessarily have [symmetrical multiprocessing] but have fault tolerance built in with some systems management capabilities," said Susan Frankle, an analyst at market research firm International Data Corp. in Framingham, Mass.

Users, however, expressed more interest in the high-end ES4000, which was developed as an alternative to Tricord's top-of-the-line ES5000.

Jim Queen, director of enterprise networking at Enron Gas Services Corp. in Houston, for example, said Enron is considering buying that model instead of the ES5000 because it is "essentially a scaled-down version of the 5000" that could be upgraded.

The ES5000 supports up to six Pentium processors and costs $78,200 to $918,000. The ES4000, which also supports six processors, starts at $43,900.

Upgrades expected

Tricord also said it will offer two processor upgrades in the first quarter of 1994. The first will be a new release of its Enhanced Intelligent I/O Processor that will double the clock speed of its Intel 80386 processor to 33 MHz. The second will allow users to upgrade their Model 30s and 40s to Pentium and advanced I486 clock-tripling processors.

"We'll definitely get a Pentium chip into one of our boxes as soon as it is available," said Jeff Johnson, director of accounting systems at Chicago & Western Transportation Co., a Chicago-based railroad. "If we see the significant performance increase we expect, we will upgrade the rest of our machines," he said.

"The I/O processor upgrade is something we'll definitely pick up," said Bob Wrage, network adminstrator at Deere & Co. in Moline, Ill., which runs two Model 40s. "I feel [the upgrade] will improve throughput and network response times . . . and allow us to add new users without a performance degradation," Wrage said.

Tricord also announced Open Fault Tolerance (OFT) for Unix, which lets customers mirror their servers in a Unix enviroment via a high-speed, server-to-server link, Tricord said. OFT is slated for fourth-quarter delivery, starting at $15,995 for a 50-user license.

"Wow, that's what I call pushing the boundaries..."

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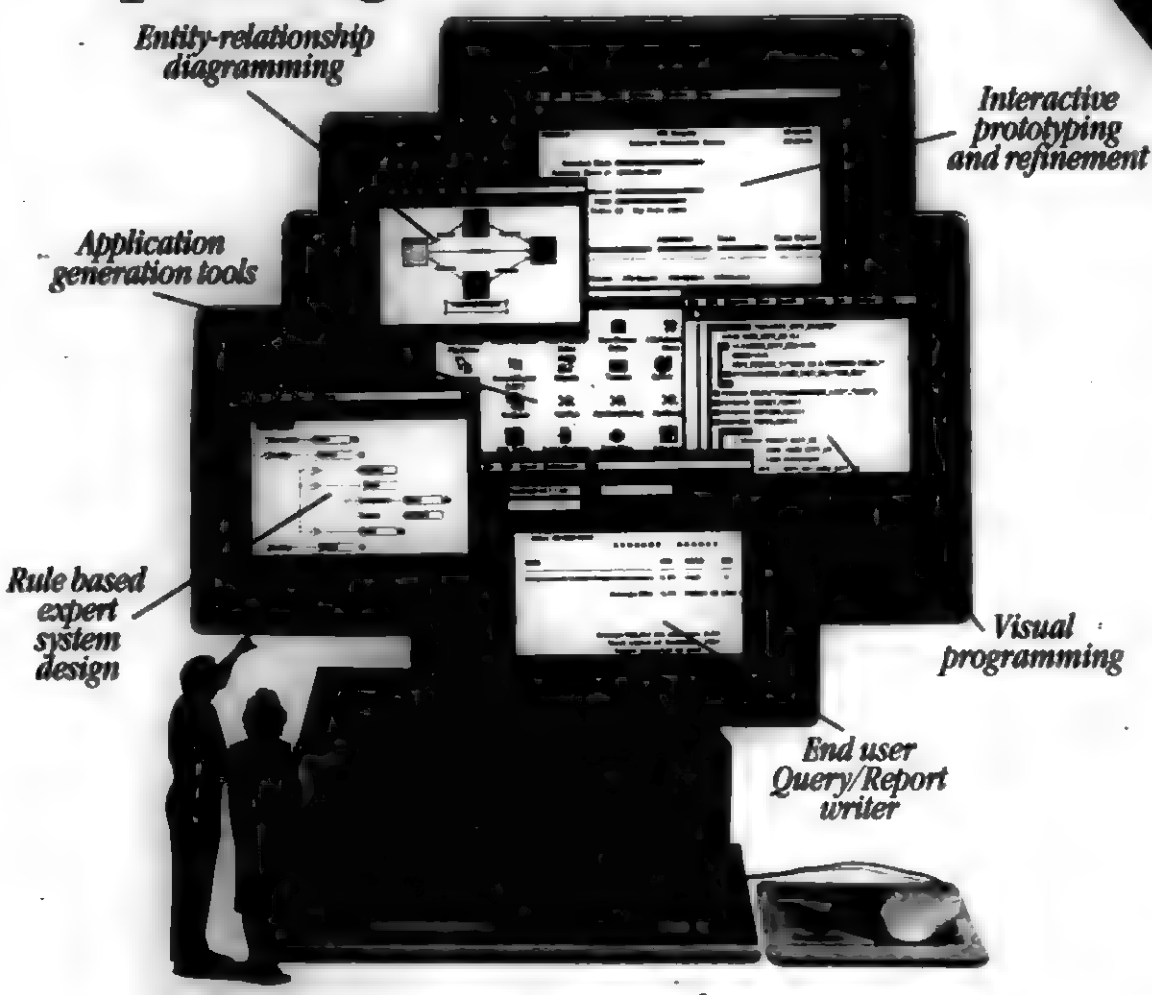

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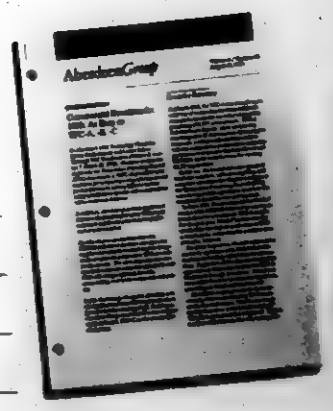

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—The Aberdeen Group, August 12, 1993

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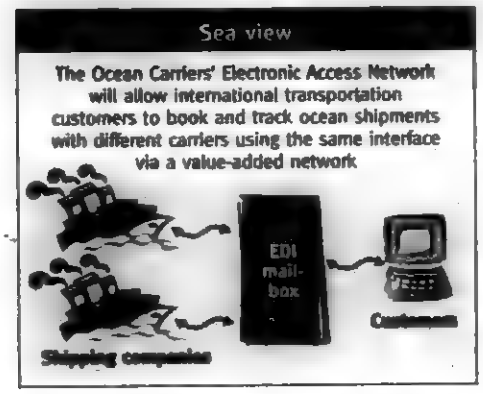
EDI spreads across different business lines

Shipping group agrees on common software

By Lynda Radosevich

Seven major ocean shipping companies recently said they will implement and offer to their customers by mid-1994 an electronic data interchange (EDI) software package that will provide a standard interface for booking and tracking ocean shipments.



The ocean carriers include American President Lines, Crowley Maritime Corp., Hapag-Lloyd America, Maersk, Inc., Orient Overseas Container Line, P&O Containers Ltd. and Sea-Land Service, Inc. They are members of a trade group called the Information Systems Agreement, which was founded in 1991 to promote EDI in the shipping industry.

The software, called Ocean Carriers' Electronic Access Network (Ocean) will be a Windows-based EDI package developed by TSI International in Wilton, Conn. Forms in the application are based on the ANSI X12 standard for document interchange.

Ocean is expected to reduce data errors because the information keyed in by customers will feed directly into the carriers' systems. Also, it is expected to pare the number of phone calls requesting tracking information.

Using Ocean, a customer can book and confirm orders with shipping instructions and receive a bill of lading, invoice, arrival notice and cargo status. Customers can use a Windows-based PC with the Ocean software and dial into a mailbox on their choice of value-added networks. The shipping companies will download information from the mailboxes and return replies.

Ocean is similar to booking and tracking applications that overnight package companies Federal Express Corp. and United Parcel Service, Inc. offer, except that it spans rival companies.

Ocean's innovative twist is that it brings together competitors and unites their customer bases, said

Shipping consortium, *page 70*

Clothing company saves time — consolidates E-mail, EDI

By Lynda Radosevich
SAN FRANCISCO

In Byer California's modern lobby, employees scurry past the slick black furnishings with armloads of lacy shirts and flower-print dresses. Behind the scenes at this clothing manufacturer operates one of this country's first integrated electronic-mail and electronic data interchange (EDI) systems based on the X.400 messaging protocol.

Currently, less than 5% of all EDI traffic runs over X.400 networks, said Vic Wheatman, an electronic commerce strategies analyst at the Gartner Group, Inc. consultancy's Santa Clara, Calif., office. Most of the traffic runs across proprietary transports, he said.

"But unless something brighter and smarter comes up, this is how people will consolidate their E-mail, EDI, voice and video traffic," he said, declining to predict a time frame for widespread adoption.

On Site

Byer California
San Francisco

Goal: To run E-mail and EDI systems over a common infrastructure.

Method: X.400-based messaging server from Isocor, X.400 EDI translation software from St. Paul Software and network services from BT North America.

Benefits: Reduction of EDI cycle times; a simplified, combined EDI and E-mail system; readiness to exchange E-mail with EDI trading partners.

Tough sell

Byer supplies retailers such as JC Penney Co., Dillard Department Stores, Inc., Dayton-Hudson Corp. and smaller stores with moderately priced clothing. The clothier uses EDI to exchange forms-based information such as purchase orders with these customers — a move dictated to a reluctant Byer by its biggest trading partners.

"If you'd asked me five years ago, I would not have been a proponent. At first it seemed more like a hassle than a benefit," said Michael Higgins, technical support manager.

Now, Byer has become a major advocate of the technology, pushing its trading partners to expand its use for the exchange of electronic invoices, advance ship notices and payments.

Furthermore, Byer wants to extend electronic communications with its partners using E-mail. To prepare for this, the company is using an X.400 messaging server from Isocor in Los Angeles. Byer uses BT North America's value-added network (VAN) to connect to its partners. E-mail and fax traffic gets piped in from BT through X.400 gateways to the server, which routes the messages to end users' desktops.

Incoming EDI traffic gets routed to an EDI user agent, which forwards the traffic to EDI translation software from St. Paul Software, Inc. in St. Paul, Minn. EDI purchase orders feed into third-generation language or Oracle Corp. databases, and EDI invoices are routed back out through the St. Paul translator.

"Combining E-mail and EDI will be a tactical advantage because there is a lot of interaction between Byer representatives and customers with any purchase," Higgins said. E-mail would be a valuable addition to phone and fax because it is not time-sensitive, he said.

From an administrator's point

Clothing, *page 70*

Digital sets '94 delivery date for Pathworks for NetWare

By Craig Stedman
MAYNARD, MASS.

This time, they say, it's for real.

After a series of false starts, Digital Equipment Corp. has set a January shipment date for a long-delayed version of its Pathworks LAN software said to enable Novell, Inc. NetWare 3.X clients to access files and applications on VAX systems via Novell's IPX transport protocol.

Pathworks Version 1.0 for OpenVMS (NetWare), a release of Novell's Portable NetWare server product for VAX machines running the OpenVMS operating system, will finally put some meat on the bones of Digital's strategy for embracing NetWare and its huge installed base.

Pathworks up to this point has been built exclusively around Microsoft Corp.'s LAN Manager technology. Support for NetWare has been limited to coexistence software that lets a PC access both Pathworks and NetWare servers but requires different transport protocols to get to them.

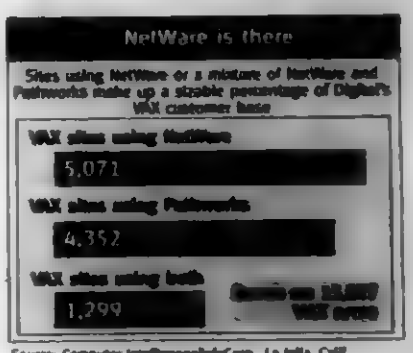
The need to load both IPX and Digital's DECnet protocol stack, plus a LAN Manager redirector, eats up PC memory, said Michael Hays, president of ITAC, Inc., a Deering, N.H., consulting firm. Separate utilities also have to be used to manage file and print services, whereas Pathworks for NetWare will support standard NetWare utilities.

However, Digital's embrace of NetWare has been a long time coming. The company licensed NetWare in early 1992 and said a product would be ready by the end of that year. The schedule was later amended to the first half of this year, and in June, Digital again pushed out shipments to sometime during the summer. More recently, officials were listing late September or this month as the target.

Couldn't wait

The wait proved too much for Dr Pepper Co./The Seven-Up Co. in Dallas, which was supposed to be a beta site for the NetWare release of Pathworks but eventually lost interest. "There were so many delays that we just decided to sit back and watch," said Ed Homko, systems manager at Dr Pepper.

Dr Pepper will still likely take a look at the NetWare product when it becomes available, Homko said. In the meantime, though, the company has put in more pieces of InterConnections, Inc.'s NetWare-to-VAX software. "They don't do everything, but at least they're there," he noted.



Source: Computer Intelligence/InfoCorp., La Jolla, Calif.

Other users plan to forgive and forget. Currently, Smith Industries Ltd., an aerospace firm in Malvern, Pa., is an all-Pathworks shop, but MIS manager Steve Ruger said being able to tie NetWare PCs into his VAX servers would give him access to a wider range of applications software.

"There are a ton of packages out there that are NetWare-compatible but have never heard of Pathworks," Ruger said.

Pathworks, *page 73*

Clothing

CONTINUED FROM PAGE 69

of view, running both functions off one system has obvious advantages, such as simplified administration, Higgins said, and makes it easier to think about adding E-mail to the EDI lineup with its trading partners.

One such partner is Mercantile Stores Company, Inc. in Fairfield, Ohio. Scott Fitzpatrick, manager of EDI administration there, said the company has been setting up E-mail with some of its larger EDI partners, including Byer, over the past six months.

"We exchange a lot of information with Byer, such as notes and memos, that don't fit into the EDI format," Fitzpatrick said.

Also, Mercantile would like to pull reports such as merchandise reports from internal systems and send them to partners using E-mail, Fitzpatrick said.

Unlike Byer, however, Mercantile runs EDI and E-mail separately, and Fitzpatrick said he did not know of plans to integrate the two systems.

That separation is common now because most VANs do not fully support the 1988 version of the X.400 worldwide messaging standard, which is needed to support the accompanying X.435 EDI standard, Wheatman said. And although he said he expects to see the VANs stepping up to X.435 early next year, it will probably be primarily to service key accounts in the petroleum and aerospace industries, he said.

"It's kind of a chicken-and-egg scene: People won't use [X.435-based EDI] because the VANs don't support it, and the VANs don't support it because people don't use it," he said.

Until its trading partners use X.400 and X.435, Byer will use a transitional X.400 specification called P2 to reduce the time it takes to receive EDI messages from BT.

Before X.400

Before moving to X.400, Byer had an EDI mailbox at BT. Once a day, Byer dialed into the mailbox to upload and download information. If a trading partner were on another network, Byer would have to wait until that network exchanged mailbox information with BT and the trading partner had downloaded the information.

Using that model, a purchase order could take 20 hours or more to get to its destination, Higgins said.

Now Byer receives all EDI information wrapped in an X.400 P2 "envelope," a much faster method because the X.400 messages are automatically piped from BT without "the resting period," Higgins said.

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CONTINUED FROM PAGE 69

Torrey Byles, EDI program manager at Input, a consulting company in Mountain View, Calif.

"Right now there is no common customer application in the shipping industry," said William H. Kendall, chairman of the trade group and a vice president of corporate marketing at Sea-Land. The group formed to address the lack of standard EDI software for shipping customers, and Ocean is the first fruit of its labor.

Next, the group would like to increase the number of carriers involved with Ocean, Kendall said.

Earlier EDI efforts in the shipping industry revolved around transportation industry groups, such as ports, warehouse operators, shipping lines and trucking companies — not the transportation customer, Byles said.

All major shipping ports in the U.S. use EDI for some functions, such as internal coordination with the trucking lines, but there is not a seamless flow of data throughout the shipping process.

By offering a standardized interface to people in the trading community, the carriers are likely to improve their business, Byles said.

Pricing for Ocean has not been established.

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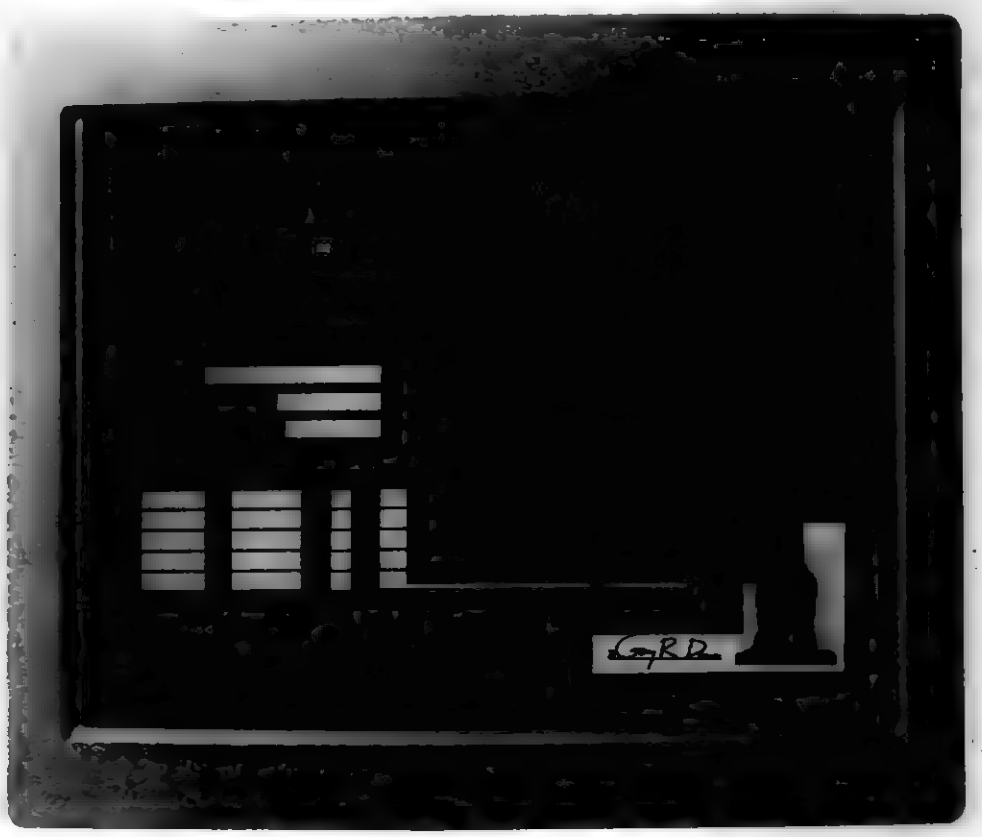

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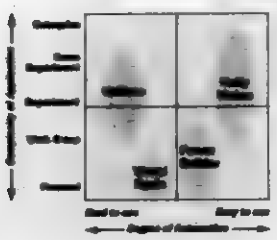

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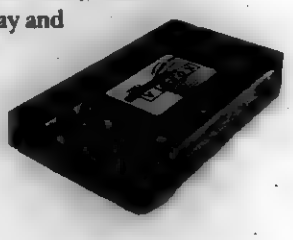

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Digital sets Pathworks delivery

CONTINUED FROM PAGE 69

Functions such as modem sharing can be implemented on the VAX to make up for the lack of Pathworks support, but that alternative "gets very expensive because they start charging VMS license prices," he added.

The NetWare scene

"I haven't seen another product that brought me as close to [NetWare server] emulation as this," said Dave Yakerson, network administrator at Bridgeport Hydraulic Co., a private-sector water utility in Bridgeport, Conn. The company is currently beta testing Pathworks for NetWare. "To our users, it smells just like NetWare."

The delays did prompt Yakerson to unplug the software and look at alternatives, but he said it was being reinstalled last week and will be used permanently "unless something major happens." He remains a bit wary about the January shipment date, though. "Keep your fingers crossed," he said.

Catherine Smith, Digital's Pathworks for NetWare marketing manager, said the delays have been caused by performance slowdowns at the server level as users are added to create "more demanding environments than small pilots." The scaling problems "will be taken care of" by the time the software becomes available, she added.

Hays noted that Digital has had to do "almost a total rewrite" of Portable NetWare, which is typically a Unix product. The company has also found it "very complex" to integrate the license management software that Novell insisted be included to keep track of NetWare licenses, according to Hays.

Digital, which is working to implement native NetWare on its newer Alpha AXP systems line, will add Alpha support to Pathworks for NetWare "in the very near term," Smith said. Support for the DEC OSF/1 operating system on Alpha is also planned, but Smith would not say when that would be available.

Trodding a similar path

Digital said shipments of its Pathworks Version 5.0 server software based on Microsoft's LAN Manager will also start in January. That is slightly behind the company's previous schedule, which called for Pathworks 5.0 to be out before the end of this year.

Pathworks 5.0 runs under the DEC OSF/1 operating system on Alpha AXP systems and under OpenVMS on both the Alpha and VAX lines. New features include support for Microsoft's NetBEUI transport and a ManageWorks module for managing native LAN Manager and Novell NetWare servers from a Pathworks-equipped PC [CW, Oct. 4].

ManageWorks is also available with Pathworks Version 1.0 for OpenVMS (NetWare), which has the same pricing as Pathworks 5.0. Traditional client licenses cost $200 and include file and print access to unlimited servers plus ManageWorks, the TCP/IP and DECnet transports and Pathworks applications such as terminal emulation and electronic mail.

As promised, Digital for the first time is also offering concurrent-use licenses providing access only to file and print services on a specific server [CW, June 21]. Prices range from $3,000 for 10 users to $18,750 for 250; a license enabling an individual PC to access multiple servers costs $99 per seat, the company said.

Catherine Smith, Pathworks for NetWare marketing manager, said Digital plans to combine that package and Pathworks 5.0 with the next major release of the software. The merged product should provide the same kind of multivendor LAN management capabilities at the server level as ManageWorks allows for clients, she added.

Both Pathworks 5.0 and Pathworks for NetWare will lack support at first for Apple Computer, Inc.'s AppleShare file and print services, which the existing Pathworks 4.X software includes. Smith said AppleShare support will be added to the new versions, but she did not say when that will happen. —*Craig Stedman*

TSI unveils Windows-based mapping product

By Lynda Radosevich
WILTON, CONN.

Developments in Windows-based electronic data interchange (EDI) software and object technology are making it easier for customers to set up EDI exchanges with small business trading partners and organizations such as ocean shipping companies (see story page 69).

For instance, TSI International recently announced a Windows-based "mapping" product that lets developers use graphical objects to link data from fields in EDI forms to fields in business applications.

Currently, companies must program such "maps" themselves or use field mapping packages, alternatives that tend to lose some attributes of the data, according to TSI officials.

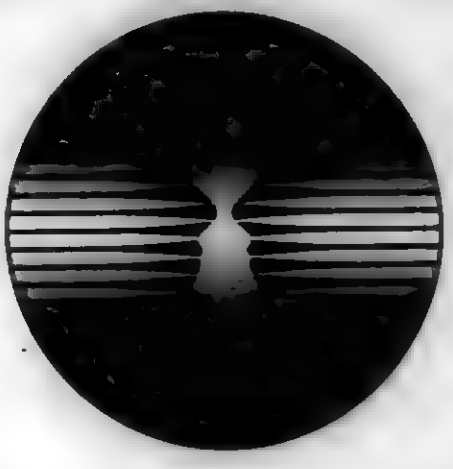
The new product, called Mercator, uses object technology and embedded rules to define both data structures and maps.

It is the first mapping product to use the drag-and-drop features of Windows, according to Torrey Byles, manager of EDI and electronic commerce at Input, a consulting company in Mountain View, Calif.

Mercator will ship Nov. 1 and cost $2,500 for one client version for creating maps and one server version for executing the links, according to TSI.

Separately, TSI announced trading partner kits, which comprise Windows-based EDI software for small business and first-time users.

The kits are preconfigured to meet the specific requirements of major EDI trading programs in the retail, insurance, health care, transportation, communications and manufacturing industries.



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☐ Yes ☐ No

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☐ Yes ☐ No

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☐ Yes ☐ No

Are you alert to *every* product your customers could use? *Every* service that might interest them? *Every* transaction they're prepared to make? *Every* sale they'd allow you to clinch? Are you thoroughly tapped into your market?

5. Does your <u>entire</u> organization know what your customers want?
☐ Yes ☐ No

A customer orientation has limited value unless it's embedded in the very fiber of an enterprise—at all levels, and at every place that directly or indirectly impacts the customer.

6. Is your information strategy <u>focused</u> on helping you hear what customers and markets are trying to tell you?
☐ Yes ☐ No

The next best thing to reading your customers' minds is listening to what they're saying. But unless you're constantly tuned in to customers' signals, you're missing messages that could guide you to greater results for your business.

7. Can your organization respond <u>quickly</u> to what customers and markets are telling you?
☐ Yes ☐ No

When the flow lines of your information system are not within your customers' reach, you won't always sense when opportunity knocks. But even if you do, getting the message is not enough. If you can't reply rapidly to market cues with information, products and services, revenue opportunities are lost.

8. Does your information strategy enable you to <u>proactively</u> deliver information to your customers?
☐ Yes ☐ No

Many business plans underestimate the power of information to build customer relationships. But imagine the advantage of an information technology strategy that transforms information into customer-generating, revenue-generating fuel.

9. Are the <u>full</u> capabilities of your organization accessible to your customers at all your field locations?
☐ Yes ☐ No

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10. Does your information strategy reflect the <u>bottom-line importance</u> of customer service?
☐ Yes ☐ No

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cus-tom-er-ize \ kŭs'-tə-mə-rīz' \ *vt* **1:** to make a company more responsive to its customers and better able to attract new ones **2:** to customerize an organization's information strategy, e.g., to extend systems capabilities to field locations and other points of customer contact and support **3:** what Unisys Corporation does for a growing roster of companies, and government agencies, worldwide *syn* see CUSTOMER SERVICE, COMPETITIVE EDGE, BUSINESS-CRITICAL SOLUTIONS, REVENUE GENERATION

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Artisoft inks deals with VisiSoft to appease corporate accounts

By Elisabeth Horwitt
TUCSON, ARIZ.

Hoping to make its LANtastic network operating system more viable within corporate accounts, Artisoft Corp. last week announced an agreement whereby VisiSoft, Inc. will provide network management software for the peer-to-peer network.

"As you move [a network operating system] from the department to the enterprise, the management issue comes up" with information systems managers asking, "How can we control network services and resources with our existing management software?" said Artisoft spokesman Joe Waldygo.

Through a new version of VisiSoft's VisiNet, scheduled for delivery by year's end, users will be able to do real-time performance monitoring and configuration tracking of "all resources tied to a LANtastic network," he said. These resources include clients, client software and hardware and the links themselves.

In addition, the VisiNet software for LANtastic can share a Windows console with other VisiNet products for managing NetBIOS LANs as well as Novell, Inc. NetWare 2.x, 3.x and 4.x; Microsoft Corp. LAN Manager; IBM LAN Server; and Simple Network Management Protocol-managed devices, the vendors said.

The VisiNet product for LANtastic will include trouble-ticket reporting and historical activity logging, as well as the use of Microsoft Dynamic Data Exchange and Object Linking and Embedding functions to alert remote sites. User-definable icons, polling, alarms and thresholds are also supported, as well as an inventory system for hardware and software.

VisiNet for LANtastic pricing was not available; however, it is likely to be comparable to the NetBIOS version, which is $795, a VisiSoft spokesman said.

Another recent Artisoft announcement geared to the corporate market was an agreement with Mountain Network Solutions, Inc. to jointly develop backup and recovery systems for Artisoft's LAN platform. The initial piece of the ArtiSave Backup software suite, to ship this fall, will be a software product that will be compatible with industry-standard SCSI tape backup drives, priced at $339.

The backup software will run on any LANtastic server to back up the drive and any other server across the network, Artisoft said.

Coming soon

Another recent corporate-oriented Artisoft announcement was LANtastic Interchange software, which links LANtastic Version 5.0 users running on dissimilar LAN hardware, cabling and topologies. The software is scheduled to ship this fall, priced at $495 per segment.

Briefs

API for petroleum industry

Hewlett-Packard Co. said it has delivered an application programming interface (API) based on object-oriented database technology to the Petrotechnical Open Software Corp., a consortium formed to facilitate the use of integrated technology. The API was designed to help companies blend independently developed oil and gas software applications.

Training addressed

The National Association of Communications Systems Engineers in Denver announced that is has become an independent certification organization for education and testing of communications professionals. The association will supplement training provided by vendors and rate skills on a common ground.

Forms software distributed

Jetform Corp. in Waltham, Mass., said Digital Equipment Corp. signed a worldwide distribution agreement for JetForms electronic forms software for the Digital VAX/VMS. Also, Jetform said that Olivetti North America agreed to resell five related JetForm forms products in conjunction with Olivetti's bank branch automation software.

ATM guaranteed

AT&T and NCR Corp. launched a technology guarantee program for their UnivercCell line of Asynchronous Transfer Mode (ATM)- based premises communication switches. The program is meant to help customers decide to stick with AT&T/NCR as they upgrade their 10Base-T hubs to ATM by promising customers an ATM hub upgrade by the end of 1994 or a $5,000 payment.

EMA board elected

The Electronic Mail Association (EMA) recently elected new members to its board, including Lotus Development Corp. and Microsoft Corp. executives and analysts from Creative Networks, Inc. and Rapport Communication. Outgoing board members include representatives from SoftSwitch, Inc., AT&T Easy Link Services, Digital, Tempus, Inc., The Boeing Co. and Finex-Daniel, Inc.

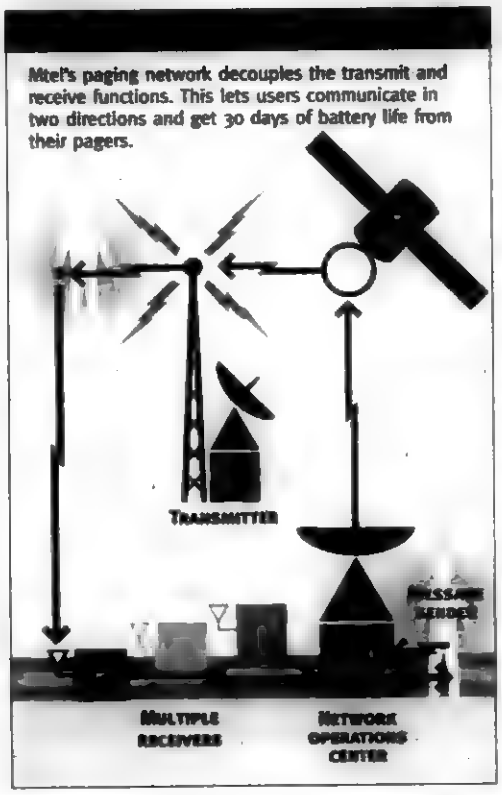
Two-way paging takes flight

National Wireless Network to soon hit 300 markets

By Ellis Booker
JACKSON, MISS.

Just when you thought you had a complete list of wide-area wireless networks to choose from, the list grows by one.

Mobile Telecommunication Technologies Corp. (Mtel), headquartered here, plans to deploy late next year a bidirectional, data-only network called the National Wireless Network (NWN), occupying spectrum in the radio-frequency band today reserved for one-way-only paging devices.



Mtel's paging network decouples the transmit and receive functions. This lets users communicate in two directions and get 30 days of battery life from their pagers.

The NWN is slated for commercial operation in about 300 markets in July 1995.

According to wireless industry analysts, Mtel's wireless network has the potential to make wireless messaging services a ubiquitous and affordable commodity for mobile professionals and a broader consumer electronics market. At the very least NWN will, they said, impact the pricing and services of existing packet radio providers.

"The fully delivered network will compete head-on with [RAM Mobile Data] and Ardis," said Andrew M. Seybold, editor in chief of "Andrew Seybold's Outlook on Mobile Computing" newsletter in Brookdale, Calif.

Meanwhile, the broad national coverage of the NWN, enabled by some technical concepts behind personal communication systems called "microcells," will upset the cellular industry's plan to pump data calls back and forth over idle voice channels on its wide-reaching networks. Several cellular carriers expect to have that technology, called Cellular Digital Packet Data, next year.

NWN leverages Mtel's experience as parent of the largest nationwide paging network, SkyTel Corp. As of Sept. 30, SkyTel had more than 265,000 subscribers.

The NWN architecture will allow the mobile terminals — either specialized devices or general-purpose computers and personal digital assistants (PDA) — to use very low-power transmitters.

"We'll offer much longer battery life ... and I don't mean increasing 'talk time' from four hours to six hours," said Emmett Hume, senior vice president of marketing and business development at NWN. "We're talking about a 30-day battery life with commercially available batteries."

Paul Callahan, a senior analyst at Forrester Research, Inc. in Cambridge, Mass., agreed that "it's a compelling technology for handheld devices."

The portable communicating devices that will work with the NWN are being built by Motorola, Inc. and Wireless Access, Inc. in Mountain View, Calif. Both firms are working on stand-alone devices capable of transmitting limited "acknowledgement" responses, such as "Yes, let's meet" or "No, I'm busy." Or an automatic acknowledgement can go to the sender to indicate, for example, simply that a message has been read.

Hume said NWN sees applications for both mobile professionals and a broader consumer marketplace for two-way paging. "We're not going after vertical segments," he said. "We're looking to distribute [this service and associated products] alongside PDAs in retail establishments."

How will NWN pay the estimated $100 million needed to build its network? Apparently, discussions with major software, hardware and networking companies as potential partners are under way, though Mtel executives would not comment on their status.

Similarly, NWN executives will not comment on the service pricing being considered for NWN.

But Seybold said Mtel is evaluating at least one $40-per-month pricing scheme. By comparison, RAM Mobile Data's regular rates are now $25 per month per subscriber plus use charges. However, RAM is running an unlimited-use, $75 special running through 1993.

Pricing, though, is less important than coverage and convenience, Seybold said. "At under $100 a month, cost is really a nonissue for most users."

Leading the pack

Already a leader of one-way paging services with its SkyTel subsidiary, Mtel is on schedule with NWN, its $100 million two-way nationwide paging network.

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IBM, Novell take divergent remote access paths

By Elisabeth Horwitt
DALLAS

IBM and Novell, Inc. outlined different approaches to the problem of managing remote user access to LAN servers at the recent Networld '93 show, though both vendors moved to help LAN administrators make LAN resources available to the proliferating population of mobile users.

Novell and partner Citrix Systems, Inc., for example, said they would integrate Citrix's WinView for Networks with Novell's NetWare Connect. WinView for Networks allows remote users to send in jobs to be run on a LAN application server; NetWare Connect manages dial-out and dial-in LAN communications.

This co-development is slated to produce what has been dubbed Domain Manager, a product that "provides a managed execution environment for applications" serving mobile laptop users, said Edward Iacobucci, Citrix chairman.

Timeworks

A week before the Personal Software Products group at IBM rolled out its OS/2-based remote-access product at Networld, the IBM Networking Systems group unfolded the first fruits of its relationship with Shiva Corp.: an internally competing hardware/software product that reportedly allows users running any of several supported protocols to dial into a home LAN and access everything they could if they were local.

The system will provide mobile users with access to LAN resources such as high-end workstations running sophisticated applications that may not fit on a laptop, Iacobucci said.

Similarly, the server will make memory- and CPU-hungry applications, such as Lotus Development Corp.'s Notes, available on 286-based PCs, said Gerry Machi, vice president of Novell's interoperability group.

Oldies but goodies

Domain Manager should help companies "keep a lot of their old clunkers" for a cost savings that should be attractive to many firms, said George Kelly, a principal at Morgan Stanley & Co., a New York investment firm.

The initial server will support 50 to 60 concurrent requests. The system will run on DOS, Windows and OS/2; a UnixWare version is scheduled, but at an undisclosed date.

Meanwhile, IBM — and partners Star Gate Technologies, Inc. and TelePartners International — took a different approach to the remote LAN access problem with LAN Distance, an OS/2 server built to connect remote OS/2 clients to servers throughout the LAN.

Unlike the Novell/Citrix Domain Manager strategy, however, LAN Distance lets remote PCs run applications locally, accessing the LAN servers only when they need data, according to Art Olbert, director of IBM's Personal Software Products division. This conserves bandwidth by limiting communications between the remote PC and the LAN to a few keystrokes and data transfers, he said.

LAN Distance Connection Server for OS/2 is said to allow multiple PCs to dial in and concurrently access LAN resources while supporting user identification, password and call-back security functions. Network software supported includes IBM's OS/2 LAN Server, NetWare and Banyan Systems, Inc.'s Vines.

The number of PCs supported depends on the power of the PC and type of communications adapter, IBM said.

The product is scheduled for Oct. 29 availability, priced at $50 for the client software and $595 for an eight-port LAN Distance Connection Server. A 32-plus port server version will cost $1,995.

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[redacted]

Memorex Telex has introduced products designed to provide mainframe access to intelligent and SNA devices.

According to the Raleigh, N.C., company, the products integrate LAN and mainframe environments for client/server computing.

The Memorex Telex 9400 Enterprise Communications family consists of the 9432 Enterprise Gateway, an integrated gateway server that provides channel attachment to mainframes for enterprise networks; the 9420 Communication Server, an integrated product for communications and applications serving to meet branch office and departmental needs; and the 9460 Internetworking Communication Subsystem, a bus-attached network communication system for superservers.

Support is provided for Novell, Inc.'s NetWare, traditional SNA and TCP/IP devices.

Pricing begins at $20,500.

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(919) 250-6100

McData Corp. has announced network software modules designed to give Novell, Inc.'s NetWare LAN users and Unix workgroups access to IBM mainframes.

The products consist of the Advanced SNA/IP Gateway, an application for Novell's NetWare for SAA users and the X-Direct tn3270 Client and Server packages.

According to the Broomfield, Colo., company, the Advanced SNA/IP Gateway is coupled with its Advanced SNA/IP transport technology to provide end-to-end SNA services over an IP network from the Novell LAN to IBM mainframes.

The X-Direct tn3270 Client emulates a 3278/3279 IBM terminal and supports both the X Window Motif and OpenLook window managers.

An average package of the Advanced SNA/IP Gateway costs approximately $1,500 based on the number of users supported. Single-user prices for X-Direct tn3270 Client software start at $495.

▶ *McData*
(303) 460-9200

Livingston Enterprises, Inc. has introduced an enhanced PortMaster product family that fully supports Novell, Inc.'s IPX protocol.

Consisting of a series of scalable communications servers and a line of multiprotocol routers, PortMaster products extend advanced dial-up internetworking services and secure remote network access to NetWare LAN users, according to the Pleasanton, Calif., company.

Shared peripheral capabilities for TCP/IP network systems and terminal-to-host links are provided. Options such as dial-back, filtering and centralized authentication services are also offered.

Prices range from $395 to $3,750.

▶ *Livingston Enterprises*
(510) 426-0770

Product shorts

Castelle, Inc. has announced FaxPress 1000, a compact fax server for Novell, Inc.'s NetWare networks. The product includes all of the hardware and software necessary for fax services for up to 100 network users. Users can send faxes from within any DOS or Windows 3.1 application, and FaxPress 1000 features extensive user-definable options, secured manual routing and personal and corporate phone books. Cost: $1,995. Castelle, Santa Clara, Calif. (408) 496-0474.... **Elcon Technology Corp.** has introduced InterConnect Server for NetWare, a router/gateway product designed to provide remote PC and workstation users with complete access to their corporate resources over an internetwork or SNA network. Highlights include the ability to route IPX, IP and Apple Computer, Inc.'s AppleTalk LAN protocols, remote configuration and management through a Windows-based console. Cost: $3,495. Elcon Technology, Montreal (514) 631-2592.... **Beyond, Inc.** has announced BeyondMail Remote Access for Banyan Systems, Inc.'s Vines, a single-user edition of BeyondMail for remote users and for those who are traveling away from the network. Without being logged into the network, users can create and store messages, move messages from folder to folder, create and use rules and delete messages. It is available for Windows and DOS. Cost: $295. Beyond, Burlington, Mass. (617) 229-0006.

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For system administrators, the HP Windows Client offers client/server computing with centralized administration of PC software and data for faster, easier backup and simplified management of applications. The elimination of disk drives from the desktop enhances data security and control of the software environment, while reducing the risk of data theft and virus infections.

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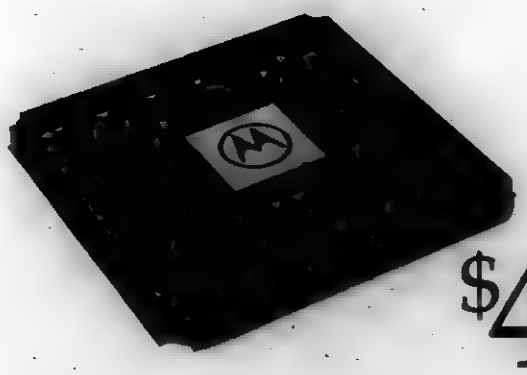

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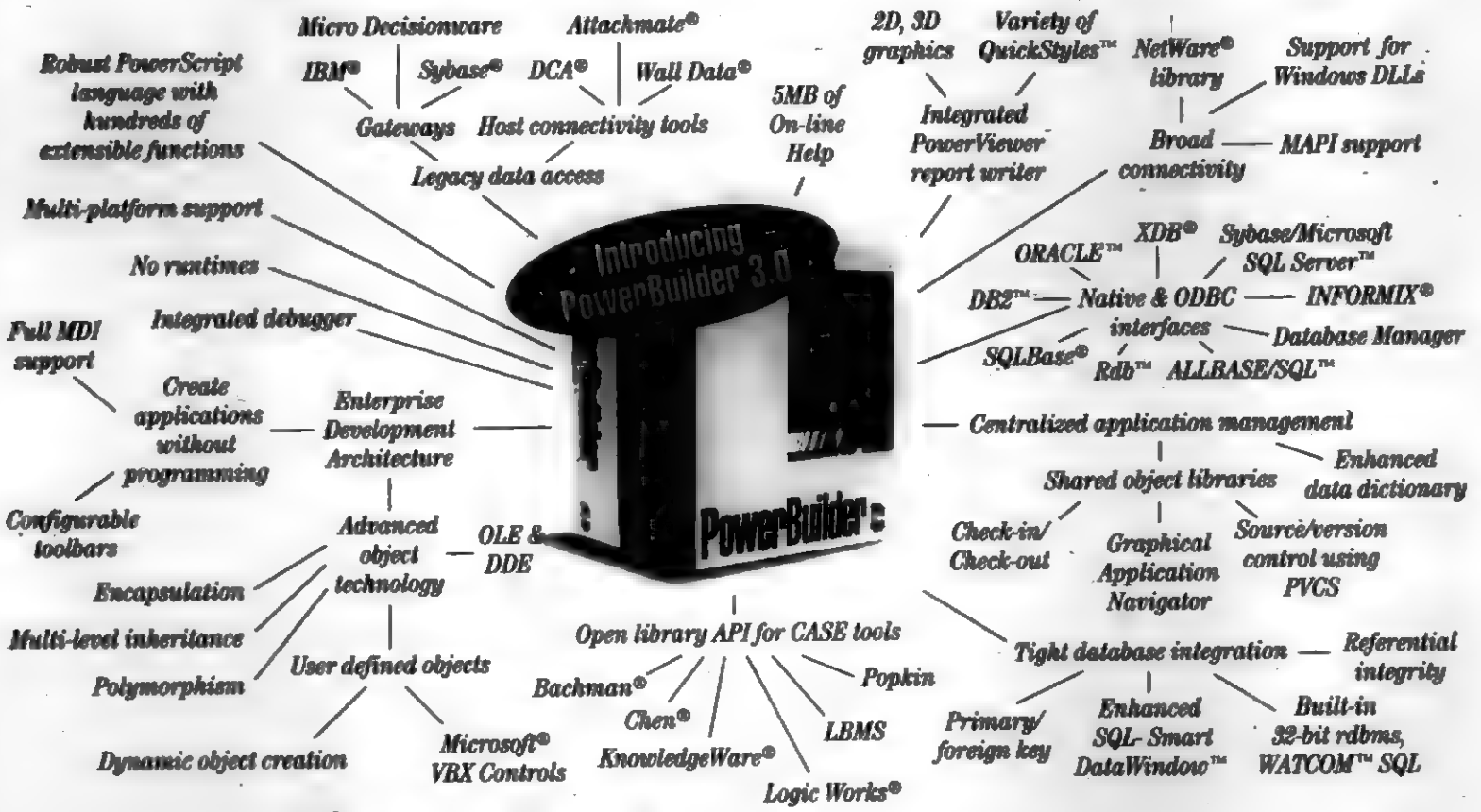

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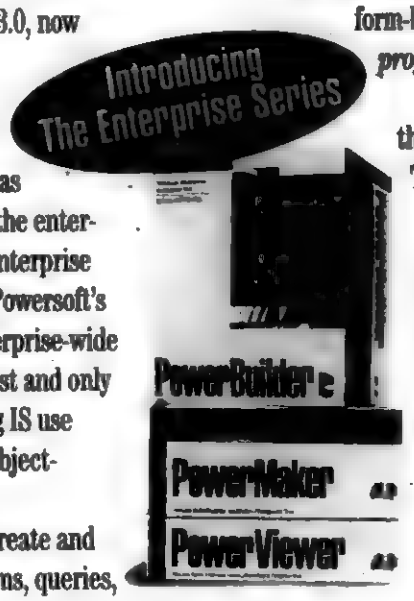

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GTE overhaul polishes customer service process

By Thomas Hoffman
IRVING, TEXAS

GTE Corp.'s Telephone Operations group has replaced its mainframe-based customer service system with a client/server architecture, for productivity gains of 20% to 30%.

Before the new system — implemented as part of a 19-month massive corporate re-engineering effort — GTE was able to resolve customer problems on-line only once every 200 calls. But that was not good enough, said Mark Feighner, vice president of product management at GTE and the person overseeing the re-engineering projects. Customers wanted a single source to resolve any and all inquiries — ranging from a problematic telephone line to billing questions.

GTE's Frank Zachert: *GTE will decide on a wireless computing platform in the next few months*

New equipment moves in

The new scenario uses Hewlett-Packard Co. Unix-based servers with attached HP client computers ranging from DOS and Windows-equipped PCs to workstations outfitted with custom graphical user interfaces. These replace the IBM 3270-type terminals that customer service representatives and other staffers use to access information in the company's IBM, IBM-compatible and Honeywell, Inc. mainframes — data on customers' telecommunication infrastructures, customer records and consignment information [CW, April 8, 1991].

No more delays

Before, if a customer representative using a dumb terminal was unable to match a customer's account with his current bill, the representative would have to interrupt the call to access another mainframe system, further delaying the resolution of the problem, according to Lanny Russell, GTE Telephone Operations director of information systems.

The mainframes are still in place, however, and are the source for the data feeding the client/server systems.

The new systems also include an automated work assignment system, a client/server configuration that allows customer service representatives to automatically as-

GTE, *page 88*

Software distribution key to open systems

By Jean S. Bozman

Distributing new or improved software to hundreds or thousands of end users is a major challenge for information systems managers. Two distribution utilities due to arrive in 1994 could help solve that problem.

Microsoft Corp.'s Hermes software distribution manager and the Open Software Foundation's (OSF) Software Distribution Service, part of the OSF's Distributed Management Environment (DME), will vie for market share in this arena. They are meant to help IS groups trying to create open systems applications without the comfort of the familiar, centralized software management utilities found on data center mainframes.

Until they become available, maintaining current copies of office automation software and custom applications will continue to be chaotic, users and industry analysts agreed. Inadequate software distribution systems could slow widespread adoption of enterprisewide open systems in the near term, analysts said.

"Right now, it's a total mess," said Ed Acly, director of software research at International Data Corp. in Framingham, Mass. "When we get serious about doing distributed computing, we need systems software because you can't mail everybody a copy of the software." Even the old-fashioned "Sneakernet" method of passing software around is not fast enough, he said, noting that many firms straddle the globe — and need updates in many countries.

Software distribution utilities do exist, not only on mainframes, but in Novell, Inc. NetWare networks and in Sun Microsystems, Inc. networks running SunNet Manager, noted Terry Bennett, an analyst at Computer Intelligence/InfoCorp in Beaverton, Ore. However, mixed-platform networks will require more tools and utilities for timely software updates, he said.

Hermes vs. SDS

Microsoft's Hermes software management utility for NT

Centralized control from SQLServer database repository
Works with servers running Windows NT
Updates software to PC clients throughout user's network
Ships by mid-1994

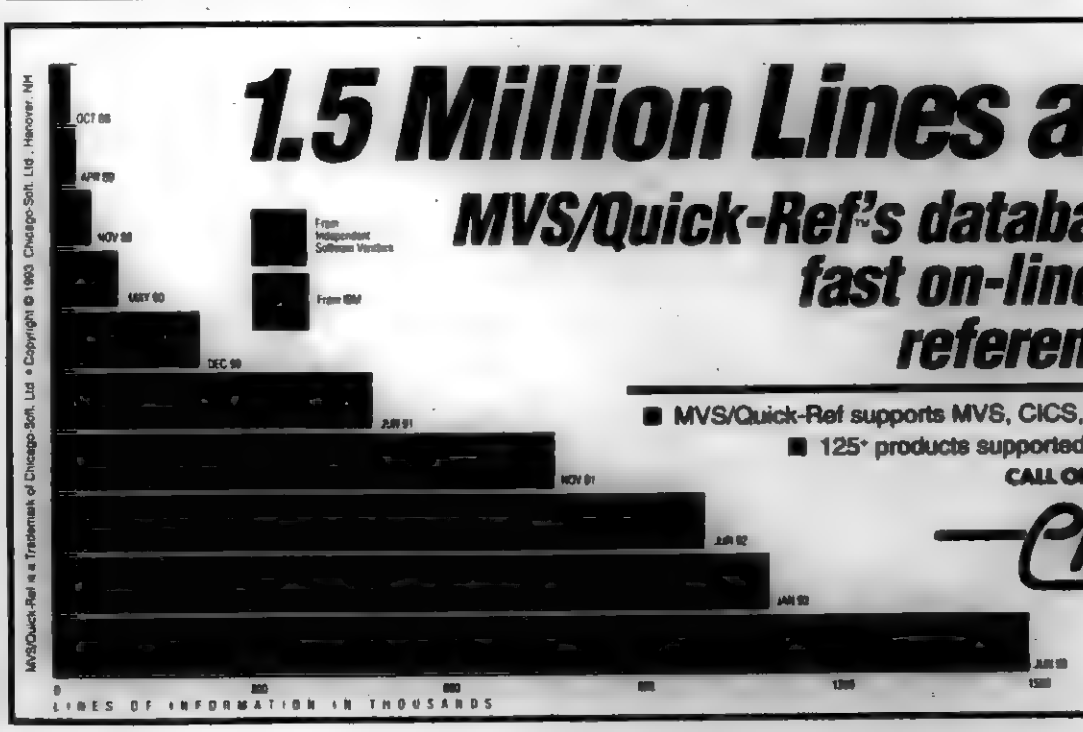
The OSF's Software Distribution Service, provided under DME

Distributes software to various open systems clients
Activates the software and verifies it once installed
One of six DME component services
Ships to vendors and resellers by January 1994

CW Chart: Dave Marshall

The distribution problem is as down-to-earth as copying data from floppy disks and as complicated as coordinating a mass mailing. "It's a controlled replication problem, since each of

Microsoft, *page 92*



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HP mulls Image/SQL fixes

By Mark Halper
PALO ALTO, CALIF.

Users of Hewlett-Packard Co.'s HP 3000 with massive record-keeping requirements are experiencing data-entry slowdowns and capacity limitations with HP's proprietary Image/SQL database.

But HP has a few solutions in mind, some of which it plans to implement in the second quarter of 1994.

Many users hitting the Image wall are in the health care and insurance fields, where operations such as hospitals and health maintenance organizations need data sets that are too large for the 4G-byte limitation imposed on Image by the HP 3000's MPE/IX operating system.

While the number of HP users with this limitation is "very small," according to HP's Image/SQL lab manager Jim Sartain, the restriction is a "very important limitation" to them, he acknowledged.

Jerry Potchman, chairman of Sigimage, a special interest group within the HP user organization Interex, said more users will start running into this problem because HP continuously enlarges hardware capabilities, thereby encouraging users to keep pushing the database to its limits.

Fix on the way

About 5% of the HP users user base has capacity limitations with HP's proprietary database. HP promises at least a partial fix by June 1994.

A database analyst at a manufacturing company said he has never relied on his 150 HP 3000s to store large databases because of historic capacity limitations.

"We keep our mega databases on mainframes," he said. And although HP is addressing the problem, the company may still not use Image for its large databases because its long-term goal is to migrate to Unix platforms; it may change its database supplier altogether, he said.

HP is contemplating two ways to enlarge Image data sets, both of which would require a major re-release of the database. One would mean a change to the MPE/IX operating system.

Multiple file data sets

One technique that could yield a quantum leap in capacity: permitting a data set to house multiple files. Right now, an Image data set can house only one file. Through this method on Image, "instead of going from 4 to 8 gigabytes, you could go from 4 to 400 or 4,000," Sartain said.

The drawback of such a gargantuan limitation would be robbing disk space from nondatabase functions, so HP is considering modifying MPE/IX to permit more modest leaps in Image capacity.

Sartain said HP has surveyed users and expects to make a decision in two to three months based on that feedback. The company may decide to implement both enhancements, he said, although he declined to say how long each might take.

While HP contemplates enlarging data set capacity, it has in the meantime committed to a couple of modifications to Image that should help speed up data entry for large users.

In one case, HP is redesigning Image so the HP 3000 will no longer automatically execute the "delete chain" method of entering data. In this method, the HP 3000 routes new data to disk space freed by earlier deletions from the database.

Some users have complained that the delete chain method slows new data entries because the system labors through the time-consuming task of searching for empty space. HP is modifying Image/SQL so it will instead store newly entered records immediately after the last record stored.

HP plans to support this process in the next release of the HP 3000's MPE/IX scheduled for the second quarter of 1994. The company is adding this feature as an option on each data set.

Meanwhile, HP has at least one other plan to improve Image/SQL's write speed. Namely, the company is modifying MPE/IX to support dynamic changes to record size.

When that is completed, users will be able to expand disk space allocated for the database without having to shut the machine down as they do now.

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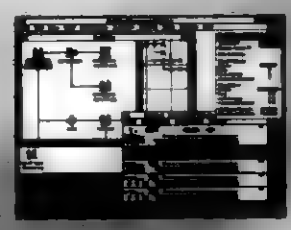

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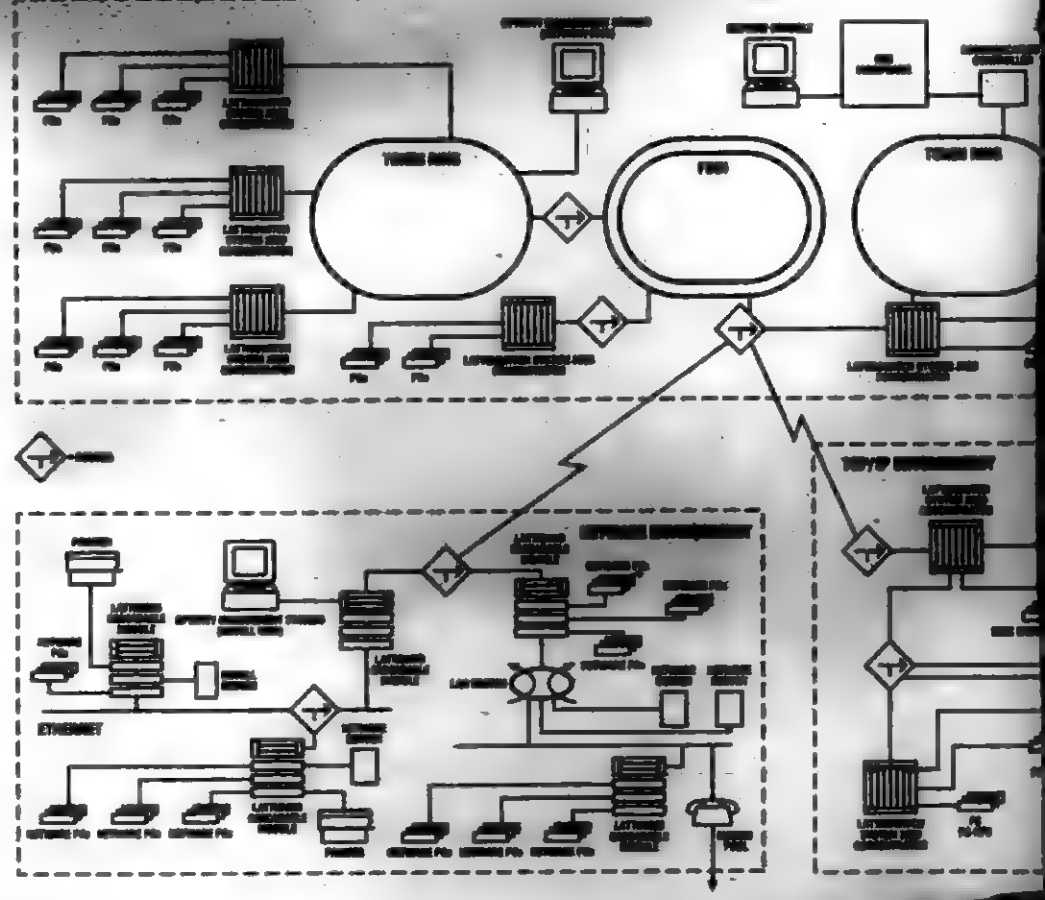

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Vernon M. Allison

Storing away savings

System-managed storage (SMS) is now widely used in the the MVS community. Almost everyone has either implemented SMS or say they plan to. But few are actually realizing the full benefits.

SMS isn't paying off as well as it could because it isn't being aimed in the right direction. Most sites employ SMS to give the storage administrator better control and/or to make more efficient use of storage resources. Both goals are worthwhile, but the improvements that SMS can produce in these areas are small compared with what it can accomplish when used for the specific purpose of improving service to storage users.

Sound unlikely? Then consider this: If your storage costs are 10% of your IS expenditures, achieving a 10% savings here gives you 1% on the bottom line of the IS budget. While this is certainly worth pursuing, remember how a much bigger part of your IS budget is given to the costs of people — most put the figure at somewhere around 80%. If SMS can help you to improve the productivity of your IS staff and reduce that number, then the payback is virtually guaranteed to be bigger.

Whether or not they realize or admit it, IS users do spend time managing storage. They find and defend storage space. They perform backups to guard against problems with the storage hardware and software. They contend for the "best volumes" searching for better performance.

Of course, users don't view these tasks as storage administration; it's just "part of the job." That's why it's so difficult to find the total cost of data storage. Nevertheless, all of these small tasks do add up and it's possible to use SMS to relieve the users of most of this burden. This can be the most important benefit of SMS.

If the productivity of the users could be improved by just 5%, there would be a 4% savings, or four times the SMS savings in storage hardware costs.

Unfortunately, because the storage administration function in most installations has not embraced user service as an objective for the SMS implementation, the potential benefits of SMS are not being realized.

Setting priorities

IS management will have to make the implementation of SMS a priority — not just for the storage administration function, but for user departments as well. Cooperation among the users of storage and storage administrators is essential.

Considerable design creativity will be required to build SMS applications that really deliver. The storage administrator may even want to seek help from the application development side, to make sure he or she is understanding and meeting requirements. It is also important to understand that if you want to get the users out of the storage-resource management game, you probably need to adopt a service-based accounting and billing system to replace resource-based billing.

Some installations have taken this approach and are already realizing a wide range of benefits. Most, however, have just not found their way to a quality storage management application that actually delivers better service to the users of storage resources.

Allison is a consulting partner and vice president at Washington Systems Consulting, Inc., a management consulting firm in Gaithersburg, Md. He has worked in the industry for more than 25 years, most of that time at IBM.

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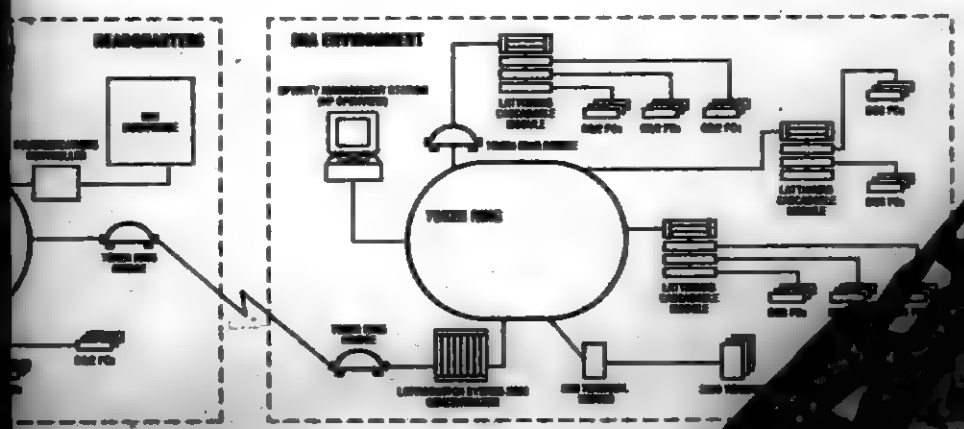

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GTE overhaul

CONTINUED FROM PAGE 85

sign repair technicians to a customer's site while the client is still on the phone. In the past, GTE's repair clerks would jot down information from a customer, fill out a trouble ticket and route the ticket to repair technicians, who tested customer switches and telephone lines until the problem was corrected.

With the new systems, some of the repair work will continue to be handled by field technicians, who will be equipped with mobile data terminals once GTE decides on a wireless computing platform in the next few months, according to Frank Zacherl, assistant vice president of re-engineering systems at GTE.

Boosted service

Taken together, the new systems have enabled the company to resolve customer inquiries on-line 30% of the time. Feighner has set a goal of 70% on-line customer satisfaction after further refinements are made to the systems in the next 18 to 24 months.

Unix was chosen so the telephone company would not be beholden to one vendor, Russell said. He added that GTE is betting that a common set of Unix application programming interfaces being developed by the Open Software Foundation and X/Open Co., among others, will allow GTE to mix and match Unix systems throughout its enterprise.

GTE Telephone Operations embarked on a major business process re-engineering initiative in January 1992 to transform its customer services operations. IBM Consulting Group, Boston Consulting Group and Andersen Consulting, among others, are providing technical and professional services. The projects will include the implementation of $300 million to $500 million in client/server systems in the next five years.

Although GTE Corp.'s Telephone Operations is consistently profitable and accounts for 80% of the telecommunications giant's $20 billion-plus in annual revenue, wholesale operational changes were needed to improve the unit's efficiency. GTE continues to lag behind industry leaders such as Bell Atlantic Corp. and Ameritech Corp. in this area, according to financial analysts.

To meet these challenges, "a telephone company is the perfect place to try to implement a single point-of-contact for customers," said Joseph Beatty, a telecommunications analyst at Duff & Phelps, Inc., a brokerage in Chicago. Beatty said GTE's client/server plans make sense, especially because a similar effort undertaken five years ago by Bell Atlantic helped fuel productivity gains and reduced headcount by 20,000.

Test pilot

For the past year, GTE has run a pilot application called the Customer Marketing Service System (CMSS) at its Tampa, Fla., center.

CMSS, used by 150 service representatives, is made up of HP 9000 Model 715 workstations running HP/UX and Motif. It includes an application developed in-house, The Sales Assistant. The application prompts representatives to offer customers services such as call waiting, data transfer and even videoteleconferencing. Frank Zacherl, assistant vice president of re-engineering systems at GTE, said the company plans to implement similar systems at its other regional centers next year, except in California, where the systems will be phased in during 1995.

Kaila Leslie, a billing service representative in Tampa, said she likes the system because it has replaced many manual processes, such as disconnecting a phone or reconciling bills. These are now handled automatically.

But as much as some of the representatives like the system, some customers do not. "Once that due date comes around and a customer hasn't paid, the computer cuts off their services. Customers have complained that it's dehumanizing, but it makes it easier for us," Leslie said. —*Thomas Hoffman*

CHOOSING THE WORLD'S BIGGEST DATABASE COMPANY MAY SEEM SAFE.

Freeport makes early move to client/server

By Mark Halper
NEW ORLEANS

Freeport-McMoRan, Inc. knew it would eventually ask its mainframe outsourcer, IBM's Integrated Systems Solutions Corp. (ISSC), to migrate headquarters operations here to a client/server platform.

But Freeport had to make that request a lot sooner than it had anticipated, prompted by a major change in business last January. The energy and mining company gave up control of its most mainframe-reliant operation, its Agrico Chemical Co. retail fertilizer subsidiary, to a joint venture run by International Mineral Corp. in Chicago.

The Agrico spin-off led Freeport and ISSC to abandon their previous 10-year, hybrid mainframe/client/server contract in favor of a five-year, purely client/server pact [CW, Oct. 11].

The new arrangement calls for ISSC to start moving Freeport's home office computing platform in January from an ISSC mainframe data center in Lexington, Ky., to a Hewlett-Packard Co. HP 9000 machine in New Orleans.

Although International Mineral joined forces with Agrico in January, the real instigator to renegotiations came in July, when it assumed processing responsibilities for Agrico. Until that time, ISSC's mainframe service was indispensible to Freeport, said Freeport chief information officer Mike Arnold.

ISSC was running the fertilizer retailer's sales and marketing program and processing vital retail orders six days a week from 6 a.m. to 11 p.m.

Fertilizing MIPS

"The one system that had the most stringent uptime requirement was the Agrico marketing system. It was taking customer orders from all distribution sites all day long," Arnold noted.

By comparison, Freeport's sulfur, oil and gas and copper and gold businesses process sales on a contractual basis and do not have the same real-time needs as does a retail business.

Programs that Freeport is moving from ISSC's mainframe to the HP 9000 Model 890 include corporate financials, oil and gas accounting, master limited partnership tax, corporate tax, human resources and benefits and administration, said Steve Bellis, director of corporate MIS.

Freeport and ISSC hope to tie the HP computer into its 500 PCs in New Orleans by July of next year.

ISSC will also take over operation of a Digital Equipment Corp. VAX 4300 that Freeport uses for materials management, purchasing, inventory control, inventory accounting and preventive maintenance for its sulfur business, Bellis said.

While the move to client/server computing is new for Freeport's New Orleans operations, the company has had client/server experience at other sites.

For instance, Freeport uses HP 9000s to support purchasing, inventory and financial applications for its copper and gold mining operations in Djakarta and Irian Jaya, Indonesia; in Singapore; and in Cairns, Australia.

Meanwhile, Andersen Consulting will continue in its role of application developer, Arnold said, writing code in New Orleans around an Informix Corp. database using Informix tools. The company is purchasing a smaller HP 9000, a Model 847, for development.

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Important Client/Server Environments

- Platforms: Windows, Macintosh, OS/2, UNIX, Alpha
- User Interfaces: Windows, Motif, Macintosh, Character Mode
- Networks: Netware, LAN Manager, TCP/IP

•

Key Client/Server Technologies

- Graphical User Interfaces (GUIs)
- Event-Driven Applications
- Object Oriented Development

•

Client/Server Software Types

- Database Management Systems
- Network Software
- Tools: CASE, Application Development, and End User
- Application Packages

•

Selected Client/Server Standards

- ANSI/ISO SQL is the industry standard for RDBMS access
- OSF DCE defines specifications for distributed computing, including remote procedure calls, directory services, and security services
- X/Open's XA interface defines a standard interface which provides interoperability between heterogeneous transaction processing monitors

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(2) In the late 1980s, as the price/performance and benefits became apparent, Fortune1000 organizations began deploying client/server applications at the department level. LAN-based computing became pervasive and provided the impetus to a host of new technologies, including GUIs, RDBMs, and powerful Unix servers. The typical configuration for these early decision-support systems was PC LANs connected to a departmental server.

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This is the era of enterprise client/server systems when mission-critical applications begin to move off the mainframe. These larger and more complex systems will spur the development of new client/server technologies and bring to the forefront issues such as system administration, performance tuning, security, reliability and interoperability. **(4)**

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Microsoft, OSF

CONTINUED FROM PAGE 35

the copies of software is worth money to somebody," Bennett explained. "You've got to count noses and assure it as you go or you'll end up with millions of dollars of bogus software." Incorrect replication of software would replicate costly data errors, he noted.

Users at large open systems sites say allowing support technicians to do in-person software distribution using floppy disks or CD-ROMs is time-consuming.

"You can't have all your users doing their own software installs because they can make mistakes," said David Pensak, adviser for computing technology at Du-pont Co. in Wilmington, Del., which has hundreds of distributed Unix computers. "We have a few support people who go around and do the installs. They have to feed the floppies into the machines, and it's terribly inefficient."

Some users said they would prefer an electronic update utility and would consider using communications networks such as the Internet for that purpose. Others think Internet updates would be impractical, given the burden they would place on network traffic.

Who's got what

Kash n' Karry Food Stores, Inc. in Tampa, Fla., uses a central software server to update software on remote Sun machines. But the grocery chain plans to evaluate OSF/DME software distribution services, provided Sun supports them through its ONC+ networking environment, said Jim Stikeleather, director of systems development at the chain.

"Right now, we have software in one set of directories," he said, "and when users log on, the file is automatically downloaded to their machine. With DME, you'll know what users are running the software, and who has what release."

Many users still resort to manual software distribution methods, using people to carry out updates that will be handled automatically with the Hermes and OSF/DME systems.

"We do software distribution by hand," said Bruce Campbell, a project manager at BC TEL, a Canadian phone company in Burnaby, British Columbia, that has dozens of IBM RS/6000 Unix servers. "A central server dials up remote machines over leased lines, and downloads the software to them."

In the future, he said, "it would be great to be able to say, 'Here's a new software load and here's where it needs to be, and let me know what doesn't work.'"

Part of the package

Many users said they think a software distribution utility should be delivered as part of a systems management framework supplied by vendors such as IBM, Hewlett-Packard Co., Digital Equipment Corp. and Sun.

These Unix vendors may yet adopt the OSF software distribution utility, industry analysts said, once it ships to systems vendors later this year. But users who plan to install Microsoft Windows NT servers are banking on Microsoft's Hermes utility, which will distribute software throughout a client/server network, based on addresses held in a central database.

Microsoft managers are promoting Hermes, an unannounced but often demonstrated product that Microsoft plans to ship by mid-1994, as easy to use. "When you want to change the version of the application, all you have to do is 'point' at a new server," said Mike Nash, product manager for Windows NT. "The idea is that if you can do it once, you can do it for everybody."

That allows IS managers to appoint a few system administrators to do software updates. Microsoft told users at the Networld '93 trade show that Hermes would manage Microsoft software; more than 20 vendors said they would support Hermes with their own network management software [CW, Oct. 11].

To reach into open systems networks, Hermes will have to be made to work with the OSF's Distributed Computing Environment (DCE) architecture, analysts said. Nash said that will be possible through Hermes' planned compatibility with DCE's remote procedure calls. Now, Hermes supports Windows NT servers, including Digital's Alpha workstations and Windows NT machines from Sequent Computer Systems, Inc., Compaq Computer Corp. and AST Research, Inc.

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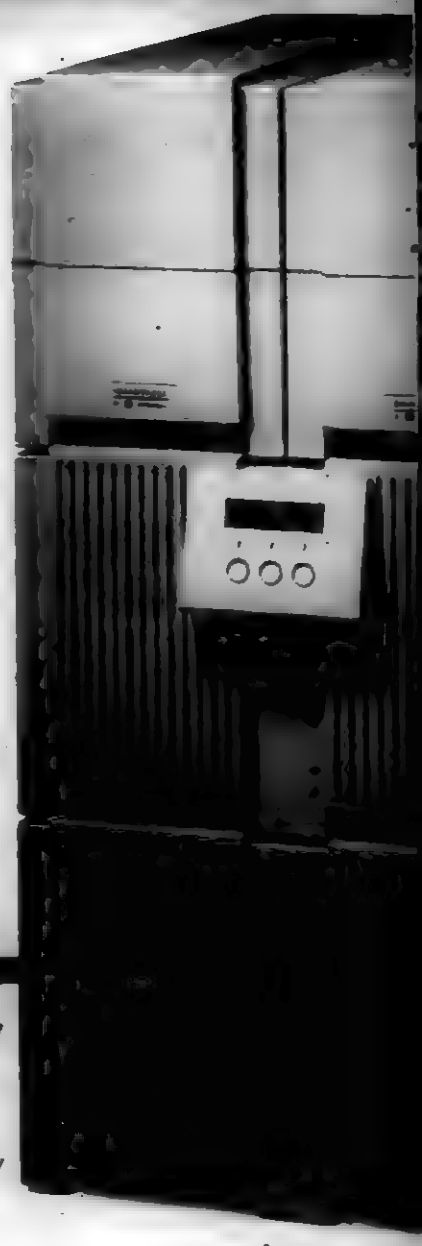

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Deltec Electronics Corp. has introduced the PowerMate XL Uninterruptible Power System.

The product was created for frequency-sensitive environments and protects microprocessor-based equipment up to 1,100 VA including PCs, workstations, LAN file servers, point-of-sale terminals and network nodes.

According to the San Diego-based company, PowerMate XL is network-compatible and compliant with all existing SNMP standards.

Other features include automatic transfer to bypass to protect the load from internal system failures and overloads, three-way inverter protection, an input wiring fault indicator and selectable auto or manual restart.

PowerMate XL is available in 650 VA, 900 VA and 1100 VA models.

Prices start at $849.

▶ *Deltec Electronics*
(619) 291-4211

Instrumental, Inc. has announced Version 2.0 of PerfStat, Unix performance monitoring software for Cray Research, Inc. systems.

According to the Minneapolis-based company, PerfStat 2.0 is able to collect any specified performance data in a running system, including data generated by user applications.

The product employs a client/server architecture to gather, interpret and graph real-time and historical system, application and process-level data.

PerfStat allows a data center staff to monitor and tune overall work load, reduce turnaround time for critical jobs and isolate problems.

Prices range from $16,000 to $90,000.

▶ *Instrumental*
(612) 920-6188

Four Seasons Software has introduced SuperNova, a product that provides access to the DB2/6000 database from non-IBM clients.

According to the Edison, N.J., company, SuperNova is a database and platform-independent fourth-generation language application development environment that can construct Open Software Foundation Motif applications to run on DB2/6000.

The product can also help build the client portion of a client/server application that interacts with a DB2/6000 database server.

SuperNova licenses range from $900 to $100,000 per computer, depending on the size of the processor and the number of users.

▶ *Four Seasons Software*
(908) 248-6667

Enterprise Research, Inc. (ERI) has released ERI/CICS, an integrated set of CICS management tools.

According to the Research Triangle Park, N.C., company, the product includes three tools: CICS-Lock, CICS-DupS and CICS-View.

CICS-Lock is a user-friendly replacement for CICS terminal time-out. On command, users can activate CICS-Lock by using a configurable hot key for user-initiated terminal lock.

CICS-DupS is a tool that controls the number of concurrent CICS sessions that are permitted to a single-user identification.

CICS-View is a session status monitor for the CICS system administrator or help desk staff. CICS-View displays data in user activity tables and provides built-in functions to support problem resolution.

ERI/CICS requires MVS/XA, MVS/ESA, CICS 2.1 or above and RACF 1.7 or above.

The MVS price for a set of all three tools is $7,500 per CPU for a perpetual user license.

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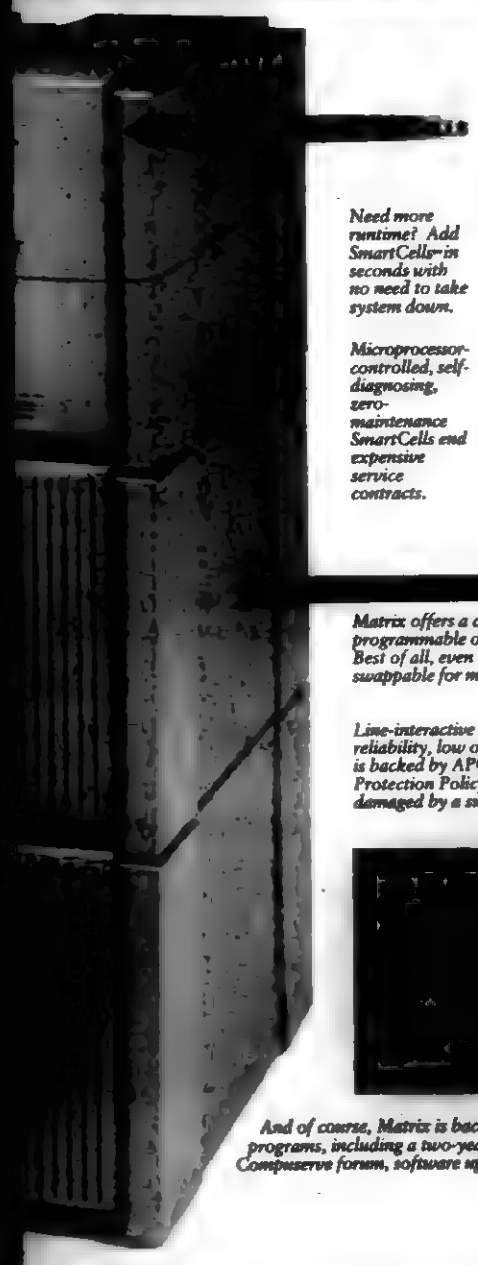

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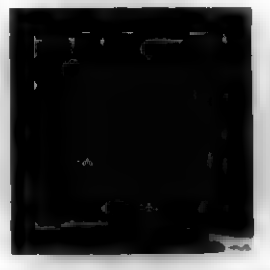

Matrix provides auto-shutdown support of all major network, and midrange OS. The SNMP-compatible Matrix also supports APC's MeasureUPS which meters temperature and humidity, and monitors smoke, fire, water, and security detectors.

And of course, Matrix is backed by a suite of award-winning support programs, including a two-year warranty, 24X7 toll-free tech support, a Compuserve forum, software upgrades, and more.

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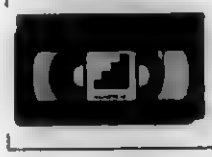

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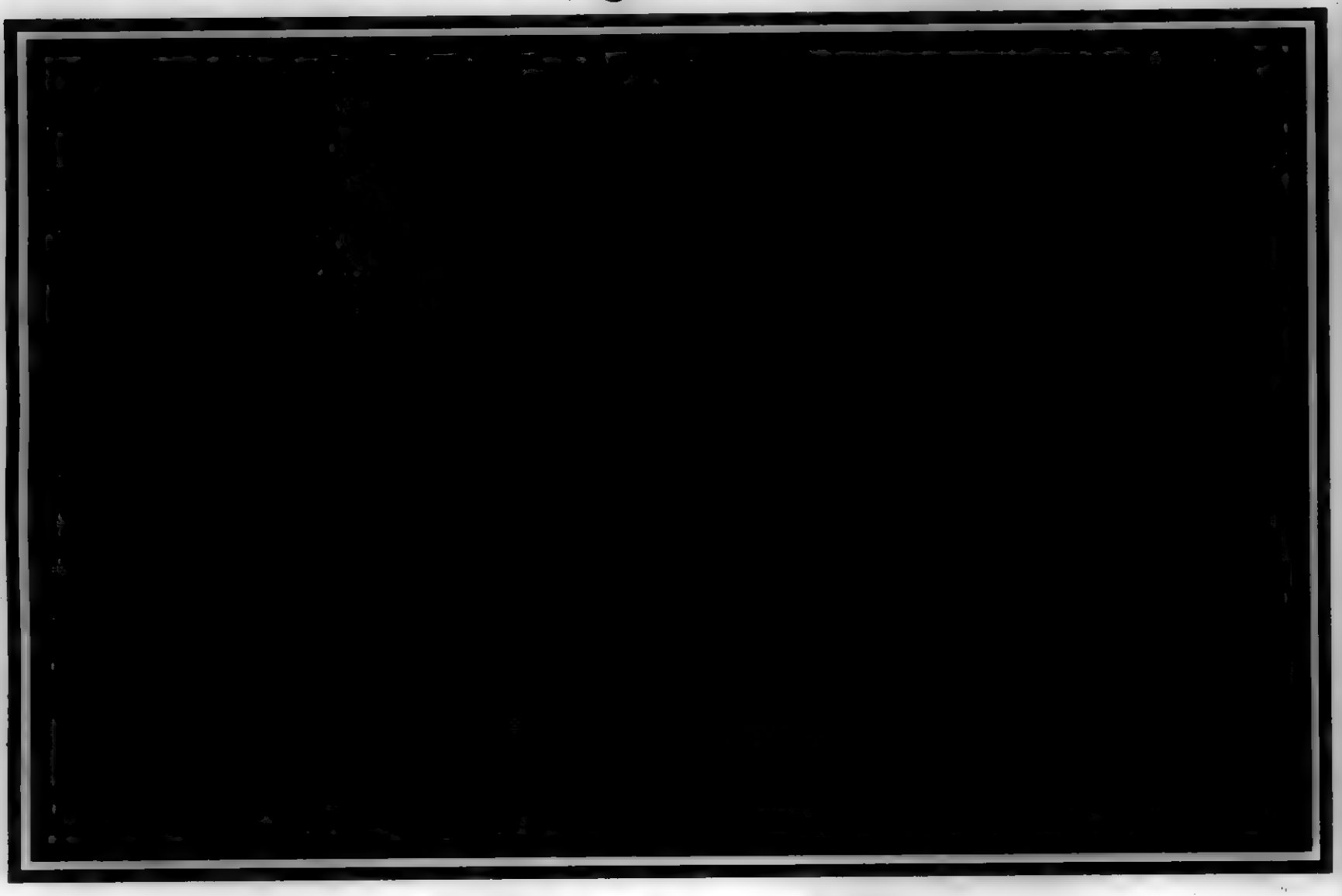

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High-end tools arrive to applause

By Melinda-Carol Ballou

Seeking to take advantage of a developer population that is beginning to hit the wall with the current crop of client/server tools, companies ranging from fourth-generation language (4GL) purveyers to traditional mainframe computer-aided software engineering (CASE) suppliers to a new breed of vendors are leaping into the fray.

This month, for instance, saw the official unveiling of products from CASE vendor KnowledgeWare, Inc. and 4GL vendor Cognos Corp. (see stories pages 96 and 97). These followed announcements from Jyacc, Inc. and Progress Software Corp. on the 4GL side and Texas Instruments, Inc. and Andersen Consulting on the CASE side during the past several months, to name a few (see chart).

> Moving to mission-critical client/server application development with lower-end products would be a chaotic business, developers said.

IBM announced its own graphical tools last week. These include VisualAge, a visual development package known by the code name "Camelot" that helps developers create applications by combining objects on screen. IBM also announced its intention to deliver two other tools: HighPoint, an application generator that runs on both host and PC platforms; and ReDiscovery, which allows developers to make a PC object out of Cobol code on the mainframe.

Before the end of the year, a new crop of client/server tool companies is expected to officially unveil products, among them Dynasty Technologies, Inc. in Naperville, Ill., and Forte Software, Inc. in Oakland, Calif. [CW, March 1].

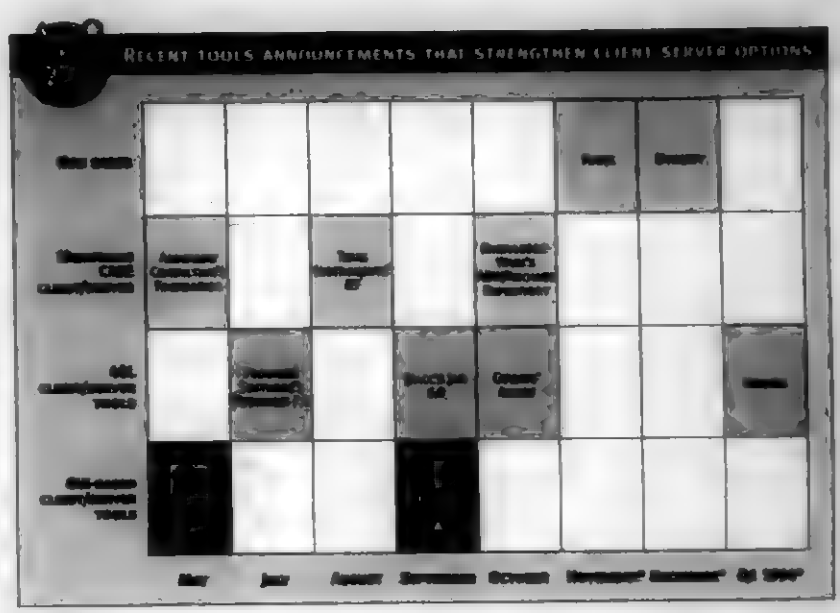
Developers at major corporate sites, meanwhile, are beginning to make plans to move beyond early prototyping and decision-support types of client/server application development to include mission-critical applications. But to do so with lower-end products would be a chaotic and uncertain business, according to developers and industry analysts.

New kinds of tools are needed to handle infrastructure creation, security, data- and transaction-processing management, versioning, the incorporation of business rules into application design and other critical issues.

Trying to create complex client/server applications without such capabilities is not something that Sikorsky Aircraft Co., an aerospace firm in Stratford, Conn., was willing to try.

Sikorsky is building enterprisewide client/server applications to manage data related to its customers and suppliers. According to Al Corsino, a specialist in advanced technology at Sikorsky, lower-end tools such as Powersoft Corp.'s PowerBuilder are good for "spot applications," but "when it comes to widescale inheriting of those applications, we were afraid of bringing on problems," he said.

Among the main issues for Corsino are maintenance and parallel development. Sikorsky is evaluating tools that are expected to ship from Dynasty late this year. They will allow him to store logic at the data level so that business rules, for instance, can be associated with the data. Developers will also be able to partition their applications across multiple clients and servers, he said.



*Projected

No new problems, please

"If we're going to get involved with anything new, we want to be solving problems rather than getting into new ones," Corsino said. With the low-end tools, "people get fired up creating redundant data structures on different platforms, which could be 20 times worse than they originally were on the mainframe."

David Hanifin, MIS director for Collier County in Naples, Fla., agreed. "End users want you to just jump into client/server, but we haven't had the tools to create the infrastructure to support it."

Jan Polish, associate director for architecture planning at Colgate U.S., a subsidiary of Colgate Palmolive Co. in New York, said, "You need to plan ahead to create an infrastructure in order to build mission-critical client/server applications. We're a global company, and we need global standards. We're looking at how all the pieces fit together." Polish is examining a range of tools but has not yet decided what to use to make the push for Colgate.

On the other hand, customers should exercise caution before jumping too quickly into any of these products, according to Rich Finkelstein, president of Performance Computing, a Chicago consulting firm.

The issues of managing the software and of version control will remain problematic "for some time," Finkelstein said. "I suspect it will slow the adoption of client/server for large-scale applications."

Although the next generation of development tools will likely fix those problems, vendors' attempts to retrofit existing tools may lead to substandard products, he added.

HarborView promises visual development

By Melinda-Carol Ballou
MANCHESTER, MASS.

For developers seeking to entice end users to do it themselves, start-up Harbor Software is shipping a new tool for visual development of client/server applications.

Harbor was founded by Interbase Software Corp. founder Jim Starkey. The firm's HarborView tool allows developers and end users alike to create applications using visual programming language. Applications are developed by building graphical representations of the procedures on the screen using icons, diagrams and templates rather than keywords, semicolons and parentheses.

HarborView lets developers *build applications by creating diagrams and moving screens rather than writing code*

Analyst Judith Hurwitz, president of Hurwitz Consulting, said HarborView is a prelude to what will become a wave of development tools targeting end users.

These new environments allow "sophisticated end users to put the pieces together and sophisticated developers to do complex development more easily," she said. "With PowerBuilder and other visual tools, you must do a lot of coding in their scripting language." But HarborView does not require knowledge of traditional programming languages or even fourth-generation languages, she said.

HarborView users define business rules using visual templates first, and forms and reports are then automatically created from these rules.

To maintain HarborView applications or change them, developers change the picture or graphical representation; HarborView then automatically rebuilds the applications. Since no scripting language is required, end users can modify their own applications, Harbor officials said.

"There is really a great need to create facilities" to allow end users to develop and customize their own applications, said Mimmo Montalenti, systems manager at Lipper Analytical Services Corp. in Summit, N.J. He said that with HarborView, the information sys-

HarborView, *page 100*

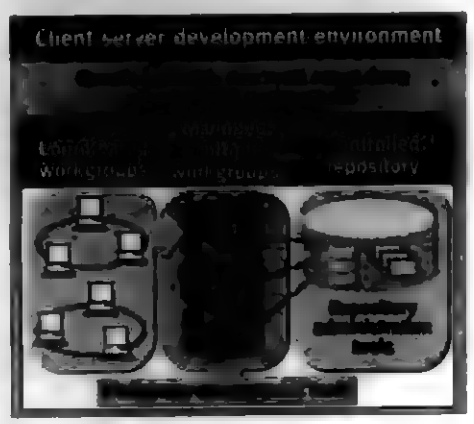
Vendor targets client/server

By Melinda-Carol Ballou

KnowledgeWare, Inc. announced a trio of products earlier this month that target the development of complex, mission-critical client/server applications.

The new products include an agreement to resell the Rochade repository from R&O, Inc. [CW, Sept. 13] and two tools — Application Development Workbench (ADW)/Workgroup Coordinator and ADW/Workgroup Manager — to help users access and coordinate multideveloper projects.

With these, KnowledgeWare is attempting to manage the development process at three levels (see chart). The Coordinator allows multiple developers to access ADW encyclopedias and synchronizes their work. The Manager comes into play when it is time to consolidate those separate encyclopedias in one place. It handles change management, security and impact analysis. The Manager's encyclopedias can, in turn, be consolidated into the Rochade repository.



These announcements come on the heels of other vendors also trying to address the high-end corporate development marketplace (see story page 96).

For its part, the Rochade repository will help control and manage multiple ADW encyclopedias and provide access to third-party tools, KnowledgeWare officials said.

While industry analysts praised the repository for the range of platforms on which it runs and its nonproprietary architecture, some said it is not yet proved for mission-critical, transaction-intensive applications.

According to Jim Sinur, analyst at Gartner Group, Inc. a Stamford, Conn., consultancy, work is moving ahead to "check the robustness" of Rochade and links to ADW at a number of U.S. companies.

One beta user who has been testing Coordinator for about a month said it is a time-saver. "Our developers like being able to use just one encyclopedia as opposed to reconciling and consolidating several," said Byron Gustafson, corporate computer-aided software engineering administrator at Kirke-Van Orsdel, Inc., a third-party broker for insurance services.

ADW/Workgroup Coordinator is available now for $10,000 per server. ADW/Workgroup Manager is scheduled for release in the first quarter of 1994; prices will be announced at that time.

AMS has suite deal: Reusable software

By Mitch Betts

ARLINGTON, VA.

Just as its customers are re-engineering their operations, American Management Systems, Inc. (AMS) has re-engineered its library of reusable software modules to support the development of mission-critical client/server systems.

AMS is a software and services firm that offers its clients a mix of generic and customized software all wrapped up in a consulting contract. Previously, AMS' core software was focused on IBM mainframes, but last month AMS introduced a suite of integrated software building blocks for client/server systems.

Core pieces

AMS' Core 2000 library of software modules uses VisualWorks, an object-oriented application development environment from ParcPlace Systems, Inc. in Sunnyvale, Calif. VisualWorks allows developers to build graphical user interfaces and business applications for client/server platforms, using the Smalltalk object-oriented programming language.

The new suite, known as Core 2000 Foundation Software, provides reusable software modules for generic programming tasks such as database interaction, user interfaces and error correction. On top of that foundation, AMS and clients can build an applications layer for basic business functions, such as purchase orders and loan applications.

Then, those basic application programs, built with object-oriented programming, can be easily customized and reused, AMS officials said. The resulting applications can run on a variety of computing platforms (such as Unix and IBM's OS/2) and interoperate with other software, without the code being rewritten, according to Andy Baer, an AMS vice president and project manager for Core 2000.

AMS officials said their experience shows that more than half of all applications can be constructed from previously developed blocks of code, and when that happens, programmer productivity jumps by 35% to 100%.

For users, the most noticeable improvement is that reusable code makes development projects go faster. For example, Columbia University in New York is using Core 2000 to re-engineer a facilities management system in just one year, said Mike Marinaccio, deputy vice president for administrative information systems.

"For a system this large and robust, it's been a remarkably rapid development cycle," Marinaccio said. The university hopes to someday rebuild all of its applications using Core 2000 as part of a drive toward open systems, he said.

Core 2000 features the following major components:

- **Object Core Client/Server** for developing new systems using object-oriented programming and client/server technology.
- **Core Client/Server** for migrating existing mainframe systems to a client/server environment.
- **Core Enterprise** for systems using the mainframe as server.
- **Core Connect** for tying the first three components together.

One interesting aspect of Core 2000 is that once AMS customers have the source code for a software module, they can reuse that code on non-AMS projects as well, Baer said.

AMS also modernized its systems development methodology to include new technologies. Object Methodology, for instance, provides a guide for the effective use of object technology in building large client/server systems, the vendor said.

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Symbolics bets on Alpha power

By Ellis Booker

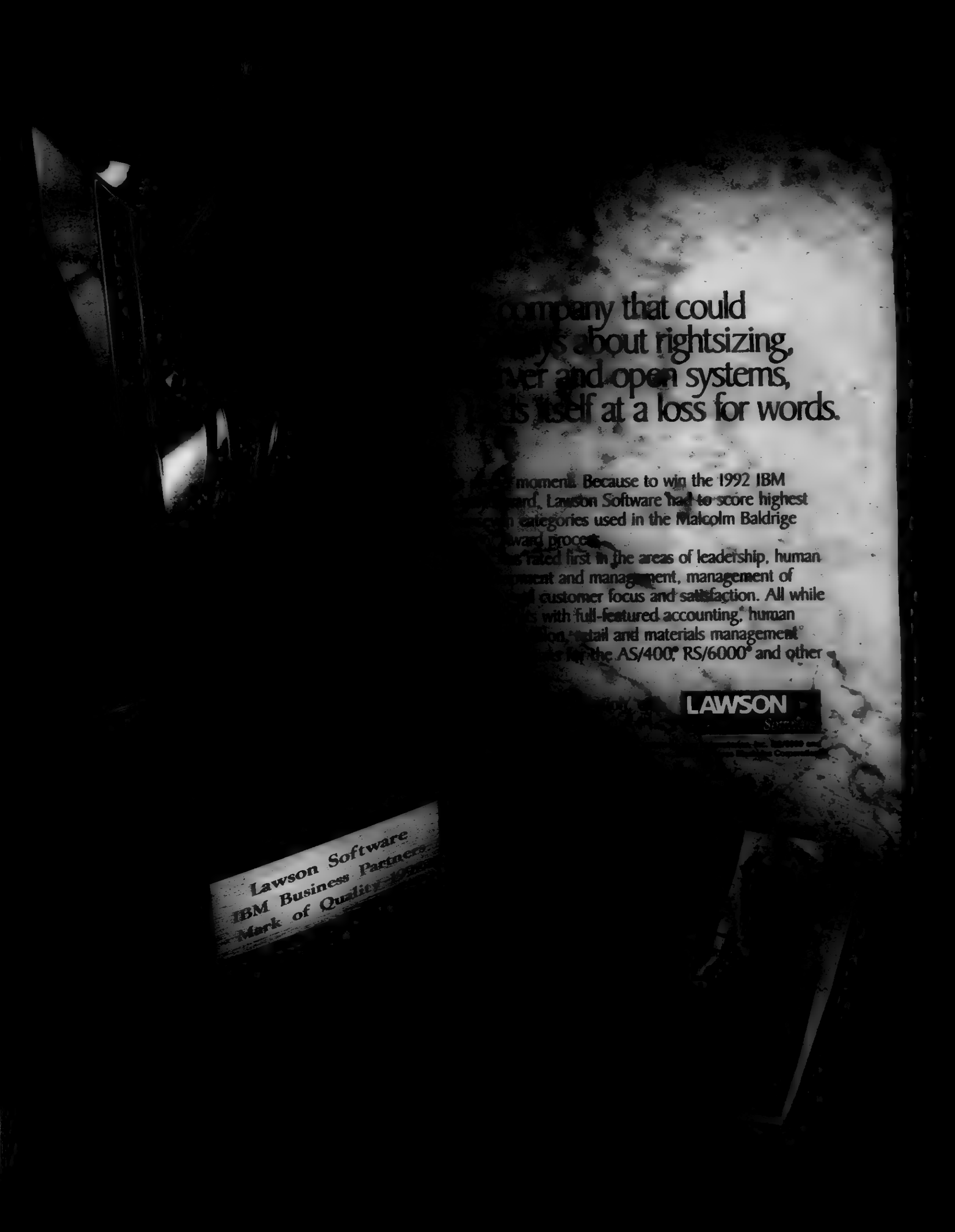
Even after the rest of the world cheered the arrival of commercial 32-bit architectures, Symbolics, Inc. wanted more power to support Genera, its integrated object-oriented LISP development environment.

Last week the Concord, Mass., firm said it has found the horsepower it needs in Digital Equipment Corp.'s Alpha chip, and it has begun shipping a version of Genera on the Alpha workstation running the Open Software Foundation's OSF/1 operating environment.

Called Open Genera, the system manages the development and execution of application code in the same 64-bit address space, enabling programmers to detect and fix errors faster. "Normally [these errors] aren't picked up until runtime," said Bill Clark, Symbolics director of marketing.

According to Clark, this sort of functionality was even beyond the power of 32-bit architectures, which is why, for the past three years, Symbolics has sold its own proprietary 40-bit processor, called Ivory, to run the Genera software. Ivory/Genera systems range in price from $18,000 to $60,000.

Open Genera, which requires a DEC 3000 AXP workstation, is priced at $18,500 and is available now. Symbolics is offering the environment at a 20% discount through December 1994.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Cognos to offer client/server tools

By Melinda-Carol Ballou

Cognos, Inc. earlier this month announced a push to client/server with its Axiant development tools, which integrate visual tools with an extensible application engine and a new multiuser object-oriented repository.

Axiant manages the scaling of applications across the enterprise to hundreds of users to address the needs of high-end client/server development, company officials said. New Axiant Professional tools will allow developers to build online transaction processing applications visually, said Hans Galldin, Cognos' marketing director for client/server tools.

Based on a three-tiered architecture, Axiant separates the presentation, the application logic and the data access logic. These different components can then physically reside on three separate processors, officials said.

The presentation layer will run on Windows and Macintosh clients, while the application engine will run on mobile and networked PCs, as well as Unix and Digital Equipment Corp. VMS servers.

Databases supported through native application programming interfaces include Sybase, Inc.'s SQL Server, Borland International, Inc.'s Interbase and Oracle Corp.'s XBase. Axiant also supports the Open Database Connectivity standard and will support Microsoft Corp.'s Object Linking and Embedding 2.0.

Features supported by Axiant include the following:

- Visual development using Cognos' existing PowerPlay decision support and Impromptu query and reporting tools.
- Methodologies, including rapid iterative development and rapid application development.
- Automated maintenance for impact analysis reports and cross-referencing.

Cognos users responded enthusiastically to the idea of being able to extend the capabilities of the PowerHouse fourth-generation language out to client/server environments.

"We're just moving to client/server now and Axiant is very interesting," said Byron Welch, systems analyst at the Association of American Medical Colleges in Washington. Welch's organization manages the MCAT medical examinations and sends out results for roughly 20,000 applicants to each of 10 to 20 medical schools. "For this mission-critical data we need tools that are rock solid ... not merely [graphical user interface] tools."

The Windows-based developer's kit will ship in April and prices will range from $3,000 to $5,000. An Axiant end-user license with access to Impromptu and PowerPlay will cost around $1,000.

Axiant will ship on Intel Corp. platforms running Windows with Unix or DOS and Digital VMS servers during the first half of 1994. Support for IBM's AS/400 and Hewlett-Packard Co.'s MPE/IX servers will follow later next year.

Windows training critical skill for

HarborView

CONTINUED FROM PAGE 95

tems group can put together building blocks and make them available as "Legos" to end users, who can then use HarborView to create what they need.

Adarbad Master, project engineer at Inland Steel Co., concurred. "Why give the control to the end users? The simple answer is money," he said. "Fifty percent to 60% of the work we do is end user-related. If we can take that work and give it to the end users themselves, it cuts way down on the development costs." The end users benefit, he said, "because they get the screens and the reports they wanted because they did it themselves."

HarborView is shipping on Unix workstations from Hewlett-Packard Co., Sun Microsystems, Inc. and IBM as well as Digital Equipment Corp.'s VMS systems and The Santa Cruz Operation's SCO Unix PCs. It is priced at $3,900 for a development license. Drivers for Oracle Corp. databases will be available later this year and will cost $700.

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LBMS smoothes link to PowerBuilder

By Melinda-Carol Ballou

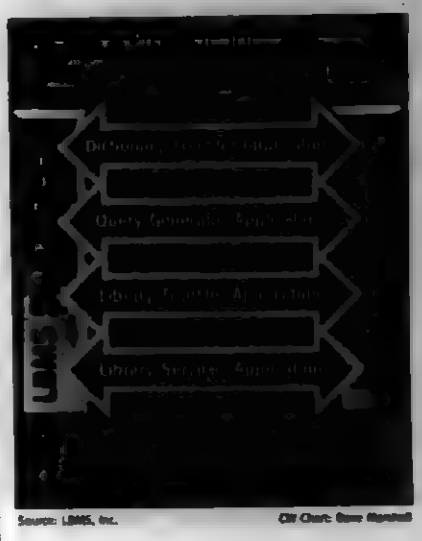
LBMS, Inc. is releasing a new version of a gateway that links its own System Engineer (SE) design tool and Powersoft Corp.'s PowerBuilder.

While at least 20 other companies provide interfaces between a range of other development tools and PowerBuilder, this is said to be the first to support bidirectional exchange of data via a central repository, and the first to support PowerBuilder 3.0, the latest release of Powersoft's tool, officials at both firms said.

Some LBMS users seem eager to get hold of this new version.

Kay Wise, program analyst at First Data Corp., a credit-card firm in Omaha, said the bidirectional support will be helpful. Wise's group does its design work with LBMS and then uses PowerBuilder to create applications.

"With the previous version, we could export files [to PowerBuilder] but it was awkward. This should be much smoother," she said. "We'll also be able to model inheritance of Windows within PowerBuilder and manage security for our applications from within PowerBuilder." Before this release, Wise said, the company did not have a single place to map out security in advance as to who had access to what screens, for instance.



Source: LBMS, Inc. CW Chart: Dave Hershell

Graphical user interface objects created in PowerBuilder 3.0 can be stored in SE 5.0's repository, where developers have access to version control, configuration management and security. LBMS' SE/Stor and Powersoft's application programming interfaces are used to handle the bidirectional transfer of the objects.

Two ways better than one

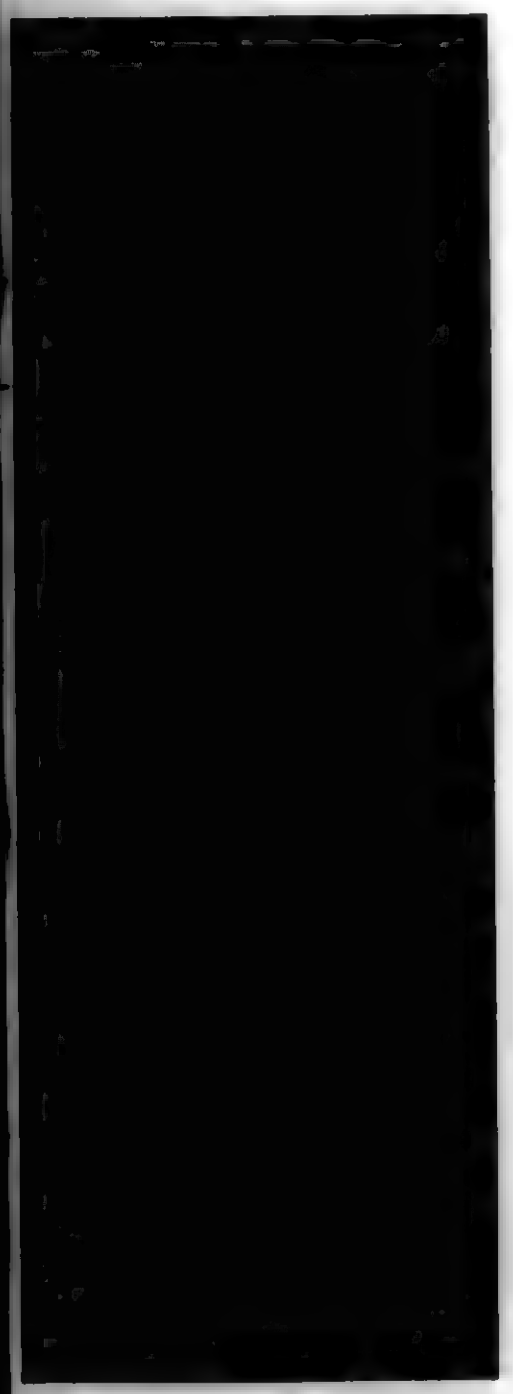
Previous versions of the gateway supported only file export. Now, developers can do work "live" in SE and in PowerBuilder at the same time. They can open up PowerBuilder, launch SE from an icon on the core panel in PowerBuilder, create the design for an application and then flick a button to return to PowerBuilder.

The results of the design will then be in PowerBuilder, according to Bill Critch, director of business and alliance programs at Powersoft. Developers can also reverse-engineer graphical design models in SE by reading PowerBuilder applications.

Powersoft officials said links to products from other vendors will be out by the beginning of 1994 with interfaces to PowerBuilder 3.0, including links to KnowledgeWare Corp.'s Application Development Workbench and Intersolv Corp.'s PVCS. Last week, Popkin Software Systems, Inc. released links to PowerBuilder and Gupta Corp.'s SQL Windows.

SE/Open for PowerBuilder 3.0 will be available in early-release form in the fourth quarter. Prices will be announced at that time.

has become a growing people.



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Q&E tool sings Visual Basic tune

By Michael Vizard
RALEIGH, N.C.

Q+E Software, Inc. has enhanced its client/server application development tool for Visual Basic with, among other features, support for Microsoft Corp.'s Open Database Connectivity standard, a widely supported implementation of the SQL Access group standard.

MultiLink/VB, the enhanced Q+E tool, gives corporate developers a way to link client applications written in Visual Basic with data stored in SQL databases.

"I'd say it cut down about 70% of the work associated with direct access to a SQL database," said Jack Crawford, director of information systems at Analytic Technologies, Inc. in San Diego.

Currently, Analytic Technologies has about 420 users in seven locations running Visual Basic and Oracle Corp.'s SQLForms applications side by side under Windows and accessing the same data in an Oracle database.

Crawford, however, plans to replace the SQLForms applications with the more flexible Visual Basic applications.

Visual Basic "allows us to package reusable code into objects. Two years ago I wouldn't have attempted this, but the third-party tools around Visual Basic are really making all this possible," Crawford said, adding that the Q+E tools were even robust enough for him to incorporate a horizontal scroll capability into his applications.

MultiLink/VB, which supports 20 database drivers, is priced at $399.

Briefs

Tools, tools everywhere

Texas Instruments, Inc.'s computer-aided software engineering workbench can now build applications for Informix Software, Inc.'s OnLine database. ... Developers of embedded systems will be able to use V.I. Corp.'s DV-Draw, an interface builder, with Ready Systems' Spectra tool kit.

Workbench for RS/6000

IBM will include Micro Focus, Inc. tools with its developer's workbench for the RS/6000 Unix computer. The workbench, called Cobol Powerbench, has development and maintenance tools including those for file management, program editing and debugging. Separately, Micro Focus said it has struck a joint development deal with Sybase, Inc. to integrate its Cobol development software with Sybase's SQL Server database.

Auto auditing

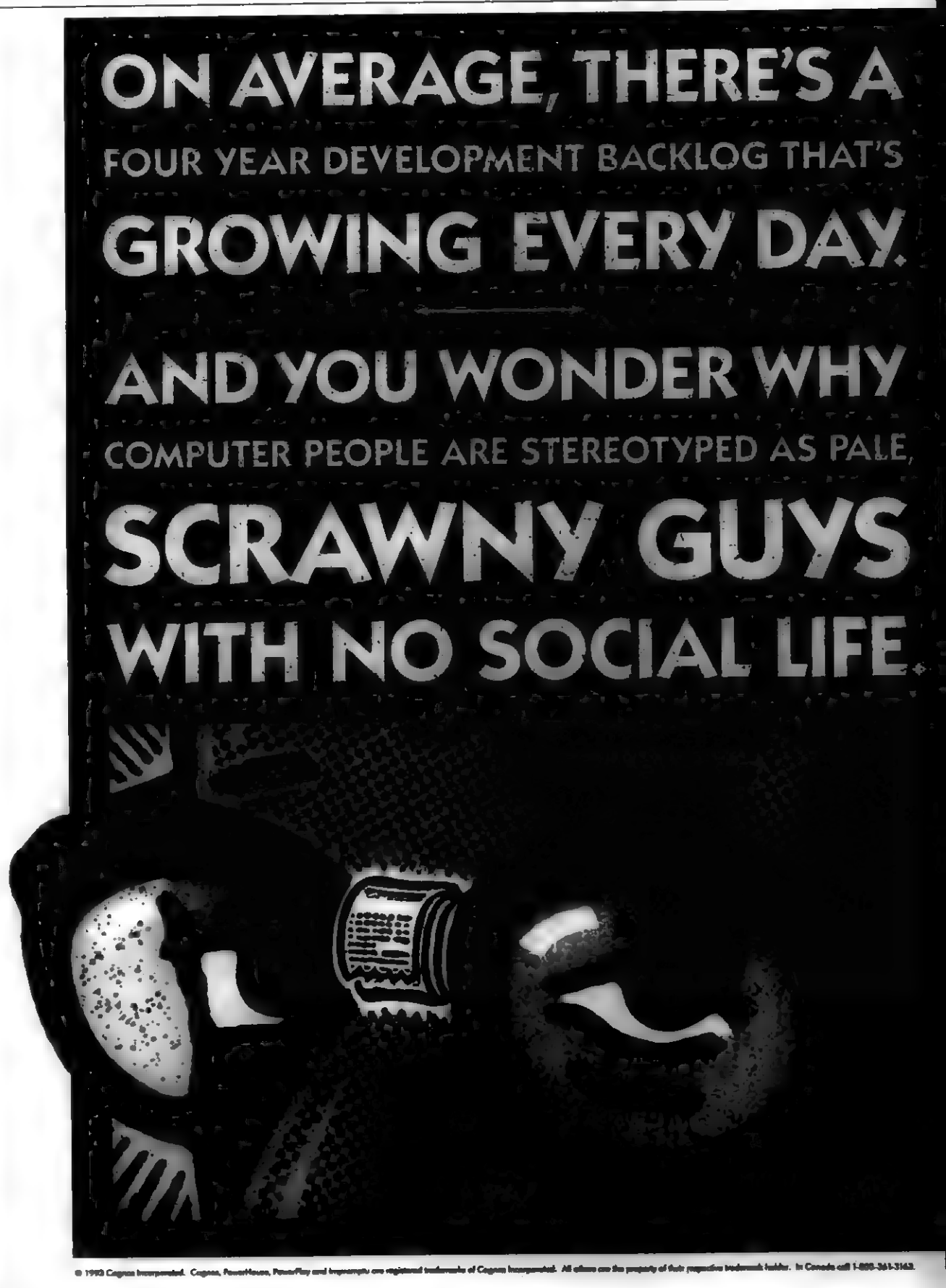
Price Waterhouse was due to launch last week an automated auditing system that was developed using object-oriented technology from Rational International, Inc. The system, which has been adopted by UBX Corp., is intended to allow auditors to share information more easily.

HP cranks up OpenODB

Hewlett-Packard Co. has ported its Unix-based object-oriented database, OpenODB, to run on Sun Microsystems, Inc. workstations. Other enhancements include the ability to access legacy data via Information Builders, Inc.'s EDA/SQL package. Pricing for OpenODB has been changed to a per-user basis of $1,500 to $5,000 per user.

Three's company

Three partners — Interactive Development Environments, Inc., the Advanced Concepts Center of Martin Marietta Corp. and General Electric Co.'s Corporate Research and Development Center — have teamed up to provide object-oriented development software for Unix.



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Empress Software, Inc. has introduced Version 6.4 of its Empress relational database management system (RDBMS) and fourth-generation language (4GL), which features Dynamic SQL that is compliant with the ANSI SQL 2 standard.

According to the Greenbelt, Md., company, Dynamic SQL is implemented as an extension of the C precompiler.

Features such as a C callable RDBMS kernel, 4GL application generator and full-function report writer are included.

Empress offers multimedia data types and object-oriented capabilities. It produces high-performance applications that can be prototyped, developed and executed in local or distributed mode with true location independence, the company said.

Pricing for Version 6.4 of the Empress RDBMS ranges from $3,000 to $500,000. The Dynamic SQL costs from $1,000 to $200,000.

▶ *Empress Software*
(301) 220-1919

National Information Systems, Inc. has announced Accent Sun Transition Pack (STP) Version 2.0, an OpenLook-to-Motif source code translator.

Accent STP was designed for Sun Microsystems, Inc. developers who intend to migrate their applications to the Open Software Foundation's Motif.

According to the San Jose, Calif., company, Accent STP translates 80% to 100% of the C or C++ language application source code generated by OLIT, XView or Devguide GIL files, including header files, where there are equivalent facilities provided in Motif.

Other features include the TTY Widget, drag-and-drop capabilities and internalization support.

Accent STP is available in four modules. Devguide Conversion, XView Conversion and OLIT Conversion cost $4,995 each. The WindowMaker GUI Editor is priced at $1,495.

▶ *National Information Systems*
(408) 986-7100

Corporate Computing, Inc. has introduced RadPath, a Windows-based software development product designed to help organizations develop graphical user interface client/server applications.

According to the Bannockburn, Ill., company, RadPath provides clear, easily used paths to deliver "high-quality" applications.

RadPath is a development methodology that provides on-line check lists to ensure consistent software development processes. The product includes three paths — Infrastructure, Management and Development — that were designed to define optional and required tasks.

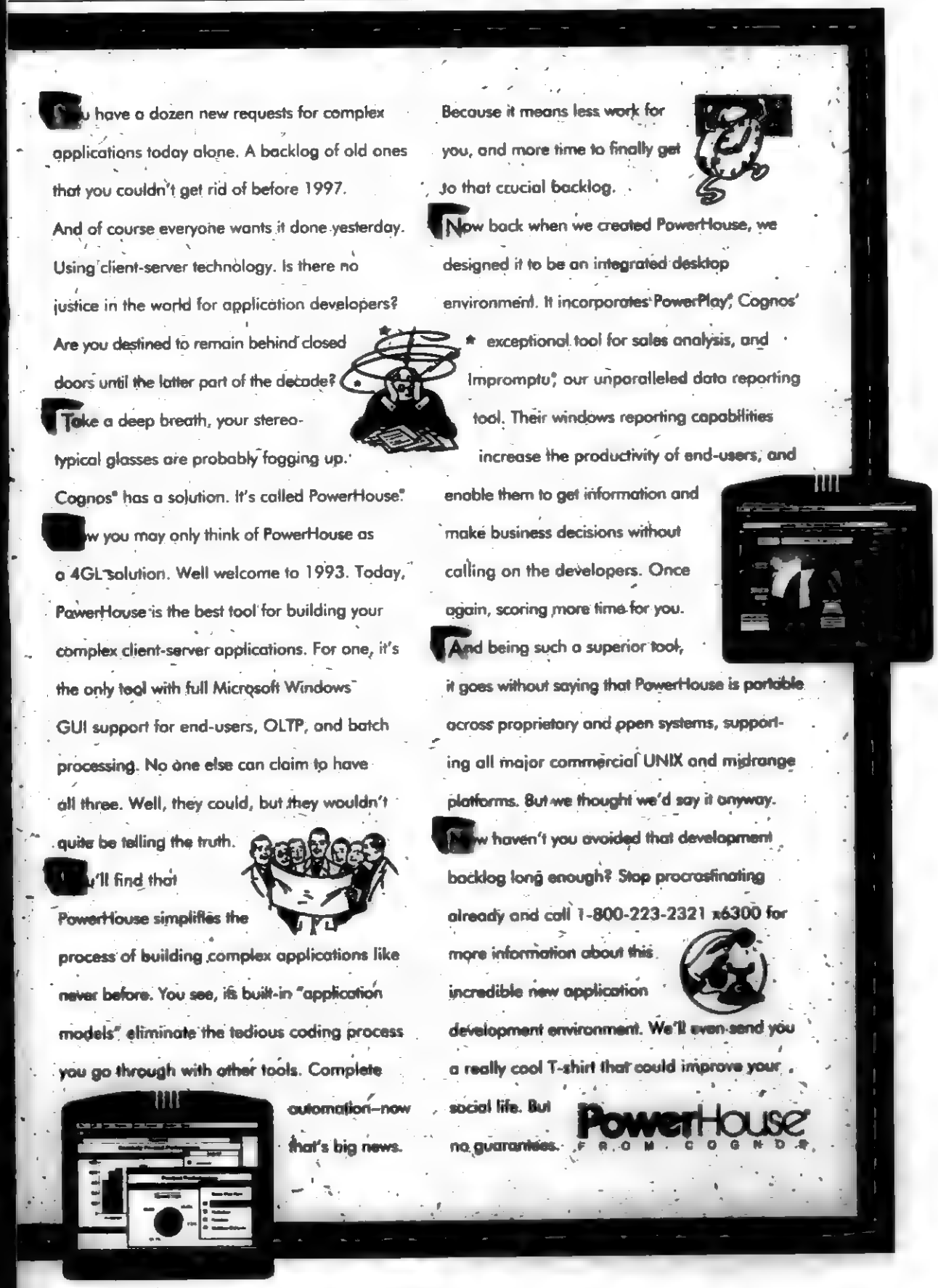
RadPath runs under Windows 3.1 and can run stand-alone or on a LAN.

RadPath costs $4,995 per manager and $995 per developer.

▶ *Corporate Computing*
(708) 374-1995

Product shorts

Greenleaf Software, Inc. is scheduled in December to ship Greenleaf ArchiveLib, a Windows-compatible data compression and archive library for C and C++ programmers. ArchiveLib is an object-oriented data compression runtime library. Equivalent C functions for C developers are included that allow developers to compress ASCII or binary data into an archive for storage. The Windows product can also run in the DOS operating environment. Cost: $279. Greenleaf Software, Dallas (214) 248-2561.... **Spectrum Systems, Inc.** has announced Objecthase, an object-oriented C++ class library for relational databases, that allows tables or groups of tables to be accessed as objects. Cost: starts at $899. Spectrum Systems, Schaumburg, Ill. (708) 330-3797.



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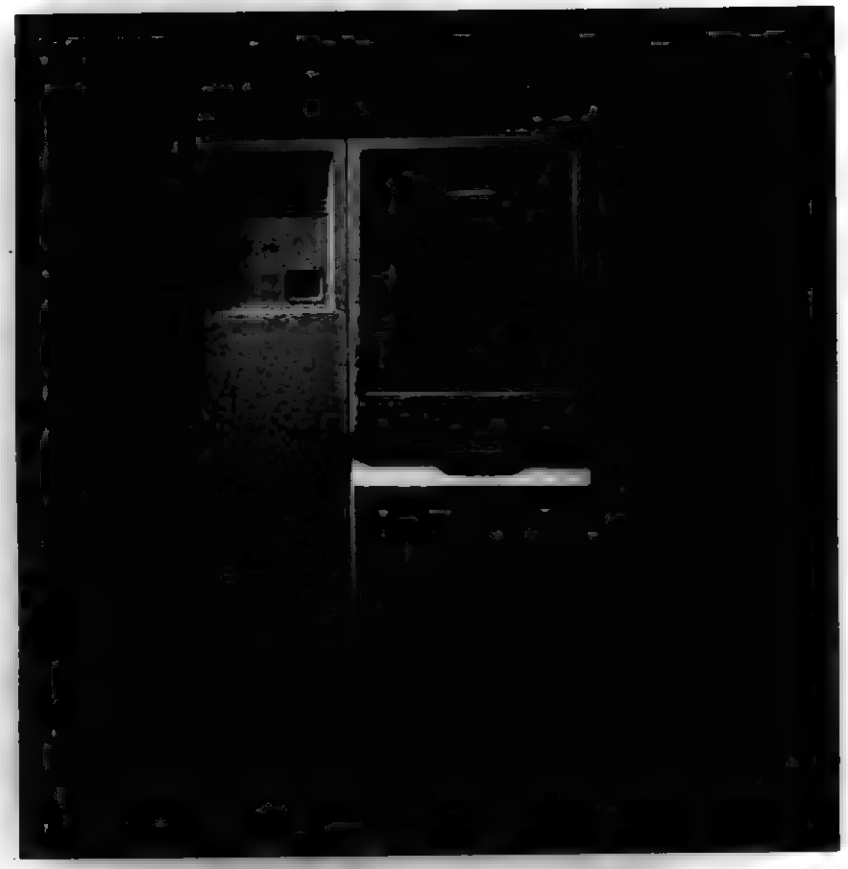

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▶ IKEA's KERRY HALL: *It's still unclear if in-store CAD system will boost the retailer's sales*

Everard Morsink

Everybody "pays lip service to customer service, but the fact is that only a few companies do it really well," observes Dick Lancioni, a professor of marketing at Temple University in Philadelphia and president of Customer Service International, Inc., a Warminster, Pa.-based consulting company.

Anyone who has waited on hold for minutes knows that customer service is often an oxymoron in the business world. Yet it seems every manufacturer, bank and retailer touts excellent customer service as one of its key competitive weapons.

In some cases, the reason companies fail to deliver good customer service is economics. "Some com-

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Are you being DISSERVED?

ALSO INSIDE:

THE ROAD TO CUSTOMER SERVICE HELL IS OFTEN PAVED WITH INFORMATION TECHNOLOGY

By Julia King

FAST

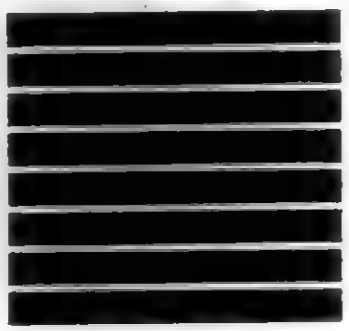
Customer service

CONTINUED FROM PAGE 107

panies just don't have a lot of dollars to throw at customer service," Lancioni says.

But often, inadequate customer service is rooted in poorly applied information technology.

Many companies regularly conduct surveys to learn what customers think of their products. But few take readings on how buyers rate their customer service, according to Lancioni. Surveying customers or conducting trials before a new information technology-based customer service is initiated can help information technology managers assess how much customers are willing to pay for a new service, or how many are willing to use it.



Lancioni recommends surveying not only what customers need, but what IS technologies they would be willing to accept.

For example, executives at Safeway Stores, Inc., an 1,100-store supermarket chain based in Hyattsville, Md., thought shoppers in a hurry might find it convenient to check out their own groceries with the help of an automated point-of-sale system. A six-month trial at one of Safeway's busiest stores, located near Washington in Prince George's County, Md., convinced them otherwise. Only 15% of the store's customers used the equipment. The system was removed, and there are no plans to resurrect it, according to Safeway's customer service spokesman, Larry Johnson.

"There was a lack of trust and understanding [on the part of customers]," Johnson says. "The system worked, but it was just a fear of the technology."

Information technology managers should therefore beware: Leading the charge toward improved customer service involves much more than installing an 800 number or tracking customer complaints. Complex questions with complex answers must be addressed up front, including the following:

- What do your customers want and how does this compare with how your company defines customer service?
- Is it delivering services that will delight customers, or is the real goal boosting internal efficiency?
- Are customers ready for information technology-based services?

Experts advise applying the golden rule of any effective customer service operation first: Know your customer. But there's a corollary rule IS managers should keep in mind: Know what your customers are willing to pay for and how that impacts your bottom line.

At Ikea North America, based in Plymouth Meeting, Pa., customers want affordable prices on the furniture and other home accessories that the Swedish-owned company sells at 20 stores throughout the U.S. and Canada.

"If we offer too many services, you as a customer pay for it," explains Rich D'Amico, Ikea's manager of new business development. "And rather than pay higher prices, customers have told us over and over again that they prefer to do things themselves."

Consequently, the retailer's chief customer service challenge is to strike a careful balance between keeping prices low and providing shopper-friendly services.

Ikea provides customers with play areas for children, facilities for warming baby bottles and changing diapers, and free use of wheelchairs, strollers and roof racks. The company also provides a free shuttle bus service between New York and its Elizabeth, N.J., store.

Similarly, Ikea is testing an information technology-based service it provides at no cost to its customers: a computer-aided-design (CAD) system that customers can use to diagram kitchen floor plans.

Might the CAD system upset the balance between service and cost? IS director Kerry Ruhl isn't sure. So far, it's unclear whether the system generates more sales, which the company needs to keep prices competitive, he says.

Good customer service and improved productivity are by no means incompatible, experts say.

For example, the U.S. Social Security Administration reduced operating costs by 26% under various customer service initiatives, such as installing a nationwide toll-free information service and providing service representatives with access to on-line databases, according to Renny DiPentima, the SSA's deputy commissioner for systems.

But all too often, technology-based services are installed not with customers in mind but as a means to improve efficiency and reduce overall operating costs.

"One of the biggest mistakes companies make is imposing technology on external customers for internal productivity," says Richard Whiteley, president of The Forum Corp., a Boston consultancy, and author of *The Customer Driven Company: From Talk to Action*.

When management makes that mistake, the result can be a customer service application that doesn't appeal to customers.

One company that fell into that trap was Milwaukee-based motorcycle manufacturer Harley-Davidson, Inc.

"We tried a phone-mail menu application to handle requests for information, but it was quickly ripped out because we learned that our customers were not interested in pushing buttons," says IS director Rich Kolbe.

"In general, Harley riders are more high-touch than high-tech, so now we tend to use [information technology] in customer contact applications very sparingly," he says. "The phone-mail system is an example of where a

Customer service, *page 114*

The best customer service applications can be the ones customers never see.

QUIET DIPLOMACY

Customers may never deal with a company's most effective customer service applications. Harley-Davidson relies extensively on systems that work behind the scenes to improve overall product quality and customer satisfaction, says information systems director Rich Kolbe.

One such application gives product designers and engineers access to information about problems with previous designs by linking warranty data into Harley-Davidson's manufacturing and engineering databases. Engineers use this data to track deviations and correct recurring problems.

Another application enables Harley-Davidson's telephone customer service representatives to send product literature pronto to Harley Owners Group members. The representative can print out an address label with just two keystrokes, then slap the label on the requested literature and put it in the mail — all while the customer is still on the phone.

"A little enabler like that goes a long way to providing good customer service," Kolbe says. "Customers get a prompt response without our people having to take and key in address information."—*Julia King*

Companies need to learn from their noncustomers, too.

LOYALTY LOST

One important group that companies need to survey is noncustomers, notes David Reibstein, a professor of marketing at the University of Pennsylvania's Wharton Business School. However, even those companies that do conduct customer satisfaction surveys mistakenly tend to exclude noncustomers.

"I think there is a sincere effort by some companies to measure customer satisfaction, but the problem is they never look at what it is they are not providing to people who have rejected them and gone to somebody else," Reibstein says. "For example, Southwestern Bell Telephone Co. calls up customers [after a sale] to see how they did. But what Southwestern Bell should do is call up former customers and find out why they switched," he notes.

Southwestern Bell does send out "loyalty surveys," which ask current customers what the company can do to keep their business. But it does not survey former or noncustomers, said Linda Geiner, a spokeswoman at Southwestern Bell in St. Louis.

—*Julia King*

Sources: The International Customer Service Association, The Forum Corp., and Customer Service International, Inc.

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Climbing the CIO ladder

By Leslie Goff

If you're looking for leadership training that will groom you for the chief information officer's spot, the pickings are slim.

Only two organizations, the Society for Information Management (SIM) and the College of Healthcare Information Management Executives (CHIME), offer management training designed for information systems executives with CIO aspirations.

SIM sponsors what it calls Chapter-Hosted Learning Forums focused on individual development and learning, says Richard Dooley, president of The Dooley Group in Riverwoods, Ill., and a founding member of SIM. In seven two-day workshops over the course of a year, attendees cover such topics as negotiating, business ethics, career planning, team building and the ideal CIO.

"Rather than talk about re-engineering, we're focusing on people, getting them to exercise their capacity to learn and grow and change," Dooley says. "Learning to learn and learning to change is important today because the half-life of what you know is very short."

SIM forums offer the rare opportunity to ask questions of the CIOs.

"We had a unique access to these CIOs, to ask questions about their careers like, 'Did you plan out where you wanted to end up, or did you just land there?'" says one participant, Helen Cavany, director of applications development at Summit Information Systems in Akron, Ohio. "Or how they make decisions about things, like a reorganization — 'How did you decide who to keep and who to cut?' — things you could never ask in a more public forum."

SIM held its first Chapter-Hosted Learning Forum in Chicago in the spring of 1992. The Salt Lake City and Washington chapters are in the midst of their first forums and the Boston forum will begin in January. A second Chicago-hosted forum will start in October 1994.

Specific training

CHIME targets CIO training for a specific field. The organization hosts a twice-yearly, week-long training conference titled "CIO Leadership Skills for the Era of Healthcare Reform" at the University of Michigan in Ann Arbor.

The CHIME conferences steer potential CIOs away from the nuts and bolts of technology in favor of how technology can be "harnessed to serve health care organizations' strategic objectives," says Rich Correll, president of CHIME.

"It's the CIO's role to bridge the world of high tech and its specialists to the boardroom."

CIO candidates from hospitals, health maintenance organizations and health care systems get a primer on the health care industry as a business. They learn where the industry is headed with regard to the Clinton administration's health care reform package.

Other sessions, led by top health care CIOs such as John Glaser, vice president of information services at Brigham and Women's Hospital in Boston, and Larry Grandia, vice president of information systems at Intermountain Health Care, Inc. in Salt Lake City, address such issues as managed care, developing clinician systems and the future role of technologies in health care.

As with the SIM forums, group discussion plays a large part in the CHIME conference, including an interactive problem-solving exercise in which attendees break into small groups to tackle hypothetical management problems.

Robert Pickton, vice president of IS and CIO of EHS Health Care, credits the CHIME program with enabling him to parlay his CIO experience at a small North Carolina hospital into the top spot at EHS, a Chicago-based health care system that encompasses hospitals, extended-care centers, physicians' offices and other facilities. ■

Goff is a free-lance writer in New York.

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WHERE Chicago, Salt Lake City, Washington, Boston

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WHAT College of Healthcare Information Management & Executives' (CHIME) "CIO Leadership Skills for the Era of Healthcare Reform" course for IS executives

WHERE University of Michigan at Ann Arbor

WHEN November 15-19, 1993. The course will be offered twice in 1994.

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Scanners and stories: How marketers really use data

David Goldstein

A little knowledge about what marketers do with data can go a long way toward improving how information systems organizations work with marketing organizations. With a little help and understanding from IS, marketers will be able to do more with the data they use in storytelling.

All of us are storytellers. Much of our casual conversation at work and at home involves sharing stories about our boss or the latest accomplishments of our children. It should come as no surprise then that when marketing managers are confronted with a great deal of data and very little time to analyze it, they use this data to create stories about what has happened and use it to support their opinions about what ought to be done.

But what may be surprising is that managers generally rely on simple analyses of a very small subset of the hundreds of megabytes of data available to them. A recent study of what marketing managers do with point-of-sale (POS) scanner data showed that their preexisting knowledge — their stories and hunches — guides the data they choose to examine. They rarely run regressions or develop statistical models. This may be because the managers analyze data to convince themselves and others that their prior knowledge is true.

After marketing managers receive a new set of POS scanner data, they review the data to see if it fits their stories, focusing on key issues — the impact of a new competitor or a recent promotion. If the data fits their stories, the managers say they understand it and do nothing.

If the data does not fit their stories, managers explore further, with the goal of modifying their stories.

Take the case of a product manager who was tracking a competitor's new product. When she examined the previous month's supermarket scanner data, she was surprised to find that the sales per store of her competitor's product had declined and it had not been introduced into any new markets.

She informed her boss that the competitor was going to discontinue its product. She then created a story for her salespeople to tell their buyers. Its message was, "get the competitor's product off the shelf and replace it with more of ours." With the scanner data, she created a chart to support the story.

Poor promo

Another product manager was surprised that her last product promotion was not as successful as previous ones. She assumed this was due to an increase in store-brand sales. Using scanner data, she compared the promotion's effectiveness in markets with strong and weak store brands. While store-brand sales had some impact on the promotion, she found large differences in regions with strong store brands.

She studied more data to determine the cause of those differences and found that when store-brand promotions occurred soon before her promotion, her promotion was much less effective.

Of course, managers do learn a great deal from such analyses of scanned data. Since they can more rapidly identify problems and opportunities, they can adjust marketing tactics more frequently and can communicate more effectively to their customers. And they can provide data to back up the stories they tell.

Marketing managers need to integrate data from multiple sources — internally generated and purchased. For example, a manager guessing that a regional downturn in market share is the result of an inventory shortage at a distribution center would need to examine scanner and distribution data for verification.

Unfortunately, few IS organizations have worked with purchased data, and even internal databases are difficult to combine. If IS could provide marketing managers with simple, flexible tools that integrate and provide easy access to data sources, marketing managers could explore their hunches more quickly.

In addition, expert systems that identify anomalies in detailed market-level data could help managers find problems that might otherwise go unnoticed. ■

Goldstein is an assistant professor of information systems at the Boston University School of Management and is affiliated with the Center for Information Systems Research at MIT. His Internet address is dgoldstn@acs.bu.edu.

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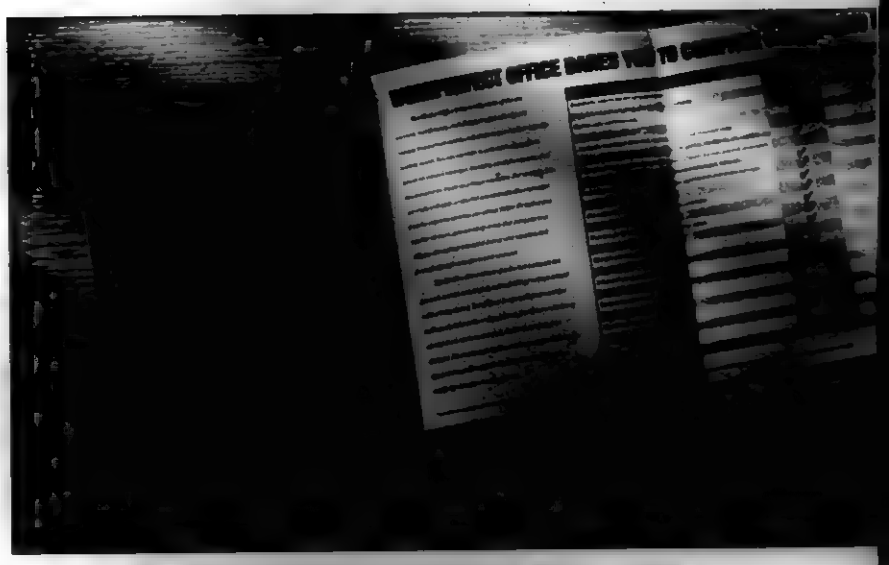

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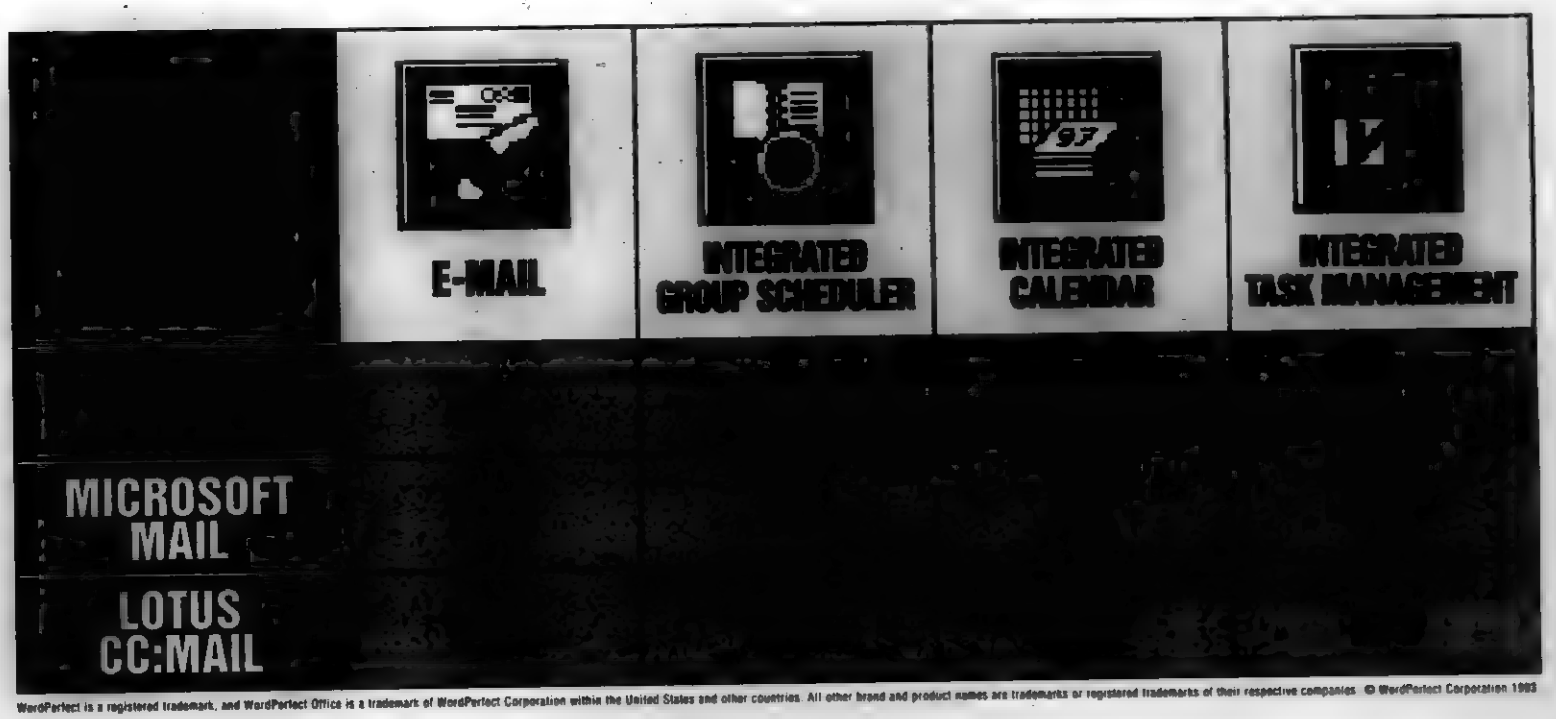

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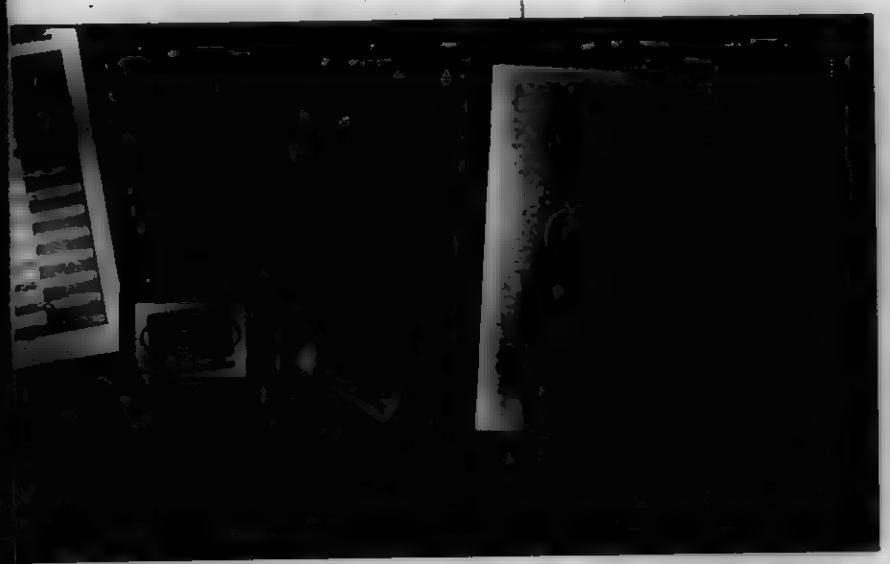

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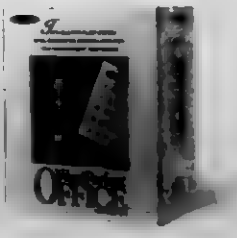

Customer service

CONTINUED FROM PAGE 108

system was clearly more efficient, but not more effective."

The issue of public acceptance of technology, and how much people will pay for it, comes up even in government circles.

Under a governmentwide customer service initiative known as Service to the Citizens, the federal government's General Services Administration (GSA) is considering an application whereby citizens could apply for a Social Security card or copy of a birth certificate by calling a 24-hour toll-free number.

"But we have to ask ourselves whether people will use it and whether it's worth it to make this service available at 3:00 in the morning," says Tony Trenkle, Service to the Citizens' project manager.

"Should we establish a minimum level of service, or charge people extra for after-hours service? We need to know how much in dollars customers are willing to pay to have customer service as good as American Express," he says.

Currently, he adds, individual agencies such as the Internal Revenue Service are surveying citizens to determine answers to these questions.

With so much that can go astray when applying technology to customer service, is there a principle for IS managers to guide them when deciding whether or not to build a customer service application?

What it comes down to

The bottom line, Whiteley says, is that any organization, regardless of its line of business, cannot be customer-driven without the voice of the customer hardwired into the organization. As a result, "any technology that helps you understand what it is a customer wants will be a good investment," he says.

Unfortunately, too many organizations have invested in systems that focus primarily on measuring internal efficiency, Whiteley says. These include hardware and software to track the amount of time callers remain on hold or the number of calls processed in an hour, week or month. But if an organization is to be successful, it needs to shift its focus to what a customer actually wants. Only in this way can it provide service that will truly delight the customer. ■

King is a free-lance writer in Ridley Park, Pa.

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WirelessWorld Conference & Exhibition. Orlando, Fla., Nov. 2-4 — Contact: Interac Publishing (Cellular Business), Chicago, Ill. (312) 922-2435.

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1993 Info/Tech. Phoenix, Nov. 7-10 — Contact: DPMA, Park Ridge, Ill. (708) 825-8124.

Back to the Future with Macintosh 1993 Fall Conference. Orlando, Fla., Nov. 7-10 — Contact: Managing Apple Computers in Information Systems, Mason, Ohio (513) 398-7500.

Fourth International Conference on Applications of Software Measurement '93. Orlando, Fla., Nov. 7-11 — Contact: Applications of Software Measurement, Jacksonville, Fla. (904) 268-8639.

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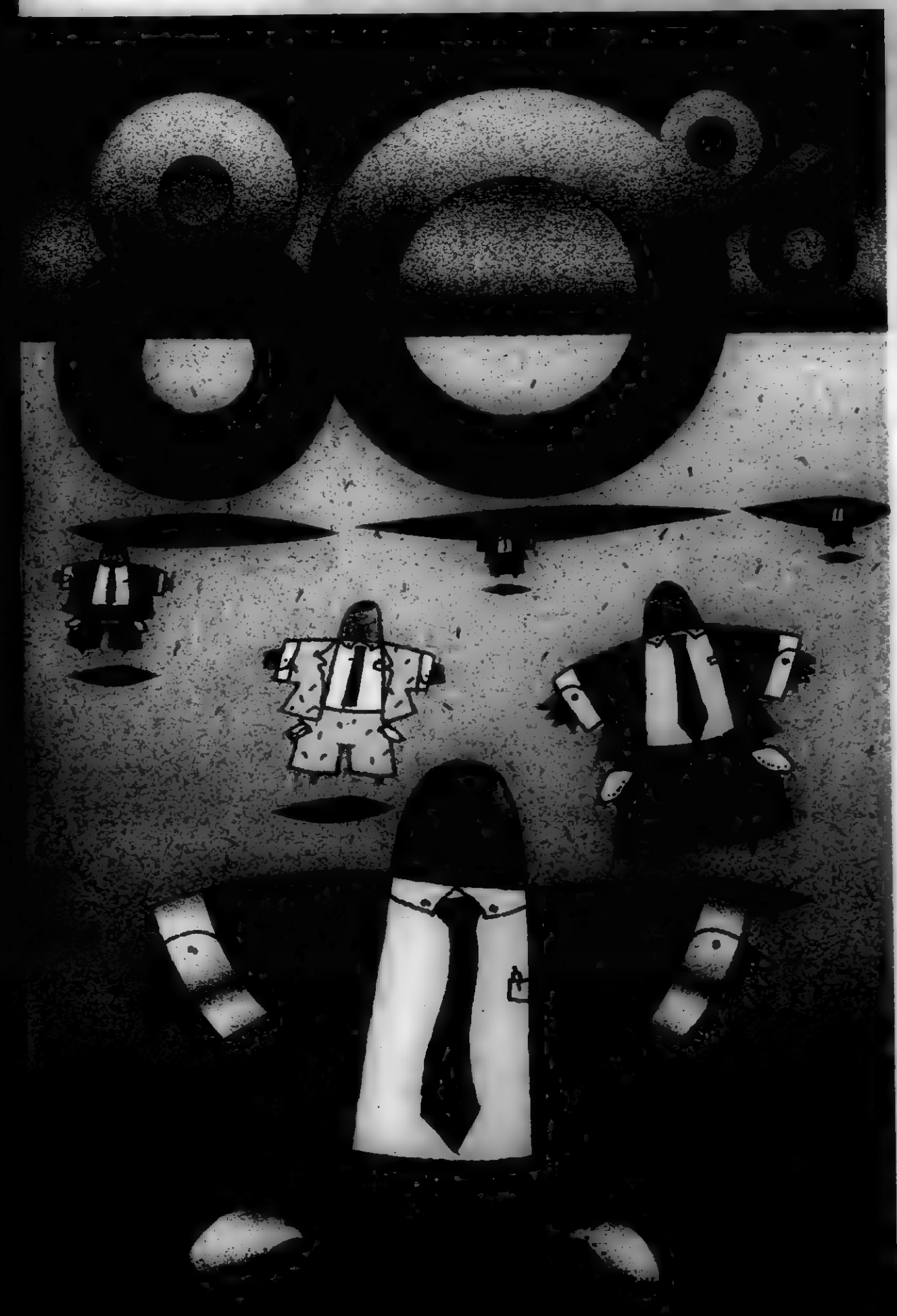

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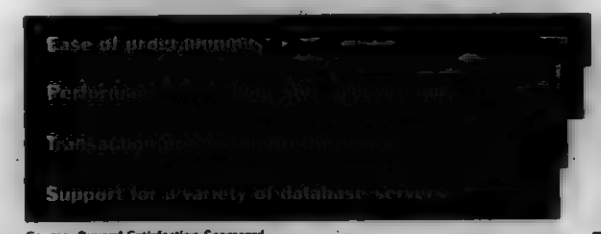
PC databases grow up

earning respect

The leading PC databases scored above average in the following areas: (Ratings are based on a scale of 1 to 10, where 10 is best)



Source: Buyers' Satisfaction Scorecard

Base: 113

inside

PC possibilities
Some actual enterprise applications for PC databases.
Page 119.

Buyers' Satisfaction Scorecard
Paradox, Access, FoxPro all rated equally by users.
Page 128.

Firing Line
Users of Lotus Approach say it's easy to use, but it lags on query and reporting.
Page 133.

At one time, information systems managers scoffed at PC databases as insignificant 90-pound weaklings suitable only for running small, local applications, such as tracking leads from a marketing promotion. Of course, end users loved them because they could manage data without calling IS. But what did end users know about serious database development anyway?

Well, don't look now, but the 90-pound weakling is back — and it's bigger than ever. After a Windows-based regimen of database access tools, server connectivity, advanced visual programming tools and even object-oriented capabilities, PC databases are suddenly a strong option as client/server front ends. A new generation — Microsoft Corp.'s Access and FoxPro, Borland International, Inc.'s Paradox, Software Publishing Corp.'s Superbase, DataEase International, Inc.'s DataEase Express for Windows and Lotus Development Corp.'s Approach — has evolved into seri-

PC databases, *page 118*

STRONG CONNECTIONS TO SERVER DATABASES GIVE THE "LITTLE GUYS" A BIG ROLE IN THE ENTERPRISE. THEY'RE EVEN RUBBING SHOULDERS WITH CLIENT/SERVER TOOLS.

PC databases

CONTINUED FROM PAGE 117

ous development environments fit for accessing multiple databases on distributed platforms.

Databases are even challenging traditional fourth-generation language (4GL) tools, such as Gupta Corp.'s SQLWindows and Powersoft Corp.'s PowerBuilder, especially in giving small workgroups access to data residing in various places throughout the organization.

Such applications typically track things (like the vacation time taken by individuals in a department) and monitor information (such as maintenance scheduling on a fleet of trucks). They're applications that don't require a million-dollar IS solution but do demand a degree of sophistication.

For example, the Federal Aviation Administration uses a PC database in its work to certify the flight patterns of planes landing at U.S. airports. Each year, the agency refines each flight pattern, 40,000 in all. It uses Software Publishing's Superbase in each of its seven regional offices to collect the information and monitor the certification process.

Eli Lilly & Co., an Indianapolis pharmaceuticals company, turned to Microsoft's Access to handle reporting to the Food and Drug Administration (FDA). With its database, the firm collects product and trial test data from different systems, organizes it, allows it to be viewed in various ways and submits it electronically to the FDA, as was recently mandated.

Increasingly, applications such as these require data that isn't local. With the SQL capabilities of PC databases, a budget analyst, for instance, can send ad hoc queries directly to a DB2 database, which will process the request and send back the results rather than download the entire file of expense data. Similarly, a human resources manager can access employee information on multiple databases as if he were accessing the local PC database.

The Windows interface has also done a lot for databases — more than for any other class of application. Closer integration with other desktop applications is possible via Object Linking and Embedding (OLE) and Dynamic Data Exchange (DDE). Windows databases can exchange data and interoperate with word processors and presentation programs to create impressive reports and merge letters and address lists. Or they can work with a spreadsheet when complex analysis and number-crunching is required.

many not flying solo

Half of the Buyers' Satisfaction Scorecard respondents say their PC DBMS runs in a networked environment

Source: Buyer's Satisfaction Scorecard

Base: 113

Armed with these features, Eli Lilly, for example, can create executive information system types of applications that provide decision support to managers. These applications automatically access data, process it and display it in the desired form, complete with charts, spreadsheets and text that help convey the significance of the information quickly.

Before Windows, PC databases were procedure-driven. Now, driven by the requirements of the graphical user interface, they're moving squarely into the object-oriented, event-driven programming arena.

Both Access and Paradox for Windows are leading the charge to object technology, although neither is fully object-oriented. "I prefer to call [Paradox] object-based because it is not true to object principles. Still, it provides a big advantage over competing databases because it lets us do event programming," explains Bill Vannerson, supervisor of user services at Blue Cross/Blue Shield Association in Chicago. Event-driven programming makes it possible for Blue Cross analysts and researchers to view health insurance data from a number of perspectives, changing their views on the fly.

End-user benefit

In spite of these myriad advances though, back-end connectivity still promises the biggest payback for most users. Users create the data request on the front end, often by pointing and clicking on the appropriate fields. The request is shipped off to a back-end database for processing. Only the results of the request, generally a small subset of the total data, are returned to the user. Local applications can further refine, manipulate and present the data on the PC. This saves the network from having to move around large extracts of data and saves IS from having to program every little request for a new look at the data.

The connectivity capabilities open up a whole new dimension. "With products like Microsoft Access, we're seeing PC databases move forward toward enterprise connectivity," says Peter Kastner, vice president of corporate computing at Aberdeen Group in Boston.

The leading products sport built-in drivers for specific SQL databases. Drivers free users and application developers from having to learn SQL. "Learning SQL can be a hard path to hoe, and it's a pretty limited language, so you really benefit from a front end," says Robert Marmion, a database application development consultant in Flemington, N.J. Marmion uses DataEase and its Microsoft SQL Server connectivity package to build applications for an insurance industry client. When the program executes, DataEase generates the required

PC databases, *page 122*

strengths

- PC databases are suitable for developing enterprisewide applications in smaller companies or departmental applications in medium to large firms.
- They have significant advantages over their older mainframe and minicomputer cousins in the areas of screen design, report writing and end-user analysis tools.
- They are capable of processing gigabytes of data and providing acceptable response time for up to 50 users.

weaknesses

- PC databases typically lack the level of security and data-integrity controls that one takes for granted on large systems. Of the major PC databases, transaction processing is available only on Microsoft's Access and Borland's dBase; database-level password schemes are available on Access, dBase and Borland's Paradox.
- Another shortcoming is the lack of support for multiprogrammer teams. Although all of these products allow for multiprogrammer projects, there are no built-in facilities for source-code management, version control or the enforcement of coding standards. Because of the proprietary nature of most database development environments, third-party tools (typically targeted at projects coded in C) will not fill the bill. For maximum productivity, programming teams require tools that are integrated with the database engine and development language.
- PC database performance bogs down when transactions grow too large, but currently that is a limitation of PC and LAN technology, not the database software itself.

— Mark Gerow

limits and possibilities

By Mark Gerow

It's happened — PC databases have become reliable tools in the information systems tool kit. Not by themselves, though. For developing demanding, enterprisewide applications, these databases are best used in conjunction with more traditional information systems technology.

In fact, many of the solutions being created involve downloading and sorting through data from existing mainframe databases.

By themselves, the PC packages are more suitable for departmental or small business solutions.

The key questions that determine whether to use a PC database include the following:

•**Number of users:** I would hesitate to recommend a PC database for more than 50 concurrent users, but this is really a function of LAN technology today and not a specific limitation of PC database software.

•**Users' geographic dispersion:** The impact on performance is even greater over a wide-area network because line speeds are typically much lower than those found on the office LAN. Applications that run well on the office LAN can crawl when run over a WAN.

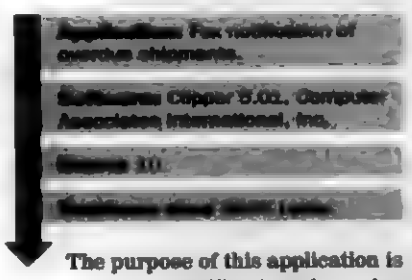
•**Volume of data:** The impact of database size varies widely, depending on the application. But with appropriate design (such as correct use of indexes, data access strategies, etc.) multigigabyte databases are reasonable. What's critical is the average size of information a user requests at one time. A database of 1G byte is acceptable if the typical user needs to see only one 1K-byte record at a time.

•**Security requirements:** As with performance, security is as much a function of the network operating system as the database itself. Most PC databases have limited security features. Even those that do have security, such as Borland International, Inc.'s Paradox and dBase IV and Microsoft Corp.'s Access, may be thwarted by a determined intruder. Therefore, where ironclad security is a must, a client/server approach is preferable. The data is then protected by the more advanced features of the back-end database, such as those from Oracle Corp. or Sybase, Inc.

•**Integrity requirements:** Integrity refers to the database's ability to keep users from violating the business rules embodied in the data. Of the top-tier PC databases, only Access and Paradox have entity and referential integrity checking built into the database itself.

Sample applications

Here are three "typical" PC database applications. Note that they are integrated with and add value to information gathered from other (often mainframe) database systems. This isn't a true "client/server" approach, where core systems are moved to database servers and the PC front end has read and write access to the data. But because in these examples the transfer of data is one way, from the mainframe to the PC database, no redesign of existing systems is required.



The purpose of this application is to automate the notification of overdue orders. It saves one-half to one day per month at each of the client's purchasing sites.

The application downloads approximately 10,000 records from a mainframe manufacturing control system, formats the data and automatically sends a fax to each vendor with outstanding, overdue shipments.

As for the product used, Clipper is for professional programmers only. No editor, report writer or screen painter is provided. The learning curve is steep. CA is close to releasing a Windows successor to Clipper, called Visual Objects for Windows. As with Clipper, this product will be for the professional developer.

The company using this program sells only through distribution channels; therefore, it is critical for it to tie the sales information received from distributors and value-added resellers (VAR) back to actual customers and sales representatives. Otherwise, the company does not know how much to pay its salespeople.

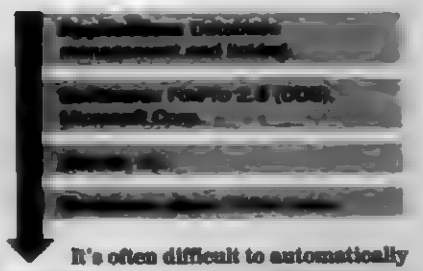
This application automates that function and also lets the company move information out to the regional sales offices and onto the notebook computers of the field sales force.

The application reads in ASCII files from 10 distributors, detailing monthly sales in the distributor's own unique format. Data for another 20 smaller distributors and VARs is manually entered into the database.

Data from the company's production scheduling system is also merged with this information and stored in the Access database.

The system then calculates and pays commissions to the outside sales force, reports actual sales through the distribution channel and identifies discrepancies between expected and reported sales by distributors.

This is an increasingly common situation: the sharing of electronic data among a company, its suppliers and customers. Because PC databases are particularly strong in supporting various input formats, they're often the tool of choice for integrating data from multiple platforms.



It's often difficult to automatically identify related records in different databases. For example, "Acme Corp." in one table may be "ACME Corporation" in another.

This application was designed to cull data from six databases and apply an extensive set of rules to find logical matches between records.

To do this process, the application must download and process approximately 2G bytes of data from Oracle databases.

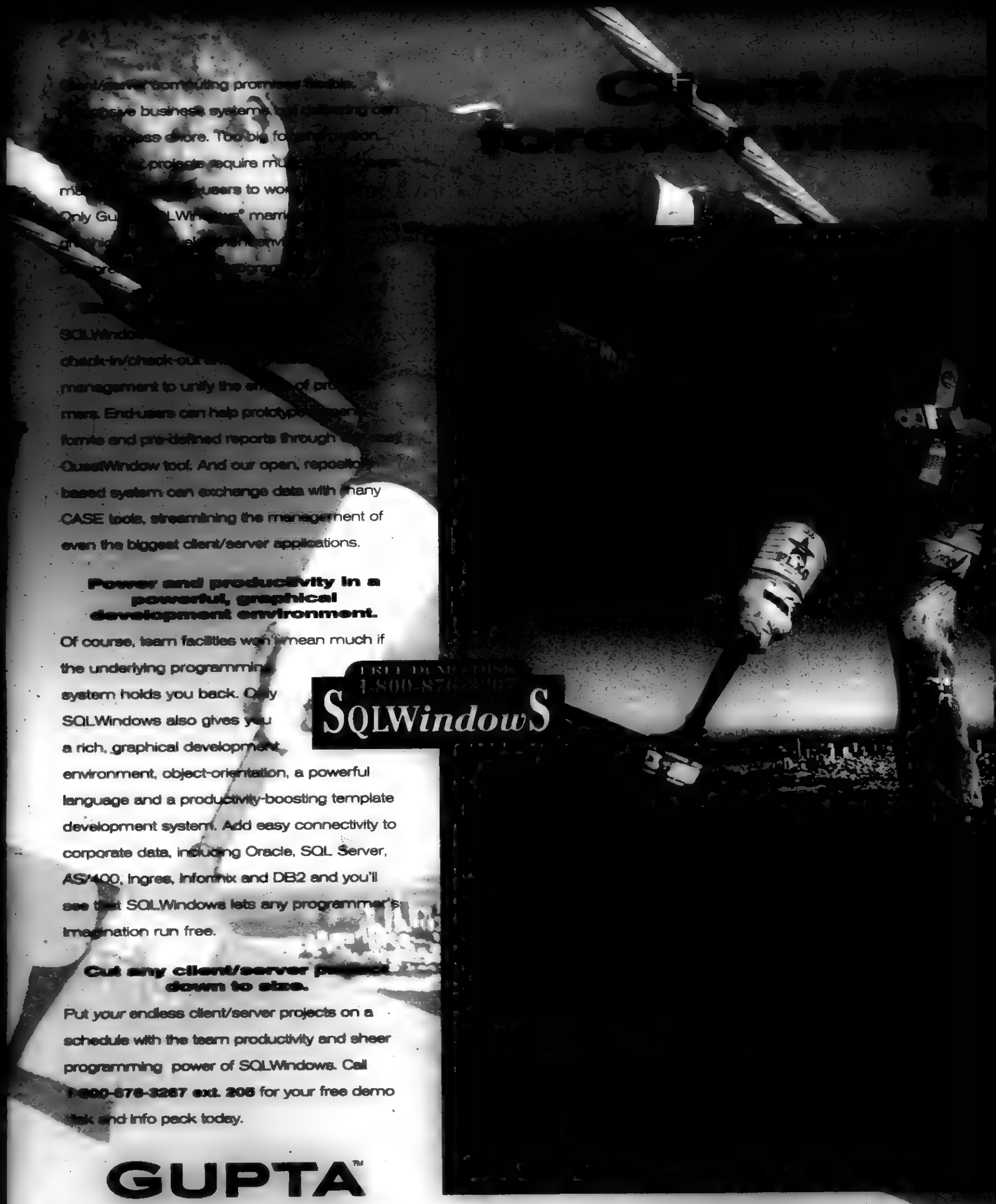
After matching is complete, the staff reviews a sample of the records to ensure they are correct.

Then an extract file of cross-references between records in the different source databases is sent to another division to be incorporated in a commercial product.

The application tests the upper limits of current PC database size. For example, processing takes 12 to 16 hours, which would not be acceptable for more time-sensitive applications. Once loaded, single-record response time is under three seconds.

Because most PC database products use the same method for indexing structured files, the single-record seek time will be roughly equivalent for all major PC database products. ■

Gerow is president of Megabase, Inc., a Mountain View, Calif., company that specializes in Windows and client/server database application design and implementation. He can be contacted at (415) 960-3575 or on CompuServe at 73237,3665.



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PC databases

CONTINUED FROM PAGE 118

SQL, even regenerating any triggers should the SQL table change.

For organizations with multiple back-end databases, however, a proliferation of drivers can quickly get out of hand. That's where middleware specifications such as Open Database Connectivity (ODBC) and Integrated Database API (IDAPI) come in.

ODBC and IDAPI allow programmers to write a single database call that can be understood and acted upon by any database that complies with that particular middleware application programming interface (API). Developers — power users or IS professionals — can create applications that access a multitude of databases without painstakingly writing low-level, database-specific SQL code for each database.

There are trade-offs, though. Database-specific drivers deliver better performance and allow you to take full advantage of all the specific features and capabilities of the particular back-end database. Middleware APIs add a processing layer, which slows performance and limits capabilities to a common denominator.

"Most of our developers don't use ODBC or IDAPI. They aren't sure what the clear standard will finally look like, and they have to sacrifice some functionality because they can't use all the specific commands of the actual database," says Noah Ross, director of technology at CAP Gemini America, Inc. in New York.

Most Windows databases offer or promise support for ODBC. Microsoft, which developed the API, is pushing it hard. "Microsoft greased the skids for ODBC in Access. It is very well supported," says David DeBrota, information advisor at Eli Lilly. DeBrota's group standardized on Access as part of its effort to speed end-user access to corporate data.

ODBC is the key to providing access to the variety of databases within Eli Lilly, but the API is still evolving. Once all the pieces are in place, however, DeBrota envisions replacing Eli Lilly's IBM mainframe- and midrange-based databases with more cost-effective systems, such as Microsoft SQL Server.

ODBC has a rival in IDAPI, which was created by Borland, IBM, Novell, Inc. and WordPerfect Corp., mainly with the intention of blocking Microsoft from controlling key enabling technology in client/server computing, notes Judith Hurwitz, publisher of "Client/Server ToolWatch." IDAPI is positioned as a superset of ODBC, supporting ODBC and additional databases, most importantly, dBase. Except for the few differences in the databases supported, the two APIs do the same job essentially the same way.

User companies do not gain anything from having two competing APIs, so one or the other should eventually push its rival out. "Most vendors will provide direct support for Sybase, Oracle and DB2 and rely on ODBC for everything else. There isn't room for IDAPI," notes Donald DePalma, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Given the uncertainty, some vendors are hedging their bets. DataEase, for example, supports ODBC but has also developed its own API, called Prism. In fact, Prism offers one of the broadest sets of servers that can be accessed from within a PC database. The drawback, however, is that you must learn the proprietary Prism API.

Superbase offers a SQL connectivity library in the form of a set of Dynamic Link Libraries to access Microsoft's and Sybase's SQL Server, Oracle Corp.'s database, Gupta's SQLBase and IBM's DB2.

not mission-critical

A minority of Buyers' Satisfaction Scorecard respondents run mission-critical applications on PC DBMS. A full quarter of the respondents reported they've experienced integrity problems

Base: 113

Source: Buyers' Satisfaction Scorecard

Pushing the 4GLs

With Windows, connectivity capabilities and advanced visual programming languages, PC databases are starting to encroach on the 4GLs designed to develop database applications, such as PowerBuilder or SQLWindows, DePalma says.

"Starting" is the key word here. PC databases lack the more robust transaction processing and integrated data integrity features, such as two-phase commit. "We still use PowerBuilder for our bigger development projects. We're not sure how Paradox will behave in the enterprise environment, and we're concerned that IDAPI adds another layer,"

Vannerson says.

"When a group goes beyond 10 to 12 users, you probably need to go to the big databases and tools," advises Timothy Boudreau, associate partner at Andersen Consulting's New Age Systems group in Chicago.

In addition, Ross says PC databases suffer from performance problems because they lack the fine controls required to tune an application for client/server computing or to perform complex processes such as two-phase commit. He also is concerned that many of the PC databases, such as Paradox, are built on non-SQL engines. Although they can generate SQL commands, they pose a problem if you try to deploy the applications on other (non-Windows) platforms.

By comparison, tools such as SQLWindows offer more complete development environments that support multiple developers. They allow full use of triggers and stored procedures. The 4GLs also allow developers to drop down into third-generation languages when even greater control is required or for particularly complex processing, such as tricky mathematical computations.

There's no doubt, however, that Access and other databases will continue to close in on the 4GLs in some of these areas — and users stand to benefit from

PC databases, *page 124*

what the other guys are up to

by Christopher O'Malley

With two PC database products each, Borland and Microsoft generate a lot of noise in the marketplace. However, other solid PC databases are available. Each of the following has distinct strengths and weaknesses, so be sure to choose a product appropriate for your needs:

	PROS	CONS	BEST USED AS...
Alpha Five 3.0 Alpha Software Corp. Burlington, Mass. $495, or $995 for the multiuser version	• Improved relational features: lookups, posting and referential integrity. • Completely menu-driven application development (no coding required). • Improved data-entry features, such as ability to enter data into more than one database from a single screen.	• No Windows version until 1994.	• A fast, robust DOS-based tool for end users.
Approach 2.1 Lotus Development Corp. Cambridge, Mass. $99 until end of the year; $395 thereafter	• Supports ODBC for back-end connectivity. • Easy to use. • Ever-improving integration with other Lotus applications; Smarticons added to interface.	• No programming language. Not suited for heavy-duty application development. • No DOS version.	• An easy-to-use front end provides end users with access to server data.
DataEase Express 2.1 DataEase International, Inc. Trumbull, Conn. $495	• Very casual end-user database that nevertheless develops reasonably sophisticated applications. • Good integration with DataEase for DOS; imports data from variety of sources. • "Query-by-model" feature pulls together multiple tables and relationships.	• No programming language.	• A casual end-user development tool for Windows.
R:Base 4.5 Microrim, Inc. Bellevue, Wash. $795	• A mature, well-rounded DOS database. • Clearly a tool for serious application developers: robust relational engine, strong programming language. • Supports SQL.	• No Windows version. • Menu-driven interface is dated. • Querying and indexing is improved but still slower than Paradox and FoxPro.	• A heavy-duty alternative to dBase, Paradox or FoxPro for DOS.
Superbase 5.0 Software Publishing Corp. Santa Clara, Calif. $795	• Powerful, flexible DOS database that has both a programming language and a macro recording function that produces the same code. • Quick reports and query-by-example features. • Mature product that has been around longer than most Windows databases.	• Awkward Windows implementation. • Not a speed demon.	• A programmer's tool for developers.

Easy to use? Not exactly, but easier to use

PC databases owe a lot to Windows, not the least of which is a friendlier interface and simpler application development.

Ever since dBase, top-end PC databases have offered powerful programming languages that are perceived as difficult to use. Now, the new databases provide powerful programming and near-programming capabilities through less complex macro and scripting capabilities and visual programming tools.

The visual programming tools make programming easier by replacing tedious coding with pointing and clicking.

Computer Associates International, Inc.'s CA-dBFast 2.0 is a good example. CA-dBFast provides a visual design feature for developing XBase applications for Windows. However, it still lets the programmer debug at the source code level.

Microsoft Corp. also offers a version of Visual Basic in Access, a graphical programming language to create Windows front ends. Borland completely revamped its Paradox Application Language (PAL) as Object PAL with extensive object-like capabilities. And Software Publishing Corp.'s Superbase has Super Basic Language, which is similar to Visual Basic.

No matter what the vendors claim, however, these tools are still not for end users. They work best for professional programmers or highly capable power users. "Our users don't use Object PAL," says Bill Vannerson, supervisor of user services at Blue Cross/Blue Shield Association in Chicago. Instead the company trained two mainframe programmers in the language.

Lotus Development Corp.'s Approach is the exception. It lacks a formal programming language, but developers report they can still create substantial applications relying on the user interface to accomplish just about whatever they need.

"I can't do 100% of what I want with any of [the PC databases], but there are so many ways to trick Approach into doing what I need that it isn't a problem," says Michael Nelson, systems integration engineer at Computer Support Services in Falls Church, Va. ■

—Alan Radding

PC databases

CONTINUED FROM PAGE 123

the competition.

For instance, Access already provides referential integrity for its native data at the engine level and allows users to define default values and validation rules to enforce data integrity when creating tables.

Through Access Basic, developers can use commit and rollback features and locking for transaction operations. As a result, "You're going to see the PC databases pushing the bigger database development products down in price," Kastner says. It's going to be a lot harder to ask, say, $2,000 for SQLWindows when you can get any of the top PC databases for less than $500.

In response, the 4GL vendors are likely to boost the object capabilities of their tools, add even more transaction processing and configuration management/version control capabilities and expand their cross-platform capabilities to include multiple clients, servers and databases.

While nobody will mistake a PC database for a muscular 4GL, PC database management systems have clearly established a place for themselves in client/server computing. As these products continue to mature and push the big boys further up the technology curve, users can only win. ■

Radding is a free-lance writer in Newton, Mass.

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The database that won't go away

DBase — it's a character-based, procedural program in a world of objects and graphical user interfaces. It has endured a disastrous release (dBase IV 1.0), the collapse of its company (Ashton-Tate) and an agonizingly slow move to the Windows environment. Yet it still tops the market share charts.

"Our corporate PC standard is Paradox, but nobody is using it. The installed base is still dBase," says Nick Wulderk, assistant vice president at Marsh & McLennan, Inc., a Pittsburgh insurance brokerage firm. Although it handles 95% of the work, dBase isn't relational, and it lacks built-in referential integrity, Wulderk says. "We use it for a lot of those quick and dirty applications, like claims-to-payment look-ups," he says.

Like Lotus Development Corp.'s 1-2-3, dBase applications are so entrenched in the corporate world that "it's not going to disappear anytime soon," says Peter Kastner at Aberdeen Group in Boston.

DBase holds down some pretty important applications. Almost every department at HCA Johnston-Willis Hospital in Richmond, Va., has a valued application running on it. For David Love, director of quality resources, dBase keeps an eye on multiple databases and generates an alert when mismatches occur among prescribed drugs, patients' medical records and recent lab results. For the human resources department, Love created a dBase application to handle benefits reporting and risk management. "Why spend big money for a [commercial] benefits package when I can whip something up with dBase?" he asks.

Valuable skill

Given the widespread use of dBase and its reputation for difficulty, accomplished dBase programs and programmers are in high demand. "I have a hell of a market for source code," Wulderk says. He developed a dBase application that looks at more than 800,000 claims files to find past insurers that bear some responsibility for current claims.

Borland International, Inc., which markets dBase, knows it can't rest on its laurels, however. So does Computer Associates International, Inc., which markets Clipper, the leading compiler for dBase applications. Both firms continue to push dBase and its XBase programming language into the client/server world. A Windows version of dBase, currently undergoing alpha testing, is due next year, and object extensions to the dBase programming language are promised. CA's version of dBase, dBFast, already provides Windows capabilities.

Although some dBase programmers, such as Love, are quite satisfied with the character-based interface, others are itching for Windows and object capabilities. "I expect much better editing with Windows," Wulderk says. "Now, multitable editing is hard. And objects will make it easier to build interfaces."

For those wary about trusting important applications to a proprietary product, Borland promises to open up dBase's XBase language through an ANSI XBase specification. The first phase will address the base-level language. A second phase will address client/server extensions for SQL and, eventually, objects. ■

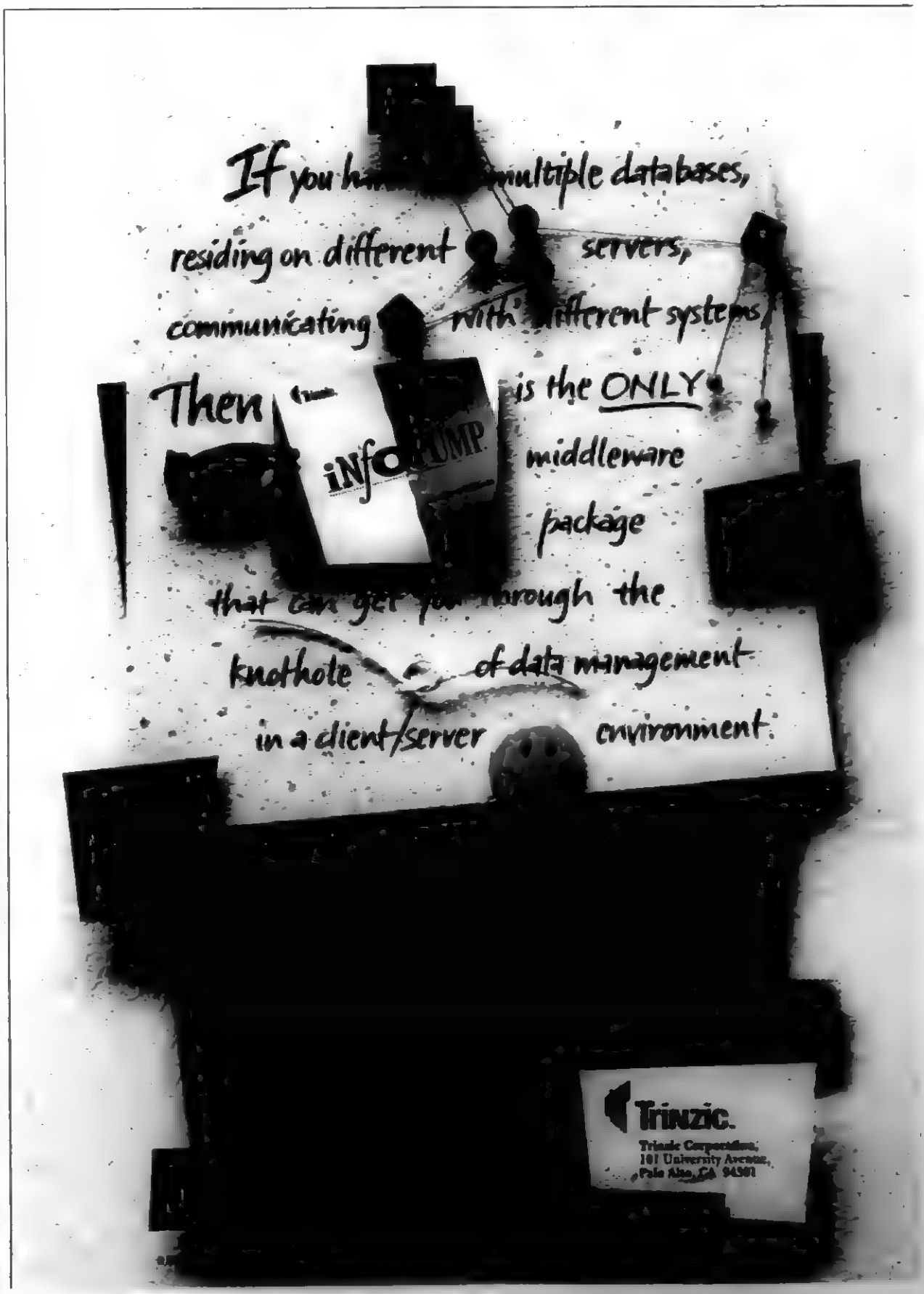
— Alan Radding

dBase rides again

dBase sales for 1993 are expected to be above last year's figures — the first increase in at least five years

	1992 revenue (millions)	1993 revenue (millions)	Share of programmable DBMS market
Borland's Paradox (all versions)	$219.1	$476.7	33%
Microsoft's Access	$342	$247.5	17%
Borland's dBase	$185.1	$215.8	15%
Microsoft's FoxPro (all versions)	$114.1	$191.2	13%

Source: Computer Intelligence/InfoCorp, Santa Clara, Calif.



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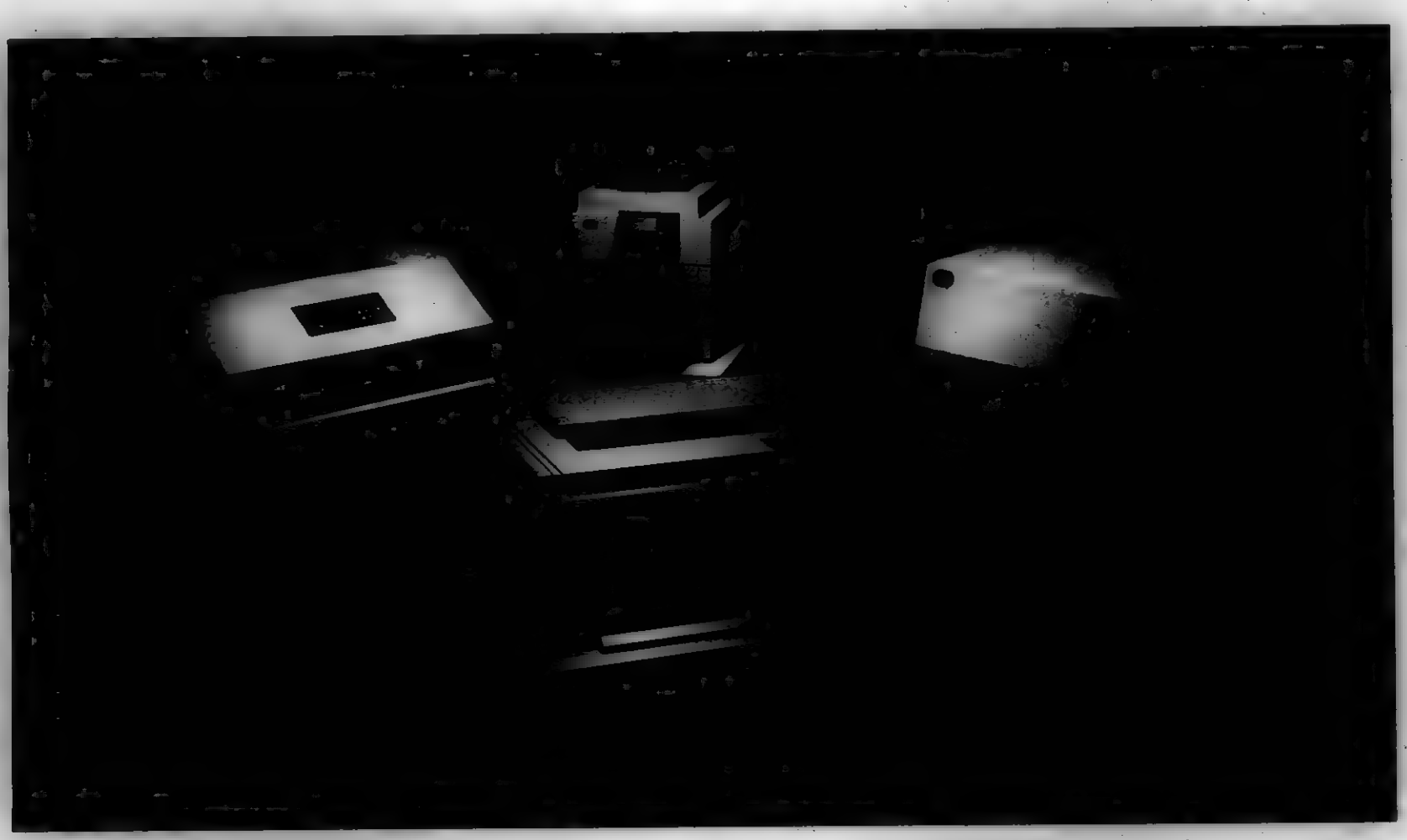

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COMPUTERWORLD BUYERS SATISFACTION SCORECARD

Borland, Microsoft dead even in Windows DBMS matchup

By Michael Sullivan-Trainor

In the Windows database management system market, it's not enough to be good. You also have to be different. With 60% of the market just about evenly split between them, Borland International, Inc. and Microsoft Corp. achieved matching total scores in our Buyers' Satisfaction Scorecard, indicating that both vendors' offerings are good, but users don't see much distinction between them.

More than 140 users of Borland's Paradox for Windows and Microsoft's Access and FoxPro for Windows participated in the survey, which revealed that buyers place higher value on reliability, data integrity and ease of use than they do on differentiating features such as Paradox's object-oriented capabilities and Access' application linking ability.

Borland's Windows database strategy is based heavily on object-oriented tools. In fact, the company recently announced that dBase IV for Windows, due out next year, will include object extensions [CW, Oct. 4]. Such features in Paradox for Windows were rated highly by users but placed 22nd in importance out of 25 categories.

Part of the low importance standing of object-related features may be explained by the learning curve users go through to attain expertise with the new features. Paradox received the lowest rating of the three products in compatibility with previous applications.

However, ease of programming — where much of the power of objects is applied — yielded Paradox a higher rating than Access, but one that was just about even with FoxPro.

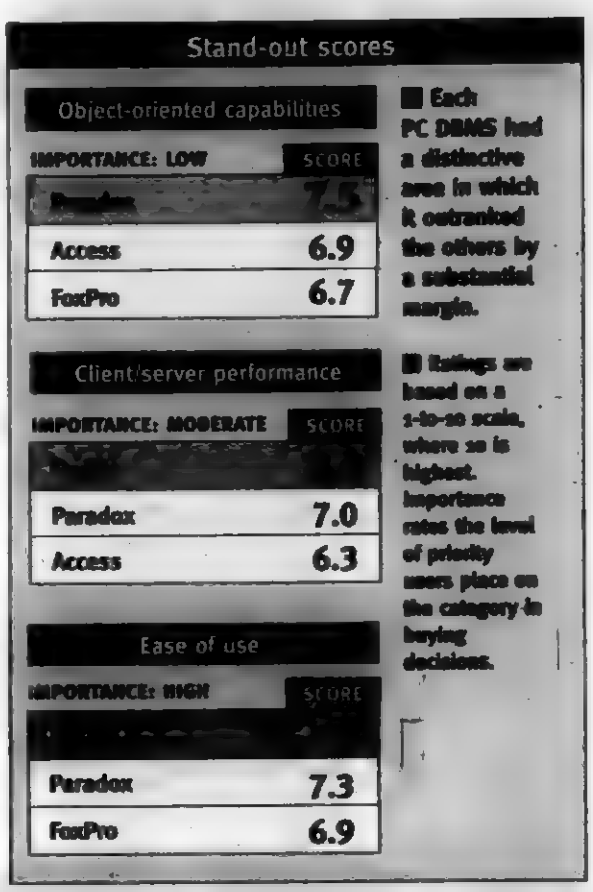
Sweet benefits

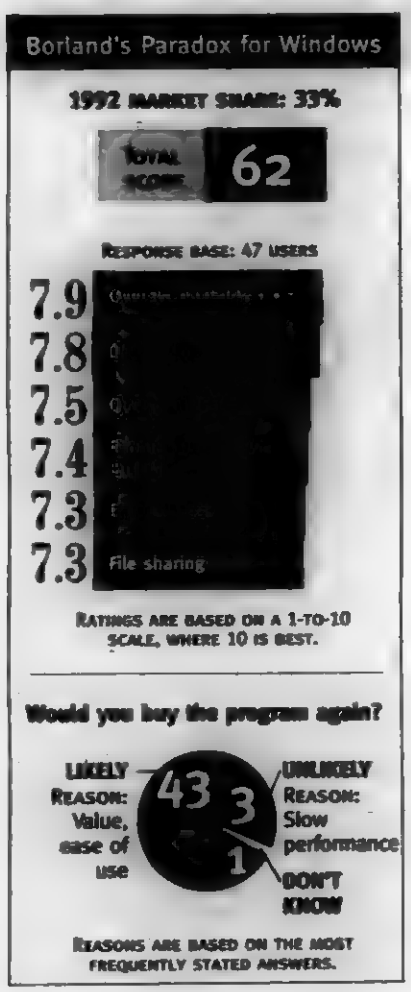
Object Linking and Embedding (OLE) 2.0 features will be implemented more ambitiously in Microsoft's Office suite of applications this month [CW, Oct. 4]. As a member of the suite, Access benefits from such features. But OLE received a low importance rating: 21st out of 25 categories.

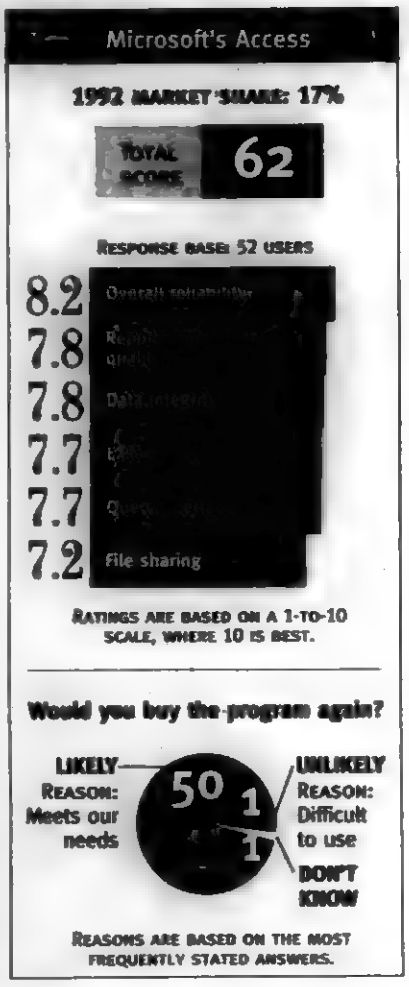
Just ahead of these feature wars on the importance scale, according to the survey, is the battle over upgrades. Borland received slightly higher ratings for delivering frequent and reasonable upgrades. User satisfaction with this area was high overall despite the fact that while new package prices have been falling 15% a year, upgrade prices have been rising about 20% over the past two years [CW, June 21].

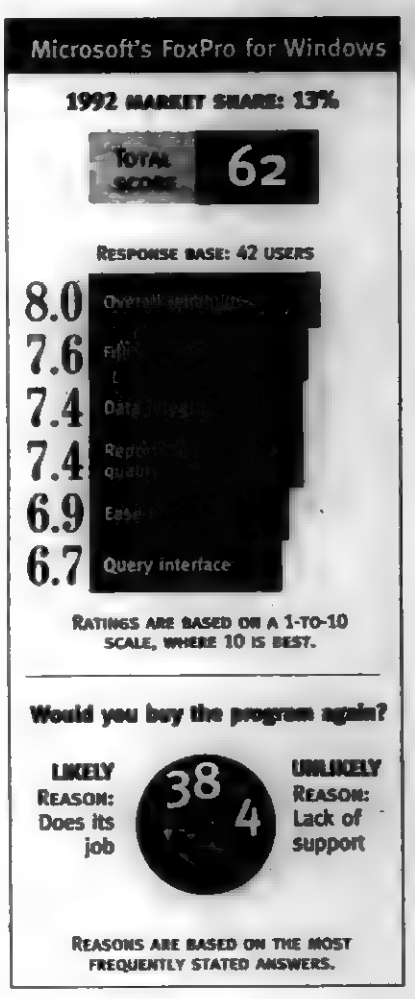
Methodology

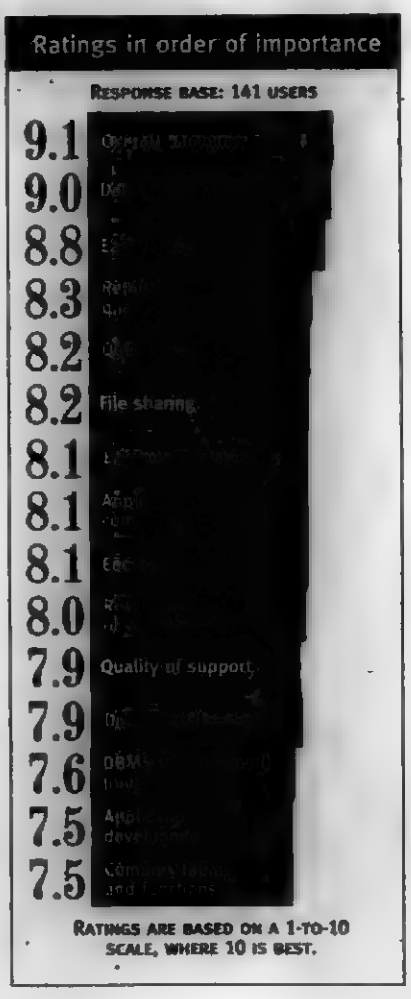
Buyers' Satisfaction Scorecard surveyed users of the market-leading Windows DBMSs. Response bases included a minimum of 40 users per product. A total of 141 users responded to the survey, which rated the products across 25 categories to assess their performance in key areas. User names were randomly selected from the *Computerworld* Buyers Database. The survey was conducted by First Market Research in Austin, Texas. For more information contact Michael Sullivan-Trainor, (800) 343-6474, ext. 229. ■











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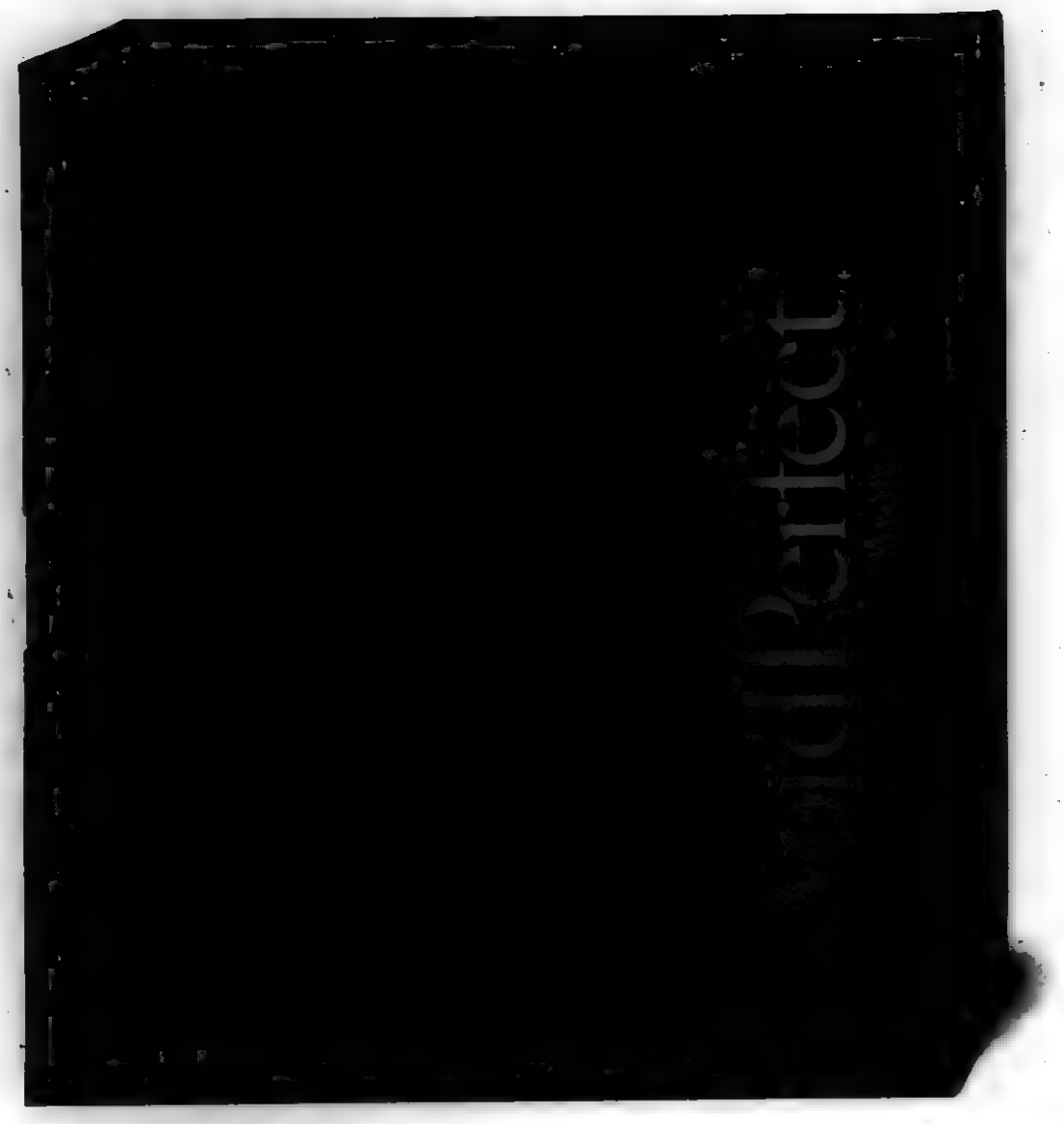

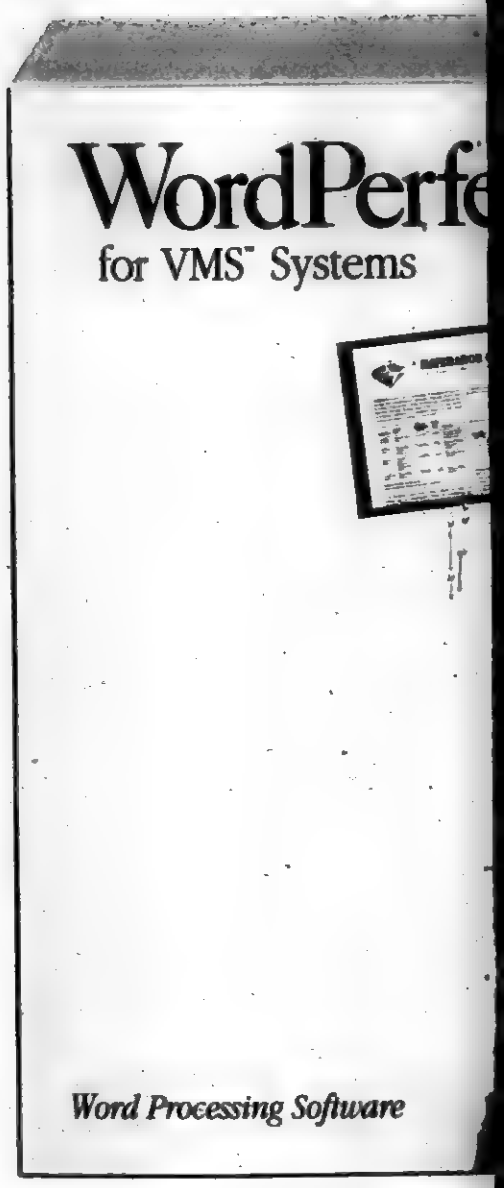

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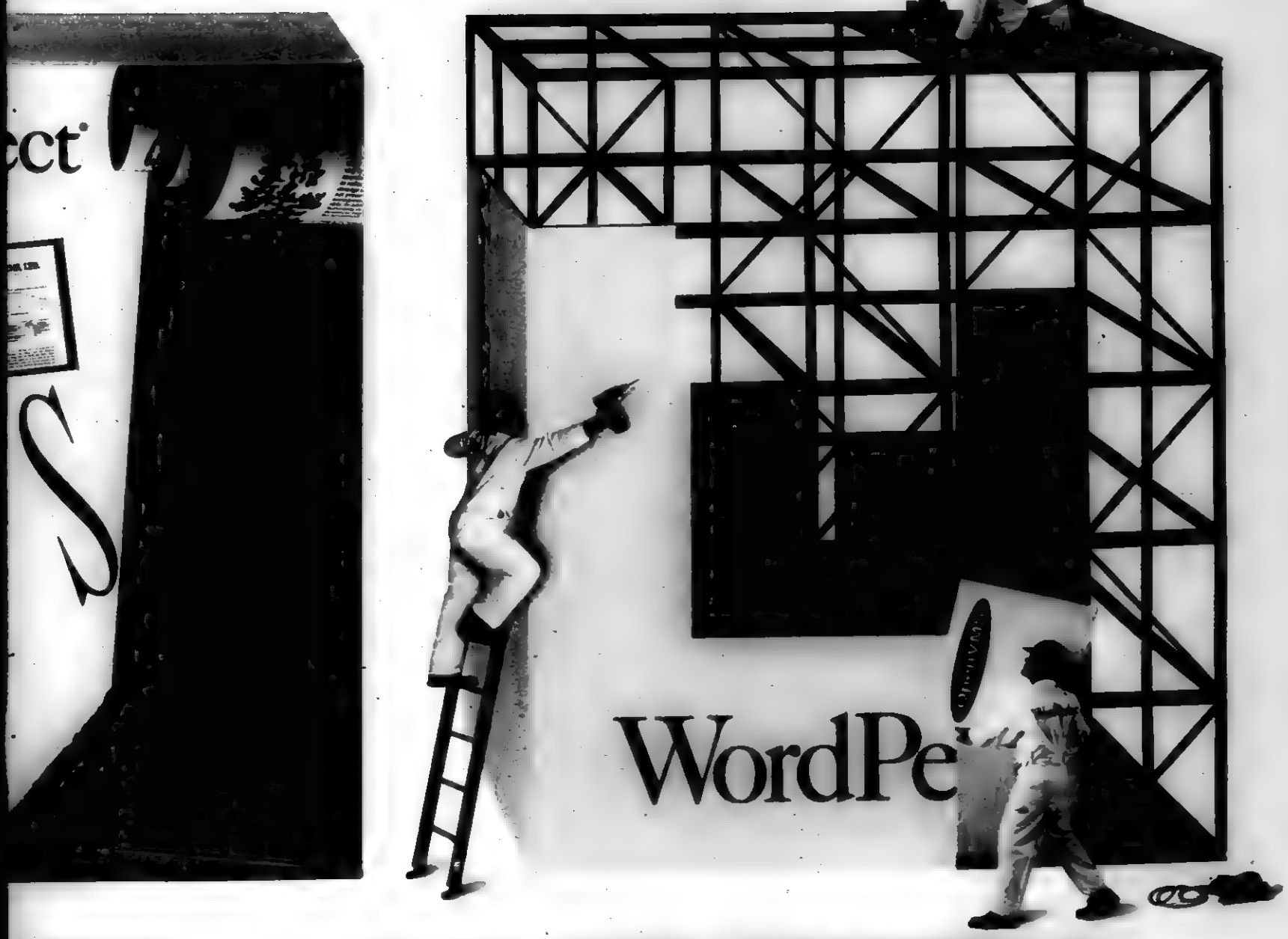

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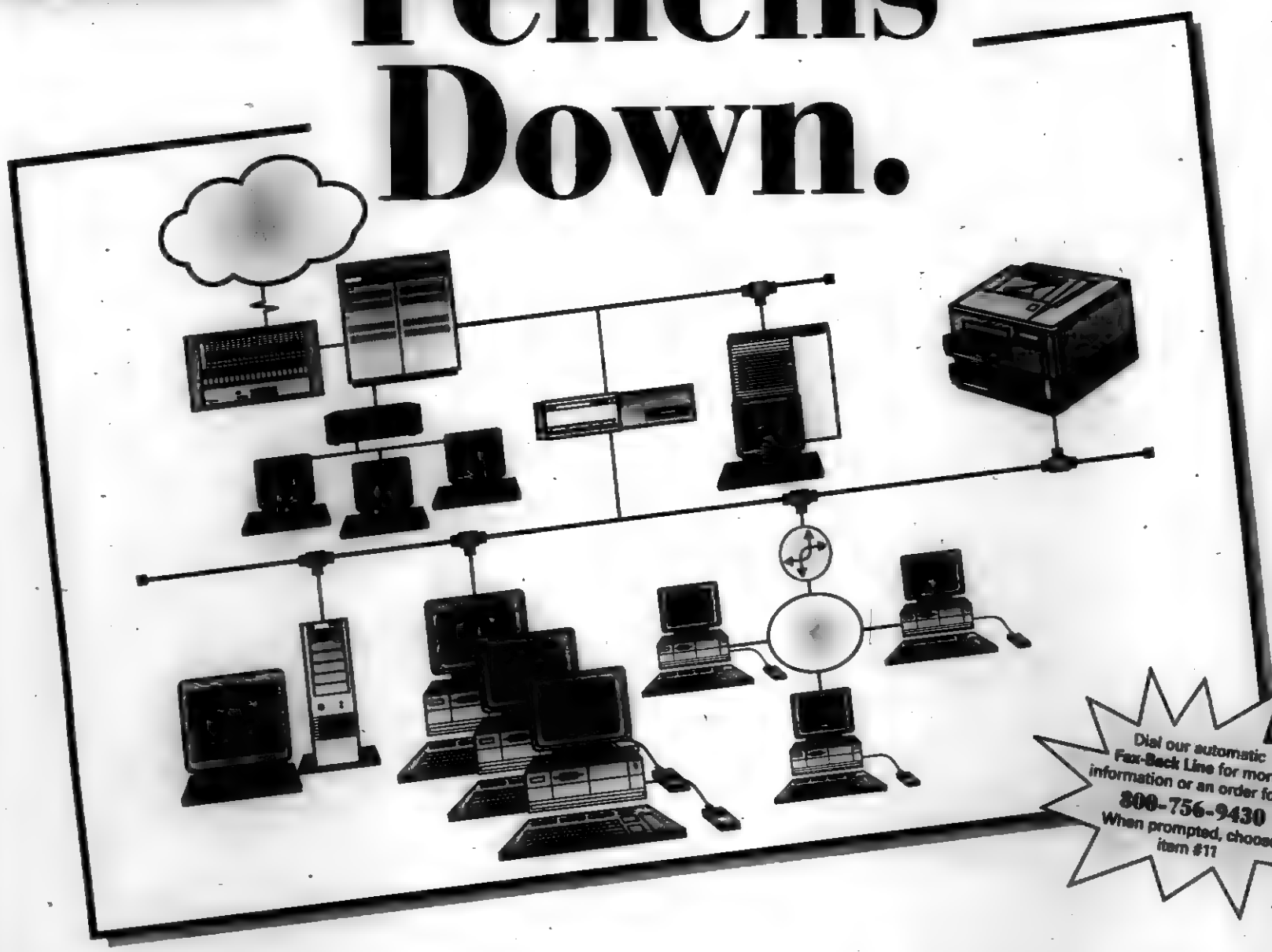

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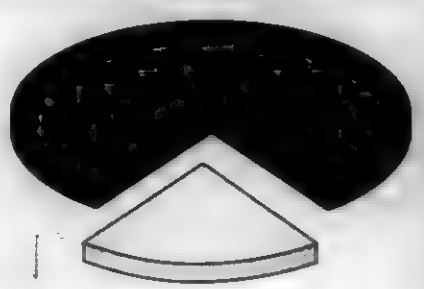

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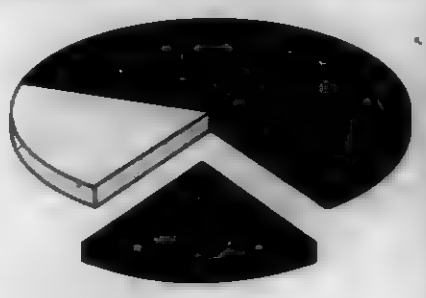

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Lotus' Approach: Easy to use and install; lags on reporting

Approach

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ Evaluators said Lotus Development Corp.'s Approach is an excellent database for corporate and desktop use, with reliability, installation and networking taking high marks, but they wished for better performance in queries and sorting.

Take a celebrated Windows database, add the backing of a high-profile software giant and what do you get?

According to the evaluators who helped in this look at Lotus' Approach database, the result is a mature product that will find ready acceptance in many corporate settings.

Originally released in 1992, Approach quickly gained a wide following due to its relational capabilities and its ability to work with many database formats including Borland International, Inc.'s Paradox and dBase, Microsoft Corp.'s FoxPro and Oracle Corp.'s Oracle. The database has also been applauded for its easy-to-use interface and end-user orientation. Our evaluators said last June's purchase of Approach Software Corp. by Lotus has made the database a viable choice for mission-critical, corporate applications.

The evaluators for this survey included information systems managers from a hospital, a national food wholesaler, a major accounting firm and a global manufacturing company. The hospital evaluator had completed applications for asset and patient tracking; the food wholesaling evaluator had recently converted fleet management and personnel databases to Approach; the accounting firm's developer was responsible for an extensive Approach application with more than 90 forms and 10 linked databases; and the manufacturing firm's IS manager oversaw a variety of Approach databases being used by more than 250 employees in marketing, sales and billing departments.

This survey was developed with the assistance of Howard Rubin Associates and Technology Investment Strategies Corp.

Reliability

After more than 18 months of availability, Approach is a mature product, the evaluators said. They reported no problems or failures that could be attributed to the database.

Hospital: "I was surprised there were no failures since we try to keep everything in DBF format."

Performance

If anything, Approach could stand improvements in its querying and sorting speed. The evaluators said users sometimes complained about response times. None considered this a great problem given the comparative benefits of Approach in other categories, such as ease of use.

Manufacturing: "I don't know what can be done [to improve performance] given the size of our databases, some of which have 300,000 records."

Ease of use

The evaluators said Approach shines in the ease-of-use category. They reported that end users and developers benefit from an intuitive interface that provides easy access to development tools and querying and reporting facilities.

The hospital and wholesaling evaluators said converting data from earlier database applications was easy. The evaluators concurred that ease of use was a major reason behind their decision to use Approach.

Wholesaler: "At the time I got Approach, I was thinking of rebuilding a dBase program, and I was going in circles."

Technical support

The evaluators said Approach required little technical support from either Approach Software or Lotus. The evaluators reported that technical support, when needed, was efficient and accurate.

Installation, networking

Installation was simple, the evaluators said, because Approach is delivered on only two 1.4M-byte floppy disks. The accounting and manufacturing evaluators, both of whom had extensive experience with networked Approach databases, said their applications were easy to configure.

Manufacturing: "The connection to Oracle databases was easier than we thought. Other database programs we tried presented nasty [installation] scenarios."

Queries and reporting

Although they considered the Approach query and reporting facilities adequate for most users, the evaluators wished for enhancements in both areas. One major complaint was that repetitive queries and sorts were often not transferred to reports. The evaluators also said that date queries sometimes did not produce the proper results and that identical summary fields could sometimes not be used in two different reports.

Accounting: "For the majority of users, it's fine. They have some tweaking to do at the high end."

Manufacturing: "When power users begin working with it, they say, 'I wish I could do this or that.' They can hit the wall."

Programming

Approach provides a macro facility to automate some tasks. Macros are constructed from an extensive dialog box and, once completed, can be attached to buttons or included in the main pull-down menus. No procedural programming language is provided. The evaluators considered the programming capability adequate and useful.

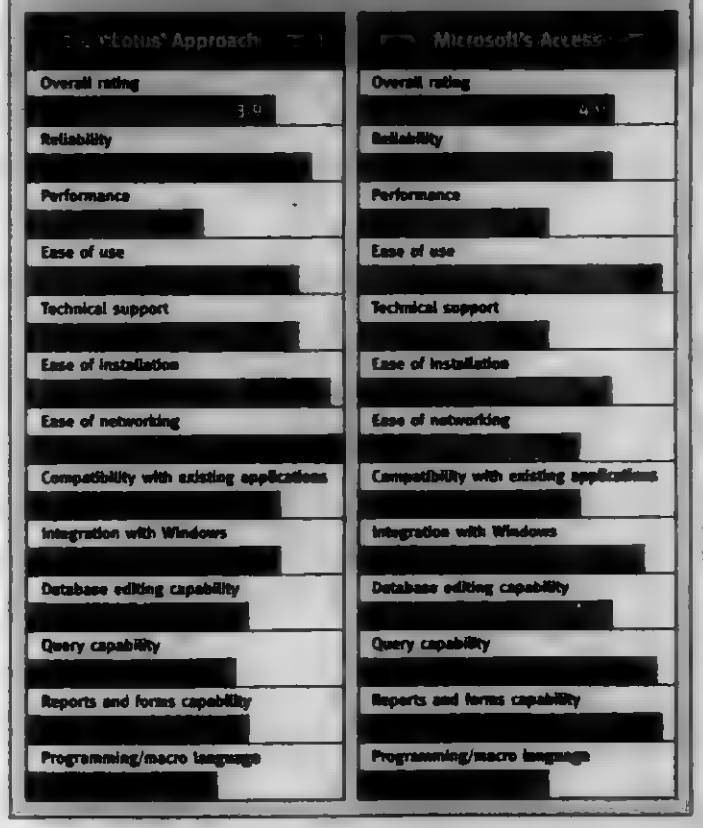
Accounting: "You can't make stupid mistakes with the macros."

Written by Computerworld *senior editor Garry Ray.*

RATINGS

Lotus' Approach

Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users. Access ratings based on May 24, 1993 head-to-head comparison with Paradox for Windows.



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THE WHITE MAN'S CLUB

Minorities still represent a small percentage of the systems work force, especially at the management level

By Julia King

Priscilla Brown is a 34-year-old senior systems programmer and the only black staffer in the 20-member information systems department at Elf Atochem North America, a chemical company in Philadelphia. Before that, she was the only black systems programmer in her group at Cigna Insurance Corp.

"It's usually like that," Brown says.

"Usually like that," indeed. Minorities continue to make very limited progress in the IS profession. The U.S. Equal Employment Opportunity Commission (EEOC) notes that in 1991 (the most recent year for which figures are available), 13.9% of IS professionals were minorities. That's only a 1.9% hike from 1988, when 12% of IS staffs were minorities, according to the EEOC.

At the management level, things look even bleaker. In a recent *Computerworld* survey of 107 IS people, only 9% said their organization's top executive was a minority. The U.S. average is even lower, says the EEOC, with minorities representing only 8.5% of technology managers nationwide.

Yes, the old (white) boy network is alive and well in corporate technology shops, says Suzanne Fairlie, president of ProSearch, Inc., a Conshohocken, Pa., IS recruiting firm.

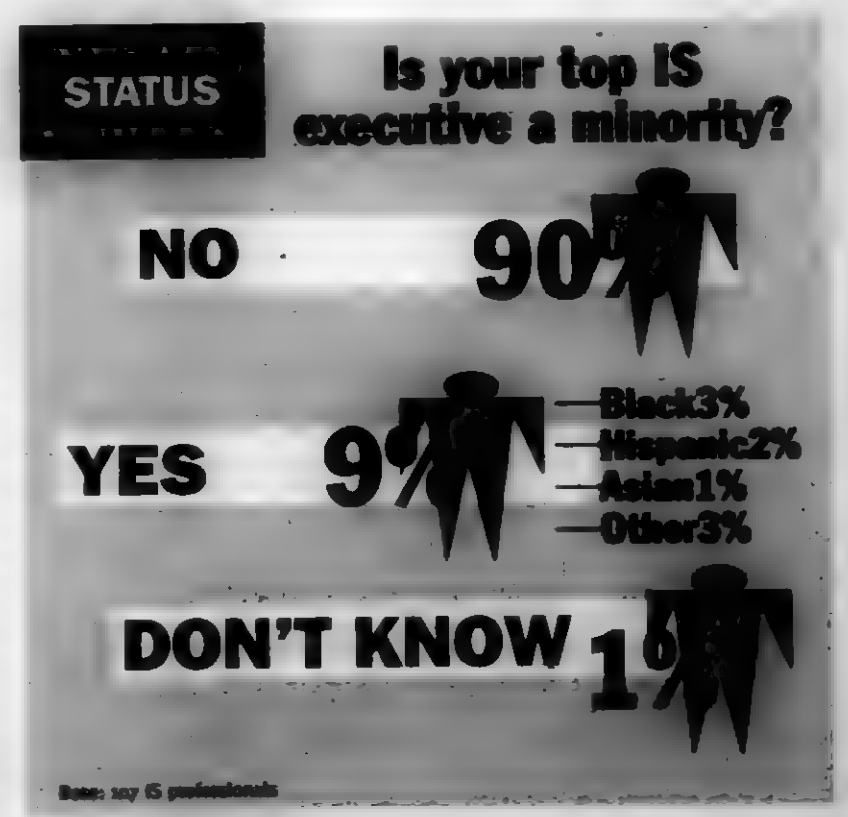
Part of the problem, observers say, is the country's recent economic slump. Virtually all large companies are in some phase of downsizing, which means aggressive budget and staffing cutbacks in IS groups across all industries. Cultivating a culturally diverse work force is not a top priority.

In fact, the *Computerworld* survey found that minority hiring in the past year has been at a standstill. Seventy-four percent of respondents said the number of minorities in their IS organizations has stayed the same in the last year, with 7% saying that number has actually decreased.

"Companies like IBM that have had a series of [financial] problems aren't focused on cultural diversity programs. They're laying off people," says Beverly Lieberman, president and owner of Halbrecht Lieberman Associates in Stamford, Conn. Lieberman estimates that only about one-third of Fortune 1,000 companies have some sort of formal cultural diversity hiring program or policy.

Minorities can expect fierce competition for jobs at all companies, even those like Chicago-based Kraft General Foods North America, which boasts an in-house cultural di-

White man's club, *page 136*



Source: *Computerworld* Database Division

King is a free-lance writer in Ridley Park, Pa.

White man's club

CONTINUED FROM PAGE 135

versity program and a history of recruiting candidates from at least one predominantly black college, Washington's Howard University.

Higher standards

Earlier this year, Kraft hired 10 systems staffers, but for every person who got a job, three other highly qualified candidates were turned away. "There are fewer jobs, and the competition is very keen," says Willie Fields, who is 54, black and the company's director of corporate business systems. "We have been able to find minorities who have been able to compete, but they need to know the bar has been raised."

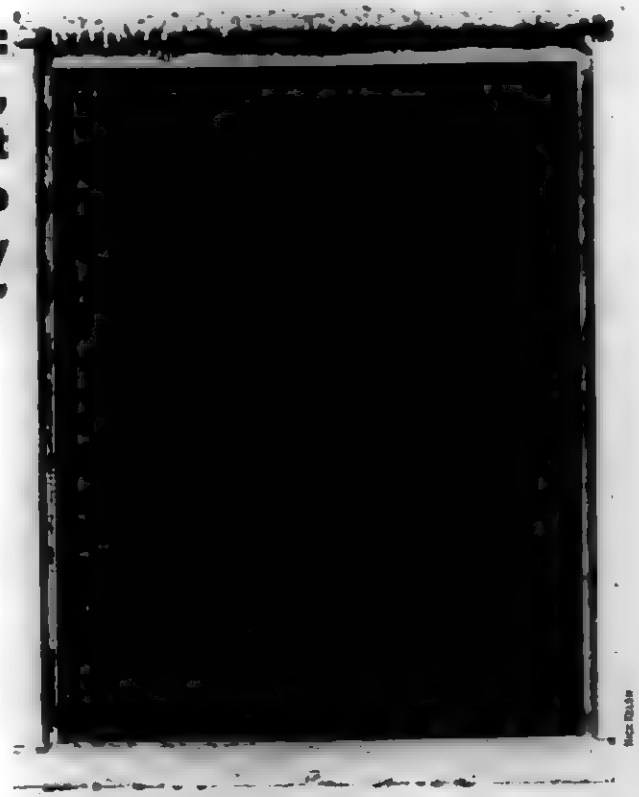
Fields says that five to seven years ago, a near-3.0 grade point average and a good mind for information technology would land a job. Today's emphasis is on top-notch qualifications, not enhancing the company's cultural diversity.

The going gets tougher higher up the ladder. "In my present job it's not an issue at all. But when I worked for a small private firm many years ago, it was never spoken, but it was known that there was a level of promotion that you could never get past," says Enrique Crespo Jr., manager of corporate sales systems at Torrington Co., a manufacturing division of Ingersoll-Rand Co.

Michael Hwu, manager of systems and software development at the Four Seasons Hotel in Toronto, says he thinks the problem comes down to communication.

"There's big money involved [in projects]. You've got to convince people of why they have to buy your project." Hwu says he has seen few minorities with the skills it takes to present a project.

Priscilla Brown: "As a minority, you can get lost because you're there by yourself."



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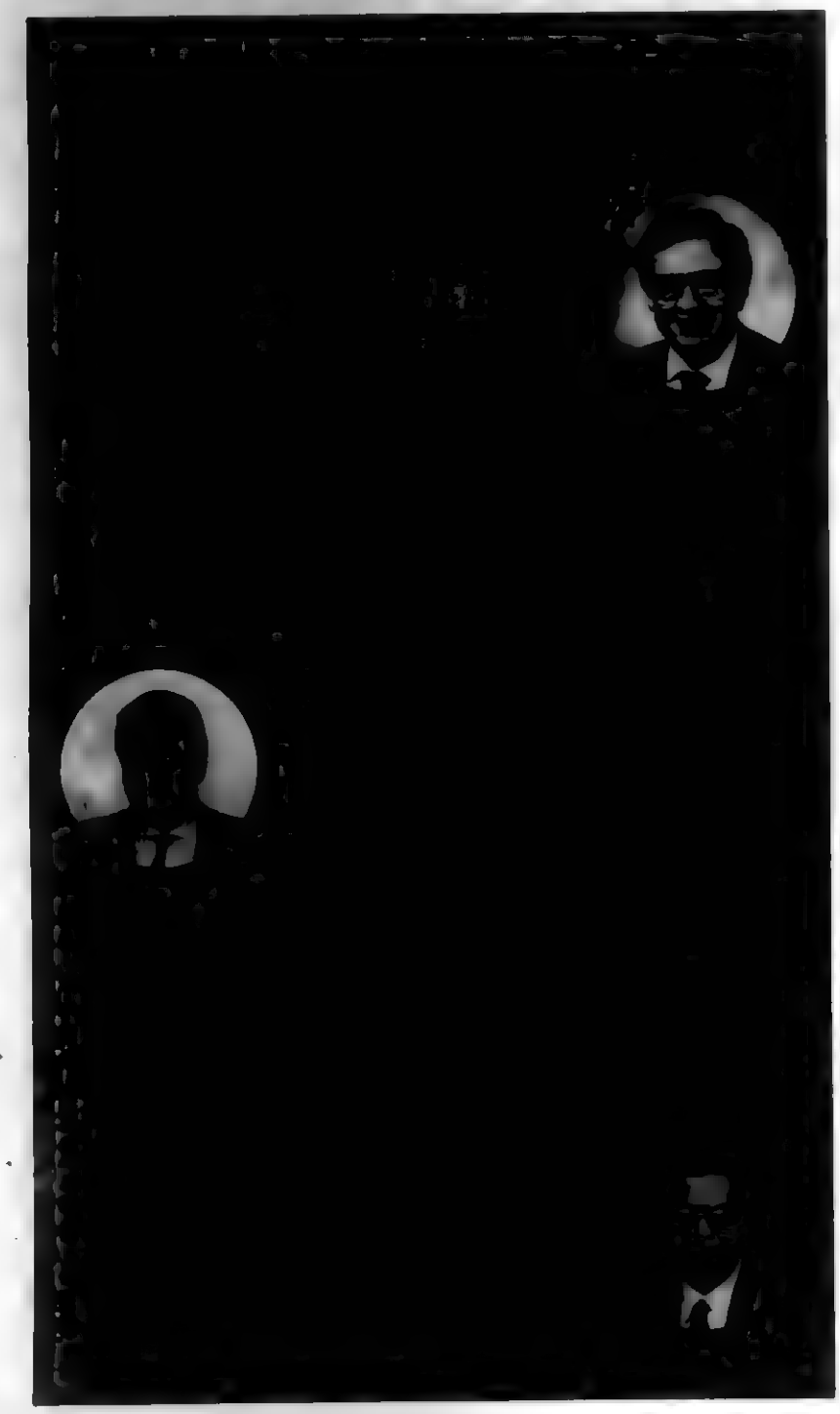


Lieberman notes that minorities may be caught in a vicious cycle; with so few of them at high levels, most can't gain the presentation and management skills needed to get noticed, which may keep them from advancement.

Hwu, 38, acknowledges that his rise from programmer/analyst to management may have been easier than for most because he got involved in a company without an established IS presence. (He was one of two original IS staffers.) There were no predisposed notions of the typical IS person and no "political mountain" to climb to get ahead.

Despite Hwu's example, however, he is the only minority on the 16-member IS staff at Four Seasons.

Few and far between

Like Hwu, Brown says she does not believe her chances for advancement are impeded just because she is a minority. Still, she says she can't help but notice that there is only a very small percentage of minorities who hold high positions in IS organizations. Women, for instance, held the top IS job at only 15% of the 107 companies *Computerworld* surveyed.

"You have to question whether human resources departments are getting information about jobs out to minorities," she says.

Are there any bright spots? Fairlie says she is beginning to see more companies, primarily those in heavily market-driven industries such as pharmaceuticals and cable television, actively recruiting minority management candidates as well as grooming minorities already on the job for upper-level posts.

"The more progressive companies are aware that not for legal reasons but for business reasons they have to integrate," Fairlie says.

Companies may not have a choice. According to a 1991 government study called Workforce 2000, only 15% of entrants to the work force in the year 2000 will be white males. In 1991, that figure was 47%. Between 1991 and 2000, nearly two-thirds of workers joining the employment ranks will be women.

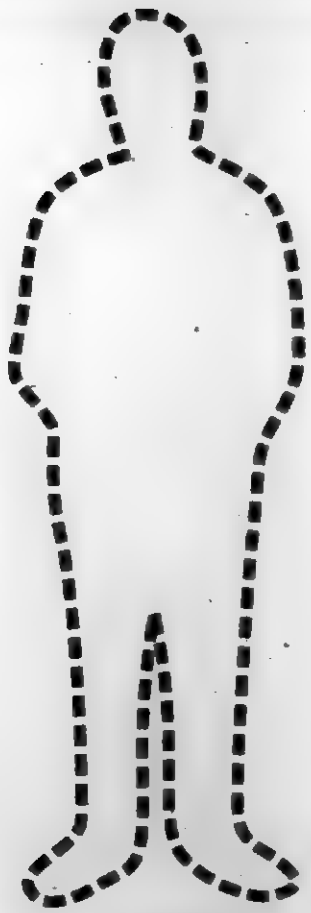
"It's the companies that are concerned with the bottom line that are now moving forward" in minority hiring, Fairlie says. "They realize they have to in order to stay competitive."

Over the years, certain progressive companies, including Johnson & Johnson, John Hancock Insurance Co., 3M Co. and General Electric Co., have established positive track records in cultural diversity, according to executive recruiter Lieberman.

Unfortunately, Lieberman notes, these companies are all outside the financial services and telecommunications industries, which for now is where almost 50% of the IS jobs are. "The companies that

White man's club, *page 139*

Source: EEOC, 1991



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3. Include the name, address, phone and fax number of the two entrants, along with two or more references who are familiar with the project and are willing to be interviewed. One reference should be a beneficiary of the project: a customer, supplier or user from the sponsoring business unit.

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White man's club

CONTINUED FROM PAGE 136

are hiring the most technology people are the Morgan Stanleys, First Bostons and Fidelitys of the world," she says. "They're hiring Unix and C++ [experts], and they're recruiting aggressively. They are indeed hiring anybody who can do the job," she says.

feeling both uncomfortable and isolated as a black woman in an overwhelmingly white male profession.

"As a minority, you can get lost because you're there by yourself and have no one else to recognize your experiences," Brown says. "You feel that isolation. It may not be intentional [on the part of nonminority employees], but you still feel it." ■

Senior editor Lory Zottola Diz contributed to this report.

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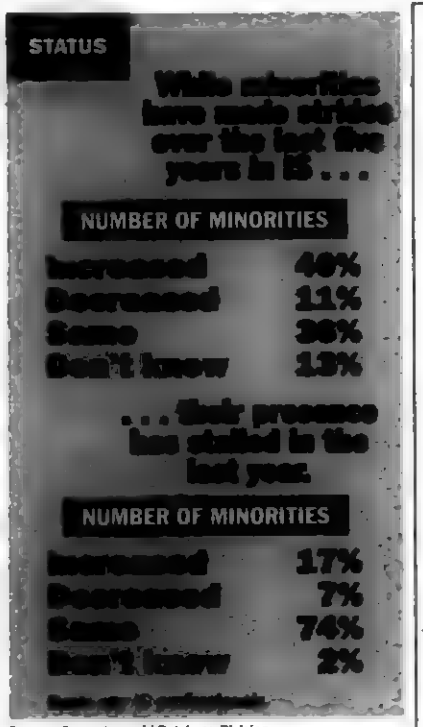

Source: *Computerworld* Database Division

Yet Lieberman isn't overly enthusiastic about minority representation in the ranks of financial service companies.

"It is only in companies where there is a proactive human resources executive who has the ear of the president that cultural diversity programs are strong," she says. "And in financial services, brokerage and investment banking, human resources has traditionally been weak."

Long road ahead

Earl Pace, president of Pace Data Systems, Inc. and co-founder of Black Data Processing Associates, says there is some truth to the statement that companies are preparing for the upcoming change in work-force demographics by establishing cultural diversity programs.

"They see the handwriting on the wall," Pace says. "But the attitude is: 'Let's do this thing as slowly as we can.' I don't see corporations moving ahead with any deliberate speed. It's window dressing for now."

Fields says he, too, does not see companies moving ahead aggressively with cultural diversity programs. "PR is the primary issue today," he says. "[True] cultural diversity will be more of a 1998-99 issue."

For now, any successes tend to be bittersweet. Brown says that while she has not had any direct experience with on-the-job discrimination, she has seen it in places she has worked. And it has been hard to rise through the ranks without

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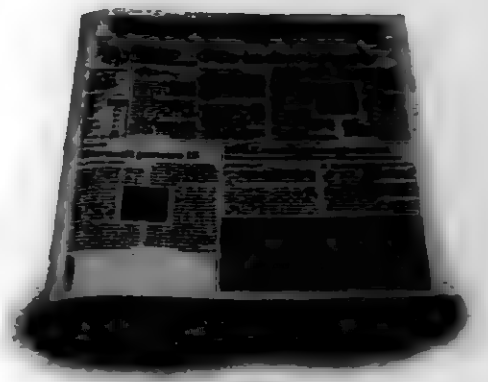

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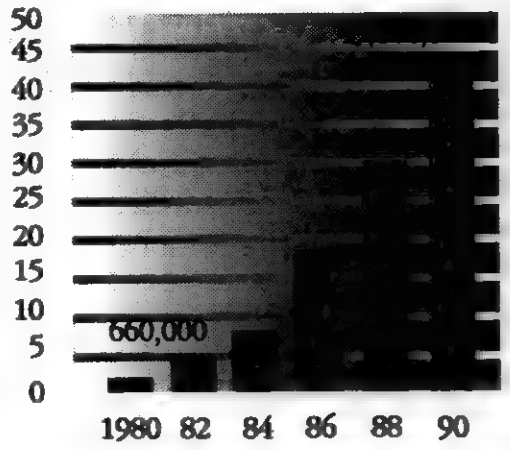

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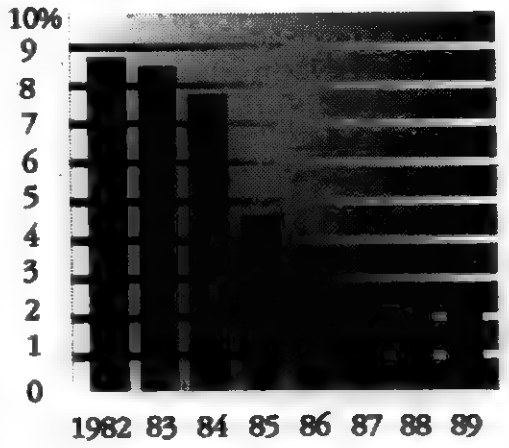

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Leave analysis behind

Learn to adjust to a less structured and more chaotic, iterative development process through rapid application development

By David Baum

MOST PROGRAMMERS still design systems the old-fashioned way, using a syntactical language and a step-by-step waterfall approach to get through the development life cycle. The results of one cycle phase spill into the next, and each phase must be completed in an orderly, serial fashion — analyze, design, code, test and deploy. User needs are identified, a design is frozen based on those needs and implemented by coding the application.

This approach, however, allows too much time in the early phases without realizing any tangible benefit. It also assumes that user needs can be accurately identified by reviewing written specs. If needs change once the requirements are set, however, it becomes costly to fix.

Such problems have led to the adoption of a rapid application development (RAD) approach based on the concepts of iterative development using rapid prototyping tools. Most rapid prototyping approaches devote less time to early analysis and design phases, encouraging developers to dive in and mock up an application prototype. The prototype is then refined based on user input in an iterative fashion as the finished application takes shape.

To succeed using a RAD approach, Eric Clayberg, project manager at American Management Systems Co. in Arlington, Va., says the key is learning to balance traditional analytical skills with a more spontaneous approach. Step one is still identifying the business requirements, Clayberg says. Then, instead of spending weeks devising written specifications for users to review, you sit down and start prototyping the application.

It can be difficult at first, but you become adept at thinking on your feet. Ultimately, you can design better systems because the rapid prototyping process leads you to discover types of functions you wouldn't have thought of initially.

"If you sit down with a rapid prototyping tool, you are going to see new kinds of interactions among the data, new ways to juxtapose windows, new ways to link application functions," Clayberg says.

The trick for programmers is to learn the proper balance between planning and spontaneity. You need to have a strong sense of the business requirements before prototyping, but you don't want rigid, predetermined views of the final system to restrict creativity.

Succeeding with RAD

Lengthy analysis isn't so important with the newer, RAD-oriented tools because it's easy to change what you create as you go along. Previously, a mistake in the interface could mean redesigning the underlying data structures. Now the interface comes together quickly and can be changed quickly. The data structures can be added later.

"It's hard to comprehend how easy a product like Visual Basic is to use until you sit down with it," says Chris Barlow, a software engineer at Sun Hydraulics Corp. in Sarasota, Fla. "In three minutes, I can create a full-blown text-editing window with mouse control, buttons, save functions and a lot more."

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.

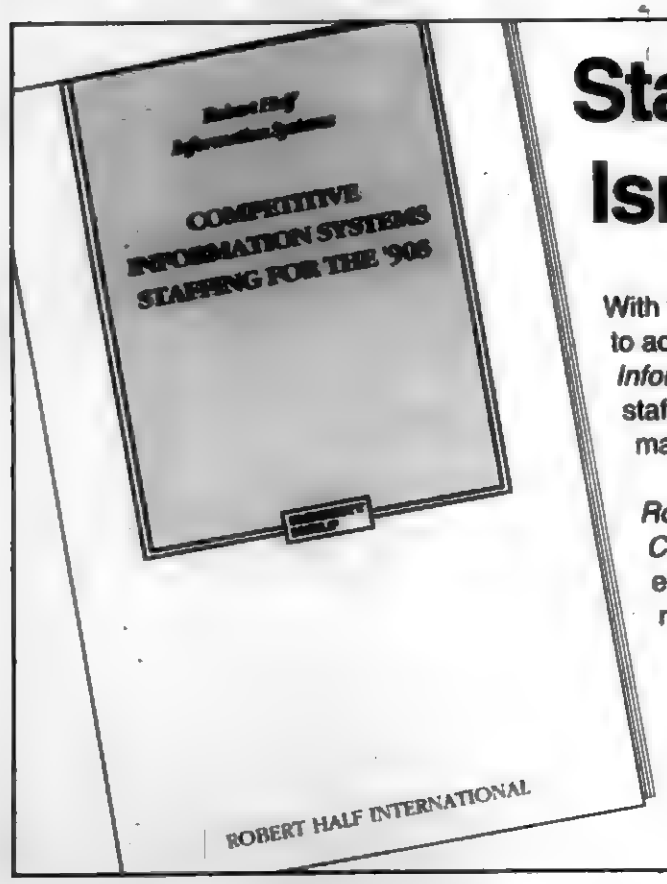
A RADICAL CHANGE

Developers insist that talk about leaving analysis behind is a myth. "You still need to carefully analyze the business problem," says Eric Clayberg, a project manager at American Management Systems. "You need to have a good mental model of the system and a clear view of where you're going."

Here's one technique Clayberg uses to teach mainframe programmers how to adjust to new RAD tools:

- Spec out the first dozen or so tables, getting a firm idea of how they fit together.
- Let the process of building the user interface naturally uncover additional data requirements.
- Have a sense of the basic database requirements. Make sure that:
  - The data is normalized.
  - There are no data redundancies.
  - You account for data protection and validation.
  - You have thought about the big-picture issues such as the system's goal and its impact on the overall information enterprise.

The real difference? It's the starting point. It's not a complete set of written specifications but a basic road map that leaves room for the creative process to unfold. "You aren't necessarily leaving analysis behind. You are just approaching it from a different direction," Clayberg concludes. "This is what allows you to create a superior system." —*David Baum*



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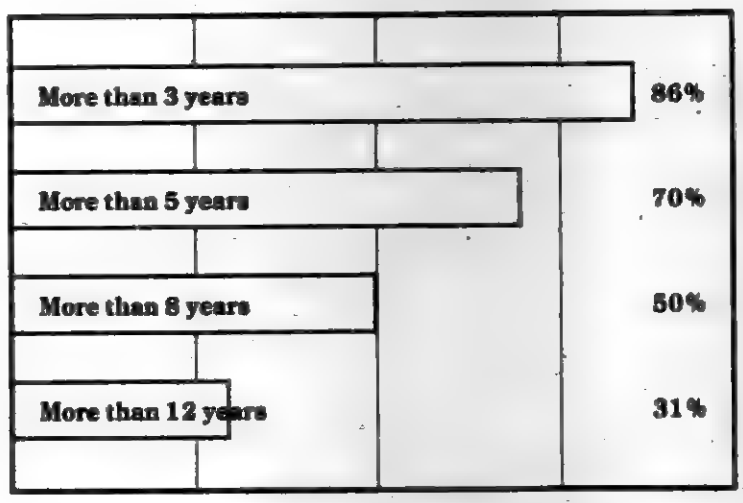

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BEST READ

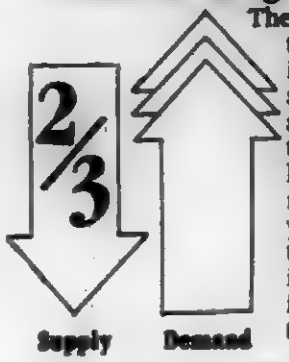
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active ☐☐
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In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

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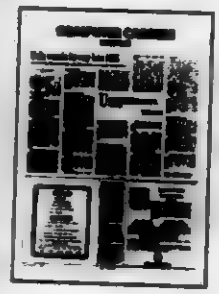

And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

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Is OS/2 for you?

By Joe Panepinto

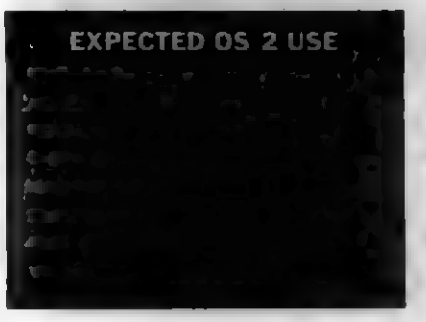
Over the past few years, many information systems managers interested in a 32-bit desktop operating system sat on the fence waiting for the arrival of Microsoft Corp.'s Windows NT. Now that Windows NT is a reality, and too memory-intensive for most desktops, many of those managers have come down firmly on the OS/2 side, plunking down cash for the recently released Version 2.1. But what does this mean for the career-minded? Will interest in OS/2 continue to grow, and is it a marketable skill to have?

Some say yes . . .

"If you want a 32-bit desktop operating system you have three options," says Neal Hill, senior analyst for computing strategy research at Forrester Research, Inc. in Cambridge, Mass. "You can get Unix and plunge off the end of the earth into the land of technical computing; buy NT, which is a beast on your resources; or pick up OS/2, which behaves well and doesn't cost two arms and half a leg in terms of desktop resources."

By 1995, Forrester predicts Windows NT and Unix will each hold only 10% of the "superclient" operating system market compared with 23% for OS/2.

In fact, it seems that for the first time since it was introduced by IBM and then-partner Microsoft, OS/2's current and future place in the market is assured. For example, in a little more than a year, the Bay Area OS/2 User Group has grown from an idea to an organization with more than 250 regular members.



"There is a really big ground swell of enthusiasm for this operating system," says Sanford Rockowitz, president of Minaret Software and head of the Bay Area OS/2 group. "It was an approach/avoidance thing with NT. When it was far away, it was perfect. Now that it's here, people are realizing the advantages of OS/2."

The resurrection of OS/2 may be a quirky little tale, but it is one that does not surprise those who have touted OS/2's multitasking and multithreading abilities, along with its ability to run DOS, Windows and OS/2 applications simultaneously on a single desktop machine. What sets OS/2 apart from Windows NT is its comparatively slim memory requirement.

Some say maybe . . .

This is not to say OS/2 is setting the world on fire and becoming the must-have desktop operating system and skill set. Windows is still far-and-away a more popular, albeit lower-end desktop.

OS/2 is mainly a development platform because development takes advantage of its inherent strengths such as preemptive multitasking and multithreading.

"OS/2 is a good development tool because it allows a developer to write a program in one window, compile it in another and debug it in a third," says Paolo Pignatelli, a former researcher at AT&T Bell Laboratories and owner of The Corner Store, an OS/2-only store in Litchfield, Conn.

Preemptive multitasking supports the kind of client/server applications that have complex communication requirements such as maintaining simultaneous communication with a local file server, a remote database server and a mainframe. The only problem is, there's a dearth of applications with such high levels of communications requirements.

OS/2 enthusiasts, however, are quick to point out that through the Win-32 Program Manager in OS/2 2.1, users can run all Windows and DOS applications.

"We use OS/2 in a very limited way," says John Sill, manager of technical operations at CBI Industries, Inc. in Oak Brook, Ill. "We use it to run our [Microsoft] SQL Server database server, but it is too big and complicated for most people's desktops."

For example, while OS/2 may take fewer resources to run than Windows NT, it is more memory-intensive than Windows. Also, while navigating the file system in OS/2 would be familiar to people with Windows or DOS experience, the setup of the system is very complex.

Panepinto is a free-lance writer in Amherst, Mass.

Learning OS/2

The difficulty of learning OS/2 varies widely, depending on its intended use. From an OS/2 programmer's perspective, there is a demand for programmers who know C, IBM's DB2 2.0 and SQL, as well as IBM's CUA [Common User Access], which is a guide to graphical user interface development, according to Mark Larsen, account manager at Computer Task Group, a consultancy in Danbury, Conn.

"If you're working on building OS/2 applications, you should understand and adhere to IBM's CUA guidelines," Larsen says. "But, all it takes is some reading."

Andy Spanos, a senior software engineer at Unisys Corp. in Plymouth, Mich., says he taught himself OS/2 programming using a 32-bit compiler, the IBM manuals and the "brute force method."

"We decided it was the platform our group was going to use, and we had a month to learn it," he says. "It really wasn't any harder than teaching myself Windows." —*Joe Panepinto*

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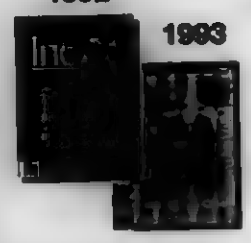

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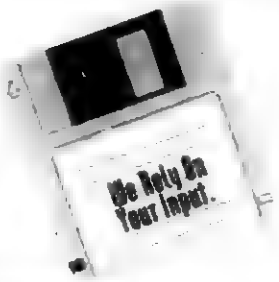

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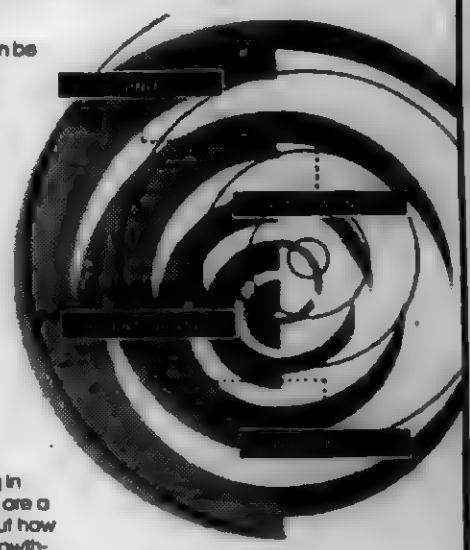

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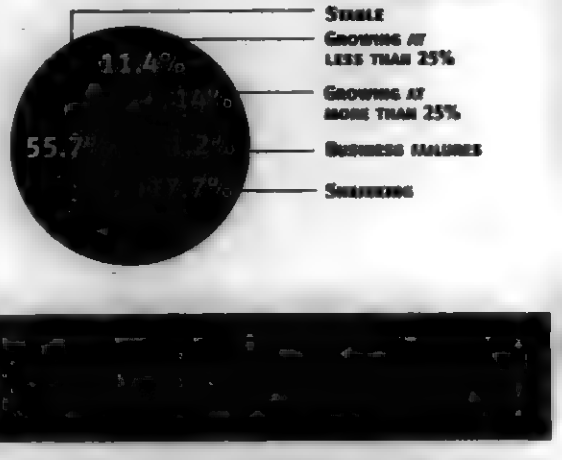

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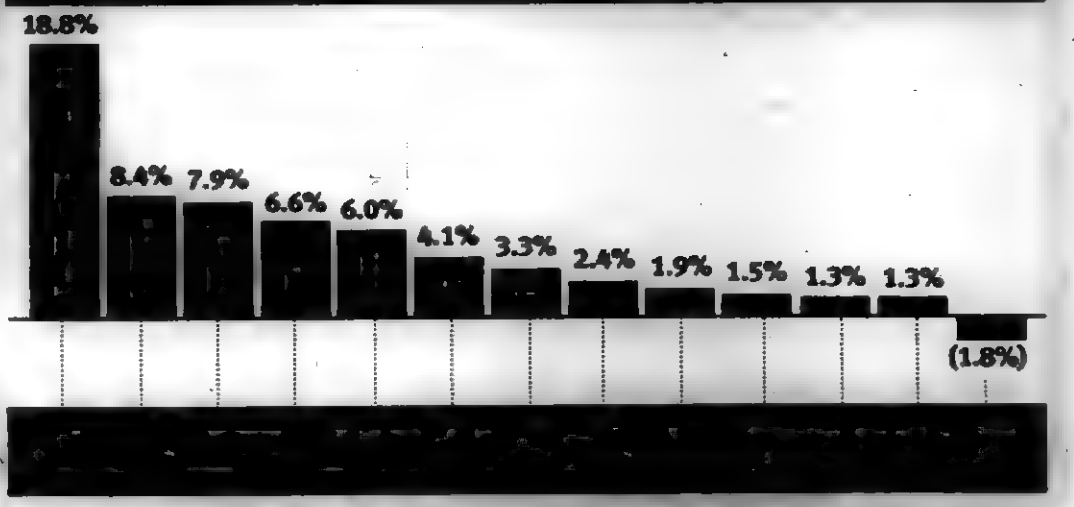

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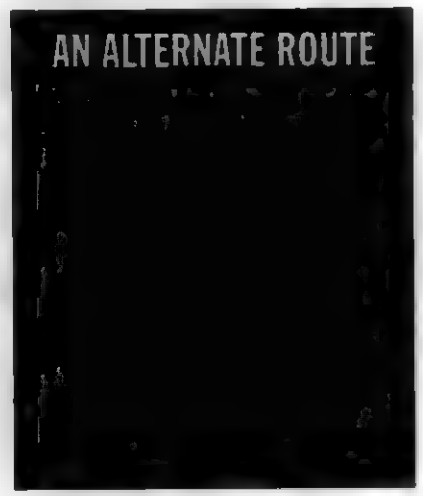
CorpTech, a directory publisher in Woburn, Mass., tracks the U.S.' 35,000 technology manufacturers. This survey relates to the 25,252 tracked firms with fewer than 1,000 employees.

Start-up telecom providers pass on savings

By Joe Panepinto

Prior to 1984, choosing a telecommunications service provider was easy — you picked up the telephone and called Ma Bell. Today, especially with new niche telecommunications service vendors popping up all the time, what used to take a single call — local, long-distance, voice and data services — takes months of planning and plenty of know-how.



"You can shop around and look to get everything piecemeal, or you can hold your nose and get AT&T to do everything," says Ray Boggs, senior analyst at BIS Strategic Decisions in Norwell, Mass. "Luckily for people who don't want to shop around, in many places, it's still like it used to be for IBM — you won't get fired for going with AT&T."

As was (and is) the case with IBM, however, AT&T is feeling the squeeze from all sides as small start-ups rush to provide specialized services for everything from WATs and leased lines to cellular and international telecommunications. With such vigorous competition, you can be sure there are bargains to be had.

"Never, never, never tell a vendor to give you whatever you need because they will charge you a premium on everything," says Ed Roberts, telecommunications manager at Fletcher Construction of North America, a large outfit in Seattle. Many times it works out that the smaller the vendor the better, even for large companies, he says.

With the market so dynamic and telecommunications managers stuck in the Ma Bell way of thinking, small or relatively unknown telecommunications service vendors are being aggressive and taking the savings directly to end-user organizations. For example, Fletcher Construction of North America had been using Cellular One for cellular telephone service and was being charged roughly 32 cents per minute when a smaller provider offered the same service for 10 cents less per minute. He called other users, checked their support records and signed with the smaller provider.

To take advantage of such savings, Roberts recommends keeping contracts as short as possible.

Panepinto is a free-lance writer in Amherst, Mass.

Using a seat-of-the-pants shopping style for telecommunications services may work for some, but it's an option in which few can indulge. Large organizations use the following methods when selecting a provider:

Visa International, Inc., San Mateo, Calif.: Visa has set rigid guidelines to evaluate the services of outside vendors, as well as internal organizational needs.

How: To evaluate global satellite services, Visa has assigned a project manager and formed a group with people from various corporate departments. The group develops evaluation criteria and assigns weights to each. The list includes hard information such as price and mean time between failure, and softer information regarding a vendor's service record, reputation and potential for bringing future developments to the table.

"This elaborate set of internal rules helps guarantee all products and services are evaluated on an equal basis," says Morgan Taylor, telecommunications manager. A lot is at stake. Taylor says his budget for voice and data telecommunications services is more than $10 million per year.

Los Angeles County: Los Angeles County has an internal process for evaluating requirements that kills two birds with one stone.

How: While it analyzes the county's telecommunications needs, this process also puts together key information to include in a request for proposals (RFP) for new services. In the past six months, the county has settled at least two major telecommunications contracts, a Centrex services agreement with Pacific Bell and a new long-distance service agreement with MCI Communications Corp. worth $1.1 million per year.

A critical key: When assembling the RFP and evaluating vendor bids, a detailed report of telecommunications service use was culled from six months of billing information. Vendors were asked to bid on the basis of the summary statistics and use patterns.

As part of its telecommunications services contracts, Los Angeles County also requires providers to offer billing tapes or files that it can analyze using specialized billing analysis software.

Currently, Los Angeles County gets bills for telecommunications services from about a dozen vendors that are run through the software and summarized into management forms that detail use.

The software also has a database of equipment the county leases, including telephone lines, that it checks against incoming bills to ensure that all charges are appropriate.

"The more you know about your requirements, the better able you are to make informed decisions about purchasing services," says Tom Lang, an internal consultant with the Los Angeles County.

"That doesn't mean you're going to necessarily make good decisions, just informed ones. In this market there is still lots of guessing involved and some luck."

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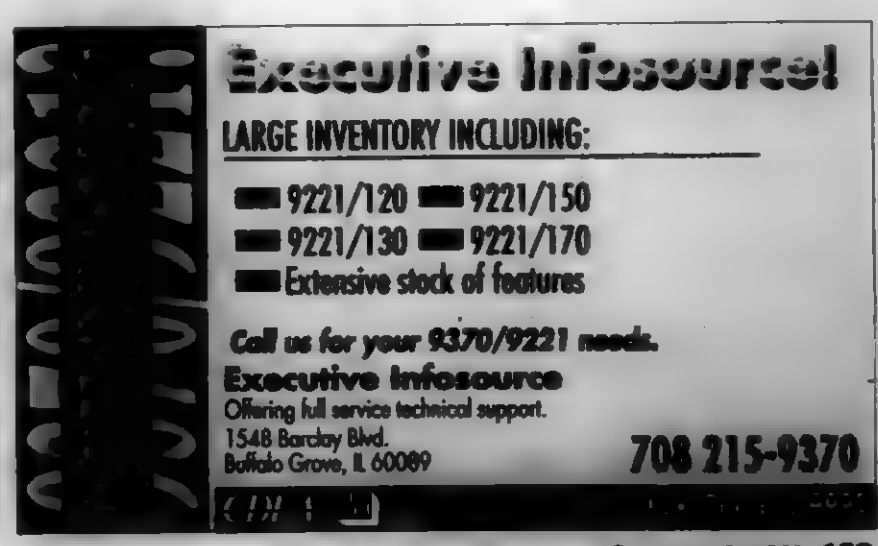

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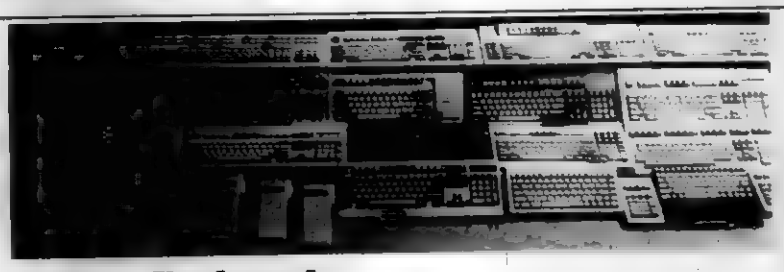

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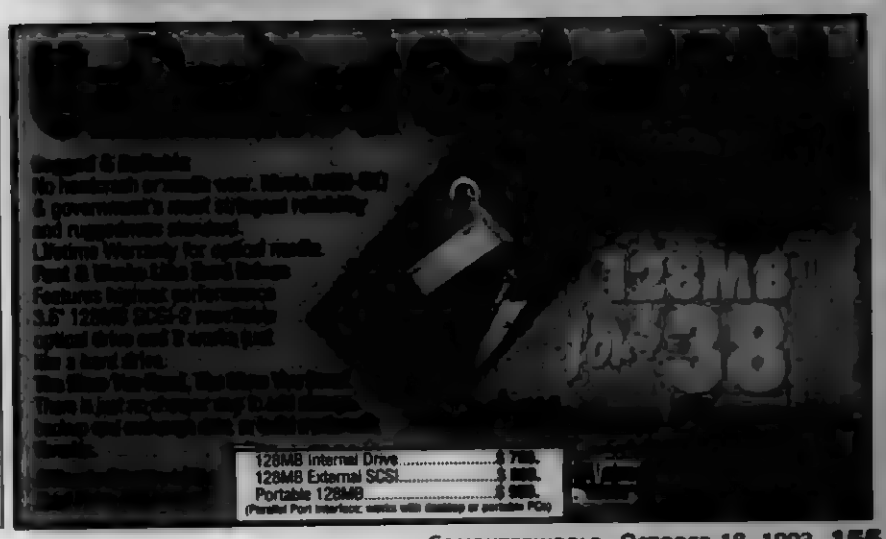

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Sequoia Systems Inc.	57.4
Symbios Inc.	34.0
Exabyte	31.8
Wellfleet Comm.	29.3
Gupta	28.1
Data Race Inc.	27.6
Xircom	27.3
Mentor Graphics	26.3

Dollar

DSC Communications	15.50
Wellfleet Communications	11.00
Motorola Inc.	9.13
Bell Atlantic Corp.	6.75
Cabletron Systems	6.75
SynOptics	6.38
Oracle Corp.	5.88
Silicon Graphics	5.75

Losers

Percent

McAfee Associates	-37.3
Cray Computer	-21.9
Raychem Technologies Inc.	-21.0
Analysts Int'l.	-20.7
Maxtor Corp.	-17.9
Adv. Computer Systems	-15.0
Gambit Square Research	-11.8
Oracle Software Assoc.	-11.9

Dollar

Raychem Technologies Inc.	-5.75
Analysts Int'l.	-4.25
Symbios Inc.	-4.00
Intel Corp.	-2.75
Xyvision Corp.	-2.75
Micro Focus (L)	-2.63
Oracle Corp.	-2.50
Novell Inc.	-2.25

Conference theme: Everything that converges must rise

The magic word was "convergence" at the 14th Alex. Brown & Sons, Inc. Technology Seminar held in Baltimore last week.

Convergence refers to the intersection of semiconductors, computer systems, cable TV, consumer electronics, communications technology and the kitchen sink that is increasingly referred to as the hoped-for "digital highway."

Alex. Brown analysts said they expect new digital highway media such as interactive television, as well as more current multimedia platforms, to be the next driving force for technology stocks.

"We've hit a flash point," analyst Eric Jansen said. According to Jansen, the rapid advances in semiconductor technology have brought multimedia capabilities to an acceptable combination of price and quality.

Microsoft Corp. (MSFT) played to the convergence theme in its presentation at the seminar. Craig Mundie, vice president at Microsoft's Advanced Consumer Technology Group, said his division has more than 200 employees working on platforms and applications for the digital highway. Microsoft hopes to develop a software architecture for interactive television, which Mundie called "the next volume opportunity after the PC."

In the future, for example, cable operators may be able to "narrowcast" over switched networks, presenting an interactive interface and a selection of channels that is customized to each viewer's preference.

The convergence theme was also highlighted by the news of **Bell Atlantic Corp.**'s (BEL) intended acquisition of cable company **Tele-Communications, Inc.** (TCOM) (see story page 16).

—Derek Slater

Picks and pans

Institutional investors tapped communications technology as the runaway choice for most-attractive investment opportunity; design automation software and desktop software received the fewest votes

Source: Alex. Brown & Sons, Inc. poll of 122 institutional investors

Exch	52-Week High	52-Week Low		Oct. 15 3 PM	Wk Net Change	Wk Pct Change
OTC	40.00	17.63	3 COM Corp.	31.50	1.88	6.3
NYS	91.13	63.38	American Info Techs Corp.	87.75	3.63	4.3
NYS	65.00	41.00	AT&T	60.75	-3.13	-5.4
OTC	4.06	0.75	Antel Communication Corp.	4.06	0.81	25.0
OTC	24.50	12.50	Banyan Systems Inc.	19.00	1.50	8.6
NYS	67.13	44.50	Bell Atlantic Corp.	67.13	6.75	11.2
NYS	62.88	46.75	BellSouth Corp.	62.38	2.75	4.6
NYS	14.75	3.75	Bolt, Beranek & Newman	10.63	1.13	11.8
OTC	18.50	9.50	Brooktrout Technology	12.50	-0.25	-2.0
NYS	119.00	66.00	Cabletron Systems	99.13	6.75	7.3
OTC	36.50	8.50	Centigram Communications (H)	35.75	1.50	4.4
OTC	55.50	20.25	Chipcom Corp.	52.50	6.88	10.2
OTC	59.25	28.38	Cisco Systems Inc.	50.13	5.13	11.4
OTC	17.25	7.63	Compression Labs Inc.	17.25	2.50	16.9
OTC	36.00	20.75	CrossComm	28.25	3.50	14.1
OTC	4.63	1.69	Data Switch Corp.	2.50	0.25	11.1
NYS	19.88	12.38	Digital Comm. Assoc.	18.63	-0.13	-0.7
OTC	12.75	3.75	Digital Systems Int'l. Inc.	4.50	0.00	0.0
OTC	71.13	13.50	DSC Communications	71.13	13.50	23.4
OTC	9.50	4.75	Fibronix Int'l. Inc.	5.38	-0.38	-6.5
OTC	24.00	8.75	Filenet Corp.	15.00	1.00	7.1
OTC	4.38	1.50	Gandalf Technologies Inc.	3.25	0.53	19.5
OTC	2.06	0.75	Gateway Communications	0.78	-0.03	-3.9
NYS	15.75	3.88	General Datacomm Inds.	10.88	0.63	6.1
ASE	3.75	2.00	Go Video	2.63	0.06	2.4
NYS	39.00	32.88	GTE Corp.	38.88	0.63	1.6
NYS	94.75	64.63	ITT Corp.	92.50	0.25	0.3
OTC	29.88	16.81	MCI Communications Corp.	29.50	1.75	6.3
OTC	6.50	1.50	Microcom Inc.	2.88	-0.25	-8.0
OTC	24.25	3.50	Netrix Corp.	5.25	0.50	10.5
OTC	19.00	6.50	Network Computing Devices	7.75	1.25	19.2
NYS	15.00	5.38	Network Equipment Tech.	8.50	0.25	3.0
OTC	20.13	8.00	Network General	14.25	1.75	14.0
OTC	15.75	6.88	Network Systems Corp.	8.25	0.38	4.8
OTC	73.88	11.19	Newbridge Networks Corp.	69.38	2.13	3.2
NYS	46.00	21.38	Northern Telecom Ltd.	26.88	2.50	10.3
OTC	35.25	17.00	Novell Inc.	19.25	0.88	4.8
NYS	48.88	39.50	Nynex Corp.	45.38	0.75	1.7
OTC	30.00	18.00	Octel Communications Corp.	25.13	1.13	4.7
OTC	6.13	3.50	Penril Data Comm Networks	4.31	-0.06	-1.4
OTC	30.50	14.50	Picturetel Corp.	17.50	0.00	0.0
OTC	11.50	3.63	Proteon Inc.	5.88	0.25	4.4
NYS	38.88	17.75	Scientific Atlanta Inc.	38.88	5.38	16.0
NYS	47.00	31.75	Southwestern Bell Corp.	42.63	1.13	2.7
NYS	39.50	23.38	Sprint Corp.	39.50	2.38	6.4
OTC	27.00	12.50	Standard Microsystems Corp.	23.50	-0.38	-1.6
OTC	18.88	9.25	Stratacom Inc.	18.88	4.88	34.8
OTC	42.75	18.63	Synoptics Communications	27.00	5.50	25.6
OTC	7.75	2.88	Telebit Corp. (H)	7.75	0.75	10.7
OTC	17.88	3.00	Telematics Int'l. Inc.	15.25	0.88	6.1
OTC	35.25	15.75	US Robotics	33.00	0.25	0.8
NYS	50.25	35.25	US West Inc.	50.00	0.88	1.8
OTC	56.00	23.50	Wellfleet Communications	54.00	11.00	25.6
OTC	19.50	7.25	Xircom	18.25	1.25	7.4

Exch	52-Week High	52-Week Low		Oct. 15 3 PM	Wk Net Change	Wk Pct Change
OTC	5.56	2.50	Advanced Logic Research	2.88	-0.38	-11.5
OTC	61.25	22.00	Apple Computer Inc.	28.00	5.00	21.7
OTC	24.25	12.75	AST Research Inc.	18.00	1.00	5.9
NYS	9.25	2.50	Commodore Int'l.	3.25	-0.13	-3.7
NYS	62.00	38.13	Compaq Computer Corp.	62.00	4.38	7.6
OTC	49.88	13.50	Dell Computer Corp.	18.88	2.50	15.3
NYS	89.25	53.75	Hewlett Packard Co.	69.88	2.13	3.1
NYS	46.00	20.38	Silicon Graphics	46.00	5.75	14.3
OTC	41.00	21.13	Sun Microsystems Inc. (L)	23.38	1.63	7.5
NYS	39.38	24.63	Tandy Corp. (H)	37.13	-1.75	-4.5
OTC	7.00	2.50	Zeos International Ltd.	3.75	0.63	23.8

Exch	52-Week High	52-Week Low		Oct. 15 3 PM	Wk Net Change	Wk Pct Change
ASE	8.75	4.50	Adaptec Corp.	4.88	-1.00	-17.0
NYS	8.75	3.63	Conner Computer	5.38	-0.13	-2.3
OTC	6.13	2.25	Cray Computer	3.13	-0.88	-21.9
NYS	30.88	19.00	Cray Research Inc.	23.75	-0.38	-1.6
NYS	13.88	7.75	Data General Corp.	9.88	-0.25	-2.5
NYS	49.25	30.38	Digital Equipment Corp.	37.38	-0.63	-1.6
NYS	44.00	30.50	Harris Corp.	43.25	1.38	3.3
NYS	70.25	40.63	IBM	44.50	0.50	1.1
OTC	25.75	6.75	Kendall Square Research	18.50	-2.50	-11.9
NYS	141.50	83.00	Matsushita Electronics	139.00	2.00	1.5
OTC	23.75	9.50	NetFrame	16.63	1.88	12.7
OTC	25.00	9.25	Parallan Computer	21.50	0.00	0.0
OTC	23.25	7.75	Pyramid Technology	15.50	0.00	0.0
OTC	24.00	11.25	Sequent Computer Sys.	17.75	2.50	16.4
OTC	5.50	1.38	Sequoia Systems Inc.	4.63	1.69	57.4
NYS	41.25	20.25	Stratus Computer Inc.	27.00	0.50	1.9
NYS	16.88	8.50	Tandem Computers Inc.	12.50	-0.25	-2.0
OTC	23.75	10.63	TriCord Systems	23.75	3.25	15.9
NYS	13.88	8.00	Unisys Corp.	11.88	-0.25	-2.1

Exch	52-Week High	52-Week Low		Oct. 15 3 PM	Wk Net Change	Wk Pct Change
OTC	37.00	14.00	Adobe Systems Inc.	22.25	2.75	14.1
OTC	23.00	11.75	Aldus Corp.	23.00	4.13	21.9
OTC	11.25	5.50	American Software Inc.	7.13	0.38	5.6
OTC	28.13	9.50	Ask Computer Systems	12.00	-2.13	-15.0
OTC	56.75	38.75	Autodesk Inc.	47.75	3.25	7.3
OTC	7.75	2.50	Bachman Info. Systems	3.25	-0.13	-3.7
OTC	63.00	24.00	BGS Systems Inc.	26.00	0.50	2.0
OTC	84.13	38.75	BMC Software Inc.	58.88	1.63	2.8
OTC	28.25	18.00	Boole & Babbage	25.00	0.50	2.0
OTC	35.00	12.75	Borland Int'l Inc.	15.38	-0.63	-3.9
OTC	5.00	2.75	CE Software	4.19	0.31	8.1
ASE	40.25	14.41	Cheyenne Software Inc.	38.00	5.25	16.0
OTC	19.50	8.25	ChipSoft	14.75	0.25	1.7
OTC	9.88	5.63	Cognos Inc.	9.88	1.50	17.9
NYS	35.50	16.50	Computer Associates (H)	35.00	1.00	2.9
NYS	7.00	2.75	Computervision Corp.	2.88	-0.13	-4.2
OTC	34.25	19.25	Compuware Corp.	26.25	2.75	11.7
OTC	14.75	5.75	Comshare Inc.	11.00	-0.50	-4.3
OTC	37.00	10.75	Corel Corp. (H)	34.25	0.38	1.1
OTC	15.25	5.00	Easel Corp.	6.00	-0.25	-4.0
OTC	25.25	15.00	4th Dimension	23.88	1.00	4.4
OTC	19.25	5.25	Frame Technology	8.63	1.13	15.0
OTC	17.50	8.00	Group I Software	10.25	2.25	28.1
OTC	35.25	14.00	Gupta	18.50	2.25	13.8
OTC	12.00	4.75	Hogan Systems Inc.	11.25	0.00	0.0
OTC	26.75	11.25	IMRS	26.75	4.00	17.6
OTC	44.75	25.50	Information Resources	37.75	1.25	3.4
OTC	27.25	12.00	Informix Corp.	20.50	-1.25	-5.7
OTC	14.50	8.50	Intergraph Corp.	10.25	0.25	2.5

Exch	52-Week High	52-Week Low		Oct. 15 3 PM	Wk Net Change	Wk Pct Change
OTC	13.63	4.88	Interleaf Inc.	6.13	0.63	11.4
OTC	16.50	4.75	Intersolv Inc.	8.75	-0.50	-5.4
OTC	17.25	7.75	Knowledgeware Inc. (H)	16.75	2.50	17.5
OTC	54.75	15.50	Legent Corp.	24.75	0.75	3.1
OTC	50.25	17.50	Lotus Development (H)	49.50	3.13	6.7
OTC	23.00	4.25	MathSoft	5.25	-0.63	-10.6
OTC	22.00	4.50	McAfee Associates	6.00	-2.25	-27.3
OTC	11.63	2.50	Meca Software	6.67	1.34	26.2
OTC	12.00	6.00	Mentor Graphics	11.63	1.50	14.8
OTC	46.00	20.38	Micro Focus (L)	21.88	-2.63	-10.7
OTC	13.25	6.38	Microsoft Inc.	8.25	0.63	8.2
OTC	98.00	70.38	Microsoft Corp.	82.25	-1.88	-2.2
OTC	64.38	18.88	Oracle Corp.	64.38	5.88	10.0
OTC	44.25	22.50	Parametric Technology (H)	44.25	4.25	10.6
OTC	40.50	22.50	Peoplesoft	39.25	2.88	7.9
OTC	7.13	3.75	Phoenix Technologies	6.38	0.13	2.0
OTC	40.00	22.00	Powersoft	30.00	3.50	13.2
OTC	38.25	11.34	Platinum Software (H)	35.25	5.50	18.5
OTC	25.00	8.75	Platinum Technology	10.38	0.63	6.4
OTC	61.50	32.25	Progress Software Corp.	57.25	-1.00	-1.7
OTC	7.38	2.13	Quarterdeck Office Sys. (L)	2.13	-0.03	-1.4
OTC	32.00	16.00	Rainbow Technologies Inc.	18.75	-5.25	-21.9
OTC	11.38	4.25	Rasterops	7.75	-0.38	-4.6
OTC	15.25	3.63	Ross Systems	12.88	-0.13	-1.0
OTC	28.75	10.88	Sapiens Intl. Corp. N.V.	27.25	1.50	5.8
OTC	14.50	5.50	Software Publishing Corp.	6.75	0.50	8.0
OTC	16.63	2.63	Software Toolworks Inc.	16.63	2.13	14.7
OTC	2.75	0.75	Spinnaker Software	1.44	0.13	9.5
OTC	13.75	4.63	State of the Art	10.25	0.50	5.1
NYS	28.13	17.63	Sterling Software Inc. (H)	29.13	4.25	17.1
OTC	21.63	9.63	Struct. Dynamics Research	14.13	0.75	5.6
OTC	77.50	38.00	Sybase Inc.	68.63	4.63	7.2
OTC	20.50	8.75	Symantec Corp.	20.00	0.13	0.6
OTC	25.50	10.00	System Software Assoc.	13.00	-1.75	-11.9
OTC	6.38	2.75	Timeize Corp.	6.00	0.50	9.1
OTC	26.50	13.50	ViewLogic Systems	23.00	-0.38	-1.6
OTC	23.50	5.50	Walker Interactive Systems	7.75	0.00	0.0
OTC	3.19	0.97	Wordstar (L)	1.00	-0.09	-8.6

Exch	52-Week High	52-Week Low		Oct. 15 3 PM	Wk Net Change	Wk Pct Change
NYS	32.88	12.88	Advanced Micro Devices	20.50	-0.25	-1.2
NYS	28.00	10.38	Analog Devices Inc.	23.38	-1.63	-6.5
OTC	38.63	12.13	Atmel Corp.	32.38	-2.75	-7.8
OTC	6.25	2.75	Chips and Technologies	5.38	0.50	10.3
OTC	39.75	13.00	Cirrus Logic	35.50	3.75	11.8
NYS	36.75	7.88	Cypress Semiconductor Corp.	12.63	-0.88	-6.5
NYS	19.00	11.13	Dallas Semiconductor	17.75	0.75	4.4
OTC	74.50	31.13	Intel Corp.	66.00	-2.75	-4.0
NYS	19.25	6.25	LSI Logic Corp.	15.38	0.38	2.5
OTC	26.75	11.88	Lattice Semiconductor	22.63	0.25	1.1
NYS	63.63	16.25	Micron Technology	47.50	-0.13	-0.3
NYS	105.88	47.06	Motorola Inc.	105.88	9.13	9.4
NYS	21.75	10.13	National Semiconductor	17.38	-0.75	-4.1
OTC	15.75	6.50	Sierra Semiconductor	8.00	0.38	4.9
OTC	51.88	25.75	SynOptics	51.88	6.38	14.0
NYS	84.25	45.13	Texas Instruments	68.38	0.13	0.2
OTC	18.88	6.50	VLSI Technology	14.75	-1.50	-9.5
OTC	14.38	3.50	Weitek	12.13	0.00	0.0
ASE	9.63	3.63	Western Digital Corp.	6.63	1.50	29.3
OTC	54.50	15.50	Xilinx	43.25	-2.13	-4.7
OTC	39.75	18.00	Zilog Inc. (H)	39.75	4.88	14.0

Exch	52-Week High	52-Week Low		Oct. 15 3 PM	Wk Net Change	Wk Pct Change
OTC	24.75	9.25	American Power Conversion	23.50	2.38	11.2
OTC	22.75	15.50	Banctec Inc.	21.75	1.00	4.8
OTC	18.00	3.50	Cambex Corp.	3.94	-0.31	-7.3
ASE	18.38	3.88	Cognitronics Corp.	4.13	0.00	0.0
NYS	25.50	9.00	Conner Peripherals	10.13	0.63	6.6
OTC	38.50	16.50	Creative Technologies Inc.	25.00	4.00	19.0
OTC	30.75	6.50	Data Race Inc.	9.75	2.00	27.6
ASE	13.25	5.63	Databarn Corp.	9.88	0.50	5.3
NYS	38.88	7.38	EMC Corp. (H)	38.75	4.38	12.7
OTC	10.50	5.25	Emulex Corp.	6.88	0.00	0.0
OTC	19.00	14.00	Evans & Sutherland	17.00	0.00	0.0
OTC	20.63	7.50	Exabyte	13.75	3.25	31.0
OTC	34.00	9.59	Intelligent Info. Systems	25.25	-1.25	-4.7
OTC	6.88	2.50	Iomega Corp.	3.50	0.75	27.3
OTC	14.75	5.75	IPL Systems Inc.	9.25	1.25	15.6
OTC	24.00	14.25	Komag Inc.	15.13	0.13	0.8
OTC	19.63	4.38	Maxtor Corp.	5.25	0.63	13.5
OTC	10.00	5.75	Micropolis Corp.	6.13	-0.38	-5.8
NYS	117.00	97.25	3M Corp	104.50	0.75	0.7
OTC	8.00	4.00	Printronix Inc. (H)	7.25	0.00	0.0
NYS	17.25	7.38	QMS Inc.	8.88	-0.13	-1.4
OTC	17.88	9.38	Quantum Corp. (L)	10.63	-0.13	-1.2
OTC	7.13	3.13	Radius Inc.	3.63	-0.13	-3.3
NYS	17.00	10.13	Recognition Equipment (H)	16.88	0.13	0.7
OTC	13.88	3.75	Relion Inc.	3.75	-0.13	-3.2
OTC	22.38	13.13	Seagate Technology	20.00	2.63	15.1
NYS	45.00	18.00	Storage Technology	26.25	-0.50	-1.9
NYS	27.88	17.63	Tektronix Inc.	23.25	0.25	1.1
NYS	88.88	69.88	Xerox Corp. (L)	73.25	1.13	1.6

Exch	52-Week High	52-Week Low		Oct. 15 3 PM	Wk Net Change	Wk Pct Change
OTC	23.75	14.88	American Mgmt. Systems	18.38	0.38	2.1
NYS	4.75	2.38	Anacomp Inc.	2.88	0.00	0.0
OTC	23.84	13.36	Analysts Int'l.	16.75	-4.25	-20.2
NYS	66.13	46.00	Auto Data Processing	53.00	2.38	4.7
NYS	19.88	13.00	Ceridian Corp. (H)	19.38	-0.13	-0.6
OTC	18.25	13.13	Comdisco Inc.	18.25	1.25	7.4
OTC	13.00	4.50	Computer Horizons (H)	13.00	0.13	1.0
NYS	94.88	66.00	Computer Sciences	94.75	4.00	4.4
NYS	9.25	6.00	Computer Task Group	6.88	0.00	0.0
NYS	40.50	19.00	CompUSA Inc.	26.00	-0.88	-3.3
OTC	14.25	7.00	Corporate Software	11.25	-0.25	-2.2
OTC	13.75	6.63	Egghead Discount Software	7.38	0.38	5.4
NYS	35.88	26.00	General Motors E (EDS)	30.00	1.50	5.3
OTC	25.50	12.00	Intacon Corp.	17.50	-0.50	-2.8
OTC	24.13	8.13	Intelligent Electronics	23.38	0.13	0.5
OTC	16.50	7.88	Mervises	16.50	1.50	10.0
OTC	28.50	5.75	Microdot Inc. (H)	28.25	0.75	2.7
OTC	34.75	20.34	Paychex	33.75	0.50	1.5
NYS	87.25	21.63	Policy Management Sys.	34.38	0.50	2.1
NYS	43.63	23.06	Reynolds and Reynolds	41.38	1.38	3.4
OTC	20.75	12.13	SEI Corp. (H)	20.50	-0.25	-1.2
OTC	25.88	17.50	Shared Medical Systems (H)	25.75	1.13	4.6
OTC	12.63	5.75	SHL Systemhouse	9.38	0.00	0.0
OTC	36.75	20.00	Software Spectrum Inc.	22.75	-1.25	-5.2
OTC	42.75	26.25	Sungard Data Systems	38.00	-4.00	-9.5
NYS	4.38	1.13	Ultimate Corp.	3.38	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

Everex finds buyer

Everex Systems, Inc. has been sold for an undisclosed amount to Yside Investment Group, an alliance of Taiwanese companies. Yside said it will keep the Everex brand name alive to gain a foothold in the U.S. PC market.

Wellfleet soars

For its first fiscal quarter ended Sept. 30, Wellfleet Communications Corp. reported revenue of $72.4 million, up 125% from the same period a year ago. Net income was $11.6 million, up 134% from the quarter a year ago.

Iomega posts loss

Iomega Corp. reported third-quarter net income of $900,000, an 85% decline from the comparable period last year. Revenue in the quarter was $36.1 million, off slightly from the year-earlier period. Iomega recently said it will lay off about 100 employees in a cost-cutting move [CW, Oct. 11].

Drive maker cuts 290

Conner Peripherals, Inc. has cut 290 employees as part of an overall, ongoing effort to resize the company because of market conditions and its acquisition of Archive Corp. in late 1992. Other elements of the restructuring will be announced with the release of third-quarter results on Thursday. Since January, 2,700 jobs have been cut.

SHORT TAKES H&R Block bought Meca Software, Inc., a provider of consumer financial software. . . . Stratus Computer, Inc. signed an agreement to buy the assets of BellSouth Systems Integration, Inc., an Atlanta vendor of networking software for Stratus' fault-tolerant computers and IBM's RS/6000 systems. The $15 million deal, expected to be completed this month, is the second for Stratus under a plan to diversify by acquir-

Intel stock takes surprise hit

Price drop belies record earnings; company readies for PowerPC onslaught

By Michael Fitzgerald
SANTA CLARA, CALIF.

The spotlight cast an unflattering light on Intel Corp. last week, despite a record earnings report.

Intel's stock was hammered, falling nearly 7% the day after its earnings came out, even though the company virtually matched analysts' expectations by posting a profit of $584 million on sales of $2.24 billion for the quarter ended Sept. 25. This compares with a profit of $240 million on sales of $1.4 billion for the year-earlier period. Intel posted a profit of $1.7 billion on sales of $6.3 billion through the first three quarters, up from $637 million on sales of $4 billion a year earlier, making it among the most profitable companies in the U.S.

Intel's stock was at $70.25 on Oct. 8, hit a high of $71.50 on Oct. 11, then closed at $65.50 after the news broke. It dipped even further to $62.50 before finishing Friday at $66.

Intel's David House: *Addressing the threat in a potentially crowded market*

Competition looming

Behind the contrarian stock drop is the potential for significantly increased competition next year in Intel's bread-and-butter I486 market. IBM, Texas Instruments, Inc., Advanced Micro Devices, Inc. and Cyrix Corp. will all ship 486 chips in volume next year.

Perhaps more ominous, at least in Intel's eyes, is the forthcoming threat posed by the PowerPC chip co-built by IBM, Apple Computer, Inc. and Motorola, Inc. IBM has already begun its PowerPC rollout, and Apple has said it intends to ship 1 million PowerPC systems in 1994. Groupe Bull also recently announced six new PowerPC-based workstations, which will be available in November in Europe and early next year in the U.S.

Such activity may have spurred Intel's recent decision to hold a press briefing at which an executive derided the company's RISC competitors, in particular railing against the PowerPC (see stories page 33 and 35).

Speaking at the briefing, David House, Intel's senior vice president of corporate strategies, singled out the PowerPC in many of his comments. He attacked its small software base and sneered at what he said was inflated system pricing, given that the PowerPC chip costs nearly $600 less than a comparable Pentium.

House compared system pricing for the new IBM RS/6000 PowerStation 250 workstation, which costs $8,495, with a Gateway 2000, Inc. 5/60's $4,290 price tag. He also compared a high-level version of the PowerStation priced at $22,607 with a $14,259 DeskPro 5/66M from Compaq Computer Corp. The systems are comparable.

'Bogus' criteria

Further, he downplayed various technical features, such as the smaller die size, lower chip price and lower power draw, that recent Motorola advertisements have touted as reasons for the PowerPC's superiority.

"Those are all bogus [buying criteria], and we just want people to pick up on that," House said in a separate interview with *Computerworld*.

Meanwhile, officials from Motorola and IBM seemed more bemused than wounded by the assault.

"I guess I am somewhat appreciative of the attention," said Phil Pompa, director of marketing at Motorola. Pompa said the software market was not static, noting that developers were porting applications to PowerPC. He said some developers are even building software that takes advantage of floating point, a RISC strength and an Intel weakness.

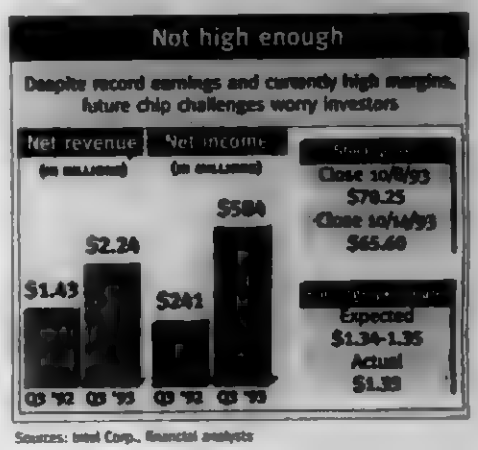
John Holz, IBM's director of technical workstation marketing, claimed that comparing RS/6000s with Pentium PCs is like "comparing a thoroughbred to a quarter horse." He cited the higher-performance, higher-cost graphics, internal bus structures and other components in any workstation vs. a PC. He also said that Intel quoted street prices on the PCs and list prices on the RS/6000s, adding that actual RS/6000 pricing can fall nearly 30% lower than list.

"Wait until the first part of next year, when IBM and others build PC-class machines around PowerPC," Holz added.

Reason for concern

The PowerPC teams also announced last week an 80-MHz version of PowerPC (the current versions run at 50 MHz and 66 MHz) and will announce today that they have reached first silicon on the 603, which is oriented toward portable computers [CW, Sept. 27].

Despite Intel's put-downs, it does have reason to be concerned. While Intel has touted Pentium and its follow-ons as its answer to the superior performance of RISC chips, those competitors still outperform Pentium in benchmark tests. Even House conceded that the PowerPC is 20% faster than the Pentium in floating-point operations. And the advent of platform-independent operating systems such as Microsoft Corp.'s Windows NT has focused industry scrutiny on Intel's ability to maintain not only its dominant market share but also its high margins.



Perhaps with that concern in mind, during the briefing, House, once Intel's leading RISC proponent, stressed Intel's huge installed base and application support, which analysts acknowledged gives it a step up in maintaining a grip on users' desktops.

But Dean McCarron, an analyst at Micro-Design Resources, Inc. in Scottsdale, Ariz., suggested Intel's installed base is not as dominant as it seems. "About a quarter of the market is non-Intel stuff, including [AMD and Cyrix]. All of that is potentially PowerPC," he said.

Odd claim

Taking another tack, House acknowledged that Intel-based vendors have lower prices in large part because of ferocious competition but argued that a similar clone market for RISC architectures will not develop.

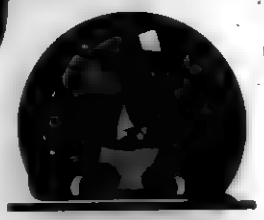
This seemed an odd claim, given that Apple and Groupe Bull already plan to ship PowerPC-based systems, and other systems are in the works. Also, the PowerPC initiative is targeting the chips to a wide variety of noncomputer industries where Motorola is a dominant player, such as automobiles, giving it a way to spread development costs.

In addition, Mips Technologies, Inc. has signed up OEMs for its chip as well.

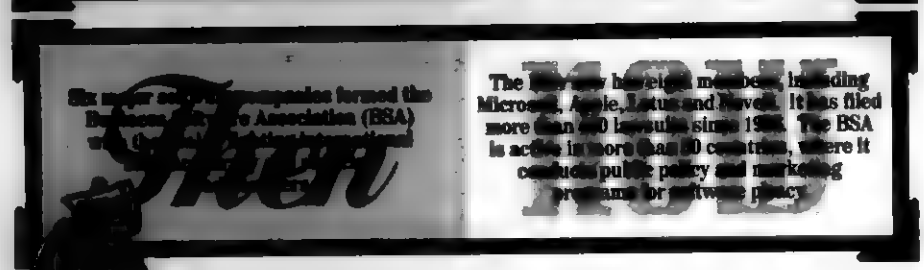
New and improved

Intel's Dave House acknowledged publicly for the first time that Intel's next 486DX chips will have "higher frequencies and higher performance" than the current DX2 chips, thanks to a new 0.6 micron manufacturing process. He said Intel has working models of these chips, which are referred to within the industry as the DX3 and are expected out in early 1994 [CW, July 26].

Wysiwyg



Here are some of the weird news stories from Computerworld's pages five years ago — but's now what has happened since the news broke in 1988.



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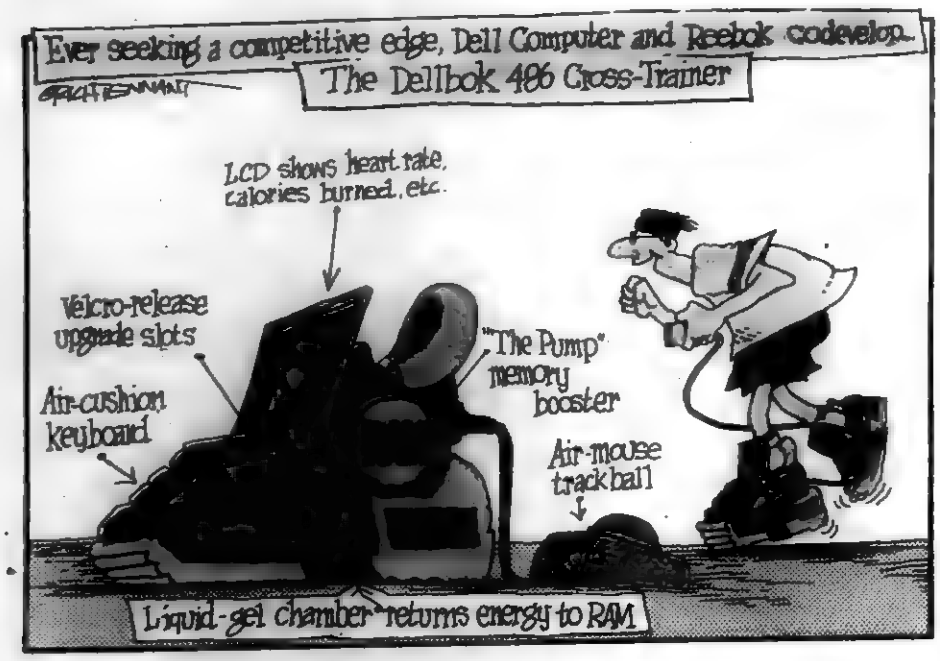
The 5th Wave *by* Rich Tennant



Inside Lines

Anyway but loose

Expect a half-dozen vendors next week to disclose their plans for implementing IBM's APPN Network Node in their products — using source code from UK company Data Connections Ltd., not IBM. IBM has said that it doesn't mind, as long as the industry starts buying APPN as an open internetworking strategy. APPN needs a jump-start: Gartner Group's David Passmore reports that only 15 out of 100 IS managers at a recent Gartner Group seminar indicated any interest in the architecture. So far, only four vendors have licensed APPN Network Node from IBM: 3Com, Systems Strategies, NRT and, most recently, Cisco.

AnyNet will do

Meanwhile, IBM is about to put some more meat on the bones of AnyNet, software that lets applications written to one networking protocol talk to applications written to another. Coming this week: sockets over SNA gateway that will let systems running TCP/IP communicate with systems talking Advanced Program-to-Program Communications (APPC) — without the need to run AnyNet software on every one of those systems, said Frank Dzubeck of Communications Network Architects. IBM will also make statements of direction to provide AnyNet APPC-to-TCP/IP products for AS/400s and RS/6000s, as well as an OS/2 AnyNet offering that will support NetBEUI over APPC.

Polishing the Emerald

It's been a year and a half since Hewlett-Packard started a full-throttle mainframe alternative push with its line of corporate business systems code-named Emerald, and now the company is ready to put a little more shine on its guns. HP has scheduled conference calls this week to let users know about a new series that will use a 7100 version of HP's PA-RISC microprocessor, scale up to eight processors and represent a 1½ times performance gain over the present series.

Why can't we get together?

Industry newsletter "Unigram-X" reports that members of the 10-month-old COSE vendor consortium want to create an entity dubbed "NewOrg" as a marketing arm, which would be detrimental to the OSF and Unix International. Sources told *Computerworld* the proposed group would bring HP and IBM — which both belong to the OSF — together with Sun up Sunday time so that the three can more aggressively market Unix.

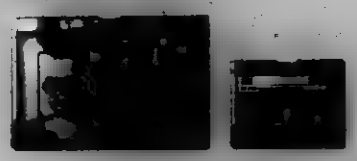
PS/Who?

Look for The PC Co. next month to add IBM's Blue Lightning processors, including the unannounced 33/100-MHz clock-tripler, to the PS/2 Models 70 and 77, and the 25/75-MHz chip to Models 60 and 57. PC Co. will also introduce a low-cost Model 30, based on the 25/50-MHz 486SLC2, with smaller hard drive configurations and a lower price, sources said. The PS/2s will also include optional CD-ROM drives and modularer versions that use Ieee Ethernet or Token Ring included on the motherboard. Prices could be as much as 30% less than those of existing PS/2s, the sources noted.

As the disk drive whirls

Compaq, meanwhile, will introduce an Nov. 1 the DeskPro/6M, with a full range of 486 processors, Enhanced Business Audio and Microsoft Corp.'s Windows Sound System 1.0, as well as some multimedia models, sources said. Compaq will also introduce ProLinea with an integrated design, made like the consumer-oriented Presario desktop.

Microsoft went to Atlanta to hook Cullen, tapping Lewis Hicks, chief networks officer at the Centers for Disease Control's National Immunization Division, as program manager of connectivity for the follow-on to Windows NT. Rahn confirmed. The outspoken 34-year-old is due to start at Microsoft on Oct. 20. Phone, fax or Computerworld News Editor Alan Alper with news tips at (508) 343-6474, (508) 875-8931 or 76537,2412, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8545.



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October 25, 1993, Vol. 27, No. 43, 146 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Mac user loyalties under stress

By James Daly

How could a company with brilliant engineers, wonderful technology and a fiercely loyal following make such a mess of things?

That's the question fans of Apple Computer, Inc. technology were asking last week as Chairman John Sculley packed his bags and left Apple in the throes of perhaps the biggest technological and spiritual crisis in its 17-year history.

Although Sculley left Apple in a state of disrepair — its earnings down, stock under water, top executives departing and the Macintosh an increasingly tough sell against the DOS/Windows juggernaut — corporate information systems managers who embraced Apple technology still display a brand loyalty that rivals that of Harley-Davidson enthusiasts.

Losing battle

Users say Apple's trademark ease-of-use distinction is giving way to low-cost Windows-based PCs

LOST [illegible]CTION

53% Yes

20% Somewhat

26% No

1% Don't know

(Response base: 124 Macintosh users surveyed in August 1993)

Source: Computerworld Database Division

Hanging tough

In a random survey of nearly two dozen corporate sites last week, none said they planned to leave the Macintosh.

"I've never met anyone who went from a PC to a Mac and then switched back. It only happens at gunpoint," said Valerie Tokunoto, who helps manage more than 1,800 Macintoshes as a member of the technical staff at The Aerospace Corp.

Mac users, *page 6*

CA to reveal plan to manage mixed nets

Unicenter goes client/server; OS/2 first port

By Thomas Hoffman

■ Computer Associates International, Inc. this week will disclose plans to deliver client/server versions of its CA-Unicenter systems management software for administering distributed platforms across a network.

CA's client/server systems management strategy is twofold. The company is developing client/server versions of CA-Unicenter to manage several specific distributed systems, including IBM's OS/2, Microsoft Corp.'s Windows NT, Novell, Inc.'s NetWare and UnixWare and Sun Microsystems, Inc.'s Solaris.

> "If we can centralize a lot of those management functions . . . that would be a big help."
> —*Gary Graham, Home Oil Co.*

The Islandia, N.Y., software giant is also building an OS/2-based Unicenter product that will enable users to manage multiple heterogeneous systems across a network from a single workstation, according to users and analysts who have been briefed by CA.

The announcements will be made in Chicago at CA's Systems Software Conference.

Although users said they were excited about CA's heady plans, a few prospective customers voiced skepticism over the vendor's ability to deliver one-stop systems management tools, given the technical hurdles CA will face in making Unicenter work across multiple operating systems.

For example, CA may have to develop a set of application programming interfaces to enable an OS/2-based client running Unicenter to manage an HP/UX server environment, said John Donovan, a senior analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

CA officials declined to comment on the strategy.

CA's Unicenter has evolved from its mainframe roots to embrace open systems. For example, CA has already delivered a version of CA-Unicenter for HP/UX Unix [CW, Aug. 9]. Versions for Sun and other Unix platforms will soon enter beta testing.

CA, *page 15*

Customer support

IBM blends services to strengthen sales

By Johanna Ambrosio and Thomas Hoffman

IBM consolidated its services under one virtual roof last week, a move that may finally put some muscle behind the company's longtime goal to derive more of its revenue from nonhardware businesses, observers said.

The new services group will also help the company get closer to its customers. It will, for example, provide IBM's sales force with even more industry-specific knowledge about customers' businesses, sources close to the company said. As such, the restructuring could help resolve long-standing complaints from many shops that IBM salespeople have lost touch with their needs.

The move more tightly connects IBM's outsourcing, consulting, technical, educational and other related functions for the North Amer-

IBM, *page 8*

As top PC makers regain edge, cloners lose, price wars wane

By Michael Fitzgerald

Compaq Computer Corp. and IBM PC Co.'s continuing gains against clone makers have users wondering if the steep price drops of the past two years will soon be a distant memory — like some of the smaller vendors that helped drive down tags.

Analysts project that the Top 10 PC makers will boost their share by 7% (see chart) to 11% this year at the expense of smaller vendors.

Shifting balance

The Top 10 PC hardware vendors, including IBM, Apple and Compaq, are gaining market share on the rest of the pack

Source: Computer Intelligence/InfoCorp, Santa Clara, Calif.

The resulting consolidation, analysts and vendors predict, could mean a return to the days of orderly price decreases based on component pricing, rather than the bloody battles that have characterized much of the 1990s.

"Smaller vendors simply aren't making money, and they can't use price as an attack weapon the way they used to," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. IDC projects an 11% gain for the Top 10 PC makers this year.

Meanwhile, the big players' results — fueled by aggressive cost-cutting and more innovative products — are booming. Com-

PC makers, *page 16*

Newspaper

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Report

CIOs tune in to interactive TV

Information systems executive Roy Prater is a man in a hurry. Prater and other IS chiefs at the nation's media and communications companies are in a feverish high-stakes race to install the technoinfrastructure that will turn the grand visions of interactive TV services into a reality

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October 25, 1993

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■ **IBM** puts a good face on **third-party sales of APPN** and makes major additions to **Networking Systems** product line. *Page 14*

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GEORGE LANGE/OUTLINE

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Executive Briefing

Skill fragmentation is a major challenge for companies attempting to implement client/server. The typical method of attacking projects is to stitch together teams consisting of specialists in various areas — LANs, PCs and mainframe databases. Working this way just doesn't cut it, say those who have tried. Some reasonable means has to be found to train IS staff in all disciplines *and* across platforms. *Page 53*

Some of the comforts of host-based systems are finding their way into the client/server environment. CA plans to deliver client/server versions of its CA-Unicenter systems management package for a variety of distributed operating systems over the next six months. *Page 1* This week, **Unisys** will release a port to Windows of its **Open/Mapper** application development environment. *Page 88* Several providers of departmental peer-to-peer networks are claiming to offer sophisticated centralized network management, user administration and security features. *Page 4*

Progress in network integration: At many sites, network management requires multiple terminals and staffs. New developments hint that the need for such redundancy will be short-term. **HP** promises that, by early 1994, network managers will be able to control TCP/IP and SNA networks from one OpenView management station. **Cabletron** plans a version of its network management software that will allow other management apps to run its hardware. And **IBM** enhances its **Networking Systems** product line to help SNA shops moving into distributed computing retain network coherence. *Page 14*

Windows made easier? Software developed by **Xerox's XSoft** division, from research at Xerox PARC, reportedly makes Windows easier to use, enclosing it within the metaphor of a student's notebook. **Compaq** has exclusive rights to the interface for a year and will include it with its next model release. *Page 16*

In the tip of the iceberg category are a couple of alliances, which experts say are the beginnings of trends: A Lotus pact with Gupta will add Notes support to Gupta's line of client/server development tools. This collaboration may be the first of many with RDBMS makers. *Page 20* Another is the merger of some small, privately held, suppliers of message-oriented middleware. Many mergers and buyouts are expected in this area as companies attempt to stock up on integration talent. *Page 133*

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Novell ups ante in peer LANs

By Elisabeth Horwitt
SAN JOSE, CALIF.

Novell, Inc. last week released Personal NetWare to go head-to-head with Microsoft Corp.'s Windows for Workgroups 3.11 in the corporate peer networking market.

The preceding generation of peer networking products essentially provided low-end file- and print-sharing services for small businesses that did not want the cost or technical trauma of setting up a true network operating system in a client/server environment.

While still serving small businesses, Personal NetWare, Windows for Workgroups 3.11 and Artisoft Corp.'s LANtastic 5.0 (see chart) also offer corporations an entry-level peer networking system for small sites that can hook into a full-scale client/server network whenever users are ready. The latest versions of all three products provide the centralized network management, user administration and security features that information systems managers have been demanding, the vendors said.

Transamerica Financial Services is thinking of implementing Personal NetWare to allow a few users to share hard disk space, according to Cheryl Grossman, senior technical analyst at the Los Angeles firm.

A major advantage that Personal NetWare has over the previous version, NetWare Lite, is the Universal NetWare Client, which allows users to do peer-to-peer and NetWare client access with the same protocol stack, said Ken Diliberto, network systems specialist for the city of Fresno, Calif. NetWare Lite had its own client protocol.

Still working

While Windows for Workgroups 3.11 supports Novell's IPX transport protocol, Microsoft is still negotiating with its rival for the right to implement the NetWare client requester on Windows for Workgroups and Windows NT. Without the requester, Windows NT and Windows for Workgroups clients can access an application, such as SQL Server, on NetWare, but not file or print services, a Microsoft spokesman said.

Both Novell and Microsoft are bundling their peer networking products into their respective desktop platform. Microsoft is positioning Windows for Workgroups as a much more network-capable Windows, and Novell is incorporating Personal NetWare into the soon-to-ship Novell DOS 7.0.

Priced at $99 for a single-user version bundled into DOS 7.0 (see story at right), Personal NetWare is a cheap way to get users started on NetWare, said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington-based consulting firm. In contrast, Windows for Workgroups 3.11 is priced at $219.95 for DOS users.

Among the new features that Personal NetWare offers are the following:

- Software that allows any Simple Network Management Protocol-based system to monitor disk and operating system configuration and resource utilization on Personal NetWare PCs. Users with no central management system can configure one Windows workstation as a management console.
- A "replicated directory" enables desktops to keep current on resources residing on other Personal NetWare systems.
- Password security at the machine, file and directory level.

Peer networking comes of age

	Server support	Network management	Security	Price
Windows for Workgroups 3.11 (available early November)	NT, Vines (via NetBEUI) NetWare (via IPX)	Yes (via Hermes)	Network level; centralized administration	$219.95 for DOS users; $69.95 add-on for Windows 3.1
Personal NetWare (available by year's end)	NetWare	Yes (via SNMP)	Machine, file and directory level	$99 per single user; bundled with Novell DOS 7.0 ($69)
LANtastic 5.0 (available since March)	NetWare	To come (via VisiSoft)	File level; centralized administration	$119 per node for adapter-independent version, DOS only; $139 for Windows

Dueling DOS

Trying to take the edge off Microsoft's MS-DOS 6.0 (see story below) and Windows for Workgroups 3.11 initiatives, Novell will next month unveil Novell DOS 7.0 integrated with Personal NetWare.

Version 7.0 will feature preemptive multitasking capabilities that let users run multiple DOS applications in protected mode. Unlike Windows 3.1, where users multitask multiple DOS applications, they can see only one application on screen at a time. Applications that are not running under Novell DOS 7.0 on screen will continue to execute unseen in the background, said John Linney, product line manager for Novell DOS 7.0.

Novell has also developed a DOS Protected Mode Services application programming interface designed to relieve users of the problem of memory constraint.

The product also comes with Stac Electronics, Inc. Stacker 3.1 program, which lets users send data across networks and from drives that are compressed or uncompressed.

Novell DOS 7.0 supports Windows 386 Enhanced Mode, which means it is compatible with the soon-to-be-released Windows for Workgroups 3.11, Linney said.

Novell said the product initially will carry a $99 price tag.

— *Ed Scannell*

'Ferengi' arrival raises pricing questions

By Ed Scannell

While IBM's Personal Software Products group may lose some sales of OS/2 2.1 to a version with built-in Windows emulation that is expected to ship next month, the gamble may prove worthwhile if the product attracts enough DOS and Windows users.

Code-named Ferengi, the alternate version allows Windows and DOS users to seamlessly layer OS/2 2.1 functionality on top of their existing operating system software for an introductory price of about $50, sources said [CW, Oct. 18]. Conversely, the current version of OS/2 2.1 has built-in support for DOS, Windows and OS/2-compatible applications based largely on source code licensed from Microsoft Corp.

Users can today buy a new version of OS/2 2.1 for $150 or a version that allows them to upgrade to OS/2 2.1 for $120. Ferengi's $50 promotional price tag could stall some of those sales, which have shown a sharp upturn in the last month or two [CW, Oct. 18].

IBM plans to raise the price on Ferengi early next year to where "it would be more in line with the current pricing on OS/2 2.1," sources close to IBM said. But its price would still be less than that of OS/2 2.1.

"We really don't see this [Ferengi] eating into our present sales as much as we see it expanding our chances in the Windows market," said one IBM executive who requested anonymity.

Timing is right

IBM believes it has accomplished its goal of converting over the majority of OS/2 2.0 users to Version 2.1, and that the timing is right to turn its attention to the much bigger opportunity the Windows market represents. "There is a huge base of Windows users to whom we can offer the chance to run their applications faster and more reliably," the executive said.

In interviews last week, information systems organizations using both OS/2 and Windows said they are at least interested in examining the options Ferengi gives them. They see the product as a cheap way of keeping up with their users' Windows applications demands while preserving their systems configurations.

"My users are always saying that there is an application they need but it only runs under Windows. I think IBM can solve that problem for me [with Ferengi]," said Deems Davis, vice president of IS at Fireman's Fund Insurance Co. in San Francisco.

Fireman's Fund has about 2,700 desktop users of OS/2 with about 100 who use Windows.

Some IS executives with Windows-based shops who are evaluating Windows NT said they do not believe a product like Ferengi offers a compelling reason to switch.

"What IBM is selling Windows users is this great [crash] protection. But if you properly tune Windows, there are few problems," said Mike Drips, a consultant and beta user of both Windows and OS/2 in Tampa, Fla.

DOS upgrades

MS-DOS 6.2 won't be a bug fix

By Ed Scannell

Microsoft Corp. this week will formally announce MS-DOS 6.2, featuring several improvements to Version 6.0's compression utility, a SmartDrive caching utility and a new utility that repairs hard disks.

Sources said company officials will make a point of saying the release is a features upgrade and not a bug fix to correct problems concerning its DoubleSpace compression utility and SmartDrive, which some users said caused them to lose data earlier this year.

Because it is a features upgrade, Microsoft will charge users for the program. While final pricing has not been set, sources close to the company said the cost will be "at least as aggressive", as it was for MS-DOS 6.0, which was slightly under $20.

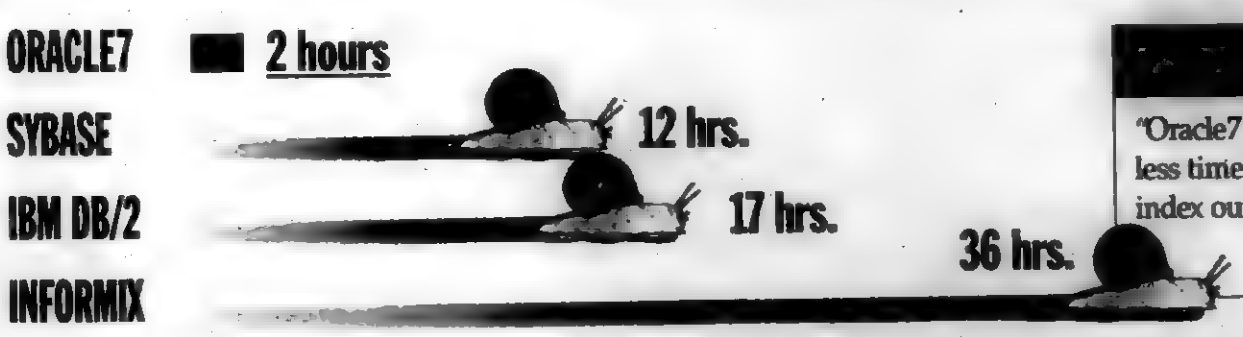
Some of the new improvements to DoubleSpace include DoubleGuard, which protects data against corruption by verifying data integrity before writing to disk, and the ability to uncompress any DoubleSpace drive or completely uninstall the product.

The new ScanDisk utility is able to detect and repair disk errors on both uncompressed and DoubleSpace drives.

Microsoft has changed SmartDrive so it now loads as a read-only cache by default. If users enable write-caching, MS-DOS will not display the command prompt until SmartDrive has written its cache to disk. This prevents users from turning off their systems before data in memory has been saved.

Gentlemen, start your snails.

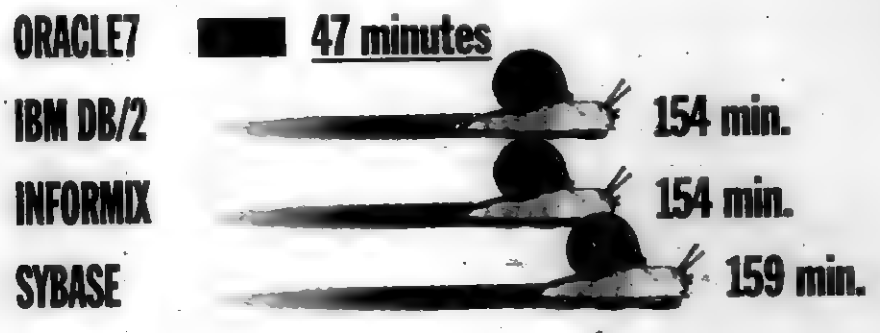
PC Magazine independently defined and ran a battery of real world performance tests to compare database server software. PC Magazine states, "Oracle7 was the hands down winner on our performance tests, outperforming the others by a wide margin."



LOAD AND INDE

"Oracle7 finished the entire test suite in the less time than most took just to load and index our data."

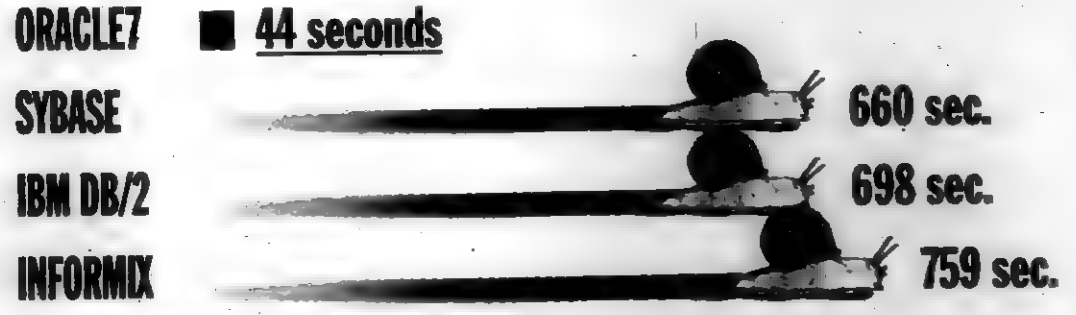
PC Magazine



AD HOC QUERY

"Oracle7 completed the queries in a blistering 47 minutes, three times as fast as...the other products."

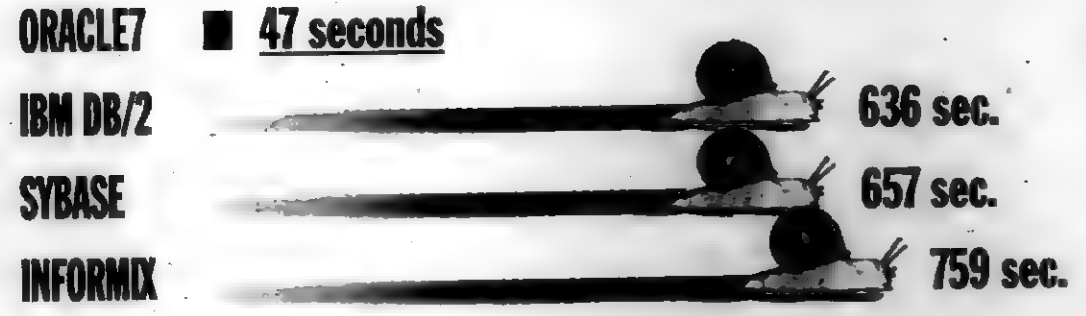
PC Magazine



CONCURRENT RANDOM READ

"Oracle7's read-consistent model and record level locking helped it breeze through the test."

PC Magazine



CONCURRENT RANDOM WRITE

"Even with the many new features that were added, we found Oracle7 to be exceptionally stable"

PC Magazine

Just to be fair, here's what PC Magazine had to say about the other guys:

Informix OnLine *"Only after days and days of repeated crashes were we able to obtain a full set of results."*

Ingres Server *"...we would not recommend it because of the showstopping multi-user bug we encountered."*

Gupta SQLBase *"...took an unthinkable 60 hours to load the tables and then crashed on the index builds..."*

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ORACLE®

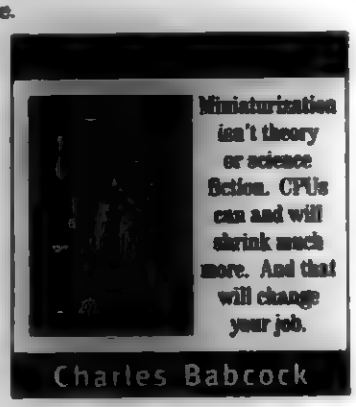
The incredible shrinking computer

For 30 years, makers of computers and their peripheral devices have consistently packed more and more power into smaller packages. Many people assume we have moved so far down the path to miniaturization that few gains remain to be found. Far from being played out, however, this downsizing trend is accelerating.

Ralph Merkle, a Xerox PARC researcher in Palo Alto, Calif., says the mainframe of the first or second decade in the 21st century will be the size of a sugar cube and will execute more instructions per second than today's Cray supercomputers.

This means that the glass house, which hosts water-cooled mainframes and volumes of refrigerator-size disk drives, will shrink to something closer to the size of a birdhouse. Closets that used to combine network hardware and wiring will soon be all that's needed for both the network *and* the computer room.

The smaller devices that result will require less power to run and will take up less space. By the year 2000, the largest piece of the PC is likely to be the end-user interface, whether it is a keyboard, notepad or microphone.



Miniaturization isn't theory or science fiction. CPUs can and will shrink much more. And that will change your job.

Charles Babcock

In the 1960s, computer memory consisted of tiny iron cores, or doughnuts, strung by hand, each ring representing a bit. The move to magnetic media allowed memory to expand geometrically and keep expanding at a rate of 30% a year. There have been many predictions this rate would soon reach its physical limit, but instead it has increased to 60% a year in the last two years, a rate analysts say can continue at least through the end of the century.

The computer on a chip popularized by the Intel 8088 10 years ago was fabricated with circuits three microns wide. Intel's Pentium is a 0.8 micron design; the PowerPC is a 0.65 micron design; and IBM/Siemens recently shipped 64M-bit DRAMs fabricated at the 0.35 micron level. Everyone knows there is some physical limit to how far lithographic etching can take the chipmaking process, but we also know it hasn't been reached yet. And when it is, it is expected to be supplanted by circuit-building techniques that take us down to the submicron level of a few molecules.

The industry already approaches the molecular level in a few instances. Giant magnetoresistance, which will lead to new capacity levels in magnetic disk drives, does not exist in large, bulky materials. It can be prompted to manifest itself when nickel-iron slivers two nanometers thick are separated by a four-nanometer sliver of silver. Upon exposure to a tiny magnetic field, the metal sandwich registers a large change in electrical resistance. The nickel-iron layer is equivalent to about eight layers of molecules. It would take 500,000 of these layers to equal the thickness of a sheet of typing paper.

IS directors can assume, then, that footprints will continue to shrink over the next two decades at a pace similar to the one experienced in the last two. And once the industry finds itself producing components whose working parts are a few molecules thick, authorities like Merkle and Eric Drexler, authors of the 1992 book *Nanosystems*, believe its manufacturing processes will jump to the molecular and atomic level.

Circuits will be laid down molecule by molecule — or more likely spawned in chemical processes that prompt molecules to gather in a preordained path. Drexler predicts a storage device will be available in five to 10 years in which a single molecule stores a bit.

Low-cost, highly compact computing power will make the computer a universal tool throughout the organization of the future. Mobile computing will cease to be different from any other form. Instead of managing machines, the IS staff will focus on the data itself, trying to maintain some measure of control in the face of a ubiquitous flow of information.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

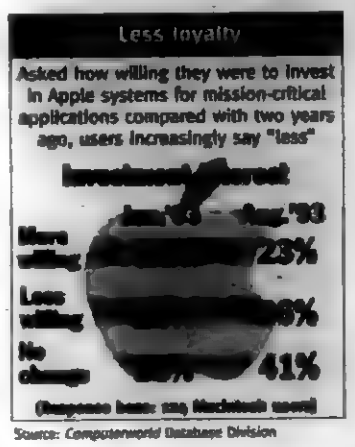
Mac user loyalties under stress

CONTINUED FROM PAGE 1

located in El Segundo, Calif.

Just because users aren't going to budge doesn't mean they don't have complaints . . . or two cents worth of advice for Apple. They have plenty.

A chief concern is that Apple has its head in the clouds, dreaming of pocket-size Newtons and a trillion-dollar marketplace where the electronic and entertainment worlds meet. That vision diluted its ability to provide goods for the corporate environment.



Other gripes concern weak support and a crowded product line with little clear differentiation among models. "I think Apple is overestimating our ability to change and upgrade constantly. We just can't afford the hassle," said Fred Morsheimer, director of MIS at Trader Joe's Co., a specialty food retailer in South Pasadena, Calif.

"Right now, Apple is going in way too many directions at once," said Eric Joa, manager of IS at BC Hydro in Burnaby, British Columbia.

Last week's announcement of a gaggle of new Macintoshes is supposed to make Apple's machines more price/performance competitive with comparable Intel Corp.-based computers and also satiate users awaiting the arrival of PowerPC machines. Several of the new models can be upgraded to the PowerPC chip.

"Whenever Apple gives you more bang for the buck it knocks off another argument against the Mac," said Tim Yancy, a unit manager at Southern California Edison Co.. "Plus we can't wait a year to buy new machines. So having them upgradable to the PowerPC kills two birds with one stone."

Conversion needed

However, topping the list of tough tasks ahead for Apple is persuading users to shift to the PowerPC architecture (see story page 46).

In January, Apple is expected to announce several models based on the PowerPC 601 chip, which is a collaborative effort among Apple, IBM and Motorola, Inc. More PowerPC-based systems are expected to ship by March and eventually all Macintoshes will run on the chip, Apple officials said.

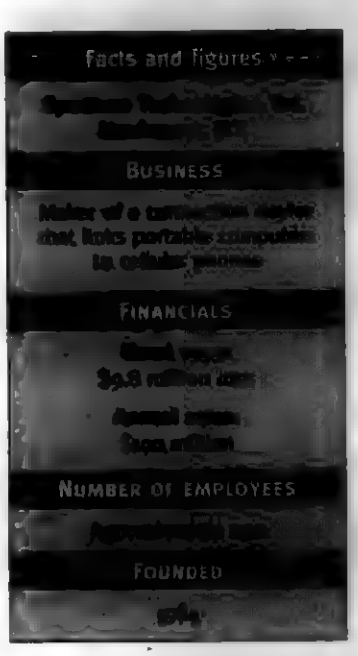
The momentous announcements have generated a nail-biting uncertainty among IS managers. "It's the traditional legacy question. How are we going to tie it into what we have

Continued on page 7

Sculley move could boost Newton

By James Daly and Joanie M. Wexler

John Sculley's move from the top spot at Apple Computer, Inc. to a relatively unknown telecommunications company could ironically prove to be the jump-start needed to drive sales of the Newton personal digital assistant, his last sweetheart project at Apple.



Last week, Sculley became chairman and chief executive officer of Spectrum Information Technologies, Inc., a wireless technology pioneer that holds a patent on technology to allow portable computers to transmit data via cellular telephone networks.

The user mobility created by wireless networks is crucial to the adoption of machines such as the handheld Newton, a project that Sculley promoted heavily during his last 18 months at Apple.

Building blocks

Spectrum, a $100 million company that lost $9.8 million in its last fiscal year, develops chips and software that enable the construction of a widespread wireless network infrastructure, said Vice Chairman Peter Caserta, who relinquished the chairmanship to Sculley.

Spectrum's main business is licensing its Axcell interface, which connects to a laptop computer housing any Hayes-compatible modem and then plugs into a cellular telephone. In its next iteration, Axcell's underlying technology, Direct Connect, will emerge in the form of chips licensed to laptop vendors that will fit right into the computer, according to a Spectrum spokesman.

Spectrum has licensed Axcell/Direct Connect to AT&T and more recently inked licensing pacts bearing codevelopment and marketing ramifications with IBM and Rockwell International, Inc. (see brief page 83).

Sculley spent much of the past two years at Apple cutting similar deals, taking criticism for diverting Apple's energies away from meeting the needs of the business market.

Sculley's arrival at Spectrum startled many analysts who expected him to wind up with a much larger firm. But one Apple insider said the move makes sense because Sculley always considered himself a builder.

Originally, Sculley was brought in to help build Apple into a world-class company. He did so, raising it from a $600 million firm to an $8 billion one.

now, how are we going to upgrade?" said Trey Thompson, systems analyst at Citgo Petroleum Corp. in Tulsa, Okla., echoing concerns among his peers. Some are wondering whether the PowerPC will render their current Macintoshes obsolete. Others are confused about the upgrade path to the PowerPC. Clearly, Apple needs to address these issues.

"Moving to the PowerPC, and keeping users interested along the way, is absolutely the most critical battle for Apple to win," said Jean-Louis Gassee, former head of the Apple Products division and currently chief executive officer of Be, Inc., a San Jose, Calif., startup.

Unique burden

Unfortunately, the problems go far deeper than shifting to a new platform and stem from Apple's raison d'etre — its desire to be different. Initially, that meant distancing itself from the herd with its proprietary software, particularly with its once-distinctive interface.

But with the enormous acceptance of Microsoft Corp.'s Windows graphical user interface (GUI), Apple's new CEO, Michael Spindler, knows he has to take the battle to new ground.

"This is not about the GUI anymore. We're way beyond that," Spindler said last week at the Seybold Publishing Conference in San Francisco, his first domestic public appearance since he took the CEO role four months ago.

"Good," said Rodney Schmidt, a systems analyst at Eli Lilly and Co. in Indianapolis, in response to Spindler. "Apple needs to support and integrate itself with the standards, whatever they are and whomever produces them."

"Spindler believes they have to put their heads down and get down to business," said Pieter Hartsook, publisher of "The Hartsook Letter," a Macintosh-specific newsletter in Alameda, Calif. "The feeling is that they have to get serious and stop fooling around."

Essentially, Apple must become a team player and provide open solutions. And yes, Spindler says that's right there at the top of his list. But again, users will believe it when they see it.

Partnerships key

A key part of meeting these goals will be continuing to team up with other companies to expand its technology base. At its Enterprise Computing Conference, for instance, Apple moved aggressively to court corporate customers with news that Oracle Corp. will port its Oracle 7 database to Apple's high-end server. That marked an important milestone on Apple's road to respectability in the corporation, something with which it has traditionally struggled.

Another request: "A decent multiplatform development environment," said Bob Novakoski, a business planner for LAN services at SaskTel in Regina, Saskatchewan. Apple's Bedrock initiative is a step in this direction.

Interoperability issues are getting a big push as Apple delivers its Apple Open Collaboration Environment (AOCE), a set of application programming interfaces (API) that promise to link and integrate disparate applications running under System 7. Developers will be able to tap into the power of the extension by simply hooking into AOCE APIs.

"These kind of moves and partnerships carry a lot of clout because they legitimize Apple in the eyes of a lot of IS folks," said Robert Anderson, a senior analyst at A.O. Smith Automotive Products Co. in Milwaukee.

Apple is also working on fixing its problems with industrial-strength support. "The problem is that Apple comes along with this great technology, and they say we have to figure out how to make it work in the real world," said Matt Rosen, assistant director for technical services at San Joaquin Delta College in Stockton, Calif. A corporate support package slated to arrive last month will not ship until November, sources said.

All these changes may be making skeptics reassess the company. Several accounts that had earlier decided to leave the Apple fold are rethinking their decisions. The New York accounting firm KPMG Peat Marwick, for instance, has postponed plans to replace its 35,000 Macintoshes with Windows machines. Similarly, Westinghouse Savannah River Project has reconsidered its plans to replace 7,200 Macintoshes with IBM PCs because the Macintosh is cheaper in terms of training and administration, a U.S. Department of Energy spokesman said.

IBM blends service

CONTINUED FROM PAGE 1

loan market in a new services umbrella organization headed by general manager Dennie Welsh, who remains chairman of IBM's Integrated Systems Solutions Corp. outsourcing subsidiary. Some 18,000 employees will now be under Welsh's purview.

Key to the strategy, IBM sources said, is getting all the pieces of the services pie to concentrate on the same vertical markets. These include banking, health care, insurance and manufacturing. IBM is also imposing common financial and performance measurements across the services businesses to provide more consistent pricing and to help the company better measure profitability.

"With moves like this, IBM is transitioning toward looking more like a services company," said Bob Djurdjevic, president of Annex Research, a consultancy in Phoenix. Another reason the move is important, he added, is that it could well "get IBM back into the boardrooms" of customers.

To get there, IBM's consulting group intends to work more closely with customer executives on strategic planning issues. The rest of the services organization will implement these plans. Providing these kinds of high-level services will enable IBM to rekindle the high-level customer access it had in its heyday.

IBM, however, is battling some customers' perceptions that some of its services are overpriced and overrated. "We don't expect to get service for nothing; we're willing to pay for it," said Randy Aldrich, technical support supervisor at Federal Kemper Insurance Co. in Decatur, Ill.

"But IBM's Consulting Group is charging about $130 an hour per consultant for services. We'd like to see that come down to under $100 per hour," more in line with other service providers, he said.

On the plus side

IBM executives were unavailable for comment because of a news blackout imposed until after IBM's third-quarter financial results are announced tomorrow (see news short page 6).

> Key to the strategy is getting all the pieces of the services pie to concentrate on the same vertical markets. These include banking, health care, insurance and manufacturing.

But one source close to the company defended IBM, saying the company continues to invest in employee training in these businesses and is bringing in new talent. Out of the 3,000 IBM consultants worldwide, between 10% and 15% have been hired from the outside.

Another customer, an information systems vice president at a large manufacturing company in the South, said that six months ago he hired two IBM technicians — at $235 an hour for the pair — to convert System/36 software to AS/400 software. "And we had to train them on the AS/400," he said.

Daniel Roberts, president of Ouellette & Associates Consulting, Inc. in Bedford, N.H., said, "We've been receiving mixed feedback from customers on IBM services. Nothing's really changed yet."

Others are more willing to give IBM a chance. Although Federal Express Corp. in Memphis has not used many outside services, Senior Vice President Dennis Jones said he is impressed with what he has seen from IBM so far and would consider the company for future services needs.

Still, the hope is that IBM will continue to derive an increasingly larger percentage of its revenue from software and services, and that will probably continue to be the case, particularly with the increased focus, observers said.

IBM service revenue for 1992 was an estimated $7 billion, according to Julie Schwartz, an analyst at Dataquest, Inc. in Framingham, Mass.

John Jones, an analyst at Salomon Brothers, Inc. in San Francisco, estimated that 1993 services revenue will grow to about $9.5 billion worldwide, with about 40% of that figure attributable to the U.S.

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News Shorts

Another down quarter expected for IBM

Analysts do not expect much from IBM's third-quarter results, due to be announced tomorrow. Estimates range from a loss of 37 cents per share to about break-even if revenue reaches $15 billion. For the fourth quarter, traditionally IBM's strongest, analysts expect the company to return to the black.

Objects mix it up with database

Montage Software, Inc. in Emeryville, Calif., last week announced what it calls an object relational database management system and a concurrent-use pricing model of less than $1,000 per user. Montage supports complex object-oriented data types such as image and audio while also providing SQL query capabilities, the company claimed.

Ellison named in sexual harassment suit

Oracle Corp. Chief Executive Officer Larry Ellison was named in a sexual harassment and wrongful termination lawsuit filed last week by Adelyn Lee, a former executive assistant. Lee, who also named Oracle and Craig Ramsey, her ex-supervisor and vice president of USA commercial sales, in the suit, alleges that she was wrongfully fired soon after breaking off an affair with Ellison. Oracle declined to comment beyond a written statement, part of which said that Lee's dismissal was the result of her "unsatisfactory performance and ... complaints about her performance from Oracle managers and co-workers."

French government plans Bull infusion

The French government last week proposed an infusion of 7 billion francs ($1.2 billion) for Groupe Bull and said it would be "the last time" it puts money into the troubled company before trying to sell off its majority share. The government also named Jean-Marie Descarpentries to take over as Bull chairman from Bernard Pache, who sought more government financing, according to reports in the French press.

Fast Ethernet gets boost

A coalition of networking vendors led by Grand Junction Networks, Inc. said it will make available this week a specification that will provide users with interoperable products for 100M bit/sec. Ethernet networks. A key benefit of the 100Base-X standard is that it is based on Ethernet's media access control method, Carrier Sense Multiple Access with Collision Detection, which means customers can migrate to Fast Ethernet technology without special training. A vendor coalition, led by Hewlett-Packard Co. and AT&T, is proposing a Fast Ethernet standard based on a new media-access control method called demand priority, which would require training and additional cabling.

SHORT TAKES R. Elton White has announced his plan to retire as president of NCR Corp. in early 1994. White, 51, joined NCR in 1967 as a price analyst.... The Object Database Management Group, a vendor consortium, said last week it has agreed on a database interface standard. The group said the specification will provide a single interface for its object database applications.... AST Research, Inc. will today introduce its first Pentium-based desktop, the Premmia LX P/60. The Pentium system will be priced starting at $3,325, with no hard drive and 8M bytes of RAM.... Wang Laboratories, Inc.'s management triumvirate was reduced to a duo last week with the resignation of Michael Mee, who had been chief financial officer and also acted as chairman of the company's board of directors.... Gateway 2000, Inc. has filed an initial public offering worth as much as $160 million.

More news shorts, *page 16*

Software broadens protocol choice

By Joanie M. Wexler
SAN JOSE, CALIF.

User angst over having to choose between Novell, Inc.'s NetWare applications and corporate Internet Protocol (IP) backbones should end Friday when Novell ships long-awaited software that separates applications from their underlying transport protocols.

The NetWare/IP NetWare Loadable Module (NLM) brings "freedom of choice" to the backbone, said Bob Davis, vice president of marketing at Novell's Unix Systems Group here.

The software does this by separating NetWare applications from their native IPX protocol and giving users the option of running them over IP, a widespread — and growing — standard for corporate wide-area network backbones.

Source: *Computerworld* Database Division

WAN users cheer

"This is a product that has long been anxiously awaited by customers with large, router-based WANs," said Jay Batson, an analyst at Forrester Research, Inc., a Cambridge, Mass., consultancy. "These people tend to be IP-sympathetic."

For example, "We are probably going to be doing NetWare/IP here because our long-range plan is to move to TCP/IP over our internet," said Bill Bergdorf, senior internetwork analyst at Cargill, Inc. in Minneapolis. The reason is, "Novell IPX is so chatty over an internetwork," despite vigorous efforts by Novell to hone the protocol for wide-area network applications.

One such Novell effort is Burstmode IPX, which allows communicating network nodes to transmit multiple packets before an acknowledgment is sent by the receiving station. This scheme differs from standard IPX, which requires an acknowledgment after every packet and clutters up the network.

"We ran tests with Burstmode IPX, IPX and IP and found IP was faster in transferring files," Bergdorf said.

Marc Trachtenberg, chief technology officer at NetLAN, Inc., a Novell reseller in New York that has been working with NetWare/IP beta customers, said it is likely that "banking and trading floor customers with large investments in Unix will really take a strong look" at the NLM.

RAM overloads

He said, for example, that one customer considered eliminating NetWare from its back-office environment to alleviate router configuration complexity, expertise and "RAM-cram" — desktop issues associated with running both IPX and IP. However, since the company decided it needed the enabling aspects of NetWare in the back office and Unix in the front office, NetWare/IP could solve both problems, Trachtenberg said.

NetWare/IP builds on Novell's efforts to blend NetWare and Unix environments. The company's 2-year-old LAN Workplace, for example, provides a given workstation connectivity into both NetWare and Unix computing communities, though the applications stay specific to the underlying IPX or IP protocols, Davis explained.

National Semiconductor tries hand at adapters, hubs

By Elisabeth Horwitt

National Semiconductor Corp. is expected this week to branch out from its traditional chip business to the comparatively higher-margin network adapter and hub market, with Novell, Inc. providing the ready-made distribution through its value-added reseller network.

The chip maker will start out in the low-end Ethernet hub and adapter market, going up against such entrenched veterans as 3Com Corp., IBM and Hewlett-Packard Co., according to Frank Dzubeck, president of Communications Network Architects, Inc., a Washington consulting firm.

Market newcomer

Analysts agreed that National Semiconductor is well-positioned to make a splash in the low-end market, particularly given that the vendor supplies about 70% of the chips to Ethernet vendors, according to Dzubeck. The chip maker's presence should speed low-end hubs and adapters toward becoming strictly commodity items, he added. Rival Intel Corp.'s entry into the adapter market some years ago "did the same thing, devastating the price."

National Semiconductor and Novell will also work together on higher-end, higher-speed network technologies, such as Asynchronous Transfer Mode (ATM), analysts said.

Effective alliance

The joint clout of Novell and National Semiconductor could hasten ATM's progress toward a truly standard, affordable technology, said Charlie Robbins, an analyst at Aberdeen Group, a Boston research firm.

The move is a good one for National Semiconductor, given that its chips represent the bulk of development work behind a given adapter but only about 20% of the profit, Dzubeck said. "They want to get the rest."

Novell and National Semiconductor will also work to integrate Novell's NetWare capabilities on adapters and possibly hubs, analysts said. Novell already has a similar deal with SynOptics Communications, Inc. and should shortly announce yet another deal of this kind with Cabletron Systems, Inc., said one analyst.

The idea is for NetWare services, such as faxing and asynchronous communications, to run directly on and be managed from the hub, the analyst said.

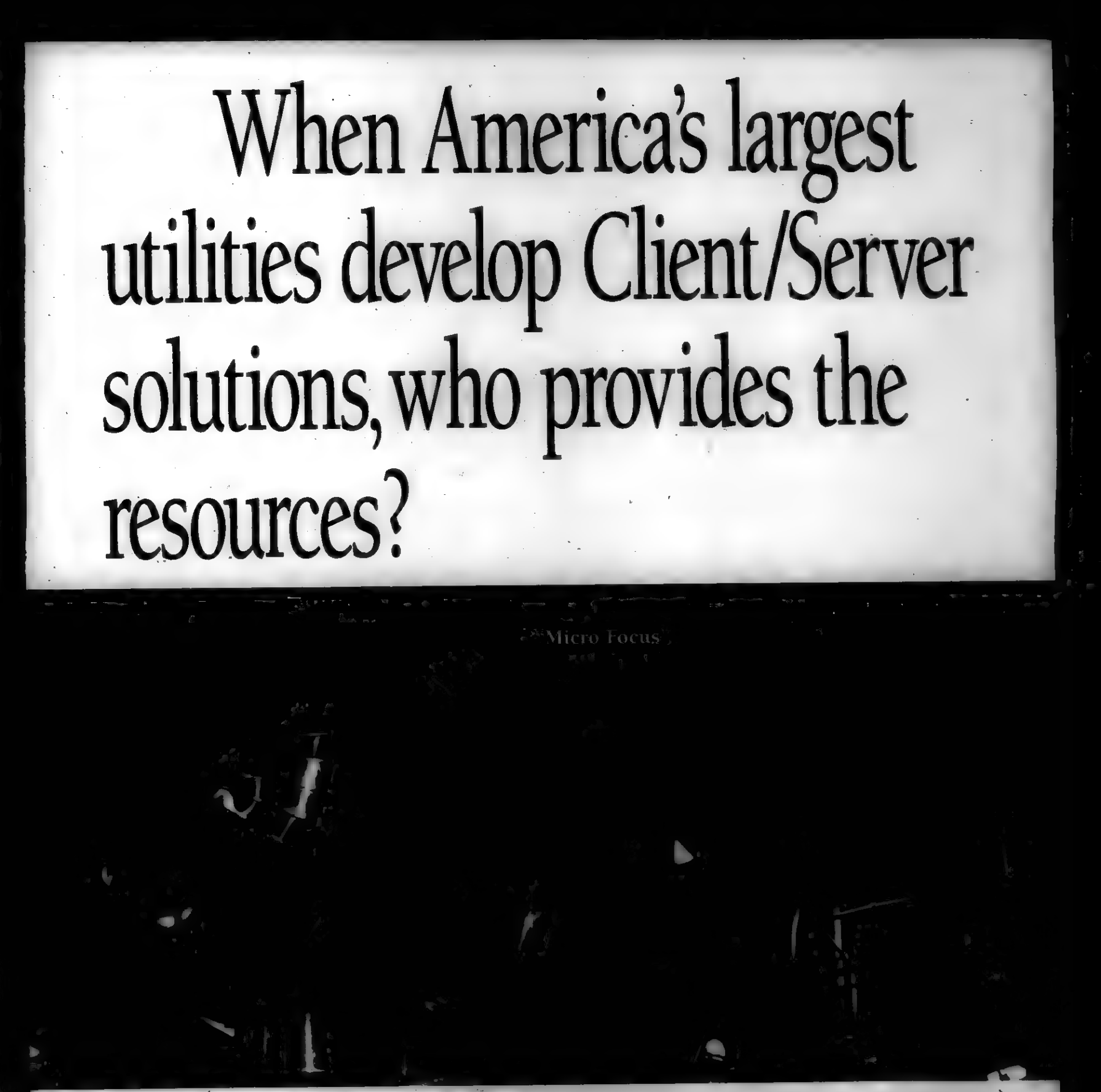
Corrections

Due to a reporting error, a story in the Oct. 18 issue incorrectly stated that Cellular One's client/server billing system was built internally. Computer Sciences Corp. built the system and worked with Cellular One developers to customize it. However, comments about Cellular One's strategy were based on the inaccuracy.

A photo identified as Bob Holmes that ran on Page 20 of the Oct. 18 issue was not Mr. Holmes.

A story in the Oct. 11 issue quoted a user as saying that NCR Corp. offers PCs only on a build-to-order basis. NCR, in fact, also offers off-the-shelf configurations.

When America's largest utilities develop Client/Server solutions, who provides the resources?



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Office 4.0 facility eases use

By Michael Vizard
NEW YORK

To help information systems shops gear up with the next generation of highly integrated application suites, Microsoft Corp. last week laid out a multitiered strategy designed to make its suite easier to manage.

Microsoft Office 4.0, a suite of applications based on forthcoming upgrades of Microsoft applications (see chart), will support Version 2.0 of the Object Linking and Embedding (OLE) interface [CW, Oct. 11].

By adding support for OLE 2.0, Microsoft is providing a facility that allows in-place editing across multiple applications, a true drag-and-drop protocol for sharing data across those applications and a facility through which programming languages can serve as a common macro language across multiple applications.

To help deal with some OLE management issues, Microsoft has included a Microsoft Office Manager (MOM) facility in Office 4.0 that serves as a program manager for the suite [CW, Oct. 18]. Using this tool, an IS manager can have third-party and custom applications displayed on the same button bar as Microsoft Office applications.

Additional tools on the way

However, while MOM serves to manage applications on an individual system, Microsoft is also working on a second level of management tools for managing documents.

And finally, Microsoft has included an Object Browser tool in each of its applications, which keeps track of all the OLE 2.0 objects available to a Windows developer.

"Right now it's kind of daunting. There are so many objects available using OLE. I definitely see room for a more robust object manager on top of the browser," said Pete Claar, a developer with a large Northwest retail store who has worked with OLE 2.0.

"From a hierarchical perspective, you'll have MOM, then a document management tool and the Object Browser," said Mark Krocse, general product mananger for Microsoft Office.

But while Microsoft has moved to provide management tools for individual systems that use OLE 2.0, industry analysts noted that Microsoft's lack of an enterprise focus is likely to slow the widespread endorsement of OLE 2.0 applications across IS organizations.

In particular, they pointed out that OLE 2.0 does not allow users to access resources — data across a network, for example — on other users' systems. For OLE 2.0 to become widely accepted, analysts said Microsoft will have to provide the ability to transparently access resources that way.

"With objects, you shouldn't have to know where a particular object is on the system or network to use it," said John Donovan, an industry analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

"We're still in a file-oriented world. Beyond using stuff like the drag-and-drop protocol on your desktop, most IS shops won't take full advantage of what things like OLE offer until there are object operating systems on their desktops," said John Faig, an industry analyst at Meta Group, Inc. in Stamford, Conn.

Sizing up the suites

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For example, Directors Mortage Co. in Riverside, Calif., recently opted for SmartSuite from Lotus Development Corp. because Lotus applications are better integrated with one another. In contrast, OLE 2.0 is not yet widely supported and will require Directors Mortgage to essentially rewrite all of its custom applications to support it, said Bob Dingle, vice president of production technology.

"From a technical point of view, OLE 2.0 is a whole new platform. We're not going to be interested in that until I perceive that Windows and NetWare are no longer doing the job for us. I don't think I'll be worrying about OLE 2.0 for at least 12 months," Dingle said.

In fact, the only OLE 2.0 application that will initially be available from Microsoft is its Word 6.0 word processor.

Short wait for 32-bit programs

By Michael Vizard
NEW YORK

■ Users can expect to see the first 32-bit iterations of spreadsheets and word processing applications from Microsoft Corp. in the first half of next year, according to Microsoft Chairman Bill Gates.

Speaking at the launch of Microsoft Office 4.0 last week, Gates promised that 32-bit versions of the Excel spreadsheet and Word word processor will appear on Intel Corp. systems in the first quarter. In the second quarter, Microsoft will deliver 32-bit versions of these applications for RISC systems.

The applications will run on Windows NT and the upcoming 32-bit Windows 4.0, which is the follow-on product for 16-bit Windows 3.1.

While 32-bit versions of these applications will be able to work with larger data sets and provide significant speed improvements, most sites are likely to initially perceive them as providing performance overkill.

However, there are a number of applications in the financial and scientific communities that require 32-bit spreadsheets to run effectively, according to Don Baarns, president of Baarns Consulting Group, Inc. in Sylmar, Calif.

Baarns noted that a client/server application in which a 32-bit implementation of Excel is the front end to a 32-bit SQL Server database would provide a huge performance advantage.

But only those few who are building gigantic spreadsheet applications are likely to benefit from 32-bit applications in 1994, noted Daniel Gasteiger, editor of the "Spreadsheet Consultant" newsletter in Cambridge, Mass.

In fact, most vendors and information systems shops are not expected to do any major 32-bit application work until Microsoft delivers its first beta release of Chicago in December.

But while most other software vendors will wait for Chicago before moving up to 32 bits, Microsoft's need to have a full set of native 32-bit applications for NT is driving its efforts.

ATM will start with WANs

By Joanie M. Wexler

In the wake of several Asynchronous Transfer Mode (ATM) developments last week, some analysts and users predicted that the communications technology is likely to catch on in wide-area networks before it hits the desktop.

And, they added, the initial role of WAN-capable ATM switches, such as those making waves last week from Motorola Codex, StrataCom, Inc. and others, is likely to be that of a humongous multiplexer.

Such boxes, in an era of corporate transitions from multiple network types to the future ATM network nirvana, would accept various data and voice feeds, aggregate and compress them, and spit them out over one high-speed WAN link, which could include ATM.

Witness, for example, Motorola Codex's $60,000-and-up 6950 SoftCell ATM Networking Node product. The bandwidth management-oriented WAN device, like many low-end products on the market today, uses compression and traffic prioritization schemes to help companies squeeze more out of their costly telecommunications links as their computing enterprises become increasingly dispersed, analysts said.

Traffic pattern

The 6950 accepts frame-relay, voice and circuit-switched traffic, compresses it over an internal, Codex-developed cell-relay scheme and spits it out over T1, Integrated Services Digital Network or 45M bit/sec. ATM wide-area links, explained Gail Smith, Motorola Codex's director of worldwide product marketing.

Smith estimated a 200% to 300% performance improvement over traditional time-division multiplexing techniques and a payback period of nine months.

"Codex, with its huge installed base, can do a lot of handholding to migrate customers" from myriad network types to ATM with the 6950, said Joe Noel, an analyst at Dataquest, Inc. in San Jose, Calif.

In the case of StrataCom, Inc.'s BPX ATM switch, announced in January and delivered last week, the multiplexing function would gather ATM-only traffic from multiple sites, like the 6950, rather than traffic from a single site. The BPX relies on the conversion of other types of traffic to ATM elsewhere, such as within its own IPX frame-relay device.

Noel predicted that the BPX is likely to "be a carrier switch for a while; I don't think corporate networks are up for its horsepower yet."

Last week's ATM news: Motorola Codex rolls out the 6950 bandwidth management-oriented premises switch with an ATM WAN interface; StrataCom delivers its BPX switch, a pure ATM WAN product; Ungermann-Bass, Inc. adds a High-Speed Serial Interface to its Access ATM switch.

Some users beg to differ, though (see story page 71). For example, John Boyd, communications director at Northeast Utilities System in Weathersfield, Conn., is using the BPX on his premises as a window into his hybrid private/public WAN: "We're looking at ATM to be the solidifying manager of media," he said.

ATM standards specify initial speeds of T3 (45M bit/sec.). However, today only about 15% of T3 networks in the U.S. stretch beyond 500 miles, the crossover point where private T3-speed ATM networks become cost-effective, said Rick Malone, principal at Vertical Systems Group, a Dedham, Mass., consultancy. This means T3 pricing must drop dramatically for wide-area ATM to catch on, he said.

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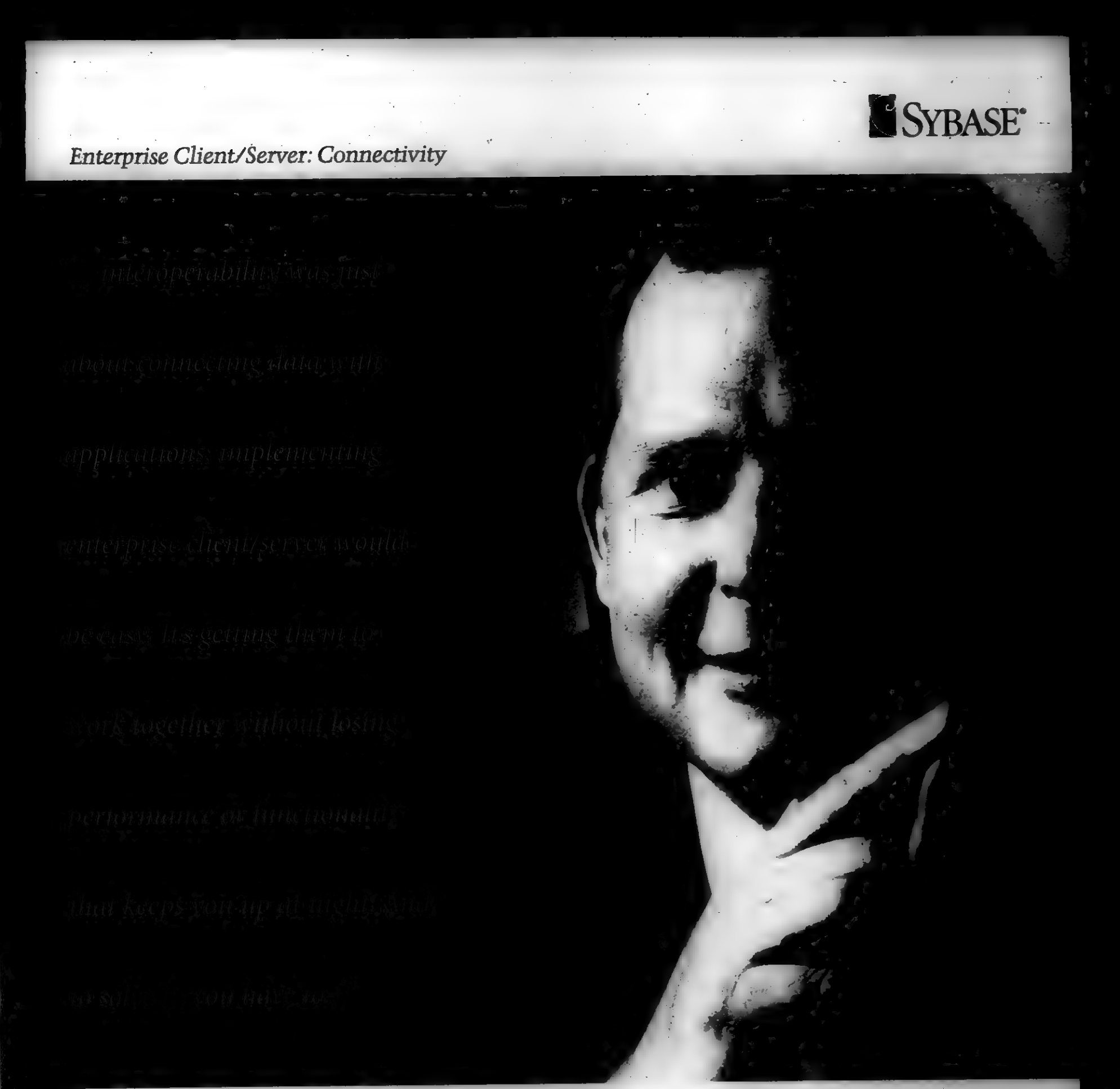

Mark Page knows the situation well. Vice President of Connectivity Products at Sybase, he's helped a long list of customers develop integrated solutions to one of the most significant problems in client/server computing. He shares that experience in a taped conversation *"Making Connections In Client/Server Computing."* For your copy, call 1-800-SYBASE-1.

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Single-console net control gets boost

By Lynda Radosevich

Hewlett-Packard Co. and Cabletron Systems, Inc. announced additions to their enterprise network management systems that promise to broaden options for managing diverse network elements from one console.

HP said it will deliver software that lets network managers control TCP/IP and SNA networks from one HP OpenView management station in first-quarter 1994.

Cabletron said it will offer in November a version of its Spectrum network management software that runs on top of other management platforms and allows those applications to manage its network hardware. The platforms include HP's OpenView, IBM's NetView/6000, Novell, Inc.'s NetWare Management System and Sun Microsystems, Inc.'s SunNet Manager.

HP has added *technology to OpenView that enables multiprotocol network management from one console*

"Now I have different staff managing TCP/IP and SNA networks," said Wayne Bowker, advanced analyst in the information technology department at 3M Co. in St. Paul, Minn. "The benefits of combining are that ultimately we can resolve problems quicker, cut down on management staff and use them other places."

The HP product is based on technology licensed from Peregrine Systems, Inc. Combined with the currently available HP software for NetWare networks on an OpenView platform, it allows multiprotocol network management from one console, according to David Schwaab, an HP marketing program manager.

However, some analysts and users contacted said the Peregrine Systems-based node takes up too much memory. Schwaab responded that the 64M to 125M bytes of workstation memory required is not unreasonable for large networks. Additionally, HP is working with Peregrine to reduce the amount of memory required and to reduce the network bandwidth requirements, he said.

Practical side

Meanwhile, the main benefit to Cabletron's approach is that it allows the hub customer to use the management system it already has in place, said Jill Huntington-Lee, principal analyst at Brandywine Network Associates, a consultancy in Cinnaminson, N.J.

Cabletron said it will deliver, in the first quarter of 1994, data gateways that allow the network management applications to share information, with Spectrum riding on top as a "manager of managers," as well as the Spectrum 3.0 distributed network management system in the second quarter.

Becoming a LAN manager means slogging through lots of manuals and CompuServe forms and learning from mistakes. *Page 114*

Good news, bad news for IBM on APPN front

By Joanie M. Wexler

In what could be the kickoff in a series of bittersweet victories for IBM in its determination to make it big in the distributed networking arena, several communications companies last week said they have licensed "the next SNA" software from a vendor other than IBM.

Data Connection Ltd. (DCL) has been chosen by Cabletron Systems, Inc., Hewlett-Packard Co., Hitachi Data Systems Corp., Memorex-Telex, Northern Telecom, Inc. and Unisys Corp. as their vendor for Advanced Peer-to-Peer Networking (APPN) source code [CW, Oct. 18].

APPN is IBM's architecture for migrating hierarchical SNA networks to a peer-to-peer structure that supports new client/server applications alongside terminal-to-host applications.

All aboard

DCL rolled out its iteration of APPN Network Node, which includes routing functions, and its End Node software last spring. Router maker Wellfleet Communications, Inc. said at the Interop '93 August show that it had become the first vendor to hop on the DCL bandwagon.

The growing acceptance of another vendor's IBM code signifies an industry bent on freeing the user community from the potential product delays and price premiums that result from a single vendor's control of a technology. And while the vendor flockings will cost IBM lost licensing fees, IBM looked on the bright side: More sources for APPN will probably mean more APPN in user shops, said Marcia Peters, lead APPN architect at IBM.

"[DLC] did a super job with the code," she said.

One analyst, Dave Passmore, a vice president at Gartner Group, Inc., a Stamford, Conn.-based consultancy, said he was surprised that IBM looked on the situation as opening up APPN, "rather than suing DCL."

Crucial timing

Licensing vendors indicated time-to-market motivations. For example, Tom Burkardt, director of IBM connectivity products at Cabletron, said that what was important was that the DCL code is "written in such a way that our engineers can port it quickly" to any platform.

Still, it is not clear how much near-term demand there is for APPN. On the one hand, "our level of customer requests for APPN has increased dramatically over the last 10 months," said Don Rosenbaum, research and development manager at HP.

However, Burkardt said, the only trend he sees is smaller SNA shops getting rid of SNA altogether. "I don't see a pattern in larger networks; some are stabilizing, downsizing or even expanding their 3270 populations."

SNA shops to get distributed tools

By Joanie M. Wexler

WHITE PLAINS, N.Y.

Far-reaching additions to the IBM Networking Systems product line last week should help move some SNA shops that are on a distributed computing bender a notch closer to their goal of one cohesive network.

The IBM moves included bundling a 3174 Establishment Controller, a PS/2 server, an Ethernet switch and a transparent bridge into the IBM 8250 intelligent wiring hub.

Todd Dagres, vice president of communications research at The Yankee Group in Boston, said he sees the hub-bundling as reflective of companies' moves from controller-attached terminals to LANs. "There is an uncomfortable period when you're caught with both the old and the new," he said. "Users want LAN-based processing but can't give up [SNA's] class of service."

Dagres explained that because hubs evolved primarily for cohesive management of LAN internetworks, collapsing IBM gear into the wiring closet with LAN paraphernalia "at least means you're not managing two environments."

In addition, IBM rolled out performance and connectivity enhancements to the 3746 Communications Controller Model 900. The 3746 is the "multiprotocol" version of IBM's mainstay 3745 front-end processor.

IBM said a new Synchronous Data Link Control line adapter for the controller should yield as much as a threefold throughput improvement. It also announced that it plans to support frame relay on the device.

IBM's product announcements included the following:

Smart hub modules:
- **PS/2 server:** Shipping Dec. 31 for $7,000.
- **3174 controller:** Shipping Jan. 28, 1994, for $12,990.
- **Six-port Ethernet bridge:** Shipping Jan. 7, 1994, for $8,920.
- **Ethernet switch:** Shipping March 25, 1994, for $6,095.
- **Hub-specific management program:** Shipping Jan. 28, 1994, for $995.

AnyNet/2 Sockets over SNA Gateway for running TCP/IP communications applications across SNA nets. Shipping Dec. 31 for $1,950.

The 3746 moves "are kind of a sleeper," said Steve Romaine, a consultant at Informed Technology Decisions, Inc. in Green Farms, Conn. Corporate moves to client/server for mainstream applications "will require greater file-transfer rates, and object-oriented processing will eat bandwidth," requiring the added horsepower, he pointed out.

However, the usefulness of IBM's migratory products will depend on individual user company network plans. For example, SNA shops simply weaning themselves off mainframe computing may have no use for the products.

Loral Aerospace Corp. in Newport Beach, Calif., for one, is dumping IBM protocols entirely, despite the fact that it runs about two-thirds of its traffic over SNA today, said Bill Conley, manager of corporate information systems.

Rather than using the peer-oriented IBM enhancements, he said, "we'll pretty much let what we have die, reallocate bandwidth and go on from there."

IBM also delivered software for running TCP/IP applications over SNA backbones —a product implementation in the IBM Networking Blueprint called AnyNet for letting applications run across non-native transport networks [CW, Oct. 11]. The jury is still out on AnyNet, though.

"The problem is there are so many choices, people are still at the stage of sorting through to see what makes sense," Romaine said.

"IBM has to evangelize with AnyNet because people don't understand it," Dagres added. "The necessity for the function is there. But users need proof, delivery and price."

CA to reveal plan for managing nets

CONTINUED FROM PAGE 1

A handful of products available today address low-level systems management capabilities across heterogeneous environments. These include IBM's NetView/6000 and Hewlett-Packard Co.'s OpenView network management packages, which are beginning to offer systems capabilities. However, analysts said none are robust enough to meet user requirements.

CA's "master console" version of CA-Unicenter would offer features such as security, storage management, report management and job scheduling management. The master console version will differ from the systems-specific client/server ports of Unicenter in that customers will be able to remotely manage several operating systems, such as OS/2, Unix and Windows NT, from a single point in the enterprise.

CA is expected to deliver the master console product in the next six to 12 months, analysts said.

Platform proliferation

Client/server versions of CA-Unicenter will appear on the following platforms:

Platform	Delivery date
IBM's OS/2	March 1994
Sun's Solaris	June 1994
IBM's AIX, Sequent's Symmetry and Pyramid	First-quarter 1994
Novell's NetWare	First-quarter 1994 (beta)
Novell's UnixWare, Microsoft's Windows NT, NCR's System 3000, Data General's DG-UX and Tandem's Guardian	Second- or third-quarter 1994 (beta). Deliveries by end of 1994

Source: Kidder, Peabody & Co., New York

Users said they anxiously await the fruits of CA's labor but have limited expectations.

"I can't see it being done easily," said M. Lewis Temares, chief information officer at the University of Miami, who said he was familiar with CA's plans.

However, Temares said a master console product would alleviate many of the problems the university faces in having to manage its enterprise from five control points. "A multivendor client/server version of Unicenter would be a lifesaver. It would save the university a bundle of aggravation," Temares said.

Answering critics

Analysts familiar with CA's plans lauded the vendor for setting its sights on an initiative they described as overwhelming, yet one that users sorely need.

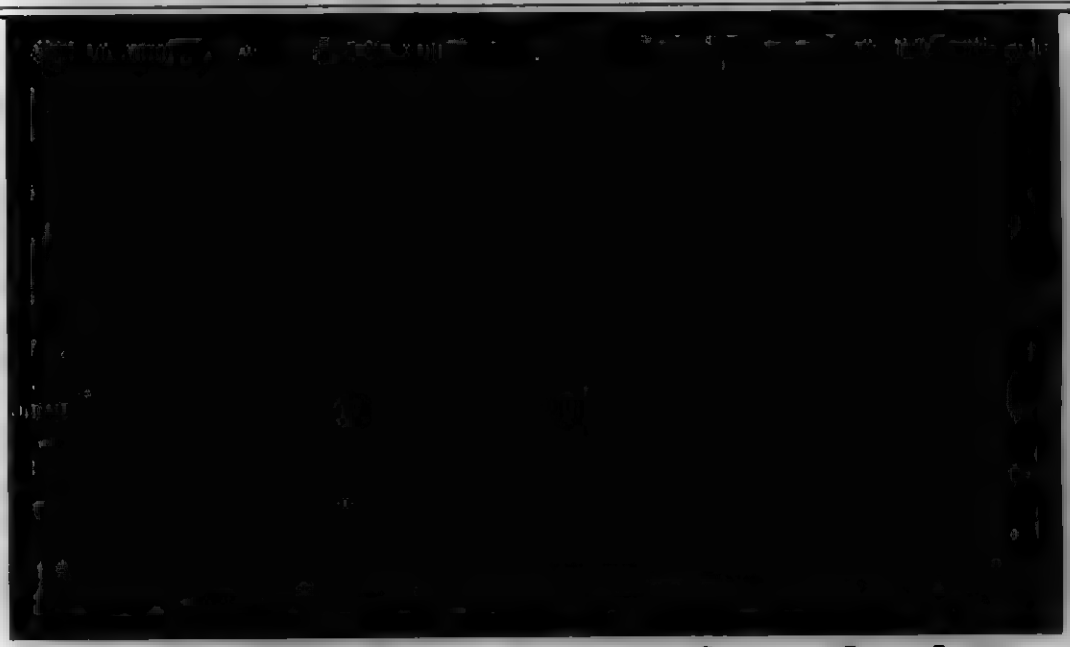
"By introducing a product with a client/server architecture, CA will answer a lot of its critics. The market for data center Unix management is relatively small, but the market for client/server-based Unix management will be very large," said Igor Stenmark, program director for software management strategies at Gartner Group, Inc., in Stamford, Conn. Stenmark was unsure of the potential size of the client/server Unix systems management market.

The first client/server version of CA-Unicenter, which is being designed for OS/2, has been in development for the past year and will enter beta testing in the next few weeks, with delivery scheduled for early next year, according to Charles E. Phillips, a financial analyst at Kidder, Peabody & Co. in New York.

CA's plans to deliver client/server Unicenter products for NT sparked the interest of Ronan McGrath, a vice president of information systems and accounting at the Canadian Railroad in Montreal. McGrath said the railroad is planning to switch its OS/2 application development to NT in the next few years.

"We're interested in viewing a client/server version of Unicenter for NT," McGrath said.

A few NetWare users also expressed strong interest in CA's plans. "If we can centralize a lot of those management functions, like single user IDs, single passwords and file management capabilities, that would be a big help," said Gary Graham, coordinator of data management at Home Oil Co. in Calgary, Alberta.



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News Shorts

Xerox hires Laraine Rodgers

Laraine Rodgers is joining Xerox Corp. on Nov. 1 as vice president and chief information officer of U.S. Customer Operations, a unit based in Rochester, N.Y. The post was previously held by the current CIO of Xerox, Pat Wallington. Rodgers is currently director of MIS for the city of Phoenix.

Digital's loss larger than expected

Digital Equipment Corp. last week surprised analysts with a larger than expected $83.2 million loss for its first fiscal quarter, as revenue declined 9% from the previous year [see chart page 133]. The company lost $103.2 million from operations; product sales dropped 12%, and Digital's services business fell 6%. Company executives blamed the results on low demand in Europe and negative currency translations but acknowledged U.S. sales were down slightly.

New Zenith PCs debut

Zenith Data Systems will tomorrow announce the first desktops it co-developed with Packard Bell Electronics, according to sources close to Zenith Data. Called the Z-Select 100, it features a range of Intel Corp. 486SX, DX and DX2 processors, Pentium OverDrive upgrade slots, a choice of Ethernet or Token Ring, plus preinstalled shells for various network operating systems, according to the sources. Pricing will start at $1,000 for a 25-MHz 486SX with 4M bytes of RAM and a 170M-byte hard drive, the source said.

Computervision cuts deeper

Computervision Corp., the remnant of the former Prime Computer, Inc., last week said it plans to quit the hardware resale business at the end of this year and cut 2,000 employees during the next 18 months — a move that will reduce its 4,700-person work force by 43%. Computervision, which got 14% of its third-quarter revenue from hardware sales, has signed a deal for primary supplier Sun Microsystems, Inc. to sell directly to its computer-aided design customers and said it is trying to negotiate similar agreements with other workstation vendors. The company lost $543 million in the third quarter, including a $515.8 million restructuring charge, as revenue fell from $234.2 million a year ago to $183.9 million now.

Computer fraud schemer goes to jail

Stew Leonard, owner of the Connecticut dairy giant, was sentenced last week to more than four years in prison and fined $947,000 for his role in a sophisticated tax-fraud scheme that stands as one of the nation's largest-known computer-driven tax evasion cases. Leonard, 68, pleaded guilty earlier this summer to skimming more than $17 million in sales from his family's Norwalk, Conn., store by customizing its computer programs.

SHORT TAKES WordPerfect Corp. last week added two paid support programs aimed at large accounts that require dedicated account coordinators and on-site service.... The NASDAQ Stock Market, Inc. signed a five-year, $25 million contract with Unisys Corp. for two Unisys 2200/900 mainframe systems and services designed to support the stock market's 800 million share daily trading volume. The mainframes, which will be installed next year at NASDAQ's primary data center in Trumbull, Conn., and its backup data center in Rockville, Md., will replace existing Unisys 1100/90 mainframes.... Dell Computer Corp. released the new Dimension V family, with prices beginning at $1,230, including a color monitor. The Dimension V is based on a range of 486SX, DX and DX2 processors, and pricing starts at $2,149 with a color monitor.

Compaq makes Windows easier

By Michael Fitzgerald
HOUSTON

Compaq Computer Corp. last week claimed that with its upcoming line of PCs it will remarket software that will make Windows applications easier to use.

Developed by Xerox Corp.'s XSoft division, TabWorks acts as a shell over Windows, turning the PC interface into what resembles a student notebook with tabs. It looks much like the interface for Lotus Development Corp.'s Organizer or Go Corp.'s PenPoint operating system.

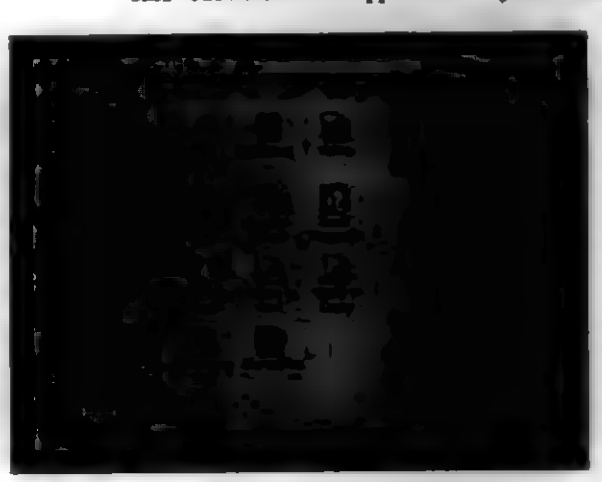
Officials from Compaq and XSoft claimed that beta users completed tasks 25% faster in TabWorks than in Windows' Program Manager.

"This is a much more intuitive, easy way to do work — plus people are used to the notebook metaphor," said Lorie Strong, Compaq's vice president of portables and software marketing. Strong said TabWorks will appear on Compaq's upcoming line of computers and will eventually ship with all of Compaq's PCs.

Users and beta testers said the product held interest for them.

"It's a little more drag-and-drop-oriented than Windows," said Steve Verderber, a systems analyst at Varian Associates, a maker of medical and silicon production equipment in Palo Alto, Calif.

While Compaq has exclusive one-year rights to TabWorks, the program runs on any PC-compatible system. Varian's Verderber, for instance, uses a system from a small clone maker. Non-Compaq users can buy TabWorks through Compaq DirectPlus or Compaq resellers for $69 ($99 after Jan. 1).



TabWorks uses a three-ring notebook metaphor

PC makers

CONTINUED FROM PAGE 1

paq last week said third-quarter earnings rose 118% to $107 million, on sales of $1.75 billion, a 64% increase (see chart page 133).

Analysts said they expect the IBM PC Co. to also post uncharacteristically large sales increases in its third quarter. The ValuePoint line alone has shipped more than 1 million units in its first year.

"It shows that top-tier market momentum is definitely growing," said Steven L. Eskinazi, an analyst at Alex. Brown & Sons, Inc.

Several large users contacted illustrated how the PC Co. and Compaq have regained corporate accounts.

"We've definitely moved back," said Paul Bandrowski, manager of advanced technology at Sara Lee Corp. in Chicago. He said his company had been purchasing desktops largely from CompuAdd Computer Corp. and Gateway 2000, Inc., but "as the price gap narrowed, we decided it made no sense at all."

Similarly, Joseph Barrett, lead technology analyst at Whirlpool Corp. in Benton Harbor, Mich., said Whirlpool's desktop purchasing was shifting toward the PC Co.'s ValuePoint line, though Dell Computer Corp. and Zenith Data Systems remain on the company's approved vendor list.

Still, many clone makers continue to survive, refuting expectations that Compaq's low-priced desktop initiative, started in June 1992, would kill them off. Second-tier companies such as Zeos International Ltd., which posted its fifth consecutive quarterly loss last week, remain in business and, in many cases, report higher sales, thanks to overall market growth and availability problems of the major vendors.

The clone makers "are showing much higher resilience than we thought," said Gian Carlo Bisone, Compaq's vice president of North American marketing.

But executives at top-tier companies insisted the shakeout will happen. "People like Zeos and others are slowly bleeding to death, rather than having the precipitous losses we expected," said Michael Winkler, vice president and general manager at Toshiba America Information Systems, Inc.

Staying alive

Still, the shakeout may be a trickle. Analysts say the Taiwanese, who control up to 40% of the world market for PCs, have redoubled efforts to stay in business, despite extremely low margins. They point to moves such as the recent purchase of the Everex Systems, Inc. name and assets by YSide, a Taiwanese-backed consortium. Everex thus "dies" yet remains alive, and sources said Everex will introduce a new line Nov. 1.

The 486-based desktop line, the Step Plus, will include integrated features such as SCSI and Ethernet. Everex declined comment.

"We're looking purely at price — Compaq's name doesn't do anything for me," said Rich Davis, a technology consultant at Pacific Bell's Network Technology district in Sacramento, Calif. Davis said Pac Bell's official corporate standard was Hewlett-Packard Co., but individual business units buy what they want; his unit bought machines from a local systems integrator.

Price wars rage on

The major vendors may soon put the squeeze on the clone makers, as top executives at HP and Compaq stated publicly they expect to introduce $500 systems next year.

"I disagree wholeheartedly that the price wars are over — I think you'll see price wars well into 1995, until we have the shakeout everybody's been talking about," said Boris Elisman, an HP product marketing manager.

Do not expect the $500 name-brand systems to be targeted at corporate users, though. Elisman, for instance, said HP will likely follow a strategy where it will add features to its Vectra lines to keep pricing stable and build lower-priced brands "without the latest and greatest components."

Likewise, IDC said that while prices dropped 13% for desktops and towers and 15% for notebooks in the first half of 1993, price cuts appear to have slowed since then. That condition will last through the first half of next year, when Intel Corp. in particular is expected to face new price pressures [CW, Sept. 27].

"Vendors have milked all the margin out of their low-end lines, though there may be some movement at the high end," said Brian Clarke, pricing analyst at IDC.

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Lotus, Gupta join to build better Notes

By Michael Vizard and Kim S. Nash
CAMBRIDGE, MASS.

Lotus Development Corp. this week will announce a pact with Gupta Corp. under which Gupta will add Notes support to its line of client/server development tools.

This will be the first in what is expected to become a series of alliances Lotus will make with relational database management system makers.

The pact between Lotus and Gupta will address two key gripes of Notes users: the need for both better application development tools and better integration with SQL database data.

Notes application developers will gain access to more sophisticated Gupta tools that will let Notes users build applications with a better user interface than Notes offers today. "Anything that gives me a tool for creating a better interface for Notes is going to be welcome," said Norman Weizer, president of Weizer Associates, Inc., a consultancy in Lexington, Mass.

Secondly, users have criticized the workgroup product's lack of integration with data stored in RDBMSs that use SQL [CW, Aug. 16]. Connecting Gupta's RDBMS and development tools to Notes would give users a way to build programs that incorporate both traditional row- and table-type data and unstructured data, such as documents and images now stored in the Notes database.

Gupta users, meanwhile, stand to gain access to free-form data types used in Notes applications, such as scanned documents and material stored as images or objects. Gupta's SQLBase already supports binary large objects, but most users have not exploited that capability to its fullest, a Gupta spokesman said.

Links between SQLBase, the SQLWindows application generator and Notes are due out by mid-1994, according to a source inside Gupta. Lotus has already delivered the drivers needed to connect Notes 3.0 to SQL databases. The drivers currently provide rudimentary read and look-up functions between Notes and RDBMSs. Full-blown data update, or write, capabilities are not expected to appear until Notes 4.0 is released in the latter half of next year.

New integration

Currently, users can integrate SQL databases with Notes using InfoPump, a batch-oriented data pump tool from Trinzic Corp. in Waltham, Mass.

Meanwhile, Lotus is talking to several other tools makers about similar deals, including Oracle Corp., Powersoft Corp. and Informix Software, Inc., according to Lotus sources. Taken together, the end result of all these deals will be the ability to better integrate Notes with existing database resources.

Let's make a deal

Powersoft is expected to announce a similar deal before the end of the year, according to Tom Herring, the firm's vice president of marketing and business development. Informix and Lotus have begun "preliminary conversations" about a partnership, "but nothing has been decided," said Steve Sommer, vice president of marketing at Informix.

Meanwhile, Oracle plans to deliver its own groupware product [CW, Sept. 6]. However, Oracle's approach focuses on integrating enterprisewide applications that span multigigabyte databases. In comparison, Notes is a distributed database aimed at PC end users and currently limited to 1G byte of data.

Larry Ellison, Oracle's chief executive officer, "continues to have discussions" with Lotus CEO Jim Manzi, but the two have yet to hammer out a technology swap, according to Fred Cutler, vice president of business development at Oracle.

For a Notes link to be of use to Oracle customers, the product would have to support on-line transaction processing, Cutler said, adding that Notes and Oracle databases would have to be "substantially integrated, which is more difficult than building a basic gateway between the two products."

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"It was taking us ten days to get price quotes in a market where prices changed hourly."

– Chevron Canada

"Our client, TRW, found that getting information for project planning was simply too slow."

– NetBase Corporation

"Teachers were spending more time on reports than on teaching."

– National Computer Systems

"We had multiple systems from two companies, all with different looks, all taking data and processing it in a different way."

– Chemical Bank's Geoserve® Group

"Despite automation, drafting was still a paper intensive process."

– Aetna Life and Casualty

"There was no easy way to get critical ticketing information to the PCs on agents' desks."

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"Agents can grab data, work with it, and use it to give customers better service."

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SPARCs fly in Sun's multimedia lineup

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

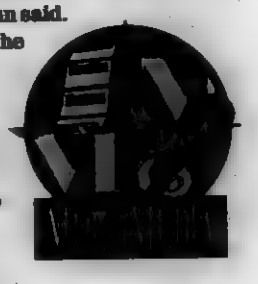
Sun Microsystems Computer Corp. last week attempted to answer criticism about its spotty multimedia product family with the introduction of three new workstations.

This week, Sun is expected to further pad its multimedia lineup with ShowMe 2.0, a desktop videoconferencing package that supports real-time video, as well as shared audio and display screens. ShowMe is expected to ship by year's end.

The debut of Sun's workstation trio — SPARCstation 10SX, SPARCstation 10M and SPARCclassic M — will address specifically two key multimedia shortcomings by offering high-resolution imaging used in desktop publishing and support for real-time video. The company is also offering field upgrades for current workstation users.

Some users who have waited for an integrated Sun videoconferencing solution, such as Ahmad Saadeh, a software engineer at Loral Space Systems, Inc. in Mountain View, Calif., said they are excited by the idea of upgrading workstations for use with video cameras.

Saadeh said he would like to use Sun workstations as desktop videoconference links to overseas offices. But he would prefer to use Solaris 1.X because he does not want to buy a new Solaris 2.X workstation just for video applications. Some video features will require the use of Solaris 2.3, Sun said.



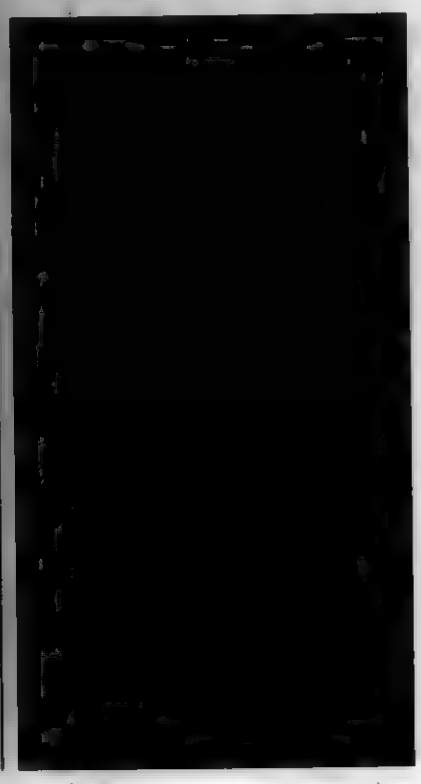
Saadeh said he is also concerned about overall system price, which would include a $5,000 to $15,000 workstation. A one-person ShowMe license, which includes a video camera, costs $3,270, and a three-person ShowMe license is priced at $8,430.

For its part, Silicon Graphics, Inc. (SGI) said Sun's printed comparisons between the SPARCclassic M and SGI's Indy were unfair. Both units are priced at about $5,000, but Scott Bonham, SGI's Indy product manager, said Sun appeared to imply that SGI needed additional equipment to support video compression.

Without compression, users' LANs would be swamped by the bandwidth requirements of video transmissions, analysts said. "We integrate video into the base motherboard [of Indy]," Bonham said. "We can do software compression, and we don't need hardware accelerators to do that."

Sun's low-end multimedia workstation targets the SGI Indy but lacks Indy's support for Intel Corp.'s Indio standard and Apple Computer, Inc.'s QuickTime multimedia standard, said Terry Bennett, a Unix analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif.

"Leaving those out really limits the catch for Sun," Bennett said.



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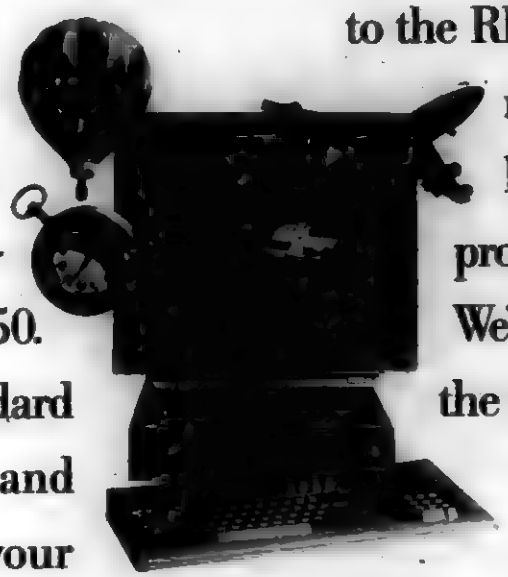

RISC System/6000

	Price	SPEC™int92	Cost/SPECint92
IBM 25T	$9,390	62.6	$150
HP® 715/33	$9,990	24.7	$404
DEC™ 300L	$7,920	45.9	$173
IBM 990	$147,800	126.0	$1,173
HP J60	$136,530	82.0	$1,665
DEC 4000/610	$131,728	94.6	$1,392

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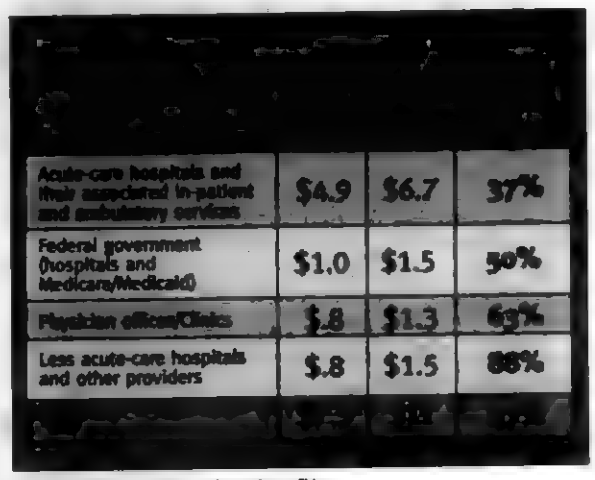
CIOs brace for health care reform

Clinton health plan will require hospitals and other medical providers to increase their IS budgets

By Allan E. Alter

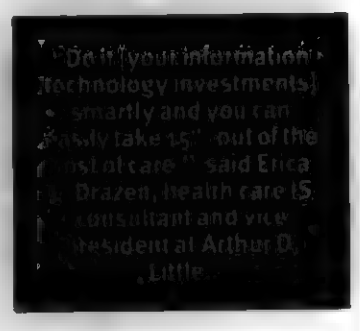
President Clinton's health care reform plan purports to bring simplicity, savings and streamlining to the U.S. public. But health care chief information officers are finding that instituting health care reform will require complex new information systems, a big increase in IS spending and compliance with regulations overseen by a federal health care bureaucracy.

The result? "We may be talking about doubling the annual IS budget we now have," said Erica L. Drazen, a health care IS consultant and vice president at Arthur D. Little, Inc., a consultancy in Cambridge, Mass. Hospitals typically spend about 2.5% to 3% of their total operating costs on information technology, she noted.



Acute-care hospitals and their associated in-patient and ambulatory services	$4.9	$6.7	37%
Federal government (hospitals and Medicare/Medicaid)	$1.0	$1.5	50%
Physician offices/Clinics	$.8	$1.3	63%
Less acute-care hospitals and other providers	$.8	$1.5	88%

Source: Sheldon I. Dorsinfest and Associates, Chicago



In the majority
Eighty percent of the members of the White House Task Force on Health Care are government employees; only 20% come from the private sector.

More money, more money

"Our message to our boards of directors is bad news in times of stress — more IS spending, long lead times, technical difficulty," Kerry W. Kissinger, a partner at Ernst & Young in Boston, summarized at a roundtable discussion on health care reform held at a recent conference sponsored by the Ann Arbor, Mich.-based College of Healthcare Information Management Executives (CHIME).

Clinton's proposal [CW, Sept. 6] calls for health care providers to create "electronic documentation of all clinical encounters . . . using current information systems technology," among other things (see box far right).

Therefore, health care organizations intend to spend a good chunk of cash (see chart above) in the next few years, computerizing patient records and integrating departmental systems such as pharmacy, laboratory and outpatient systems. They also need to share data with other providers, the federal government and the "regional health alliances" that will negotiate with providers under the Clinton plan.

Completing projects of this magnitude has health care CIOs wondering where the funding for these projects will come from. Many said the money would come from cuts in physical expansion. CIOs also expect to look to outsourcers and share a community health information network with nearby hospitals to defray costs.

As the cost concerns mount, some CIOs are already creating budgets and planning new investments to specifically prepare for health care reform.

Harry E. McQueen, CIO of Good Shepherd Medical Center in Longview, Texas, is increasing his IS budget to between $1.2 million and $1.5 million in the next three years, up from $800,000 last year. The additional money will go toward an enterprisewide fiber backbone network and will begin to establish a hospital information system based on open standards.

"This will position us for health care reform so we can be part of communitywide networks and install an enterprisewide patient repository for clinical information," McQueen said. Good Shepherd is a 350-bed medical center that has five outlying clinics and a trauma center.

Grants available

David E. Garets, director of MIS at the 100-bed Magic Valley Regional Medical Center in Twin Falls, Idaho, said he is applying for a National Institutes of Health grant to pay for the development of a prototype rural hospital system. His current annual capital budget is $300,000, but Garets is budgeting "between $3.6 million and $4 million over the next four fiscal years to be able to provide the kind of systems that will put us in compliance" with any likely health care reform. These include systems that will link physicians and payers and measure treatment outcomes.

G. Ward Keever, the senior vice president of information services at the Medical Center of Delaware in Wilmington, said he had just obtained funding to establish a clinical repository that will be available to the center's medical staff over an electronic network by mid-1994. Keever said the repository will eventually be available to providers throughout the region and will include patient eligibility and payment information.

High anxiety

Health care CIOs said they are worried about another clause in the Clinton blueprint. It states: "Current information systems technology readily supports the capture, retention and electronic data interchange of [medical] encounter records as a byproduct of the provision of care and with favorable benefit cost efficiencies."

Source: Alan F. Dowling, national partner of health care information services at Ernst & Young

Many CIOs disagreed with this statement, fearing it would create unrealistic expectations among health care chief executive officers, who may wonder why their own IS organization cannot quickly create such systems.

Boon to IS

Despite funding questions, CIOs attending the CHIME conference agreed that health care reform was certain to upgrade the status of IS within the health care industry. "I think this will be a tremendous assist to the IS community," said Larry D. Grandia, vice president of IS at Intermountain Health Care, Inc. in Salt Lake City.

IS executives also point to evidence that shows the payback from these information technology investments far outweighs the cost. "Do it smartly and you can easily take 15% out of the cost of care," Drazen said.

For example, a study conducted at the Wishard Memorial Hospital in Indianapolis found that "a network of [Intel Corp. 80386-based] microcomputer workstations for writing all inpatient orders" that provides cost data to physicians "saved more than $3 million in charges" at the hospital.

The authors concluded that such systems could potentially save tens of billions of dollars if implemented nationwide. The study was published in the Jan. 20, 1993, issue of the *Journal of the American Medical Association*.

A bounty of bureaucracy

According to a September draft of the president's health care reform proposals, the federal government will establish several oversight organizations and a network of computing centers that will directly affect the health care IS executive. These include the following:

- **The National Health Board:** charged with overseeing the implementation of the health care plan. It will set up a National Quality Management Program to ensure that regional health associations obtain the data they need from providers to evaluate the quality of health care.
- **National Health Data Advisory Council:** charged with specifying data definitions, standard electronic data interchange formats and transfer protocols and other information requirements.
- **A network of regional computing centers** will be created to store as well as analyze the data provided by the health care providers.

—Allan E. Alter

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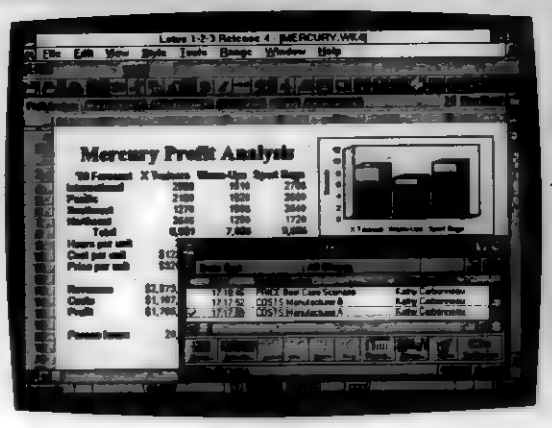

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Windows Spreadsheet Ratings

"1-2-3 Release 4..... **7.8**"
InfoWorld 8/93

"Excel Release 4.0..... **6.9**"
InfoWorld 10/92

"Quattro Pro Release 1.0..... **6.5**"
InfoWorld 10/92

"The Smarticons in 1-2-3 for Windows are smarter and Lotus's approach to swapping different tool-bars in and out beats Excel's and Quattro Pro's."

PC/Computing 6/93

"1-2-3 LEAPFROGS EXCEL AND QUATTRO"

"Lotus's version manager blows away similar features in Excel and Quattro Pro."

Walter S. Mossberg,
Wall Street Journal 7/29/93

–*PC World* 6/93

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BYTE 6/93

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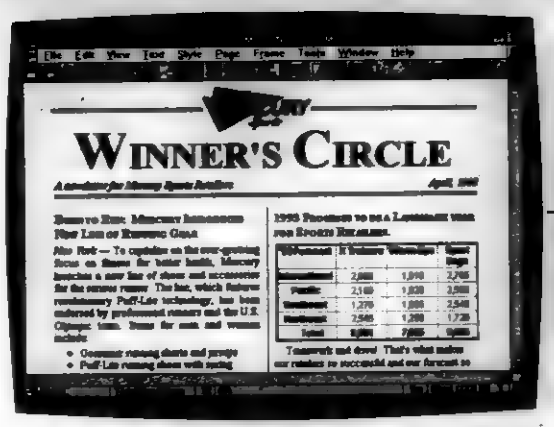

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PC World 3/93

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Lotus
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"Creating a presentation of even (100 slides) is absurdly easy--and much easier in many ways than with competing products..."
PC Week 2/15/93

"Freelance is as close to presentation perfection as you'll find on any shelf."
Windows User 8/93

"FREELANCE SCORED AN AWESOME 98.9 OUT OF A POSSIBLE 100... POWERPOINT 3.0 SCORED 83.6, HARVARD GRAPHICS 2.0 SCORED 80.4"

–*PC Computing* 9/93

"Lotus Freelance Graphics
★★★★★
Microsoft PowerPoint
★★★
Software Digest 7/93"

"(Freelance Graphics) outclasses the competition in features and ease of use."
InfoWorld 6/21/93

"The users in this study were more productive, more effective and more satisfied with Freelance Graphics than PowerPoint...PowerPoint users took 64% more time to complete their presentations."
Usability Sciences Corp. 3/93

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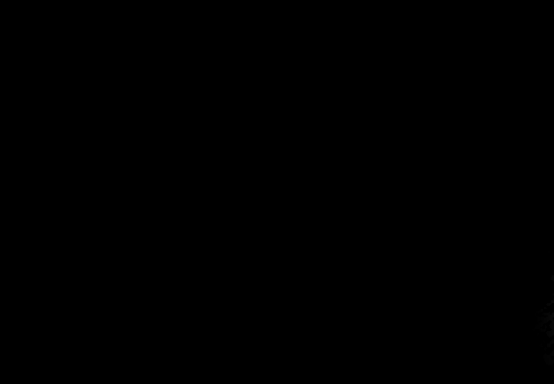

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PC Week 6/28/93

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"...Approach 2.0 is one of the few (software) packages...for which it's truly possible to never open the manuals."

Windows Magazine 12/92

MICROSOFT ACCESS WILL BE TOO OVERWHELMING FOR END-USERS..."

–*InfoWorld* 1/17/93

"Best Buy Approach is the simplest and most straightforward relational database."

PC World 6/93

"The most usable Windows relational database ever."

PC/Computing 8/93

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The new Lotus® SmartSuite™ 2.1 is the most complete desktop solution for Windows™ users. It brings together 1-2-3® Release 4, Ami Pro® Release 3.01, Freelance Graphics® Release 2.01, Approach™ 2.1 and Organizer™ 1.1 at an irresistible price (upgrade for just $299***). But it's much more than a deal on an all-star collection of Windows applications.

The applications in SmartSuite 2.1 are closely integrated, sharing a consistent appearance and behavior. This reduces the time it takes for a user to learn each application. For example, the three most used applications in SmartSuite share 26 common SmartIcons® (In Microsoft® Office, they share 3).

Far beyond anything possible with Microsoft Office, Lotus's integration also simplifies the process of switching between applications, sharing information across applications and using functions from one application while working within another.

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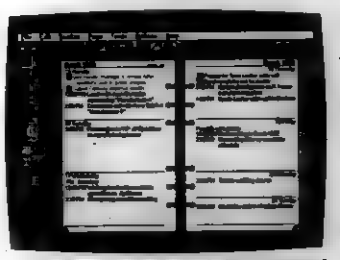

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For the whole story, visit your Lotus Authorized Reseller. Until 12/31/93, you can upgrade from any Lotus or competitive product to SmartSuite 2.1 for just $299.*** Or for a SmartSuite demo disk, call **1-800-TRADEUP, ext. 9080***.

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"When you buy...SmartSuite, the pieces really work together!...The point: There's more to a suite than cramming four boxes into a suitcase and cutting the price."
PC/Computing 8/93

—*PC Letter* 6/7/93

"The level of integration in the SmartSuite makes complicated, cross-application tasks easier for users and lets them take full advantage of...the Windows environment."
Dataquest 6/15/93

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'Friends, Romans. . .'

In *Julius Caesar*, Shakespeare noted: "The evil that men do lives after them. The good is oft interred with their bones."

This may not be the best quote to use when talking about John Sculley, as he is neither dead nor even departed from the industry (witness the fun we're having at his expense in the cartoon at right). But since Sculley stepped down from the top post at Apple earlier this month, about the only place you could read of his unique accomplishments was in the press release issued by Apple. Otherwise, he's been roundly castigated for a variety of managerial offenses.

So let's take note here of some of his accomplishments. First and foremost, Apple was a bit player in the business market when Sculley arrived at the company. Today, it is the only PC company that has had significant success in the home, educational and small and large business markets.

In 1992, Sculley's last full year at the helm, Apple sold more PCs than any other company in the world — 10% more than the No. 2 company, IBM, and 125% more than Compaq, the No. 3 company.

By engineering a partnership with Motorola and IBM to produce the PowerPC microprocessor, Sculley attempted to give Apple a path away from the Macintosh line, which had made the company so successful in the past decade, but whose end was in sight.

These accomplishments, meanwhile, took place while Sculley skillfully imbued Apple with a culture far different than the one he inherited from company founder Steve Jobs. And if you think this is easy, ask IBM's Louis Gerstner or Digital's Robert Palmer about culture and how tough it is to change.

Ultimately, if Sculley was guilty of anything, it was the same human frailty that has afflicted countless other industry executives and also struck so many IS managers along the way. It goes like this:

An executive defines a strategy and the company gains success, perhaps great success. Then the underlying fundamentals that made the company successful start to shift, sending out low-frequency signals to that effect. But past successes cause even the brightest executives to turn a deaf ear to those signals, even to reject them outright.

At Apple, as at Compaq under Rod Canion, the commoditization PC hardware ran counter to what had made the company so successful. Therefore, it was rejected as a strategy, just as the decentralization of the highly structured glass house of MIS/data processing was so antithetical to IS managers in the late 1980s.

One could attack Sculley for being profoundly human. But that certainly does not demean a legacy that saw him guide Apple into the realm of world-class corporations.

Bill Laberis

Bill Laberis, *Editor in chief*

Peer-to-peer payoff

Art Olbert of IBM should reconsider his thoughts on peer-to-peer networks [CW, Sept. 13]. The current annual sales in that section of the LAN marketplace are more than $200 million and by 1996 should reach at least $1 billion.

Currently, more than 50% of all networks contain fewer than 10 workstations; estimates suggest that this percentage will not change through the end of the century, even though network sales will expand dramatically.

Richard P. Clowes
New York City

Nothing to cheer

Where is the data to support the glowing statements you printed about women's progress being responsible for the shrinkage in the gender gap for pay ["Women cheer salary gap news," CW, Sept. 13]? I suspect much of the change parallels the general economy.

Large numbers of men lost high-wage jobs and couldn't find high-wage replacement jobs, switching to low wages in the service sector instead. This is the primary factor in the recent pay disparity shrinkage for the general population.

The same pattern might easily be true for computing professionals. If this is why our pay disparity is shrinking, I don't consider it progress.

Bonnie Hawal
Houston

Contractors sound off on competition, clients and costs

Regarding "Who's a contractor? IRS cracks down" [CW, Sept. 27]: It is not illegal to be an independent contractor! We are issued 1099s, and they are cross-checked by the IRS.

Many companies welcome independents to compete along with brokers and agencies for contracts. Most of my clients prefer to deal directly with the person who is doing the work, rather than with someone who is a full-time marketing person adept at flinging buzzwords at them.

Anthony Melodia
Independent consultant
San Francisco

Your article regarding computer contractors does a great injustice to all independent consultants who are fighting often corrupt agencies for clients. Agencies and brokers take great delight in scaring clients into not using the services of an independent consultant.

There are acads of tax-problem cases in which agents have tried to place independents on a 1099 basis with clients in direct violation of Section 1706 of the tax code.

Because independent consultants can (and do) underbid the large agencies, the agencies attempt to neutralize the competitive environment by scaring clients into not signing directly with an independent by claiming the client might face tax consequences.

Thus the client company pays 20% to 30% more for the same services it could get by working with a consultant directly. It is an interesting story the brokers tell convincingly.

Alan N. Canton
Vice president
Adams-Blake Publishing
Fair Oaks, Calif.

Shame on *Computerworld* for giving voice to those who denigrate independent contractors. The "groupthink" mentality that says "Hire contractors only through contracting agencies, which are responsible for paying taxes" implies that independent contractors will cheat if given half a chance.

Bureaucrats like Tom Charbeneau have helped to destroy many small businesses. Worse, they defeat themselves by not considering some of the best independent contractors who refuse to give 30% of their income to a brokerage firm that provides no value to the customer.

Richard A. Menard
Framingham, Mass.

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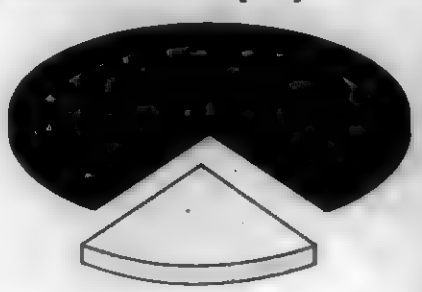

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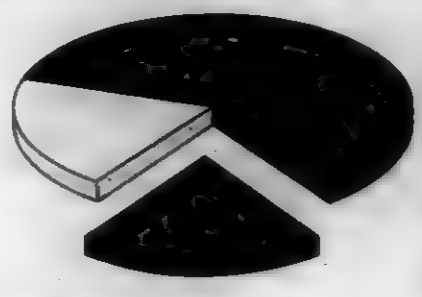

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Don't wait to be asked

By Dennis Jones

What do customers want? It's a simple question, but difficult to answer successfully. The real problem is that most businesses today can't wait for customers to realize what it is they want, and that's just as true for the information technology function as it is for business as a whole. Customers may not even realize they have a problem or a need until it's too late for an acceptable response.

Knowing what your customers need before they have time to think about it is a powerful strategy in today's market.

At Federal Express, we've made it the driving strategy of our business and our technology team. Along the way, we've discovered some guiding principles:

•Responsiveness is not enough. The traditional interpretation of the information technologist's role is that we respond to users' requests and aim to fulfill their expressed needs. This is an outdated idea. We can't sit back and wait for requests. We have to get up, get out and learn so much about our customers' jobs that we are able to see and suggest opportunities for improvement even before they do.

This is done by working with end users as they close their books, make sales calls, sort packages. During peak work periods, information technology personnel don't just observe but actually perform the work. There's no better way to get to know the ins and outs of a process than to take an active part in it.

•All information technology activities must have a business purpose. Our rule is that there are only three good reasons to undertake an information technology project: to reduce cost, to improve the quality of the company's product and to increase market share. Some projects — such as our Powership network of PCs at customer sites — can achieve all three, and those triple-crown types are obviously the ones we most like to find. But the main objective is never to deploy technology just for technology's sake.

We can either cannibalize our own architectures and operations or let our successors have that opportunity.

•It's imperative to eliminate sources of time and paper. Needless cycle time and paper are always sources of waste; eliminating them is a surefire way to "delight" customers. Getting to this point often requires a pitched battle, however, because feifdoms are constructed around prerogatives such as taking time and passing paper.

•Client/server is inevitable, and we can either lead the transition or get out of the way. Whether those in the information technology function like it or not, our users are quickly moving us out of the glass house. We have a basic choice: We can either cannibalize our own information services architectures and operations or let our successors have that opportunity.

Scott Rogers

The graphical and information sharing capabilities of client/server environments are too enormous to delay delivering them to users. The text-based, data processing model has served business well, but it is quickly reaching the end of its useful life.

Jones is chief information officer at Federal Express Corp. in Memphis. Federal Express was recently included, for the sixth time, in *Computerworld*'s Premier 100, a group of companies that are judged as particularly effective in their use of information technology. Jones was also named the Lattanze Center Information Executive of the Year for 1992.

The perfect trap

Many businesses owe their current prosperity to imperfections in the marketplace. Soon there may be few places to hide.

By Max D. Hopper

There's no shortage of expressions to describe the tremendous pressures on business in the 1990s. Some of them are even printable. Economists who contemplate the tides of commerce from the comfort of their tenured university chairs can take loftier positions. Some of these are even pertinent.

In the 1940s, Harvard economist Joseph Schumpeter coined the term *creative destruction* to describe the constant mutation of the economic structure: the incessant destruction of the old order and the unceasing creation of a new one. Schumpeter held that creative destruction is driven by the emergence of some new factor — technology, commodity or source of supply — that commands a decisive cost or quality advantage. The introduction of such a catalyst, he said, strikes at the very foundations of existing enterprises.

Today, information technology is that catalyst. It is both the destroyer of the status quo and the enabler of those enterprises that employ it astutely. We see an agile new breed of retailers using the blitzkrieg efficiencies of information technology in inventory deployment to unseat the sedentary giants of their industry. We see service businesses surpassing regimented rivals by arming front-line employees with the information to serve customers more effectively. Indeed, the most-aggressive efforts in this arena place the tools in the hands of customers themselves. Like most catalysts, however, technology is volatile and can produce unexpected consequences.

It is becoming clear, for example, that it may be possible to provide customers with too much information for an industry's own good. When all buyers and sellers of essentially commodity products and services have complete access to the prices being asked across the market, you have a condition called *perfect pricing*. You also have a key attribute of another classic concept of economics long thought to be unattainable in the real world: the ominous ideal of *perfect competition*.

If the ravages of perfect competition exist anywhere today, they are reflected in the beleaguered airline industry, where dozens of carriers vie for cost-conscious customers who largely view an airline seat as a commodity item. Here, perfect pricing information is enabled by computerized reservation systems that allow travelers to instantly compare all competing fares on any route. Although the resultant fare wars may strike some travelers as too good to be true, the airlines that are subsidizing this buyers' market with their would-be profits find it too true to be good.

The glaring visibility that computerized reservation systems have brought to airline pricing may presage a trend toward perfect pricing information in other industries. The financial world is moving in that direction, with buyers and traders having up-to-the-minute information on commodities and currency. While it is possible to offset fierce price competition with differentiating factors, such as quality, service and convenience, many businesses owe their prosperity to imperfections in the marketplace. As widespread access to information exposes these niches, there will be fewer places to hide.

Hopper is chairman of AMR Corp.'s Sabre Technology Group.

Even now, Chicago's scofflaws recall the sport warmly. ◆ You took a parking ticket. Folded it. Crumpled it. Then, simply booted it away. ◆ Thirteen thousand parking tickets written each day. Maybe, on a charitable day, 10 percent paid. ◆ But if you're thinking of playing that game these days, officials have one word of advice: Don't. ◆ Sun™ computers have been installed. And they are very, very effective. ◆ Claim the meter was broken, and a Hearing Officer will check a "meter database" on a Sun computer. Protest the ticket isn't yours, and a scanned image of the original is pulled from a database. Yell that you're in a hurry, and all these

HOW A NEW TYPE OF COMPUTER PUT A STOP TO ONE OF CHICAGO'S FAVORITE SPORTS.

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GSA Contract Number GS00K93AGS6403.

David Coursey

Suite deals

I've just finished testing both WordPerfect 6.0 and Microsoft's Word for Windows 6.0, and I think I like WordPerfect best.

But there's a good chance I won't use it.

The issue isn't file compatibility. We are already slinging a variety of file formats around the LAN and use both Windows and Macintosh. No matter what I do — upgrade the Winword I'm using today or make the switch — I will still be saving files in some sort of a common denominator format until everyone else catches up. No big deal.

The real obstacle to following personal preference in this case is that WordPerfect is a stand-alone application. WordPerfect and its partner, Borland, won't weigh in with a real integrated suite until next spring. I think there's a reasonable possibility they will catch up all at once, but we won't know that until after the last frost.

In the meantime, WordPerfect does include nice spreadsheet and graphics capabilities, but the quality of an individual application isn't the point anymore. Integration is. For better or worse (and it's likely there'll be a lot of that), software suites are the way we're all headed.

Patchwork buying

It used to be our desktops were a patchwork of our software packages. The best choice from the spreadsheet column, the best word processor and a bunch of apps, like communications or graphics, that few outside our immediate workgroup would care about. How well these applications worked together didn't matter much once we got over the major hurdle of file sharing.

Today, the "best of breed" approach has been replaced with a new concept: What you do isn't as important as who you do it with. Call this the social climber school of software thought. It says that

Coursey, *page 46*

Intel fixing PCI bugs

Level of openness still questioned by analysts

By Michael Fitzgerald
SANTA CLARA, CALIF.

Intel Corp.'s proposed new Peripheral Component Interconnect (PCI) local-bus standard has surprisingly big question marks next to its name for a bus with support from more than 200 vendors.

The questions center on the usual industry issues: bugs and the efficacy of vendor alliances.

Intel recently had to acknowledge bugs in the way PCI works with some implementations of Pentium systems. In a box that combines PCI, the Extended Industry Standard Architecture (EISA) bus and write-back cache, a Pentium chip will run software some 15% slower than it should. Two large vendors, Dell Computer Corp. and Gateway 2000, Inc., said they would delay some systems shipments for a month until the bugs were clearly fixed.

Minor issues

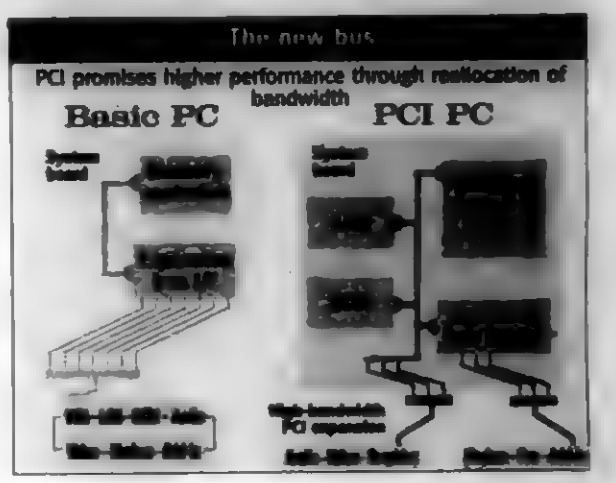
The issue may be a small one for users, given the slight delay in ship dates and the actual demand for EISA-bus machines, and, for that matter, Pentium systems themselves.

"Most people are using [AT] buses, and those chip sets are in very good shape," said Albert Y. C. Yu, Intel's senior vice president and general manager of the microprocessor products group. Yu said Intel has "fixed the problem, and is sampling chip sets to our customers, and they've said it looks pretty good."

Yu predicted Pentium-and-EISA system shipments in November.

As if to underscore the real lack of impact this will have in the market, IBM PC Co. last week announced an AT-bus-based PCI/Pentium combo in its new ValuePoint line (CW, Oct. 18). PC Co. officials said they have no problems with bugs.

The ominous question, analysts said, revolves around the level of openness Intel will give PCI. Intel worked to establish a PCI Special Interest Group (SIG), throwing in documentation on its three major patents related to PCI. Since then, the group, which has nine committee members and some 200 other members, has developed a new 64-bit standard for PCI.



"A lot of manufacturers have this sort of paranoia that if they buy into PCI, the payback reaper will come in later and say 'pay up!'" said Bruce Stephen, director of PC hardware and pricing research at International Data Corp. in Framingham, Mass. Stephen said "everyone seems to agree that it's a superior technology, but what's the real cost to Intel?"

Giving up control

The fear for users would be higher costs for add-in cards and giving control of the bus to one vendor. Manufacturer paranoia was heightened by Intel's decision last year to sue a Taiwanese clone maker, Twinhead International Corp., for using non-Intel chips in a machine that shipped bundled with Windows. Intel's weapon here was its patent addressing the way a machine shipped with Windows boots up.

Members of the PCI SIG include Digital Equipment Corp., which has built PCI support into its Alpha processor, Apple Computer, Inc., which is wedded to the PowerPC architecture, and Advanced Micro Devices, Inc.

"It's a pop-up patent, and that's what they are doing again," said Kimball Brown, an analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif.

Intel officials bristled at the idea that the company might not be serious about making PCI open.

"We've agreed to license on an open and royalty-free basis [our] intellectual property. We have documented that, and that documentation and agreement has been issued to every registered holder of a PCI spec," said Ron Smith, general manager of

Intel fixes, *page 50*

Data infrastructures

Software may clear some hurdles on data highway

By Michael Vizard
CAMBRIDGE, MASS.

With more than $30 billion expected to be spent on the construction of a national data highway, some of the luminaries of the computer science world gathered here at MIT last week in an effort to highlight the major research challenges involved in creating a national data infrastructure.

Probably the most pressing issue is a lack of intelligent software capable of taking advantage of such an infrastructure.

Speaking at the Society of Minds symposium sponsored by The Media Laboratory at MIT, most researchers concurred that while the elements to build an infrastructure for a national data highway are in place, it will still be years before researchers develop software that is sophisticated enough to turn the dreams that such highways invoke into a reality.

Most of the $30 billion that will be spent in the coming years will be focused on creating a fiber-optic network and linking homes and businesses to that network, which will then serve as the functional equivalent of a Route 66 highway, providing an infrastructure for speeding the transfer of data by creating more direct links between sites.

The challenge is turning that highway into a more effective tool for sending information other than basic mail messages.

"Right now, the Internet is the duck tape gluing together the infrastructure," said Michael Hawley, an MIT assistant professor of media arts and sciences.

Many goals to meet

In particular, an effective national data highway is going to require significantly faster switches capable of supporting voice, data and video simultaneously and a wide variety of intelligent software agents that can find and gather information strewn across any number of systems attached to the network.

To accomplish these goals, software vendors are looking to create agents using some of the principles first established in the artificial intelligence domain, while hardware vendors

Data highway, *page 46*

Mac users waiting for PowerPCs

By James Daly

Some longtime fans of Apple Computer, Inc. are putting off buying new Macintosh PCs and are squirreling away their money while waiting for machines based on the impending PowerPC RISC chip. But most said they will spend those stockpiled funds only if the new models come in at the right price.

"If they cost anything over $2,500, they're just whistling Dixie," said Mike Bailey, a systems integrator at Lockheed Missiles and Space Co. in Sunnyvale, Calif. Bailey said his company intends to use the PowerPC Macintoshes as high-end workstation.

"But if they come in too pricey, then I'll have to re-evaluate. Heck, I could buy a [Intel Corp.] Pentium," Bailey said.

In January, Apple is expected to announce several models based on the PowerPC 601 chip, which is a collaborative effort among Apple, IBM and Motorola, Inc. Several models employing the new chip are expected to ship by March.

While the momentous announcements have some information systems managers rethinking autumn purchasing plans, they have also generated a nail-biting uncertainty. Some interviewed recently wondered whether the PowerPC will render their current Macintoshes obsolete. Others were confused about the upgrade path to the PowerPC.

Upgrades on the way

Apple spokeswoman Betty Taylor said the firm intends to provide PowerPC upgrades for the 68040-based Macintoshes, including the Macintosh Centris 610, 650 and 660AV; Macintosh IIvx and IIvi; Performa 600; and Quadra 800 and 840AV systems.

Apple also announced last week that it would offer a PowerPC upgrade for all three models of its Workgroup Server line.

If you have Quadras of the 700, 900 or 950 variety you are also in luck: DayStar Digital has said it will make upgrade cards for these Macintoshes. Taylor said Apple is working with other third-party developers to create upgrade paths for other models as well.

That news has altered some buying patterns. "We're only buying the upgradable Macintoshes," said Brian Comnes, manager of the information center at DHL Airways, Inc. in Redwood City, Calif. "We're not going to shortchange the folks who need new machines now, but we've got to make plans for the future."

Upgrade prices will vary by model, but they are expected to start at less than $1,000. Prices will be finalized by the time PowerPC Macintosh products are announced in January, Taylor said.

For those who do not need the power of the new RISC chip, fear not. Apple will continue to offer 680X0-based systems well after the initial introduction of Macintosh on PowerPC, Taylor said. In addition, software that runs on today's Macintoshes will also run on the PowerPC machines. "Apple's chief goal is to retain a high degree of compatibility with existing Macintosh applications," she said.

Meanwhile, Apple is also optimizing parts of System 7 to achieve better performance on the PowerPC processors. For example, many Macintosh applications spend most of their time calling procedures from the Macintosh Toolbox, a set of system software modules designed to handle common tasks. Apple has modified the Toolbox procedures that take the most computation power (such as QuickDraw routines for on-screen graphics) to take advantage of RISC.

What's in store

The PowerPC microprocessor family looks like this:

- PowerPC 601: Will be used in initial minirange and high-end Macintosh systems. Availability: early 1994.
- PowerPC 603: Designed for high-volume desktop Macintoshes, as well as portable PowerBook and Duo models. Also suited for embedded controller applications. Offers performance similar to the 601 in a lower-power, lower-cost design. Availability: mid-1994.
- PowerPC 604: Will eventually replace the 601, offering better performance in midrange and high-end Macintoshes. Availability: late 1994.
- PowerPC 620: Intended for high-end products, it offers premium performance using full 64-bit architecture. Designed primarily for high-performance workstations and servers. Availability: late 1994 to early 1995.

Coursey

CONTINUED FROM PAGE 45

software integration now matters more than what software you are running.

Suites are what's happening, and we can't avoid them. This is good for cross-application integration and seems to be good for pricing, but it has a dark side as well.

Suites encourage people to buy applications they don't need and install them companywide. This raises training, support and upgrade costs. Worse, suites are headed down the road toward making the Windows user interface more and more proprietary. A function that has been made really simple in one suite is likely to require many more keystrokes and mouse clicks in another. Or if there is a comparable shortcut in two packages, the user can count on them being implemented in different ways.

As a result, a user who spends his or her day in Lotus SmartSuite could have some real problems moving to a Microsoft or WordPerfect/Borland package.

Right now, many companies are purchasing the packages and then spreading the components across multiple desktops — a spreadsheet here, a word processor there. The software publishers are, predictably aghast at this, sometimes claiming the license agreements prohibit splitting up the packages. If they get really serious about locking customers in, there's an easy way for them to do it. All they need to do is create high-end integrated packages in which the applications are inseparable; just as they already do with their $99 "works" packages.

> **Suites encourage people to buy applications they don't need. This raises training, support and upgrade costs.**

If that happens — and I think it's likely — we may soon come to think of suites as single, tightly integrated "hyperapplications" instead of collections of stand-alone pieces. I'm not sure that will be in anyone's best interest.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4460.

Data highway hurdles

CONTINUED FROM PAGE 45

are looking to incorporate some of the principles associated with biological systems in their systems. Once these are concocted, researchers will have to focus on linking personal devices — Apple Computer, Inc.'s Newton could be considered a forerunner — back to network resources.

"We need to evolve ways of searching and filtering information. This will give rise to the use of intelligent systems. There is no other way to deal with the infrastructure," Hawley said.

Already, users are seeing the first rudimentary implementations of agents. For example, Microsoft Corp.'s latest software offering includes a number of agents that automate tasks, and a small number of agents, called Knowbots, are available for searching for text across the Internet.

Independent agents

The long-term goal, however, will be to make these agents less dependent on preprogrammed rules. Instead, users will see a new generation of intelligent agents that will be capable of learning by example.

For example, an agent might learn by monitoring your interaction with a system that information regarding the performance of the New York Giants football team is important to you every Sunday night.

> **An effective national data highway is going to require significantly faster switches that are capable of supporting voice, video and data simultaneously.**

It will then automatically scan all available resources and collate that data for your perusal prior to your logging into the system on a Sunday night.

To accomplish this, programmers will have to eventually give up their traditional programming and debugging methodologies in favor of treating a machine like a child that is capable of learning by example, argued Marvin Minsky, founder of the artificial intelligence laboratory at MIT.

The major stumbling block in this area, however, is that in trying to replicate how humans think, programmers do not yet have the tools available to accurately emulate the human mind's ability to organize related data and to represent that data by multiple symbols, noted Kenneth Haase, an MIT assistant professor of media arts and sciences.

Long time coming

Meanwhile, hardware vendors have discovered that it would probably take decades to build systems using conventional processors capable of supporting the switching and sorting algorithms necessary to create a data highway that would be shared by millions of users.

However, some hardware vendors are investigating borrowing concepts from the theories of evolution and natural selection to create highly efficient sorting engines, said Danny Hillis, a founding scientist at Thinking Machines Corp. in Cambridge, Mass.

Hillis said since current engineering methods are not practical for making a truly thinking machine, he is investigating how the human mind sorts images and data in the hopes of applying that knowledge on a larger scale.

Hewlett-Packard servers and INGRES software help PBS bring Sesame Street to Main Street. Faster, more accurately and on a tight IT budget.

"It's the ideal system environment for running complicated, mission-critical broadcast applications with high reliability."

— Frank Pellegrino, Associate Director, Computer Services, Public Broadcasting Service

PBS has 346 member stations, scattered across seven time zones. They all have widely varied broadcast schedules, requiring continuous transmission of programs from PBS headquarters in Alexandria, Virginia.

The speed, accuracy and reliability demanded for this task was proving too much for their old computer system. So, after carefully checking out the leading suppliers, PBS chose HP 9000 servers as the hosts for the INGRES database management software.

This approach allowed PBS to run their programming and library applications faster. And HP's Open Systems environment meant they could integrate existing client hardware. And save scarce IT funds.

With advantages like these, it's small wonder HP is the fastest growing UNIX platform for INGRES software. For more reasons, call 1-800-637-7740, Ext. 7899. Maybe your company's programs can run faster than you think.

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Paul Gillin

Portable pleasures

Portable PC users today can pretty much agree on one thing: They want a computer that fits on an airplane tray and lasts for a complete flight from San Francisco to New York. Unfortunately, no computer I've used has yet met that challenge, but a couple of recent entrants take pretty good shots.

The **IBM ThinkPad 350C** color notebook is where the IBM PC Co. wants to steer the legions of users who can't get the elegant 750C, which has been plagued by supply problems. Sporting a 486SL chip, passive-matrix color display, a 125M-byte hard disk and 4M bytes of main memory in a 5.2-pound package about the size of a high school textbook, the $1,999 350C is hard to beat. It should be on the short list of anyone who wants color portable computing on a budget.

The 350C's display is crisp and surprisingly responsive for a passive-matrix model. I didn't encounter any lighting condition that made it difficult to read. The keyboard is a bit cramped but workable. The best feature of the machine — and all IBM ThinkPads — is the TrackPoint II, an ingenious little mouse control that works by finger pressure alone.

It takes a little getting used to, but once you get the hang of it, the TrackPoint is the most convenient, best designed mouse controller on the market.

The ThinkPad has a few other nice features. A software power management configuration utility is accessible with a two-key combination at any time from within any program. The feature lets you instantly customize power-management features to get the mix of battery life and performance you desire. A 3½-in. diskette drive is conveniently built into the unit.

IBM claims that the ThinkPad 350C gets up to 9.8 hours of battery life "depending on usage," which probably means sitting quietly on a shelf. Battery life is a disappointing 2 to 2½ hours at best. What's worse is when the ThinkPad's battery gets low, the unit beeps and flashes every few seconds. It can do this for an hour or more, making for great relations with your airline seatmates. IBM should make the ThinkPad's low-battery reminder less aggressive in the future.

Now for something else . . .

Dauphin Technology presents an entirely different bid for the traveler's wallet with its **DTR-1**, an intriguing little handheld device that explores new dimensions in miniaturization. Lombard, Ill.-based Dauphin is aiming the DTR-1 at business users who want an elegant, compact, touch-typable portable computer and who occasionally need to accommodate pen input.

Priced at $2,495, the DTR-1 has many innovative design features, including an internal fax/modem and optional internal Ethernet. The DTR-1 comes equipped for use as a pen computer or an ultracompact portable. The unit is in two pieces: a pen-ready 9- by 5½- by 1½-in. deep base unit with built-in VGA display and a separate keyboard.

You can run DOS, Windows or Microsoft's Windows for Pen Computing, using the unit either as a very small notebook computer or a largish handheld system. The system unit and keyboard are strapped into a leather billfold that zips shut like a traveling toilet kit.

The best part of the DTR-1 is its brilliant little screen. The backlit LCD is

The Dauphin DTR-1 *packs an internal fax/modem and optional internal Ethernet card into a 2½-pound package*

bright enough to read in any lighting situation. Battery life is an unspectacular two to three hours.

Unfortunately, in trying to do two things at once, the DTR-1 succeeds in doing neither particularly well. Windows for Pen Computing is a poor choice of operating environment, in part because Windows doesn't translate well to a pen interface and in part because its primitive handwriting recognition renders it almost useless for serious notetaking.

Also, The DTR-1 is just big enough to be inconvenient as a handheld system. A serious pen user would want something smaller or flatter. The keyboard isn't up to the quality of most notebook alternatives and the key spacing was a bit cramped for my long fingers. The leather case has an elegant but flimsy feel and the lack of a hard shell case may be disquieting to the traveler who is used to heaping abuse on a portable system. The DTR-1 comes with a skimpy 20M-byte hard drive. These days, that's barely enough to hold Windows and one or two applications. Serious users will quickly run out of space.

The DTR-1 is in many ways a breakthrough in portability, one that could find a following among overladen business travelers. But as a general-purpose notebook, it's a couple of megabytes short.

Fax to the max

If you're in the market for fax software, run, don't walk, to buy **FaxWorks Pro 3.0** from Atlanta-based SofNet, Inc. This is what fax software should be. It not only supports just about any fax modem under the sun, but its interface is slick, intuitive and fast. In two months of using FaxWorks, I have yet to crack the cover on the manual. Among its many nice features are automatic cover page generation. FaxWorks Pro's image manipulation and page rotation is the fastest I've seen. If you're a Delrina Technology WinFax Pro user, it will blow you away.

SofNet has taken the pain out of using a fax modem. This is certainly a great product.

Gillin is *Computerworld*'s executive editor. His MCI Mail address is 575-4120.

Firm pioneers software for annuities

Mutual fund company deploys user-developed tool to explain investments

By Mitch Betts
WASHINGTON

Some of today's financial investment vehicles are so complex that even brokers cannot grasp all of their features, let alone explain them to most of us.

That is certainly the case with "variable annuities," so one leading financial firm is deploying laptop PC software that uses presentation graphics to explain and sell customers on its version of a variable annuity.

The first-of-its-kind software was developed by Calvert Group, a mutual fund management company based in the Washington suburb of Bethesda, Md. In fact, the notion of using computer software to explain an investment product is so new that Calvert had to get approval from the National Association of Securities Dealers (NASD) in Washington.

NASD had to review the text and illustrations to ensure that they provide the same disclaimers, caveats and "fine print" as a paper prospectus so the software doesn't bamboozle customers.

"They wanted a lot of proof that we calculated the illustrations correctly," said William R. Chambers, director of business and product development at Calvert, a subsidiary of Acacia Mutual Life Insurance Co. in Washington.

"They had never reviewed a software product before," Chambers said, "so instead of the usual 10-day review period, it took two months."

Variable annuities are a hot investment product for baby boomers facing middle age and higher income taxes. They combine the investment potential of mutual funds with the tax-deferral attributes of insurance, but the features and options are very hard to explain.

So Calvert holds training seminars on the Calvert Prism Variable Annuity for investment brokers and then hands out (at no charge) the software to help them understand, explain and sell the product. The software allows the broker to fill in data for prospective clients and then show customized graphs that illustrate how the investment might look in their retirement years.

"Calvert Group needed approval from the National Association of Securities Dealers to market its annuity software."

By the end of 1993, Calvert expects to have handed out 5,000 copies of the Prism Edge software to independent financial advisers, Chambers said.

In addition to being a sales tool, he said the software ensures that brokers in the field provide accurate and consistent information about the investment product.

Module compatibility

The software has modules for client management, competing products, calculations and printing out forms and contracts. Programming was done by Maytech, Inc., a small software development firm in Lenexa, Kan.

The laptop software may give Calvert a competitive edge for a while, but Chambers said he expects other firms will soon use the same technique for educating people about complex financial products.

Consumer reaction has been favorable, Chambers said, because the software presentation uses a customer's actual financial data for making retirement decisions rather than a generic illustration of some "average" person's finances.

"Presentations with flip charts and three-ring binders err on the side of simplicity," said Dale E. Cooper, director of retail marketing at Capital Holding Corp. in Louisville, Ky., which handles the insurance side of the Calvert product.

The software will be updated every six months in order to reflect any changes that might occur in tax law, stock performance and the features of competing products.

Hewlett-Packard and Informix help the Midwest Securities Trust Company handle customer inquiries in a tenth of the time. And at a twentieth of the cost.

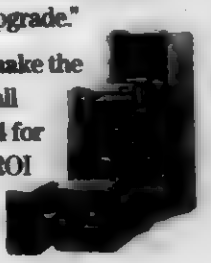
"I don't think I could have done it with any other vendor than HP."

— Donald S. Elko, CIO for the Midwest Securities Trust Company, a subsidiary of The Chicago Stock Exchange

Their customers were having to wait over two weeks for critical information about trades and dividends. Trying to fix the problem with a new mainframe application would have taken about a year, a lot of programmers and a ton of money.

Instead the Midwest Securities Trust Company turned to HP's UNIX®-based client/server technology, the #1 platform for Informix's relational database management software.

"We were able to complete the system within three months, using one developer," Donald S. Elko said. "It provides responses nearly ten times faster than the mainframe. They're online, real-time rather than paper-based. And the HP 9000 system only cost us a fraction of what we spent on our last mainframe upgrade."



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Can pen be mightier than the mouse?

By Michael Fitzgerald
REDWOOD SHORES, CALIF.

A small pen-based vendor may have come up with a way to make the pen supplant the mouse.

Communication Intelligence Corp. (CIC) last week released Handwriter for Windows, which bundles its handwriting recognition software with CalComp Corp.'s digitizer and Microsoft Corp.'s Pen Extensions for Windows. It will cost $199 during its first 60 days and $399 thereafter.

CIC said the handwriting recognition may prove less important than the ability to use the pen like a mouse, which could give the company an entree into the massive installed base for desktops. The company included several pen-oriented games, such as a crossword puzzle, with Handwriter for Windows. It also included Signature Sentinel, a security utility tied to the user's signature.

"Solitaire taught people about the mouse. People need to get used to the pen, and these games should help them do that," said Madeline Duva, CIC director of business development.

Duva also pointed out that mice can be difficult to use on portables, so the product may gain some momentum there.

"You've got an increasing number of people interested in Windows in a portable environment, and the mouse itself is difficult to implement on portables," agreed Ray Boggs, an analyst at BIS Strategic Decisions in Norwell, Mass. "This could turn out to be an important idea."

Intel fixing PCI

CONTINUED FROM PAGE 45

Intel's integrated microcomputer division, which makes the PCI chip sets.

But Smith did acknowledge that the subsequent round of negotiations within the PCI SIG has been less fruitful in producing an agreement on how to move PCI forward in an open fashion. He said with so many companies involved, it was difficult to ensure that all vendors with patents that might relate to how the local bus operates threw them into the ring.

Smith said Intel wants to avoid the situation that occurred when Dell, a Video Electronics Standards Association (VESA) member, unexpectedly announced that it held a patent related to VESA's VL local bus, temporarily causing some controversy around that bus.

Analysts said Intel's ability to hammer out patent issues within the PCI SIG is key to the openness of PCI.

"The danger here is PCI-II," Brown said. "The world was not worried about [IBM's Micro Channel Architecture], II was worried about giving control of the bus to IBM. I don't know why people are willing to trust Intel."

Smith countered, "We've been the only ones who've gone public with what we're willing to do, and we said we're willing to do it on an open and royalty-free basis. That's what we would like to see come out of this thing."

He added, "We feel that Intel and the industry benefit more by having [PCI] as an open standard than if we take it proprietary, and we've been consistent in that."

Rajesh Vashist, marketing manager at Adaptec, Inc. in Milpitas, Calif., and an original member of the PCI SIG, downplayed fears that the group may never formalize the standard.

"Intel has been very forward and open, and we think the progress we've made is excellent, given the size of the group," he said.

AT 9 A.M. HE DIDN'T KNOW HOW TO WORK WITH A DATABASE.

When Don Glor came to work on the morning of September 15th he'd never used a database before. Two hours later he'd developed his first application — it looks like a fire truck actually it's a customized inventory and billing management system for the South County Fire Department, San Mateo County, CA.

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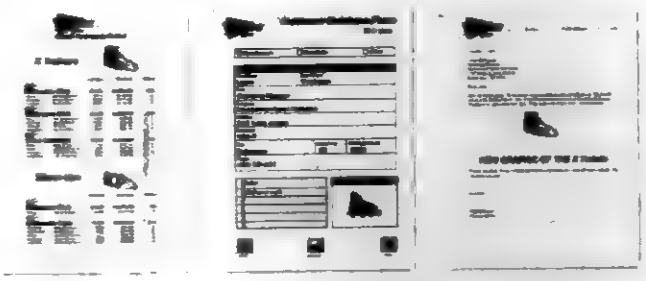
This will surprise anyone who has tried to work with databases like Paradox® or Access.® According to Don, "I tried Access and shelved it. It was just too difficult to get a handle on." That's not surprising considering the 543 page supplemental language reference for programmers Don would've had to pore through. Which looks like light reading next to Paradox's 1300 pages of programming instruction.



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[redacted]

Baarns Consulting Group, Inc. has introduced Version 2.0 of the Baarns Utilities, a software package.

The product is a collection of 23 productivity-enhancing utilities for Microsoft Corp.'s Excel.

The Baarns Utilities 2.0 features extensive printing options, improved file management and file grouping capabilities, customized start-up screens and tool bars and an assortment of text enhancement capabilities, according to the Sylmar, Calif., company.

This release offers improved versions of the Baarns AutoSave, Setup, Print Special and Zoom utilities.

Windows 3.1, Excel 4.0 and an 80286 or higher IBM-compatible with a minimum 2M bytes of RAM and 1M byte of free hard disk space is required.

A single-user version costs $89.95.

▶ *Baarns Consulting Group*
(818) 362-9235

Nu-Mega Technologies, Inc. has introduced Version 2.0 of Bounds-Checker for Windows, a development tool.

The product has an event logging and viewing capability that offers automatic bug detection and shows the user the events that led to the problem, according to the Nashua, N.H., company.

Bounds-Checker's event log window saves the most recent events in memory, which allows users to view application programming interface calls, hooks, window and dialog box messages and tool help notifications.

Version 2.0 requires Windows 3.1 (running in enhanced mode) and a 386/486 or Intel Corp. Pentium-based PC with a minimum of 4M bytes of memory.

Bounds-Checker 2.0 for Windows costs $249.

▶ *Nu-Mega Technologies*
(603) 889-2386

Andyne Computing Ltd. has introduced Andyne Pablo, a multidimensional data access and reporting tool.

Andyne Pablo provides an additional perspective on information by enabling users to extract multidimensional summary information from relational databases.

Pablo employs a HyperCube technology. According to the Kingston, Ontario, company, HyperCube is a means of storing and combining multidimensional summary information from almost any data source.

A point-and-click interface lets users manipulate and change summary information stored in HyperCube into reports.

A single copy of Pablo for the Macintosh costs $695. A Windows version is scheduled for release in 1994.

▶ *Andyne Computing*
(613) 548-4355

Simpact Associates, Inc. has announced Version 1.3 of Remark, voice integration software.

According to the San Diego company, the product allows networked PC users to include voice information in Windows applications and mobile users to use a telephone as a virtual workstation.

This release lets users link voice information to an electronic document, storing the voice on the Remark server instead of embedding it into documents.

Version 1.3 also features system administration enhancements, a simplified user interface and support for Novell, Inc.'s SPX/IPX protocol. Users have the option to streamline the recording process by reducing the steps involved with a simplified recording feature.

A base system with Remark voice and telephony server software and a Remark client software applications license costs $2,850 and supports 25 to 50 users.

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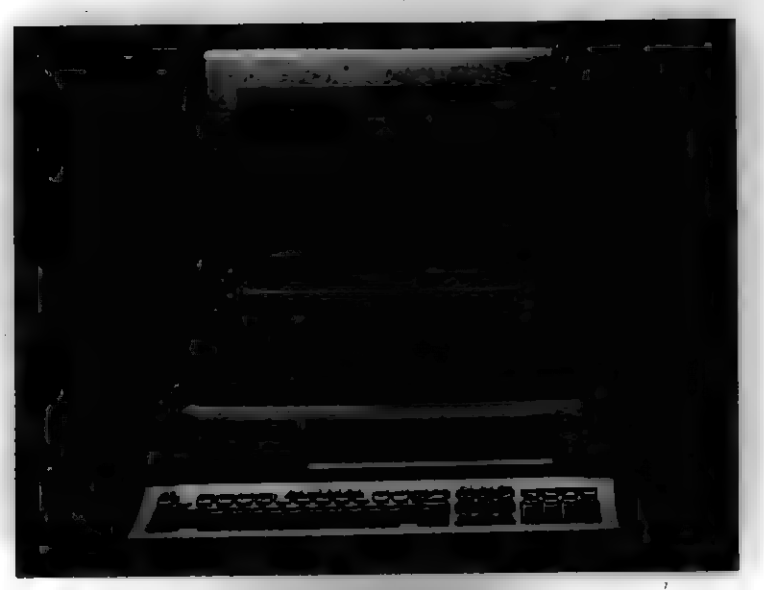

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intel inside

Windows users begin journey to Chicago

By Ed Scannell

Microsoft Corp. will begin moving its huge base of Windows 3.1 users to Chicago, its next-generation operating system, when it delivers Windows for Workgroups Version 3.11 early next month.

The new version sports a 32-bit file system — largely borrowed from Chicago — along with several 32-bit networking components, including a new redirector and IPX protocols. With the help of the 32-bit file system, the product is said to be 100% faster than the original version in some applications.

This transition is perhaps well-timed, coming shortly before Novell, Inc. is expected to formally introduce Novell DOS 7.0. That product will have preemptive multitasking, high levels of security and, of course, tight integration with NetWare.

Much of the added support for NetWare in Windows for Workgroups was driven by corporate users who also wanted greater central control over network privileges. Both of these items were missing from the first version, released last fall.

Experience counts

"IS focus groups over the last few months told us that [peer-to-peer networking] works well with experienced users who know what they are doing. But they often run into problems with inexperienced users who wander into directories they shouldn't," said Rogers Weed, lead product marketing manager of Windows for Workgroups.

With Version 3.11, Windows for Workgroups now supports

Windows users, *page 61*

Think big picture for client/server

By Elisabeth Horwitt

Corporate users at two conferences recently took aim at one of the biggest barriers to successful client/server implementation: how to teach mainframe-oriented information systems managers to cope with the mishmash of protocols, formats, tools and architectures typical of so many corporate PC network installations.

Key participants at both conferences made the point that IS managers who assume they can work effectively in a client/server environment with their old, specialized, mainframe-based database or application development skills are almost certainly going to take a major fall.

A big reason corporate client/server implementations get into trouble is that the implementors typically go at the project like the proverbial blind men and the elephant: one understanding LANs, one understanding PC hardware and one knowing databases, said Paul Hamel, a senior vice president at Putnam Investments in Boston.

"Client/server reality is an integrated whole," Hamel said. Each developer needs to be "not an expert, but conversationally fluent" in all the key areas.

The problem, as identified last week by the Open User Recommended Solutions (OURS) Multivendor Education Task Force, is to give IS managers a working knowledge in the basic areas of client/server implementation when each area is fragmented into incompatible, vendor-specific products.

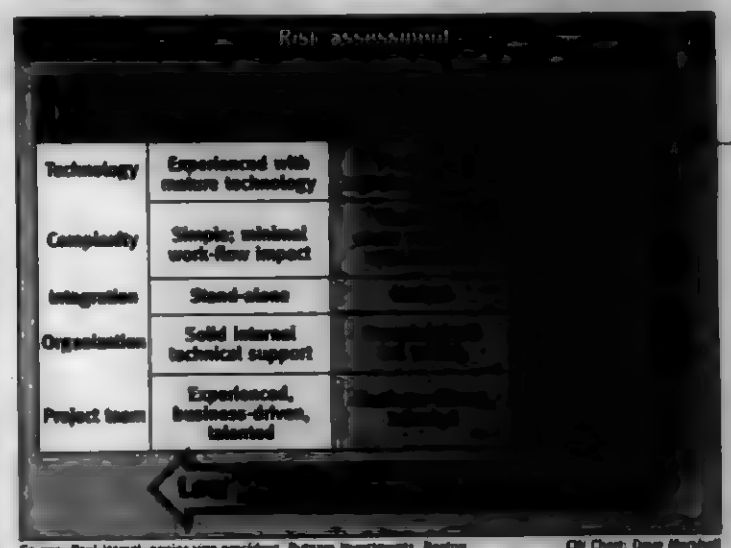
Something to strive for

The ideal would be industrywide software and hardware standards that would save corporations with heterogeneous environments from "having to replicate technical staffs with expertise in each of those particular platforms," according to Wade Brown, executive vice president and chief information officer at Washington National Insurance Co.

Given that such standards are still a long way off, the OURS task force's answer to the immediate problem is "to come up with a core curriculum that would be consistent from vendor to vendor, so if you learn this, it applies across the board," said Donald Sternfeld, director of IS at law firm Morgan Lewis & Bockius in Philadelphia and a member of the OURS task force.

For example, an IS manager might learn the basics of how a network operating system works,

Client/server, *page 66*



GM hops on new document highway

By Michael Vizard
SAN FRANCISCO

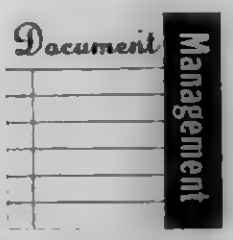
Typical of corporate America's drive to get a handle on its mountains of paper, General Motors Corp. is employing a robust set of document management tools in a bid to gain more control over information assets.

One of the cornerstones of GM's effort will be an electronic delivery system from Electronic Book Technologies, Inc. (EBT) in Providence, R.I. The system will be used to distribute 3,500 documents, ranging from five to 150 pages each, to its engineers. GM and EBT revealed details of the project at the Seybold Conference Exposition '93 here last week.

Initially, GM will use EBT's DynaText delivery system to distribute documents that comply with the Standardized Generalized Markup Language (SGML) to about 1,000 engineers, with a target goal of supporting 30,000 engineers during the next couple of years.

GM is just beginning to implement a coordinated electronic document management strategy, analysts said, as are other corporations with large amounts of online information that cannot be easily accessed by all users.

"People are just now becoming sophisticated about what electronic document management tools are, but the infrastructure isn't in place yet," said Carl Frappaolo, executive vice president of the Delphi Consulting Group in Boston.



"We'll start with the core engineers on major projects, but the plan is for everybody to be using it," said Terrence Sadlier, a GM systems development manager in the System Engineering/Technical Process Group. GM will deploy DynaText on its Unix and Windows workstations, which will be equipped with EBT hypertext searching and querying tools for accessing information on-line. "We'll probably be using a mix of electronic and paper distribution for quite some time," he added.

At most major corporations, the move to adopt electronic distribution of documents will not be a panacea. However, it will provide an important tool in the quest to regain control over the information stored on individual systems and servers across an enterprise.

"Tracking and distributing documents has always been an unwieldy process, but the technology is finally there that you can begin trying to control this," said Priscilla Emery, a vice president at New Science Associates, Inc., a consulting firm in Westport, Conn.

Among those tools are CD-ROMs; electronic distribution technologies from companies such as EBT and Interleaf, Inc.; and imaging and work-flow software and font technology from companies such as Adobe Systems, Inc. At the same time, Microsoft Corp. is working to improve document-handling capabilities in Windows 4.0, and PC application vendors are readying document management system strategies [CW, Oct. 11].

"Document management systems will be the traffic cops for accessing electronic document libraries," Frappaolo noted.

Client/server engine

Client/server computing is providing the underlying technology, which makes it easier to put data close to the end user. Client/server computing's emergence "has caused a reawakening about how we manage documents," Emery said.

For instance, at GM, Sadlier said, a wide-scale evaluation process is under way. "There's a lot of activity focused on getting more information out of product data, especially since it's updated just about every day."

As part of that effort, Sadlier said, GM is examining what role Lotus Development Corp.'s Notes might play in managing documents created on PC tools that do not directly support SGML. "Ideally, we're looking to see what kind of integration there will be between Notes, SGML and word processors using [Object Linking and Embedding] 2.0," Sadlier said.

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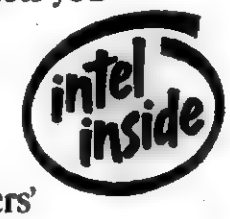

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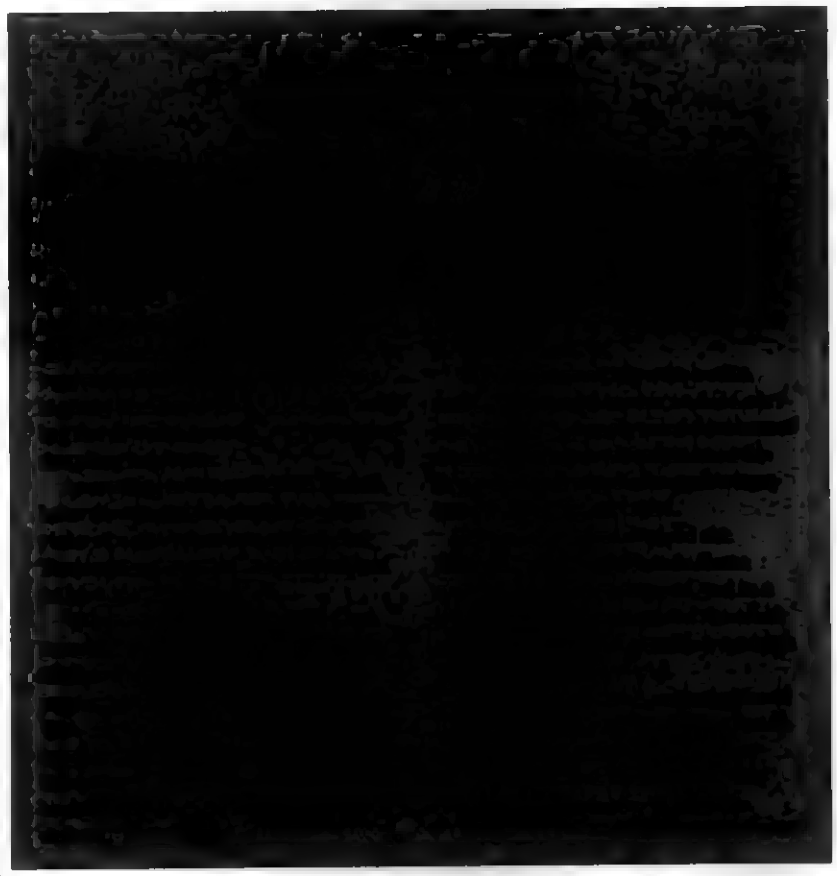

Client/server

CONTINUED FROM PAGE 53

which would be applicable whether the system is from Novell, Inc., Banyan Systems, Inc. or Microsoft Corp.

The need for effective training, everyone agreed, is dire.

Formal training costs about $1,350 per client/server application per employee, according to "Changing IS organizations: The effect of client/server implementation on job skills requirements," a report commissioned by OURS from Gartner Group, Inc. and presented at the recent meeting of the vendor/user organization in Boston. On the other hand, "an untrained user will spend between $3,000 and $5,000 to get to the same or lower skill level, a 300% hidden premium," the report said.

New skills set

Participants at the Technology Transfer Institute's Client/Server Applications and Systems Solutions Conference in New York last week also focused on the difficulties IS managers run up against when they try to apply mainframe-based skills in a client/server environment.

Hamel, for example, related how a client/server project he headed in a former job initially was a disaster, primarily because the team of IS managers tried to build a system from scratch with immature, complex and largely unfamiliar products (see story above).

At The Chase Manhattan Bank NA, "We took a position early on that training has to be considered part of the project, built into cost timescale and expectations," said Elaine Bond, a fellow at the bank and president of OURS.

One key aspect of that training is to break down IS managers' mainframe "preconditioning." For example, "most mainframe folks think they can do everything on the mainframe that you can do on client/server," Bond said.

At Chase, however, as elsewhere, IS is still "sorting out what's generic" to developers' jobs and what is specific, she said. "If my job requires me to understand the difference between LAN and mainframe operating systems, don't train me" on Novell's NetWare.

Mythical savings

Another part of the job is puncturing myths about what client/server tools will do for productivity and costs. For example, corporate programmers naturally assume that graphics-based client application development tools, such as Microsoft's Visual Basic, will mean a huge increase in programmer productivity, on an order of 10 to 1, said Shaku Atre, president of Atre Associates, Inc.

"We see a 2-to-1 increase because, while you maybe have fewer programmers, you need more testers," she said.

The reason: Icon-driven programs provide far more chances for users to go astray than do the older, menu-driven systems.

Having made a first cut at training needs assessment by commissioning the Gartner Group report, the OURS task force plans next to hammer out a "matrix that details the level of specificity of client/server needs." It also plans research case studies of companies that have successfuly implemented client/server solutions in terms of how they addressed the skills issue.

Eventually, the task force plans to work with vendors and educators on how best to deliver generic skills to IS managers who have become client/server application developers.

Retailers take client/server initiatives to home offices

Some struggle with bottlenecks, others find savings

By Ellis Booker

Having proved the value of client/server in their stores during the past two years, many retailers now want to do the same for corporate applications in the home office.

The problem is that few companies have made this migration successfully.

"I've had experience with four retailers now that have tried to do it. Every one of them has failed," said Eric L. Denna at Brigham Young University's J. Willard & Alice S. Marriott School of Management in Provo, Utah.

"Retail is detail," said Denna, who attributed the bottleneck to I/O speeds of client/server-based systems. "When you're talking about Sears logging 50 million to 60 million event records every day, there isn't a client/server [system] today that can handle one-tenth of that."

Denna added that client/server is a very appropriate arrangement for use in stores because the amount of data that even the largest individual store collects is manageable.

Denna was one of the speakers at the RisCon '93 Expo earlier this month in Chicago, where client/server computing, wireless networking and ways of capturing and mining customer data were top issues. This year's three-day show attracted a record 5,409 attendees and more than 200 exhibiting vendors.

Making it work

Nevertheless, success stories are out there. The cases of Texas State Optical in Beaumont, Texas, and Galyan's in Plainfield, Ind., are typical.

Texas State Optical, an $18 million manufacturer and retailer of prescription glasses, migrated off a proprietary NCR Corp. mainframe two years ago. It has since put all its business functions on a LAN-based system running the Paradox relational database from Borland International, Inc.

According to Mike Sales, chief financial officer at Texas State, who attended RisCon with MIS director Kraig Black, the company has been able to slash its administrative and informations systems support staff thanks to the new system.

At Galyan's, a $50 million sporting goods company, an IBM RS/6000 server now supports about 100 users. It replaced a Data General Corp. platform 18 months ago.

"We're using commercial software augmented with an Informix database," said MIS director Michael Anderson.

One of the first

The Bombay Co. in Fort Worth, Texas, was an even earlier downsizer, although it chose an IBM AS/400 rather than a Unix platform when it began its move in 1991.

"The business is growing 30% to 40% per year, and while Unix would have given us the scalability we wanted, the software wasn't mature," said Christopher W. Buttine, director of IS.

The Bombay Co. took its administrative and financial systems off a Wang Laboratories, Inc. host in 1991 and its merchandising and inventory systems off an IBM System/38 last summer. Nowadays, two IBM AS/400s run the business in the corporate office and connect to 486-class point-of-sale (POS) terminals in the company's 400 retail locations.

Meanwhile, the rest of the retail industry is clearly walking the path forged by Kmart Corp. and others a few years ago: putting client/server-based networks in stores. A typical configuration sports PC-compatible POS devices at checkout counters connected over a LAN to one or more high-end processors. These in-store processors, in turn, communicate with corporate hosts over dedicated, dial-up or satellite communication links.

Mainframes made more efficient

For retailers that want to "mine" hundred million-record databases quickly, Price Waterhouse offers a product for IBM mainframes called Geneva, a system software architecture that is said to make data capture and data analysis on a mainframe more nimble.

Geneva, now being tested in a handful of retail locations, is a data-independent architecture that separates the placement and relationships between data elements from the raw data itself. As a result, a mainframe running Geneva can show a dramatic increase in performance when it comes to examining a large volume of data.

Price Waterhouse said customized machine code functions in Geneva Version 2.0 yielded a fifteenfold performance increase over the previous custom Cobol version of the code functions, and a sixtyfold increase over the previous generalized Cobol code functions. The current version of Geneva runs at 1 CPU second per view per million records; a 30% decrease in this cycle time was achieved in Version 3 of the software, which became commercially available last month.

—Ellis Booker

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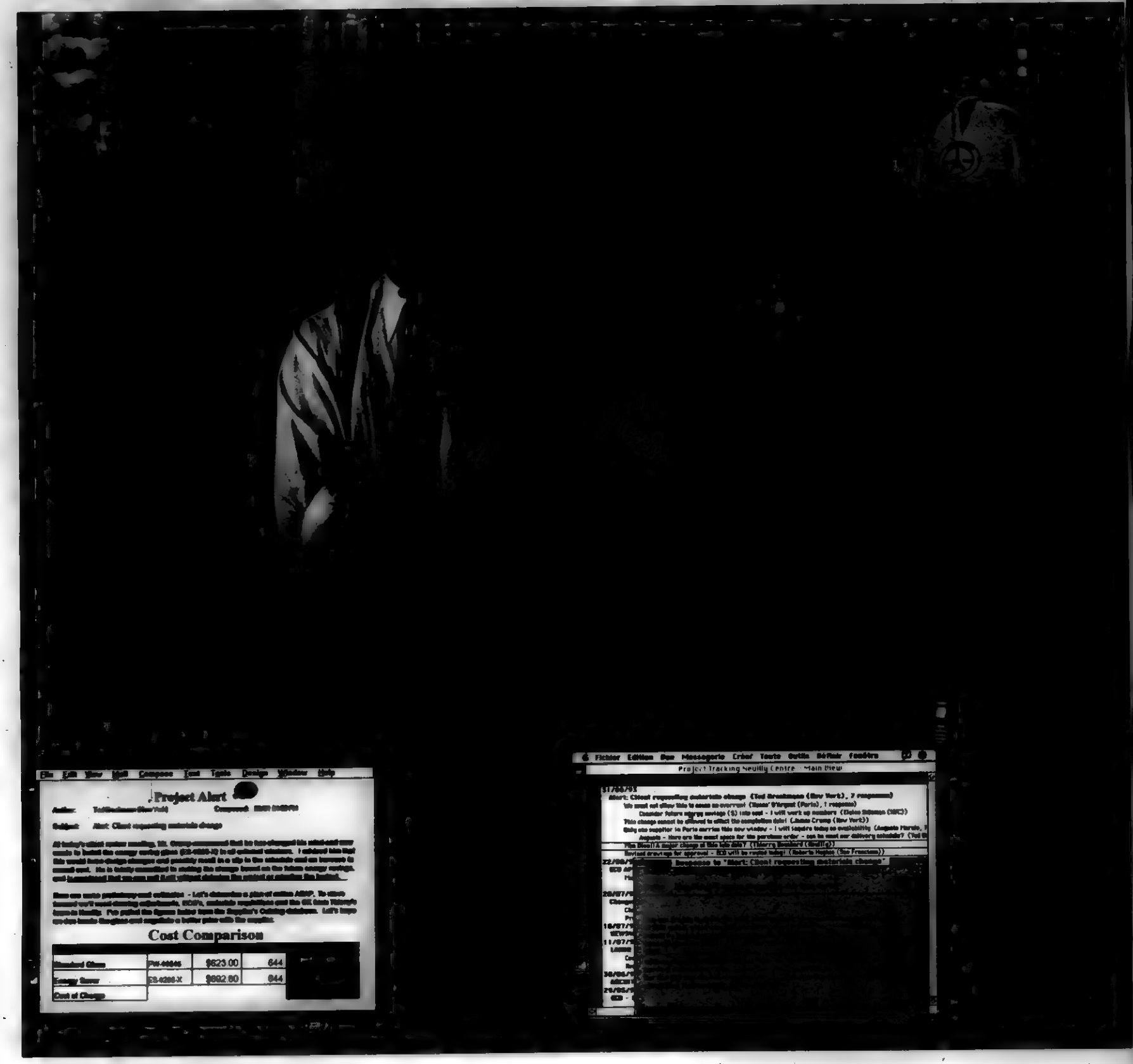

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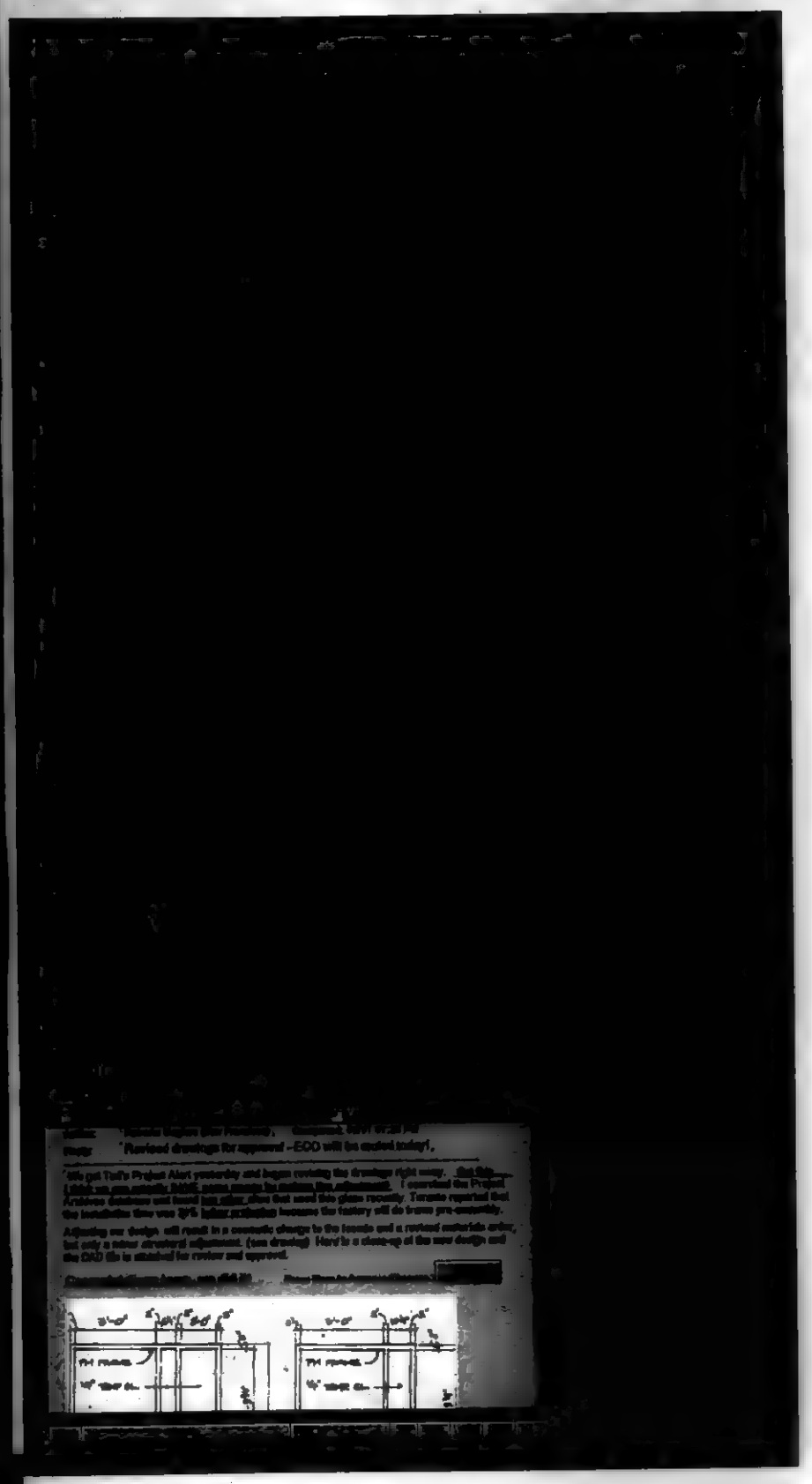

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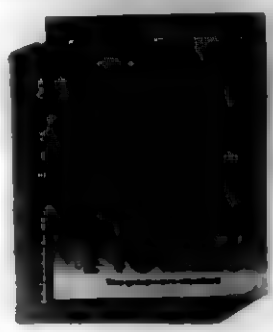

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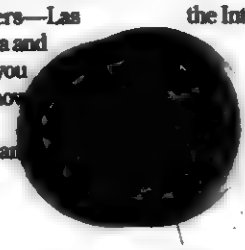

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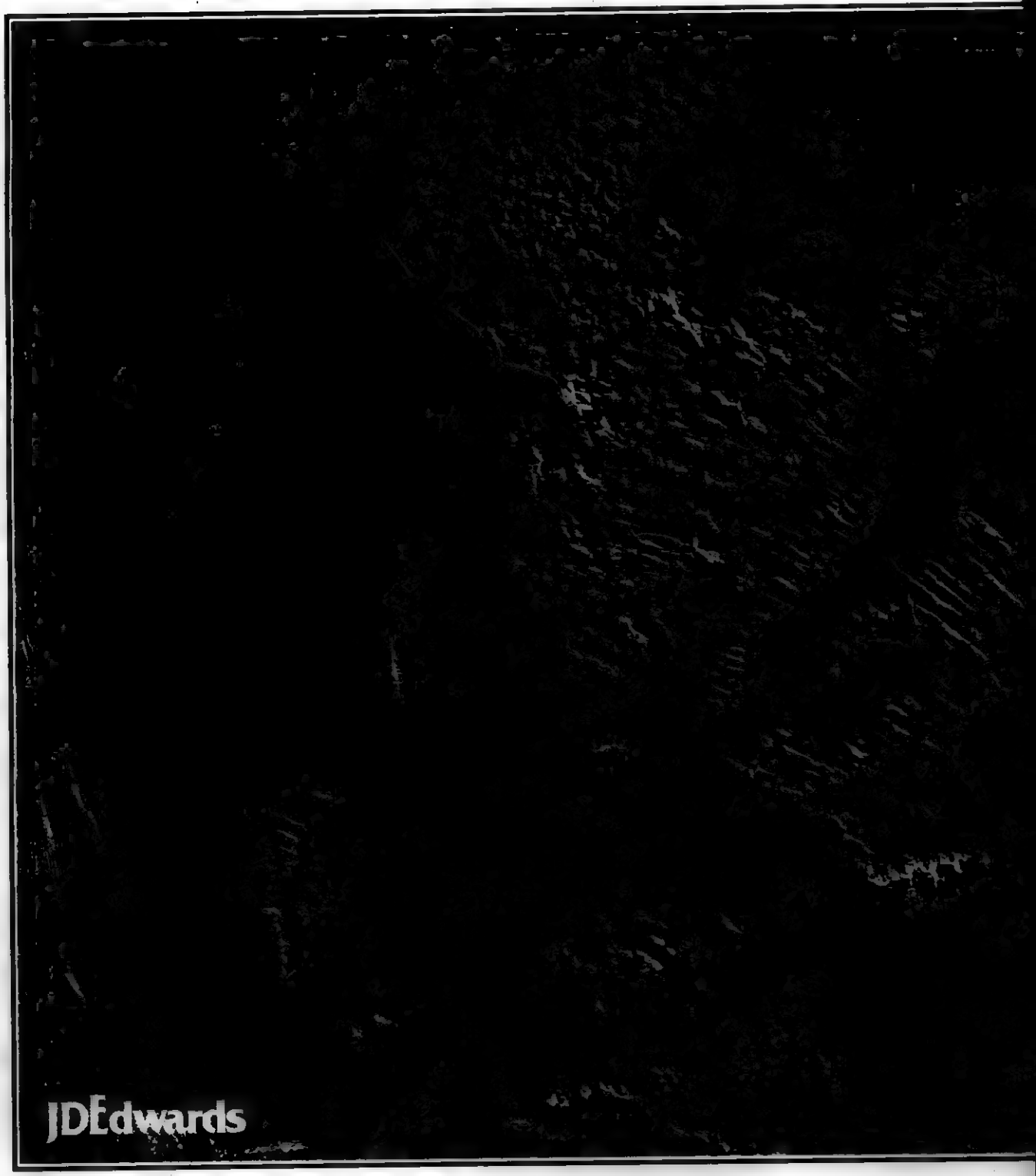
Before you make a move in this rapidly changing environment, take a minute to consider the next step.

Does your software h
evolving world? Or will it



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ave the ability to adapt in an fall prey to the changing times?

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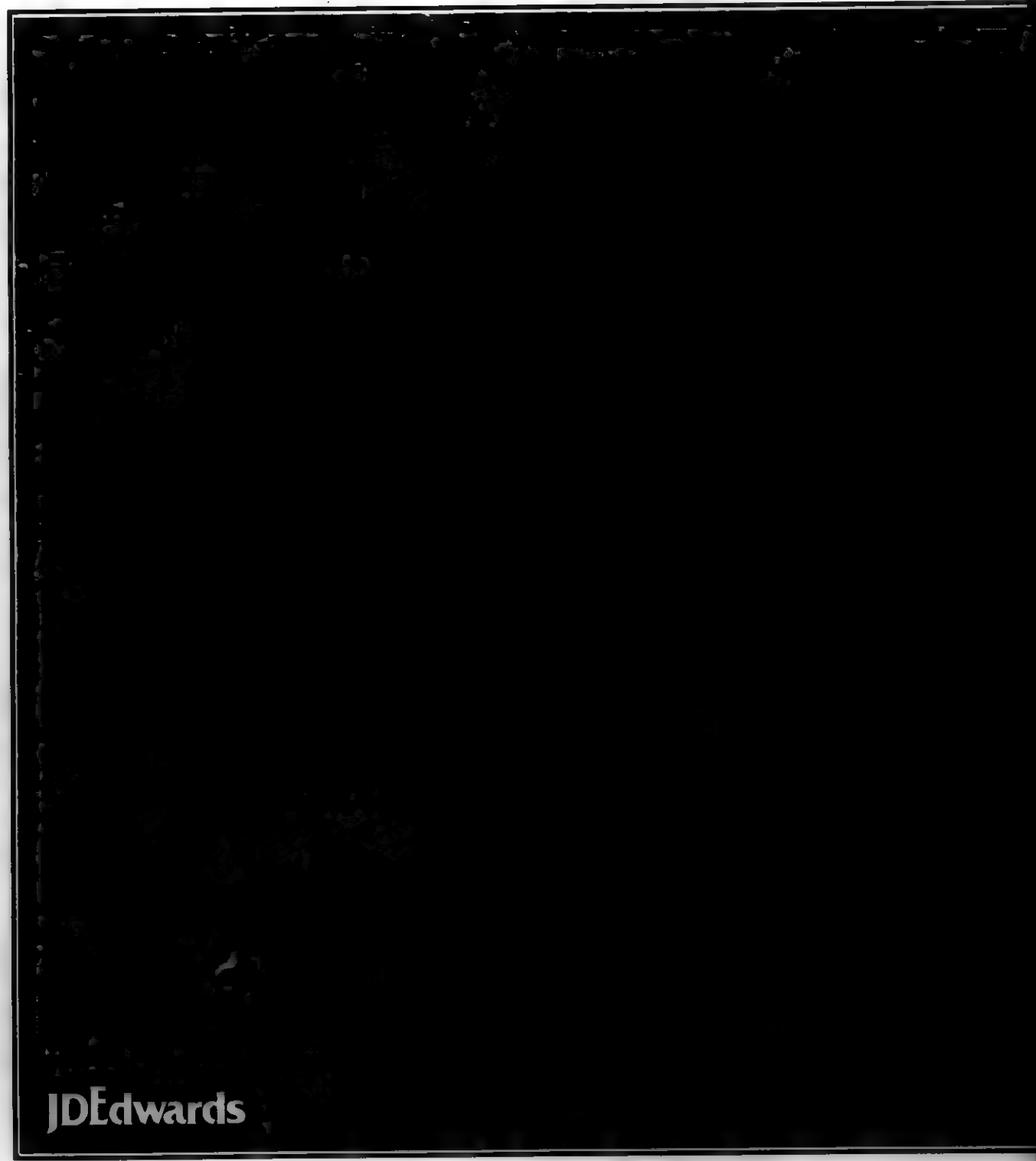
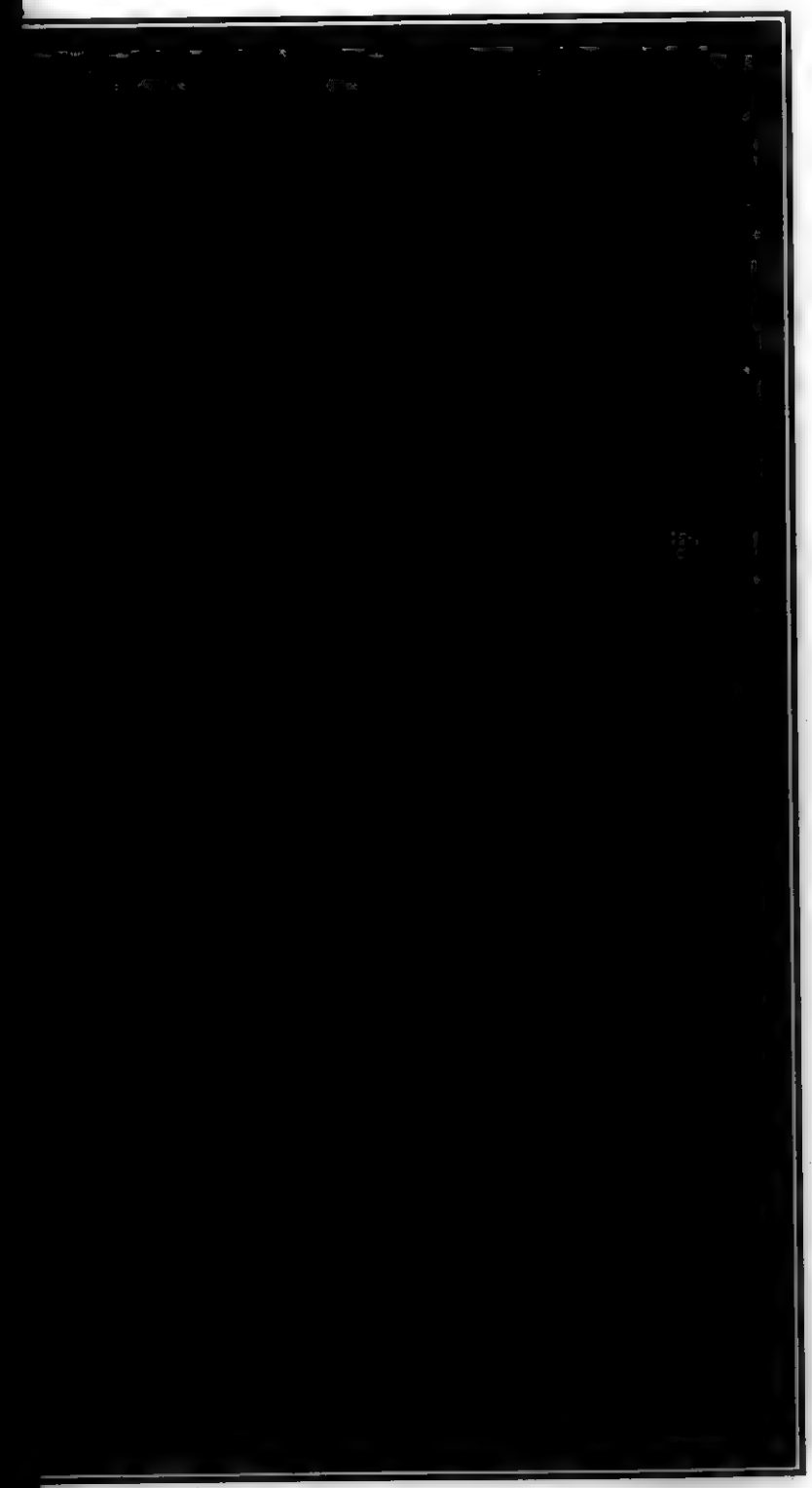
new territory?



are company leading you into Or just migrating with the herd?



These days the talk is all about the migration to open systems. But how can you be certain you're getting the right technology and not just following the crowd?

While other companies are rushing to jump on the UNIX® bandwagon, J.D. Edwards is taking the time to explore other open systems technologies as well, such as Windows NT,™ Cairo and Taligent.™ What's more, we offer strong vertical applications for a variety of industries, so right out of the box your software will be closely tailored to your specific needs.

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nment where the sky is the limit, mes from knowing when to act.

With technology rushing by at such a rapid pace, it's hard to tell exactly when to jump in and grab onto something. J.D. Edwards gives you the confidence to act now without worrying about locking yourself into one technology. By participating in our maintenance programs, your software investment will be preserved even as you migrate to another platform.

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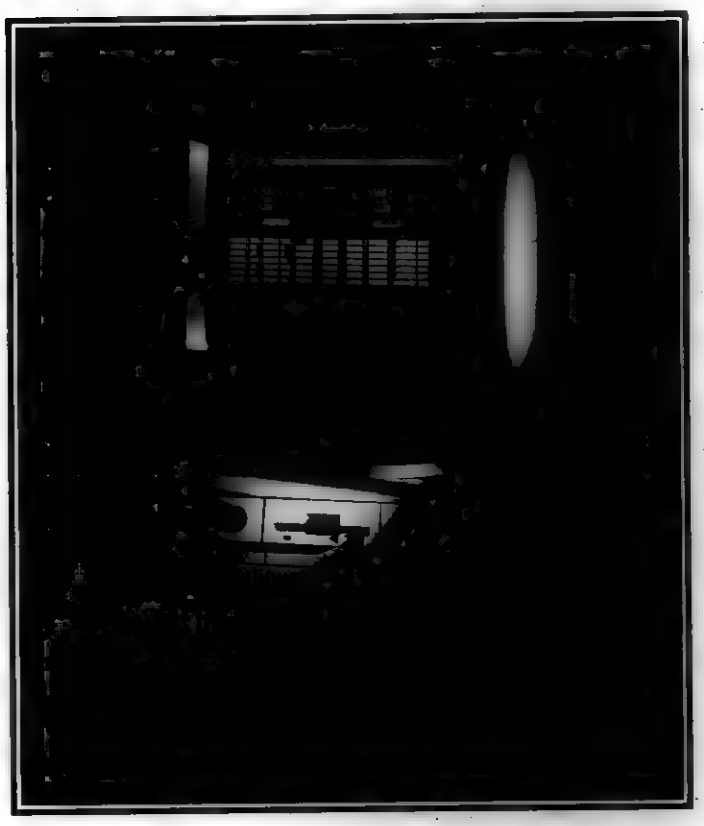

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Windows users

CONTINUED FROM PAGE 53

NetWare's Open Document Interface drivers and can run peer-to-peer services over a new 32-bit IPX protocol. Some users think this support makes Windows for Workgroups a more appealing client in heterogeneous networks.

"The enhanced support for NetWare makes it an ideal client for PCs operating in heterogeneous networks," said Paul Fjeldsted, an engineer at Hewlett-Packard Co.'s scientific intruments division.

Microsoft has also added support for its recently released Windows NT operating system. With the new 32-bit networking and disk-access features, company officials will position Version 3.11 as a more ideal client to Windows NT for client/server or mission-criticial applications.

The latest version has also added support for remote users who can now access all of the program's features from the road. Now a complete superset of Windows 3.1, Version 3.11 is reportedly 50% faster than the original.

Fast around the track

Much of the product's added speed has to do with its 32-bit file system, which is borrowed largely from Chicago, the 32-bit version of Windows due in the second half of 1994.

"What we have is a 32-bit version of the [file allocation table]," Weed said. "It speeds up I/O requests from Windows both to local drives and to ones over the network."

The first manifestation of Microsoft's At Work operating system appears in Version 3.11: the ability to send and receive messages and fax files that can be edited from one Windows for Workgroups machine to another.

"This means I can have a peer-to-peer network and put a fax/modem in one PC and share it with all other PCs on the network," said Tom Gibson, PC coordinator at Weyerhaeuser Co. in Portland, Ore. "Anyone can send a mail message with a fax to anyone on the network."

Unflattering label

Trying to refute the "Windows for Warehouses" tag that some have placed on the product because of sluggish sales, company officials announced earlier this month that they have sold more than 1 million copies of the product. However, several analysts have noted that the number of copies in use is likely lower.

If Microsoft can win the hearts of users with added speed and features, it may also try to buy their hearts. The company has priced the upgrade of the product at $50 for registered users of Windows 3.1.

The full package, aimed primarily at DOS users wanting to add Windows and networking support, will cost $219.95 for the first 90 days of availability.

After that, the price will rise to $249.95. It should be widely available through resellers early next month.

The Workgroup Add-On For Windows is targeted at Windows 3.1 or Windows for Workgroups 3.1 users who want to gain more networking capabilities. It will be offered at $69.95 for the first 90 days and $99.95 after that.

Trying to hook DOS-based users, Microsoft also unveiled The Workgroup Add-On for DOS, which features DOS peer service capabilities. This product was designed to let users take better advantage of older hardware systems as print or file servers. Expected to be available a few weeks after Windows for Workgroups 3.11, Add-On for DOS carries a retail price of $49.95.

Minimum software and hardware requirements for the product include DOS 3.3 or higher, a 386SX-based system with 3M bytes of RAM (although the company recommends 4M bytes) and 7M bytes of hard disk space (although the company suggests 12M bytes).

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Low-end server descends from rugged line

By Stephen P. Klett Jr.
HOUSTON

Texas Microsystems, Inc. last week jumped into the low-end server race, unveiling the first of a family of fault-tolerant servers aimed at workgroups of up to 50 users.

The company also spun off a new business unit, called the Fault Tolerant Systems Division, to manufacture and market the server line.

The Fault-Tolerant Systems Architecture (FTSA) server offers dual, hot-swappable power supplies and mirrored disk drives. Hot-swappable disk drives are slated for the first quarter next year, said Charles D. Hultgren, general manager of the Fault-Tolerant Systems Division.

The FTSA includes a diagnostic coprocessor card that monitors system components and notifies administrators of component failures. A data auditing and recovery feature allows administrators to reconstruct lost data.

Alpha-test site Kontek Industries in New Madrid, Mo., has been using the server to run its accounting and computer-aided design software on roughly 20 PCs for about a year.

"The built-in redundant power supply and mirrored drives were key in making the decision to go with Texas Micro," said Sheila Marshall, a controller at the engineering firm. "We've had problems in the past with losing data due to power outages, and we haven't experienced any such problems with [the FTSA]."

The FTSA represents Texas Micro's first push into the commercial server market. It is a scaled-down version of the firm's ruggedized high-end industrial server, which debuted one year ago.

High hurdle

"Name recognition represents our biggest hurdle out of the gate," Hultgren said. "However, we believe our price point and reliability features are in line with competitors' products, such as Compaq's ProLiant line."

"Server vendors are scrambling to bring the reliability qualities of minis and mainframes down to the PC level," said Susan Frankle, an analyst at market research firm International Data Corp. in Framingham, Mass. "This [low-end] segment of the market is very competitive and is just starting to heat up. Texas Micro is getting in at the right time."

In addition to fault tolerance, the FTSA also inherits the ruggedized features of its industrial forefather, such as extra fans for cooling and a chassis built from heavy-gauge steel, and was designed to operate at temperatures ranging from 0 to 55 degrees Celsius.

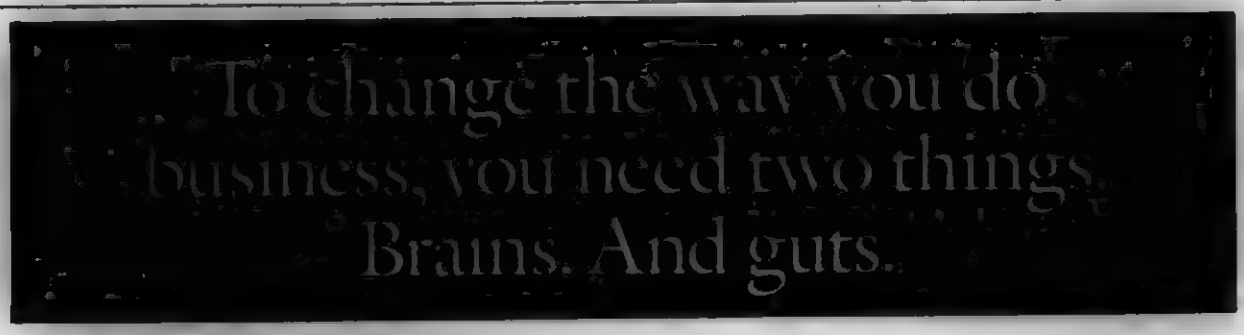
Pricing for the FTSA begins at $9,500 for an XT/AT bus-based system that includes an Intel Corp. 33-MHz 1486 microprocessor, 4M bytes of RAM, 245M bytes of disk storage, keyboard and Super VGA controller. An Extended Industry Standard Architecture version is slated for early next year and will start at $12,000.

The server supports several operating systems, including Novell, Inc.'s NetWare and IBM's OS/2. Support for Microsoft Corp.'s Windows NT and Intel's Pentium processor is planned for early next year.

Brief

Oracle prices 'Ware'

OracleWare, a bundling of Oracle Corp.'s database and electronic-mail system with Novell, Inc.'s NetWare or UnixWare announced four months ago, will be priced at $250 per user, according to Oracle Chief Executive Officer Larry Ellison. That falls square in the face of Microsoft Corp., which is offering a desktop version of its SQL Server database for Windows NT for as low as $139 — albeit as a limited-time-only discount for OS/2 converts. OracleWare's first iteration — Oracle 7 on NetWare 3.12 — is due out next month, officials said. The UnixWare version is slated for delivery by year's end, Oracle said.



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By Dr. Laurence Walker, Vice President
Worldwide Networks Engineering
Digital Equipment Corporation

By now, the news is out.

Digital is changing the way it does business — not just in small steps, but in leaps and bounds. The customer is at the heart of our work as we simplify the process of doing business and strengthen our core competencies.

Networking is one area where Digital offers incomparable strength and uncompromising breadth to bridge customers' business applications through client/server computing. But tying together computers and people with the network is successful only if networks are easy to install, use, and manage.

By incorporating this ease-of-integration network focus into our unified open network strategy, Digital is committed to delivering flexible and modular products with built-in intelligence and management along with integrating multiple network technologies, protocols, operating systems, and future technologies.

Client/Server Networking: Fundamental to Business Success

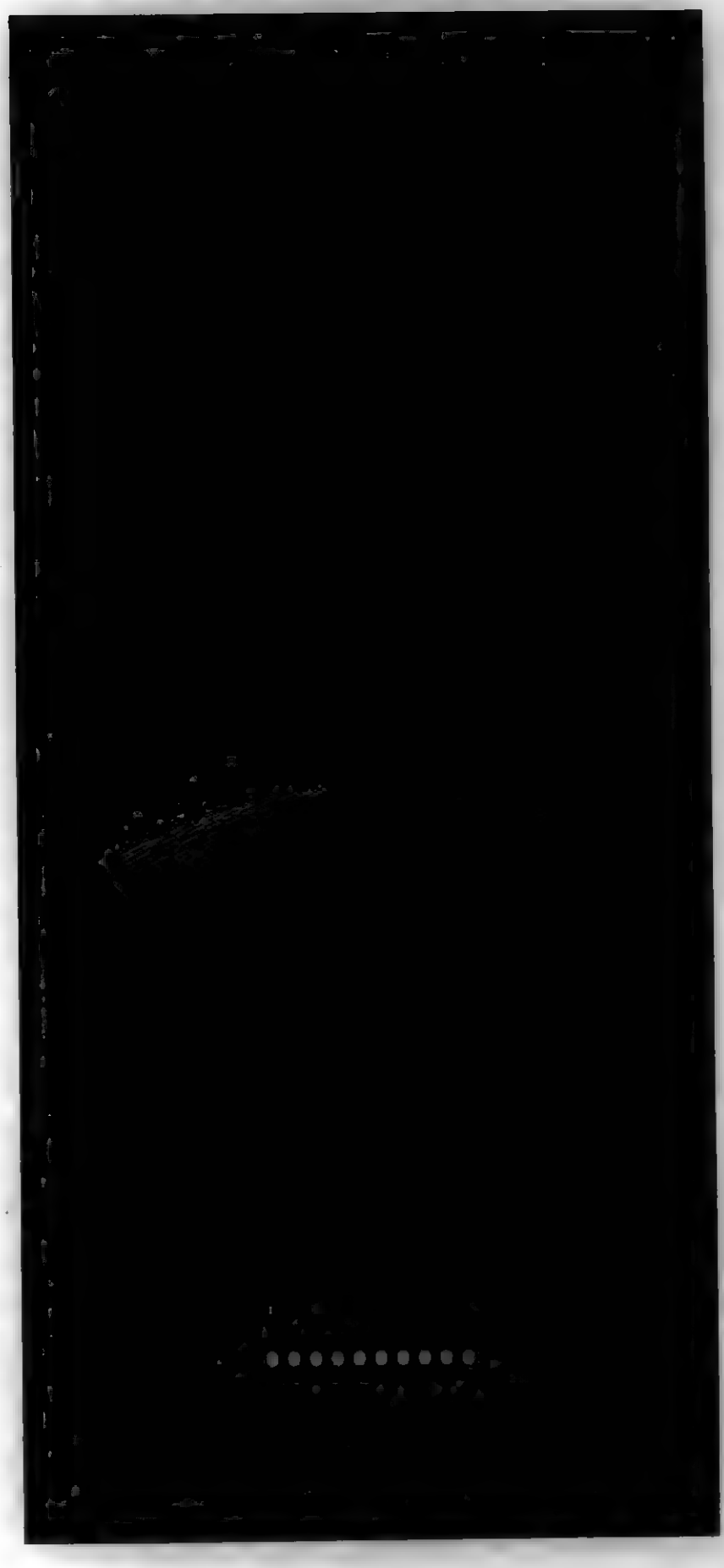
Client/server networking is truly at the heart of business success. Businesses are demanding nothing less than top network performance. With client/server networking, the computing system that used to run on a single machine is now a distributed system — a network — spread across multiple computers, technologies, geographies, and organizational functions.

The network takes on the role of integrating diverse systems, multi-technologies and protocols, and mixed software platforms to interoperate with each other. The resulting challenge? To implement networking solutions that are:

- Scalable from small workgroups to large corporate offices
- Flexible, to cost-effectively meet users' changing requirements
- Able to integrate applications on disparate system platforms
- Easy to manage
- Compatible with both existing and future innovative technologies

Digital Puts It All Together

For nearly twenty years, Digital has been an undisputed leader in networks. In fact, we have grown our networking capabilities into a more than $1 billion business through successful installation of more than 110,000 networks and networking of more than 1.5 million systems. In short, we have the staying power, commitment, and strategy to deliver the best and most comprehensive range of networking products and services for open client/server solutions.



Digital's open networking strategy provides future directions in network software, hardware, and emerging technologies, with focus in critical products areas such as:

- **Network Operating Systems (NOS) — PATHWORKS Product Family**
  Offering out-of-the-box system integration and the easiest management of PCs, servers, and multivendor NOS.
- **Network Interconnect — The DEChub 900 MultiSwitch**
  Offering the lowest-cost adds, moves, and changes of any hub around.
- **Mobile and Wireless — WaveLAN and DECtransporter Products**
  Giving users boundless freedom to access information anytime and anyplace.

Network Operating Systems

Users need secure access to data regardless of the PC platform or operating system. But PC "islands" running popular NOS software present network managers and users with the challenge of first getting to and then managing data.

Digital's network operating system strategy focuses on integrating a multivendor PC LAN into enterprise networks.

The PATHWORKS product family, Digital's PC networking and integration software, enables users to weave together all major client PCs, database server systems, and networking protocols into a single open network. Network managers and users can now access files and services and manage NetWare, LAN Manager, and AppleShare PCs while using familiar interfaces. PATHWORKS products can connect these workgroup LANs with resources and services on the wide area network.

Network Interconnect Products

Business changes create unending network changes. With 80 percent of all networks needing some kind of reconfiguration every year, network flexibility is crucial for adapting to change and minimizing cost.

Digital's network interconnect strategy focuses on universal connectivity and multivendor interoperability through the delivery of flexible, reliable, easy-to-manage, high-speed networking systems with built-in intelligence.

A key product within this strategy is the DEChub 900 MultiSwitch — the most cost-effective way to add, move, or make changes to the network.

The DEChub 900 MultiSwitch — with more than 3 gigabits of Ethernet, Token Ring, and FDDI — provides bandwidth on demand. It also offers unsurpassed modularity with modules that snap freely into the backplane or can be used as standalone units. In addition, it has the flexibility to switch ports LAN-to-LAN with graphical software on a PC or workstation.

continued on page 2 ▶

PUTTING IMAGINATION TO WORK

Imagine a network that adapts to your environment.

digital

Digital's networking strategy focuses on easy-to-use network integration products and services to help customers quickly evolve to open client/server computing.

Repeater, concentrator, and router modules are designed "hub-ready." The newest addition to Digital's multiprotocol router family, the DECbrouter 90 bridging router, offers low-cost LAN connections and remote access for Digital and Cisco environments and supports all popular networking protocols and router standards.

Another key benefit of the DEChub 900 MultiSwitch is its built-in investment protection. The product has been designed to allow more than 20,000 installed DEChub 90 modules to snap into and be managed in it. Plus, the DEChub 900 MultiSwitch will integrate future technologies as they arise, such as asynchronous transfer mode (ATM).

In addition, we complement our hub offerings with a line of switches and routers — for campus and enterprise integration — as well as network interface cards (NICs) for desktop appliance connectivity.

Mobile and Wireless Products

Today, workforce mobility is becoming increasingly critical for business. Completing work away from the office requires simple and secure access for those professionals who demand the freedom to easily access the network anywhere, anytime.

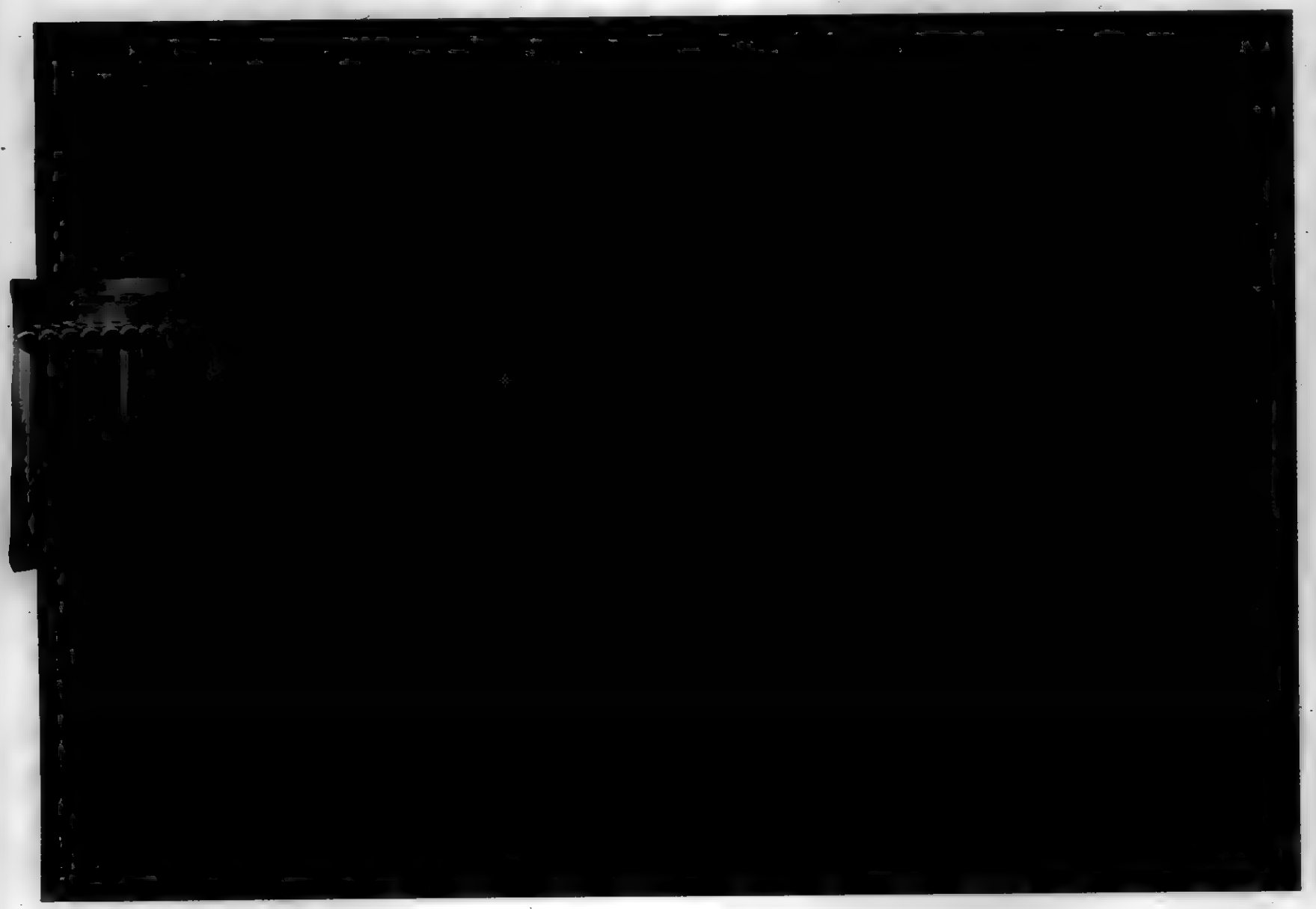
In answer to those demands, Digital has launched mobile and wireless products into the marketplace today. With the wireless WaveLAN product, users can use networked PCs — without a physical network connection. With DECtransporter software, users can access networked resources — from wherever they work.

For the future, Digital will continue to deliver leadership products to address mobile, wireless, multimedia, cable TV, and public transport areas.

Putting Innovation to Work

Digital's open networking strategy offers easy-to-integrate, easy-to-manage network solutions that logically and physically connect clients to servers. We can help you build workgroups with PATHWORKS products and hubs; tie together global information highways with routers, gateways, and high-speed switches; and give you boundless freedom through mobile and wireless networking.

Most important is how these technologies affect your bottom line. That's why Digital is committed to working with what you have while paving the way for future innovation, growth, and success. ■



imagine the best solutions for your business needs.

Meet Business Changes Head On

WITH DIGITAL SOLUTIONS FOR MIGRATION

Migration is one alternative for meeting your changing business needs. And who better than Digital to help you every step of the way.

Global competition. Shorter product life cycles. An accelerated rate of technology change. Business challenges are all around you — making it harder for your company to remain competitive in the '90s.

Whether you prefer to call it downsizing, upsizing, or rightsizing, companies like yours will be forced to take a long, hard look at their computer resources. As you look for new ways to streamline your business, sustain competitive advantage, and reduce operational costs, you will need to consider doing things differently.

Take Steps Toward Successful Migration

Digital understands that the migration process can be a complex prospect if it is not well thought out. Good planning is key. That's why it is critical that your company — large or small — follow five basic steps toward successful migration. These include:

- Identifying your business goals, needs, and wants
- Identifying possible solutions including rehosting, rearchitecting, or reengineering
- Determining the feasibility of each solution from a financial, technical, and operational perspective
- Choosing the appropriate solution
- Developing a plan to implement your solution of choice

Having already helped many companies migrate from non-Digital platforms, Digital has demonstrated flexibility in enabling companies like yours to address each of these steps. For example, your company may have some of the resources to carry out the migration. In that case, we will tailor the project to meet your specific needs. This includes formation of a team that may consist of your staff, our migration specialists, and appropriate partners as required to ensure a quality solution delivered on time and within budget.

We also offer a complete migration solution for those businesses that may need more assistance or prefer to outsource. In doing so, Digital can take care of all the details including converting your applications, training your people, and managing the implementation of the total solution.

Take Advantage of All We Offer

What exactly do we mean when we say that Digital offers the complete migration solutions package? Take a look.

Multivendor Services

For starters, we offer multivendor services for your existing computing environment — be it Hewlett-Packard, Sun, IBM, Prime, Wang, Data General, etc. You continue to use your current system until the new solution is safely up and running to your satisfaction. These services facilitate periods of coexistence or ongoing multiplatform development — meaning no downtime and no productivity loss for your business.

Migration Tools

Digital offers industry-standard migration tools such as DECmessageQ and DEC FullSail products to streamline the application conversion process. A broad range of industry-standard tools from our business partners are also available to facilitate various aspects of the migration process. Our migration partners include:

- Alternative Office Solutions
- Arris Software
- Boston Software Works
- Compuuron Technologies Corporation
- IDSI
- UNICOM
- Unidata, Inc.
- VMark Software, Inc.

Consulting Services

We have an expert staff of consultants experienced in migration from non-Digital to Digital-based solutions. Consulting services include:

- Application reengineering and migration services for ease in code conversion and migration from your current computing environment to the target environment.
- Customized training that lets you choose from a range of education options to match the needs of your organization. Courses cover the target system, software, networking, systems management, and more.
- On-site hardware and software maintenance for non-Digital as well as Digital systems.

You Choose the Platform

No matter what platform you choose to migrate to — including Digital's Alpha AXP platform running DEC OSF/1 AXP, Windows NT, or OpenVMS operating systems — we'll help you get there. In fact, we simplify migration of your applications to the Alpha AXP platform via Digital's Privileged Architecture Library (PALcode).

Essentially, PALcode enables the software to become independent of the hardware architecture — allowing you to run other operating systems on Digital's revolutionary 64-bit Alpha AXP platform. PALcode is like a microcode library on the chip that enables you to translate the calls of different operating systems and/or applications. Once the call is translated, it is then executed by the Alpha AXP system.

You are also free to choose the database that's right for your business needs. Digital's migration methodology and tools allow you to migrate to DEC OSF/1 AXP or Windows NT operating systems with databases that include INFORMIX, INGRES, ORACLE, PI/Open, SYBASE, Unidata, PROGRESS, or Rdb.

We Deliver the Complete Package

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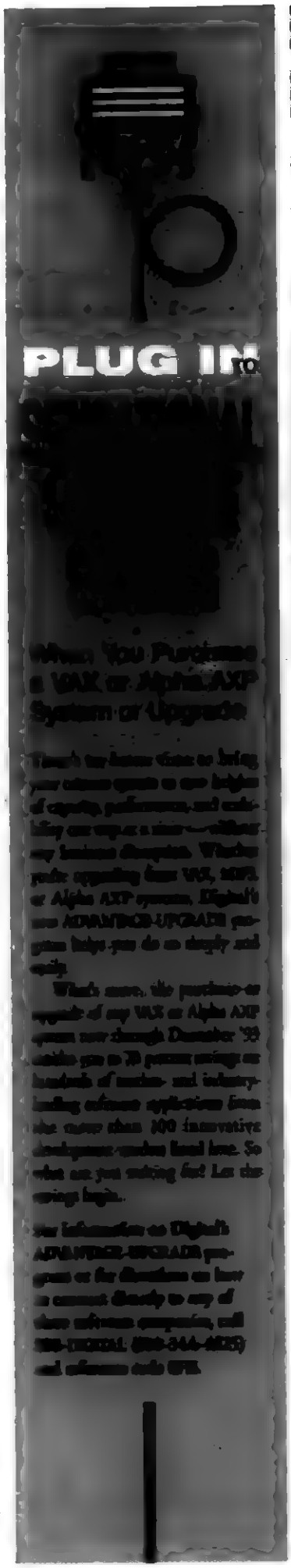
COMPANY	APPLICATION
AccessWare	AccessPoint 4.1, ViewMaster 4.2, InfoPath 4.2
Advanced Technology Computing	EasyBatch, Easy Validate, A365/Schedule
Advanced Technology Services	OptiDoc Document Imaging, OptiDoc Cold, OptiDoc Barcode, OptiDoc OCR, OptiDoc FullTEXT Indexing
AXP Systems, Inc.	KEREN'S "Fwks"
Abeyo, Inc.	TeleUSE 2.1.5
AQS	SEARCHmate/VMS DDS
Applied Information Systems Inc.	Burcom, Ulysses, XESS
Arcadd, Inc.	LotsCadd
Argent	JAMS, AGP, Argent/Archive, Diskeeper
The ASK Group, Inc.	INGRES Intelligent Database
Automation Management & Services	Apropos, Devote, PC Menu
BDS Systems	Xcalibur Image Processing, VEST, V-tac, MED-X
Beacon Expert Systems, Inc.	Negotiator Pro for Widows, DOS, Mac, MPro Module, IMP
Bear Computer Systems, Inc.	BMON, EMON, DMON, SMON
Bellwether	Purchasing Order & Receiving Software, Requisition S/W, Requisition Proposal S/W, Inventory Control Software
Bernstein & Associates, Inc.	Response Time Monitor, Network Traffic Advisor
BGS Systems	BEST/1 for Open VMS, BEST/1-Visualizer
Boston Business Computing	VCL, VBackup,VMail, EDT+
Bowden Systems, Inc.	BSI-X6530
Brainlove	Auditor Plus, Governor, Fast Copy, Overseer
BSA Systems	GAINS Forecasting, and Inventory Planning Manager, GAINS Distribution Planning Manager
Buzzwords International	WINGEN, Professional EDIT, ANALYST GOLD
BV Technologies	BVC Process Monitoring & Control Software
CAP Systems, Inc.	Captain
CEDRA Corporation	CEDRA SEA, CEDRA LAND, CEDRA SAND, CEDRA WATER
Century Analysis Inc.	CAI Integration Toolset
CIS	RoboCharge, RoboSecure
Compu-Share	Receivables Management System, Payables Management System, Payroll Management System
CompuSoft	Human Resources, Financial Information Control System, Manufacturing and/or Distributing
Cornelow Information Services	Basic Bibliotech
Coromandel Industries	Integra VDB for Visual C++, Visual Basic
CorVision	CorVision
CPlex	CPlex Linear Optimizer, Callable Library, Mixed Integer Optimizer, Library
CSSC	TOPS, AD-HOC
Data Center Software	MONITOR/PLUS, Queueman
Data Pro Accounting Software	Infinity Advanced Accounting Solutions
Data Processing Design	Gold-Fax, Gold-Mail
Datametrics	Viewpoint for Open VMS/VAX, AXP, Datametrics Jobwatcher
Decathalon Data Systems, Inc.	GOLDMEDAL Elite, GOLDMEDAL Workgroup
Dialogue Software	ANALECT DSS, Access Executive
Dimeric	easyDBA for ORACLE, easyDBA Executive, easyDBA Table Editor
Distribution Architects International	DAI MASTER DISTRIBUTION SYSTEM (pods) MODULES
EasyEntry Software	EasyEntry
EEC Systems	Supercache, SuperDisk
Ellery Systems, Inc.	Ellery Open Systems
EMS (Effective Management Systems)	Food Distribution Management System, Vending Management System, Office Coffee Management
ENSODIC System, Inc.	MDS32 Overseer, MacroSpitbol
ESCOM	FMC, JMC, MMC
Evans & Ricker, Inc.	Relational Application Programmer Toolkit, System Manager Automated Resource Toolkit
Everest	Peak Advisor/Fundamentals, Peak Advisor/Advanced
Executive Software	DISKEEPER PERFORMANCE EDITION, I/O EXPRESS, DISKEEPER Alpha AXP, FILEMASTER
Financial Accounting Systems	Loan Related Software
FutureSoft	DynaComm 3.1 for Windows, Terminal Plus
GEJAC Incorporated	ARSAP for VMS, ARSAP for UNIX
Glimpel Software	FlexLint
Graphic Data Systems	GDS Drafter License, GDS GIS License
GSI	TOLAS (Distribution, Logistics, Financial)
Harmonic Design Corp.	Empire/SQL HRMS
IBES	Financial Accounting Control, Integrated Distribution and Integrated Manufacturing System
Information Builders	FOCUS for OpenVMS (NOT FOCUS for OpenVMS customer)
Innovative Software	Powerstation
Integrated Solutions Inc.	Graphical Environment Builder, XIMS, Graphical System Manager
Integrated Systems, Inc.	Xmath
Intelligent Software Solutions	XNET License
Interactive Software	UDMS
Intraco Systems, Inc.	TELEMARK 50
ISE, Inc.	SCHEDULE, MEDIA, ACT/PROJECT
IXY Network Partners	Trapper
Kig Research	Picture Center Imaging and Visualization System
Logical Technology, Inc.	Hazmin, Logitrac, MSDS Solution, Chemical Compliance Monitor, Directory
MEC	Wizword, Wizdraw, MASS-11 Classic Document Processor
Mercury	XRunner Automated Software Testing Tool, XRunner Text Recognition Licenses
MIO Monitron Wireless Corporation	Eagles
MKS, Inc.	MIDAS Distribution, Accounting, Product Tracking, Warehousing, Export/Import Manufacturing



COMPANY	APPLICATION
Multiware, Inc.	MGS
MUST	NOMAD for OpenVMS, Reporter NOMAD OpenVMS, NOMAD Svr for Rdb, NOMAD Srv for RMS
NetWeave	NetWeave
NSS	Watcher
Numberical Algorithms Group, Inc.	NAG Fortran 90 Compiler, NAG Fortran Library, NAG Graphics Library, NAG OnLine Help, NAG Fortran/Matlab Gateway Generator
Objective Solutions	ORIN Designer for VMS ORIN Designer for ULTRIX, ORIN Designer for OSF/1, ORIN Designer for Windows, ORIN End User Executable
Oniteol	Fax Sr. Forms Package, Fax Sr. PATHWORKS Package, Fax Sr. ALL-IN-1 Package, Fax Sr. WordPerfect Package
P-STAT, Inc.	Pstat Base Program, Tabs, Advanced Statistics, Data Entry, SQL & Prgrap module
Paritaja Consulting	Armadillo Tools, ATXtract, Atraport
PCS Systems, Inc.	Scanner-face, Scan-EVA/View, Scan-EVA/Annotate, SQL-View
Pennington Systems	XTRAN
Performance Software	V-Test, V-Timer, Video (Alpha AXP version only)
Performance Software, Inc.	ACT III Multimedia
PIXAR	Pixars RenderMan Toolkit, NetRenderMan
Polestar Software	Polestar Windows & Mirror for OpenVMS VAX
Process Control Systems	WORCS, LRS
Progressive Computer Systems, Inc.	TIREPRO
PROSIG USA	Data_Plus Signal Processing Software Package
PSA	Bac/Plus Backup Management Software
PSI - Paralog Systems International	TRP
Puzzle System Corporation	SoftNet Utilities
QTC	Mass Advantage, Stack Advantage, Spec Advantage, Alpha Advantage, Software Foundry, GIS
READY TO RUN SOFTWARE	LANGUAGEPAK, OFFICEPAK, TESTPAK, DESKPAK UTILITYPAK, COMMPACK, XPAK, XTRAPAK, BBSPAK, FUNPAK
Research Systems, Inc.	ENVI
Saiga	Hillman, Ferret, RA, VDM, Watch
Sapiens	Sapiens SmartStar and Sapiens-Smart Report Painter
Scandura	PRODoc Components
SIS	INSIGHT, SIS RAD, SISHeart
Software Development & Support	Quick-EST, Summit
Software Moguls, Inc.	SM-Arch
Software Partners/32, Inc.	Hierarchy, Thruway
Spectra Data Systems	Radio Frequency Distribution, Warehouse Distribution, Property Management, Seafood, Route, Job-Cost
Spokane Computer	Facs
Spotlight Graphics	Spotlight Ray Tracer, Spotlight Rendering Libraries, ArtLib, RayLib
Spyglass	Transform
StageSoft, Inc.	StageSoft Accounting for small business product line
Structured Software	Facetorm
Summitpointe Technologies, Inc.	ASCwindows
Sunrise Software	Gui-builders, ezX
SYMARK SOFTWARE	SqueezePak, PakManager, Watcher, Distributed Disk Manager, Resource Manager Terminator-Plus & ChalkTalk
Symbolics, Inc.	Open Genera
Synergen	MMIS
Systech, Inc.	Systech, SPDS, AutoCAD
System Administration & Management	SMART
System Analysis Corporation	Clini-CAL Laboratory Information System, MacPath Anatomic Pathology/Cytology System, SBB-Blood Bank/ Immunohematology System, Micro-Cal, Clari-CAL, Physician Results Reporting Module, Instrument Interface Module, Hospital Information System Interface Module
System Industries	Raider Disk Array Monitor Software, Automated Tape Librarian, exSitedow Disk Mirroring Software
System Insights	Sidon
System Management	Remote Tape Facility, Dynamic Tape Accelerator, Dynamic Load Balancer, RMS Expert
Systematrics, Inc.	Sentry, PAGEmate, AudioToolKit
Tactics International Limited	Tactician, Buttons, Heavy Duty Tactician
Target Systems	Target-Hotline
TEAM ONE CONSULTING	Multistone
The Wyndgate	Eden-QA SUBSYSTEMS
Thoroughbred	Basic, IDOL IV, Script-IV, Sourcerer, Query-IV, SOLUTION-IV
Trinary Systems	EDIwindows
TSI-Transportable Software International	TBL/VMS TBL/ALPHA
U.S. Design	Optical Superstar for Optical Products
Unitace Corporation	Unitace
Unitronix Corporation	PRAXA
Universal Technical Systems	TKSolver, Roark & Young on TK, Heat Transfer on TK, Dynamics & Vibration Analysis
Viking Software Services, Inc.	Portal
VSA Applied Computer Solutions	VSA-3D, 3-Dimensional Tolerance Analysis
VTI-Virtual Technologies Incorporated	Sentinel
W. Quinn Associates, Inc.	Q-Files, Menu, DOFW, QPrnes, File/UNIX
WordMarc	WordMarc, Linkmarc
Z/MAX Computer Solutions, Inc.	Z/MAX Xchange, Current X/change Retail Pricing, Z/MAX Computer Solutions

PUTTING IMAGINATION TO WORK

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Compuware Corp. has introduced EcoScheduler, a member of the EcoSystems family of client/server systems management software.

According to the Farmington Hills, Mich., company, EcoScheduler lets users schedule batch jobs for the enterprise based on calendar events, the status of other jobs and resource use in an open systems data center.

The product provides integrated management of networks, operating systems and databases, addressing production support for mission-critical applications.

Features include flexible scheduling, complete schedule control and limits on resource consumption. Version 1.0 is scheduled for shipment in January.

Prices for EcoScheduler start at $8,000.

▶ *Compuware*
(313) 737-7300

XLI Corp. has introduced the Image Xpert Network Print Server, a product that creates an integrated, high-performance printing system.

The product manages, stores, processes and transmits image-intensive data.

According to the Woburn, Mass., company, the Image Xpert Network Print Server consists of an Intel Corp. I486-based computer, built-in Ethernet/Localtalk capability, a 245M-byte hard disk, XLI's Image Xpert 5000 plain paper imagesetter, Zenographics SuperPrint and Zenographics Zscript PostScript Interpreter.

Available for Windows and Macintosh users, the Image Xpert Network Print Server costs $10,995.

▶ *XLI*
(617) 932-9190

Computron Technologies Corp. has announced that N-Dimensions financial software and EPIC imaging and workflow systems are now available for Informix Corp.'s relational database.

According to the Rutherford, N.J. company, the partnership blends Informix's client/server database and Computron's advanced Level 3 client/server architecture, allowing individual application functions and processes to run on either the client or the server pieces of a computing environment.

Computron applications run on Unix servers such as Hewlett-Packard Co.'s HP 9000, IBM's RS/6000 and Digital Equipment Corp.'s Alpha AXP as well as IBM's AS/400, Digital's VAX and HP's 3000 legacy systems.

Pricing is based on a module basis starting at $30,000 per module.

▶ *Computron Technologies*
(201) 935-3400

Business Objects, Inc. has announced BusinessObjects for Unix Motif and BusinessObjects for Unix Character, designed to provide complete information access, analysis and reporting solutions on an enterprisewide basis.

According to the Cupertino, Calif., company, BusinessObjects for Unix Motif supports the Open Software Foundation's Motif user interface and can be deployed in two different configurations: on Motif workstations that are attached to a Unix database server or on Unix-based servers that are running Motif with users accessing the data through X11 terminals.

BusinessObjects for Unix Character is a character-mode implementation of BusinessObjects.

The User Module, the end-user version of BusinessObjects, costs $595; the database administrator version, the Manager Module, costs $3,495.

▶ *Business Objects*
(408) 973-9300

Product short

AFIC Technologies, Inc. has announced the Multi Server Option (MSO), a database replication system designed to deliver fault tolerance, disaster recovery, high availability and a broadcasting platform. The product allows an unlimited number of users to simultaneously access the same database from any server, in any location. MSO provides zero downtime and reduced response time. The product is available on Sun Microsystems, Inc. and Hewlett-Packard Co. platforms. Cost: Ranges from $6,400 to $26,000. AFIC Technologies, New York (212) 406-2503.

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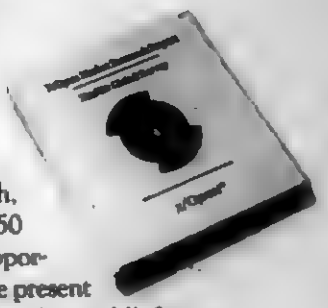

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IDC Insight
INTERNATIONAL DATA CORPORATION

New Cost-to-Use Analysis Key to E

Sponsored by IBM Appli

IDC has developed a better method of evaluating costs of computing. Price/performance numbers based on hardware benchmarks are often extremely poor predictors of the actual computing costs users will face. This is especially true in situations where customers are distributing very-complex workloads across an enterprise.

Hardware price-performance benchmarks such as TPC-A provide solid, base-level comparisons in specialized environments. They don't reflect the complexity of most users' business needs and processing workloads. Therefore, they have limited value in making realistic buying decisions.

The IBM AS/400, sometimes mistaken as a premium-priced product, emerges as the lowest cost-to-use system in complex, networked, enterprise-wide processing environments

To help IS management better predict the true cost of computing, International Data Corporation (IDC) developed a "cost-to-use" model. This model is intended to more-accurately measure and compare the full costs of using four types of leading midrange systems in networked, enterprise-wide applications. The systems in the study were: IBM AS/400, DEC VAX VMS, HP UX, and NetWare LANs.

Contradicts Price-Performance Ratios

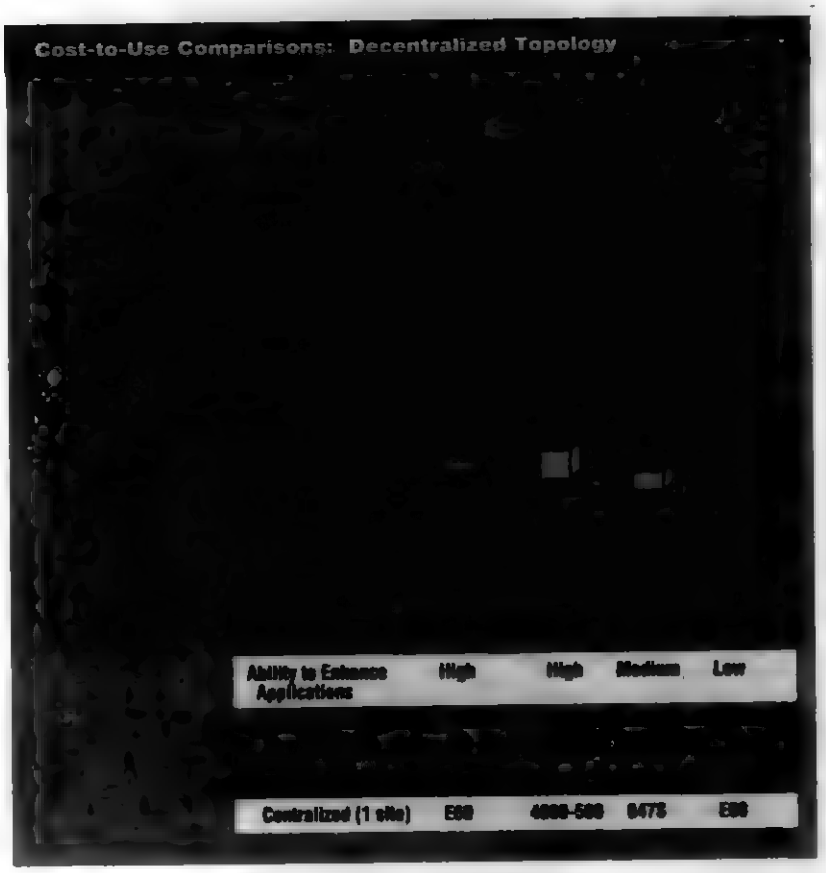
IDC studied more than 150 commercial computer installations in the United States. We interviewed more than 30 customers who have installed networked-enterprise systems to assess the full range of computing costs in complex, enterprise-wide environments. The model IDC developed from this research includes hardware, system software, application software, development-staff and operations-staff costs, and all overhead costs associated with remote-systems management performed by a central site over a five-year period.

IDC believes the results of this study provide IS professionals with the best information available on the costs of processing in the most-complex type of computing environment, the networked enterprise. While we doubt that the results of the study will come as a major surprise to those who have fully considered the issues, our data contradicts notions based simply on hardware price/performance figures.

Options

Four major options appear to be available to PC LAN users.

1. Do nothing, and continue to live with existing distributed or decentralized topologies and functionality as they currently exist.
2. Wait for LAN vendors to deliver the needed functionality.
3. Add to operations staff, even though this will increase costs out of proportion to the increase in benefits.
4. Implement currently available technologies that provide the advanced functionality not yet available on LANs. While this may result in higher up-front costs, the IDC Cost-to-Use model indicates that this is the most-effective choice.



Staffing costs dominate

For example, consider the following:

- Integrated systems-management software services (a series of coordinated tools for administering local and remote systems) are a major differentiator for users because staffing expenditures dominate overall cost in the networked enterprise.

  In a distributed topology, operations-systems staffs for IBM AS/400 and DEC VAX systems cost $36 per workstation per month, roughly a tenth of the cost of a LAN-based system. In a decentralized topology, as opposed to distributed, the reverse is true — LANs had the lowest costs for operations staff at $244 per workstation per month. However, IDC believes these staffing costs are likely to rise during the next two years as the LAN-based applications mature and require reworking.
- Users — even IT professionals — generally lack experience with networked enterprise topologies. The logistics of distributing new software, software updates, physical and electronic support services, and hardware in a networked enterprise are viewed as a major barrier to success. As a result, few users are taking full advantage of the possible benefits of complex, distributed processing.
- The application set on LANs tends to be less-sophisticated than those on minicomputers. Development resources available for minicom-

Cost Components: Typical TPC-A Model vs IDC's "Cost-to-Use" Model

	TPC-A	[illegible]
[illegible]	CPU, memory, disk/tape, terminals, 5-year maintenance	[illegible]
[illegible]	Operating system, runtime database, transaction processing monitor, minimal networking, 5-year software maintenance	[illegible]
[illegible]	None	[illegible]
[illegible]	None	[illegible]
[illegible]	None	[illegible]

** Minicomputer-based topology included 60% PCs, 40% terminals. NetWare LAN-based topology included 100% PCs. Source: International Data Corporation, 1993.*

valuating Networked Enterprises

cation Business Systems

puters often are considerably more sophisticated that those available for LANs. In response to rapid changes in business environments, we believe that many LAN-based applications in networked enterprises will require significant reworking in the 1993-1995 time frame as the environments move from support roles (i.e. file, print, and electronic mail servers) to full-fledged production applications (OLTP, database, accounting, and data analysis) computers.

- The IBM AS/400, sometimes mistaken as a premium-priced product, emerges as the lowest cost-to-use system in complex, networked, enterprise-wide processing environments.

The IT industry is currently investing heavily in distributed computing — and rightly so. Distributing processing power while retaining overall cohesiveness is an outstanding strategy for achieving the most-pressing objectives facing IT professionals today: organizational effectiveness, better return on IT investments, increased productivity, and more-rapid exploitation of new technologies.

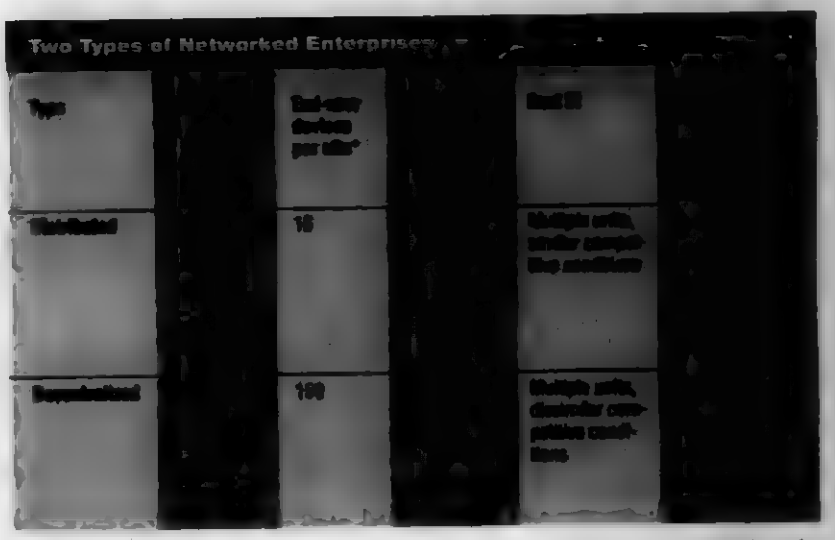
However, distributed processing is associated with significant complexity and uncertainty. Making the right decision requires higher quality, more-relevant information.

Conclusions

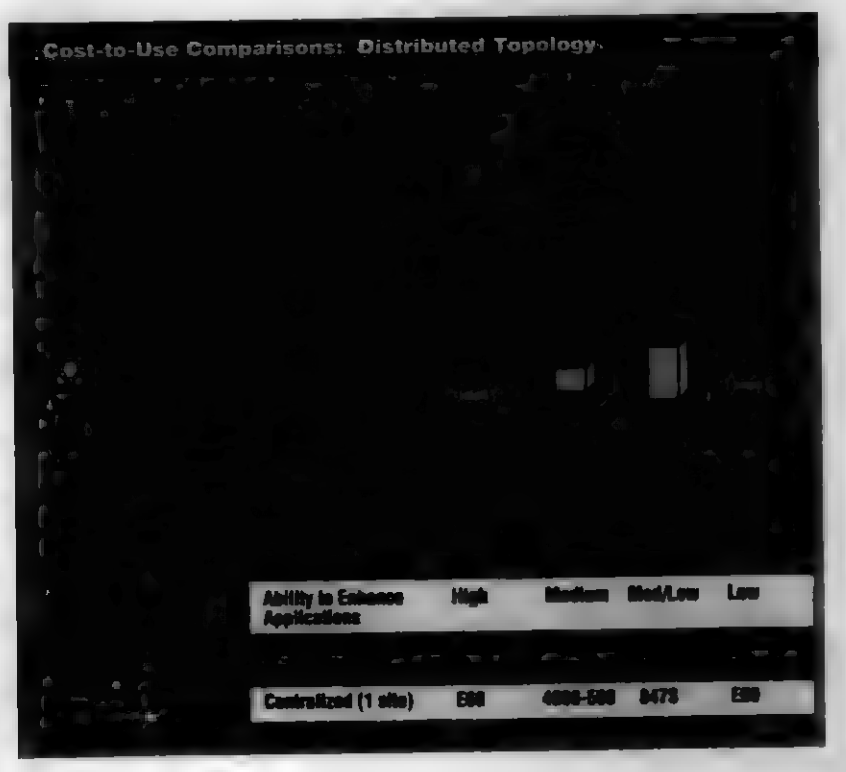
The information technology market is a very-complex place to shop. An expanding variety of hardware, software, and communications technologies, most associated with individual functional capabilities — that offer unique benefits — is being marketed by IT vendors to prospective and current customers. IT professionals demand better sources, quality and types of information to help them make the right decisions when planning purchases in this market.

Popular benchmark metrics such as TPC-A are specialized indicators of application performance (e.g. OLTP). As systems topologies get more complex, the appropriateness of this benchmark decreases dramatically. But TPC-C and the forthcoming TPC-D and TPC-E benchmarks will provide significant advances.

Users are exploring more-complex topologies as they attempt to support more-complex business strategies.



** Site size and end-user populations based on survey data. These qualities are used as the basis for all distributed and ecentralized analysis Source: International Data Corporation, 1993.*



The distributed enterprise and the decentralized enterprise, although more complex relative to traditional host-based, fully centralized configurations, are especially attractive to many companies. Comprehending options in these more complex setting, however, requires special costing tools.

IDC applied its Cost-to-Use model to help users better understand trade-offs between alternatives. From our research, the following conclusions emerged:

- Overall costs-to-use in networked enterprise are very dependent on staffing levels. Superior systems-software services allows users to minimize staffing levels at remote sites without also minimizing IT support and responsiveness.
- IBM's AS/400 and Digital's VAX VMS systems, largely because of their advanced system-software capabilities, are more attractive alternatives to LANs in sophisticated, networked OLTP enterprises. Moreover, our research indicates that IBM's AS/400's cost to use is superior even to Digital's VAX VMS offerings.
- The Hewlett Packard 9000 offers excellent pricing at the hardware level. It is being positioned to attack costs of complex topologies and staffing issues. Its vulnerabilities are in applications software and system software in distributed topologies. In decentralized topologies, HP displays a lack of sophistication in system- and network-management tools relative to IBM and DEC.
- As customers gain more experience with complex, networked enterprise topologies, they will (1) become more familiar with the logistics and politics of choosing, implementing and managing complex topologies, and (2) they will deploy these complex topologies more often.

Although we feel that the functionality of UNIX and LAN alternatives will increase over time, customers looking to take advantage of the benefits of networked enterprise topologies should strongly consider more integrated alternatives.

- Many users with LAN-based, decentralized enterprise topologies will be forced to chose between continued reliance on aging, less-sophisticated applications — and the potential competitive disadvantages implied by that choice — or greater staffing costs to rework and maintain their code base. We feel that they will have to choose more staff, despite the added costs, if they retain these topologies.

For a copy of the complete report, "Cost-to-Use of Midrange and PC LAN Systems in the Networked Enterprise," call 1-800-765-0119.

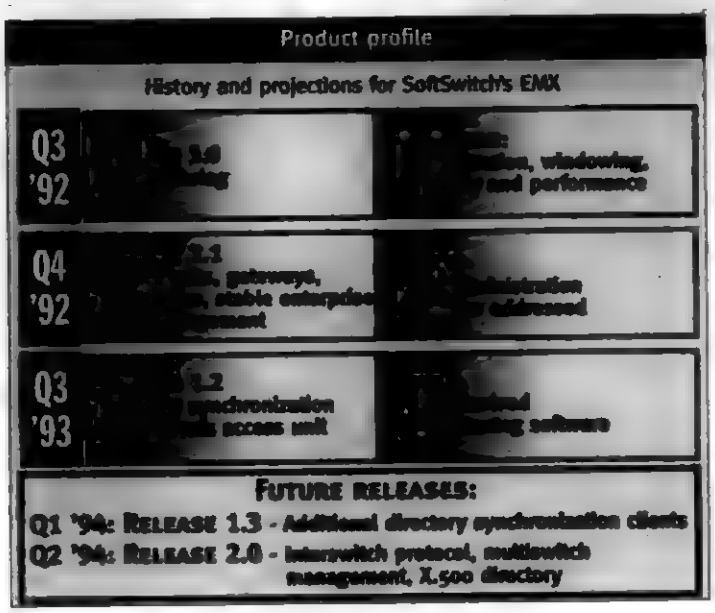
SoftSwitch fixes EMX shortcomings

By Lynda Radosevich

Initial releases of SoftSwitch, Inc.'s Unix-based electronic-mail integration system fell short in reliability and features, but recent and upcoming versions address those areas, according to a recently published study.

For companies combining independent E-mail platforms into one enterprisewide messaging network, SoftSwitch's mainframe-based messaging switch, SoftSwitch Central, is recognized by users and analysts as a market leader.

Its Unix-based product, called Enterprise Mail Exchange (EMX), uses X.400 messaging. EMX offers large users a migration path off the mainframe and provides small to medium-size companies an entry point.



"While users said that early EMX releases suffered initial quality and performance problems, indications are that the current EMX 1.2 release has resolved the most serious reliability shortfalls," said the report's author, Daniel Blum, a principal at Rapport Communication in Tacoma Park, Md.

Better tracking

For instance, Don W. Price, a corporate messaging technologist at Texaco, Inc.'s 22,000-user E-mail network, said the initial EMX releases tended to lose connections. Now, "we've seen the software stabilized, and we've seen better diagnostic tools appear in later releases that help us track messages and audit the system."

To complete the report, Blum interviewed SoftSwitch experts, industry experts and seven large user sites with roughly 20,000 to 30,000 E-mail users and five to 10 different E-mail brands.

The most surprising discovery of his research was that users said they were generally happy with SoftSwitch's EMX support, Blum said. That countered earlier negative feedback about the SoftSwitch Central support because "the mainframe platform is harder to support," he added.

EMX is a combined software/hardware system that receives incoming messages from LAN, midrange and mainframe E-mail systems and value-added networks via access units. Access units are software modules that translate the protocols from the initiating systems. From there, messages are passed through a Message Transfer Agent and routed to remote recipients.

One of EMX's greatest strengths, according to Blum's research, is its built-in multiprotocol support for X.400, Simple Messaging Transport Protocol (SMTP), System Network Architecture Distribution System and

SoftSwitch, *page 77*

User ATM plans in sync with vendor progress

By Joanie M. Wexler
ROSEMONT, ILL.

Data communications veterans who have high hopes for Asynchronous Transfer Mode (ATM) but worry that it might suffer the Edsel-like fate of Integrated Services Digital Networks (ISDN) or Open Systems Interconnect (OSI) can probably relax.

ATM forum moderator Kenneth Zeline: *Cable TV/phone company partnership plans hinge on ATM*

Unlike those cart-before-the-horse technologies, the much-hyped ATM, a functional blend of circuit- and packet-switching networks, already has user interest that stretches way beyond the academic. So said a group of information systems executives at a Corporate Association for Microcomputer Professionals (CAMP) conference here earlier this month.

Attendees said they are busy lining up applications for the still-unproven but promising networks; meanwhile, vendors and carriers are scurrying to resolve standards issues and offer products and services to both fuel and meet demand (see story page 79).

In a CAMP forum, attendees quickly stepped up to the plate to rattle off ways they would use ATM — a high-speed LAN/WAN technology optimized to mix data, video and voice — provided they can resolve infrastructure migration challenges.

For example, Melissa Faun-Bull, a network planner at Northwestern University in Evanston, Ill., is working to get all dormitory students onto an ATM network so they can send "live" term papers incorporating text, images and even video attachments to their professors on-line. She said the university will likely leapfrog interim technologies such as switched Ethernet for ATM because its network infrastructure needs upgrading anyway.

Meanwhile, Bill Wolfe, a network technologist at the Chicago Board of Trade, said he an-

ATM, *page 79*

Mary J. Cronin

Exploring the Internet

Most businesses connected to the Internet are using only a small fraction of their resources. After being "lost in cyberspace" a few times, many network users confine themselves to a few familiar pathways, thereby missing out on some of the greatest benefits of global connectivity.

Adventurous Internet veterans know that the network's discussion groups offer great shortcuts to specific information or expertise. At their best, Internet groups provide a forum for experts from around the world to collaborate on problem-solving. Business users can post questions on almost any topic — system integration, total quality management, government policy or international trade — and can count on receiving knowledgeable answers.

There is an art to getting the most from Internet discussions, however, beginning with selecting the right groups. A "List of Lists," available on-line from the InfoSource (telnet to is.internic.net and search under "discussion groups") or in hard copy from SRI International (send E-mail to nisc@nisc.sri.com), describes thousands of special interest groups accessible through the Internet. Choices relevant to business range from finance, marketing and personnel administration to management policy, technology and networking.

Narrow your choices

Another challenge is winnowing out just the bits you want or need from the massive amount of information available. Participating in even a handful of high-volume discussions can quickly translate into hundreds of E-mail messages daily, creating an intolerable amount of "noise" on the desktop. Organizations participating in Usenet, the largest collection of discussion groups, often choose to deal with this by limiting the number of groups received or the amount of time messages are stored.

The first line of defense for individuals is "newsreader" software that stores a profile of the specific groups of interest, then screens and sorts the messages for convenient reading. This allows users to browse through many potentially valuable discussions, selecting items of interest. Such software is freely available on the Internet for a variety of workstations and network configurations. The group called news.software.readers is a good place to find it.

Another technique is to begin with the most narrowly focused groups and ask participants

Cronin, *page 77*

X windows lead the way to open systems

Companies struggle to migrate legacy mainframe applications to low-cost open systems computers

By Jean S. Bozman

X windows are a mirror on a company's computing infrastructure. Originally intended as a way to view applications in a Unix network, the X Window System is becoming the information systems manager's ally in migrating from legacy mainframe systems to distributed open systems.

By running the X Window System on Unix workstations, X terminals and even PCs and Macintoshes, IS managers can distribute shared applications across a network.

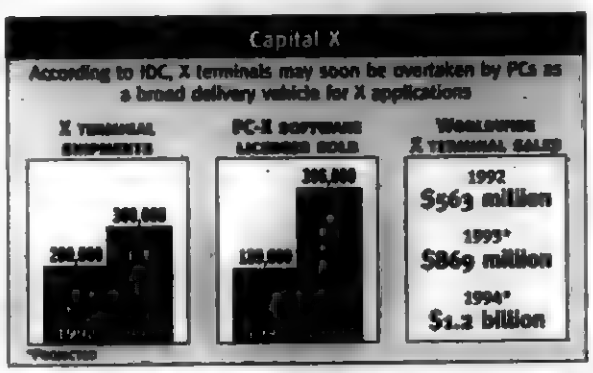
The trick of the X data management technique is this: Any X window can display the same information in exactly the same way, as long as it is written to X11 windowing standards from the X Consortium in Cambridge, Mass.

Users at large sites report they are using X windows to display mainframe and Unix applications side by side on the same screen. Users can transfer data from one X window to another by cutting and pasting — forging a link between two incompatible computing environments (see story below).

Good migrations

"It's a great migration strategy," said John Morrell, a Unix research analyst at International Data Corp. (IDC) in Framingham, Mass. "It allows you to use the network to distribute applications, allowing users to get simple access to those host-based applications without having to wait for the software vendors to rewrite them."

That will give corporate developers many months, or even years, to write new applications for use in a client/server network, he said. "You don't have to take a huge leap of faith to go from completely centralized host applications to completely distributed ones," Morrell said.



"Our goal is to replace the IBM 3270 environment entirely with an X environment, but the problem is you can't get there in one step," said Bruce Campbell, project manager at BC Tel, a telecommunications firm in Burnaby, British Columbia. "The conversion job is huge, and it will take so long to do it that we have agreed to take an evolutionary [approach], taking it step by step."

By using X Window System technology, users in mainframe shops are taking the first steps toward client/server technology, industry analysts said.

X terminals can present a colorful graphical user interface to the user, even though the computational work load is run on a Unix workstation across the network. Some models, such as Hewlett-Packard Co.'s recently introduced Envizex line, are outfitted for multimedia, including voice annotation and shared whiteboard software.

A further sign of the trend to mix and match legacy and new applications is a wave of IBM 3270 support on X terminals.

Space saver

X terminals can also save on desktop space, said Jim Stikeleather, director of systems development at Kash n' Karry Food Stores, Inc. in Tampa, Fla. "People have an X station on their desk instead of a PC, an IBM 3270 terminal and a Unix workstation," Stikeleather said.

Kash n' Karry has more than 150 Network Computing Devices, Inc. (NCD) X terminals and more than 20 Sun Microsystems, Inc. servers in its network, as well as mainframe applications, according to Stikeleather. "We're re-engineering so that as functionality appears on the Unix side, it disappears off the mainframe."

The move to rewrite legacy applications for client/server networks at such sites is one reason why X terminal sales are growing, said Eileen O'Brien, director of terminals research at IDC. Legacy applications were generally expensive to develop but were known for reliability proved through decades of use, she explained. Now, "people want to compare the numbers in the legacy applications and the new applications."

A further sign of the trend to mix and match legacy and new applications is a wave of IBM 3270 support on X terminals provided by NCD, Digital Equipment Corp., Tektronix, Inc. and NCR Corp., O'Brien said.

The X terminal market is growing, with shipments expected to rise from about 200,000 in 1992 to nearly 300,000 this year, O'Brien said (see chart).

Benefits abound

IS managers have found important operational benefits from using X Window System technology: reduced costs, increased data security and improved software administration due to centralized hosting of shared applications. Another benefit is the ability to present a single software application consistently, whether it is viewed from a PC or a workstation.

Central-site management of distributed applications is a valuable consequence of using the X Window System, said Terry Bennett, an analyst at Computer Intelligence/InfoCorp in Beaverton, Ore.

"You only change the software if management lets you do it," said Bennett, who noted that many X terminals do not even have a floppy disk drive, ensuring that data cannot be removed. Large corporations, including Chevron Corp., Ford Motor Co. and Wall Street brokerages, use X terminals as part of an open systems mix, lowering the overall cost of distributed systems and gaining security through centralized backups.

Expense has become one of the leading drivers of X Window System use, along with concerns about data integrity and software management, users said.

"It's a lot easier to license and keep track of software because it's on a few machines," said Mark Anderson, a computer scientist at the Advanced Photon Source research project at Argonne National Laboratory in Argonne, Ill. Anderson estimated the ratio of X terminals to Unix workstations at his site to be 1-to-10 but added that the number of X terminals at the laboratory is still growing.

The X protocols, developed in the 1980s at MIT and now managed by the X Consortium, define the mechanism by which a terminal, workstation or PC displays graphical information. That is why X windows can push shared applications across networks, no matter what type of computer is at the other end.

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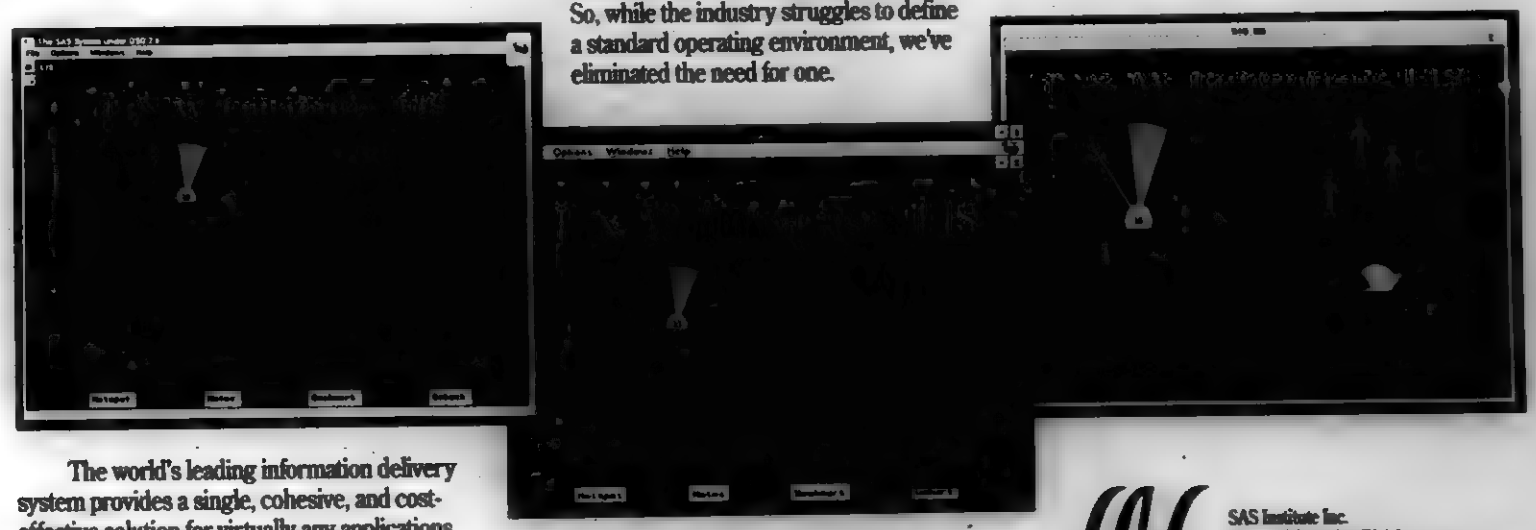

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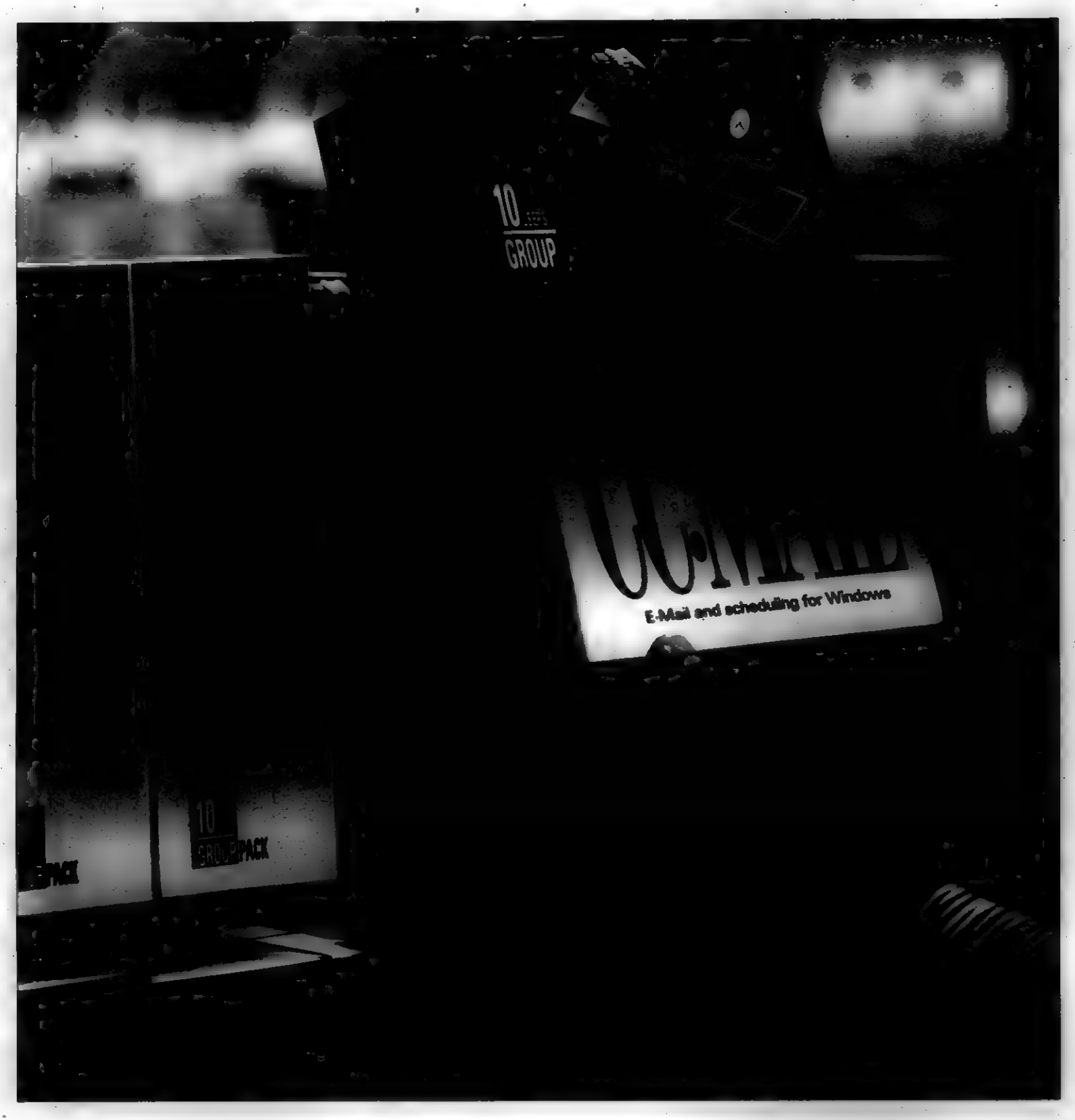

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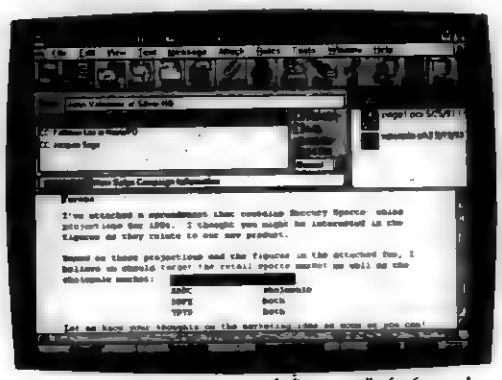

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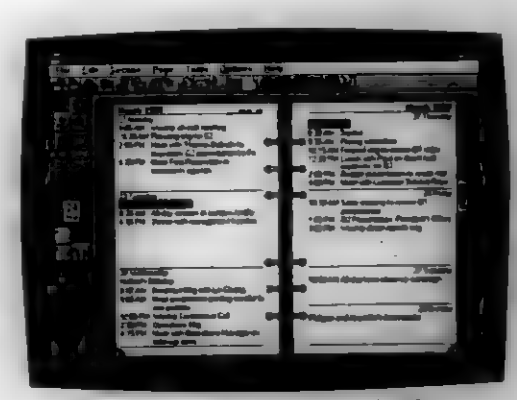

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SoftSwitch

CONTINUED FROM PAGE 71

SoftSwitch's System Network Architecture Interface.

Other access units, such as for CC:Mail and Microsoft Mail, are separately available from SoftSwitch.

"The protocol support is very important. We're using SMTP, Distributed Office Support System [IBM mainframe] and CC:Mail access units to integrate three platforms," said Jeff Jones, a director of information technology at the Swiss Bank Corp.'s Chicago office. Swiss Bank has been using EMX since March to integrate E-mail systems supporting roughly 23,000 users.

Other EMX strengths highlighted in the report include rules-based names transformation to help solve nasty addressing problems when sending messages between E-mail systems with different naming schemes. Another strong suite, directory synchronization capabilities, has been promised, but the users Blum contacted had not received the software yet. Also, a graphical management user interface, support for symmetrical multiprocessing and mail monitoring capabilities are high points.

One drawback is that there is no support for the X.500 directory protocol yet, according to the report.

"In many cases, that is not a weakness, but among Fortune 500 and government users, there is a small but growing percentage of users that want to be early X.500 adopters," Blum said.

For instance, Jones said the X.400 and X.500 standard seem to be the way to keep E-mail systems in the mainstream so they can interoperate with products in the future. SoftSwitch said it plans to add X.500 support in future releases.

Also, it is difficult to discover up front how EMX will perform because SoftSwitch does not publish benchmarks, and in multiprotocol scenarios, the company's published performance "goals" are not met, Blum said.

Blum's research also found that EMX propagates directory changes made in local systems by local E-mail administrators, but does not allow central administration of the enterprise directory.

At Texaco, local administrators complete most directory information changes. However, central administrators can make changes to fix routing errors. Although Texaco is using homegrown directory synchronization software, Price said he plans to move to EMX's version, and he requires some central control.

Cronin

CONTINUED FROM PAGE 71

to recommend other related topics. The "comp" or computer-related category of Usenet, for example, includes more than 400 distinct groups on topics such as client/server technology (comp.client-server), networking IBM mainframes (comp.protocols.ibm) and Unix-based systems (comp.unix.admin). Operating tips and new solutions are offered in vendor and product-oriented groups focused on a particular type of hardware or software. Postings are often archived on a host computer, where they can be consulted and downloaded as needed.

Usenet groups such as comp.sources.reviewed and alt.sources also open doors to another Internet business resource: free and public domain software.

Cronin is university librarian at Boston College where she manages a highly automated networked information service and teaches a graduate course on international perspectives on information management. Her book, *Doing Business on the Internet: How the Electronic Highway is Transforming American Business*, was published by Van Nostrand Reinhold.

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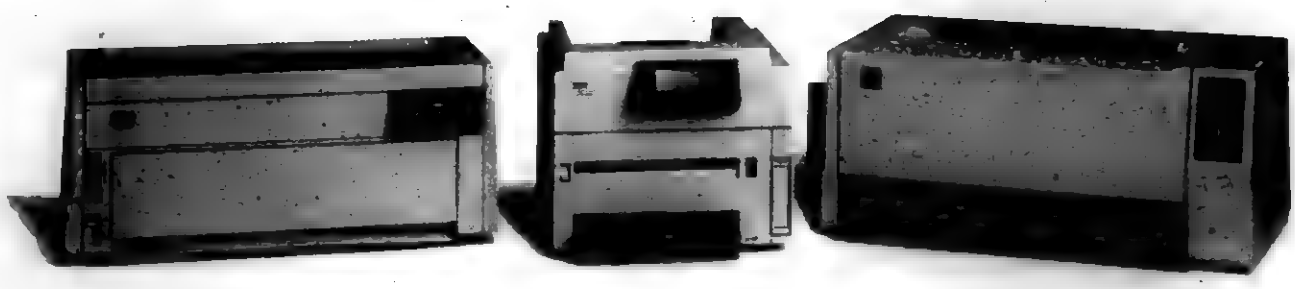

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User, vendor ATM plans in sync

CONTINUED FROM PAGE 71

ticipates less flashy initial uses for the technology: "It solves throughput problems, and that payback is usually justified in the backbone first," where the exchange would likely get started with the technology, he said.

Because ATM specifies fiber-optic cabling as its medium, users with copper wiring throughout much of their enterprises are likely to start with the backbone, where fiber is more prevalent, he said.

Issues still to be addressed

Products to accommodate such applications already exist in the form of switches from companies such as Adaptive Corp., Fore Systems, Inc. and SynOptics Communications, Inc. However, interoperability among vendor products, congestion control schemes and blending ATM with today's shared-medium LANs must still be resolved, said conference speaker Kenneth O. Zoline, president of Kenneth O. Zoline and Associates, a networking consultancy in Chicago.

Meanwhile, other users said the technology should simply deliver cheaper bandwidth: Mixing various applications over one service rather than running them over separate circuits means the economies alone should eventually play out.

And the ballyhooed interactive services on the drawing board by phone and cable company partnerships, including the recent Tele-Communications, Inc./Bell Atlantic megamerger [CW, Oct. 11], will rely on ATM technology, Zoline said.

Such situations, in which users are carefully plotting where and how they will deploy the technology, diverges from the histories of ISDN, OSI and even Fiber Distributed Data Interface (FDDI). It has taken years for users to figure out applications to justify ISDN, for example; however, the killer use may finally be arriving in the form of the telecommuter and remote user.

With OSI, it will simply take much longer than expected to make the networking standard ubiquitous at all levels — and thus useful — to most organizations.

Bogged down in the process

And FDDI missed a portion of its window of opportunity, largely because of the cumbersome formal standards process. ATM is circumventing that problem by assembling a much more nimble group of interested vendor and user parties known as the ATM Forum. The forum has been nailing down preferred standards pieces, which it then presents to the formal T1/S1 standards body under the auspices of the CCITT.

Users expressed confidence that the networking community has learned from its mistakes and that ATM is a network that will hit the mark. One user said his hospital is already undergoing the infrastructure revamp required to support ATM and awaits imminent hospital diagnostic and imaging applications.

Another user said his firm is looking ahead to interactive video, combined with collaborative computing, simply to cut down on travel costs, as intracompany personnel become more geographically dispersed and on-line collaboration with business partners picks up.

"There's software today for this kind of activity but not the bandwidth" to render it mainstream, which ATM should provide, he said.

Regional Bells do their part

US West recently became the latest regional Bell operating company (RBOC) to cite plans for ATM service. RBOC deployment of ATM is necessary for filling the segment of an enterprise ATM network running on local public services.

Pacific Bell is the only RBOC slated to roll out service this year (December), though all reportedly have ATM trials in place. Meanwhile, US West's Advanced Communications Services division earlier this month mapped out a three-phase ATM program to stretch over the next two years, beginning with infrastructure deployment — which is nearly complete — and customer trials, to start next month.

The trial participants include an 11-company consortium in the Boulder, Colo., region and state universities and government agencies in Oregon.

At the end of 1994, US West will openly service based on trial findings, said Jerry Parrick, US West's vice president of customer solutions.

He said the following decisions have yet to be made:

- What network speeds to offer. For example, there's a controversy over whether ATM at T1 (1.5M bit/sec.) speeds and below is beneficial. This is because large chunks of ATM overhead make the technology — for which users will initially pay a premium — not worthwhile at lower speeds.
- Whether to offer variable- or constant-bit rate interfaces. Many ATM switches today cannot accommodate both functions.
- Whether pricing should be flat-rate, use-based or a choice.

"The definition of 'ATM service' isn't always clear," said Rosemary Cochran, principal at Vertical Systems Group, a consultancy in Dedham, Mass.

For example, she said, carriers can offer vanilla transport services, but those require ATM gear on the user's premises, and "there isn't much out there today."

Most carriers have indicated that they will offer ATM-capable applications instead; witness, for example, long-distance provider WilTel's channel-extension service or MFS Datanet, Inc.'s LAN interconnect services, both based on ATM infrastructures.

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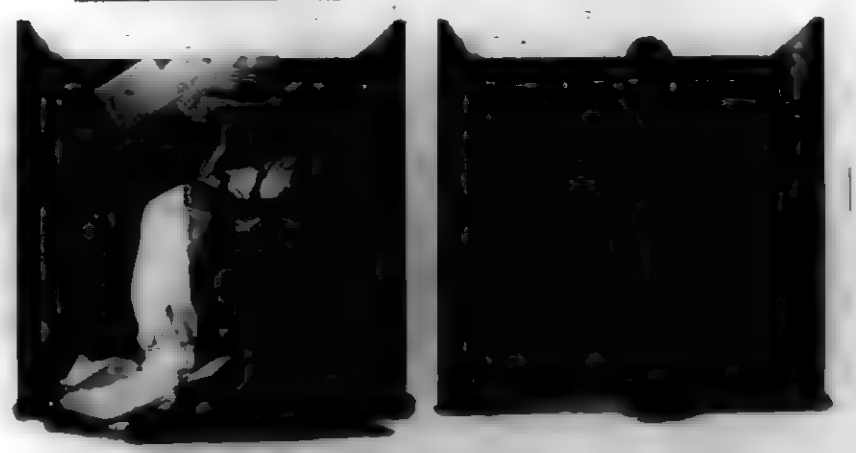

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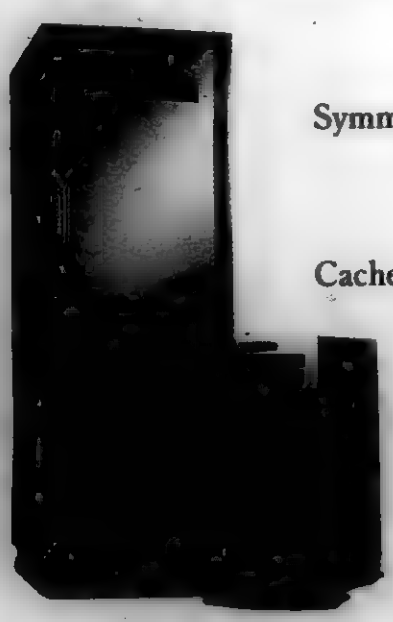

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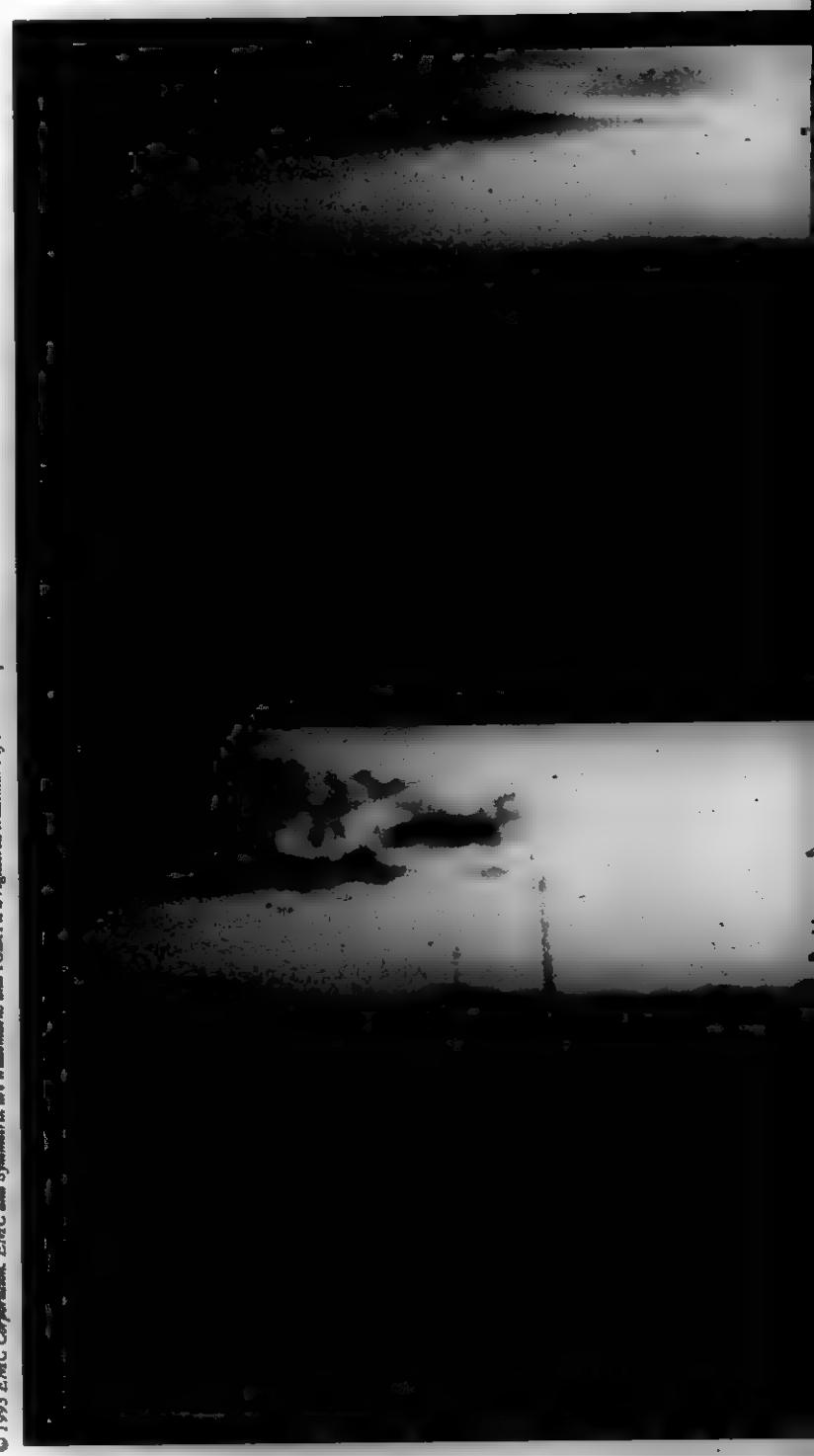

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Bell faces regulatory hurdles

By Ellis Booker

Well before Bell Atlantic Corp. and TeleCommunications, Inc. (TCI) can merge or offer information age services, their merger will have to gain the approval of shareholders, the Federal Communications Commission, antitrust regulators and legislators on both sides of the aisle.

Unquestionably the most serious regulatory obstacle is the prohibition on regional Bell holding companies from offering long-distance services outside of their territories. That restriction, a major piece of the Modified Final Judgment (MFJ) ruling that broke up AT&T in 1984, would seem to be compromised by TCI's assets. With more than 20% of the U.S. cable customer base, TCI has 1,200 cable systems serving more than 10 million subscribers.

But a Bell Atlantic spokesman said the company will "move quickly" to seek waivers for the long-distance restriction, arguing that the MFJ rule does not address video signals and that "long-distance video signals do not intrude on long-distance voice services." Bell Atlantic said it plans to sell the 14% of TCI cable holdings that operate in Bell Atlantic's six state territory, thus avoiding anticompetitive claims. Bell Atlantic has not decided what it will do with New York-based Teleport Communications Group, Inc., a local-access bypass provider in which TCI has a 30% ownership.

Video content allowed

In a related event last month, Bell Atlantic won a precedent-setting victory in a federal appeals court in Alexandria, Va., which ruled the company could provide video content as well as transport over its network. Bell companies have been prohibited under the 1984 Cable Act from providing video programming.

Bell Atlantic has long-standing interests in cable TV and is testing a technology called Asynchronous Digital Subscriber Loop to pump compressed video signals over a twisted-pair wire to about 300 to 400 subscribers in Arlington, Va.

Haven Tree Software Ltd. has introduced Nodemap Version 2.0, a software program that automatically updates Novell, Inc.'s NetWare network diagrams.

The product is a DOS-based, Windows-compatible program that employs a series of standardized shapes and icons to consolidate system information and create graphic representations of complete network configurations, according to the Kingston, Ontario, company.

Features include an "intelligent" line router and a text formatter.

Nodemap 2.0 tracks interconnected printers, file servers and workstations and supports more than 270 output devices.

Nodemap 2.0 costs $290.

▶ *Haven Tree Software*
(613) 544-8035

Advanced Digital Information Corp. has introduced the Virtual Library Systems-8 (VLS-8) system, a 110G-byte, 8mm autoloader.

The product employs Exabyte Corp.'s half-height EXB-8505 8mm tape drive. The union of VLS-8's 11-cartridge magazine and the EXB-8505 running in data compression mode offers an unattended capacity of 110G bytes for network backup and data management applications, according to the Redmond, Wash., company.

A front control panel provides a full range of library control and diagnostic functions.

The single-drive library is priced at $14,500. The fully configured, dual-drive library costs $20,900.

▶ *Advanced Digital Information*
(206) 881-8004

Optical Data Systems, Inc. has introduced the ODS Infinity 1100-FL10 and 1100-FL20 fiber-optic series of 10BaseFL stand-alone hubs.

The products support either 10 or 20 10BaseFL ports in a compact 3½-in. rack mountable unit, according to the Richardson, Texas, company.

The series also supports an additional optional port of either 10BaseFL or AUI.

Management options include support for all nine Ethernet Rmon groups and advanced Simple Network Management Protocol.

Prices for the 1100 Series 10BaseFL hub start at $3,600.

▶ *Optical Data Systems*
(214) 234-6400

Hayes Microcomputer Products, Inc. has introduced the Hayes JT Fax 14400B Dual, an internal dual-port fax board.

According to the Atlanta company, the product supports Group 3 fax speeds of 14.4K bit/sec. and full-featured digital voice capability.

The product can be used in gateway or LAN fax server applications and for fax on demand.

The fax board comes equipped with two dedicated fax and voice units.

The Hayes JT Fax 14400B Dual costs $699.

▶ *Hayes Microcomputer Products*
(404) 840-9200

Product short

21CenNet, Inc. has announced MobileWare, a software system. The product allows mobile professionals to connect with their corporate computing environments over wireless and traditional land-line telephone networks. Users can send and receive files, faxes, electronic mail and printed documents in compressed and encrypted form. Cost: begins at $500 for a single-user system. 21CenNet, Richardson, Texas (214) 690-6181.

Briefs

Chip deal

On the eve of the appointment of former **Apple Computer, Inc.** Chief Executive Officer John Sculley, cellular modem patent-holder **Spectrum Information Technologies, Inc.** in Manhasset, N.Y., said it licensed its technology to **Rockwell International, Inc.** in a deal with codevelopment and marketing ramifications. According to Spectrum, the two companies will develop chip sets incorporating its technology. The chips will be used in portable computers, personal digital assistants and personal communicators.

App gets wireless link

XcelleNet, an Atlanta maker of software tools for automating transaction-based business processes in remote and mobile computing environments, will reportedly soon offer a link to the **RAM Mobile Data** wireless messaging network in its RemoteWare product. Roving users would gain wireless access to information housed in home-office databases, such as customer order numbers, inventory levels and account status, the companies said.

New Cisco distributor

Router maker **Cisco Systems, Inc.** said **Ameritech Corp.** will begin distributing Cisco's entire internetworking product line in conjunction with Ameritech's network integration and remote network management services.

Phones to get 'smart'

Tandem Computers, Inc. has agreed to sell **VeriFone, Inc.** "smart screen" telephones to act as intelligent interfaces to Tandem servers. The phones, expected in mid-1994, will include a screen display, keyboard, modem, magnetic strip card reader and system software for automating card-based transactions.

Expediting FCC licenses

With eyes on the sky, two companies with planned worldwide low-earth satellite networks have petitioned the Federal Communications Commission to accelerate the licensing process for this technology. **Motorola Satellite Communications, Inc.** and **Loral Qualcomm Satellite Services, Inc.** filed a joint proposal with the FCC.

Nextel billing streamlined

Computer Sciences Corp. (CSC) signed a $25 million contract to provide **Nextel Communications, Inc.** with a system that lets Nextel send customers one bill for different kinds of cellular services such as paging, phone and voice mail. Also, the system will help track inventory, customer communications and marketing, according to CSC.

Reuters turns to paging

Reuters America, Inc. will use **Motorola, Inc.**'s one-way Embarc messaging network to deliver financial, business and general news to mobile computer users, the two companies said recently.

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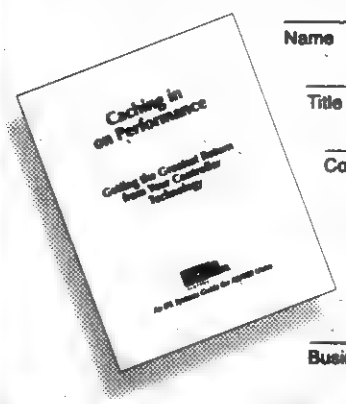

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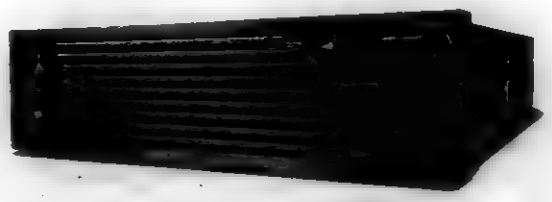

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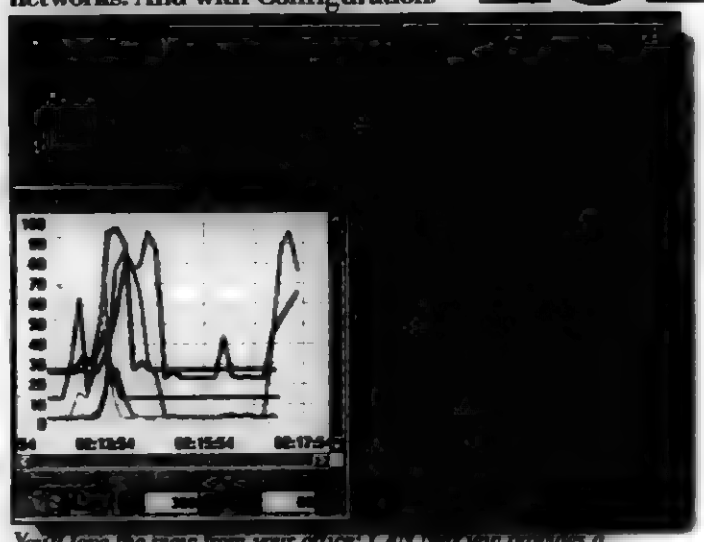

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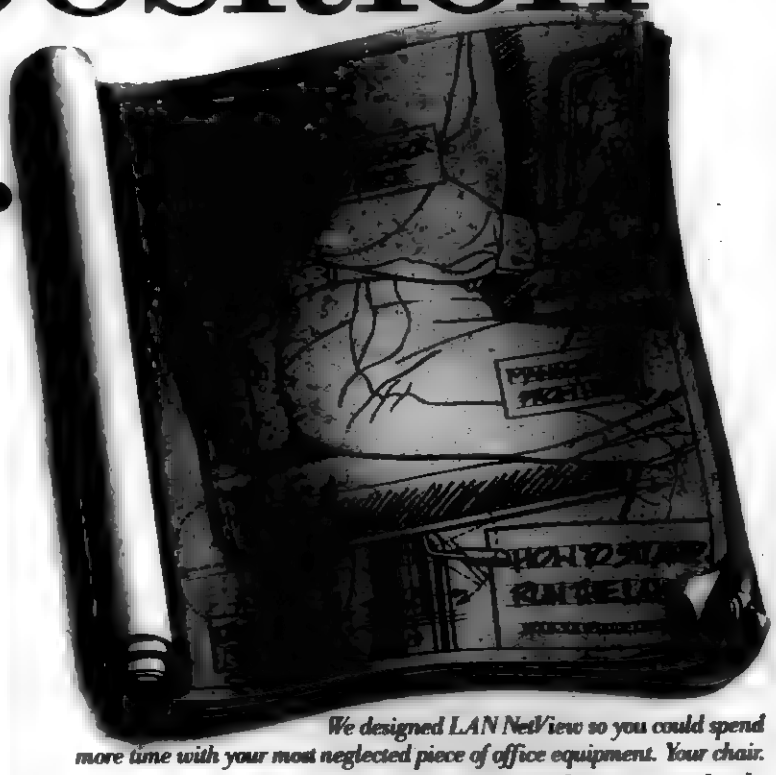

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IBM

VAX shares Digital's attention

By Craig Stedman
MAYNARD, MASS.

Digital Equipment Corp. may be in the throes of "Alpha-holism," a term that International Data Corp. analyst David Smith uses to describe Digital's emphasis on its new Alpha AXP computing technology. But the company is not letting the tap run completely dry on its venerable VAX systems line.

VAX machines still outsell their ramping-up Alpha cohorts by a wide margin, according to Digital executives. As a result, while the hardware portions of the company's Oct. 12 product blitz focused mainly on Alpha workstations and servers, the VAX got more than a passing mention.

Digital revamped the low-end workgroup and departmental members of the VAX family, adding five new MicroVAX 3100 and VAX 4000 models (see chart). It also said that a complete overhaul of the VAX line is in the works, from the workstation level up to the VAX 10000 mainframe-class system.

Alpha is next

While the VAX architecture is not being deadended, Pauline Nist, vice president for Alpha and VAX servers, said Digital has no plans to develop any all-new VAX microprocessor designs beyond the current NVAX technology. "Alpha is essentially the next microprocessor" for VAX users, she said.

The VAX systems introduced two weeks ago include one machine, the VAX 4000-700A, with an NVAX processor sped up to 100 MHz from the previous maximum of 91 MHz. The other new models expand on earlier hardware, primarily by means of increased I/O throughput, Digital indicated.

No big gains

Despite the addition of the Alpha AXP line, Digital officials acknowledged that the company has not yet started gaining back the workstation market share it lost in recent years.

"But certainly we would expect now that this will begin to happen," said William Demmer, vice president of Digital's computer systems group. The Alpha machines were held back by a lack of applications but are supported by "an adequate number" at this point, he added.

Nist said Digital will likely do an optical shrink of the NVAX device for the next generation of VAX machines, which should allow clock speeds to be increased beyond the 100-MHz mark. The company also is looking at increasing the memory caches included with the processors, she added.

Terry Shannon, an analyst at D. H. Brown Associates in Port Chester, N.Y., said an optical shrink would be the cheapest way for Digital to expand the VAX line. The overhaul is expected within the next year and should appeal to users who "are not yet willing to migrate" to Alpha, he said.

"People are still buying first-time VAXs," added Wes Melling, a Gartner Group, Inc. analyst in Stamford, Conn. Melling noted that the new low-end VAX machines actually did better than Alpha systems in transaction-per-second cost on TPC-A benchmarks run by Digital prior to the recent rollout.

The VAX line remains central to the purchase plans of some Digital customers. Dave Federman, vice president of systems and planning in the broker/dealer services department at Chemical Banking Corp. in New York, said VAX machines are still "our bread and butter" computing platforms.

"From our point of view, it's too early to think about Alpha," Federman said, citing a continuing lack of key layered software packages.

PacifiCare Health Systems, Inc. in Cypress, Calif., will probably not move to Alpha in a serious way for another year or more, said Matt Holdrege, senior network specialist at PacifiCare. The company recently bought VAX machines and is open to getting more if business growth makes that necessary, he noted.

Other users have closed the door on VAX, however. The ongoing VAX development "is to DEC's credit, but we're only going to be doing Alphas," said Tim Bird, director of information services at Paws, Inc. in Muncie, Ind. "Alpha is a faster box and it's definitely the future of DEC."

"They're putting more VAXs out for the customers who can't move to Alpha yet, but I can move most of my production and that just makes a lot more sense than trying to stick with the VAX," said Bob Cloninger, data processing manager at OK Industries, Inc. in Fort Smith, Ark.

Just the VAX

Digital's new VAX server lineup for workgroups and departments

	CPU clock speed	TPC-A performance	Backplane I/O bandwidth	Entry price
MicroVAX 3100-90	72 MHz	86 tps	40 byte/sec.	$19,290
VAX 4000-106A	72 MHz	96 tps	266 byte/sec.	$30,180
VAX 4000-300A	72 MHz	117 tps	266 byte/sec.	$46,300
VAX 4000-600A	83 MHz	180 tps	266 byte/sec.	$68,500
VAX 4000-700A	100 MHz	254 tps	266 byte/sec.	$95,300

Source: Digital Equipment Corp.

Impatient Legent to build own DME

By Gary H. Anthes
RESTON, VA.

No longer willing to wait for the Open Software Foundation's (OSF) much-delayed Distributed Management Environment (DME), Legent Corp. has announced plans for building a DME of its own.

Legent's strategy will bridge hosts and client/server systems through a suite of systems management products, middleware, application programming interfaces (API) and development tool kits. As such, it spans Legent's product line, encompassing multiple operating systems, including MVS, Unix and OS/2.

Legent said its approach — which builds substantially on technologies from other companies — will allow users to reduce staff costs and improve systems reliability by simplifying resource management, software development and distribution, troubleshooting, backup and recovery and user administration across heterogeneous environments.

The strategy, dubbed Cross-Platform Environment (XPE), pulls together under one architecture a number of initiatives started during the past three years. Its announcement was prompted in part by a spate of bad news last summer that sent Legent's stock price tumbling and prompted users and analysts to charge the company with failing to keep them fully informed of its plans [CW, July 19].

XPE is no copycat

Legent Chief Executive Officer John Burton said the middleware, APIs and development tool kits in XPE will be used by Legent, its customers and by third-party software vendors. At the same time, he differentiated XPE from DME.

"DME was designed for Unix servers and desktops," Burton said. "What we've done is extend from the host all the way to the desktop those common services between platforms."

Burton said that although Legent is a member of OSF, it could not wait for the pieces of DME to roll out over the next year. Therefore, the company struck deals with others to produce its own tool set. Nevertheless, DME and XPE will be complementary, and users will be able to mix and match both architectures.

The middleware components of XPE include user presentation services developed using graphical user interface technology from Visix Software, Inc. in Reston, Va., communications services based on Pipes technology from PeerLogic, Inc. in San Francisco, object services based on technology from Tivoli Systems, Inc. in Austin, Texas, and directory services.

Some XPE capabilities exist now, and most of the remaining features will emerge by the end of 1994, Legent said. In most cases, XPE functions are embedded in Legent's systems management products and entail no extra license fee.

Desperately seeking XPE

"When we heard about XPE we said, 'When? We need it desperately,' " said Lee Figliuolo, vice president of information systems operations at Progressive Corp. in Mayfield Village, Ohio, an insurance company that is moving to client/server. "It saves me from having to do all that work." The alternative would have been for Progressive to develop its own middleware, APIs and tools.

Others were less enthusiastic. Bruce Allen, vice president at Meta Group, Inc. in Westport, Conn., said Legent is at least 18 months behind Computer Associates International, Inc. in its rollout of products for distributed systems management.

Allen, who said he had been extensively briefed on XPE by Legent management, said Legent's "buy vs. build" approach works against its claims for integration and interoperability. Legent will find it difficult to get the same interoperability that CA has achieved within its CA-Unicenter suite of system management products, he said.

One of the objectives of XPE is to allow users to transparently manage system resources across dissimilar operating systems using just one workstation. That idea was embodied in a limited way in Legent's recent alliance with Hewlett-Packard Co. to develop tools spanning mainframe and client/server environments for performance and resource management [CW, Sept. 27].

Sequent pushes the Pentium envelope

By Mark Halper
BEAVERTON, ORE.

■ Sequent Computer Systems, Inc. has driven its line of Unix multiprocessing minicomputers into the next dimension by unveiling its latest processors based on Intel Corp.'s Pentium chip.

Although Sequent did not release transaction processing benchmark figures, it said the new Symmetry 2000 models double the price/performance of Sequent's previous Symmetry 2000 line, which is based on Intel's 1486.

Kevin Joyce, Sequent product manager for future systems, said the company achieved the performance gains by means of a more powerful processor. Sequent doubled the width of the I/O bus from 8 bits to 16 bits and used 3½-in. drives that accommodate 76 I/O requests per second, compared with 65 per second on the earlier 5¼-in. drives.

The new lineup

The Symmetry 2000/790, 2000/490 and 2000/290 scale up to 30 processors, 10 processors and 6 processors, respectively, through two-processor boards housed in any of the Symmetry's 26 add-in slots.

Mike Higgins, technology support manager at Byer California and a beta customer for the Pentium box, said he expects to eventually move Byer to the new machines from its clustered 486-based Symmetry systems. Higgins lauded Sequent for doubling Symmetry's bus width, noting that a failure to do so would have crippled the I/O performance because the Pentium operates significantly faster than the 486.

Wausau's Dick Lund *has no plans to buy new Sequent machines for a while*

"When you have 30 Pentiums in a machine, you better have a screaming I/O bus or you're going to throttle your processor," Higgins observed.

Sequent's move to 3½-in. drives was a boon to performance because the smaller form factor means each drive in a fully stacked storage cabinet will reside closer to the system and thereby require less cabling. As cable distance increases, performance suffers, according to Higgins.

Dick Lund, vice president of information systems at Wausau Insurance Co. in Wausau, Wis., said he does not plan to rush out and replace his 486 Symmetry box with a Pentium unit.

"Right now, we have plenty of capacity," said Lund, who converted Wausau's pension management program from an IBM 3090 to a Sequent box running an Oracle Corp. database in early 1992.

More change

Futhermore, Lund noted, Wausau's parent, the Nationwide Group, is considering consolidating its pension management system with Wausau's, a move that could entail switching platforms again.

Joyce said Sequent is emphasizing sales of clustered configurations under the moniker Symmetry 2000/900. It is offering each of the models in a two-box clustered package.

With the move to 3½-in. drives, Sequent increased storage capacity slightly, to 806G bytes from 768G bytes. Mean time between disk failure also improved, to 500,000 hours from 300,000 hours, Joyce said.

Rivals cooperate

Sequent buys the 3½-in. drives from minicomputer rival Hewlett-Packard Co. Like Sequent's earlier Unix models, the Pentium boxes, which are available now, run the company's Dynix/ptx Unix operating system.

Prices range from $83,000 to $1 million, depending on the configuration and number of users. A Symmetry 2000/290 with two processors, 64M bytes of memory, 2G bytes of storage and a 16-user license is priced at $85,500.

A Symmetry 2000/990 two-box cluster with two Pentiums per box, 64M bytes of memory, 6.2G bytes of storage and two 16-user licenses lists for $271,900. This price also includes three Ethernet cards per system, a shared expansion cabinet, two copies each of ptx/Cluster, ptx/LAN and ptx/TCP/IP software, plus two weeks of training.

Unisys clears trail for migration to V series

Ports of Mapper development tool kit to run on four different platforms

By Thomas Hoffman
MINNEAPOLIS

Unisys Corp.'s promise to deliver a migration program from its older V series to its newer A series was warmly received by customers at the vendor's recent user group conference here, as were the company's plans to port its Mapper development tool kit.

The Mapper ports will enable Unisys mainframe applications to run on Windows-based PCs, IBM RS/6000, Novell, Inc. UnixWare and Sun Microsystems Computer Corp. SPARCstation environments (see story at right).

Changeover

About 46 of Unisys' 1,000 V series customers have already migrated to the A series, the company said. Another 75% to 80% of the remaining users are "prime candidates," said Dennis M. Murphy, a Unisys V series program manager.

For its part, the V series migration program, called Evolution V to A (EVA), includes software and services to aid the transition to an A series platform.

EVA/Workbench is a PC-based migration tool kit that provides users with a step-by-step migration guide, including an inventory analysis of applications, management of files transferred to the A series and on-line transaction testing between both environments, according to Mike Deneen, a director of product marketing at Unisys' U.S. division.

EVA Terminal Coexistence is another component in the EVA migration package. This set of alternative terminal coexistence products includes Vcon, which allows users to connect one or more A series hosts to a V series network; and Acon, which enables V series users with Gemcos or VCS networks to move their V series terminal network intact to an A series network while providing message routing to the V series via Ethernet CPlan.

The third piece of the terminal coexistence series is CP2000/BNA, which allows any user attached to a CP2000 network to access applications on any A series or V series host in the network.

Already in use

Although the EVA products and services are still in beta testing and will not become generally available until the first quarter of 1994 — when prices will also be announced — the program has already been used to migrate some early customers, including United Fire & Casualty Co. (UF&C) in Cedar Rapids, Iowa.

UF&C, a V580 and V510 shop that began migrating 650 batch programs and 75 on-line Cobol programs in April 1992, completed the transition to an A16 mainframe in May.

The project, which included the conversion of 27 million LINC database records over the Thanksgiving weekend last year, went smoothly without impacting any of UF&C's end users or customers, according to Bob Kenward, vice president of MIS at the life insurance company.

"We had never been through a conversion before, but we had heard a lot of war stories," Kenward said. He said he could have "milked out" UF&C's V series machines for another 10 years, "but there are no [research and development] dollars going into the V series machines." Unisys plans to discontinue V series hardware, engineering and manufacturing support at the turn of the century.

Also at the user group meeting, some users voiced their extreme displeasure over what they see as some pricing imbalances by the vendor. V300 users, for example, have seen their software licensing fees rise by 30% during the past two years despite a lack of enhancements to the operating system.

In contrast, users of V400 and V500 mainframes — which use the same operating system as the V300 — have experienced 5% software price hikes, annually. V300 sites make up more than 50% of the V series installed base, Unisys said.

Unisys' response was blunt. "You have to accept that software prices are going up while hardware prices are doing down," Deneen said.

OpenMapper for Windows

Unisys is readying an Oct. 29 release of a port of OpenMapper, its application development environment, to Windows. Ports to Sun's SPARCstations are slated for fourth-quarter delivery.

OpenMapper for Windows combines Mapper application development functionality with Designer Workbench, a Unisys Windows-based graphical user interface. It will be priced at $695 for a developer's tool kit; end-user copies will cost $300, according to Jay Chaundhry, vice president of marketing and program management at Unisys' Software Products Group.

Robert A. Kilgore, a systems analyst at the Texas Department of Human Services in Austin, who has been beta testing OpenMapper for Windows since June, said he plans to use it to develop executive information systems.

Mapper ports to Sun SPARCstations would be a boon to the California Department of Water Resources in Sacramento, Alan L. Cooper, chief of the unit's dispatch support branch, said he would like to move some of the agency's Unisys 2200 mainframe applications onto SPARCstations.

Unisys also plans next year to deliver Unix versions of Mapper for The Santa Cruz Operation, Hewlett-Packard Co. and Digital Equipment Corp. platforms.

— *Thomas Hoffman*

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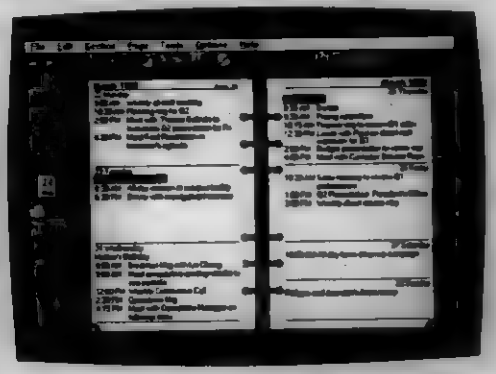

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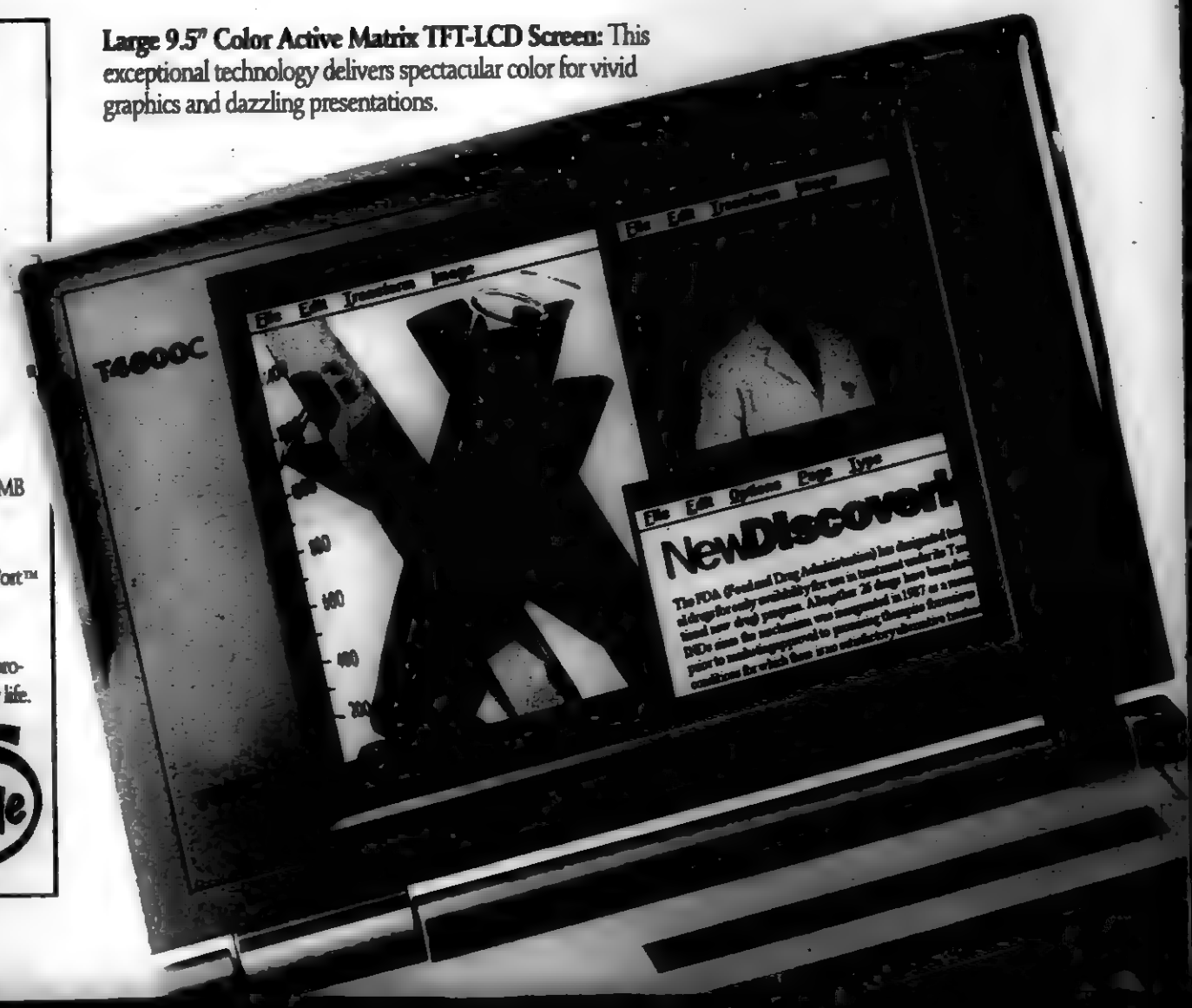

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Software AG forms client/server team with NCR, Apple

Marketing and product alliances link desktop and server technologies

By Gary H. Anthes
RESTON, VA.

■ Mainframe software vendor Software AG of North America, Inc. waded deeper into client/server waters recently by disclosing product development and marketing alliances with NCR Corp. and Apple Computer, Inc.

The partnerships are the latest in a series of links forged between companies specializing in mainframe systems, such as Legent Corp. and Amdahl Corp., and those oriented more toward distributed systems, such as Hewlett-Packard Co. and Sun Microsystems, Inc. [CW, Sept. 27].

The arrangements are intended to bridge legacy and client/server systems and to simplify enterprise-wide computing.

The city of San Antonio developed a 911 emergency dispatching system using Natural and Adabas on a mainframe and then ported it to a client/server environment built around NCR servers and PCs. To ensure uptime for this mission-critical application, San Antonio will use NCR's LifeKeeper to link two servers. If one fails, LifeKeeper will start the application on the other.

All-around better support

Frank Stromboe, director of information services for the city, said the newly formalized relationship between Software AG and NCR will ensure that new products or product ports will support each other's products and that joint customers will get better support.

For example, he said, if a CPU fails, LifeKeeper must be able to quickly and accurately restore Adabas databases. "I hope the agreement means we could work with either vendor and get it resolved quickly," Stromboe said.

"Both NCR and Software AG are trying to come to grips with the market demand for comprehensive, easy-to-use tools to develop client/server applications with all the robustness that people need to run their business," said Peter Kastner, vice president of corporate computing at Aberdeen Group in Boston.

Between now and next year, Software AG and Apple agreed to do the following:

- Port Adabas, Natural and middleware products, Entire Net-Work and Entire Broker, to the Unix-based Apple Workgroup Server 95.
- Interface the Apple/Events messaging protocol with Software AG's Entire Broker Gateway to enable Apple Macintoshes and servers to share data with servers communicating under IBM, Digital Equipment Corp., the Open Software Foundation and Microsoft Corp. distributed computing protocols.
- Cooperate on future development of Apple's Virtually Integrated Technical Architecture Lifecycle (Vital), a set of development guidelines for distributed systems, and jointly develop middleware tools based on Vital and Software AG's Entire architecture.

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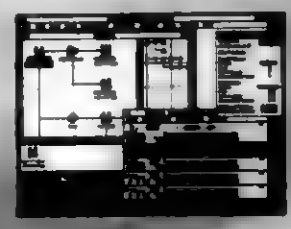

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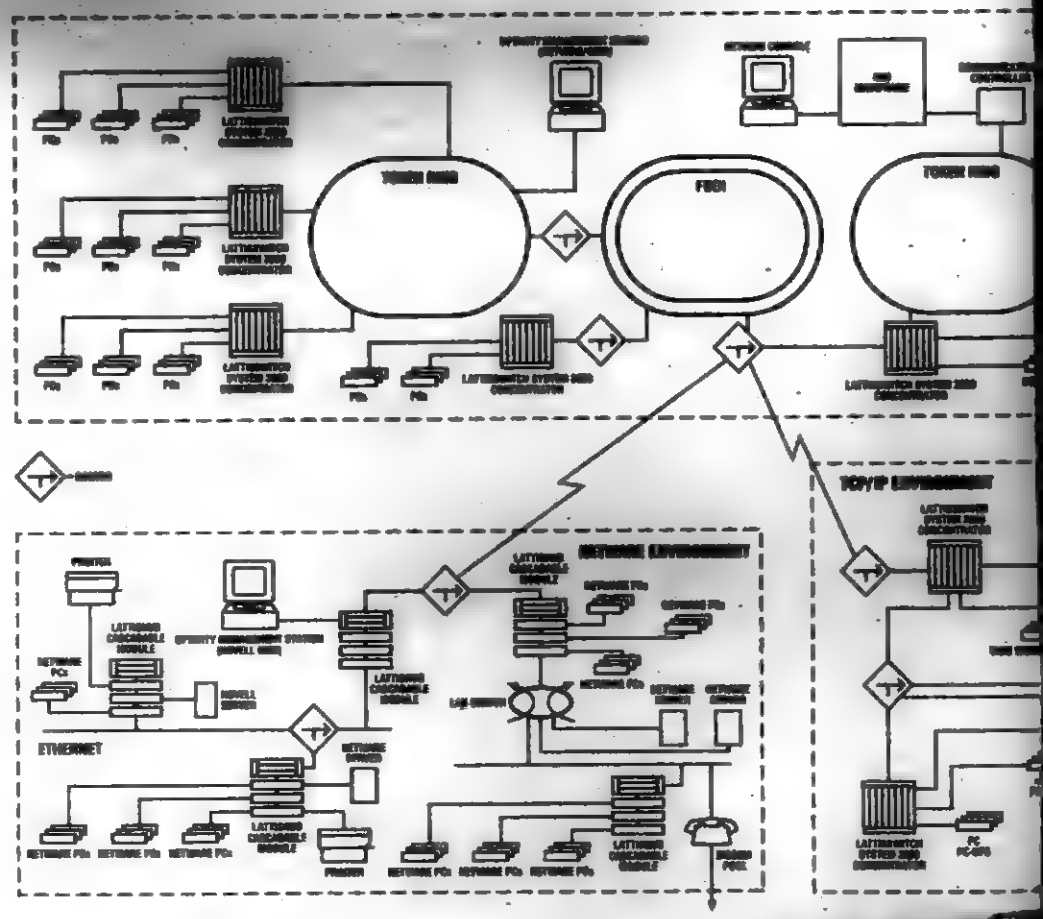

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Sterling Software has announced Gentran:Structure, an add-on mainframe module for the Gentran family of electronic data interchange (EDI) management software.

According to the Dublin, Ohio, company, Gentran:Structure was designed to translate between internal business application formats and a proprietary or private EDI standard.

Gentran:Structure is priced at approximately $10,000.

▶ *Sterling Software*
(614) 793-7000

BRS Software Products has introduced BRS/Search C/S, a product that allows BRS/Search, the company's text retrieval engine, to perform document management applications within client/server architectures.

According to the McLean, Va., company, this release enables BRS/Search to support the customer's choice of standard text, Windows and Macintosh interfaces and a variety of hardware platforms and operating systems.

The client/server software operates on Unix, Digital Equipment Corp.'s VMS and Microsoft Corp.'s Windows NT servers and contains all of the basic search and print functionality of the original host-based product.

Client prices begin at $1,500, and server prices start at $250.

▶ *BRS Software Products*
(703) 442-3870

Tone Software Corp. has announced Release 2.5 of DCC-Compact, a high-performance data compression tool for DB2.

According to the Anaheim, Calif., company, DCC-Compact provides DB2 compression rates averaging 50% to 80%.

Version 2.5 offers an analysis feature that assists DB2 installations in selecting the maximum compression method for each DB2 data structure.

The product fully supports DB2 Version 2.3 and DB2 Version 3.1, and DCC-Compact's Ziv Lempel compression is fully compatible with IBM's Ziv Lempel technique.

The product is CPU licensed and is available for MVS/XA and MVS/ESA.

Pricing ranges from $19,000 to $26,500.

▶ *Tone Software*
(714) 991-9460

Generic Software, Inc. has announced the W-2 Magnetic Media and 1099 Magnetic Media for 1993 reporting.

According to the Madison, Miss.-based company, W-2 and 1099 Magnetic Media instantly give users the ability to magnetically report W-2 and 1099 forms to the government on tape or diskette.

Features for the systems include verification reports; interactive, edited data entry; a multicompany capability; and on-line help text.

The products are available for IBM's AS/400 (native), the System/36 and System/34.

W-2 and 1099 Magnetic Media each cost $395 per CPU.

▶ *Generic Software*
(601) 853-1189

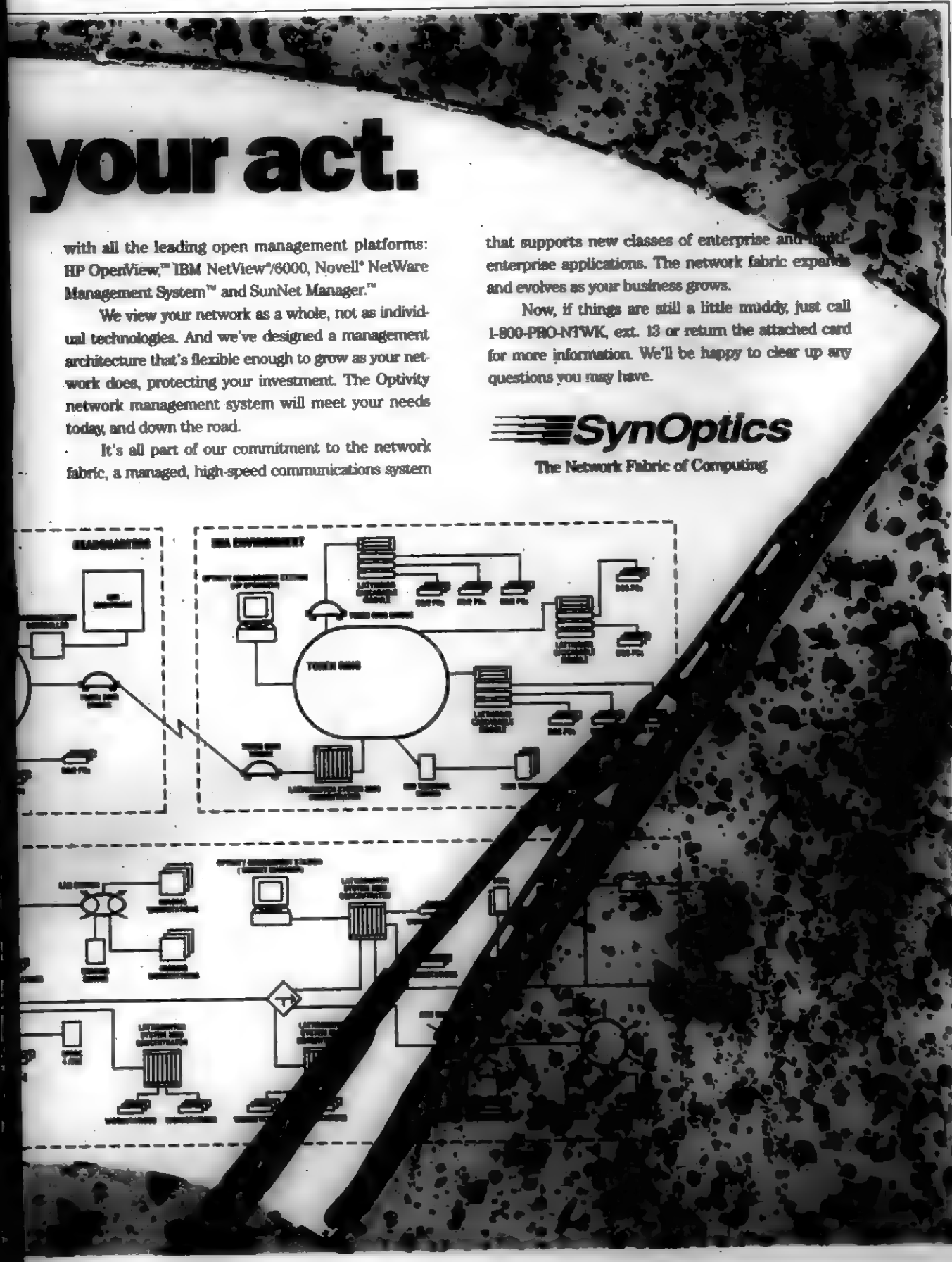
Search Software America has introduced SSA-Name3 Version 1.6, a name search software product that allows users to perform a name search of people and company names regardless of variations such as abbreviations and errors in spelling, phonetics and keypunching.

According to the Old Greenwich, Conn., firm, the product is used for databases with 100,000 to 100 million records.

SSA-Name3 is available for Unix, PC-DOS, IBM, Digital Equipment Corp., Unisys Corp. and Tandem Computers, Inc. mainframes.

A perpetual license for SSA-Name3 costs between $24,000 and $66,000.

▶ *Search Software America*
(203) 698-2399



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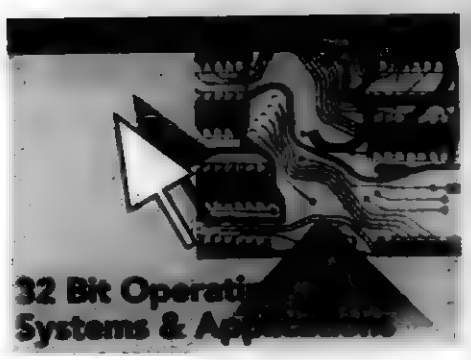

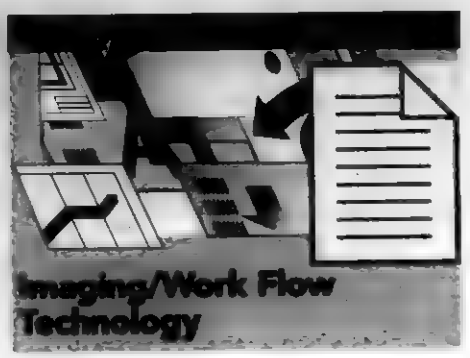

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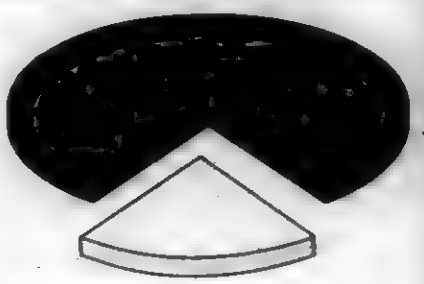

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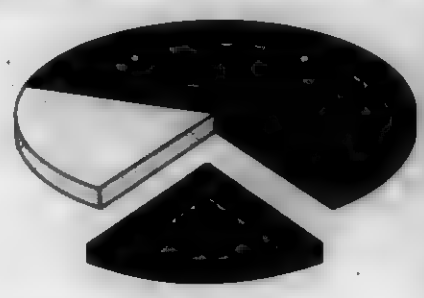

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Vendors tackle software version-control beast

By Melinda-Carol Ballou

One of the biggest headaches for developers in client/server environments is managing different versions of software across a range of platforms and development groups.

Realizing this, an increasing number of version-control tools vendors, including Intersolv, Inc., Legent Corp. and Softool Corp., are targeting client/server. Tools vendors such as Powersoft Corp. are linking their products to existing version-control and configuration-management tools.

While version control simply tracks changes to a particular application component over time, configuration management addresses all the components that make up an application. It identifies and controls changes and manages the overall change process. Configuration management is almost like a bill of materials for an application: It is an aggregate of all the functionality contained within an application.

Handling this is vital for developers as they move forward. "We are looking at client/server on a pilot basis, and controlling our [source code] will be important because we'll have a much more complex environment," said Dan Howarth, a manager at Valero Energy Corp., a natural gas company in San Antonio. "We're just at the tip of the iceberg."

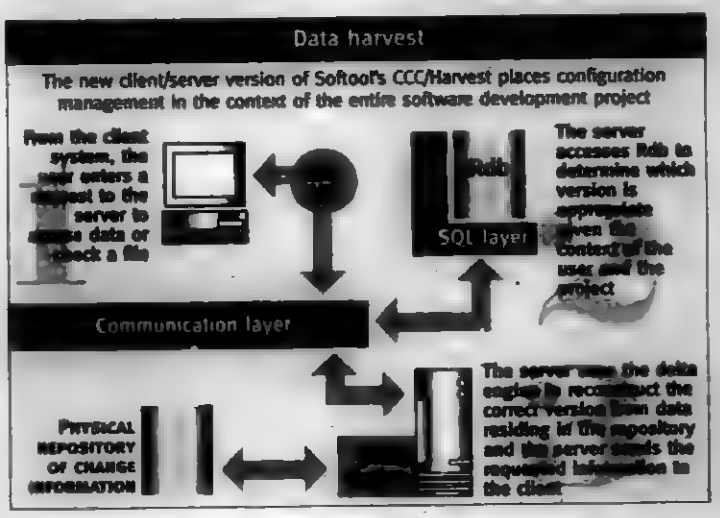
Powersoft is addressing version control by linking its PowerBuilder development tool with existing version-control management products, primarily Intersolv's PVCS, although Powersoft has not yet addressed configuration management.

Intersolv began shipping a Windows application programming interface (API) earlier this year, facilitating the development of such links. PVCS has garnered the lion's share of the version-control market at about 70%, according to Ed Acly, an analyst at International Data Corp. in Framingham, Mass.

Intersolv officials said more than 30 gateways between PVCS and other development tools currently exist.

However, use of those gateways can offer its own challenges, according to analysts and users.

Versioning and configuration management need to be "built into the product from the ground up in order for it to work well, and it has to be under the control of a single vendor," said Rich Finkelstein, president of Performance Computing, a Chicago consulting firm. "The multivendor products are difficult to deal with," he said, because no vendor will take full responsibility when problems arise, and the connections between tools are "often weak."



Waiting game

Powersoft officials said they have waited to implement configuration management for PowerBuilder until other products such as those from Softool and Legent have shipped; these more fully address configuration management. More robust connections will ship with the next point release of PowerBuilder, they said.

For its part, Softool late last month announced CCC/Harvest

Version control, *page 100*

Whither Win32 woes?

Microsoft addresses confusion over versions of API

By Ed Scannell and Michael Vizard

Trying to extract itself from the tangled web it has spun, Microsoft Corp. is now steering developers toward the full implementation of its 32-bit Windows application programming interface (API).

It will be up to developers, however, to decide what features of that kit they want to integrate in their applications, depending on whether they are writing for Windows 3.1, Chicago or Windows NT.

During the past couple of years Microsoft has talked fervently to developers about writing their applications to take advantage of subsets of its Win32 API, which will allow applications to run on various Windows platforms.

Coping with confusion

This new strategy is intended to resolve the confusion brought on by Microsoft's initial decision to promote three variations of the Win32 kit.

This situation has confused developers, who thought the extra two versions — Win32s and Win32c — were separate and significant alternatives to Win32. Many believed they had to place bets on which one would drive the volume platform for Windows.

But as the company began outlining Cairo and Chicago, its future operating system development strategies for Windows NT, the company found it more prudent to emphasize a single kit.

Microsoft officials, who admit they did not clearly articulate their message, now say developers should focus primarily on the Win32 API. If developers wish to optimize an application for a particular platform, they can focus on supporting only specific elements.

The name game

The confusion stems from developers' using the term Win32s to describe a subset of the kit that allows applications to run on Windows 3.1 and NT, and a second subset, referred to as Win32c, that optimizes Win32 applications for Intel Corp. platforms.

"We screwed up. We got ourselves caught up in our shorts trying to be a little too accurate in our positioning," said Jonathan Lazarus, vice president of Microsoft's systems strategy.

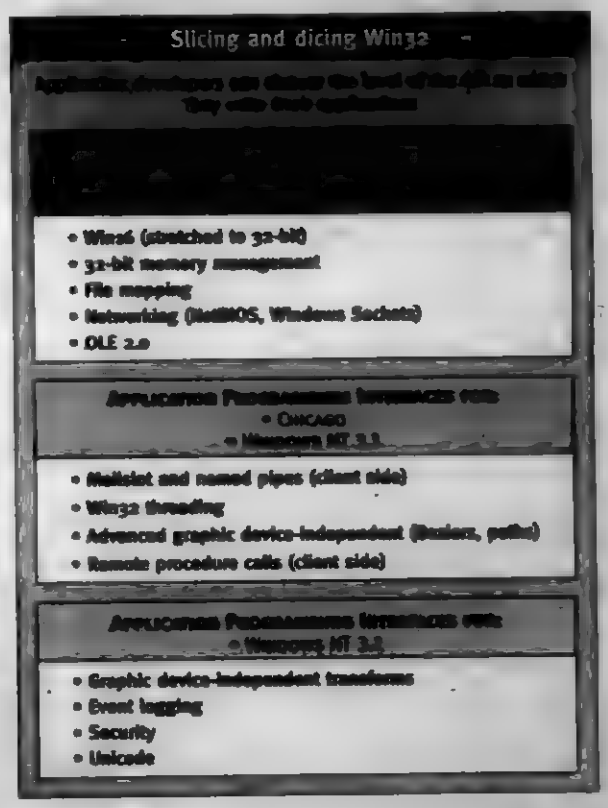
"Users always ask me about Win32c and Win32s, and even though I have the products to develop those sorts of apps, it all beats the hell out of me. I am very unclear about it," said Mike Drips, a beta user of multiple versions of Windows in Tampa, Fla.

According to Microsoft officials, the confusion was unintentional.

What the industry has known as Win32s and Win32c "are not that much different than Win32. They are merely subsets of Win32," said Doug Henrich, Microsoft's director of developer relations.

Henrich and other Microsoft officials now say developers writing applications to the several existing and future Microsoft operating system products need concentrate only on Win32.

Simply put, Win32s represents Microsoft's attempt to take all the 16-bit APIs in Windows 3.1 and allow developers to do 32-bit implementations of them. "Developers just take their 16-bit Windows source code, do a small amount of work up front, and from there it is a straight recompile," Henrich said.



The Win32c set of APIs, for the most part, is an extension of the Win32s APIs, but it specifically supports features in Chicago.

"The business of Win32c was sort of silly on our part. It is just a subset of APIs that will be natively supported in Chicago, not something that was to be an alternative to Win32," Henrich said.

Developers should think of these variations as an evolution of the Win32 API that they can use or not, depending on their development goals. The currently available Win32 software developer's kit will basically be the only one Microsoft makes available. There will not be a different one for Win32, Win32s and Win32c.

"This seems to have been a confusing issue for customers and the press, but not developers," he said. "We should have realized before that customers aren't the ones interested in APIs."

Oracle, Sybase map out multimedia maneuvers

By Kim S. Nash

Oracle Corp. and Sybase, Inc. have laid tracks for nearly polar-opposite multimedia development tool strategies. While Sybase guns for a piece of the highly competitive Windows desktop realm, Oracle envisions a digital information highway where cable and telephone companies use Oracle tools to build interactive consumer applications such as home shopping.

Each plan has merits. But the tools are unlikely to roar into typical information systems shops any time soon, observers said, because multimedia remains a fringe technology.

"Sure, pretty pictures and sound could make some applications better, but do traditional business systems really need such functions?" asked Robert Gentry, vice president at Database Server Systems, Inc., a consulting firm in San Francisco.

"We don't see much call for multimedia in traditional business applications right now," Gentry said. "Maybe it'll happen down the road."

His company helps users move applications from mainframes to Unix-based platforms running relational databases. Most of its business, he said, comprise Sybase and Oracle users.

Aiming high

Oracle's main thrust in multimedia is not the average IS department but cable, content and phone companies, such as partner US West. IS shops will benefit when the technology trickles down to Oracle's bread-and-butter database products, according to Tim Negris, Oracle's senior director for server product marketing and corporate strategy.

The Redwood Shores, Calif., company is expected to ship in January Oracle Media Objects, an object-oriented tool set for building interactive TV systems such as home shopping, personalized newspapers and movies-on-demand [CW, Sept. 27]. The applications would run on massively parallel processors, such as those from NCube, Inc., Thinking Machines Corp. and others. Couch potatoes would access them via set-top boxes that combine television and PC features.

Sybase, meanwhile, is seeking to pump up its presence in the application development tools area by tying together recently acquired products with internally built offerings [CW, Aug. 16]. PCs equipped with Windows are the platforms Sybase has in mind for its Momentum product family.

Because Sybase has been historically weak in the tools arena, Sybase's SQL Server database users have had to buy development aids from Sybase-sanctioned third parties such as Powersoft Corp. Sybase's products are due to start shipping in mid-1994.

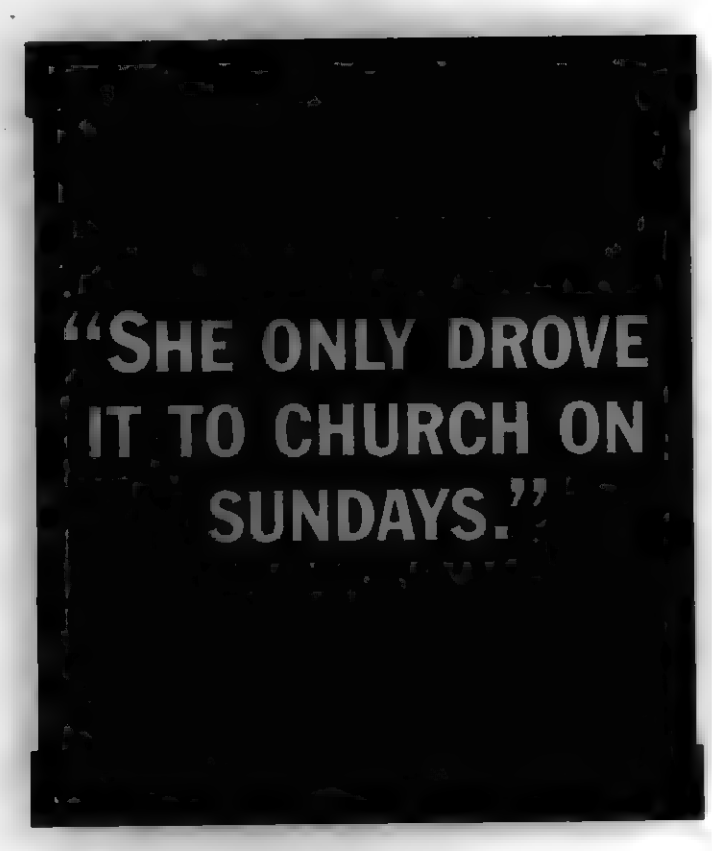
However, for Sybase's multimedia vision to become reality, the Emeryville, Calif., firm must unite disjointed products, analysts said. Gain Momentum, a tool inherited with its acquisition of Gain Technology, Inc. last year, is based on an object-oriented database from Objectivity, Inc.

Sybase recently introduced additional Momentum tools to work with Gain, but they are based on Sybase's SQL Server relational database.

SQL Server can support limited object functions, but a gulf exists between the two databases, according to Sanjeev Varma, an analyst at New Science Associates, Inc. in Westport, Conn.

"Before IS can think about using [Momentum products], Sybase has to figure out how to get the two databases to converge," Varma said.

According to Sybase officials, the disparity between the two products is an issue they plan to address next year.



Microsoft to offer class libraries for OLE

By Melinda-Carol Ballou

Microsoft Corp.'s plans to provide class libraries for its Object Linking and Embedding (OLE) environment are expected to make it easier for developers to create OLE 2.0 Windows applications.

Microsoft will make available by year's end its Microsoft Foundation Classes (MFC) for OLE. Roger Heinen, senior vice president of development tools, described MFC as a set of templates that developers can tailor to build specific Windows applications. This will allow developers to use ready-to-go templates for OLE 2.0 instead of having to learn the more arcane OLE specification.

Most likely, MFC support of OLE 2.0 will be formally announced at the Professional Developer's Conference in San Jose, Calif., during the first week of December, company sources said.

Developers agreed that linking OLE with MFC will make creating applications easier. For Roger Spitzig, a senior systems engineer at The Mutual Life Assurance Company of Canada, offering OLE support with his site's application proved to be too much effort.

"We had a deadline for getting our system out, and the complexity of OLE . . . caused it to be a larger job than we had time for," Spitzig explained.

"Class support from MFC will help to wrap the intricate details and get up to speed more quickly," he said.

Intersolv opens Gateway

Version-control giant expands Polytron system

By Melinda-Carol Ballou

Intersolv, Inc. bolstered the company's Polytron Version Control System (PVCS) last week with support for a greater range of operating systems, workbenches and better version control for LAN-based developers.

PVCS Production Gateway 2.0 for IBM's MVS, OS/2 and Windows makes it easier for developers in LAN-based environments to synchronize their files with major IBM mainframe library systems, company officials said.

This link is built on IBM's Advanced Program-to-Program Communications protocol and provides communications transparency and security for host-to-LAN or LAN-to-LAN networking, the company said.

Intersolv owns the vast majority of the version-control market, with around 70%, according to analysts.

Intersolv is also offering interfaces between Microsoft Corp.'s Visual C++ and Symantec Corp.'s C++ development environments. The link to the Microsoft tools will allow Visual C++ users to access PVCS commands and online help from the Microsoft Visual Workbench.

Developers will be able to record each successive revision of a work file, use multiple locks to prevent multiple users from updating a file simultaneously, easily revert to previous revisions of a work file and assign labels to revisions associated with a particular version of a project. The Visual C++ interface is shipping now as part of the PVCS Version Manager.

Intersolv established a joint marketing and development agreement with Symantec to provide the interface between PVCS and Symantec's C++. The agreement lets Symantec embed PVCS Version Manager Dynamic Link Libraries in its C++.

Additionally, Intersolv announced a PVCS interface to the Open Software Foundation's Motif and Hewlett-Packard Co.'s Open Look and to Repository Technologies, Inc.'s (RTI) Control First System (CFS) for problem tracking and release management. CFS offers a central repository for enhancement and problem information.

While some analysts voiced caution about multivendor product links (see story page 97), one PVCS user said he looks forward to evaluating the interfaces between Visual C++ and Symantec tools and the increased configuration-management capabilities of PVCS.

"This will make it easier to work with those tools and use version control — we'll be looking into those soon," said Mike Hall, a software engineer at National Instruments Corp., an instrument control and scientific data acquisition company in Austin, Texas. "We initially just used version control but increasingly we need configuration management because our projects have grown so much."

The link to Symantec's C++ tools is priced at $499 per copy; the interface to CFS is priced at $99 and is available from RTI.

Briefs

HP adds library to SoftBench

Hewlett-Packard Co. announced that it will embed Ilog, Inc.'s library of reusable objects and behaviors into future versions of SoftBench, HP's computer-aided software engineering tool set and integration framework.

Aurum, Verity team up

Aurum Software, Inc. and Verity, Inc. announced a joint sales and marketing partnership to offer Aurum Software's Customer Resource Planning system and Verity's Topic document-retrieval system to automate customer support and help desk applications.

Deal for ADW/MVS users

Attention KnowledgeWare, Inc.'s Application Development Workbench (ADW)/MVS repository customers: Manager Software Products, Inc. in Lexington, Mass., has a deal for you. Manager Software Products is offering a dollar-for-dollar credit for the full ADW/MVS purchase price if its users exchange their current systems for Manager Software Products' Method Manager repository and dictionary product. The trade-in offer will be valid until March 31, 1994, according to company officials.

Cross develops access

Cross Access Corp. will implement IBM's Distributed Relational Database Architecture — a set of protocols defined by IBM for access to relational and nonrelational databases — in the Cross Access Data Delivery System, a middleware product that provides seamless open access to enterprise-wide data.

Klee joins Transaction

Transaction Solutions, Inc. has appointed Shel Klee as president. Previously, Klee was senior vice president at Home Savings of America, one of the largest savings and loan institutions in the U.S., where he was responsible for all software systems development and implementation.

"I READ IT FOR THE ARTICLES."

"IT CAN BUILD ANY MISSION-CRITICAL, CLIENT/SERVER APPLICATION."

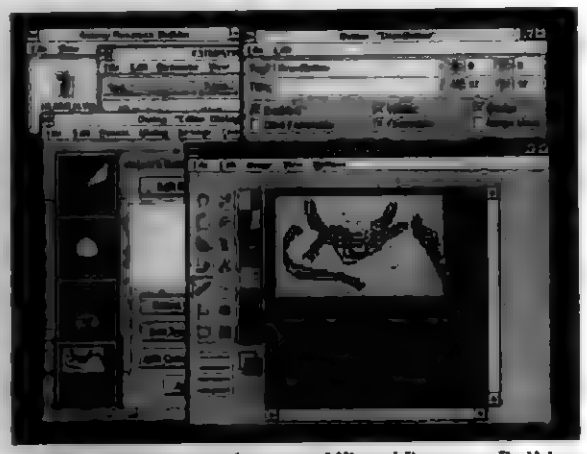
Visix releases new version of Galaxy

By Melinda-Carol Ballou

Visix Software, Inc. announced a new release of the company's Galaxy Application Environment, which sets up consistent development capabilities across a wide range of operating systems.

At the same time, Visix announced a C++ version of Galaxy.

Galaxy is a cross-platform development environment for creating large-scale applications that are graphical and that can be distributed across a range of platforms. The new version works under Unix, Macintosh, Windows, Windows NT, OS/2 and OpenVMS platforms, company officials said.



Galaxy 2.0 *features an improved Visual Resource Builder, making it easier to construct the user interface portion*

Using Galaxy, applications are created once, and then are compiled to run on the range of Visix-supported platforms, windowing systems and networks.

To create portable applications, Galaxy abstracts the system services required by a specific platform. Developers write to a uniform, multiplatform application program-ming interface (API).

Galaxy also offers a superset of the capabilities of native tool kits, including those for Macintosh Toolbox, Windows SDK, Motif and Open Look, so developers do not have to manually port applications to multiple tool kits.

"Visix has done a credible job — it's the best thing of its type on the market," said Rikki Kirzner, an analyst at Dataquest, Inc., a San Jose, Calif., consulting firm. "They offer portability at the application level across a broad range of platforms."

A number of development groups at J. P. Morgan & Co., a financial services company in New York, are using Galaxy to build trading systems, according to Steve Kavanaugh, an associate there. Galaxy lets him move applications from Sun Microsystems, Inc. platforms to Apple Computer, Inc.'s Macintosh.

"In some instances, the applications need to be running on both Sun workstations and Macintoshes and [Galaxy] gives us the ability to do that," Kavanaugh said. The new release offers a number of new features and enhancements. These include the following:

- The uniform multiplatform API.
- A runtime system that will allow developers to construct networked applications.
- Three new managers — Combo Box, Spinner and Drag — for developing drag-and-drop applications.
- Support for the Windows Multiple Document Interface.
- An improved Visual Resource Builder, a Galaxy tool that makes it easier to construct the user interface portion of an application.

C++ Version

Some users were looking forward to the C++ version of Galaxy. According to Brian Salzman, a senior programmer at Murphy and Durieu, a New York brokerage house, the C++ version will lead to cleaner programming.

In C, Salzman said, "you have to make sure that you reference the pointers correctly when you go through the classes. But in C++, if you've inherited those functions from a parent class, you don't have to worry about it," he said.

Galaxy 2.0 will ship by December for Unix, Macintosh System 7.0, Windows 3.1, Windows NT, OS/2 Version 2.1 and Open VMS.

The prices for the C version range from $7,800 to $9,600 per developer seat, depending on platform. Galaxy/C++ is priced at $12,100 per developer seat on all platforms.

Tools

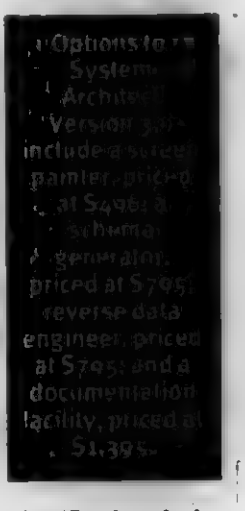
CASE offering strengthened

By Melinda-Carol Ballou

Popkin Software & Systems, Inc. last week released a new version of its System Architect (SA) computer-aided software engineering (CASE) tool, which features improved support for developers creating client/server applications, company officials said.

Popkin is also shipping links between SA and Powersoft Corp.'s PowerBuilder.

Included with SA Version 3.0 are new network security features that enable project leaders to identify and classify personnel with appropriate levels of authorization. Also included are access control functions, enhanced data modeling, improved graphical user interface and real-time modeling and a new browser.



The access control functions allow members of a project team to check in, check out or freeze repository objects or groups of objects. This gives project leaders control over system development and allows team members to access and protect the data that they are working on more easily. "The access control will be useful," said Andrew Renouf, senior information systems analyst at Ontario Hydro Corp., a utility in Toronto.

Enhanced data modeling with Version 3.0 includes broader support of the database administration function through database management system-specific models, support for logical views and the identification of relationship lines between two connected entities, officials said.

The new SA Browser allows users to search their databases to locate diagrams and provide model representations. Users can search through databases for various kinds of definitions and then determine where a dictionary item or data element might be used.

System Architect 3.0 will ship in December. A single-user version for the Windows environment is priced at $1,895, and the first two copies of the network version cost $2,940. The OS/2 PM version is priced at $1,795 for the single-user version and $3,750 for the first two copies.

Version control

CONTINUED FROM PAGE 97

that seeks to address configuration management and version control in client/server environments. CCC/Harvest supports various phases of the application life cycle, including turnover and migration management and impact analysis, company officials said.

Project level information and configuration management reside in a relational database management system with CCC/Harvest, and version-control data is located in a repository of change information.

CCC/Harvest will work with databases from Oracle Corp., Sybase, Inc. and Informix Corp. by next June, the company said.

Softool users said they are interested in checking out the new product.

"We need to work out interfaces with a lab which is 10 miles away from us, and we're hoping Harvest may make that easier for us," said Dorothy Huffman, information systems manager at the Jet Propulsion Lab in Pasedena, Calif., a NASA research and development facility.

Softool is not alone. To name two others, Legent is expected to announce by mid-1994 client/server versions and API for its Endeavor product. And Intersolv will beef up its application development system tools later this year.

According to Acly, the Intersolv announcement indicates that there is a "very hot marketplace for configuration management right now. PVCS has been on a roll for six to eight months."

In the client/server environment, however, it is not always easy to keep both the client and server versions of the products in sync.

Some analysts suggested that users be careful in their selection. The technology is, for the most part, new and not fully proven for distributing configuration management across large, corporate, client/server environments, they said.

"A next generation of software will recognize these problems and come up with a more integrated design from the ground up," Finkelstein said.

[redacted]

Micro Focus, Inc. has announced Version 1.0 of Remote IMS, a product that allows the development, testing and execution of IMS applications on the workstation with access to IMS/ESA databases located on the mainframe.

Remote IMS is able to test large and complex IMS databases by creating distributed IMS systems, copying databases and testing logical relationships, according to the Palo Alto, Calif., firm.

Remote IMS comprises the mainframe Remote IMS Server and the workstation Remote IMS Requester.

The Remote IMS Server for IMS/ESA costs $15,000 per logical CPU. Each workstation requester costs $300.

▶ *Micro Focus*
(415) 856-4161

Powersoft Corp. and **Ernst & Young** have announced an interface between Powersoft's PowerBuilder, a client/server development tool, and KnowledgeWare, Inc.'s Application Development Workbench (ADW), a computer-aided software engineering tool.

According to the Burlington, Mass., company, the PowerBuilder/ADW interface will allow users to automatically transition requirements defined in ADW to PowerBuilder.

The interface was designed to improve the productivity of the developer with an on-line, automated interface, as well as preserve and extend the investment of training methods, tools and existing business models.

Features include inheritance to simplify and automate the generation of an application and DataWindows and Windows. Extended attribute tables — information types (domain definitions) defined in the ADW analysis model are employed to generate validation rules and edit styles in the PowerBuilder extended attribute tables.

The PowerBuilder/ADW interface costs $4,000 per developer and is available as a tool option in the Ernst & Young Navigator System Series.

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TUNE IN, TURN ON, GET RICH?

IS executives are building and looking to exploit the techno-infrastructure for future interactive TV services

By Mitch Betts

Firms are betting literally billions of dollars that there is a profitable future in interactive TV. The dream is that America's couch potatoes will be able to surf along 500 TV channels, play video games with people across the country, select almost any movie at any time of day and pay their bills with a few clicks on the remote control.

To make it happen, information systems executives and chief technology officers are talking big-time strategy with the top corporate executives who are cutting deals with Hollywood, telecommunications, computer and cable TV companies on an almost daily basis.

"This has top-level attention, more than I've ever seen for an IS project before," says Roy Prater, vice president of MIS at Cox Enterprises, Inc. in Atlanta. Prater is in charge of upgrading the cable TV operator's wide-area network to become an information highway populated with video servers for interactive TV.

The much-hyped convergence of digital media is also prompting IS executives in other industries, such as banking, retailing, direct marketing and health care, to consider using the interactive TV services as a new channel for reaching U.S. consumers.

At your fingertips

Avon Products, Inc., for example, is eager to get two-way voice and video communications services from the new multimedia alliances. Bob Hughes, manager of telecommunications at Avon in Rye, N.Y., says interactive TV services would allow headquarters to send out video clips of information on new products to Avon's army of door-to-door sales representatives and their customers.

Hughes imagines a video clip that could demonstrate how to put on a particular facial makeup product and then accept questions about the product. But he really gets excited about the prospect of allowing customers to punch a few buttons to *order* the Avon product after the demo.

The megadeal that triggered this sort of thinking was the $5 billion alliance of US West and Time Warner, Inc. to create interactive TV services nationwide by 1998. US West brings to this high-stakes party its expertise in network switching, billing and transaction processing; Time Warner brings its cable TV stations and the entertainment resources of Warner Bros., Inc. and Home Box Office.

That deal, followed by the proposed merger of Bell Atlantic Corp. and Tele-Communications, Inc. (TCI), got the attention of chief information officers such as Martin Joyce Jr., executive vice president for client services at Blue Cross/Blue Shield of Massachusetts in Boston.

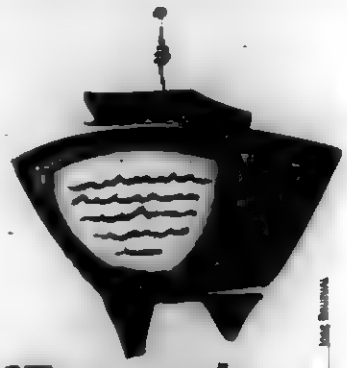
Joyce says the insurer could exploit the interactive TV channels to deliver medical advice (such as information about drug interactions and side effects) and marketing programs that enhance the company's public image. Customers might also be able to call up their medical history, review their claims payment records and even schedule their next visit to the health clinic, he says.

"We haven't spent any money on it yet," Joyce says, "but [interactive TV] has now entered into our strategic thinking about consumer marketing and services in the next five years."

Some hard-core data processing professionals might scoff at the notion of embracing TV, but Joyce says it is time to take the old IS blinders off.

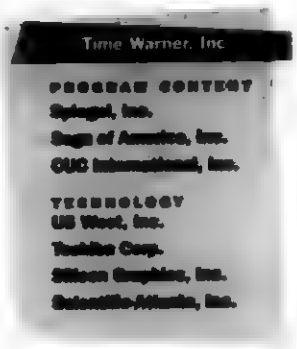
"We have to be realistic. Home PC-based services failed to get much penetration, but cable TV has the penetration [in consumer homes]. We would be foolish not to take advantage of that."

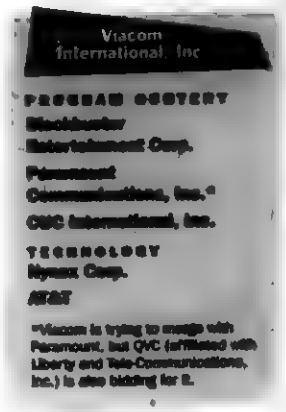
For the CIOs working within the mass media industries, this is a heady time indeed, and their star is rising out of the back office. At New York-based Viacom International, Inc., which owns the MTV,

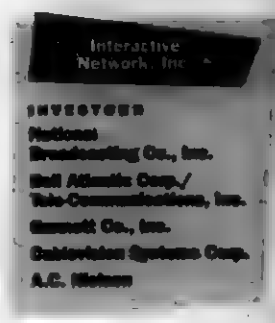


Alliance mania

A sampling of the many alliances (including joint ventures, investments and suppliers) announced for interactive TV







KATHERINE LAMBERT

▶ **Eon Corp.'s Bob Chiaramonte:** *'In a new industry such as ours, every problem that comes up has never been faced before'*

Nickelodeon and Showtime networks, CIO Henry J. Leingang was recently promoted to senior vice president in recognition of the growing strategic importance of information technology [CW, Aug. 16].

Similarly, Turner Broadcasting Co. in Atlanta recently created its first CIO position for the sole purpose of forging an IS infrastructure for the fast-growing multimedia business.

Elahe Hessamfar, who came to Turner from the telecommunications industry, says interactive TV is nothing more than a huge, distributed database of movies, news and information that allows consumer interaction. "Tomorrow, information systems will become your business," she says. "Unless you realize that, you will not be positioned for the new world."

Hard to handle

One thing is for sure: All of that consumer interacting will require some heavy-duty transaction processing systems to handle the ordering, delivering and billing chores for complex services such as on-demand videos, home banking and home shopping.

Denver-based TCI, the nation's largest cable TV conglomerate, has already started overhauling its transaction-processing systems to prepare for the rollout of 500 channels. One of its first steps was to create a centralized command-and-control center capable of processing 180 pay-per-view transactions per second [CW, April 12].

But that is just a start. Sadie Decker, TCI's corporate vice president for advanced information technology, says the astronomical number of variables in interactive TV — somewhat like the

Tune in, *page 104*

Eon Corp.
(formerly TV Answer, Inc.)

PROGRAM CONTENT
Capital Cities/ABC, Inc.
Public Broadcasting System
Encyclopaedia Britannica
Meridian Sunscrip, Inc.
Intuit, Inc.
Domino's Pizza, Inc.
JC Penney Co.

TECHNOLOGY
Hewlett-Packard Co.

DigiCable

PROGRAM CONTENT
Prodigy Services Co.

TECHNOLOGY
General Instrument Corp.
Intel Corp.
Microsoft Corp.

Digital TV converter boxes

TECHNOLOGY
Motorola, Inc.
Scientific-Atlanta, Inc.
Toshiba Labs, Inc.

First Cities Project

Microelectronics & Computer Technology Corp.
Apple Computer, Inc.
Tandem Computers, Inc.
US West, Inc.
Toshiba Labs, Inc.
North American Philips Delivery
Southwestern Bell Corp.

DAVID MCDOUGALL

IT'S A HIT?

Is interactive TV a golden ticket for the cable industry and for kids' entertainment?

It's $50 billion question whether interactive TV will be the big thing that elevated cable in the 1970s and 1980s.

After all, the consumers who currently pay $25 billion in cable TV bills are expecting $50 to $70 a month for the new wave of interactive TV services.

The optimistic view is held by Bill Mitchell, a consultant at Coopers & Lybrand in New York. The time is right for interactive TV, he says, because it is focused on the kinds of video entertainment services that Americans seem to crave — i.e., on-demand movies rather than technology serves a screen.

Interactive TV ventures, in essence, are trying to take some market share away from existing consumer behaviors, such as running out to the video rental store. "The previous failures tried to build new forms of consumer behavior, instead of evolving consumer behavior," Bettina says. "Our research shows that consumers are interested in interactivity and control."

Similarly, Gene DeRose, market research director at Jupiter Communications Co. in New York, says the huge penetration, the high market penetration of cable TV and the focus on entertainment are all good signs for the interactive TV world.

The more worrisome view is held by Steven Slack, vice president in charge of electronic services research at Link Resources Corp. in New York.

"So much is pure hype at this point," Slack maintains. Even Time Warner's $304 interactive TV trials in Orlando, Fla., will not be able to deliver full-motion video applications, he says. "They're limiting to programming providers about full-screen applications."

Having witnessed the first generation videotext experience in the U.S. and now seeing the magic-type new wave of interactive TV, Slack says he is "very highly amused that there's going to be huge investment like the expenditures that are being made and what the interactive TV industry is going to be about. Now in the next five years."

— Mitch Betts

Tune in

CONTINUED FROM PAGE 103

complexity of the Star Wars anti-missile program — will require a total rethinking of the concept of billing.

"Billions of transactions will cost billions of dollars to monitor, and that cuts into profit, and that's not smart," Decker says. Instead, she hints that it might be wise to come up with simplified pricing schemes and bill electronically, perhaps using the interactive TV service itself.

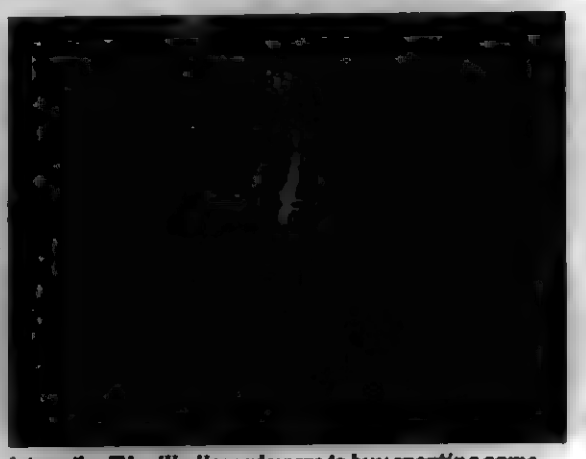
IS professionals say the new world of interactive TV requires some new skills in technologies such as real-time transaction processing, video servers, multimedia databases, network switching and digital video compression, as well as an understanding of the entertainment business and sophisticated marketing.

In other words, this is not plain-vanilla data processing, such as general ledgers and accounts receivable. For example, technologists on this frontier are addressing issues such as how seven customers who want to watch *Rocky V* at slightly different but overlapping times can do that.

Because of the cutting-edge nature of the business, Eon Corp., a Reston, Va., start-up firm that will roll out its wireless interactive TV service in mid-1994, has had the best luck hiring technical employees from academic fields that focus on creative problem-solving.

"In a new industry such as ours, every problem that comes up has never been faced before," says Bob Chiaramonte, vice president for IS and product engineering at the firm, formerly known as TV Answer, Inc.

Chiaramonte, who has already tackled many of the issues facing the newcomers, developed a hub-and-spoke architecture. "The consumer interacts with our service, such as ordering merchandise from a catalog or getting news on what's happening in Bosnia, and then we need to route that information to our providers," he explains.



Interactive TV *will allow viewers to buy sporting game tickets through their TVs*

A big question at the moment is how much of the IS work for the new interactive TV services will be done in-house and how much will be done by outsourcing vendors. Experts say the cable TV industry now outsources most of its billing functions to firms such as the CableData division of U.S. Computer Services in Rancho Cordova, Calif., and First Data Resources, Inc. in Omaha.

New mind-set

Senior executives are beginning to realize that the world of on-demand video and banking will require them to rethink their traditional IS strategy, says Bill Battino, a partner at the mass media consulting practice of Coopers & Lybrand in New York.

"Now they're assessing whether those [outsourcing] vendors can continue to provide the kind of support they'll need in the future and whether their own internal management information systems need to become more sophisticated to handle the more complex environment that is developing," Battino says.

Will sophisticated IS be a make-or-break factor in the life of interactive TV? Not really, according to Battino. Marketing and killer applications — hit forms of entertainment — will be the critical success factors.

But someone has to make the Hollywood visions of on-demand entertainment work in real life by delivering high-quality video, data and sound and accurate ordering and billing. Consumers will not be happy if their spiffy new TV system switches their movie request with another customer's or botches the monthly billing statement.

Steven Sieck, vice president for electronic services research at Link Resources Corp. in New York, says most media companies, in their rush to sign big-bucks alliances and shape the perceptions of Wall Street, have failed to consider tactical issues such as administrative systems.

"Transactional billing systems and other administrative capabilities are virtually absent from the infrastructure for interactive TV now, so the involvement of technologists who can provide those — particularly for the cable TV industry, which is woefully lacking that infrastructure today — will be critical," he says.

Betts is *Computerworld*'s national correspondent, based in Washington.

INTERACTIVE PIONEER

Meridian Bancorp takes the lead in home banking services

Meridian Bancorp, Inc. may not have the name recognition of, say, Citibank NA, but this bank holding company in Reading, Pa., is a true pioneer in allowing customers to perform services such as account inquiries, funds transfers and bill payments directly through their TVs.

Meridian already offers home banking on the Prodigy network, but last year it became the first bank to strike up an alliance with Eon Corp.'s interactive TV service.

"We see interactive TV as attractive because it has such a large market," says Joseph S. Pendleton III, senior vice president of electronic banking at Meridian. However, he acknowledges that the functionality will be limited somewhat, at least initially.

But Pendleton seems undaunted. "Our philosophy is that whatever kind of device the customer wants to use, that's what I want to support," he says. "I don't sell PCs, phones or TVs; what I sell is access and payment services to customers."

Consequently, the job of the IS subsidiary at Meridian has been to build a "back-room engine" that links all of the various banking systems, such as checking accounts and savings accounts, so consumers can transfer funds and pay bills. Just as important, the mainframe engine also has the interfaces for accepting incoming transaction requests from Prodigy and Eon.

With this front-end processor as a go-between, Pendleton says, "The checking account system doesn't know whether the transaction came from a TV set, telephone or PC, and it doesn't really care. The transaction is the same."

Pendleton says he can afford to be experimental, even if a particular home-based gizmo never pans out. When a new customer device comes along, "I'm looking at the cost of developing the interface between ourselves and the new channel," he says. "That's not cheap, but it's not so expensive that we can't take some risks."

The actual IS work is done by Meridian's automation subsidiary, headed by Bruce L. Ressler. Pendleton says he works very closely with James J. Vaiana, vice president of the electronic banking systems group, who has an IS title that may become more common in the banking industry if home banking ever takes off.

— *Mitch Betts*

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Executive Track

Professional Travel Corp. in Denver has announced the appointment of **Bob Griffith**, certified public accountant (CPA), to the newly created position of vice president, finance and administration. He will be responsible for overseeing the accounting, MIS, human resources and administrative departments, as well as the company's benefits program.

Prior to joining Professional Travel, he served as the corporation's outside business consultant and CPA.

U.S. Commerce Secretary Ronald H. Brown recently announced the **1993 National Medal of Technology** winners, who were commended for their contributions to society.

Among the nine winners were **Kenneth H. Olsen**, founder of **Digital Equipment Corp.** in Maynard, Mass., who received a product and process innovation award "for his contributions to the development and use of computer technology and for his entrepreneurial contribution to American business."

Walter L. Robb of the **General Electric Research and Development Center** in Schenectady, N.Y., was honored for his work in advanced manufacturing technology. Robb was cited "for his leadership in the development and commercialization of new medical imaging technologies and related manufacturing initiatives, both of which have improved people's health and contributed to U.S. global leadership in a high-technology industry."

Amos E. Joel Jr. of **AT&T Bell Laboratories** in Murray Hill, N.J., was awarded the Medal of Technology for his work in product and process innovation. He was cited "for his vision, inventiveness and perseverance in introducing technological advances in telecommunications, particularly switching, that have had a major impact on the evolution of the telecommunications industry in the U.S. and worldwide."

The National Medal of Technology is considered the highest award bestowed by the president of the United States for extraordinary achievements in the commercialization of technology or in the development of human resources that foster technology commercialization. Since the first awards were given in 1985, 84 individuals and three companies have received the National Medal of Technology.

Mark Groes has been appointed national director of **KPMG Peat Marwick**'s Health Care Information Technology practice in Chicago. The announcement was made by John Gannon, KPMG Peat Marwick's managing partner.

Prior to joining KPMG Peat Marwick, Groes worked at SMS Corp., where he served as vice president of marketing for two years. He was previously the national director of health care information technology at Ernst & Young.

Patricia R. Malloy has been promoted to director, information services, at **Sisters of the Sorrowful Mother** in Milwaukee, the parent company of seven Midwestern hospitals.

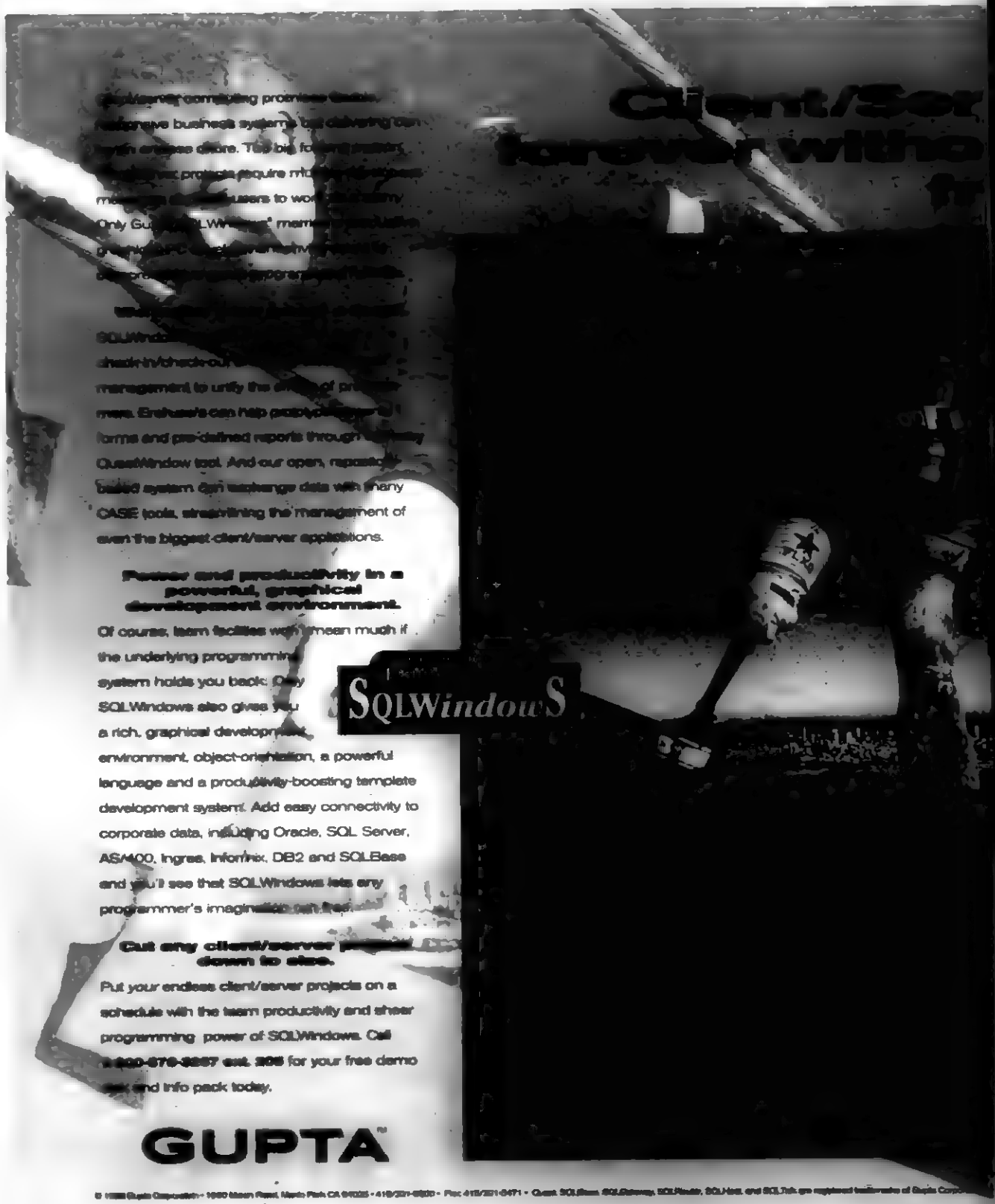
Prem Mehra has joined **Andersen Consulting** in Chicago as an associate partner. Mehra had been with IBM since 1970, as a spokesman for the database management system DB2.

Etienne Droulez has joined **The Clothestime, Inc.** in Anaheim, Calif., as director of management information systems. Droulez will be responsible for information systems, including application development, computer operations, in-store systems, micro-applications and voice and data communications.

Nolan, Norton & Co. has appointed **Charles A. Raz** as director of its New York office.

In his new position, Raz will work with managing director Ira Feinberg to expand the New York-area information technology consulting practice. Previously, Raz was a managing consultant at IBM.

Nolan, Norton is a wholly owned subsidiary of KPMG Peat Marwick, based in Boston.



Calendar

NOV. 7-NOV. 13

1993 Info/Tech. Phoenix, Nov. 7-10 — Contact: Data Processing Management Association, Park Ridge, Ill. (706) 825-8124.

Back to the Future with Macintosh 1993 Fall Conference. Orlando, Fla., Nov. 7-10 — Contact: Managing Apple Computers in Information Systems (MacIS), Mason, Ohio (513) 398-7500.

Fourth International Conference on Applications of Software Measurement '93. Orlando, Fla., Nov. 7-11 — Contact: Software Quality Engineering, Jacksonville, Fla. (904) 268-8639.

ICCAD '93. International Conference on Computer-Aided Design (ICCAD). Santa Clara, Calif., Nov. 7-11 — Contact: Association for Computer Machinery, New York, N.Y. (212) 869-7440.

First Annual Pan Am EDI Users Conference and Exhibit. Orlando, Fla., Nov. 8-10 — Contact: EDIA/Electronic Data Interchange Pan Am, Conference Registrar, Alexandria, Va. (703) 838-8042.

Pacific Region DB2 Conference. Sydney, Australia, Nov. 10-12 — Contact: International DB2 Users Group, Chicago, Ill. (312) 527-6777.

13th Annual Eastern America NCR/AT&T Computer User Conference. Lake Harmony, Pa., Nov. 11-12 — Contact: Frank Whalon, Tinius Olsen Testing Machine Co., Willow Grove, Pa. (215) 675-7104.

NOV. 14-NOV. 20

14th Annual Electronic Document Systems Conference & Exhibit. Denver, Nov. 14-19 — Contact: Xplor International, Torrance, Calif. (310) 373-3633.

Xplor '93. Denver, Nov. 14-19 — Contact: Xplor International, Torrance, Calif. (310) 375-4240.

Marketing the IS Organization Internally. St. Louis, Nov. 15-16 — Contact: Ouellette & Associates, Bedford, N.H. (603) 623-7373.

NOV. 28-DEC. 4

E-Comm '93. Atlanta, Nov. 29-Dec 1. — Contact: E-Comm '93 Conference, Dallas, Texas. (214) 424-0562.

Fourth Annual Computer Fax Conference. Monterey, Calif., Nov. 30-Dec. 1 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

DEC. 5-DEC. 11

Database Marketing Conference & Exposition. Orlando, Fla., Dec. 5-7 — Contact: The National Center For Database Marketing, Stamford, Conn. (212) 972-2410.

Lotus' Notes Users Conference. Lake Buena Vista, Fla., Dec. 5-9 — Contact: Lotusphere '93, Sudbury, Mass. (508) 443-1457.

Computer Measurement Group (CMG): Managing the Wave of Technology. San Diego, Dec. 5-10 — Contact: Computer Measurement Group '93, Chicago, Ill. (708) 655-1812.

Wireless Datacomm '93. Washington, Dec. 6-8 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

"Outsourcing the IS Function." San Francisco, Dec. 8-9 — Contact: International Quality & Productivity Center, Upper Montclair, N.J. (201) 783-4403.

The Outsourcing Conference: "Opportunities, Strategies, Realities." Boston, Dec. 8-9 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Database World. Chicago, Dec. 8-10 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3880.

DEC. 12-DEC. 18

Lap and Palmtop Expositions and Conference. Toronto, Dec. 13-14 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7968.

JAN. 9-JAN. 15, 1994

Object World. Boston, Jan. 10-13 — Contact: IDG World Expo, Framingham, Mass. (508) 879-6700.

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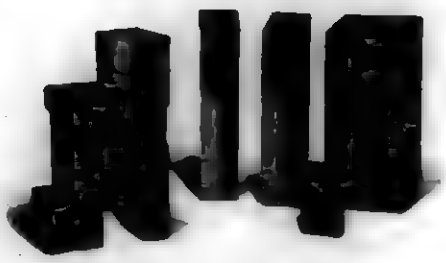

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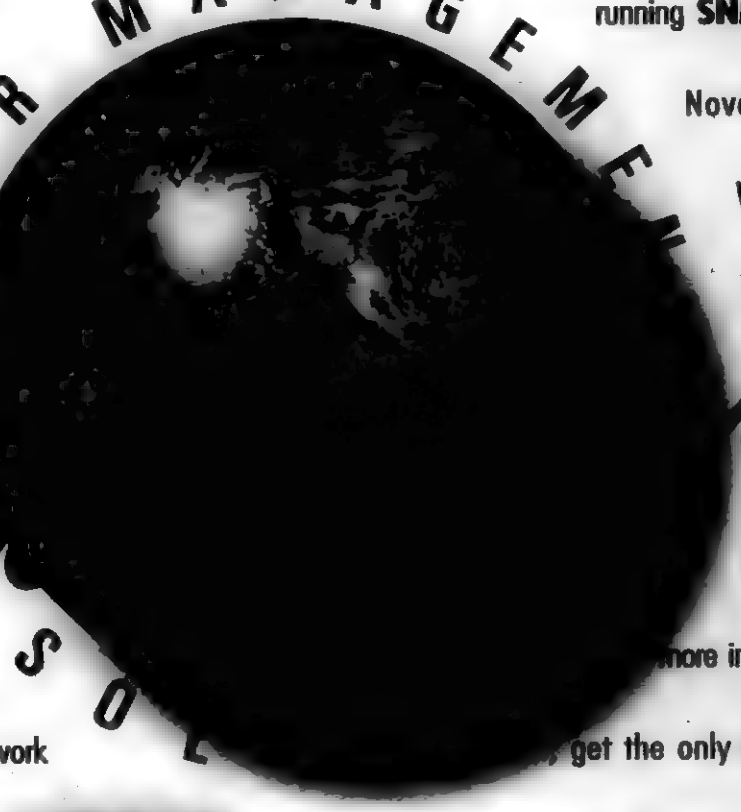

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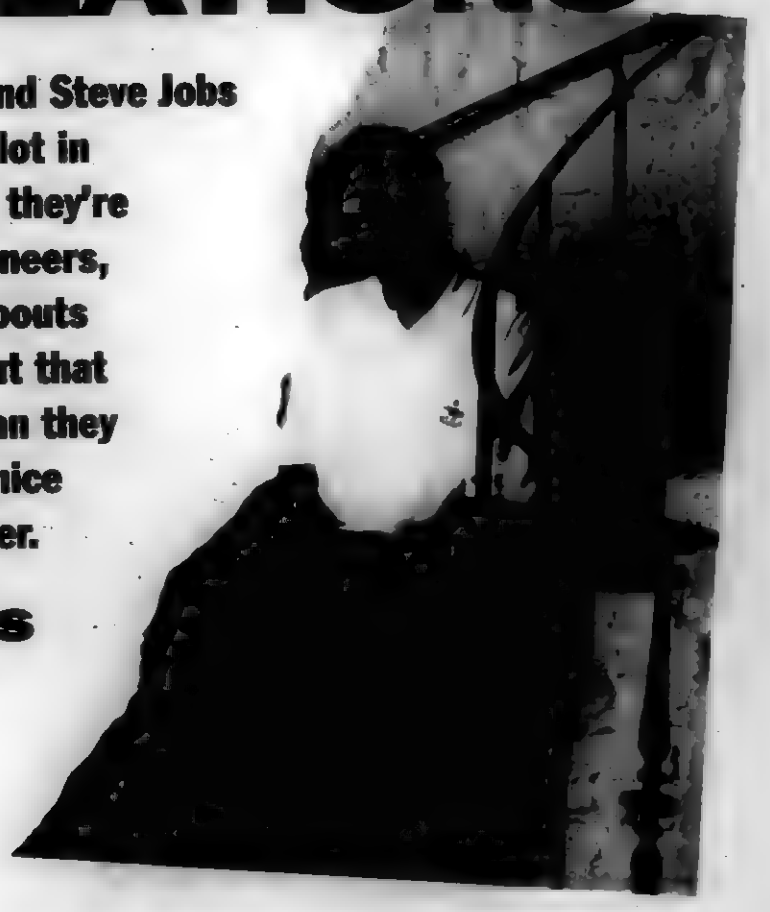
STRAINED RELATIONS



Bill Gates and Steve Jobs may have a lot in common — they're both PC pioneers, college dropouts and rich. But that doesn't mean they have to be nice to each other.

BY RANDALL E. STROSS

epetition of the Macintosh success [with Next, Inc.] would have been difficult enough to achieve even if Steve Jobs had made the correct call on every decision that came before him. He failed, however, to appreciate fully the importance of enlisting the outside support of Bill Gates' Microsoft Corp. or a similar software company to ensure that there would be plenty of software available when a new computer standard, incompatible with existing ones, was introduced to the public.

Gates' willingness to begin work on software development for the Macintosh prior to its introduction in 1984 had been instrumental to its success, but this time Jobs did not succeed in obtaining the assistance of Gates and Microsoft.

He did not try very hard, either. When Gates visited Next's offices in the summer of 1987, while the Next computer was under development, Jobs let him sit in the lobby for a half-hour while Jobs moved conspicuously about the building, letting his visitor stew. Jobs' subordinates were amused to see Jobs deliberately keep Gates waiting, which was a way of Next telling Microsoft that Next did not really need the software company's help.

But the ploy was more than an act of discourtesy. It was the prelude to what would later become an acrimonious competition between the two men for the

Strained relations, *page 110*

This is an excerpt from Randall E. Stross' forthcoming book *Steve Jobs and the Next Big Thing* to be published by Atheneum in late November. (Copyright 1993 by Randall E. Stross.) Stross is a professor of international business at San Jose State University.

Strained relations

CONTINUED FROM PAGE 109

power to direct the PC industry, which had grown manyfold since their earlier collaboration, when Jobs was still at Apple.

When Jobs finally unveiled the Next machine to the general public in late 1988, Gates said with derision about his rival, "He put a microprocessor in a box. So what?" Asked about the Next computer's disk drive, which was new for PCs and used optical technology supplied by the Japanese, Gates sneered, "Anybody can write Sony a check." (For the record, the check went to Canon, not Sony.) The all-black design did not impress him, either. Gates: "If you want black, I'll get you a can of paint." Would he develop software for Jobs' new machine? "Develop for it? I'll piss on it."

The industry consumed these remarks as delectable morsels; it also saw them as understandable, given the many threats that Microsoft already faced on a number of fronts, from a strained relationship with IBM and legal conflicts with Apple to uncertain prospects for new software called Windows and now Jobs' new machine, which invited the world to abandon the software the Macintosh provided and use a new standard.

Next had ominously secured the imprimatur of Microsoft's most important partner — IBM, no less. In October 1988, one industry analyst went so far as to say that the new IBM/Next relationship "was the biggest risk that Microsoft has, and Gates is doing all he can to undermine it."

The public feud between Gates and Jobs continued on through the following year. Gates dismissed the new technical features that the Next computer boasted as "truly trivial," and later, when Gates and Jobs found themselves sitting on a dais at a PC industry meeting, the two traded shots over the head of the hapless representative from IBM, James Cannavino, who sat between them. Cannavino said he felt like he was in Beirut.

GATES THE MONEY CHASE JOBS

1975 Bill Gates and Paul Allen co-found Microsoft.

1977 Steve Jobs and Steve Wozniak move Apple from a garage to an office.

1980 Apple annual sales reach $120 million; company goes public.

1982 Jobs, 27, listed on the *Forbes* 400 list with Apple stock valued at $100 million.

1983 Jobs' stock hits $225 million.

1985 Jobs resigns; gets dropped from *Forbes* list.

1986 Gates, 30, debuts on the *Forbes* list with shares worth $315 million.

1991 Listed No. 2 in *Forbes* with stock valued at $4.8 billion.

1992 Tops *Forbes* list with paper value beyond $6 billion.

1993 Estimated worth: $6.16 billion.

"All I'm thinking and dreaming about is selling software, not stock."

(*Hard Drive*, by James Wallace and Jim Erickson, HarperBusiness, 1992)

"Computers and society are out on a first date in this decade, and for some crazy reason, we're in the right place at the right time to make that romance blossom."

(*Rolling Stone*, March 1984)

It was Jobs, however, more than Gates who was most damaged by their estrangement. When Gates shunned the Next computer, Next was deprived of Microsoft's considerable resources for new software development, which it desperately needed. And Gates' cold response also sent a message to other interested parties that Next's place in the PC galaxy would be marginal.

Everyone knew that Gates took a considerable risk in backing the Macintosh when it was first introduced. Thus, his refusal to back Jobs this time was read as evidence that Next would be hobbled by a crippling handicap with which Apple had never had to contend.

[Yet] Jobs was unconcerned: His motto was "Build it and they will come." But hardly anyone came when the machine was introduced in 1988. Nor did they come in 1989. Jobs was so slow to perceive how grave was the failure that it was not until 1990 that he threw out the old plan and cobbled together a new one, and another and another, right up to the present.

Balancing things out

[But] Jobs has a strength that has helped redress the imbalance of power and money that had come to separate the two boy wonders: Jobs was the revolutionary, the person who had staked out for himself the mission of coaxing the world along with him to take great leaps forward in computer technology.

Gates, in contrast, stood by what he called an evolutionary approach, improving existing software incrementally and permitting computer users to keep their older PC longer. When Microsoft introduced a new kind of software program, more often than not it would be deeply flawed. But successive versions would eliminate the problems, and by dint of steady investment and persistence, the program would mature into a well-received product.

It is fitting that Jobs and Gates be treated as a royal pair. The pattern that the two have set is this: Jobs blazes the trail, and Gates comes behind, incorporating Jobs' revolutionary leap in more modest fashion but one that appeals to the millions of computer users who are reluctant to jettison past investments.

When Gates and Jobs got together in 1991 at Jobs' home for a *Fortune* magazine story on the occasion of the 10th anniversary of the IBM Personal Computer, the shift in power toward those who controlled software instead of those who made computers themselves was already evident. IBM's absence from the birthday cover story for its own Personal Computer and the substitution of Jobs and Gates was an indication of how the computer industry had changed.

So, too, was the softening of contention between Jobs and Gates themselves. Jobs still hoped to enlist Gates in his cause, and Gates, for his part, no longer had as much reason to be concerned about losing IBM's monogamous commitment to Microsoft; the two companies' formerly close relationship had ruptured, and it looked as if Microsoft was in a much better position after the split with IBM.

In 1988, when it appeared that IBM might make Next software a new standard for its own computers, Gates had derisively dismissed Next. Three years later, alignments had changed to such a degree, and Microsoft's power had grown to such an extent, that Gates could afford to talk with Jobs about Next without the rancor and perception of personal challenge.

Each declared to the other that the press had invented animosities and had erroneously assumed they were no longer friends. These were declarations that required historical amnesia but were fair indications that, at least at that moment in 1991, both preferred amity to enmity. Though this private meeting was the first in a long while, the two had maintained a wary friendliness with periodic conversations by phone, which were more often than not entreaties from Jobs for Gates to reconsider his declaration that Microsoft would consider writing software only for a computer that had sold 1 million machines, a milestone that, for Next, was impossibly far off. [In fact, to date, Next has sold approximately 50,000 machines.]

At the end of their chat in 1991, however, Jobs had failed once again to enlist Gates' help, and by the next year was speaking publicly about the dire threat posed to the world by the "Microsoft monopoly."

When Jobs appeared at a meeting of the Bay Area Next Group [in 1993], he brushed aside suggestions that Next should consider licensing its software to Microsoft. It made no sense, he said, to aid the enemy. ■

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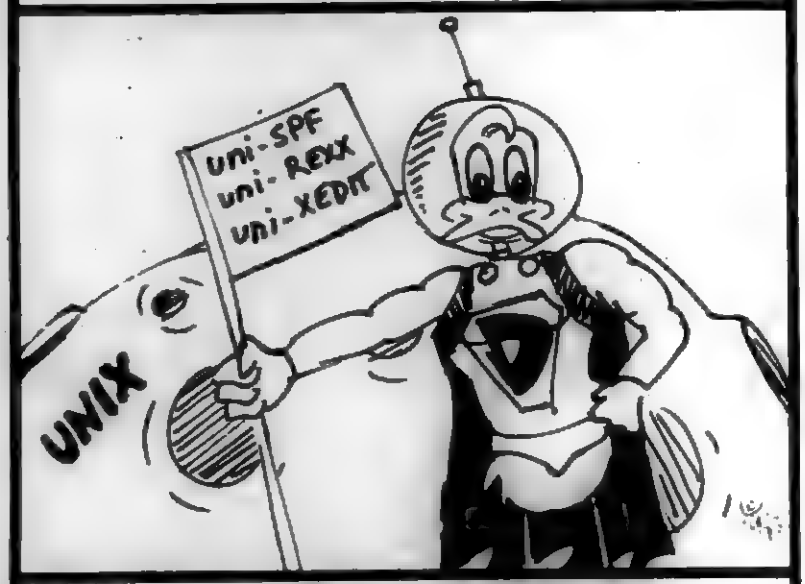

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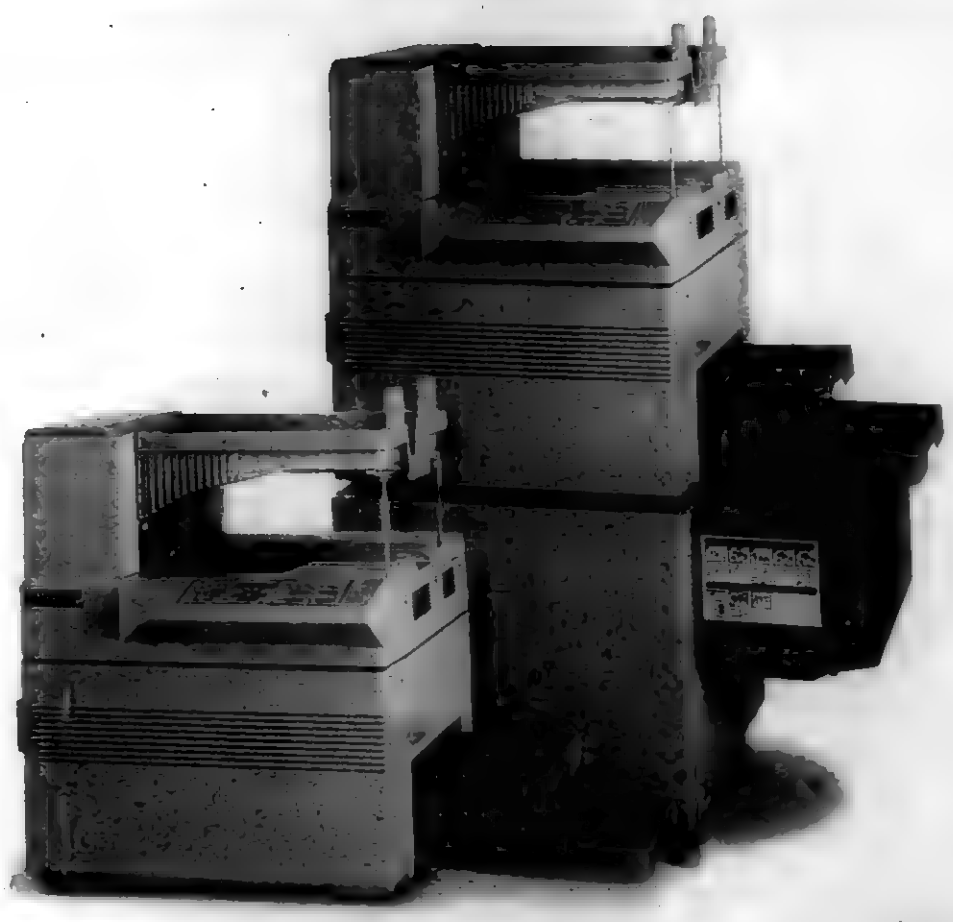

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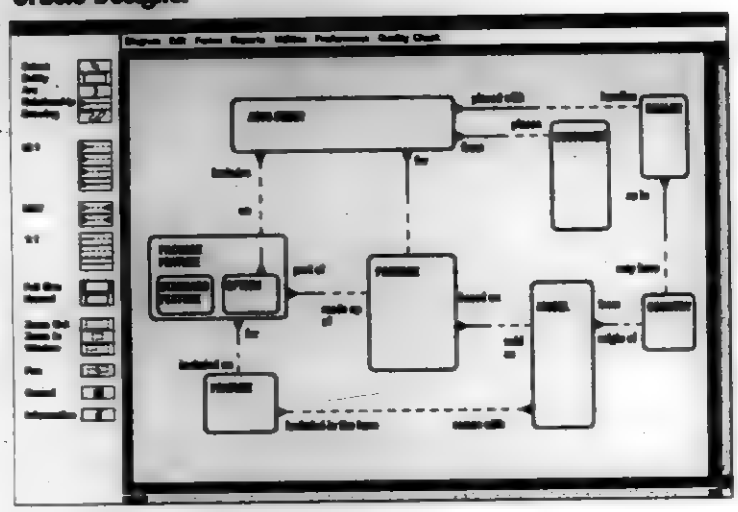

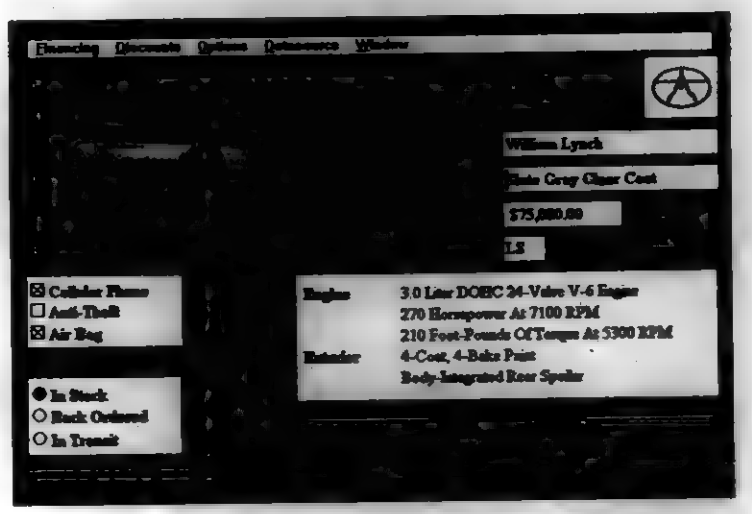

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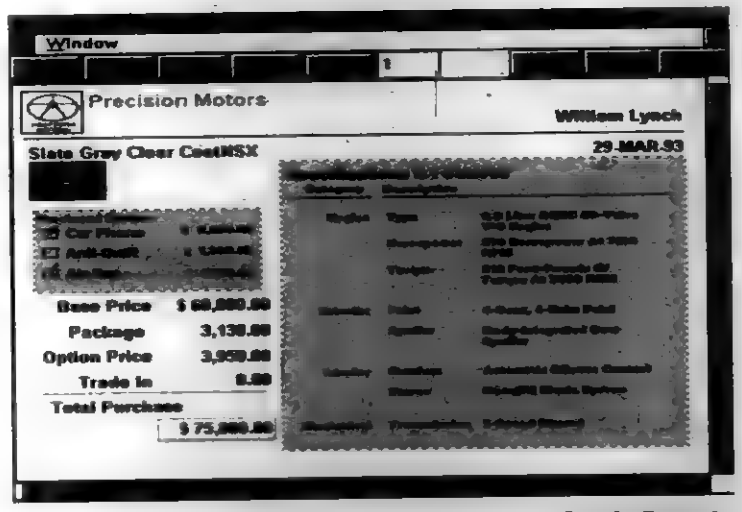

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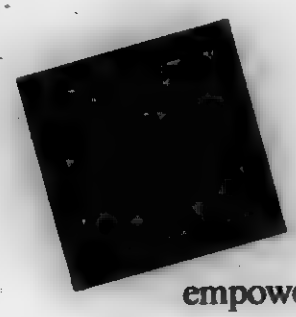

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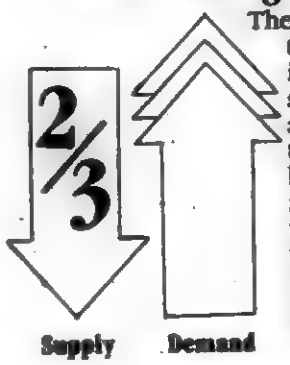
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

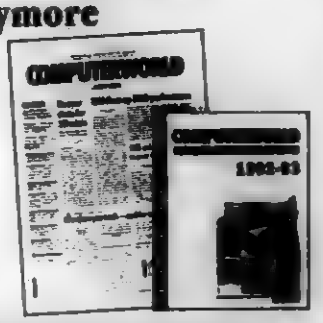
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active ☐☐
7 are Passive ☐☐☐☐☐☐☐
1 is a Non-mover ☐

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 629,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

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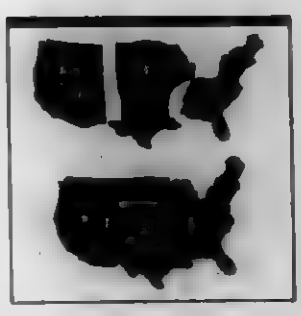

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

Computerworld needs just 2 working days for your ad to appear

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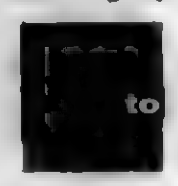
THE MANAGEMENT TRANSITION

Managers hesitate to give up technical immersion but accept it as a reality of getting ahead

By Leslie Goff

IT'S THE WAY OF THE WORLD: You gain something, you lose something. So it goes for information systems professionals who rise through the technical ranks to management positions.

Managers say they gain in terms of visibility and influence in the organization, long-term career growth, salary, benefits and overall job satisfaction. At the same time, they struggle with giving up their daily technical responsibilities and the shifting relationships with former peers who are now their direct reports.



"Given the technology treadmill that most IS staffers are on, it's a difficult transition to make," says Richard DeFiore, president of Interpersonal Technology Group in Rockville Center, N.Y., and the leader of a "Transition to Management" workshop.

DeFiore says many recently promoted first-line managers have trouble letting go of their old jobs because of their love of technology — the reason they chose an IS career in the first place.

"It's hard keeping your hands off the hands-on," says Daniel Townsend, manager of network operations at Yellow Technology Services, the IS division of Yellow Corp. in Overland Park, Kan.

"I wanted to try to do both," Townsend says. "I was trying to remain a technical person more than I was trying to become a manager. Ultimately, you have to sever the cord and have faith in your people."

Townsend says after becoming overburdened at work, he grew to see his position as that of a catalyst: "I have to motivate my staff to be conscious of doing a good job."

Mary Hopkins, IS manager at Herr-Voss Corp. in Callery, Pa., says she moved into IS from accounting because of the increased opportunities for women in management, but she misses "the element of creativity when you sit down to write a program from scratch. I still do the system design, but I let them write the program. I'm just giving them the pieces to work with."

Out of touch

Learning to give up the close contact with technology is a double-edged sword. As they become more adept at managing people, managers say they have less time to keep up with advanced and emerging technologies, which creates a different set of anxieties.

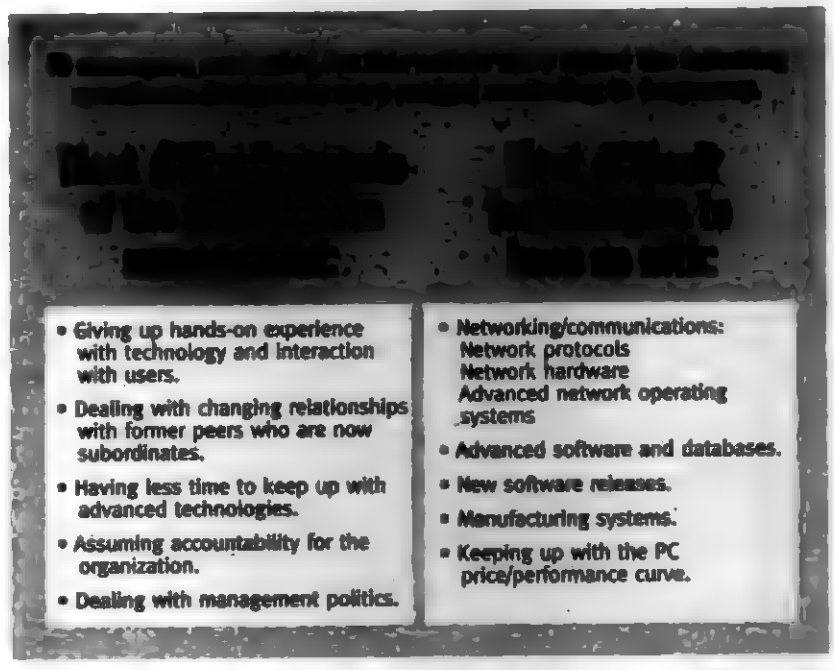
"When I have less time to work on technology, I feel a little more distanced from the state of the art," says Rick Ulene, manager of information services at Advanced Sterilization Products, a division of Johnson & Johnson Medical, Inc. in Irvine, Calif. "That's anxiety-provoking because, in theory, the people at the top of IS should be the most knowledgeable about what's out there."

If moving into management requires you to give up what you love most and, in the process, acquire a whole new set of anxieties, why do people do it? In most organizations, moving into management is the only way for IS staffers to advance.

While some companies say they offer dual career paths — one for aspiring managers and one for IS staff members who wish to remain technical but want to advance their position — DeFiore says the technical path seldom extends beyond the group project leader, a lower middle management position.

"From an advancement standpoint, management seemed the way to go, and it was something different," says Robert Duncan, IS manager at the Price Candy Co. in Kansas City, Mo. "There wasn't a lot of choice at the firms I've been in."

Goff is a free-lance writer in New York.



- Giving up hands-on experience with technology and interaction with users.
- Dealing with changing relationships with former peers who are now subordinates.
- Having less time to keep up with advanced technologies.
- Assuming accountability for the organization.
- Dealing with management politics.

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From LAN neophyte to expert

ONE IS PROFESSIONAL'S TRANSITION

By Daniel Douglas

Whether you want to or not, you could be asked to administer your company's LAN. If your networking skills are limited, you may question whether to accept the challenge or bow out gracefully. Three years ago, I faced a similar situation, but I took the challenge, and I'm still here to talk about it.

My company was installing a LAN at two remote offices. I was asked to provide LAN training and assist the network managers with software and hardware installation, systems administration and PC configuration at both sites. In one month, I needed to be up to speed on Novell, Inc.'s NetWare management, network performance monitoring and hardware installation.

My only network experience came from working one year on our help desk for our 500-node NetWare LAN. I could install and configure PCs and software and do some programming, but I knew little of what went on in a networked environment.

One of my first tasks was to set up a modem pool, which I had never done before. I had to learn the basics of NetWare Asynchronous Communications Services (NACS), the software that allows ordinary modems to be shared by network users. I also had to set users up on the LAN, install gateways, ensure system security and keep up with LAN backup. Since I already knew the basics of PC-to-PC communications, I focused my attention on learning how to use the communications packages and modems across a network.

At the same time, we were setting up an MCI Mail gateway to our electronic-mail system, adding documents from the old system and installing hardware I'd never seen before to access our IBM System/38. I felt overwhelmed.

Doing the homework

I started by reading Novell's manuals for NACS and the related hardware. The manuals gave me the installation basics but glossed over the administration of the NACS server.

I also logged onto CompuServe, read the messages in one of its forums called NetWire and did a specific search on the

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- **Subscribe to CompuServe.** I found the forums to be helpful, especially when I was updating Novell's driver software, which can be downloaded from CompuServe.
- **Read.** You've probably heard that vendor manuals, especially Novell's, are disorganized, but they got me through the basics of setting up its NetWare NACS and gave a bare bones description of NetWare system management and the use of related utilities.
- **Attend seminars and user groups for your network type.** I knew at some point our LAN would migrate to a Windows front end, and I got advice on what to expect.
- **Concentrate on the mission-critical.** I needed to stabilize the installed software, ensure network security and continue installing software and hardware.
- **If it isn't broke, don't fix it.** I knew that there was a way to tweak the system so that when users incorrectly entered their log-ons or passwords, they returned to the log-on prompt. Instead of making it easy, however, I placed them in a continuous loop that kept them from logging on at all. I should have saved this until I had time to do it right.

setup and administration of NACS. For starters, I wanted to know whether users could be restricted from running multiple sessions, tying up two or more modems in the pool.

When I finally set up the communications software and the wide-area network interface module board for the NACS, I realized that setting up modem pools wasn't as difficult as I had thought. The MCI Mail gateway setup was also easy — I simply read the documentation and called the vendor's support line.

The most challenging task I encountered was with the router for the WAN connection between all the offices, which was to link the E-mail and the billing system. I had no clue how we made or maintained the connection, but our systems analyst guided me through the basics.

Stick to the critical

My biggest mistake was trying to do too much at once. Instead of sticking to the critical issues, I strayed.

For instance, I attempted to change an already installed and working application to what I thought was a more logical approach. Instead of helping matters, I brought the application to a halt. Despite the fact that I should never have attempted this without backing up the application (and was too green to know this at the time), there were more important network problems on the table.

With that said, take heart. Whether you're thrown into this situation or you gladly accept it, take a deep breath, roll up your sleeves and grab the documentation. You can really grasp enough to get you through. I did.

Douglas is a LAN analyst at a major law firm in Washington. He can be reached on CompuServe at 75530,2611.

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SCIENTIST/ENGINEER: To work on design, engineering and configuration management of the GMHE network as mid-level engineer. Requires BSEE, BSCS or equivalent experience (10+ years); working knowledge of current/emerging technologies (DCE, DME, OSI, TCP/IP, UNIX and/or VAX systems) and industry standards.

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Software Vendor	218,027
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for personal computers	97,695
for technical workstations	33,217
Non-CPU Computer Products Manufacturer	42,051
VAR/Dealer/Reseller	27,772
DP Service Bureau/ Contract DP Services	71,293
Consulting/Planning	76,848
Manufacturer (not computers)	202,151
Insurance	91,117
Healthcare	48,866
Banking/Financial Services	116,696
Government Federal/State/Local	114,677
Business Service (except DP)	63,793
Communications Systems	55,744
Public Utilities	24,931
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SOURCE: Skill Survey of Computerworld's Audience, August 1992.

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- Conduct sales presentations

Requirements:
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- Conduct sales presentations

Requirements:
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- Proven track record of overachievement of quota
- Strong technical aptitude
- Excellent organizational and presentation skills

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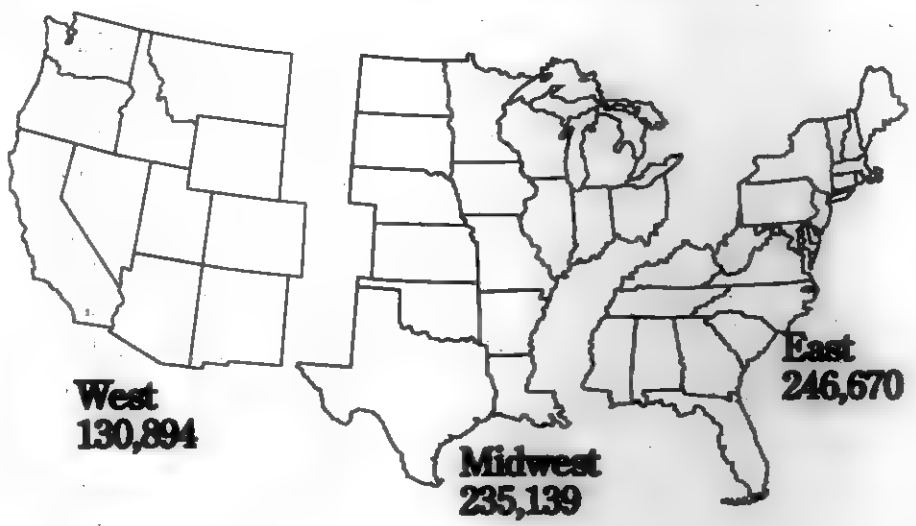

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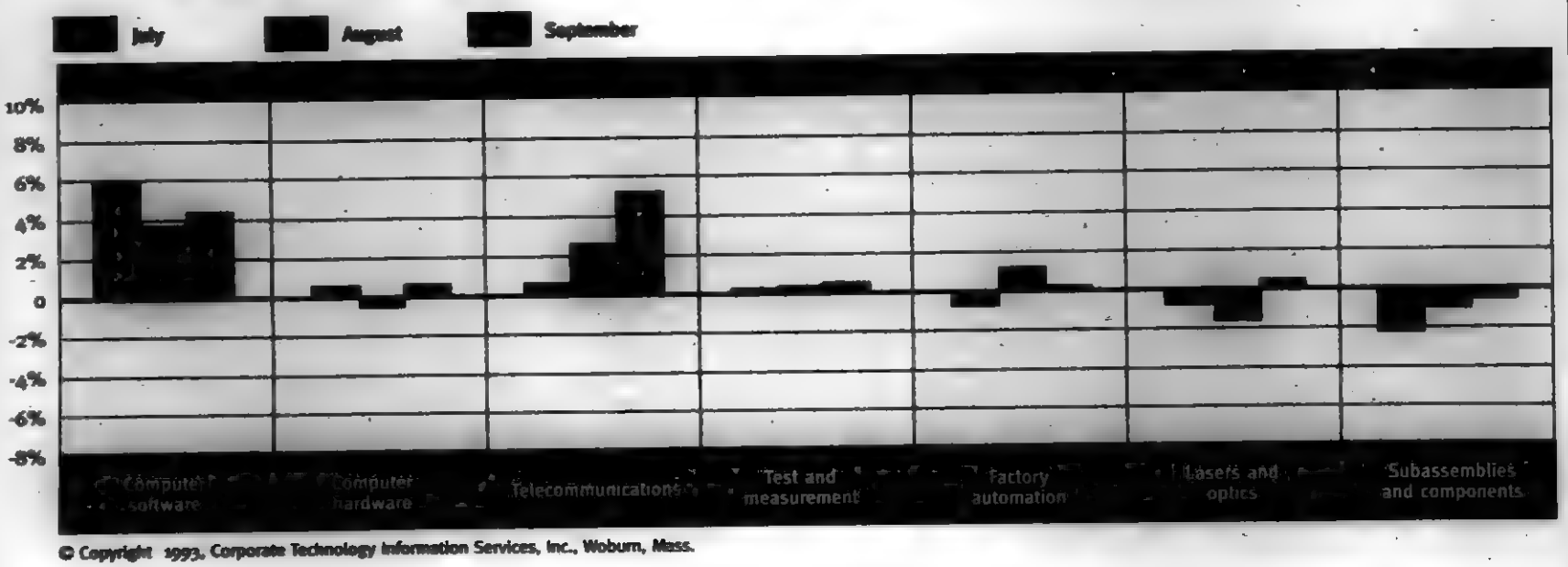

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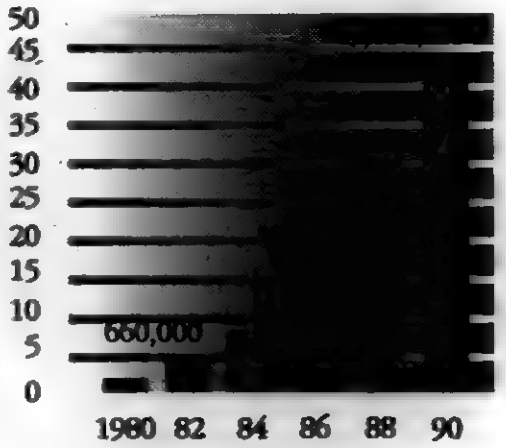

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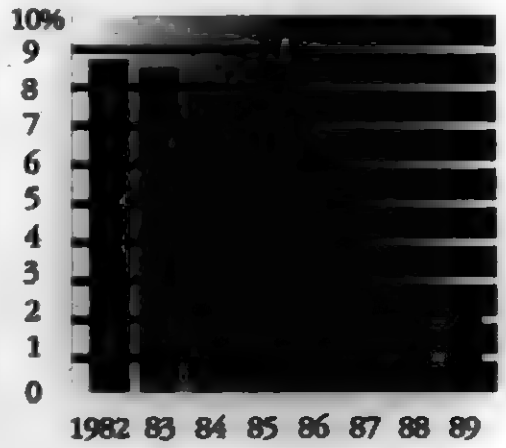

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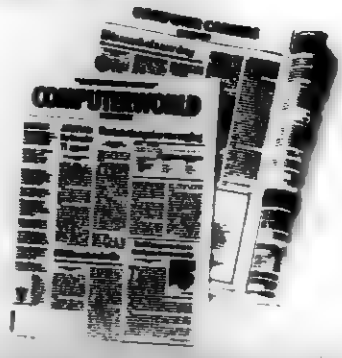

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INSTALLED reality

Information systems managers cut through the hype of open systems promises

By Alan Radding

How open is an open system? You might as well ask how many angels can dance on the head of a pin. Both defy an easy answer. Yet with every hardware and software vendor claiming openness and even patently proprietary systems waving the open banner, every company must find a mechanism to define and determine the openness of any proposed solution.

Recently, Dataquest, Inc., a technology research firm in Framingham, Mass., wrestled with the problem in a report on open systems service and support. Not surprisingly, it found that "open systems" means something different to every customer.

Users generally adopt one of three definitions of openness:

- Systems that comply with widely accepted public standards such as TCP/IP or Posix.
- Systems that comply with a widely accepted but proprietary environment, such as Windows, Novell, Inc.'s NetWare or IBM's AS/400.
- Openness as interoperability — systems that interoperate with whatever system the organization currently has.

For example, Alamo Rent A Car, Inc. in Fort Lauderdale, Fla., falls squarely into the second camp. "To me, popular is more important than open. If a platform is popular, it has lots of vendor support, lots of add-ons and peripherals. If I were betting, one popular beats three opens any day," says Tom Loane, vice president of computer services.

Based on their popularity and widespread use, Loane says he considers Alamo's CICS systems, PCs and AS/400 to be as open as anything else, "although that's not the classic definition," he concedes. But each group of systems has many hardware and software options available from multiple vendors.

Today, users have grown skeptical, if not downright cynical, of vendor claims of openness, interoperability and compatibility.

Masking the truth

"We're not really getting open systems from vendors. At best, we're getting APIs that mask proprietary structures. We don't even ask vendors to provide open systems anymore," says Joseph Vincent, director of technical services at Humana, Inc. in Louisville, Ky.

Without agreement about what constitutes an open system, information systems managers have had to develop their own ways to screen and evaluate vendor claims. Some put the burden of proof on the vendor, others rely on detailed specifications and still others do informal testing or go so far as to organize full-blown compatibility test labs. Each approach, however, presents problems (see chart at right).

Most companies rely on specifications. "In a very general sense, we've defined open as Unix, and we find [System V Release 4] pretty predictable," reports Dave Sluyter, project leader at Liberty Mutual Insurance Co. in Boston. But just specifying System V Release 4-compliance doesn't guarantee easy interoperability. Liberty Mutual found enough variation among System V Release 4 implementations to cause problems. In response, the company standardized on IBM's AIX.

"Open can mean many things, therefore you need your own benchmark," says Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle. He says he believes the best benchmark to measure openness is compliance with the Open Software Foundation's Distributed Computing Environment (DCE). The only problem is that very few products are DCE-compliant. Often Lester has to settle on "a commitment to do it within a year or so."

Because specifying standards alone doesn't guarantee interoperability, it must be combined with actual testing. "We are moving to open systems, and we are starting by specifying standards: Unix for database servers and TCP/IP [for connectivity]," says Greg Chetel, director of systems planning and research at Gillette Co. in Boston. However, Gillette has found that although "everybody claims openness and compatibility with your standards, the only way you can really tell is to try it."

Few companies today, however, can afford an extensive enough systems research and development effort to allow for comprehensive compatibility testing, says Bob Walsh, principal at Practice Corp. in Mansfield, Mass. Instead, companies are conducting informal testing as part of system implementation or dropping the burden into vendors' laps.

Gillette, for instance, has set aside a small group of facilities to test systems and leaves it to the project team to ensure that the technology works together.

Ultimately, managers try to throw the open systems ball back to the vendor. "If they want the order, they have to make sure it works," Loane says.

Radding is a free-lance writer in Newton, Mass.

ensuring open systems

MANAGERS TAKE SEVERAL APPROACHES TO ENSURE COMPLIANCE WITH THEIR SYSTEMS PLANS. EACH HAS ADVANTAGES AND DISADVANTAGES.

relying on the vendor

ADVANTAGES: EASY. VENDOR SUPPORTS IT.
DISADVANTAGES: MAY NOT DELIVER EXPECTED RESULTS. NO CONTROL OF YOUR ARCHITECTURE.

specifying standards

ADVANTAGES: LOW COST. MAINTAIN CONTROL OF INFRASTRUCTURE ARCHITECTURE.
DISADVANTAGES: HIGH-LEVEL SPECIFICATIONS DON'T GUARANTEE INTEROPERABILITY.

testing

ADVANTAGES: KNOW THAT IT WORKS.
DISADVANTAGES: COSTLY. TIME-CONSUMING.

beware evasions

WHEN YOU HEAR THE FOLLOWING, TURN YOUR SKEPTICISM ON

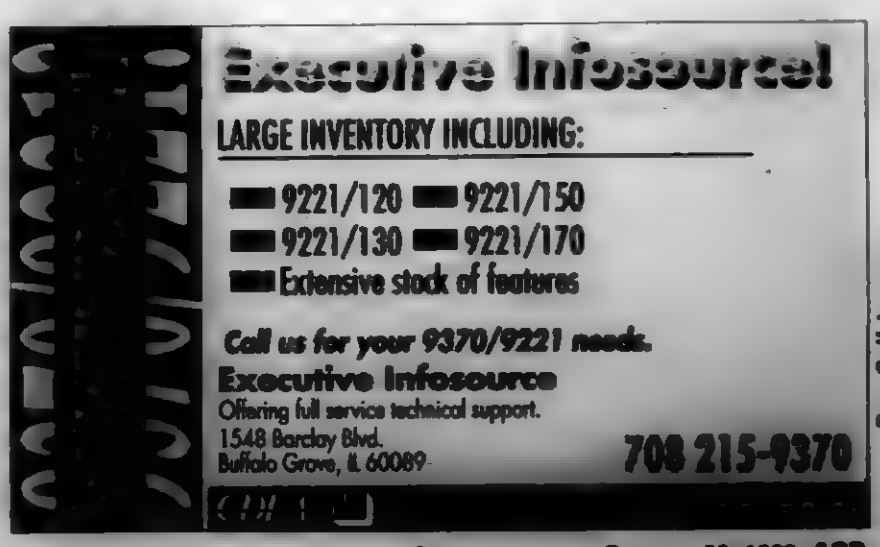
[redacted] ONLY BINARY COMPATIBILITY ENSURES DIRECT INTEROPERABILITY BETWEEN ONE UNIX AND ANOTHER. UNIX IS ONLY A SHADE MORE OPEN THAN, SAY, DOS.

[redacted] THIS IS NOT THE SAME AS DESCRIBING OPEN SYSTEMS. PIN DOWN THE SPECIFICS: WHAT AND WHEN.

[redacted] THIS GIVES YOU COMPLIANCE WITH AN OFFICIALLY SANCTIONED STANDARD, BUT YOU WON'T HAVE MUCH CHOICE IN TERMS OF PRODUCTS OR COMPLETE SOLUTIONS, AT LEAST IN THE SHORT TERM.

[redacted] EVERY VENDOR HAS ITS OWN IMPLEMENTATION OF SQL, AND MIDDLEWARE IS USUALLY REQUIRED TO BRIDGE THE DIFFERENCES.

[redacted] APIs ARE NOT A PANACEA. THEY MASK UNDERLYING PROPRIETARY STRUCTURES AND INTRODUCE ANOTHER LAYER OF PROCESSING AND COMPLEXITY. AT BEST, THEY ARE AN INTERIM STEP ON THE WAY TO TRUE OPENNESS.



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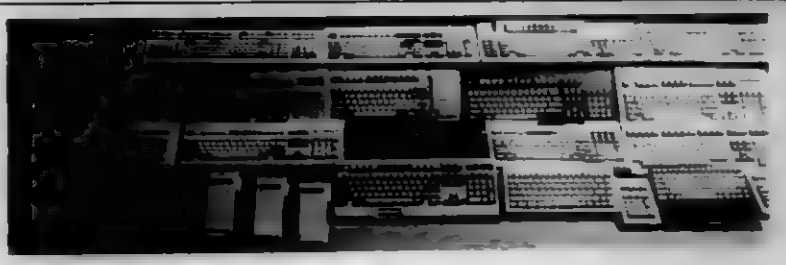

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Prolinea 486/50	$1,450	$1,500
Portable 386	$650	$600
SLT-386	$875	$875
LTE-286	$575	$525
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Gainers

Percent

[illegible] Corp.	77.0
[illegible] Corp.	44.1
Corporate Software(H)	38.1
Oasis Inc.	33.0
Wordstar(L)	30.9
Fibronics, Data Comm Networks	27.8
Spectrum Software	21.7
American Mgmt. Systems	17.7

Dollar

Tandy Corp.	5.63
Corporate Software(H)	3.38
Compaq Computer Corp.(H)	3.38
American Mgmt. Systems	3.38
Computer Associates	3.13
Cabletron Systems	3.06
Cadence Corp.	2.50
Filenet Corp.	2.38
Hewlett Packard Co.	2.38

Losers

Percent

Lattice Semiconductor	-38.2
Platinum Technology(L)	-25.3
Atria Corp.	-24.3
Platinum Software(H)	-23.6
Apple Communication Corp.(H)	-23.1
Gupta	-22.0
CE Software	-16.4
Stratacom Inc.(H)	-15.3

Dollar

Networking Networks Corp.	-9.88
Platinum Software(H)	-8.25
Atria Corp.	-7.88
Lattice Semiconductor	-6.38
Progress Software Corp.	-6.25
Cabletron Systems	-5.88
US Robotics	-5.88
Zilog Inc.(H)	-4.75

The above were gainers and losers for Common Stocks traded on the Nasdaq, Computer Associates and Computer Associates of Nasdaq Stock Exchange, Cadence and Hewlett to Hewlett. Cadence's gainers and losers were.

Creative arguments

The company that makes the Sound Blaster PC add-in card — Creative Technology (CREAF), parent of subsidiary Creative Labs — has enjoyed an upward surge on the stock market.

Creative Technology owns as much as 70% of the rapidly expanding PC sound card market and also does a healthy business in full PC multimedia upgrade kits. The company reported quarterly results after the market closed Thursday. Revenue was up 156% from the year-ago quarter at $112.9 million. Net income improved 108% to $21.2 million.

Creative Technology has its share of skeptics, though.

According to Carl Wittnebert, an analyst for the newsletter "Market Trim Tabs" in Santa Rosa, Calif., Creative Technology is overly dependent on a single product, and margins and market share for the Sound Blaster are likely to fall significantly as competition from **Media Vision, Inc.** (MVIS), Cardinal Technologies, Inc. and others beats up the PC sound marketplace. Wittnebert also said Creative Technology invests very little in research and development, which makes the company vulnerable to digital signal processor technology from other companies.

"Market Trim Tabs" currently carries a "Short" recommendation on Creative Technology's shares, which essentially means the newsletter expects the price to drop.

Media Vision's financial report last week provided evidence that Creative Technology does not have a stranglehold on the sound market. Media Vision's sales were up about 400% over last year's third quarter. The company posted earnings per share of 36 cents, compared with 3 cents in 1992. Media Vision's stock hiked up 2⅛ to reach 33½ the day of the announcement.

However, Alex. Brown & Sons, Inc. analyst Steven Eskenazi said the market is growing so rapidly that Creative Technology can still hit Wall Street's high expectations even though the company is losing market share.

"It's hard to see much erosion in a market that's growing in triple digits," Eskenazi said. "This is Creative *and* Media Vision, not Creative *vs.* Media Vision," he said.

Eskenazi also noted that the company has moved this year to broaden its product line, acquiring videoconferencing vendor ShareVision and professional audio equipment maker E-Mu Systems.

—Derek Slater

Exch	52-Week Range			Oct. 22 5 PM	Wk Net Change	Wk Pct Change
OTC	60.00	18.88	3 COM Corp.	28.63	-2.88	-9.1
NYS	91.13	63.38	American Info Techs Corp.	83.50	-4.25	-4.8
NYS	65.00	42.38	AT&T	58.13	-2.63	-4.3
OTC	4.44	0.75	Artel Communication Corp. (H)	3.13	-0.94	-23.1
OTC	24.50	12.50	Banyan Systems Inc.	19.00	0.00	0.0
NYS	69.13	44.50	Bell Atlantic Corp. (H)	62.88	-4.25	-6.3
NYS	63.38	46.75	Bellsouth Corp. (H)	62.25	-0.13	-0.2
NYS	14.75	3.75	Bolt, Beranek & Newman	11.63	1.00	9.4
OTC	18.50	9.50	Brooktrout Technology	10.75	-1.75	-14.0
NYS	119.00	66.00	Cabletron Systems	93.25	-5.88	-5.9
OTC	36.50	8.75	Centigram Communications	35.00	-0.75	-2.1
OTC	55.50	20.25	Chipcom Corp.	49.75	-2.75	-5.2
OTC	59.25	28.88	Cisco Systems Inc.	48.75	-1.38	-2.7
OTC	17.75	8.00	Compression Labs Inc. (H)	15.88	-1.38	-8.0
OTC	36.00	20.75	CrossComm	29.25	1.00	3.5
OTC	4.63	1.88	Data Switch Corp.	2.50	0.00	0.0
NYS	19.88	12.38	Digital Comm. Assoc.	18.63	0.00	0.0
OTC	12.75	3.75	Digital Systems Int'l Inc.	3.88	-0.63	-13.9
OTC	73.13	14.63	DSC Communications (H)	70.38	-0.75	-1.1
OTC	9.50	4.75	Fibronics Int'l Inc.	5.50	0.13	2.3
OTC	24.00	8.75	Filenet Corp.	17.50	2.50	16.7
OTC	4.38	1.50	Gandalf Technologies Inc.	3.13	-0.13	-3.8
OTC	2.06	0.69	Gateway Communications (L)	0.81	0.03	4.1
NYS	15.75	3.88	General Datacomm Inds.	10.25	-0.63	-5.7
ASE	3.75	2.00	Gio Video	2.69	0.06	2.4
NYS	39.88	32.88	GTE Corp. (H)	38.25	-0.63	-1.6
NYS	94.75	64.75	ITT Corp.	92.75	0.25	0.3
OTC	29.88	16.81	MCI Communications Corp.	28.50	-1.00	-3.4
OTC	6.50	1.50	Microcom Inc.	2.75	-0.13	-4.3
OTC	24.25	3.50	Netwk Corp.	5.00	-0.25	-4.8
OTC	19.00	6.50	Network Computing Devices	7.50	-0.25	-3.2
NYS	12.25	5.38	Network Equipment Tech.	9.00	0.50	5.9
OTC	20.13	8.00	Network General	14.88	0.63	4.4
OTC	15.75	6.88	Network Systems Corp.	8.50	0.25	3.0
OTC	73.88	31.19	Newbridge Networks Corp.	60.38	-9.00	-13.0
NYS	46.00	21.38	Northern Telecom Ltd.	27.00	0.13	0.5
OTC	35.25	17.00	Novell Inc.	21.63	2.38	12.3
NYS	48.88	39.50	Wyse Corp.	43.75	-1.63	-3.6
OTC	30.00	18.75	Octel Communications Corp.	25.00	-0.13	-0.5
OTC	6.13	3.75	Penril Data Comm Networks	5.50	1.19	27.5
OTC	30.50	14.50	Picturetel Corp.	17.50	0.00	0.0
OTC	11.50	3.63	Proteon Inc.	5.38	-0.50	-8.5
NYS	38.88	17.75	Scientific Atlanta Inc. (H)	37.50	-1.38	-3.5
NYS	47.00	31.75	Southwestern Bell Corp.	41.25	-1.38	-3.2
NYS	40.25	24.38	Sprint Corp. (H)	36.25	-3.25	-8.2
OTC	27.00	12.50	Standard Microsystems Corp.	21.25	-2.25	-9.6
OTC	19.25	9.25	Stratacom Inc. (H)	16.00	-2.88	-15.2
OTC	42.75	18.88	Synoptics Communications	26.63	-0.38	-1.4
OTC	8.38	2.88	Telebit Corp.	8.38	0.63	8.1
OTC	17.88	4.13	Telematics Int'l Inc.	14.63	-0.63	-4.1
OTC	35.25	16.25	US Robotics	28.00	-5.00	-15.2
NYS	50.63	35.25	US West Inc. (H)	49.50	-0.50	-1.0
OTC	56.00	23.50	Wellfleet Communications	53.25	-0.75	-1.4
OTC	19.50	7.25	Xircom	16.75	-1.50	-8.2
OTC	5.56	2.50	Advanced Logic Research	3.38	0.50	17.4
OTC	65.25	22.00	Apple Computer Inc.	30.00	2.00	7.1
OTC	24.25	12.75	AST Research Inc.	19.00	1.00	5.6
NYS	9.25	2.50	Commodore Int'l	3.13	-0.13	-3.8
NYS	65.50	38.50	Compaq Computer Corp. (H)	65.50	3.50	5.6
OTC	49.88	13.50	Dell Computer Corp.	19.25	0.38	2.0
NYS	89.25	54.50	Hewlett Packard Co.	72.25	2.38	3.4
NYS	46.75	23.13	Silicon Graphics (H)	44.50	-1.50	-3.3
OTC	41.00	21.13	Sun Microsystems Inc.	24.75	1.38	5.9
NYS	40.75	24.63	Tandy Corp.	40.75	3.63	9.8
OTC	7.00	2.50	Zeos International Ltd.	3.00	-0.25	-7.7
ASE	8.75	4.38	Amdahl Corp. (L)	4.81	-0.06	-1.3
NYS	8.75	3.63	Convex Computer	5.25	-0.13	-2.3
OTC	6.13	2.25	Cray Computer	3.13	0.00	0.0
NYS	30.88	20.25	Cray Research Inc.	25.50	1.75	7.4
NYS	13.88	7.75	Data General Corp.	10.13	0.25	2.5
NYS	49.25	30.38	Digital Equipment Corp.	35.75	-1.63	-4.3
NYS	44.88	32.50	Harris Corp. (H)	44.88	1.63	3.8
NYS	69.88	40.63	IBM	44.75	0.25	0.6
OTC	25.75	7.25	Kendall Square Research	20.75	2.25	12.2
NYS	141.50	83.00	Matsushita Electronics	137.50	-1.50	-1.1
OTC	23.75	12.00	NetFrame	16.50	-0.13	-0.8
OTC	25.00	9.25	Parallan Computer	22.25	0.75	3.5
OTC	23.25	7.75	Pyramid Technology	15.25	-0.25	-1.6
OTC	24.00	11.25	Sequent Computer Sys.	16.88	-0.88	-4.9
OTC	5.50	1.38	Sequoia Systems Inc.	4.31	-0.31	-6.7
NYS	41.25	20.25	Stratus Computer Inc.	25.75	-1.25	-4.6
NYS	16.88	8.50	Tandem Computers Inc.	13.13	0.63	5.0
OTC	25.00	10.63	TeleCard Systems (H)	22.25	-1.50	-6.3
NYS	13.88	8.00	Unisys Corp.	11.79	-0.13	-1.1
OTC	37.00	14.50	Adobe Systems Inc.	22.50	0.25	1.1
OTC	24.25	11.75	Aldus Corp. (H)	23.00	0.00	0.0
OTC	11.25	5.50	American Software Inc.	6.88	-0.25	-3.5
OTC	28.13	9.50	Asa Computer Systems	12.75	0.75	6.3
OTC	56.75	38.75	Autodesk Inc.	47.25	-0.50	-1.0
OTC	7.75	2.50	Bachman Info. Systems	3.38	0.13	3.8
OTC	43.00	24.00	BGS Systems Inc.	25.63	-0.38	-1.4
OTC	84.13	38.75	BMC Software Inc.	56.75	-2.13	-3.6
OTC	28.25	19.00	Boole & Babbage	24.25	-0.75	-3.0
OTC	35.00	12.75	Borland Int'l Inc.	15.75	0.38	2.4
OTC	5.00	2.75	CE Software	3.50	-0.69	-16.4
ASE	40.25	15.38	Cheyenne Software Inc.	34.13	-3.88	-10.2
OTC	19.50	8.25	ChipSoft	14.00	-0.75	-5.1
OTC	9.13	5.63	Cognos Inc.	9.13	-0.75	-7.6
NYS	38.13	16.50	Computer Associates	38.13	3.13	8.9
NYS	7.00	2.75	Computervision Corp.	3.13	0.25	8.7
OTC	34.25	19.25	Compuware Corp.	28.00	1.75	6.7
OTC	14.75	5.75	Comshare Inc.	10.25	-0.75	-6.8
OTC	37.00	10.75	Corel Corp.	32.00	-2.25	-6.6
OTC	15.25	5.00	Easel Corp.	5.25	-0.75	-12.5
OTC	25.25	15.75	4th Dimension	20.63	-3.25	-13.6
OTC	19.25	5.25	Frame Technology	8.88	0.25	2.9
OTC	17.50	8.00	Group 1 Software	8.00	-2.25	-22.0
OTC	35.25	14.00	Gupta	16.50	-2.00	-10.8
OTC	12.00	4.88	Hogan Systems Inc.	10.25	-1.00	-8.9
OTC	27.75	11.25	IMRS (H)	25.25	-1.50	-5.6
OTC	44.75	25.50	Information Resources	37.75	0.00	0.0
OTC	27.25	12.75	Informix Corp.	20.88	0.38	1.8
OTC	14.00	8.50	Intergraph Corp.	10.25	0.00	0.0
OTC	13.63	4.88	Interleaf Inc.	5.75	-0.38	-6.1
OTC	16.50	4.75	Intersolv Inc.	8.50	-0.25	-2.9
OTC	18.25	7.75	Knowledgeware Inc. (H)	16.50	-0.25	-1.5
OTC	54.75	15.50	Legent Corp.	24.13	-0.63	-2.5
OTC	50.75	18.75	Lotus Development (H)	45.88	-3.63	-7.3
OTC	29.00	4.25	MathSoft	5.25	0.00	0.0
OTC	21.25	4.50	McAfee Associates	5.75	-0.25	-4.2
OTC	11.63	2.50	Mega Software	6.50	0.03	0.5
OTC	12.75	6.50	Menton Graphics (H)	12.38	0.75	6.5
OTC	46.00	19.75	Micro Focus (L)	24.00	2.13	9.7
OTC	13.25	4.38	Microgate Inc.	7.63	-0.63	-7.6
OTC	98.00	70.38	Microsoft Corp.	79.75	-2.50	-3.0
OTC	64.50	18.88	Oracle Corp. (H)	61.50	-2.88	-4.5
OTC	44.75	22.50	Parametric Technology (H)	41.88	-2.38	-5.4
OTC	40.50	22.50	Peoplesoft	36.00	-3.25	-8.3
OTC	7.13	3.75	Phoenix Technologies	4.13	-0.25	-5.7
OTC	40.00	22.00	Powersoft	32.25	2.25	7.5
OTC	39.75	13.50	Platinum Software (H)	27.00	-8.25	-23.4
OTC	25.00	7.25	Platinum Technology (L)	7.75	-2.63	-25.3
OTC	61.50	32.25	Progress Software Corp.	51.00	-6.25	-10.9
OTC	7.38	1.94	Quarterdeck Office Sys. (L)	2.25	0.13	5.9
OTC	32.00	16.00	Rainbow Technologies Inc.	20.75	2.00	10.7
OTC	11.38	4.25	Rasterops	7.50	-0.25	-3.2
OTC	15.25	3.63	Ross Systems	12.25	-0.63	-4.9
OTC	28.75	10.88	Saphers Intl. Corp. N.V.	27.13	-0.13	-0.5
OTC	14.50	5.50	Software Publishing Corp.	7.13	0.38	5.6
OTC	15.88	2.63	Software Toolworks Inc.	15.88	-0.75	-4.5
OTC	2.75	0.75	Spinnaker Software	1.75	0.31	21.7
OTC	10.75	5.75	State of the Art	9.75	-0.50	-4.9
NYS	31.00	17.63	Sterling Software Inc. (H)	30.63	1.50	5.2
OTC	21.63	9.63	Struct. Dynamics Research	13.63	-0.50	-3.5
OTC	77.50	38.00	Sybase Inc.	68.75	0.13	0.2
OTC	20.50	9.25	Symantec Corp.	18.38	-1.63	-8.1
OTC	25.50	10.00	System Software Assoc.	13.00	0.00	0.0
OTC	6.50	2.75	Timlic Corp. (H)	6.00	0.00	0.0
OTC	26.50	13.50	Viewlogic Systems	23.13	0.13	0.5
OTC	23.50	5.50	Walker Interactive Systems	8.50	0.75	9.7
OTC	3.19	0.84	Wordstar (L)	1.28	0.28	28.1
NYS	32.88	14.25	Advanced Micro Devices	20.00	-0.50	-2.4
NYS	28.00	11.25	Analog Devices Inc.	22.13	-1.25	-5.3
OTC	38.63	12.63	Atmel Corp.	24.50	-7.88	-24.3
OTC	6.25	2.75	Chips and Technologies	5.25	-0.13	-2.3
OTC	39.75	13.00	Cirrus Logic	34.00	-1.50	-4.2
NYS	16.75	8.38	Cypress Semiconductor Corp.	11.63	-1.00	-7.9
NYS	19.00	11.13	Dallas Semiconductor	17.13	-0.63	-3.5
OTC	74.50	32.50	Intel Corp.	64.50	-1.50	-2.3
NYS	19.25	7.00	LSI Logic Corp.	14.63	-0.75	-4.9
OTC	26.75	13.66	Lattice Semiconductor	16.25	-6.38	-28.2
NYS	63.63	16.25	Micron Technology	46.00	-1.50	-3.2
NYS	107.50	47.38	Motorola Inc. (H)	101.88	-4.00	-3.8
NYS	21.75	10.13	National Semiconductor	16.38	-1.00	-5.8
OTC	15.75	6.50	Sierra Semiconductor	7.38	-0.63	-7.8
OTC	52.00	25.75	SynOptys (H)	49.50	-2.38	-4.6
NYS	84.25	45.13	Texas Instruments	65.25	-3.13	-4.6
OTC	18.88	6.50	VLSI Technology	14.25	0.00	0.0
OTC	14.38	3.50	Weitek	10.38	-1.75	-14.4
ASE	9.63	3.63	Western Digital Corp.	7.75	1.13	17.0
OTC	54.50	15.50	Xilinx	39.00	-4.25	-9.8
OTC	40.75	18.00	Zilog Inc. (H)	35.00	-4.75	-11.9
OTC	24.75	9.25	American Power Conversion	11.75	-1.75	-7.6
OTC	22.75	15.50	Banctec Inc.	20.75	-1.00	-4.6
OTC	18.00	3.50	Cambex Corp.	7.00	3.06	77.8
ASE	18.38	3.88	Cognitronics Corp.	6.38	2.25	54.5
NYS	25.50	9.00	Corrigo Peripherals	11.00	0.88	8.6
OTC	98.50	17.25	Creative Technologies Inc.	27.38	2.38	9.5
OTC	30.75	6.50	Data Race Inc.	8.75	-0.50	-5.4
ASE	13.25	5.88	Dataram Corp.	9.63	-0.25	-2.5
NYS	39.00	7.50	EMC Corp. (H)	34.25	-4.50	-11.6
OTC	10.50	5.25	Emulex Corp.	6.75	-0.13	-1.8
OTC	19.00	14.00	Evans & Sutherland	18.50	1.50	8.8
OTC	20.63	7.50	Exabyte	14.00	0.25	1.8
OTC	34.00	10.41	Intelligent Imp. Systems	23.00	-2.25	-8.9
OTC	8.88	2.50	Komera Corp.	3.63	0.13	3.6
OTC	14.25	5.75	IPL Systems Inc.	8.75	-0.50	-5.4
OTC	24.00	14.25	Komag Inc.	14.63	-0.50	-3.3
OTC	19.63	4.38	Maxtor Corp.	4.88	-0.38	-7.1
OTC	10.00	5.75	Micropolis Corp.	6.38	0.25	4.1
NYS	117.00	97.25	3M Corp	105.88	1.50	1.4
OTC	8.00	4.00	Printronix Inc.	7.00	-0.25	-3.4
NYS	17.25	7.50	QMS Inc.	9.00	0.13	1.4
OTC	17.88	9.38	Quantum Corp.	11.50	0.88	8.2
OTC	7.13	3.13	Radius Inc.	4.75	1.19	31.0
NYS	17.75	11.00	Recognition Equipment (H)	17.00	0.13	0.7
OTC	13.88	3.75	Reton Inc.	4.00	0.25	6.7
OTC	22.38	13.13	Seagate Technology	21.00	1.00	5.0
NYS	45.00	18.00	Storage Technology	25.88	-0.38	-1.4
NYS	27.88	17.63	Tektronix Inc.	23.38	0.13	0.5
NYS	88.88	69.88	Xerox Corp.	73.38	0.13	0.2
OTC	23.75	14.88	American Mgmt. Systems	21.63	3.25	17.7
NYS	4.75	2.38	Anacomp Inc.	3.13	0.25	8.7
OTC	23.84	13.16	Analysts Int'l	17.50	0.75	4.5
NYS	58.13	46.63	Auto Data Processing	52.88	0.13	0.2
NYS	19.88	13.00	Ceridian Corp.	18.00	-1.38	-7.1
NYS	19.38	13.13	Comdisco Inc. (H)	18.88	0.63	3.4
OTC	13.38	4.50	Computer Horizons (H)	12.00	-1.00	-7.7
NYS	95.50	66.00	Computer Sciences (H)	94.50	-0.25	-0.3
NYS	9.25	6.00	Computer Task Group	6.63	-0.25	-3.6
NYS	40.50	19.00	CompuUSA Inc.	24.25	-1.75	-6.7
OTC	15.00	7.00	Corporate Software (H)	14.75	3.50	31.1
OTC	12.75	6.63	Egghead Discount Software	7.25	-0.13	-1.7
NYS	35.88	26.00	General Motors E (EDS)	30.38	0.38	1.3
OTC	25.50	12.75	Ingram Corp.	17.25	-0.25	-1.4
OTC	24.38	8.13	Intelligent Electronics (H)	22.25	-1.13	-4.8
OTC	17.00	8.90	Merisel (H)	14.13	-2.38	-16.4
OTC	28.50	4.75	Micrografx Inc.	28.50	0.25	0.9
OTC	34.75	21.50	Paychex	33.75	0.00	0.0
NYS	87.25	21.63	Policy Management Sys.	25.63	1.25	5.1
NYS	43.63	21.81	Reynolds and Reynolds	38.13	-3.25	-7.9
OTC	21.00	13.38	SEI Corp. (H)	20.50	0.00	0.0
OTC	26.00	17.50	Shared Medical Systems (H)	25.00	-0.75	-2.9
OTC	12.63	5.75	SHL Systemhouse	10.25	0.88	9.3
OTC	30.75	20.00	Software Spectrum Inc.	21.50	-1.25	-5.5
OTC	42.75	26.25	Sungard Data Systems	38.00	0.00	0.0
NYS	6.38	1.13	Ultimate Corp.	3.38	0.00	0.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Merger boosts fledgling middleware market

Momentum, Horizon union brings together opposites

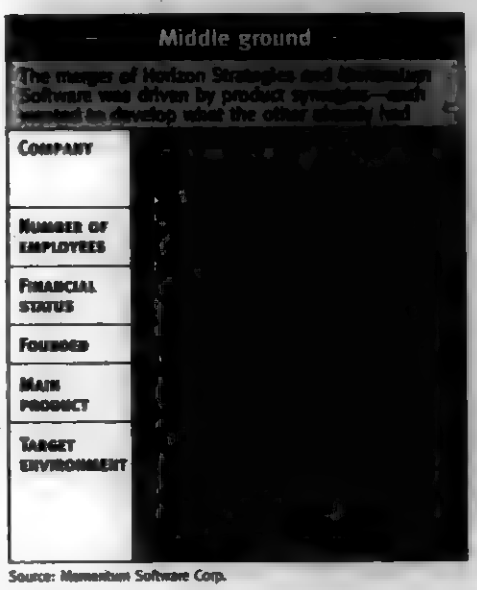
By Lynda Radosevich

The small, complicated yet rapidly emerging middleware market took a big step last week when two privately held "messaging-oriented" developers agreed to merge.

Horizon Strategies, Inc. in Needham, Mass., and Momentum Software Corp. in Englewood, N.J., will form a company called Momentum Software Corp., located in both places.

The entity combines Horizon's experience in developing peer-to-peer, mainframe-based middleware with Momentum's experience in Unix-oriented middleware for building cross-platform capabilities into applications.

Company officials said the firms joined forces because each was planning to develop what the other already had.



Source: Momentum Software Corp.

Capital idea

Helping finance the merger was the $2.7 million that Momentum received from venture capitalists in return for slightly less than half of the company. The money will be used to finance closing costs, future development and sales and marketing efforts, said newly appointed President Larry Duckworth.

Prior to merging, each company operated at break-even revenue for the past two years, Duckworth said. Each started as a self-financed consulting company and began marketing integration software several years later, accounting for the slow growth.

Although financial details were not available, the merged Momentum has 40 employees and total revenue estimated in the $3 million to $5 million range.

The role of message-oriented middleware is to allow applications to communicate when the networks are different, the hardware is different and the applications were never intended to work together when they were created, said John Mann, a senior analyst at The Yankee Group in Boston.

Specifically, the middleware sits between the applications and the networks and takes care of translating protocols. On the application side, it gives programmers one development interface. This is different from other types of middleware that are used to develop cross-platform capabilities for a single application.

> "It's complicated because you don't just need the middleware, you need the integration skill."
> —*John Mann, The Yankee Group*

Support for 20+ systems

The merger is important because messaging middleware typically connects applications running on many different hardware platforms and networks, Mann said.

Together, the two companies said they support 22 desktop and network operating systems and 30 hardware platforms.

Overall, there are roughly a dozen players in the message-oriented middleware market, including Digital Equipment Corp., IBM, Covia Technologies, PeerLogic, Inc. and TRW, Inc. Like Momentum, most efforts are small-scale because the market is in its infancy, but Digital may be the strongest entity now, according to Mann.

"It's complicated because you don't just need the middleware, you need the integration skill," he said.

Although this merger made sense because the two companies' goals meshed so well, alliances between smaller players and bigger company buy-outs are more likely in the future because of the variety of expertise and skills needed, Mann added.

Company officials said Horizon's Express software and Momentum's X-IPC software will be fully merged by mid-1994.

Select calendar third-quarter results

Company	Revenue ($ millions)	Percent change from year-ago quarter	Net income ($ millions)	Percent change from year-ago quarter
Baan				
Borland International				
Computer Associates International, Inc.				
Digital Equipment				
EMC				
Gupta				
Macge				
Netframe				
Parallan				
Platinum				
Sybase				
Unisys				
Zeos International Ltd.				

*Not meaningful **Quarter ended October 2

Sometimes for better, sometimes for worse, weak European sales, downsizing and desktop price wars are shaping quarterly returns.

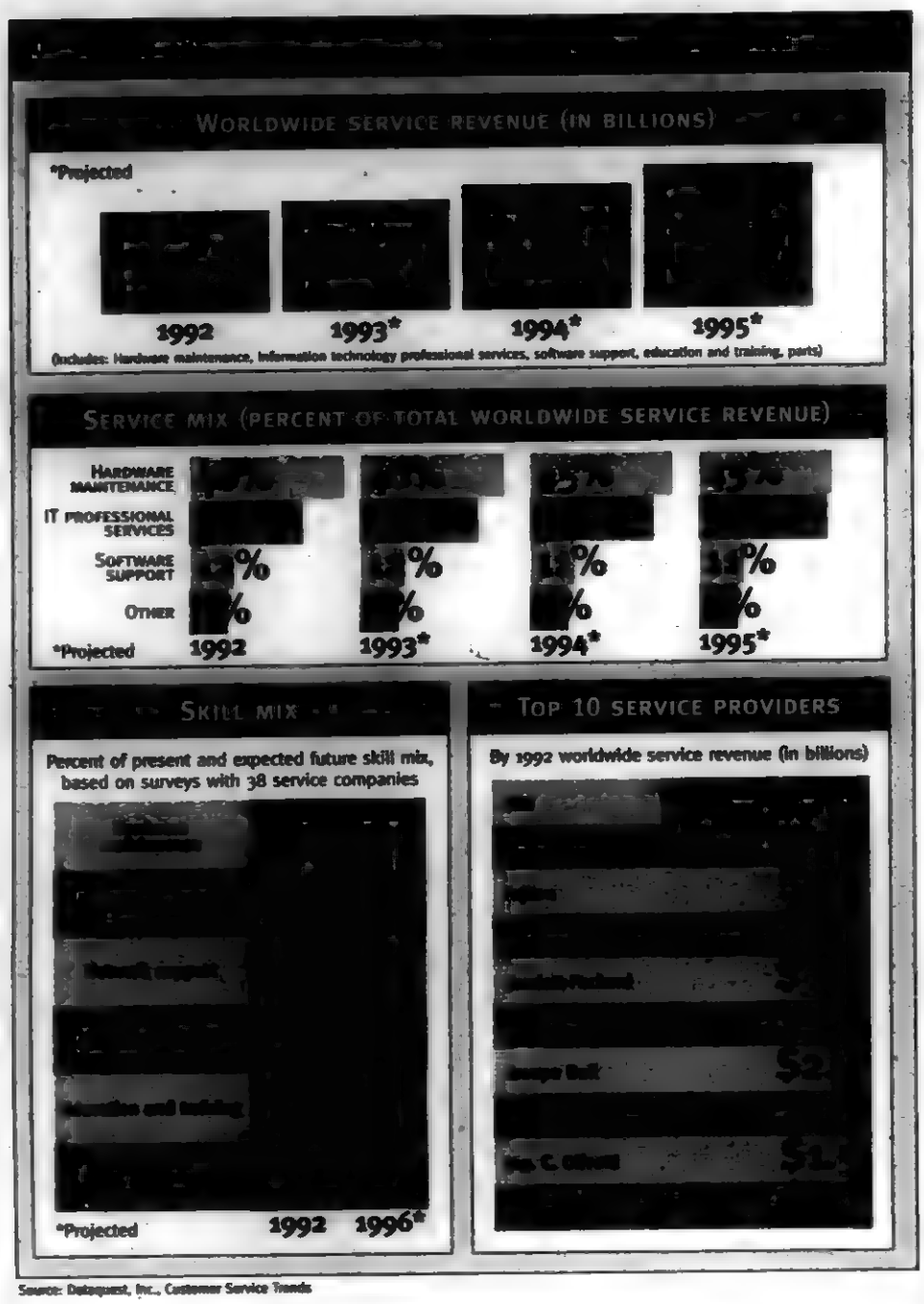
Leading the way in the PC sector, if not the computer industry, was **Compaq Computer Corp.**, which more than doubled its third-quarter revenue over last year, posting a 64% rise in sales (see story page 1). The company cited unexpectedly strong overseas sales (up 37%).

The European market was less kind to **Digital Equipment Corp.**, which reported a slightly higher than expected loss and a sharp decline in revenue, including its first drop in its services sector, for its first fiscal quarter. PC and Alpha-based sales were bright spots. An edgy Wall Street will be watching the firm closely.

Big iron software sales growth buoyed revenue at **Computer Associates International, Inc.**, which reported an 86% increase in net income and a 20% increase in revenue for its second quarter. CA's midrange product sales leaped 115% year-to-year, while its mainframe revenue, which represented 81% of total revenue, surged 20% for the period. The company cited customer acceptance of its 18-month-old flexible licensing agreements and its services team concept.

Despite its eighth consecutive profitable quarter, which saw a 23% increase in net income over the same quarter a year ago, **Unisys Corp.** revenue dropped 13%, tripping in part over a decline in the firm's client/server business.

The **Microsoft Corp.** juggernaut rolled on, albeit at a slightly slower pace. The company's fiscal first-quarter revenue growth dipped to a still-healthy 20% from its usual 25% to 50%-plus. Maturity and increased pressure from competitors are taking their toll. Microsoft, like CA, could be starting to feel the sting of the recent PC software price war. CA's micro revenue dipped 3% to 5% for the quarter. A struggling **Borland International, Inc.** suffered from a double whammy caused by the late release of dBase IV for Windows and stalled sales of its Quattro Pro spreadsheet last quarter, pending a new release. It reported a 16% drop in revenue for its second quarter. A $2.8 million net marked the company's third consecutive profit following a massive loss in its third quarter a year ago.



Source: Dataquest, Inc., Customer Service Trends

The 5th Wave *by* Rich Tennant

"YES, I THINK IT'S AN ERROR MESSAGE."

Inside Lines

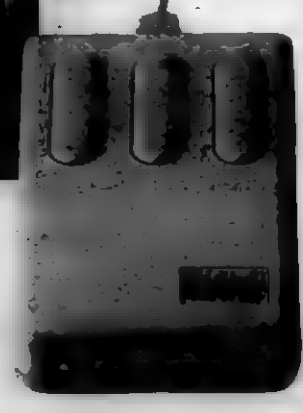
Funny thing. Seems like every time we talk to a potential customer about our ONline intelligent switching hub, the competition immediately starts discounting the price of their units.

The reason is obvious: Since Chipcom has consistently led the way in hub technology right from the beginning, what choice do the others have?

First with Fault-Tolerance. Chipcom has built fault-tolerance into all its networking hubs since 1988. Today, our ONline System Concentrator provides the industry's most complete fault-tolerant solution for large facility-wide networks, with features like backup power supplies, and Controller Modules, redundant links, backup concentrator configurations, self-healing network management and fault-tolerant transceivers.

First with Multiple Networks. When we introduced the TriChannel™ backplane, our biggest challenge was getting people to understand that now one hub could do the work of three or more, supporting up to 3 Ethernet, 7 Token Ring and 4 FDDI networks with integrated bridging and routing. Or to understand how much money it would save them on equipment purchase and operating costs.

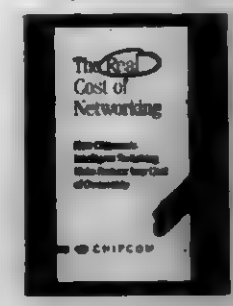
First with Port-Switching. Armed with Port-Switching, a network manager can do moves, adds and changes, and can reassign any Ethernet port from one network to another with a couple of clicks of a mouse. And only Chipcom's ONdemand™ Network Control System lets you design an intelligent network that can reconfigure itself on the fly, do load-balancing on demand, and even trouble-shoot itself. Without the ONdemand system and Port Switching, you get to make trips to the wiring closet to move cables. In fact, a lot of trips.



What does all this mean to you? It means that when you specify Chipcom, you're buying from a company that has always looked at networking differently. While the others were struggling with workgroup and departmental LANs, Chipcom hubs were running the huge manufacturing and financial networks of some of the largest companies, banks and universities in the world. Under conditions considerably tougher than any you're likely to encounter.

Does this cost more? A Chipcom cost less.

mean that Chipcom Quite the contrary. network may actually And, over time, much less. In fact, with the savings you can realize just from eliminating closet-level moves, adds and changes alone, you can recoup the entire installation costs of your network in less than three years. To learn more, call **1-800-228-9930** and ask for your free copy of *"The Real Cost of Networking."* And learn more about the real economies of using Chipcom.



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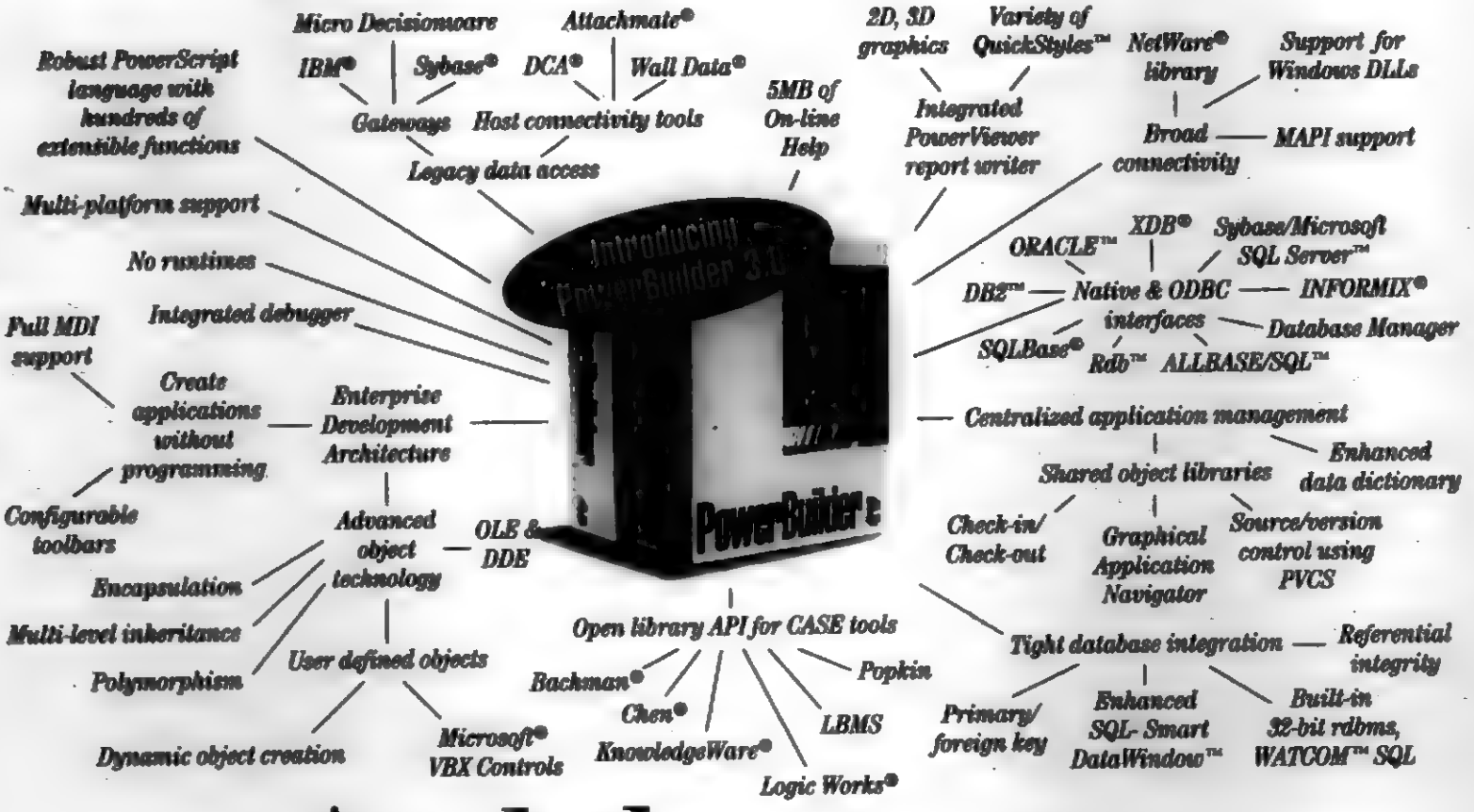

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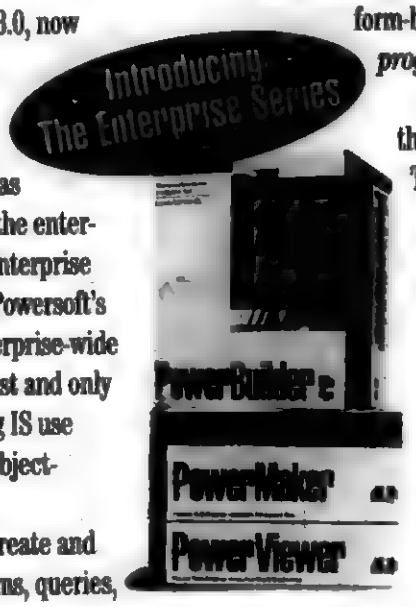

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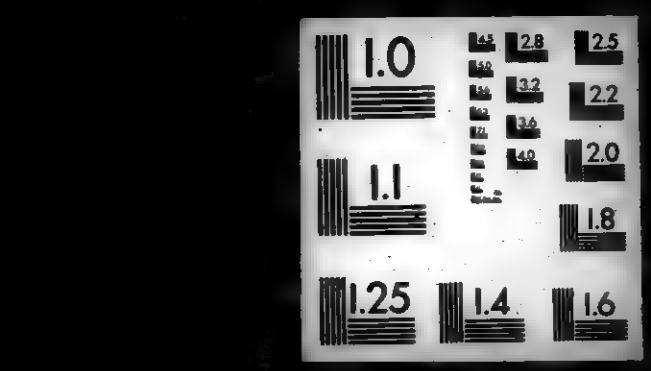
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COMPUTERWORLD

Microsoft casts object net

NT to one-up Novell's NDS with transparent data access

By Elisabeth Horwitt

■ Microsoft Corp. revealed new details last week of the object-oriented services environment with which it hopes to leapfrog Novell, Inc.'s NetWare Directory Services. The environment will provide users with transparent and dynamic access to data, images and services across the enterprise.

The system is part of Microsoft's Cairo object extensions to NT, which is slated to ship sometime in 1995, Microsoft spokesmen said.

"This is a quantum leap over existing global directories, such as NetWare Directory Services, which still require users and applications to comprehend the network's functional and logical design" to locate a resource, said Claude King, senior systems analyst at the University of Florida's College of Journalism and Communications in Gainesville.

Building access

In contrast, Cairo will allow the user to build access to a given piece of data, graphic or service into an application so it can be called up at the click of an icon, King said.

Such items are assigned monikers, which an application would always use to call an object, independent of where and on what type of system it resides, said Lyle Griffin, vice president of advanced technology at Micrografx, Inc., a Richardson, Texas, software company.

Microsoft will continue to use the domain-based system it now employs for directory searches so a moniker would be valid within a domain but might change between domains, be added. However, the moniker's attributes, such as a database or a network protocol needed to access the objects, could change.

As a result, applications always access key items in the same way, even if they have been

Microsoft, *page 14*

SOUND OFF!

► *Buonincontri* ► *Kruse*

Are foreign programmers stealing U.S. jobs?

Yes, says Louis Buonincontri, an American contract programmer who's been burned. But Steven Kruse, who hires out offshore workers, says these coders are a boon to the global economy.

For more on the debate, see In Depth on page 122

IBM gives OK to NT on PowerPC

By Ed Scannell
and Michael Fitzgerald

IBM this week will grudgingly announce support for Microsoft Corp.'s Windows NT on the PowerPC.

The move appears to be a concession to NT's market potential and its ability to undermine OS/2 and WorkPlace OS.

The acknowledgment of NT gives IBM's Personal Software Products group one more thing to worry about in its uphill battle against Microsoft for the hearts and pocketbooks of corporate users.

Delivery dates for operating systems that run on IBM's PowerPC

AIX
Currently available

WorkPlace OS
First half of 1994

Windows NT
First half of 1994

Apple System 7.5
First half of 1994

The announcement also comes at a particularly crucial time for OS/2: For the first time since its inception, the operating system appears to be gaining sales momentum on Intel Corp. platforms [CW, Oct. 18].

NT support on the PowerPC may primarily hurt IBM's emerging WorkPlace OS, a microkernel-based environment that will enable the PowerPC to run OS/2, AIX and Windows applications. The move will have minimal impact on OS/2 2.1, which currently works only on Intel platforms.

WorkPlace OS is scheduled to debut on the PowerPC in the first half of 1994. IBM hopes to show off what would be the first beta release at Comdex/Fall '93 this month.

But due to some technical snags, Personal Software Products may not be able to deliver the beta release until the first quarter of next year, pushing delivery of a final product to around mid-1994.

IBM will work with Motorola, Inc. to port Windows NT to its PowerPC-based systems. How long it will take the two companies to complete the port is not clear, although most analysts said they suspect it will be available in the first half of 1994.

While IBM officials continue to say they are not sure just how suc-

IBM, *page 16*

Enterprise security on deck

By Joanie M. Wexler

A trailblazing effort is afoot to put corporate America on a path to secure its data cohesively across distributed computing environments.

Next week, a fledgling group at Hughes Aircraft Co. will kick off what appears to be the first comprehensive crack at a centralized security scheme for network-based computing, according to sources close to the company.

The U.S. Department of Defense contractor is drawing on its weighty expertise in using stringent DOD standards to bulletproof its own computers and networks. It is poised to deliver the first in a series of products that collectively protect desktop and networked data.

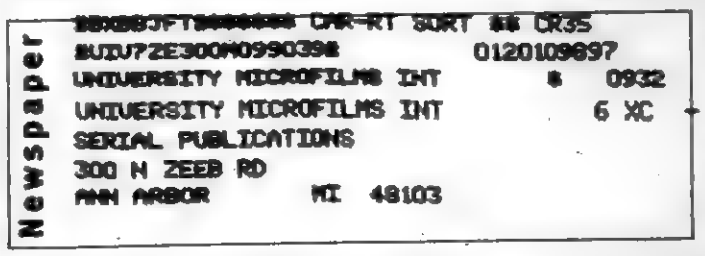
Aside from Unix, Windows NT is the only desktop operating system with plans to integrate the government's Class C2 security scheme.

The official announcement of the plans, which the company confirmed, is scheduled for the Computer Security Institute Show in Anaheim, Calif., this week.

The product is already in use at a number of unidentified government agencies and is in beta testing at some unidentified corporate sites, sources said.

The idea behind the initiative is to combine the various functional levels of security, which exist today largely as piecemeal products, into a cohesive software package that eventually

Security, *page 8*



Patent office eyes industry aid in vast database plan

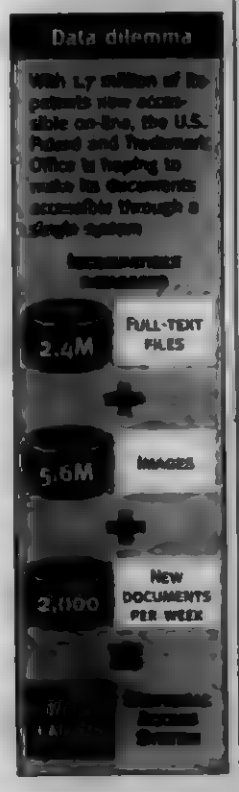
By Gary H. Anthes
ARLINGTON, VA.

■ In a bold experiment in government/industry collaboration, the U.S. Patent and Trademark Office plans to sponsor development of an advanced text search and retrieval system for use by itself, other federal agencies and commercial enterprises.

A number of vendors, including IBM, Oracle Corp., Software AG of North America, Inc., Electronic Data Systems Corp. and Thinking Machines Corp., have expressed interest in supplying the system. Oracle has submitted an unsolicited proposal, patent officials said.

The patent office is looking for a system able to offer subsecond response to complex queries against terabytes of text data using massively parallel computers. In addition, the system must be able to filter and tailor data to minimize the amount of unwanted informa-

Patent, *page 12*



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Ira Fochs/SABA

NEWS

■ **Demand melts as Storage Tek continues to waffle on Iceberg's release date.** *Page 4*

■ **Developers and users are less than thrilled with COSE's Common Desktop Environment.** *Page 6*

■ **Computer Associates promises delivery of an OS/2-based cross-platform systems management package** by next April. *Page 8*

■ **Cray jumps into commercial market with a SPARC-compatible superserver** that can run RDBMS applications and anchor a network of Unix workstations. *Page 10*

■ **HP takes direct aim at IBM's mainframes with powerful minicomputers positioned as mainframe alternatives.** *Page 12*

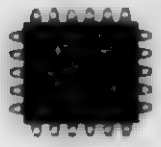
■ **Cisco teams with Microsoft on a desktop-to-enterprise communications push, anchored by a PC-based router from Cisco.** *Page 14*

■ **Novell claims to be far along with an object-oriented network services framework that will far outdo Microsoft's Cairo.** *Page 14*

■ **Compaq leaves no market segment uncovered with its release of 46 new desktop machines.** *Page 16*

■ **Digital will depend on its DEC OSF/1 operating system to carry Alpha APX architecture into the Unix market.** *Page 20*

■ **Infonet Services offers pay-as-you-go dial LAN service for low-volume mobile computing users.** *Page 24*



DESKTOP COMPUTING

■ **Intel sets up a testing lab to guarantee that systems claiming to be Pentium-upgradable really are.** *Page 37*

WORKGROUP COMPUTING

■ **SAS Institute rolls out major new release of its software, featuring support for new environments.** *Page 51*

ENTERPRISE NETWORKING

■ **IBM reaffirms intent to blend OSF's DCE services into next version of LAN Server.** *Page 65*

LARGE SYSTEMS

■ **Scattershot automation of data centers doesn't work.** *Page 77*

APPLICATION DEVELOPMENT

■ **Don't count CASE out of client/server and distributed environments.** *Page 87*

IN DEPTH

■ **Are foreign programmers** undercutting U.S. computer professionals or filling a critical skills gap? It's a raging debate. *Page 122*

CW GUIDE

■ **New client/server accounting systems** pose some real concerns, including price, security and the amount of volume they can handle. *Page 107*

Buyers' Satisfaction Scorecard: Of the leading Unix products, **Lawson** gets the highest marks from its customers. *Page 117*

Firing Line evaluators give PeopleSoft Financials mixed marks. *Page 118*

CAREERS

■ **SQL-92:** Relational database development will get easier. *Page 128*

MARKETPLACE

■ **The calculation speed of project management packages** varies considerably — from seconds to hours — making hands-on testing crucial. *Page 137*

COMPUTER INDUSTRY

■ **EDS reports another slow quarter. Analysts see outsourcing slump. Company points to transitory, company-specific factors.** *Page 145*

COMMENTARY

■ **The last barrier to confident commercial use of Unix is crumbling with the arrival of system utility suites, says Charles Babcock.** *Page 6*

■ **Microsoft is trying to put a good face on the situation, writes Paul Gillin, but it stumbled on NT and may have thrown part of the market to IBM.** *Page 32*

■ **IS has been scrambling to make computing power and communications access free and easy, says Michael Schrage. This is an invitation to waste and abuse.** *Page 33*

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Executive Briefing

Distributed computing assists from left field. The wait for tools to ease some aspects of client/server and distributed computing won't be as long as expected, thanks to third-party providers and start-ups.

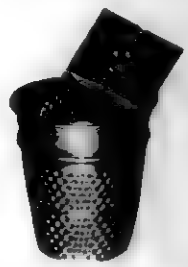
Revelation Technologies beat Microsoft to the punch, producing an object-oriented Windows repository. *Page 4* **Brainstorm Technologies**, a small consultancy, leapfrogged **Lotus** with the announcement that it will deliver a tool next month that gives Visual Basic applications the ability to read and update Notes databases. *Page 4* And two start-up companies, **Forte** and **Dynasty**, are promising a whole new breed of object-oriented client/server tools that generate cross-plaform code. *Page 28*

CASE role in client/server. It's probably a mistake to dismiss CASE as an important component of client/server development. Users and analysts say products have improved considerably and help to provide structure and consistency across platforms. *Page 87*

Power to the users . . . someday. Creating systems that embody business rules in a way that is accessible and amendable by end users will soon be an absolute must because programmers can't keep up with the pace of business changes, says **Jim Stikeleather of Kash n' Karry.** But there are big obstacles on this road. *Page 33*

Bugs, viruses and hackers got you worried? It just got easier to find out exactly what you're up against. A forum on the Internet has been devoted to collecting information about such risks for some time, and now that group is making its **listings available by fax** for those who aren't wired into the 'net. *Page 38*

In the meantime, cellular carriers are using knowledge-based systems to fight toll thieves, and there's hope these technologies may eventually help **secure wireless data transmissions.** *Page 71*



Compression breakthroughs: Good news for DOS shops that want OS/2 but don't want to give up the option of using their DOS compression features. **Stac Electronics** is planning a Comdex announcement of a utility that permits **easy transfer of compressed data between DOS and OS/2.** The utility will be bundled with its OS/2 compression program, Stacker. It's amazing what you can fit in a thimbleful of space these days. The new **64M-bit dynamic RAM chip** from IBM and Siemens AG can hold up to 6,400 pages of double-spaced text. *Page 37*

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Users cooling to oft-delayed Iceberg

By Johanna Ambrosio

■ Storage Technology Corp.'s continued waffling on delivery dates for its long-awaited Iceberg storage device has resulted in as much as a 10% slippage in demand for the product, which is now expected to ship in quantity "early next year," according to a company manager.

The sixth delay since the product's introduction in February 1992 was quietly announced with the company's third-quarter financial report Oct. 14.

Last week, Chauncey Schwartz, product marketing manager for Iceberg, said 5% to 10% of the initial 150 orders for the product are no longer on the books.

Based on a study of Iceberg orders conducted about three months ago, the backlog has slipped to 10% for "people who needed [disk storage] before we were available," he said.

One customer who could no longer wait is Howard Sorgen, senior vice president at Merrill Lynch & Co. in New York. "Our interest was piqued when Iceberg was announced. But we made our bed with other vendors, and we're happy with the decision," he said.

The vendors include EMC Corp. and its Symmetrix device, a major competitor to Iceberg announced in November 1992 that has shipped 2,500 units. IBM is expected to announce an Iceberg competitor in February, analysts said.

Iceberg is a redundant arrays of inexpensive disks (RAID) device that will store up to 400G bytes of compressed data for mainframes. Performance data has not yet been released.

Schwartz would not comment on the reasons for the delays, saying only that the company met its most recent goal of starting internal beta-testing July 23. In August 1992, a company official had attributed the delays to problems with the software that controls the RAID-specific features of the machine.

Executives at the Louisville, Colo., firm are not speaking publicly about the Iceberg schedule or what the problems are, in large part because of a shareholder lawsuit filed against the company in April 1992.

Schwartz did say Iceberg is "working" and that the company is putting the device through "final integration testing." The Oct. 14 statement said customer beta testing will be conducted this fall — meaning by late December — and that the company "expects to begin early customer shipments by year end." One prebeta version of the machine has been shipped to a customer Schwartz would not identify.

Too little, too late

By the time Iceberg does ship, some analysts said, it may be too late to capture the market Storage Tek sought.

"The window of opportunity has largely closed for the high-performance market" because of the strides EMC has made with Symmetrix, said Robert Callery, an analyst at International Data Corp. in Framingham, Mass. Still, he said, some large customers that need fault-tolerant disks may find Iceberg attractive.

Schwartz responded that user interest is still high, and he and his marketing team are asked to give three to five customer presentations daily.

One customer willing to give Iceberg a chance is Wayne Pattison, director of data center operations at Kansas City Railway Co. in Kansas City, Mo. "We're very interested in the concept, but it's got to work. We'll see what happens when it gets to market," he said.

Object-oriented tools

Revelation pushes into repository arena

By Michael Vizard

While Microsoft Corp. ponders plans for an object-oriented repository, one of its rivals last week beat it to the punch by unveiling a repository that will support derivatives of the Basic, C and C++ programming languages.

Called OpenInsight 2.0, the object-oriented repository from Revelation Technologies, Inc. in Stamford, Conn., is one of the first tools aimed at fostering team-oriented application development in PC environments.

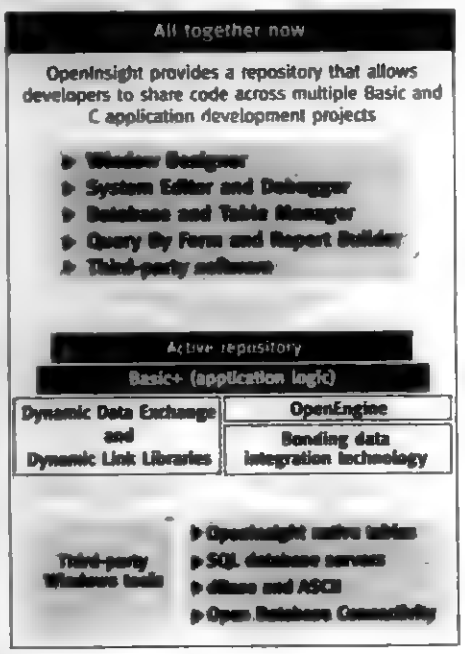
"The idea is to provide a central source where you can change something and have that change implemented everywhere it is used," said Chris LeTocq, an analyst at Computer Intelligence/InfoCorp in San Jose, Calif.

For example, Natural Gas Clearinghouse in Houston has more than 200 workstations running a DOS application that schedules the movement of natural gas across the U.S. In the next year, the company plans to use OpenInsight to migrate all the DOS applications running on those systems to Windows, as opposed to using a custom program it created to share libraries across DOS applications, said Jimmy Seranno, supervisor of the information systems group charged with building the company's accounting and trading system.

Similarly, Q. D. Systems, Inc. in Berkeley, Calif., will use OpenInsight to move a clinical application for doctors' offices from DOS to Windows. "For us, it's a lot cheaper to share a common master dictionary for DOS and Windows applications in the same repository," said Vice President Fred Dietrich.

The challenge for Revelation will be to establish its repository before rivals can leverage their stronger positions in the Windows application development arena. For example, Magic Software Enterprises, Inc. in Irvine, Calif., already offers a repository running on high-end servers capable of supporting DOS applications [CW, Sept. 13], and Microsoft executives recently said they are evaluating a move into the repository market [CW, Oct. 18].

Other companies such as Gupta Corp. and Powersoft Corp. are expected to expand their data dictionaries into repositories as part of their Windows-based application development environments. Users can expect similar initiatives from companies such as JYACC, Inc., Unify Corp. and Uniface Corp., said Mitch Kramer, an industry analyst at the Patricia Seybold Office Computing Group in Boston.



But reinventing mainframe application development environments for PCs will require more than just repositories, Kramer said. "You have to make sure you need a mechanism for version control," he said.

"The PC flavor of repositories aren't as sophisticated as what you would expect to see on mainframes, which are designed to support a vast number of people. The PC repositories are good for individual and small workgroups of developers," LeTocq added.

Pricing for OpenInsight is $249 through December, after which the price is $895.

Application tools on tap for Notes

Firm readies Visual Basic tool

By Michael Vizard

CAMBRIDGE, MASS.

A small consultancy plans to deliver a tool that will allow Visual Basic applications to read and write to a Notes database almost a year before Lotus Development Corp. is scheduled to deliver Notes application development tools that support the Basic language.

Brainstorm Technologies, Inc. in Framingham, Mass., plans to deliver VB/NotesLink at the LotusSphere users' conference next month. It will give developers the ability to build Visual Basic applications that can read and update Notes databases. Those same applications will be able to read and update most SQL databases using standard Visual Basic calls.

"The Notes programming environment isn't as powerful in terms of creating user interfaces as the SQL tools and Visual Basic are," said Brownell Chalstrom, president of Chalstrom Consulting, Inc. in Oakland, Calif., and a former member of the Notes group at Lotus.

And industry analysts said large numbers of Notes sites are already struggling with Notes and SQL database integration. "It's an issue a lot of people already have and one that everybody will have over the next two to three years," said Dave Marshak, an industry analyst at the Patricia Seybold Office Computing Group in Boston.

Lotus previously said it intends to support Visual Basic and LotusScript, a derivative of Visual Basic currently under development, as part of its notebook application development environment. LotusScript will be supported in Notes 4.0, which is due in the second half of next year [CW, Oct. 4].

Deal with Gupta

At the same time, Lotus announced a deal with Gupta Corp. last week under which Gupta's tools will be able to read and update Notes databases in addition to SQL databases [CW, Oct. 25]. However, Gupta will not deliver that capability until the third quarter.

As a result, the Brainstorm offering will be the only tool available in the near term, short of custom programming in C, that will allow developers to create applications that work against both SQL and Notes databases.

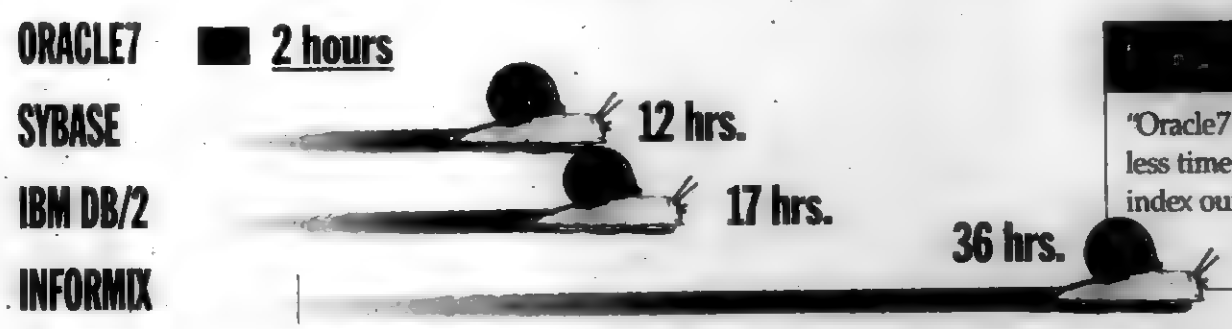
Currently, Johnson & Higgins, an insurance brokerage firm in New York, is using C to integrate Notes databases with a database running on an IBM AS/400. Once accomplished, Johnson & Higgins intends to roll up data from the Notes database into the AS/400 database, which will then give the company a central resource from which to write reports for its clients, according to Assistant Vice President Dennis Richter.

Johnson & Higgins will postpone as much of this effort as possible in favor of waiting for the Gupta tools, which it already uses. The company, however, will continue to proceed with its C development work until the Gupta tools arrive.

Marshak added that giving developers the ability to use their existing languages with Notes will be of paramount importance to Lotus as it seeks to increase Notes penetration at customer sites.

Gentlemen, start your snails.

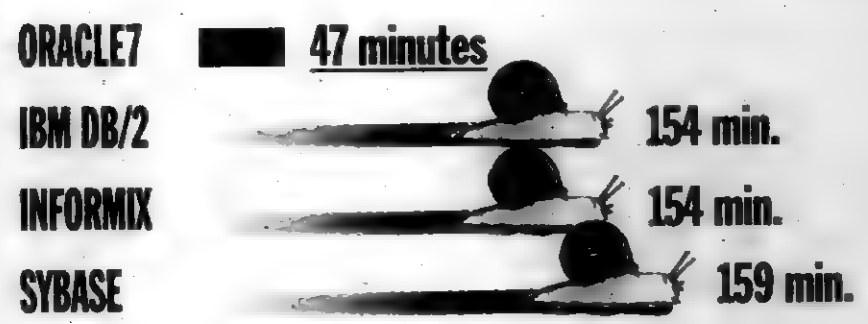
PC Magazine independently defined and ran a battery of real world performance tests to compare database server software. PC Magazine states, "Oracle7 was the hands down winner on our performance tests, outperforming the others by a wide margin."



LOAD AND INDEX

"Oracle7 finished the entire test suite in less time than most took just to load and index our data."

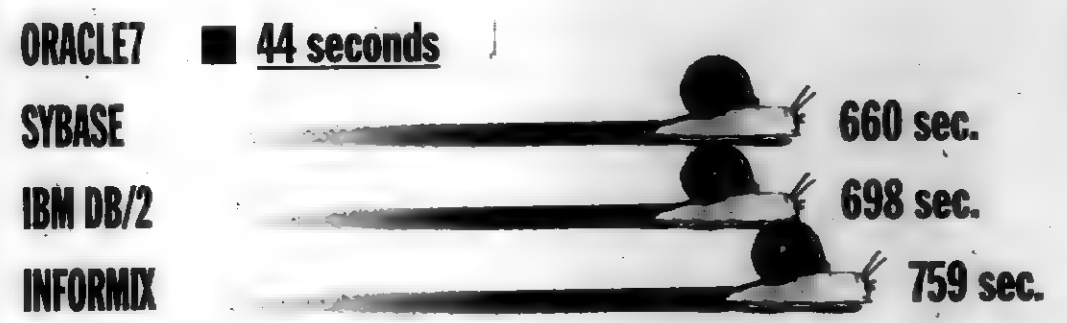
PC Magazine



AD HOC QUERY

"Oracle7 completed the queries in a blistering 47 minutes, three times as fast as...the other products."

PC Magazine



CONCURRENT RANDOM READ

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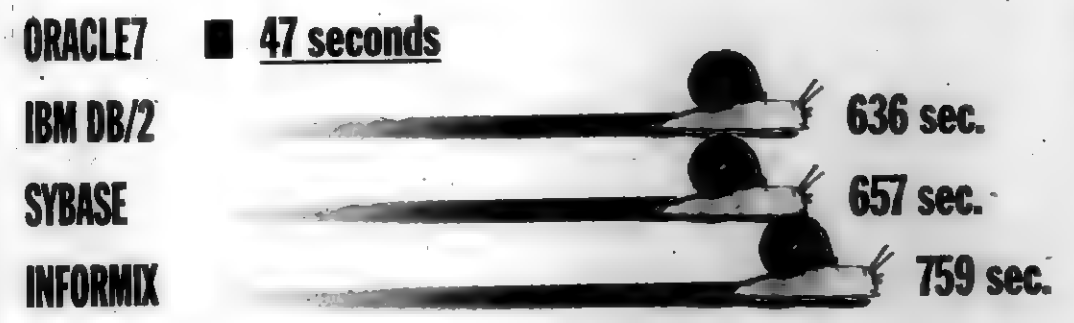

CONCURRENT RANDOM WRITE

"Even with the many new features that were added, we found Oracle7 to be exceptionally stable"

PC Magazine

Just to be fair, here's what PC Magazine had to say about the other guys:

Informix OnLine *"Only after days and days of repeated crashes were we able to obtain a full set of results."*

Ingres Server *"...we would not recommend it because of the showstopping multi-user bug we encountered."*

Gupta SQLBase *"...took an unthinkable 60 hours to load the tables and then crashed on the index builds..."*

For your copy of the complete PC Magazine article, including test results call 1-800-633-1071 Ext. 8129.

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Filling the holes in Unix system

It has been years since Unix was proclaimed ready for prime time, but there's always been a major barrier to its acceptance as a commercial system — the lack of a supporting suite of utilities to make the operating environment more manageable. Finally, however, that barrier is falling.

System utilities were one of the underrated achievements of legacy systems. Anyone who has ever watched IBM's MVS spew out a mind-numbing torrent of messages could understand the value of a utility that noted the exceptions and called them to the system operator's attention. In addition, scheduler utilities ran jobs in the right sequence. Chargeback utilities told the IS manager which departments owed how much for system use. Performance monitors indicated when the system was heavily loaded. Other utilities automated backup or did trend analysis based on system statistics. All these utilities make the environment more predictable and the life of a system manager more livable.

Unix, which was designed more as a developer's system than for running business tasks, lacked many of these features. Hewlett-Packard wanted to advance the use of Unix in commercial organizations but found "business people wanted to know if these utilities were available," says Gina Cassinelli, HP's Mainframe Alternative Program manager. In too many instances, there were holes, including HP's own HP/UX.

The final barrier to business adoption of Unix is falling, as suites of system utilities emerge.

Charles Babcock

Traditional Unix customers were skilled computer users rather than business people, and they didn't view the absence of a few utilities as a shortcoming. Unix offered system resources to developers in scientific/engineering circles without bogging them down in cross-checking or system safeguard techniques. Consequently, Unix would write over backup data on a tape drive when it needed more storage, or would speed up writing data to disk as space grew short, moving the system along more efficiently toward a crash.

Unix's Cron utility schedules the work load based on time of day and date, with no provision for checking whether requisite jobs have been completed. It's difficult to handle messages from the operating system automatically, so they get handled by a human operator or not at all. It's even difficult to print out part of a report rather than the whole thing. And there's no concept of a common database for system statistics.

To be sure, a lot of spot utilities have sprung up but they come from different vendors and may work with only one version of Unix. Creating a utility set that both meets a comprehensive set of system management needs and works across Solaris, System V.4, HP/UX, AIX, OSF/1 and The Santa Cruz Operation Unix is a tall order.

Several third-party software houses are now trying to fill the gaps, however, including Raxco Software in Rockville, Md., Computer Associates in Islandia, N.Y., and OpenVision, a one-year-old start-up in Pleasanton, Calif.

OpenVision, which launched its product line in June, purchased nine utility companies and licensed the products of two others in order to create its own utility lineup. That lineup will ultimately consist of 27 utilities with common database underpinnings through HP's OpenODB as a front end.

Raxco converted utilities on Digital VAXs to the Unix market. CA rewrote its existing line of mainframe utilities in C, sometimes combining the features of two similar packages into one product. These firms are adding common graphical front ends to their utilities, making them easier to learn and use.

With products like these available, commercial system managers may finally have the incentive they need to make the move from their legacy systems to Unix.

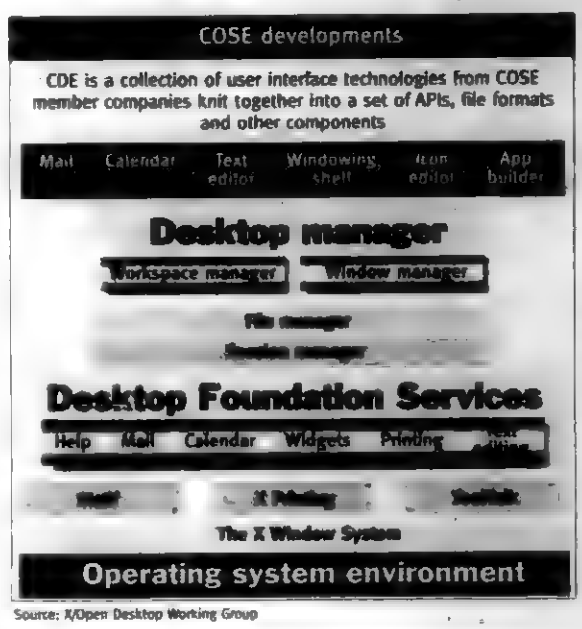
Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Unix compatibility

COSE delivers interim CDE code

By Jean S. Bozman
SAN JOSE, CALIF.

Corporate developers had better get to work quickly on the Common Desktop Environment (CDE) unveiled at last week's Common Open Software Environment (COSE) conference here because the code distributed on CD-ROMs here is designed to self-destruct in April.



Source: X/Open Desktop Working Group

COSE members IBM, Hewlett-Packard Co., SunSoft, Inc., Novell, Inc. and The Santa Cruz Operation plan to upgrade tool kit replacements by then. They said they also hope to integrate the CDE specs into their Unix desktops, which would allow all Unix systems to have a common look and feel (see chart).

CDE code elements include HP's Visual User Environment, the Open Software Foundation's (OSF) Motif 1.2 graphical user interface, a desktop manager from Novell, IBM's Common User Access shell and SunSoft's ToolTalk object-oriented interapplication messaging tool kit. Developers are supposed to write to the CDE application programming interfaces (API), even though COSE members noted the CD-ROM CDE code is nearly complete.

"We would expect to have CDE in our products by the first half of next year," said Bill Filip, president of IBM's Advanced Workstations and Systems division in Somers, N.Y. "By the second half of next year, we'd certainly expect widespread availability of CDE across the industry."

COSE delivered more than 1,000 free copies of the CDE tool kit on CD-ROM to corporate software developers and independent software vendors here last week. Upgrades optimized for each vendor's operating system will be available by April.

COSE members said they want to jump-start independent software vendor development of Unix desktop applications and hope a groundswell of applications will allow Unix to better compete with Microsoft Corp.'s Windows NT environment. "The CDE code, together with the Unix Spec 1170 [API], is about 95% of the code that is important to the [independent software vendor]," said Don McGovern, vice president of corporate strategy and business development for Novell's Unix Systems Group.

Help demanded

But many independent software vendors, who were among the 1,200-plus Unix developers in attendance, seemed skeptical that CDE's new look and feel would reduce the amount of required coding. "I don't understand why you can't use the same widgets as OSF uses in Motif 2.0," one attendee told a CDE developer's panel. Another pleaded for simplicity in the CDE code. "We want some help with this," he said. "We don't want more choices. This is coming to your desktop soon, and I'd like to get it done without pyrotechnics."

Still, some independent software vendors said CDE would broaden their business prospects. "We want to minimize the work needed to port our software to other platforms," said Lionel Simon, director of product engineering at Renaissance Software, Inc. in Los Altos, Calif. Others said they wished CDE specs had come out earlier. "If I knew something was going to be standard in a year, I wouldn't have thought about developing it," said Larry Headlund, president of Eikonal Systems in Boston.

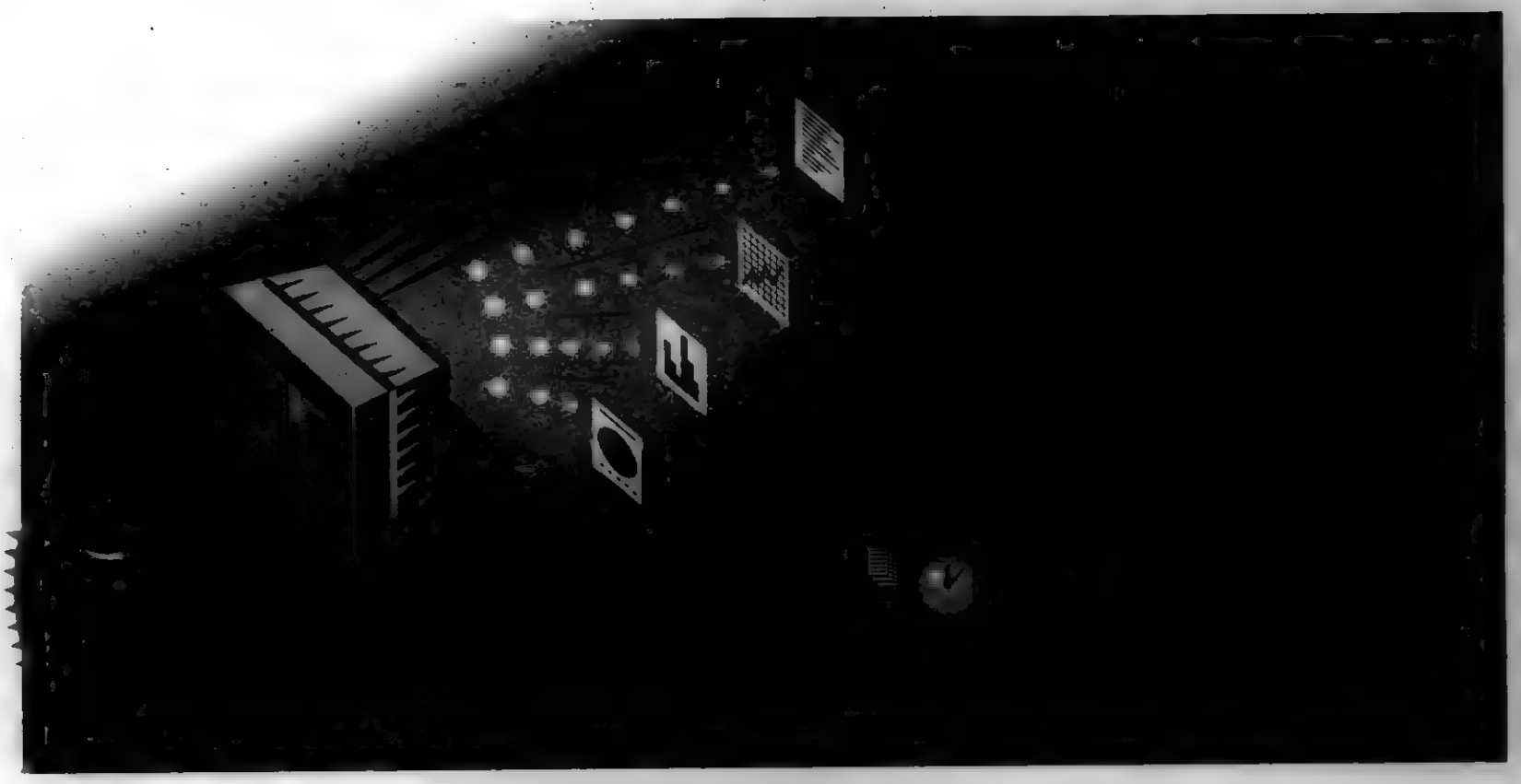
Out in left field

While developers debate the pros and cons of CDE, some large users asserted that they should have been included earlier in the COSE process.

Without early involvement, users must flip through pages of specifications before raising questions and providing feedback, said James White, vice president of technical planning at San Francisco brokerage Charles Schwab & Co., Inc. and a COSE conference speaker.

"A lot of the needless differences [between Unix systems] should go away [with COSE and CDE], which makes our job easier," White said. "But there are some potential 'gotchas' in that users were [involved] relatively late in the process, and the specifications are too detailed." More important to users, he said, is knowing the total cost of installing and maintaining CDE applications.

Novell's Don McGovern said the original game plan was for CDE and the 1,170 common Unix APIs to be announced simultaneously. But Novell underestimated the amount of negotiation it would take to reach agreement on the Unix brand name it granted to X/Open Co. and on the Spec 1170 standard, McGovern said [CW, Oct. 18]. And CDE was the only product suite that was agreed to when the COSE alliance was announced earlier in the year. —*Jean Bozman*



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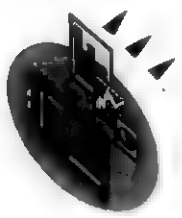

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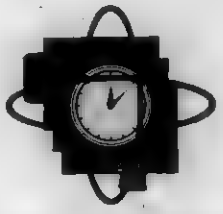

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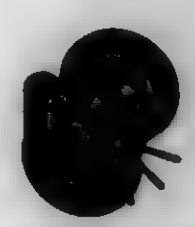

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News Shorts

Strassmann lands at Ernst & Young

Paul Strassmann, the former chief information officer at the Department of Defense and Xerox Corp., last week joined Ernst & Young's Center for Information Technology and Strategy in Boston as a research fellow. He will continue work on his return-on-management methods for evaluating alternative information technology investments. Ernst & Young will get exclusive implementation rights to the Strassmann methodology, according to an Ernst & Young spokesperson.

Bell Atlantic hires Skinner

Bell Atlantic Corp., the Baby Bell that made big headlines when it announced its merger with cable TV giant Tele-Communications, Inc., has hired Larry Skinner, formerly of Texas Instruments, Inc., as its vice president of business processing. The post gives him responsibility for business re-engineering at Bell Atlantic's telephone companies, network services and corporate information systems, according to a spokesman for the Philadelphia-based company.

IBM announces another down quarter

As expected, IBM last week announced a net loss of $48 million for its third quarter ended Sept. 30 [CW, Oct. 25]. This compares with net earnings of $86 million, before restructuring charges, for the same period last year. Revenue stayed flat, at $14.7 billion. Services revenue increased by 26.5%, while software revenue fell by 3%. Hardware revenue fell by just 1%, with PC revenue increasing "significantly" and workstation revenue declining. IBM would not provide more details. Separately, IBM Credit Corp. reported revenue of $37.7 million, compared with $55.9 million for the third quarter in 1992, largely because of an increased federal tax rate, the company said.

Canada Post taps SHL for client/server

Canada Post Corp. last week signed off on its massive client/server outsourcing deal with SHL Systemhouse, Inc. The contract, valued at about $1 billion, calls for Systemhouse to replace some 9,000 IBM 3270 terminals with PCs. The parties have not yet committed to a server operating system, so the project is shaping up as a Unix/Microsoft Corp. Windows NT showdown. Canada Post and Systemhouse also formed a joint venture to market the fruits of their labors to other postal agencies and to commercial enterprises.

Clinton calls for health report cards

President Clinton released his proposed Health Security Act last week, calling for electronic medical billing, standardized insurance claims, data-intensive "report cards" on the quality of care and a law protecting the privacy of medical records. The Clinton plan explicitly states that the Health Security Card will not be a smart card, but rather a magnetic-stripe card carrying only administrative data.

Client/server bundles from Borland

Borland International, Inc. this week will launch a promotional program under which it will bundle its Paradox database with its Interbase SQL database for $995 through March 31. The program is intended to get IS managers to deploy Paradox on user's desktops as a front-end query tool for accessing the Interbase relational database management system.

SHORT TAKE Microsoft began shipping on schedule last week the beta version of its NetWare Workstation Compatible Service, which allows Microsoft's Windows NT to access Novell, Inc. NetWare servers. A commercial version is due out by year's end.

More news shorts, *page 16*

Systems management

CA-Unicenter goes cross-platform

By Thomas Hoffman
CHICAGO

Computer Associates International, Inc. has latched its systems management client/server strategy onto a star.

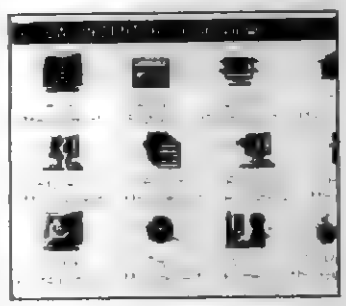
The Islandia, N.Y., software giant last week announced plans to deliver CA-Unicenter/Star, an IBM OS/2-based client/server package designed to manage multiple heterogeneous environments across a network from a single workstation [CW, Oct. 25].

CA-Unicenter/Star, announced here before 1,500 attendees at CA's Systems Software conference, is slated to enter beta testing in December. A production version should begin shipping by the end of the first quarter next year, said Jay Yesselman, director of CA's systems management strategy.

Although users and analysts hailed the vendor for its ambitious plans to deliver one-stop systems management tools, CA-Unicenter/Star does not come without its caveats.

For a systems shop to manage mixed, distributed environments, such as Hewlett-Packard Co.'s HP/UX, Microsoft Corp.'s Windows NT and IBM's OS/2, from a single workstation, server versions of CA-Unicenter for each of those environments are required.

Users said their companies would have to evaluate the costs of the necessary "enabling" software before making a decision on the package. Pricing "is something we're going to have to look at," said M. Nicholas Lovelace, an



CA-Unicenter/Star *provides singular view into networked systems*

IS review officer at Connecticut Mutual Life Insurance Co. in Hartford, which is not currently using any version of CA-Unicenter.

"It's difficult to put the price of this [required software] against years of investment in training. The costs are something our financial folks will look at, but I'm sure that we will be able to make a persuasive argument to justify it for our company to remain competitive since it should reduce the time and costs of additional training," said Ross Markley, a systems engineer at Norwest Technical Services, Inc., the technology arm of Norwest Corp., the Minneapolis-based banking conglomerate.

The OS/2-based CA-Unicenter/Star will be priced at $995, according to Charles B. Wang, CA's chairman and chief executive. A Windows-based version will go into beta testing in the third quarter next year and will also cost $995. However, users who wish to co-manage their IBM MVS Group 40 systems will have to plunk down $15,000 for an MVS server version of CA-Unicenter.

Forthcoming server ports of the systems management package for OS/2 and Novell, Inc.'s NetWare environments will be priced at $1,000 per server, according to Yesselman. Pricing for other Unix platforms has not yet been announced.

CA's one-stop systems management plans are a full six months ahead of product strategies from competing vendors such as Legent Corp. and Tivoli Systems, Inc., according to analysts. "As far as something that goes cross-platform, there really isn't a lot out there that compares with CA-Unicenter/Star," said Jonathan Eunice, research director at Illuminata, a Pittsburgh systems software technology assessment firm.

Security

CONTINUED FROM PAGE 1

will run across all desktops and network types without requiring changes to existing applications.

For example, the federal government-advocated Clipper chip addresses only one level of security: the encryption, or key-based scrambling, of data in transit. Optional encryption would be one component of the Hughes software, which would also bundle in several other security layers beginning with user authentication.

Security is No. 1

The enterprise approach to security is of the greatest concern to companies with mission-critical data and to those migrating from mainframe-based environments where security has been airtight for years, said Katrina Leinbach, a senior consultant at Aberdeen Group in Boston, who was briefed by Hughes.

For example, "Security is the No. 1 priority of everyone I know in my business today — the business of client/server computing and distributed networking," said Bruce Russell, director of corporate technologies at Amex Life Assurance Co. in San Rafael, Calif., which has been moving to a LAN internetwork from host-based computing over the past couple years.

An outstanding security gap, Russell said, is "protecting everything at one time" rather than requiring multiple log-ons and passwords for access to various environments — what he said is a more vulnerable approach.

Others considered the Hughes effort on the right track, but had reservations about the enormity of the task.

"We have 20 different systems, all with their own security, and it would be very nice to have a single structure handling all the back-end work," said Jim Queen, director of enterprise networking at Enron Gas Services Corp. in Houston. "But I'd be real surprised if someone came up with a unified way to secure all our systems."

New rules

Hughes' first offering, NetLock, will secure Sun Microsystems, Inc. Unix workstations and the TCP/IP networks enabled by the communications functions embedded in the Unix kernel. NetLock will check data integrity and allow network administrators to set rules as to what systems are authorized to communicate with one another and to optionally implement encryption schemes.

The Sun version is slated to ship on Dec. 1, followed by NetLock for Novell, Inc.'s NetWare environments in the second quarter of next year. Security packages for desktop operating systems will emerge in 1994.

Continuing concerns

Some users had outstanding concerns that Hughes was unavailable to address last week.

"My first take is these products, coming out of a government entity, will carry tremendous overhead," said Michael Higgins, technical support manager at Byer California, a San Francisco clothier.

Higgins said, for example, that he tested Oracle Corp.'s Oracle Trusted System — which requires the same federally mandated security features as the Hughes initiative — but it was not worth the processing power drain.

"It does work, though. It is absolutely bulletproof, but you could end up using a Cray to protect your PC," Higgins said facetiously.

A picture is worth a ~~thousand~~ 25,000 lines of code.

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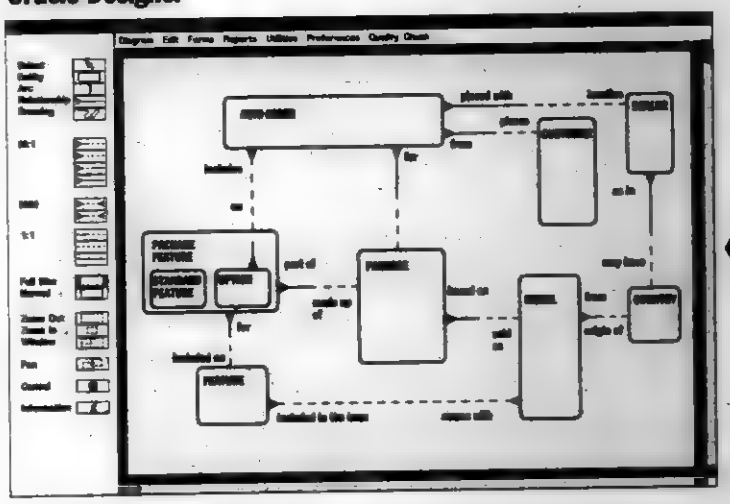

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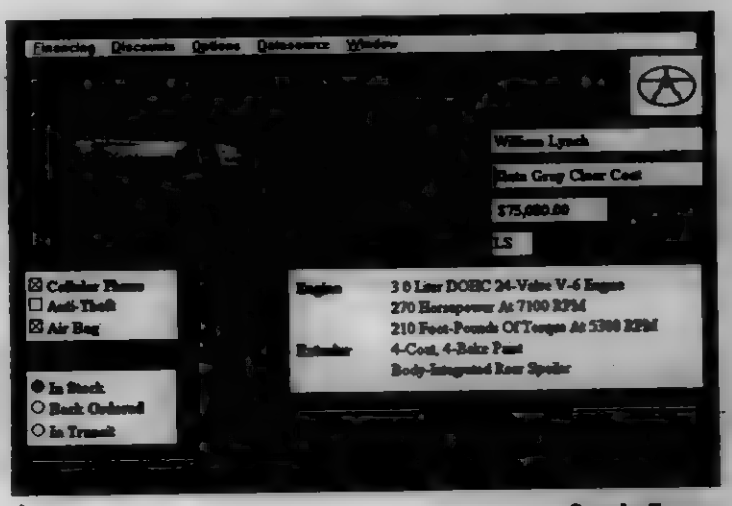

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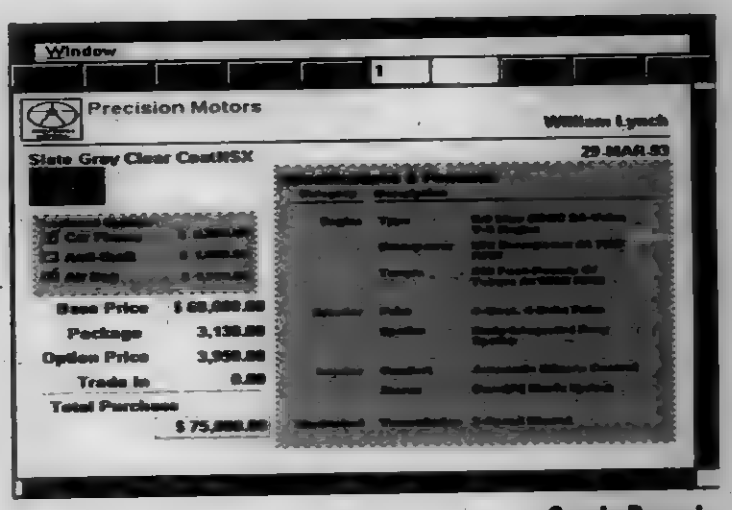

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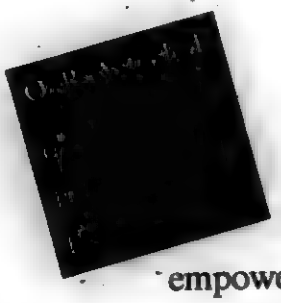

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Cray Research gets commercial SPARC

By Jean S. Bozman
BURLINGAME, CALIF.

Cray Research, Inc. stepped into the commercial market last week with the announcement of a $400,000 SPARC-compatible superserver that can run relational database applications and anchor a network of Unix workstations.

The symmetrical multiprocessor machine, the CS6400, will be sold by a Cray Research unit called Cray Research Superservers and Sun Microsystems, Inc.'s SunIntegration Services organization.

Sun Chief Executive Officer Scott McNealy said the 64-way Unix machine would complement Sun's workstations and SPARCserver 1000 and SPARCcenter 2000 machines, which top out at 20 processors. "We think we'll sell a lot more SPARCclassics every time they sell one of these," he said. McNealy was alluding to the pull-through sales of X Window System terminals and workstations, which will need access to the large amounts of data stored on the multiprocessing machine.

"We're creating a seamless computing environment between Sun and Cray," said Lester Davis, Cray Research's chief operating officer, referring to the binary compatibility of Sun and Cray Research systems.

The CS6400 also has software links to IBM-compatible mainframes and to Cray Research supercomputers, said Martin Buchanan, general manager of Cray Research Superservers. Initial target markets will be in the auto, oil, financial, telecommunications and electronics industries and government, Buchanan said.

Superservers CS6400	
CPUs	4 to 64 SuperSPARC RISC processors
Operating System	SunSoft's Solaris 2.3
Main memory	Up to 16G bytes
System interconnect	4 XD-buses
I/O channels	Up to 16 S-buses
Address	Up to 2T bytes of on-line disk-drive memory
Volume shipments	First-quarter 1994
Price	$400,000 to $2,500,000

Sun partnered with Cray Research because it does not intend to create its own 64-way Unix server, McNealy said. "Our focus has been on $5,000 to $25,000 desktops and the two- to 20-way [symmetrical multiprocessor] machines," he said. "We see lots of upside to our revenues by staying in those price/performance ranges."

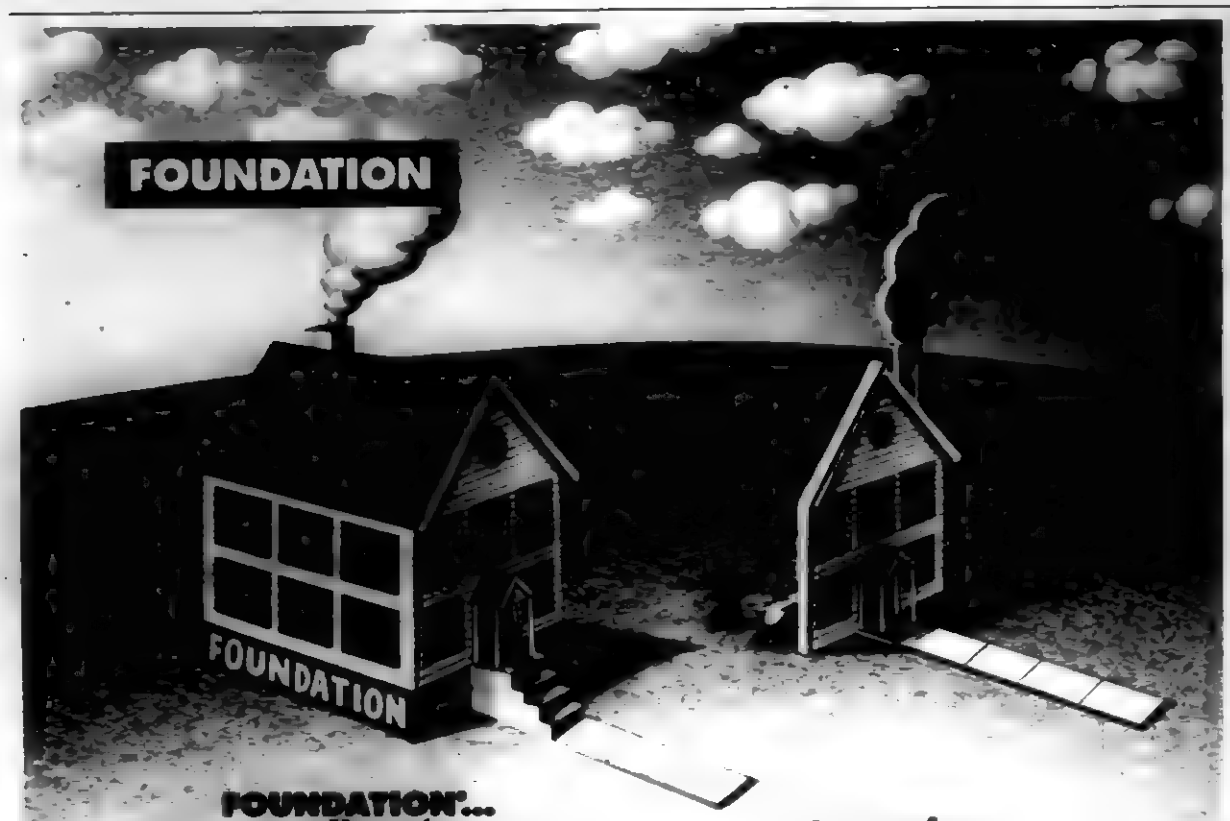
No immediate need

At least one Sun user said he does not require the horsepower in the CS6400 — yet. "I still have a lot of headroom in my SPARCserver 1000 and SPARCcenter 2000 machines," said Pompi Malik, manager of information services at Brewers Retail, Inc. in Mississauga, Ontario, which uses high-end Sun servers to run its cross-province retail chain. "I can see how it could be the main computer for accessing corporate-level information, but somehow that seems to go against the entire distributed computing paradigm." He was alluding to Sun's stance against large-scale systems.

However, a centralized Sun-compatible server could be a fast, computer-intensive engine for database applications, said Stan Hanks, president of the Sun Users Group. Users could access centrally stored data through the X terminals.

"The big stick the mainframe guys have used to beat the workstation guys is the lack of data bandwidth [on workstations]," Hanks said. "Now, you've got a computational engine that can be logically partitioned into multiple machines that have virtually instantaneous communications between them."

Industry analysts said they see a narrow market for the machine, although it fits the needs of Wall Street workstation aficionados who do a lot of number-crunching and data analysis.



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HP to deliver power-packed minis

By Mark Halper

Hewlett-Packard Co. this week will unveil its most powerful minicomputers ever in a price/performance uppercut intended to send IBM staggering further into the mainframe ropes.

Users said the move will also invigorate HP's own sluggish mainframe-alternative program.

The new versions of HP's Corporate Business Systems will incorporate the 90-MHz rendition of the company's PA-RISC microprocessor. It is a step up from the 60-MHz PA-RISC chips that HP uses in the original version of the line, commonly known as Emerald, which was introduced in May 1992.

Pushing the envelope

HP is extending the performance of its Unix and proprietary systems

		Maximum users	Standard memory	Maximum disk space		Shipment date
HP 9000 (1-12 processors) HP/UX	1,500* (on 8-way)	4,500	256M/ 2,048M bytes	1,900G bytes	$165,000-$660,000	Dec. 1993 (up to 8-way); Q1 (9- to 12-way)
HP 3000 991/800 & 995/800 (1-8 processors) MPE/IX	1,500+ (995/800)	2,700	256M/ 2,048M bytes	2,040G bytes	$223,500-$679,300	First half 1994

*Hewlett-Packard Co. estimates

Extra scalability

In a surprise move, HP will announce that Unix versions of the Corporate Business Systems will scale up to 12 processors. Earlier indications were that processor support would top out at eight [CW, Oct. 18]. Proprietary models running HP's MPE/IX operating system will scale up to eight processors, HP said. Currently, all Corporate Business Systems run a maximum of four processors.

HP said a six-processor version of a 7100-based Unix box scored 2,110.5 trans./min. under the Transaction Processing Council's benchmark parameters running an Informix Corp. relational database. An eight-processor Unix box running Oracle Corp.'s Oracle 7 will churn 1,500 trans./sec. compared with a previous HP Unix high of 700 trans./sec., the company estimated.

With the new models, HP is also taking severe pricing action. It set the retail tag for a single 90-MHz processor Unix version at $165,000, essentially offering the machine for the same price at which it has been selling single-processor 60-MHz boxes. It set pricing for a 12-processor Unix box at $660,000. Until last summer, when HP implemented price cuts in preparation for this week's announcement, that was also the price of a four-processor machine.

The company said it is phasing out all but the single-processor version of the 60-MHz line, and it is cutting the price of that box to $120,000.

Pricing for MPE/IX versions ranges from $219,300 to $879,300. The 60-MHz MPE machines cost from $259,300 to $469,300.

Speed demon

While the 7100 chip runs at a raw speed of 96 MHz, Hewlett-Packard slows it to 90 MHz to conform to the 30-MHz increments of the Corporate Business System's backplane. HP takes the same approach for lower-end boxes.

Users said the addition of the faster chip should help HP revitalize Corporate Business Systems sales. High-end sales had slowed, they noted, because HP had built the 7100 chip into lower-end models, such as its HP 9000 Series 800 G, H and I machines, which offered impressive performance for less money [CW, June 28].

H is for horsepower

"I saw a lot of customers buying the H class systems because they put out an incredible amount of horsepower," noted Sam Ellis, associate vice president of information services at Portland Community College in Portland, Ore. "People have been either buying the H or waiting for the 7100 Emeralds."

"The 'I' has a slower backplane than the Emerald. It can't handle as many users, but it did have a faster processor. So for less money, you were able to get more processor speed," agreed John Jazwiec, chief information officer at Barber Colman, Inc., a Rockford, Ill., vendor of controls for environmental and industrial equipment. "As you get into large relational database environments, chances are you might be better off trading I/O speed and capacity for higher CPU performance."

Both Ellis and Jazwiec plan to eventually upgrade their 60-MHz Corporate Business Systems to 7100-based boxes.

Jazwiec said it will cost him about $50,000 for each of the three processors he plans to upgrade and that he expects the transition to take about a half-hour. By comparison, upgrading an IBM 3090 mainframe "would take an entire weekend and cost about $2 million."

Patent office

CONTINUED FROM PAGE 1

tion flowing to users.

The patent office's text search system would allow it to evaluate alternate means of delivering information to patent examiners, who by law must exhaustively review the literature before passing on the patentability of an invention.

"The existing system is rigidly Boolean — standard Nexis/Lexis sort of stuff," said Rob Porter, director for systems development and maintenance. "That puts us in a position of absolutely flooding the search examiner with all kinds of information of marginal relevance."

The patent office database, which now holds records of all patents issued since 1971, could grow in a few years to 5T bytes, depending on how much information is made available for high-speed searching.

"In five to 10 years, we'll have two to four times more information to show examiners [in each search]," said Thomas Giammo, assistant commissioner for information systems at the patent office. "If we don't find ways of filtering information and sorting it so the most likely hits get there first, our success in bringing examiners more information will be their downfall."

No available commercial products meet the patent office's filtering needs, according to Giammo, though some are "within striking distance."

Possible users outside the patent office include the Central Intelligence Agency, which has approached the office for information about the project; agencies with large text repositories such as the Nuclear Regulatory Commission (NRC) and the Library of Congress; and commercial enterprises such as law firms, Giammo said.

For example, the NRC is looking for a text search system to help it fulfill its legal charter to support license applicants and litigants' requests for information out of vast databases of regulatory documents, environmental studies and the like.

"We are the archetype of a certain class of customer," Giammo said. "We're one of the few willing to pay the outrageous price for massive text search, but where you do see these systems in use, the payoff is incredibly high. I believe ... that once you bring down the cost, you will open up many new markets. I don't think the idea of having 400 customers is at all unlikely."

Information explosion

The patent office's existing text search system runs on an Amdahl Corp. 5990 mainframe and can support 120 concurrent users. The company foresees the need to support 750 concurrent users by 1995 as the patent office expands access from 14 to 74 public libraries. But that requirement could skyrocket if public access were provided via the Internet, as the Securities and Exchange Commission recently decided to do with its corporate filings.

Patent office's Thomas Giammo *might accept Oracle's proposal without soliciting bids from others*

Mutual benefits

Giammo said he is looking for a vendor with established technology whose implementation the patent office would partially fund in exchange for a long-term license. He said the vendor would have to prove the system would be scalable — as the office cannot predict its user demand — and that the resulting product would be "commercially viable."

The winning vendor would be responsible for marketing the system and could use the patent office as a beta site and reference account, he said.

Giammo declined to reveal either the office's budget for the project or an estimated cost to develop the system.

He said the patent office might simply accept the Oracle proposal without soliciting bids from others, but doing so would require it to show that the Oracle approach is "unique." In any case, he said he may encounter opposition from federal procurement officials, who balk at the concept of buying a commercial, off-the-shelf product that is not yet even on the shelf. Consequently, he is seeking support for the idea from senior officials at the U.S. Department of Commerce and the White House Office of Management and Budget.

"There's absolutely nothing improper about this, but I'm afraid its newness may cause problems," he said.

A Commerce Department official said while he is enthusiastic about the project's concept, he stops short of endorsing it because he has not seen details.

None of the vendors involved would say much about what approach they might take in meeting the patent office's needs.

However, Lori Mirek, director of server product marketing at Oracle, pointed out that the company just announced its Parallel Query Option, by which an Oracle database can run on shared-memory multiprocessor workstations, minicomputer clusters and massively parallel computers such as those from NCube.

Carlton Samuels, support operations manager at Software AG, questioned the need for a massively parallel system with hundreds or thousands of processors. He said the company's Adabas database management system running on IBM mainframes handles 100 million transactions a day for an airline and supports a text database for the Federal Bureau of Investigation that is "in the hundreds of gigabytes."

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Internetworking

Cisco routers to assist Windows NT

By Joanie M. Wexler

In its efforts to groom its Windows NT Advanced Server as an enterprisewide desktop server, Microsoft last week said it will deliver internetworking functions to the operating environment via the first PC-based router developed by Cisco Systems, Inc.

The two companies said they have teamed on a desktop-to-enterprise communications effort in which low-end routers from Cisco for PCs will link branch offices into corporate internetworks. The routers are due in the first half of next year. The move represents Microsoft's answer to Novell, Inc.'s home-developed MultiProtocol Router, a NetWare Loadable Module that runs on NetWare servers, for providing low-cost connectivity needs.

From one user's perspective, "one of our primary considerations is the availability of low-cost Internet connectivity options," said Bill Bard, director of the office of telecommunications at the University of Texas in Austin. This is because the university provides networking services to many schools and state agencies; because of its large site count, the university requires inexpensive connections, he said.

Cross training

Aside from the technology ramifications, "product will be delivered through one channel, and both companies are investing in cross training," said Don Listwin, Cisco's vice president of marketing. He added that the two firms are looking to integrate their network management systems.

Integrating CiscoWorks, which manages Cisco routers, and Hermes, Microsoft's code-named desktop manager due in the first half of 1994, could appeal to branch offices that might want a view of their local domains only, Listwin said.

Both CiscoWorks and Hermes are also slated to tie in to the high-level, Unix-based enterprise management systems where they will become part of a larger management picture for networking staff responsible for both the network backbone and periphery, he said.

Microsoft casts object net

CONTINUED FROM PAGE 1

updated or relocated, King said. "That's what I call an executive information system."

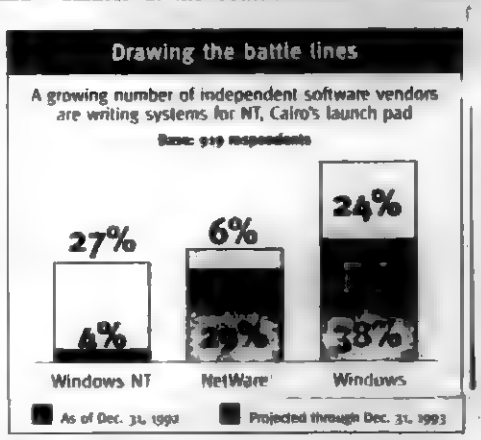
Cairo will also extend the dynamic application links provided by Microsoft's Object Linking and Embedding (OLE) 2.0 across the enterprise, said Greg Lundell, group product manager for Windows NT at Microsoft. This will move users from an "application-centric view where you click on a spreadsheet, start it up and then open a file" to an object-oriented framework where "the user can focus on the information and not have to understand whether it's a spreadsheet or general ledger."

User, software vendor and analyst sources briefed by Microsoft said they like what they have heard of Cairo's enterprisewide resource-access abilities so far, although it is early yet to tell whether the architecture will be all it is cracked up to be.

Bang must be bigger

ShowTime Network, Inc., for example, is not likely to replace its current NetWare services with Cairo unless Microsoft's platform turns out to offer a whole lot more functionality, said Peter Pollack, director of technology at the Viacom, Inc. subsidiary. ShowTime currently uses Unix, and some NT, for application servers.

On the other hand, Cairo is a likely choice for companies such as Nordstrom, Inc., which is in the process of rolling out its enterprise network environment on Windows NT Advanced Servers, according to Larry Shaw, PC coordinator at the Seattle-based department store chain.



Source: Price Waterhouse

Among the reasons for Nordstrom's choice: "NT's manageability and scalability and the fact it runs as a full 32-bit protected mode," Shaw said. An application running in unprotected mode in NetWare can bring down the whole server if it accesses the wrong area of memory, he added.

To extend Cairo support beyond its own desktop systems, Microsoft plans to base the platform's connectivity plumbing on the Open Software Foundation's Distributed Computing Environment remote procedure calls. Microsoft is working with vendor partners on a "very pragmatic solution that follows some emerging standards" and will make some preliminary introductions in the next couple of months, Lundell said.

> Microsoft's "Cairo commandos" will be Microsoft applications fitted with Cairo-compatible objects.

Various ports planned

Microsoft will also make Cairo-based services available to other vendors' platforms by porting OLE, which Cairo is based on, to non-Microsoft desktop systems such as the Macintosh, Griffin said. Microsoft will port OLE to other systems as well, based on user demand, Lundell said.

Windows icons will shield users from the dirty work involved in finding a particular application or record on a system, as well as housekeeping chores such as moving or deleting a user on systems and files across the enterprise.

"You should be able to go to a graphical presentation of the system, grab an image of the user and throw it in the trash or move it," as opposed to deleting or moving all user entries manually, according to Lundell.

Microsoft's "Cairo commandos," which will invade user and independent software vendor (ISV) turf, will be the company's own popular applications, which Microsoft is quietly fitting with Cairo-compatible objects, said John Donovan, a director at WorkGroup Technologies, Inc., a research firm in Hampton, N.H.

Microsoft's ever-popular Windows environment will be another Cairo commando, particularly in its next-generation, or Chicago, iteration, Griffin said. Chicago and NT will have "much the same user interface and APIs," and Chicago will have OLE 2.0 support, he added.

ISVs with migration jitters should be soothed by the fact that applications that support Win32 and OLE 2.0 are "80% of the way" to the new platform, according to Lundell.

Microsoft has been pushing hard to gain OLE 2.0 commitments from virtually all major software vendors, Griffin said.

Microsoft's openness stance remains less than sincere, however, as long as the company goes on insisting that its own object definitions, and not those of an industry standards body such as the Object Management Group (OMG), be used, said George Reid, director of information systems at Sanford C. Bernstein & Co., a New York financial services firm.

If Microsoft "stonewalls" on the OMG's Common Object Request Broker Architecture (Corba), it will isolate its users from the distributed networking standard, which is blessed by most of the big Unix systems players as well as by Novell, Reid added.

Standards bodies such as the OMG have yet to deliver a "practical implementation" of a standard that will "satisfy users' [distributed] needs in heterogeneous environments," Lundell said.

For example, Corba has yet to provide security features or network transport-independence, he said. In contrast, "We have object definition handling in OLE today," he added. "Realistically, if you have 40 million desktops using OLE and the Microsoft object model, the momentum will be fairly compelling."

No resting on laurels for Novell

Novell does not intend to just sit on its hands while Microsoft makes the multiyear trek to Cairo, according to Bob Young, Novell's vice president of marketing. "When Cairo ships, we'll again be two to three years ahead of them, as we are now," he said.

For the past few years, Novell has been busily working on the components of an object-oriented network services framework that will deliver everything that Microsoft promises and more, Young claimed.

One such piece is NetWare Directory Services, which is 90% to 95% object-based now, Young said.

Another important piece is an Object Request Broker, to be delivered next year, which will automatically match application and user requests to the right service, without the user's having to worry about where it is located, Young said.

The broker, which Novell is developing with its partner Hyperdesk Corp., will be fully compliant with the OMG's Corba, he added. Novell said it intends to keep adding service objects that the broker can access, again cleaving to OMG object definitions, Young said. So far, Microsoft has held aloof from OMG, claiming that the standards group's broker and object definitions are too rudimentary.

More NetWare services

While Microsoft may offer a rich set of desktop objects to be accessed through its object manager, Windows NT offers a minuscule range of network services compared with NetWare, Young said. "I would argue that until Microsoft delivers a complete network operating system," Cairo's object manager will have little value.

Rather than attack Novell's 70% share of the market directly, Microsoft will attempt to get a foot in the door of NetWare installations by offering its NT and Windows clients access to the dominant network operating system, said Claude King, senior systems analyst at the University of Florida.

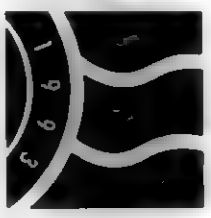
However, Cairo will not be able to just walk into Novell installations with Cairo, King said.

— Elisabeth Horwitt

E-mail conference highlights IS challenges

By Lynda Radosevich

If information systems managers think that life is complicated now, wait until speakers at the E-Mail World conference this week in Santa Clara, Calif., outline how imminent national and international data "superhighways" will lead to a vastly more complex world.



"It will be as disruptive as going from mainframes to LANs," said David Farber, a conference speaker and a board member of the Electronic Frontier Foundation, a Washington-based group that lobbies on computer-related issues.

That is because the merger of communications and computing, which has been simmering for 20 years, will swing into high gear once these data superhighways take off, requiring IS managers to rethink the way they build computing systems.

By comparison, the move from mainframes to LANs was a switch from one computing platform to another, said Farber, who is also a member of the computer science faculty at the University of Pennsylvania.

Among the challenges facing IS are rethinking the meaning of security and building new software systems that can shoot message-based information around the world in real time with 100% reliability.

Current solutions

While superhighway commercial availability is still four to five years away, vendors at the conference plan to roll out products to tackle more immediate problems, such as interoperability and enterprisewide directory synchronization. This week's announcements will include the following:

•**Banyan Systems, Inc.** in Westboro, Mass., will announce an Intelligent Messaging interface for Unix that allows organizations with mixed Unix and PC networks to communicate via integrated messaging systems. It is available now as an option for Banyan's Vines for Unix server software for Vines for The Santa Cruz Operation's Unix; the same option will be available for Hewlett-Packard Co.'s HP/UX, IBM's AIX and Sun Microsystems, Inc.'s Solaris in the first half of 1994.

Host dominates

In a recent survey of 100 large organizations, 70% of the active mailboxes were on host systems vs. 21% on PC/Macintosh and 7% on Unix platforms, according to Ferris Networks, Inc. in San Francisco.

•**Novell, Inc.** in Provo, Utah, will add Message Handling Service (MHS) criteria to its YES testing and certification program. Vendors' messaging products that meet the criteria will be ensured to interoperate with one another, according to John Rizzi, president of the MHS Alliance. The specification is expected by the first quarter of 1994. Also, the alliance will release the first draft of a calendaring/group scheduling specification announced in June. Additionally, Novell is expected to unveil new MHS gateways for Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail.

•**RadioMail Corp.** in San Mateo, Calif., will announce a new service that allows users of Apple Computer, Inc.'s Newton personal digital assistant to receive messages from any electronic-mail system through a central RadioMail gateway. The Newton must have Motorola, Inc.'s Newton Messaging Card, a wireless PCMCIA adapter.

•**Alisa Systems, Inc.** in Pasadena, Calif., will announce an enterprise E-mail directory called OpenDirectory. Based on a Sybase, Inc. SQL database, the directory allows users of Microsoft's Open Database Connectivity client software to browse through it. The directory works with Alisa's message routing and directory synchronization software.

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News Shorts

Microsoft delivers DOS 6.2

Microsoft Corp. formally announced delivery of MS-DOS 6.2 last week, pricing the Step Up version of the upgrade for DOS 6.0 users at only $9.95. For all other DOS users, the upgrade is priced at $77.95, although the company expects the street price to be around $50. Besides the expected improvements made to the program's DoubleSpace compression program and SmartDrive caching feature, Version 6.2 also sports CD-ROM caching for faster performance. The program should be available this week.

WordPerfect teams with MCI for E-mail

WordPerfect Corp. and **MCI Communications Corp.** announced last week that WordPerfect Office 4.0 will be incorporated into the MCI Mail network. The move will allow Office users to exchange messages with MCI Mail users and users of 54 public electronic-mail services in 40 countries connected with MCI, according to WordPerfect. The service will be available in the second quarter of 1994. MCI has a similar arrangement with Lotus Development Corp.'s CC:Mail.

Digital readying first ATM products

Digital Equipment Corp. said last week it will start shipping Asynchronous Transfer Mode (ATM) networking products in the first quarter of 1994. The initial rollout will include a backbone ATM switch with a throughput capacity of 10G byte/sec.; a 155M byte/sec. ATM adapter for DEC 3000 workstations; and a module for its Gigaswitch FDDI-to-FDDI matrix switch that will let it act as a gateway between Fiber Distributed Data Interface (FDDI) and ATM networks. Pricing has not been finalized, the company said.

IBM cuts PC prices

The IBM PC Co., preparing for significant product announcements in its PS/2 line, cut prices up to 20% on its PS/2 Model 90 and PS/2 E, and by more than 50% on its 486SLC2 processor upgrade for its Models 56 and 57. The base price for the Model 90 with a 25/50-MHz DX2, 8M bytes of RAM and a 540M-byte hard drive went from $4,765 to $4,135.

SHORT TAKES **Lotus Development Corp.** last week moved to make it easier to master Notes. The company will offer 10 computer-based training modules with **CBT Systems** in San Francisco.... **Kendall Square Research Corp.** last week said it expects to report a loss for its third financial quarter, where analysts had expected a gain. Word of the expected loss comes on the eve of this week's expected announcement of the KSR-2, a high-end massively parallel machine that doubles the power of its current model.... **Unisys Corp.** has completed its purchase of **Computervision Corp.**'s System 9 Geographic Information System technology; the purchase price and terms were not disclosed.... **WordPerfect** has formed a small- to medium-size-business group that will focus on customers with 50 to 299 PCs.... **Toshiba America Information Systems, Inc.** will today begin offering a three-year warranty for parts and labor on its flagship T4600 notebooks, the T6600 portable, the Dynapad T100X pen-based system and all Desk Station docking stations. Current users of those products can buy the three-year warranty for $149.95 for color products, $99.95 for the rest.... **Iomega Corp.** announced that Fred Wenninger, president and chief executive officer, has decided to leave the storage company. Senior Vice President Loon Staciokas will be interim CEO until a permanent replacement is found. ... As expected, chip maker **National Semiconductor Corp.** last week unveiled phase one of a network adapter card rollout in partnership with **Novell, Inc.**

Compaq boxes focus on ease of use

Desktops add sound, packaging upgrades

By Stephen P. Klett Jr.
BOSTON

Compaq Computer Corp. is set to unleash today a desktop blitzkrieg of 46 machines emphasizing ease-of-use features from the graphical user interface (GUI) to the packaging.

The new machines mark Compaq's attempt to blanket every segment of the market from major corporations to small business users to first-time home buyers, company officials said.

"This is the most significant product launch for the company since the breakout of the reborn Compaq in June of '92," said Richard Zwetchkenbaum, senior PC analyst at International Data Corp. in Framingham, Mass.

All of the machines will ship with TabWorks, a Windows shell developed by Xerox Corp.'s XSoft division that is said to make the system more intuitive [CW, Oct. 25].

On the desktop

Spearheading the desktop assault is the DeskPro XE series, a line of high-performance XT/AT bus, Pentium-based PCs. Pricing for the DeskPro XE, which features voice annotation and response capabilities, will start at $2,800.

In addition, the XE line incorporates the TriFlex/PC architecture of the high-end DeskPro/M series to boost I/O performance. The XE series will replace Compaq's DeskPro/I line, which gradually will be phased out of production by the end of the year, according to the Houston company.

Welcome upgrade

"The DeskPro/I was very long in the tooth and needed upgrading," said Randal Giusto, an analyst at WorkGroup Technologies, Inc., a consultancy in Hampton, N.H.

Blount Construction in Montgomery, Ala., will take a close look at the Pentium versions of the XE, according to Scott Lee, PC support manager at the company. "Right now our 486 machines are meeting our needs, but we may need a performance boost in the next six months ... and the XE's $2,800 entry price for Pentium sounds pretty good," Lee said.

In addition to the XE, Compaq will also unveil new and updated versions of its ProLinea and consumer Presario lines. Both lines are now available in five-slot, five-bay minitower configurations. Previously, the ProLinea offered up to three slots and drive bays for expandability. Both lines offer a range of processor choices that span Intel Corp.'s I486SX and DX2 offerings.

Compaq will also introduce a ProLinea model that borrows Presario's "all-in-one" packaging. Called the ProLinea Net 1/25S, it features an integrated monitor and either an Ethernet or a Token Ring network adapter card built onto the system board.

While users said they were impressed with the scope of Compaq's offerings, some were skeptical of the firm's ability to deliver the products, particularly the Pentium XEs.

Compaq said it is ramping up production to 100% of capacity in the fourth quarter and will have no trouble meeting demand. "The Pentium is in good supply," said Bob Bauer, director of North American desktop marketing at Compaq. "We have a backlog situation on 66-MHz chips but have a more than ample supply of the 60-MHz chips."

A clean desktop

Refreshed Compaq product line spans the gamut. A sampling:

Model	Features	Price
[illegible] XE	Enhanced Q-Vision graphics, business audio capabilities	$3,399 for 60-MHz Pentium model*
ProLinea Net 1/25S	Integrated monitor and network card	$4,349 for Ethernet model with 486SX/25 CPU
ProLinea 5ST	Minitower, five industry Standard Architecture drive bays and expansion slots, Pentium-upgradable	$1,449 for model with 486SX/33 CPU; $1,899 for multimedia version*

All models are Energy Star-compliant *Price excludes monitor

IBM gives OK

CONTINUED FROM PAGE 1

cessful Windows NT will be on the desktop, they said they realize NT's importance to the overall success of the chip [CW, Aug. 16].

"There is no exclusivity here; the PowerPC supports a number of 32-bit operating systems. But if people think we'll be quick to go to NT, they don't understand how strategic AIX and WorkPlace OS are to us," an IBM spokesperson said.

While Personal Software Products recently scored several volume deals with large corporate accounts for OS/2 2.1 on the Intel platform, some analysts said that that is not enough to persuade IBM's hardware units to completely rule out Windows NT from playing a strategic role on the PowerPC, given Windows NT sales projections for the next year.

"It looks like demand is going to be elsewhere, and IBM is sensibly allocating its resources [toward NT]," said Dean McCarron, an analyst at Micro Design Resources in Scottsdale, Ariz.

Strategic OS

In addition to support for Windows NT, IBM will reinforce support for a range of 32-bit operating systems it believes are strategic — including its own AIX and WorkPlace OS.

Meeting goals

As of late last month, Microsoft said it had shipped 200,000 copies of Windows NT. Company officials said they believe this puts them on target to meet their goal of 1 million NT sales by next August.

"I would not say we are ready to jump up and down about being way ahead of plan, but we are exactly where we thought we would be [for shipments]," a Microsoft spokeswoman said. "And we are pleased with where they are going."

The majority of those 200,000 copies have gone to corporate accounts that use the system to develop mission-critical and client/server applications, she said. This is exactly the market toward which WorkPlace OS for the PowerPC and Intel platforms is headed.

IBM had initially planned to deliver WorkPlace OS for the Intel platform, followed by a version for the PowerPC. But fearing that Windows NT would gain rapid acceptance on the PowerPC platform, Personal Software Products this summer flipped its priorities to deliver the operating system for the PowerPC first, sources said.

"That decision was driven by what [IBM] sees as sizable demand for something more advanced to run on the PowerPC," one developer said.

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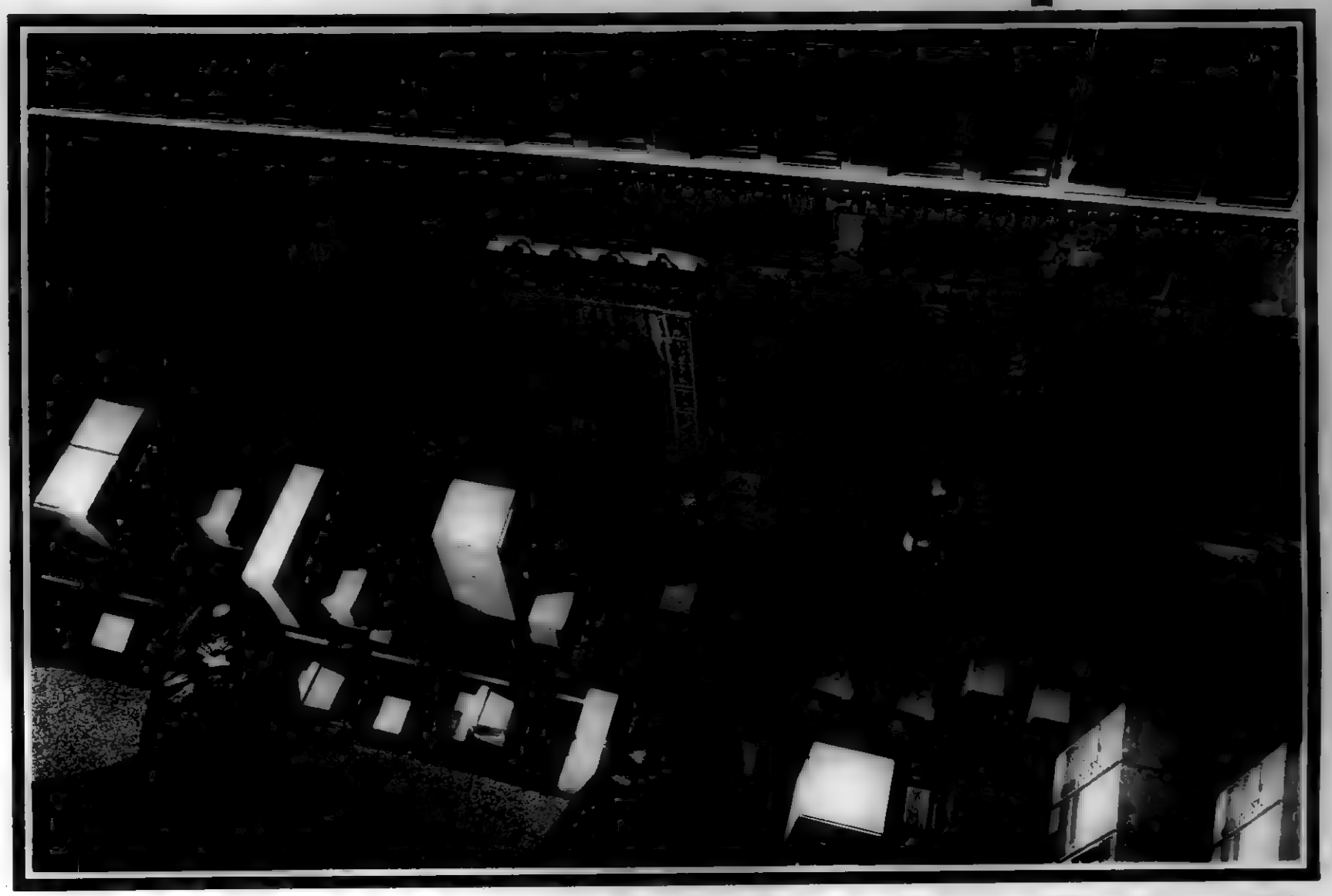

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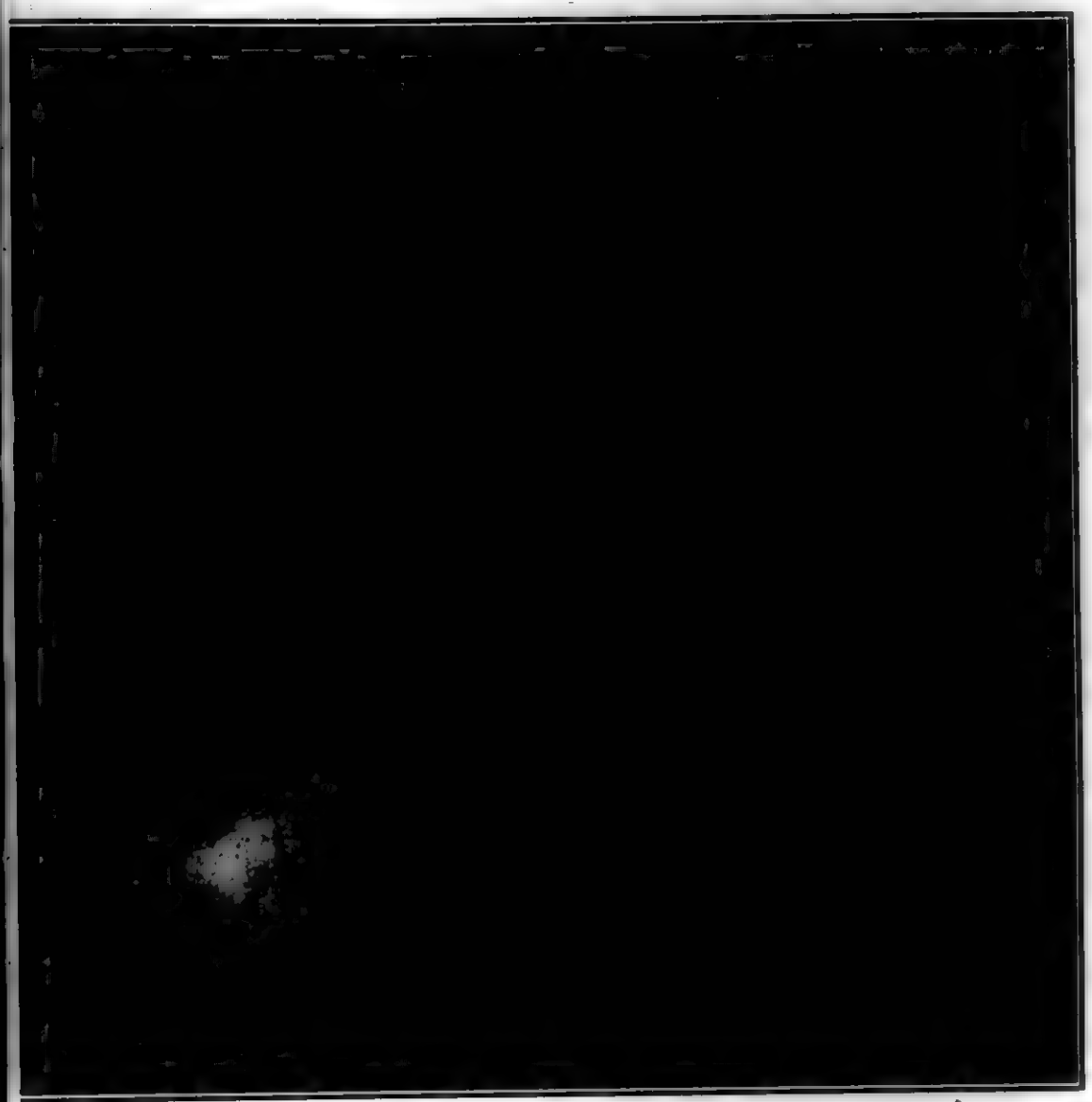

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DEC pushes OSF/1 as NT simmers

By Craig Stedman
MAYNARD, MASS.

Forecasting a two-year ramp-up for Microsoft Corp.'s Windows NT, Digital Equipment Corp. is relying on short-term growth of its DEC OSF/1 operating system despite the company's current ranking as a Unix also-ran.

NT might be more critical for driving Alpha AXP shipments in the long run because of its desktop potential. But even Dennis Schneider, director of NT marketing at Digital, agreed that this "is clearly the year to make OSF/1 a significant player in the Unix market."

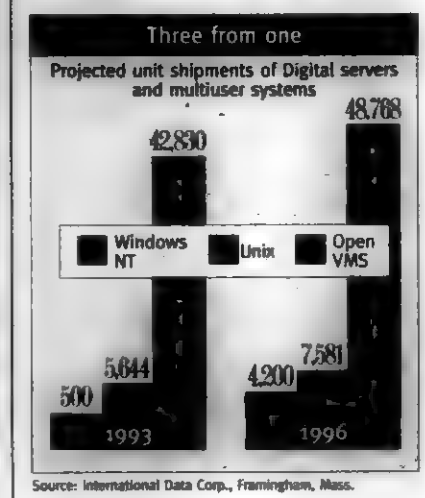
Observers said competitive pressure, particularly from Hewlett-Packard Co., is also helping to cement Digital's need for an increased Unix presence. However, users interviewed recently expressed reticence about casting their lot with DEC OSF/1, saying it remains too shapeless to latch on to right now.

"It's more an operating system of the future," said Matt Holdrege, senior network specialist at PacifiCare Health Systems, Inc. in Cypress, Calif.

"The salespeople talk about OSF/1, but they're hampered by the lack of real packaged solutions," added Tim Bird, director of information services at Paws, Inc. in Muncie, Ind. "They can only sell OSF/1 right now to people who really know what they're doing."

Rick Webster, a senior systems analyst at Caterpillar, Inc. in Peoria, Ill., said he "would like to see OSF/1 fly." However, he added that Caterpillar uses both HP's and IBM's Unix systems and has no definite DEC OSF/1 purchase plans.

Digital acknowledges that its Unix track record makes users nervous. As a result, the debut of DEC OSF/1 2.0 got top billing Oct. 12 when the company unveiled a wide range of products.



Source: International Data Corp., Framingham, Mass.

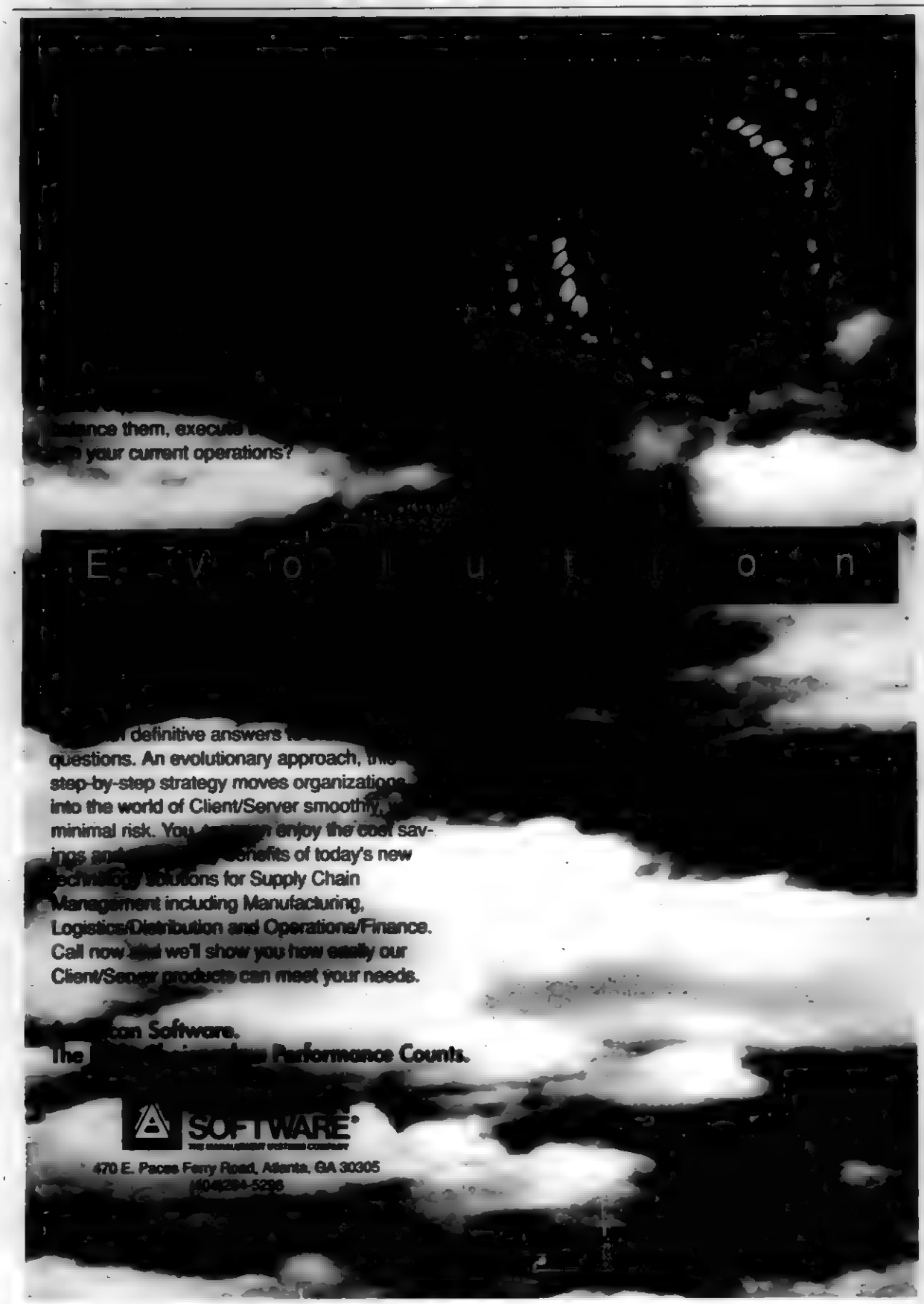
"They've been talking about OpenVMS and NT, too, but what they've pushed us aggressively on is OSF/1," noted Dennis Vohs, chairman of software vendor Ross Systems, Inc. in Redwood City, Calif. "I think they realized that HP was eating their lunch," he explained.

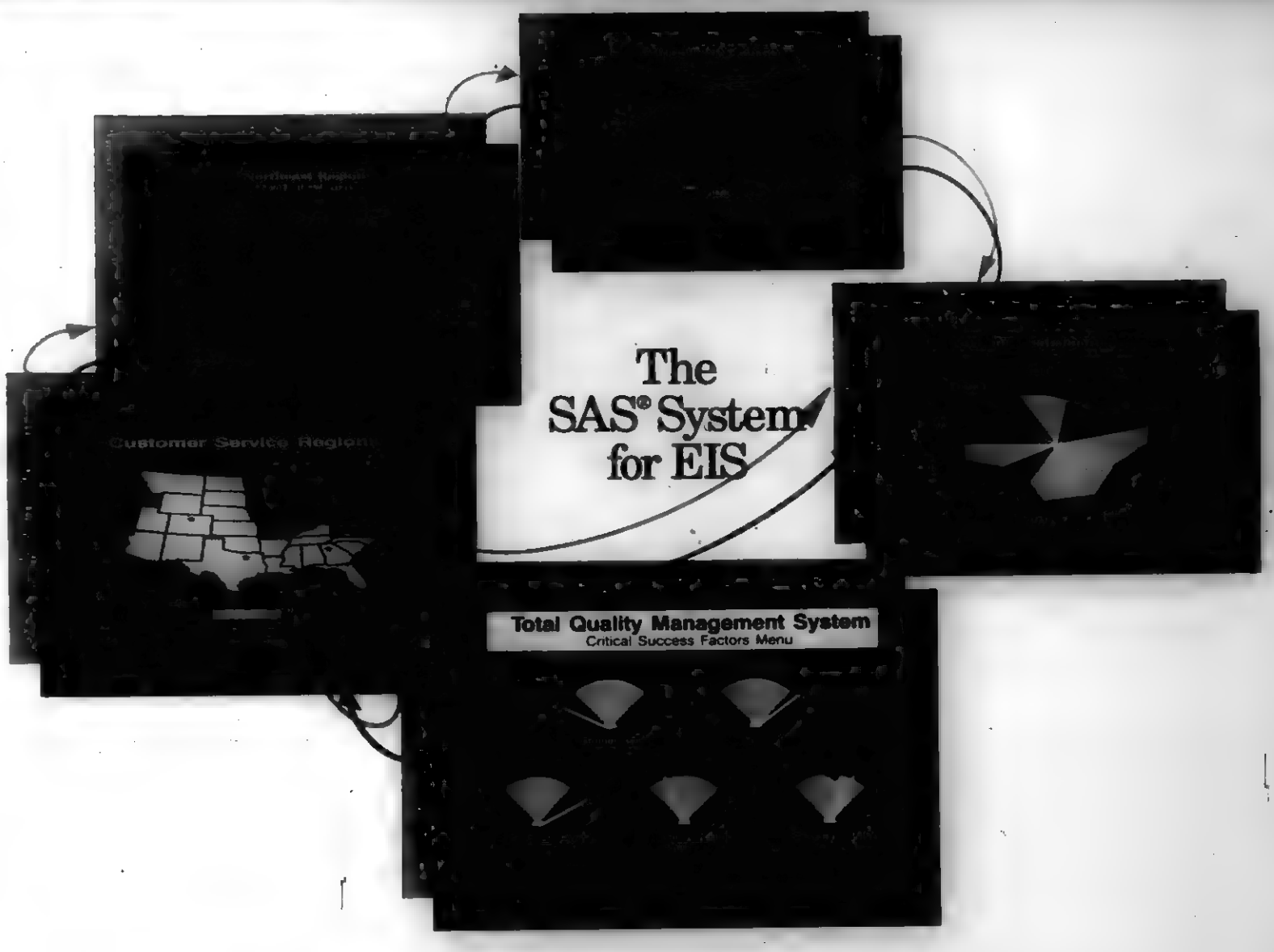
Ross has been one of the leading suppliers of applications for Digital's VAX/VMS computers. However, Vohs said "almost all" of its major sales in the last six months "have the words 'HP 9000' in front of them," a reference to HP's commercial Unix systems line.

When it comes to Unix, Digital essentially has nowhere to go but up. Edward Lucente, vice president of worldwide sales and marketing, conceded that even with Alpha, the company is "just barely holding [its] own" in the workstation market after losing significant ground in the last few years.

Digital did not rank among the Top 10 vendors of commercial Unix systems priced from $10,000 to $1 million in 1992, according to International Data Corp. (IDC). The company came in 12th worldwide on IDC's list, with just a 2.6% share of a $7.26 billion market, which amounted to less than $200 million in sales.

DEC OSF/1 sales have been slowed since its March introduction by a small applications count and the lack of multiprocessing and layered software oriented to commercial environments. Digital hopes DEC OSF/1 2.0 will attract more interest when it ships in January with new layered software and support for running recompiled Unix System V Release 4 applications.





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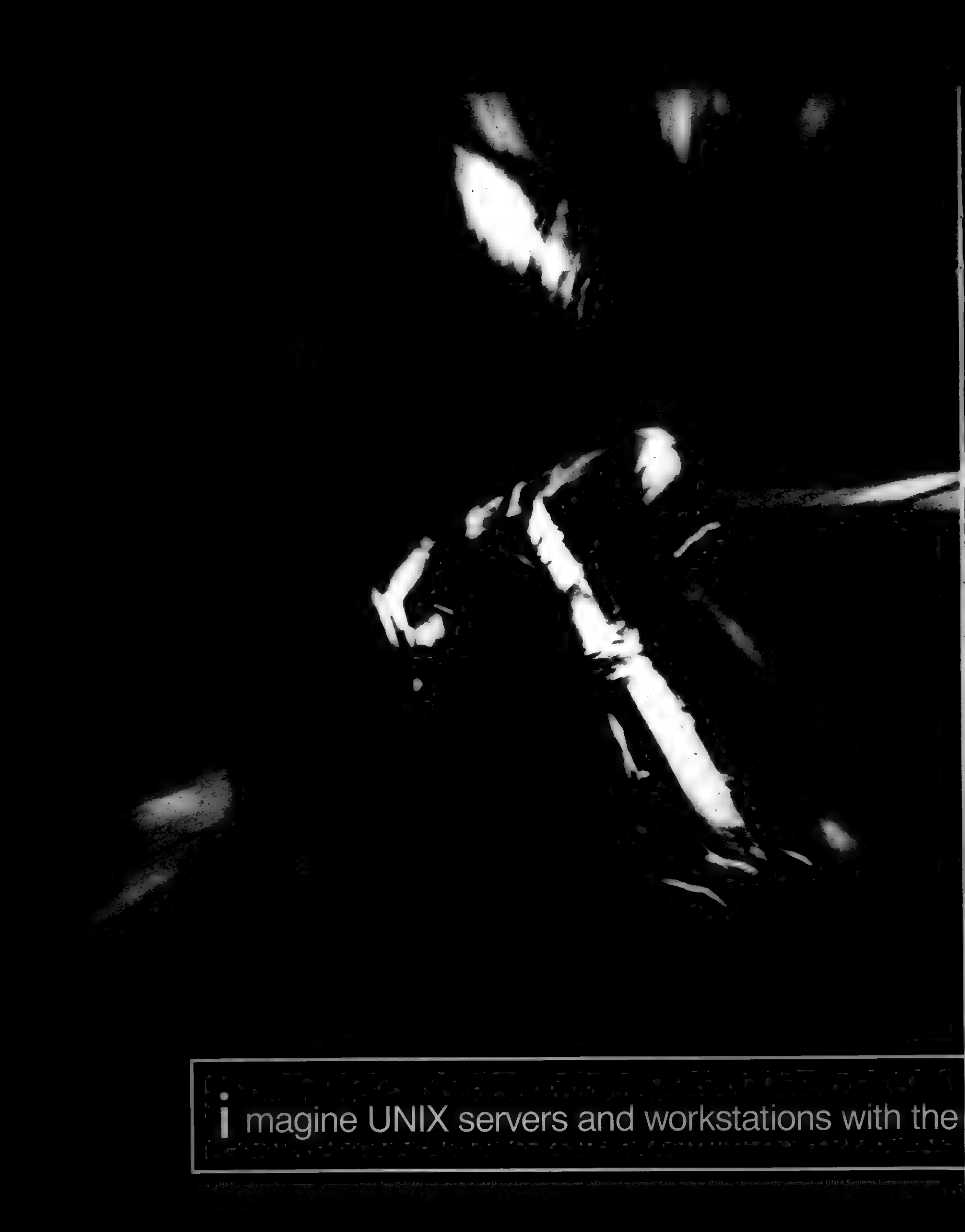
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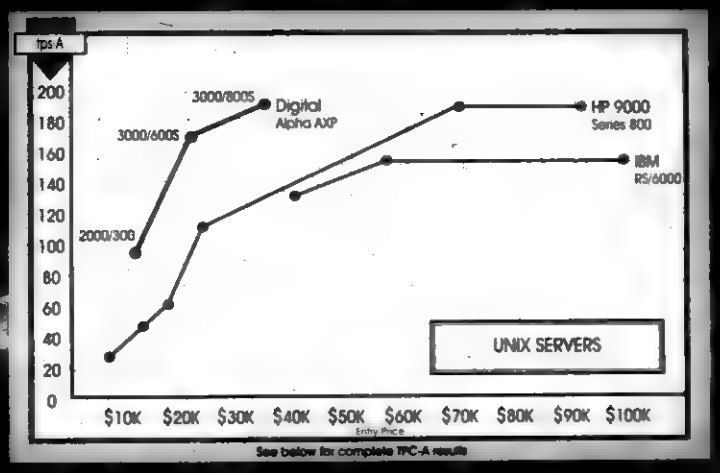

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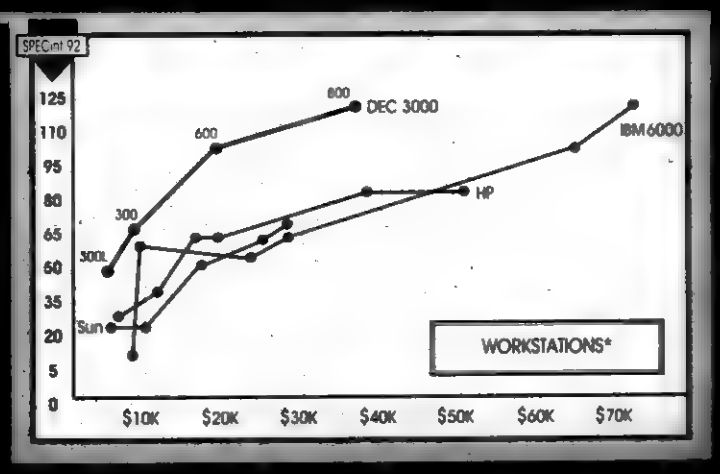

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Remote workers get pay-per-view LAN access

By Joanie M. Wexler

Another data communications option for workers at large emerged last week when Infonet Services Corp. initiated a pay-as-you-go dial LAN service.

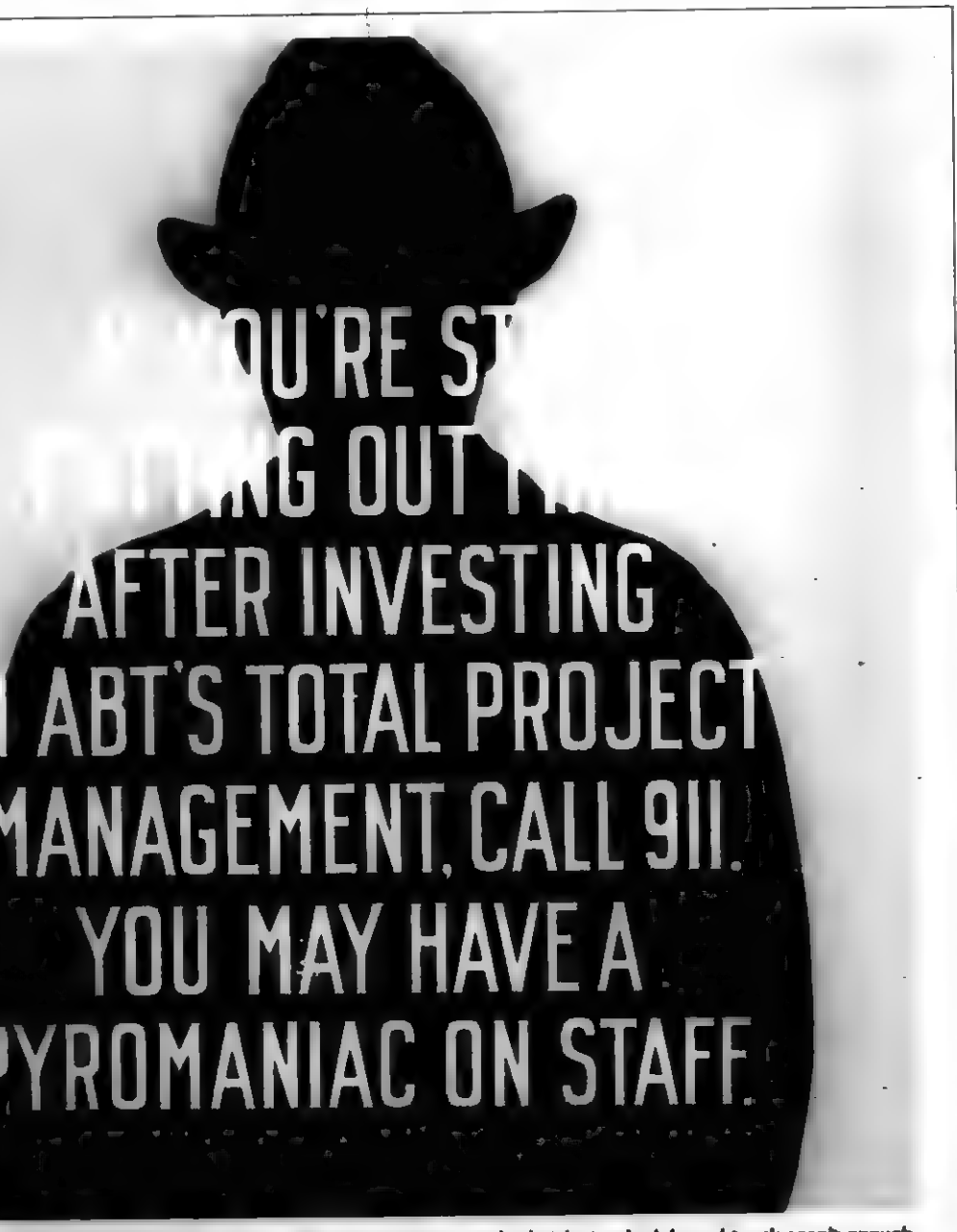
The El Segundo, Calif.-based worldwide network services provider added a usage-sensitive cousin to its existing InfoLAN service, which provides TCP/IP LAN internetworking services for large-volume applications at a fixed price.

This latest offering, Switched Access Services, is targeted at telecommuters, business travelers and other low-volume users looking to leverage their companies' existing TCP/IP LAN infrastructures with a minimal investment, said Larry Morgan, Infonet's vice president of product marketing [CW, Oct. 11].

His firm's offering comes amid a rash of remote-access product rollouts that also accommodate staffers wishing to dial into LAN internetworks. The key differentiator between these alternatives — from the likes of Shiva Corp., IBM and Centrum Communications, Inc. — is that Infonet provides end-to-end management and security, the carrier said.

Infonet found "customers do not want the Excedrin headaches associated with provisioning, maintaining and securing their own dial networks," said Doug Laurin, Infonet product manager.

Infonet said the service is available in more than 20 countries via a local or 800 number call and that eight global production customers are now on the network. Software maker Sybase, Inc. has signed on with the goal of "making access to the Sybase global network only as far away as the closest wall jack," said Don Proctor, a Sybase senior technical staffer.



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LAN-to-go

The demand for public dial-in LAN services will be fueled by at-home workers, travelers and occasionally communicating business partners

U.S. LAN dial service revenue forecast

Source: The Yankee Group, Boston

Customer Sun Microsystems, Inc. said it wants to give selected third parties access to some Sun data while isolating them from other access privileges.

Infonet is providing multitiered security to set up this scenario for Sun and other customers. Its security scheme includes user access codes, passwords and network segmentation.

Public alternatives to the Infonet dial-up offering today largely include gateway services in and out of users' IP networks to carriers' X.25 or frame-relay networks, said Caroline Michel, a senior analyst at International Data Corp. (IDC) in Framingham, Mass.

More than 75% of corporate America today has "hundreds to thousands of employees traveling at least one day a week," said Mark Winther, vice president of telecommunications at New York researcher Link Resources, an IDC company. "Dial IP services are a key way to keep them in touch."

Infonet service pricing ranges from 28 cents to $1.88 per minute, Laurin said. Users must run computer software containing the Point-to-Point Protocol for industry-standard IP wide-area network connections; Infonet will install a dial-up router at each participating site, make the appropriate hookups and manage the end-to-end link.

Initial access speeds are 9.6K and 14.4K bit/sec. Users acknowledged that comparatively skinny WAN bandwidth persists as a general drawback for users accustomed to much faster LAN speeds, but to a remote user, lower network response times "beats driving an hour into the office to get an application to run faster locally," said David C. Berg, Sun vice president of information resources.

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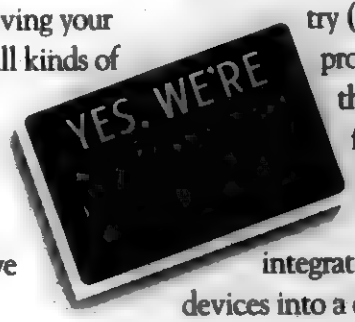

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While the 601 outruns Pentium, it actually runs cooler. The 601 draws only 8.5 watts of power to 16 watts for Pentium which, incidentally, leads to lower overall system costs.

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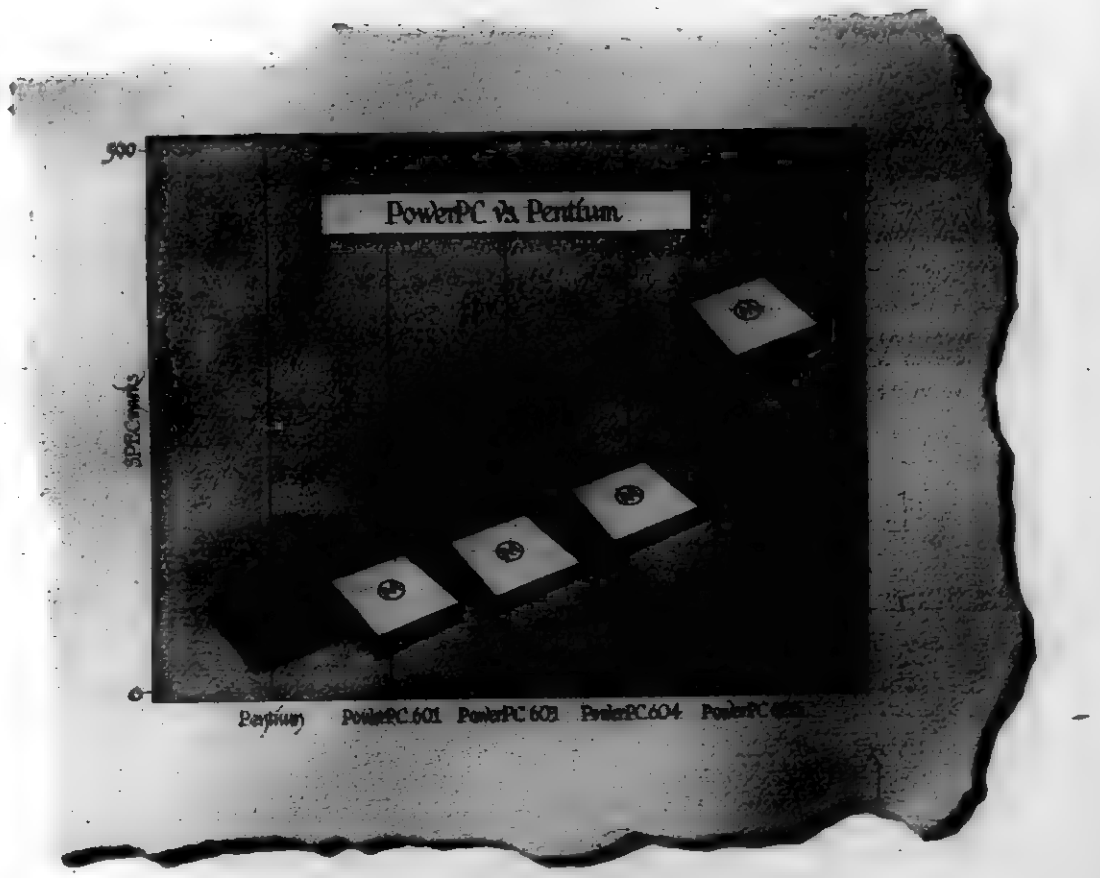

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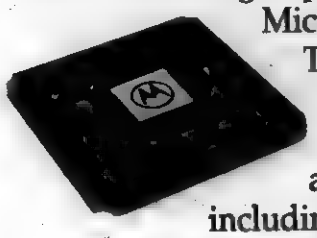

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MOTOROLA

PeopleSoft adds work-flow support

By Kim S. Nash and Craig Stedman

BURLINGAME, CALIF.

PeopleSoft, Inc. last week promised to add work-flow support to its client/server accounting packages, playing catch-up to Dun and Bradstreet Software, which has touted built-in work-flow functions as a differentiator in the financial software market.

PeopleTools 3.0, released last week, is an application development tool kit that sports rudimentary work-flow features, such as one-way electronic mail and image support. The tool kit lets users modify and add work-flow capabilities to PeopleSoft Financials and other applications.

PeopleSoft is also talking with Lotus Development Corp., Reach Software Corp. and other vendors about building links to their groupware systems, but no deals have been signed.

"Work flow will be critical" in line-of-business applications, such as accounting and order processing, according to Tom Kucharvy, president of Summit Strategies, Inc., a client/server consultancy in Boston.

For example, at drug and health care firms such as Merck & Co. and Eli Lilly, work-flow technology is "a de facto requirement," Kucharvy said.

The Federal Drug Administration's complex laws mean pharmaceutical workers must document every step in filing for patents, distribution rights and the like. Workgroup systems offer productivity enhancements and an electronic trail that make the technology "ideal for finance, inventory and other intricate processes," he said.

In tandem

Originally scheduled for an early 1993 release, Dun & Bradstreet Software's client/server financial applications are now in line with PeopleSoft's release timetable

Application	Delivery	Price
Dun & Bradstreet Software's Financial Stream		
SmartStream decision support	July 1993	Starts at $100,000.
Accounts payable General ledger Fixed assets	Oct. 1993	Starts at $225,000
Accounts receivable	Dec. 1993	
PeopleSoft's PeopleSoft Financials		
Accounts payable Accounts receivable General ledger	Sept. 1993	Average license fee for each module: $300,000
Asset management	Dec. 1993	

More on the way

The next version of PeopleTools, due out in the third quarter next year, is expected to sport full-blown work-flow functions, including two-way E-mail and links to Notes and Reach's MailMan workgroup offerings. That means D&B Software, which had pointed to its built-in work-flow features as unique, must find another way to capture user attention.

Furthermore, D&B Software's Financial Stream line of client/server accounting applications has been slow in coming. The company, which first talked about the products in 1991, released Financial Stream in early October, about a week after a promised September delivery [CW, July 26].

None of the new sites is in production yet with D&B Software's Financial Stream, a spokesman said.

While D&B Software's delay may deter potential customers, existing mainframe D&B Software sites will probably hang on. Baxter International, Inc. has tested D&B Software's SmartStream decision-support product for almost two years but has yet to put it into production. Other projects are more pressing, according to Bill Reiher, vice president of central systems.

"But being a long-term D&B user, it's just a matter of time for us to adopt it," Reiher said.

Product rollouts

Twenty-five customers have licensed PeopleSoft Financials, while D&B's Financial Stream is installed at a dozen sites.

D&B plans to add support for Sun Solaris this month. It currently supports HP/UX, DG-UX and IBM's OS/2.

In the "controlled release" category is a general ledger package from The Dodge Group, Inc., led by former McCormack & Dodge Chairman Frank Dodge. After two years of talking about the line, Dodge said he expects volume shipments to start in February. Engineering delays pushed Dodge's OpenSeries line about 18 months behind the original ship schedule, Dodge said. "The software is still kind of immature," he said. "It doesn't have every bell and whistle that it will ultimately have in February."

Evaluators in our Firing Line section liked PeopleSoft Financials' functionality but found the client/server technology difficult to install. See story page 118.

Portable People

PeopleSoft, which already supports databases from Sybase, Inc. and Oracle Corp., plans to add Informix Software, Inc. to the list "within the next several weeks," said Paul Salagiver, vice president of partnership programs at PeopleSoft.

However, support for The ASK Group, Inc.'s Ingres database "isn't as far along," acknowledged chief executive officer Dave Duffield. Although it is targeted for next year, an Ingres port is not as pressing, he said. "Ingres isn't growing too quickly, but there's an enormous installed base."

Ingres users looking to jump to other databases might do well to buy PeopleSoft applications, he suggested, because they are portable to other systems. In contrast, D&B's Financial Stream line runs on only Sybase's SQL Server.

IBM's DB2/2 and DB/6000 and Microsoft Corp.'s SQL Server for NT are also on PeopleSoft's 1994 to-do list, Salagiver said.

—Kim S. Nash

Client/server

Start-ups bring heavyweight tools

By Melinda-Carol Ballou

A new breed of object-oriented client/server tools is on the way that reportedly will speed the development process by improving performance and generating cross-platform code.

Built by Dynasty Technologies, Inc. in Naperville, Ill., and Forte Software, Inc. in Oakland, Calif., these tools are said to let developers to slice up their applications to run on the most appropriate clients and/or servers.

"These new tools use object technology without the complexity of object-oriented programming languages to let developers create graphical clients with multiple back ends," said Peter Kastner, a vice president at Aberdeen Group, a consulting firm in Boston. "And business objects will allow businesses to create units, such as a purchasing function, and then snap together applications from templates."

While the "first generation" of client/server tools, such as Powersoft Corp.'s PowerBuilder, required developers to create third-generation language scripts, these new tools offer a fairly sophisticated knowledge base to automatically generate code, Kastner said.

Unlike the existing generation, the new tools were designed to be multiplatform. Developers can create one specification and then choose the target platform on which the application will run. The knowledge base then generates the required code for the specific platform, graphical user interface or SQL database, said Judith Hurwitz, president of Hurwitz Consulting, a consulting firm in Watertown, Mass.

Here and now

Both rules-based tools develop applications that can be triggered by events or respond to external occurrences.

For example, a stockbroker might need an application to change when prices for a particular commodity reach a certain point.

Earlier attempts to target this market by Cooperative Solutions, Inc. were unsuccessful because of a premature entrance and a lack of multiplatform support, according to industry analysts. But these new companies may be hitting the market at the right time, providing a combination of capabilities that corporate developers are beginning to demand, according to some analysts and users familiar with the tools.

Dynasty began shipping its tools — also called Dynasty — earlier this year but will not officially unveil them until next month.

Forte last week announced that its tools, also called Forte, are in beta but will not ship generally until next summer. Forte will also offer management tools that will reportedly administer and monitor the performance of the partitioned applications.

The partitioning is significant because it allows developers to target the location for the performance of specific tasks. With other tools, "fat clients" can suck up bandwidth, which can create performance problems that these tools mitigate, Kastner said.

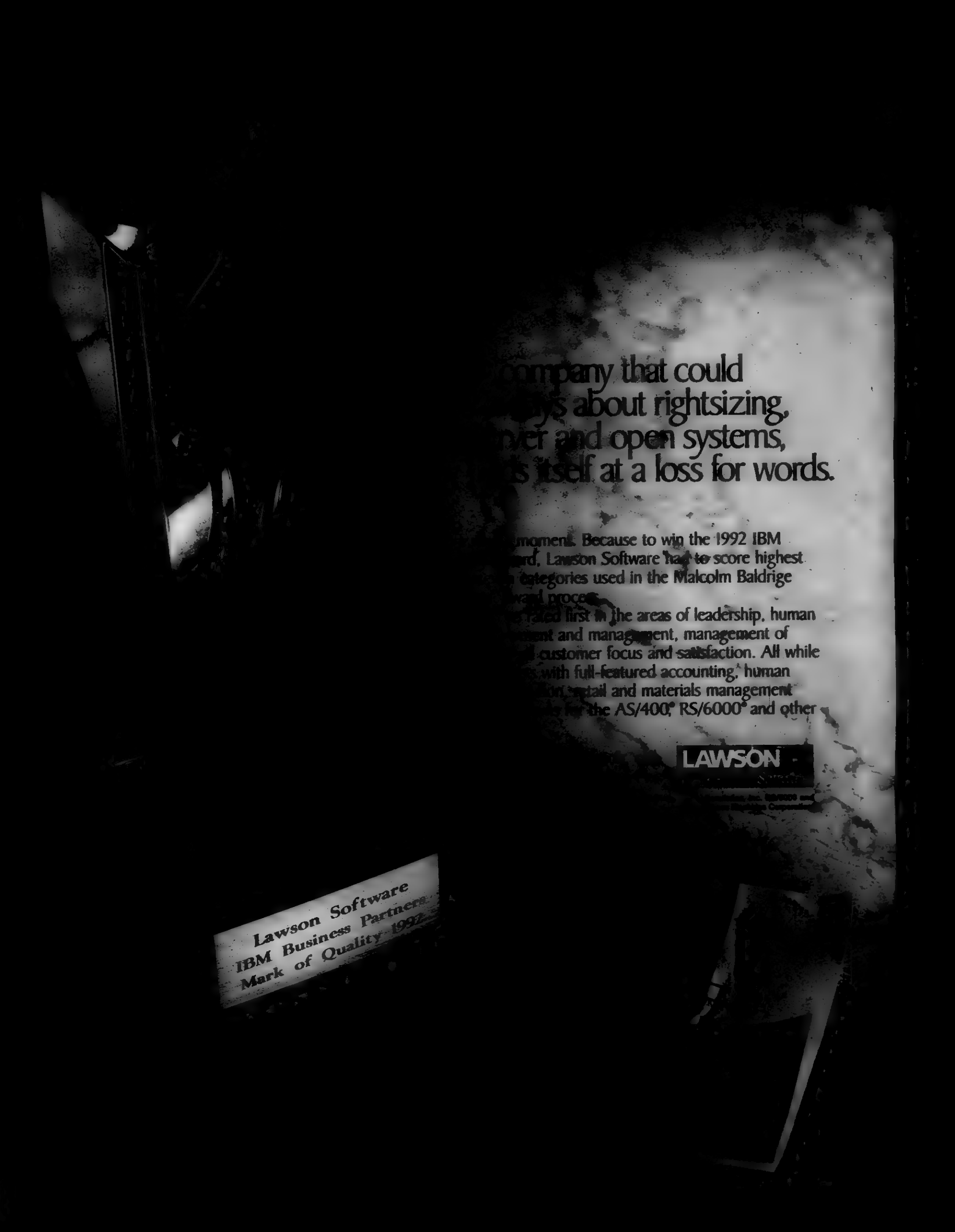
Early users of Dynasty's product — an aerospace firm, a claims processing company and a telecommunications firm — generally said the object-oriented structure and partitioning available with the tools are able to handle transaction-intensive, complex application development to distribute client/server applications.

For example, Sikorsky Aircraft Co., an aerospace firm in Stratford, Conn., is using the Dynasty tools to create an application that will manage mission-critical data such as purchasing and shipment information from customers and suppliers.

The company was worried about scaling applications, the performance of other vendors' client/server products and management and maintenance issues.

The pricing for Dynasty is $8,000 per development workstation seat and $50 to $150 per runtime license, depending on platform.

Both Forte and Dynasty support Macintosh, Windows, OS/2 and multiple Unix platforms. Forte pricing will be announced when the product ships.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Damage control

Don't look now, but that sound you hear may be from the cracks appearing in the Microsoft operating system edifice.

Despite last week's vague statements that Windows NT shipments are "exceeding expectations" — exactly what those expectations were wasn't revealed — it's clear that Microsoft is still struggling to temper optimism over NT's market performance. The optimism is almost wholly of Microsoft's own making.

When Microsoft officials first began talking about NT 2½ years ago, they confidently positioned it as the heir apparent to Windows. But a few things changed between those early heady pronouncements and NT's actual shipment three months ago. For one, Microsoft found that it couldn't fit the mother of all operating systems into less than 16M bytes of memory, a configuration used by about 2% of PCs sold today. For another, IBM got its act together with a really functional and efficient version of OS/2. Finally, Microsoft created a separate migration path for Windows users, a sort of "NT Lite" it calls Chicago.

So now the company is in damage-control mode. Microsoft has spent the last year recasting NT in a decidedly less ambitious role as a Unix competitor and telling everyone who will listen that no more than a million copies will ship in its first year (compared with about 8 million to 10 million for Windows 3.0). Rich Tong, Microsoft's general manager for enterprise marketing and products, told me last week that NT will someday overtake Windows shipments, but he said it'll be at least a couple of years before PC price/performance makes NT's voracious memory appetite a nonissue. I think he's overly optimistic. If half the PCs shipping in 1995 have 16M bytes of memory on them, I'll eat this page. And even if Tong is right, Chicago will change the market dynamics considerably, probably at NT's expense.

With the mass market clearly out of NT's reach, Microsoft has shifted its focus to the network server, where Unix is now dominant. No doubt NT will win respectable market share there, but there's no way it will overtake Unix in the foreseeable future. That means Microsoft will wind up in a trench war against a very established competitor, and that's a battle Microsoft hates to fight.

So in the ultimate tribute to IBM, Microsoft is using the old Blue trick of fear, uncertainty and doubt, or FUD, to freeze customer buying decisions. Sez Microsoft, if you'll just wait eight to 12 months, you can have 32-bit capabilities with Chicago. Another year after that and you can get Cairo with its object-oriented file system. And at some undefined point there'll be groupware capabilities built into the operating system. Just wait. Just wait.

The trouble is, customers don't have to wait. All that stuff is available right now from Microsoft competitors. Uh oh. Crack.

Paul Gillin, *Editor*

Right people for the right job

The article, "Client/server breakdown" [CW, Oct. 4] was one-sided. The examples cited resulted from not getting the right budget and/or people to do each section of the project. Why can't management understand that data processing people cannot be masters of everything?

They need some temporary help to do the special tasks that are not usually done.

Get the right people in to do the planning and testing of standards. Hire the right people with special programming talents to do interfaces with different computer systems. Don't accept one choice in selecting software. Make outside consultants inform you if they are getting paybacks for their selection.

Dennis Gilbert
New Bedford, Mass.

they had anything even close to the 4% that the article says they have!

Sheldon S. Cohen
MMA Consulting Group, Inc.
Boston

John Scoggins
John Scoggins and Associates
Danielsville, Ga.

An examination of the statistics presented in "City limits" raises questions about their credibility. If I apply the level of expenditure in the city of Oakland, Calif., then our entire information technology budget would be $2,500. That's less than the cost of one complete desktop workstation.

Here in Oakland, our information technology budget is about $10 million per year. At that level, we spend $2,500 per full-time employee. Based on my experience, that is probably a more realistic level. Yes, it is quite a bit less than the $7,000 per employee in the private sector, but nothing even close to the figure of 50 cents cited in the article.

Stephen R. Ferguson
Office of communications
City of Oakland, Calif.

Number-crunching doesn't add up

"City limits" [CW, Sept. 27] is blatantly erroneous regarding cities' spending for this purpose.

Our hands-on experience in consulting with local governments across the country suggests annual operating budgets for information systems on the order of $500 per employee and capital expenditures over a five-year horizon on the order of $600 per year. Further, we have found that operating expenditures are about 1% of a typical general-purpose local government's budget.

Most local governments wish

Sorting through postal systems

While the story "Postal Service sorts through automation" [CW, Oct. 4] quoted the U.S. Postal Service as saying its "core strategy is to sort mail using bar codes," it was interesting to note that our copy of *Computerworld* did not have a bar code on the address line.

This is because the Postal Service does not have equipment to sort magazines and newspapers that are not "8½ by 11 inches" or "digest size."

There are almost 3 billion pieces of mail a year — newspapers and magazines such as the size of *Computerworld* — being hand-sorted through all the steps involved with delivery to the subscribers' door, and guess what: There are *no* current Postal Service plans to offer bar-coding to large, flat-size publications and newspapers.

Dennis Farley
Distribution manager
Fairchild Publications
New York

"PC-based postal kiosk axed" [CW, Oct. 4] omits factual data and espouses erroneous opinions.

The Postal Buddy was *not* user-friendly. Nor did it provide changes of address quite the way the sidebar indicated. Heaven help us if this is Vice President Al Gore's idea of reinventing government.

Paying more to change addresses is not in the interest of the taxpayer. The United States Postal Service could forego profits on the machines in exchange for floor space if they had realized the projected savings on changes of address, but the procedures that the Postal Buddy provided apparently cost the Postal Service more than planned and provided no savings.

William B. Adams
Symbiotic Security
Springfield, Va.

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▶ *Cartoonist Rich Tennant is taking the week off*

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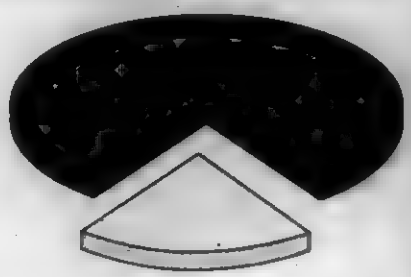

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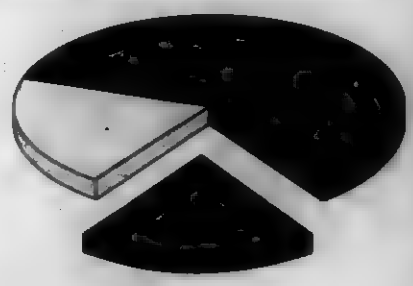

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50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
80. Sys. Integrators/VARs/Consulting Mgt.

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It may be obvious, but it isn't simple

Jim Stikeleather

Patty Seybold was right when she said we need to make business rules visible and maintainable by users [CW, Oct. 4]. The rate at which business is changing is just too rapid for those of us working in IS to keep up by reprogramming. Users must be able to manipulate and change rules as business circumstances dictate. But here's the catch: There's a world of difference between being on the trail of a solution and having one in hand.

At Kash n' Karry Food Stores, Inc., we've been working for two years to build an information architecture similar to the one Patty envisions. It has turned out to be more difficult than we ever expected.

The work we are doing with object technology has led us to a three-tier information architecture. The first tier consists of basic business entities — person, item, truck, etc. — and the relationships among them. The second tier is made up of models, which are groups of entities interacting to accomplish some business purpose. At this level, the concepts of rules and roles are introduced. The third tier consists of views and events that allow observation of and influence on the models.

For reasons of consistency and integrity, IS should retain control of the basic objects, but we've concluded that users should be able to manipulate the rest — rules, roles, views and events. However, three big obstacles block the way to actually achieving that ideal — technology, people and organizations.

We have not yet found a commercial product that supports the rule/constraint mechanism we need and that can be integrated with the other mechanisms in our object architecture. In the interim, we are preprogramming calculation-based rule types (price X < competitor Y, price X > cost, etc.) and letting users modify the variables. This won't work for long, however, because it doesn't handle rule conflicts or symbolic rule processing.

People also present difficulties. Human beings don't operate by well-formed, well-defined, consistent rules. Many of the business rules people operate with are based on habit rather than logic, are highly exception-driven and cannot generally be described by the user with any degree of accuracy.

Ask a group of people performing the same function how they do their jobs and you will almost always get variations on a common set of rules and another set of highly individual rules. None of these will necessarily be better than others because the business has been operating with all of them in effect. In fact, it can be very dangerous to impose uniformity because you may actually upset some important balance in the ecology of the business.

Organizations are also dauntingly complex. Rules vary among departments, which is why accounting and marketing can start with the same data and generate very different spreadsheets, graphs and analyses. If you do find some universals, such as a pricing strategy, you still need to be careful because their universality may be more apparent than real. Lower-level employees, exercising good judgment, may ignore price policy in some cases.

Patty was right. We do need to develop visible rules and put them in the hands of users. Dealing with the complexities involved is delicate and painstaking work, which cannot be accomplished overnight. We'll be happy if we can do it in the next three to five years.

Stikeleather is director of systems development at Kash n' Karry, a grocery chain based in Tampa, Fla.

You get what you don't pay for

When you make computing and communications free, you encourage waste and abuse

Michael Schrage

While reading my E-mail recently, I stupidly downloaded what turned out to be a 6,000-word press release masquerading as a message from some PR jerk. Instead of flaming, I very politely asked to be completely erased from his distribution list.

Next time I may not be so polite. And there will definitely be a next time because it costs guys like this virtually nothing to tell me what I don't want to know. The Internet is cheaper than a 29-cent stamp, faster than a fax and as reliable as Federal Express. This chump can launch thousands of these miserable missives with the tap of a key.

This is not a lament about junk E-mail but about underlying issues that matter far more than next-generation nuisances on the Internet. There's an economic trend here that threatens to undermine the value and importance of enterprisewide computing. And if companies don't start coming to gripe with it *now*, they are going to royally screw up their information infrastructures.

The problem is simple economics. Today's dominant information technology trend is transforming interconnectivity and computational cycles into marginal costs. Information technology organizations are hell-bent on making corporate data systems as accessible, transparent and interoperable as technically possible. Using client/server, they're pushing to cut transactions — retrieving a file, updating an inventory, scanning a database — as close to zero as possible. In econo-speak, they're turning teleprocessing into a "free good," much like the air we breathe and the internal telephone calls we make. This is a horrible, counterproductive mistake.

What happens when organizational goods and services that were once costly become free? You get a blizzard of paper memos. You hear 40 voice-mail messages a day. You get deluged with invitations to immaculately designed desktop media presentations.

Remember when spreadsheets were actually time-consuming and hard? When VisiCalc and Lotus' 1-2-3 made spreadsheeting a snap — made numerical analyses into "free goods"— companies caught matrix madness. Indeed, many corporate budget committees now refuse to look at more than three spreadsheet scenarios because they've learned how wasteful it is to compare 30 versions.

When the marginal cost of an enterprisewide replication of a Notes database or a multimedia presentation drops to zero, guess what your virtual in-basket will look like.

Offering "filters" and "agents" to screen out the cybercrud is exactly the wrong answer; it avoids the problem instead of confronting it. You fight an economic problem with an economic solution. Organizations must stop turning information technology into a free good.

Media without market discipline breeds pathologies of wastefulness. Markets matter. That's why IS needs to invest more thought in designing chargebacks than it does in adopting CASE. Why should E-mail bandwidth be free? Require a digital "stamp" to send it.

The reason our world soaks in pollution is that our natural resources have been managed as free goods. Who cares if we mess them up a bit? By relentlessly trying to make internal computing free, companies similarly mismanage their data resources. The ecology of economic organizations demands that managers understand that the most valuable things in organizational life aren't free.

Schrage is a fellow at the MIT Sloan School Center for Coordination Science and the MIT Media Lab. His Internet address is schrage@media-lab.mit.edu.

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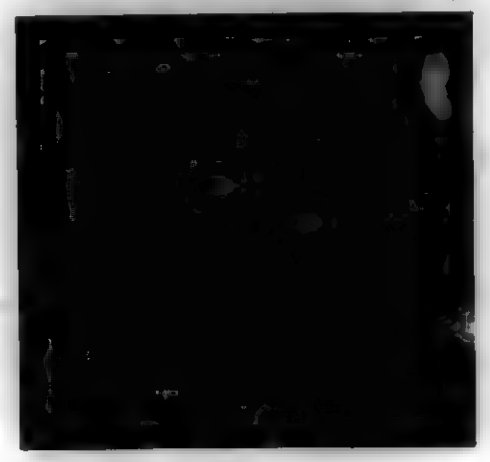

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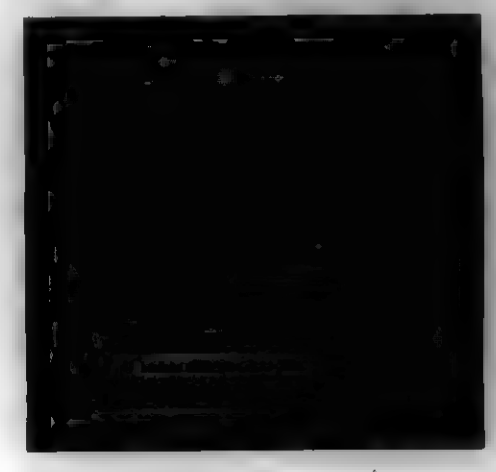

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LOTUS 1-2-3 RELEASE 4 RATED #1. CAN MICROSOFT BEAT A STRAIGHT FLUSH?

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In a matter of months **1-2-3 Release 4** has already been acknowledged by reviewers and users as the spreadsheet of choice and the way of the future. It earned the highest Windows™ spreadsheet score ever by *InfoWorld*. And more recently, an independent usability study showed that 67% of Microsoft Excel 4.0 users tested say they would prefer to be using the new 1-2-3 Release 4 for Windows.*

Ami Pro 3.01 word processor is our Cinderella story. For years, it's been ranked above both Word and WordPerfect® by reviewers, but many users had been reticent to make the switch. Now that's changed. *PC/Computing* has rated Ami Pro ahead of WordPerfect 5.2 in 8 out of 8 categories. And users by the hundreds of thousands are discovering it's a better fit.

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InfoWorld Windows Spreadsheet Ratings:

1-2-3 Release 4 (8/93)	7.8
Excel Release 4.0 (10/92)	6.9
Quattro Pro Release 1.0 (10/92)	6.5

"Approach is a big, big winner." PC WEEK 6/28/93

PC/Computing Word Processor Scores 8/93:

Lotus Ami Pro 3.0	92.0
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"Organizer is one of the most appealing Windows applications yet." PC WEEK 9/93

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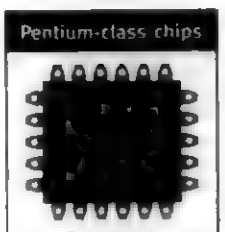
Intel to verify PC Pentium upgrades

By Michael Fitzgerald

Intel Corp. has established a program intended to iron out wrinkles in its Pentium upgrade strategy.

The Intel Verification Program, which has lined up support from IBM PC Co., Compaq Computer Corp., NCR Corp. and some 40 other vendors to date, will tell users whether the system they are purchasing is guaranteed to be Pentium-upgradable.

Intel designed the program in the wake of vendor confusion over the proper way to implement an upgrade-oriented OverDrive version of Pentium, called the P24T, which will ship in the second half of 1994.



Source: Dataquest, Inc., San Jose, Calif.

Changed expectations

An Intel official freely acknowledged that the company had developed the verification program to modify its initial expectations on a 486-to-Pentium upgrade strategy.

"We thought [upgrades] would be focused on DX2 to Pentium, and it turns out that ... [Pentium upgradability] is designed in from low-end SXs," said Paul Otellini, an Intel senior vice president. Otellini said the prevalence of universal motherboards, many of which can support any processor from a base 486SX to a top-of-the-line DX2 through the flick of a switch, caught Intel by surprise.

Analysts said Intel had to establish the verification program to prevent users from buying the wrong version of the upgrade chip. They said the lengthy development lead time for the P24T had caused some of the problems for Intel.

"Basically, it's a cover-my-ass strategy by Intel," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

Intel will charge hardware makers $5,000 per model tested to verify that a system is upgradable, with a cap of $50,000 per year. Otellini said the price was perhaps half the cost that Novell, Inc. charges to certify a server as NetWare-compatible, for instance. The nominal fees are not expected to cause vendors to raise system prices.

Black, white or blue

Otellini said the verification program, combined with the upgrade strategy, should eliminate any user concerns about the color of their upgrade socket.

Various systems use blue, white or black as the socket color. Intel will produce several different versions of the P24T, and users will only need to know what system they have to pick a chip.

Once tested, systems will receive a small logo to show they are certified. Otellini said the logo will be less prominent than the "Intel inside" campaign.

He also said Intel will continue to use the verification program because there will probably be "complexities" in upgrading from Pentium to future Intel chips.

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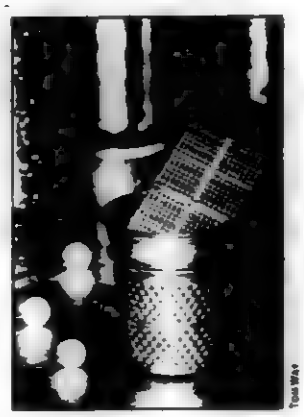
Chip dynamics



Texas Instruments

It fits in a thimble, *but this new 64M-bit dynamic RAM chip from IBM and Siemens AG can hold up to 6,400 pages of double-spaced text, which would cover two reams of paper, or, using a common industry measure, fill roughly 2½ volumes of the* Encyclopaedia Britannica. *Currently available in sample quantities, the DRAMs are among the first 64M-bit chips in the industry.*

Compressed data will go from DOS to OS/2

Stac utility steps on Microsoft plan to encourage incompatibility with OS/2

By Ed Scannell

At the upcoming Comdex/Fall '93 show, Stac Electronics, Inc. will announce that it is bundling a conversion utility with its Stacker for OS/2 compression program that lets OS/2 and DOS users transfer compressed data between the two operating systems.

The conversion utility converts data compressed with DoubleSpace, the compression technology used in Microsoft Corp.'s MS-DOS 6.0 and its upcoming Version 6.2, as well as data compressed with AdStor, Inc.'s SuperStor utility, which is provided with IBM's PC DOS 6.1.

Stac has timed the introduction to coincide with the debut of IBM's new version of OS/2, code-named Ferengi, which works transparently with Intel Corp.-based PCs running DOS and Windows. Stac's conversion utility is also compatible with Ferengi.

Stac officials said Stacker for OS/2 with its conversion utility makes it easier for DOS and Windows users to evaluate OS/2; they added that Stac is actively supporting OS/2 and Ferengi.

Incompatible with OS/2

Until now, DOS users who used DoubleSpace had no way of putting OS/2 on their systems because it was incompatible.

"DoubleSpace is a tactical effort on Microsoft's part to stop encroachment of OS/2 onto their turf," said John Bromhead, Stac's vice president of marketing.

The inability to easily transfer compressed data from MS-DOS and PC DOS over to client/server operating systems such as IBM's OS/2 2.1 and Microsoft's Windows NT has been a minor nuisance for some corporate users.

Microsoft officials recently said one of the items on users' wish lists for Windows NT was compatibility with DoubleSpace. They said it would most likely be provided in the next update of the operating system, due sometime next year.

With the release of MS-DOS 6.2 and the improvements made to DoubleSpace — most notably the compression utility's Uninstall feature — Stac believes Microsoft has left the door open to make significantly more Stac sales.

> **"DoubleSpace is a tactical effort on Microsoft's part to stop encroachment of OS/2 onto their turf."**
>
> *— John Bromhead, Vice president, marketing Stac Electronics*

"Their Uninstall feature will prove to be a big boon to users who want to remove DoubleSpace from their drives," said Ann Galdos, Stac's product marketing manager for Stacker 3.1 for Windows and DOS.

Microsoft has made several improvements to DoubleSpace including a feature called DoubleGuard that better protects users against data corruption. Some users said problems in DoubleSpace caused them to lose data earlier this year.

Strategic shift

While Stac will continue to support DOS and Windows, the company's strategy will increasingly focus on more advanced client/server operating systems and network operating systems such as OS/2 and Novell, Inc.'s NetWare and UnixWare.

"Our vision is taking on more of a corporate view. We believe if you compress data once that wherever you send it over the wires, you can still view it and it stays compressed," Bromhead said.

To reach this goal, Stac believes it must have competitive products on all major platforms. Currently, it has versions for DOS and Windows, OS/2 and the Macintosh. Novell will soon integrate a version with its Novell DOS 7.0.

"I think you will see our LZS compression engine moving to every piece of client software that Novell does," Bromhead said.

Christopher Lindquist

Ubiquitous Microsoft

It's been a few months, but I'm finally back on track, so hello again.

My new post has taught me a couple things: One is that users are probably spending a good number of MIPS on decidedly nonproductive pursuits (read: games); the other is that Microsoft, like McDonald's, really *is* everywhere. Don't be surprised to see it in your cable TV box or your car in the next couple of years.

Speaking of Mickey-D's, would you buy a cookbook from them? Somehow I think *Building the Perfect Burger* by R. McDonald wouldn't be much of a seller except on the humor charts. Angry nutritionists would probably picket any bookstore with the stomach to carry it.

OK then, would you buy a book from Microsoft on creating bug-free software? The punch line is that not just one, but two such tomes exist. What's even funnier is that some Internet surfers have read them and say they're *good*.

One message summed it up nicely: "The review given by one of our engineers about a month ago recommended that we read [the books], even though it appears Microsoft programmers haven't."

If you're interested in discovering Microsoft programming secrets so secret even Microsoft doesn't know about them, look for *Writing Solid Code: Microsoft's Techniques for Developing Bug-Free C Programs* by Stephen A. Maguire ($24.95) and *Code Complete: A Practical Handbook of Software Construction* by Steven C. McConnell ($35).

Would you know my name?

Apple reported recently that it had sold 50,000-plus Newtons worldwide. Reports from purchasers indicate that 15% have gotten the handwriting recognition to correctly spell their name in fewer than three tries, 55% have not and 27% have changed their names to "Fr1.3t." The other 3% no longer remember their names.

The Newton's handwriting recognition is not the only problem, according to the 'net.

One user reports the following: "According to rumor, certain early units have a hardware defect; several users on the 'net have reported that after getting their units replaced, they are having a much better time with Newtons.

"If you have severe problems with a flickering screen, unstable pen tracking [to test this, turn off both recognizers and try drawing circles or straight lines]; if your Newton won't start up when you want it to, even on a fresh set of batteries; or your Newton won't recognize handwriting when the AC power adapter is plugged in, contact (800) SOS-APPL; you *may* have a bad unit. Don't worry, all the Newtons in existence are still under warranty."

Risk list

Here's good news for anyone without Internet access who still wants to get a listing from the "comp.risks" group, which regularly compiles a variety of computer risk-related information such as viruses, hacking and bugs into a file. You can now have the "risk" list faxed to you.

Call (818) 225-2800 or fax (818) 225-7203 for more information. If you do have Internet access and would still like to get the fax, send E-mail to risks-fax@vortex.com.

Gates gotcha

It appears that the electronic Bill Gates impersonator has surfaced once again — this time inside Microsoft. An Internet subscriber says that a number of Microsoft employees checked their E-mail one morning and discovered messages from "Billg" saying they were fired.

The real Bill apparently is not amused, and the pretender had best stay hidden if he wants to keep his head — and his job.

Back to the future

Bulletin board services are always good for a conspiracy theory or 20. This is a recent favorite concerning talks between Apple and Next, Inc. to put NextStep on the PowerPC platform:

"It would be a homecoming for Steve Jobs. I have a warped theory that the whole reason for Next was that Steve supported a faction in Apple that wanted the Mac [operating system] to evolve in a Unixy direction, but the new corporate powers wanted otherwise.

"That faction wanted to prove them wrong, and Jobs was in agreement. Final vindication would be that Apple swallows [Next] and uses their product, and Jobs returns to the board to lead them back into the sunlight."

Stranger things have happened, and the future of Digital's Alpha chip may be one of them.

Talk was floating on the Internet that Digital is going to sell its Alpha chips to Mercedes Benz to operate "engine management, alarm systems, navigational aids" and other luxury auto toys. That may be, but will it run Windows NT?

Lindquist is technical editor at the upcoming magazine *Electronic Entertainment*. He can be reached electronically over MCI Mail at clindquist, CompuServe at 73361,263 or the Internet at chrisl@netcom.com.

Briefs

Manage the project

Microsoft Corp. recently previewed Version 4.0 of its Project project management software, which will tentatively include Wizards, support for a true drag-and-drop protocol for making assignments and integration with Schedule+. Separately, Microsoft is offering a $100 rebate on Microsoft Office and Microsoft Works for the Macintosh through Jan. 31. Version 4.0 of Office for the Macintosh will ship by spring.

Apple pushes CD-ROMs . . .

Apple Computer, Inc. will sacrifice an estimated $100 million in profits this year by selling its CD-ROMs at cost to seed the market for interactive multimedia products, Executive Vice President Ian Diery said recently. He predicted that the surrender of $100 in profit on each $329 CD-ROM drive will result in sales of 1 million Apple CD-ROM drives this year, up from 43,000 last year. Diery said Apple will also soon start selling equipment enabling CD-ROM programs written on the Macintosh to run on IBM-compatible computers.

. . . and Newton on the Mac

Apple has made several moves to get its Newton MessagePad connected to the outside world. Next week will see the arrival of the Apple Wireless Messaging Service, which will allow domestic Newton customers to receive wireless messages through the paging network provided by MobileComm, a subsidiary of BellSouth Corp. Monthly fees will start at $21. Apple has also begun shipping the Newton Connection Kit for the Macintosh, a key integration product through which users can connect their MessagePad to a Macintosh to create, view, edit, synchronize and back up their MessagePad information. A Windows version is to ship later this fall.

On the PowerPC front

In other Apple news, the company has announced that seven more developers have unveiled plans to deliver native versions of their applications for the Macintosh PowerPC. They are Artworks Systems NV, Canton Software, Inc., Fractal Design Corp., Graphisoft, Great Plains Software, Itedo Software GmbH and Wolfram Research, Inc. A native application is one that has been recompiled for the PowerPC chip. A total of 18 developers have announced native support on Apple's platform.

Windows backup

Symantec Corp. recently released Version 3.0 of the Norton Backup utility for Windows, which supports DOS 6.0, can be customized and allows data backup of network file servers on Novell, Inc. NetWare networks.

E-mail the professor

Lotus Development Corp. has established the Lotus Education Consortium, under which universities are invited to share data electronically using Notes and CC:Mail. Lotus also announced that Computerland Corp. will offer customers the option of having Lotus SmartSuite preinstalled on their systems.

NCR opts for AT&T logo

Seeking to establish brand-name recognition with retail channel consumers, NCR Corp. announced that its 1486SX PCs sold through retail computer and consumer electronics stores will carry the AT&T logo and price tags starting at $999. Lechmere, based in Woburn, Mass., and Incredible Universe in Fort Worth, Texas, will be among the first stores to offer the PCs under the new program.

Energy-compliant desktop

Acer America, Inc. has made its consumer-oriented Acros desktop line compliant with the Environmental Protection Agency's EnergyStart program.

Chip ID bracelet

With the theft of computer chips rising, Intel Corp. plans to become the first semiconductor company to stamp serial numbers on its microprocessors. By stamping an individual number on each postage-stamp-size chip, it will be possible for police to return recovered chips to their rightful owners, an Intel spokesman said last week. Two weeks ago, TSG Micro Technology in Fremont, Calif., was hit by armed robbers who escaped with $500,000 in chips, including many 1486 microprocessors that retail for up to $463 apiece.

Toshiba service

Toshiba America Information Systems, Inc. in Irvine, Calif., is scheduled this week to launch several service and support programs, including an optional three-year limited warranty on selected portable and desktop products. Another option is no-fault coverage for screen damage to portable computers.

PowerPC silicon

IBM and Motorola, Inc. recently said they have produced the first silicon for their second PowerPC microprocessor, the PowerPC 603.

Symantec distribution

PC distributor Tech Data Corp. in Clearwater, Fla., has signed an agreement to distribute Symantec Corp.'s application and system software, including Norton Utilities, Norton Desktop for Windows, Norton Administrator for Networks, Q&A, Act 1, PCAnywhere and Symantec C++.

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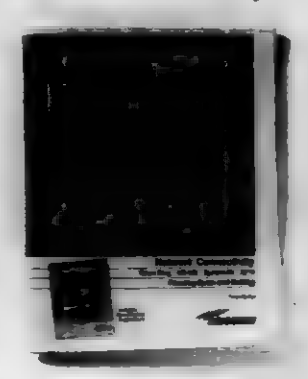
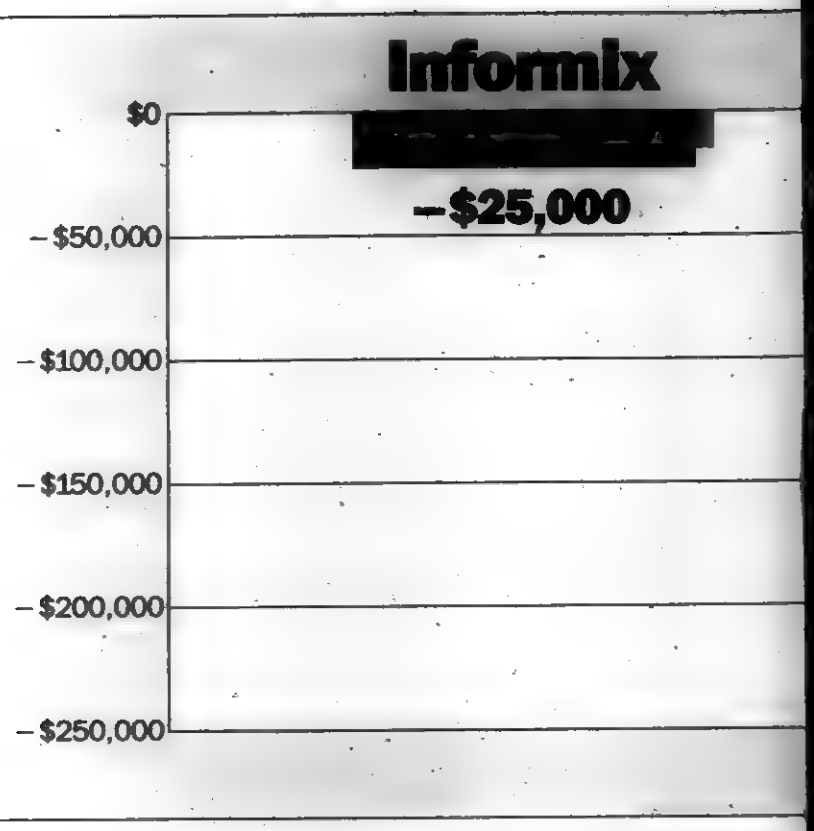


ANDREW

Cost of UNIX-to-DB2 Database Connectivity.

Connecting through DRDA:

Informix only requires one jump from its gateway to an IBM database while Oracle and Sybase require two—adding processing time and expense. The costs on the chart reflect an unlimited number of users going from a UNIX server to DB2 on the MVS platform, and are based on current, published price lists for each relational database vendor.



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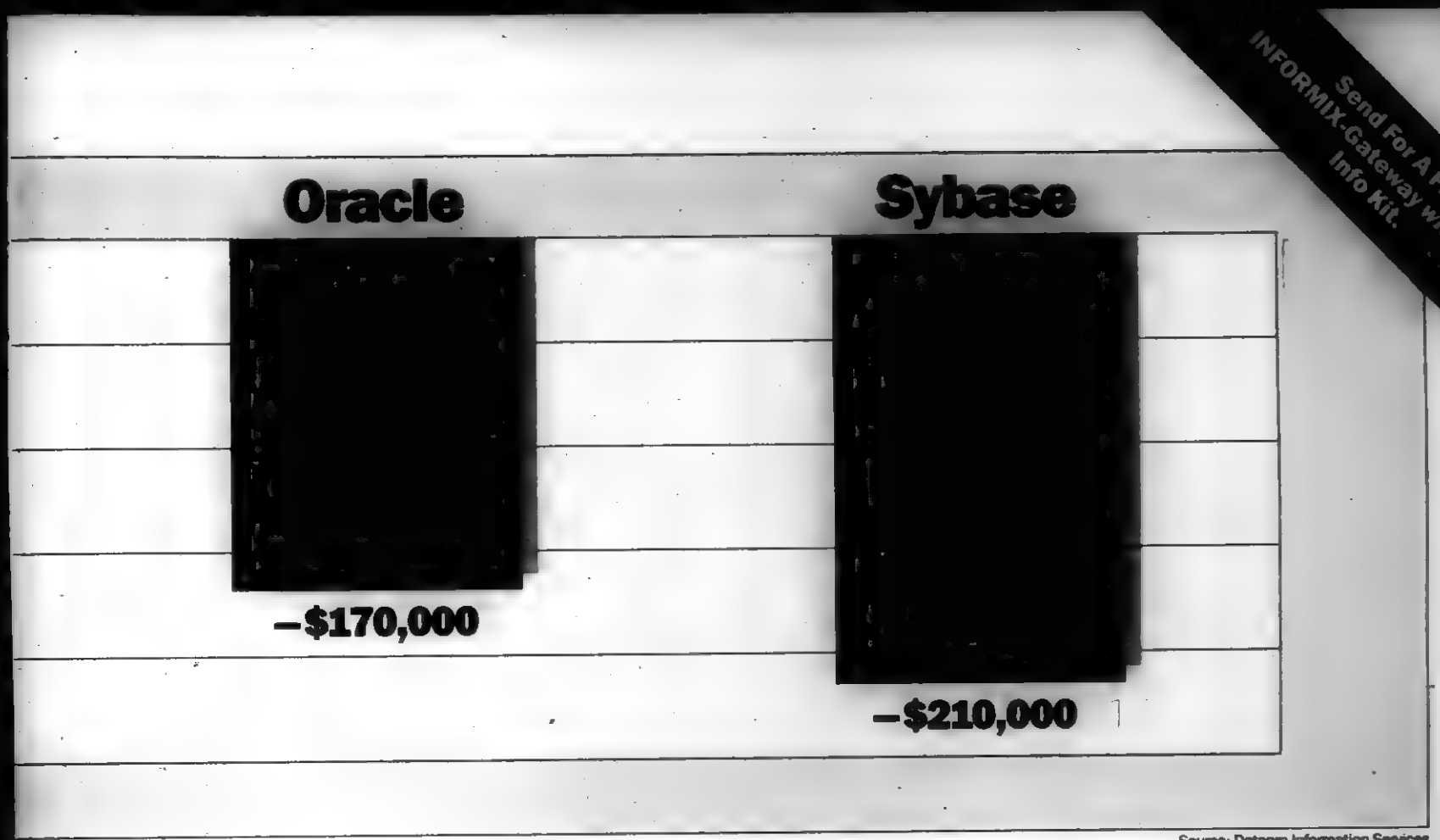

Source: Datapro Information Services

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UNIX-to-DB2 Connectivity

	Cost	Complexity	Products Required on Mainframe	Communications Protocol
Informix	$25,000	One Product: INFORMIX-Gateway	No	DRDA
Oracle	$170,000	Three Products: SQL Connect, SQL Net, Protocol Driver	Yes	Proprietary
Sybase	$210,000	Two Products: Open Gateway/DB2 Net Gateway for OS/2	Yes	Proprietary

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PC-X fills in interoperability holes

By Jean S. Bozman

A new class of software is blurring the edges of PC applications and the X Window System presentation of enterprise software. PC-X software, as it is being called, connects PC users with mainframe and Unix applications shared throughout a corporation.

Users who have tried PC-X software said it is an easy way for them to share applications across an enterprise. It allows PC users to work with familiar spreadsheets and word processors one minute and to access data stored on Unix servers or IBM mainframes the next.

Priced at $500 or less, PC-X licenses are an inexpensive way for PC users to access shared X-based applications, information systems managers said. Buying an X terminal or Unix workstation to run the X Window System would cost several thousand dollars more.

Because the X Window System runs the same way no matter where it is displayed, PCs can display the same graphical information shown on Unix workstations or X terminals — or even on IBM 3270 terminals. The X protocols, managed by the X Consortium in Cambridge, Mass., define the uniform mechanism by which a terminal, workstation or PC displays graphical information over a network.

PC-X software's leading feature is flexibility, IS managers said. Fresno County in California is using PC-X software on OS/2 and PC DOS machines to view files on IBM RS/6000 Unix servers and an IBM mainframe.

"We're replacing IBM 3270 terminals with PCs capable of emulating X Window [System]," said Will Jacobson, a senior systems programmer who oversees court management and geographical information systems running on networked RS/6000s. The OS/2 machines run an IBM product called PMX, and the DOS machines run PC-X software from Hummingbird Communications Ltd. in Markham, Ontario.

Desktop central

Users are innovating with PC-X software, making the desktop the focus of network computing. Xerox Corp. uses the X Window System to enable electrical design engineers to "piggyback" their Unix design applications. One Unix workstation can host two users, since one of them accesses the Unix software through a PC-X window. That enables users to share the same CPU cycles, said Maurice Moon, a Xerox engineer in El Segundo, Calif., who is testing the configuration.

It is also possible, he said, for a remote PC to access the Unix workstation, supporting the idea of telecommuting via modem in the crowded Los Angeles area.

One Wall Street IS manager, who did not wish to be identified, said PC-X software is a practical way to link PC decision-support software with mission-critical, number-crunching applications running on Unix servers.

"There are no Unix desktop programs to speak of," the manager said, adding that there are notable exceptions, such as a Unix-compatible version of Lotus Development Corp.'s Notes. Unless the Common Open Software Environment's common Unix desktop boosts personal Unix applications, he said, PC-X will let users mix and match PC and Unix applications on the same screen.

Industry analysts said they believe PC-X software will push X far beyond the estimated 2 million users of Unix workstations — and hundreds of thousands of X terminals worldwide — in the next few years. Leading PC-X vendors include Network Computing Devices, Inc. in Mountain View, Calif., AGE Logic, Inc. in San Diego and Hummingbird.

Is it a client?

In a twist on the PC-X approach, Unix workstations can now run PC software using X11 standards. SunSelect, Inc.'s Wabi software, introduced in May, allows Microsoft Corp. applications to run unchanged on Unix workstations running X11 protocols. Wabi works on Sun Microsystems, Inc., IBM and Hewlett-Packard Co. workstations, and more vendors are expected to sign up to support it in 1994.

Growth market

About 396,000 PC-X licenses will ship this year, compared with about 300,000 X terminal shipments expected by year's end, according to market research firm International Data Corp. [CW, Oct. 25].

The X Window System is for large corporations that want all their users to be able to access common information, said Peter Shaw, president and chief executive officer at AGE Logic. "IS managers are learning that the protocol that allows them to connect heterogeneous components on a network is X," he said.

Users said they realize that network and systems vendors have a lot of homework to do before distributed computing is commonplace. Until then, PC-X software will allow them to take a shortcut to interoperability. For Fresno County, that means accessing mainframes, minicomputers and Unix servers from the comfort of a user's PC. "When you start to go beyond your PCs and into the network," Jacobson said, "your users need to be able to get out to these multiple platforms."

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Agents get learn-at-home system

What is believed to be the largest private use of a "distance learning" system — Prudential Insurance and Financial Services' system to provide training, development and certification to 17,000 insurance agents at 2,800 locations — was made public recently.

The so-called Prudential Learning System was developed by VMI Learning Systems, an Iselin, N.J., firm that is under a multiyear contract with Prudential for the application.

The system combines a number of technologies into a "learning center." The center contains a PC with modem, a CD-ROM player and a videotape player.

Every day, a Prudential host downloads curriculum, sales and customer information to the learning center workstations. During the update, the agent's test scores are uploaded back to the host, where student progress is measured and tracked in weekly reports to field and headquarters managers. —*Ellis Booker*

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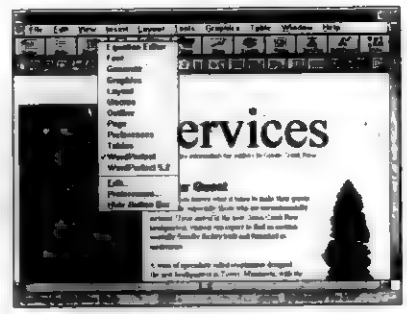

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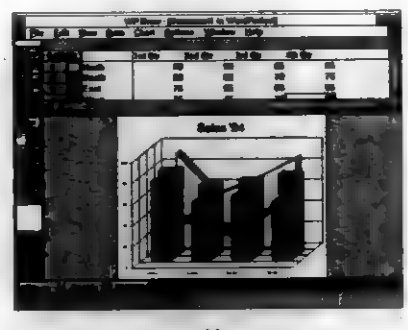

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SBT Accounting Systems has added a suite of graphical customization tools to the Professional Series 2.5, its advanced network accounting system for Windows and DOS.

According to the Sausalito, Calif., company, the series gives computer consultants and end users the power to easily configure reports, screens and communications for SBT Pro Series.

The tools allow users to tailor reports, customize data entry, access accounting data from remote sites, display custom queries and share accounting information with other Windows applications.

The system costs $895 per module for the standard Multiuser version and $1,295 per module for the Unlimited (source code) version.

▶ *SBT Accounting*
(415) 331-9900

Poc-It Management Services, Inc. has introduced MicroMan for Windows Time Entry, a Windows-based module.

According to the Santa Monica, Calif., company, the module was designed to bring an easy-to-use graphical user interface to time entry, a function of MicroMan II, the company's PC-based project and staff management system.

Highlights include a spreadsheet format for entering project and nonproject work on one screen and expanded information about project events. Users can designate time as billable or nonbillable, and the product can facilitate accounting for expenses.

MicroMan for Windows Time Entry comes bundled with MicroMan II for DOS and runs on any IBM PC or compatible with 640K bytes of memory and 7M bytes of hard disk space.

The complete MicroMan II package, including MicroMan for Windows Time Entry, costs $2,895.

▶ *Poc-It Management Services*
(310) 393-4552

Microsoft Corp. has announced Microsoft Windows Sound System Version 2.0, a product that offers improved voice recognition and audio compression. The system was designed to enable the integration of audio with any Windows application.

The Windows Sound System is available in two versions: one includes the Windows Sound System software and a microphone; the other offers a Windows Sound System audio board and headphones along with the software and microphone.

According to the Redmond, Wash., company, users who have audio boards can inexpensively add voice recognition, annotation and selective proofreading to every application on the Windows operating system.

Features include Microsoft's custom-designed directional microphone and a voice-recognition application called Voice Pilot.

Prices start at $79.

▶ *Microsoft*
(206) 882-8080

Solomon Software has introduced the Solomon IV/Windows System Evaluation Kit on CD-ROM, a product designed for anyone who wants to become familiar with Solomon IV's open architecture and industry-standard tools such as Novell, Inc.'s NetWare SQL and Visual Basic.

According to the Findlay, Ohio, company, the product includes Novell's NetWare SQL (five-user license), General Ledger, System Manager, Order Processing, Inventory, Accounts Payable, Accounts Receivable, the R7R SQL Report Writer and the Solomon IV Customization Manager.

The product costs $99.

▶ *Solomon Software*
(419) 424-0422

Nashen + Associates has introduced PaperClip Imaging Software, an access tool for desktop document management.

According to the Montreal company, PaperClip permits users to access data files, electronic mail, scanned images and fax documents from existing software applications.

Without leaving the current application, users can instantly edit, store, retrieve and route files.

PaperClip is available in both a Windows Personal Edition and a Network Edition.

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RemoteWare and the SEMINARS missed

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in a tiny center seat, in coach, staring blankly at a fly nimbly exploring the OXYGEN PANEL above him. It had come down to a scheduling conflict. One more FREE product seminar, half-day, inevitably bad deli sandwiches... potato chips that had gotten too close to the kosher dills and gone soggy. Or this junket to clean up yet another set of branch communication difficulties in Opelika, St. Louis, and San Antone. So the picture of this fly on the ceiling RUBBING ITS FRONT LEGS TOGETHER with an ominous delight didn't have the significance for him it might have had he seen that MEANWHILE, BACK AT THE SEMINAR THE REMOTEWARE FOLKS WERE SPINNING COLORFUL TALES OF SUCCESSFULLY-IMPLEMENTED FIELD COMMUNICATIONS SYSTEMS, HOLDING CHARLIE'S TECHNO-PEERS FROM COMPETING COMPANIES CAPTIVE WITH THE PROMISE OF THOUSANDS OF FULLY-AUTOMATED, EASY-TO-MANAGE AND UNATTENDED DIAL-UP COMM SESSIONS, AND RIVETING ACCOUNTS OF REAL COMPANIES WITH HUNDREDS OF MOBILE CORPORATE LAPTOPS AND REMOTE BRANCH OFFICES USING CENTRALLY-CREATED AND MANAGED ELECTRONIC FORMS, DOCUMENTS, AND REPORTS, ALL LINKED TO CENTRAL SYSTEMS AND DATABASES, AND ALL NEATLY SUPPORTED BY INTEGRAL ELECTRONIC SOFTWARE DISTRIBUTION CAPABILITIES!

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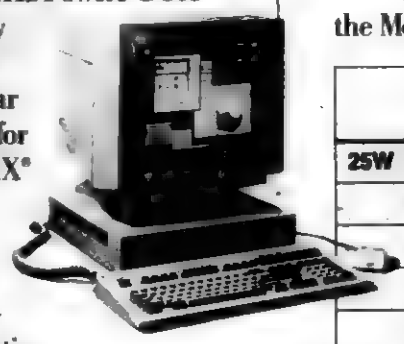

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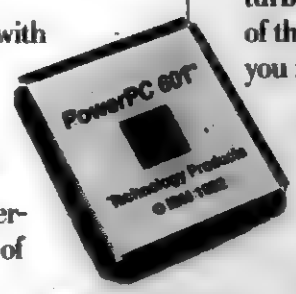

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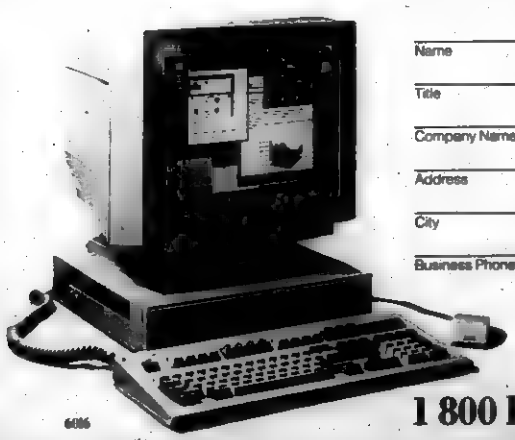

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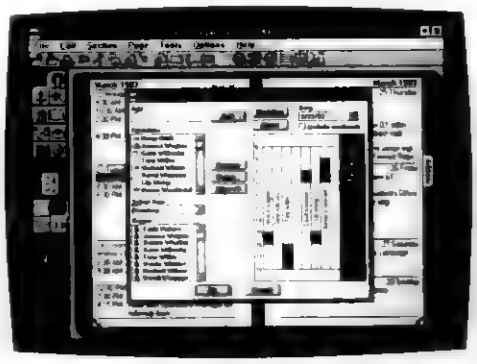

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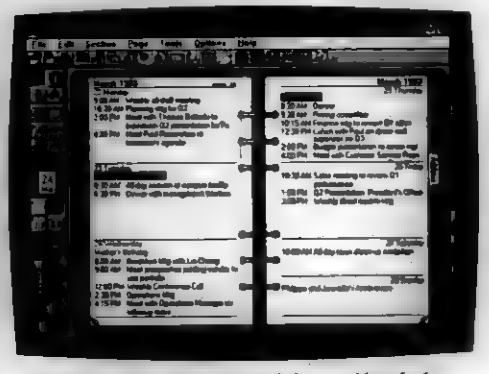

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Servers

Data General augments Aviion with 5500 system

By Craig Stedman

■ Data General Corp. last week followed up its late June introduction of enterprise-oriented Aviion servers based on Motorola, Inc.'s superscalar 88110 microprocessor with the addition of a low-end AV 5500 system targeted at small-business and departmental users.

Because of the 5500's low cost, DG said it should also be a key component of Aviion clusters scheduled to go into beta testing in December and ship in February. The clusters initially will be built around Oracle Corp.'s Oracle Parallel Server database, a parallel version of Oracle 7.0.

Sybase, Inc.'s Sybase Replication Server software for copying data between multiple Sybase databases will also eventually be supported for clustering purposes, said Stephen Gardner, DG vice president of Aviion marketing.

Computer Associates International, Inc.'s CA-Unicenter is scheduled to ship on DG hardware in early 1994.

Support for two

The 5500 supports two of the 40-MHz 88110s, compared with four on the mid-range AV 8500 and a planned 16 on the high-end AV 9500. The 5500 can handle 20 to 125 users and is rated for uniprocessor performance of 66 transactions per second, DG said.

Hardware pricing starts at $14,490 with 32M bytes of memory and a 520M-byte disk drive, according to the Westboro, Mass., company, which last week reported another loss and more layoff plans (see chart page 145). The DG/UX operating system is priced separately, with a 100-user license costing $10,000.

Gardner acknowledged that DG's AV 4600 low-end models had been "looking a little old" compared with rival Unix systems from Hewlett-Packard Co., IBM and Sun Microsystems, Inc. "Most of our business today is coming out of the higher end," he noted.

Jim Brennan, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H., said the 5500 should get DG back into the low-end race.

"They have a very focused niche market" in small to medium-sized accounts, Brennan said. "They know what they're going after and they're not trying to spread themselves too thin."

Foxworth-Galbraith Lumber Co., a Dallas lumber and building materials supplier that has used DG's proprietary Eclipse MV systems in its stores for the past 15 years, is in the process of switching a pilot Aviion installation from an AV 4625 to a 5500, said Jack Foxworth, chief financial officer.

High expectations

The company wants to shift its 50-plus locations to Unix systems during 1994, Foxworth said. The 4625 has performed "admirably" thus far and Foxworth-Galbraith has "high expectations" for the 5500, but it also plans to look at the IBM RS/6000 and other Unix platforms, he added.

Foxworth noted that the pilot is meant in part to test an in-store software package that has not been available on the Aviion line until now. "We just want to make sure it will run on Aviion and kind of get a bird in the hand before we put it all out to bid" later this year, he said.

Ramona Loudon, senior technical analyst at Sky Chefs, Inc., an airline catering firm based in Arlington, Texas, said the promised clustering support "could certainly prove interesting, especially if it's built for Oracle." Sky Chefs uses Oracle as the main database with its Aviions, she added.

SAS rolls out update

Products serve multiple facets of data management

By Gary H. Anthes

SAS Institute, Inc. has begun shipping an updated line of tools for information management, analysis and presentation. Release 6.09 of the SAS System contains several new products and supports three new environments — Microsoft Corp.'s Windows NT, Digital Equipment Corp.'s Alpha AXP workstations running OpenVMS and Convex Computer Corp.'s ConvexOS.

One new product, available previously in a beta version, is SAS/CPE for Open Systems, which the company said is the only system- and network-performance tool available for Unix systems. It runs under Sun Microsystems, Inc.'s Solaris, Hewlett-Packard Co.'s HP/UX and IBM's AIX.

SAS/CPE takes performance data from commercial network products and summarizes, analyzes and reports it in accordance with user-specified parameters. It accepts feeds from Sun's SunNet Manager, Cabletron Systems, Inc.'s Spectrum, HP's Performance Collection Software, Unix accounting data, Landmark Systems Corp.'s Probe/Net and Probe/X and Concord Communications, Inc.'s Trakker.

Air Products and Chemicals, Inc. in Allentown, Pa., runs SAS/CPE on a Digital Alpha AXP workstation to analyze performance data coming from a VAXcluster via the VMS monitor command. James Hogarth, principal information technology specialist, said SAS/CPE is a better tool than the alternative, Digital's Performance Solution.

"SAS/CPE gives you a nicer way to store and track data for long-term analysis. And it puts data in SAS format, which I am very familiar with," Hogarth said.

SAS/CPE for Open Systems can be licensed for an introductory first-year fee beginning at $2,940.

SAS also introduced SAS/Access for direct and transparent access to SQL Server and databases from Oracle Corp., Sybase, Inc. and Ingres Corp. SAS/Access interfaces allow people to use these database management systems without having to create intermediate files, as was the case. It is priced at $695 for a one-workstation, first-year license.

Merrill Lynch & Co. in Somerset, N.J., has been benchmarking new SAS components under NT for about three months. "We've been real pleased with the SAS implementation part, but we've been a little bummed by NT overall," said John Crawford, department manager.

SAS/CPE for Open Systems *shows network performance and problems at a glance*

"NT's performance running SAS has been exceptional, but its performance running everything else has been marginal."

Crawford said SAS may succeed under NT because in many cases the SAS software bypasses the operating system, making direct calls to the hardware. Merrill Lynch evaluated SAS running under MS-DOS with Windows, NT and OS/2 on 486-based PCs and found it ran fastest on NT.

Other items in the new SAS release include:

- Beta versions of SAS/Image, for image processing, and SAS/GIS, for processing of spatially related data.
- Unix, Windows and NT versions of several mainframe products: SAS/EIS for building executive information systems, the SAS/Calc spreadsheet package, SAS/PH-Clinical for the pharmaceutical industry and SAS/Lab for guided data analysis.

Alliance pursues standardized Ethernet

By Stephen P. Klett Jr.

A coalition of networking vendors led by Grand Junction Networks, Inc. last week aired a specification that will provide users with interoperable products for 100M bit/sec. Ethernet networks.

The goal of the specification, called 100Base-X, is to allow vendors to independently develop interoperable Fast Ethernet (100M bit/sec.) products running over two pairs of Category 5 unshielded twisted-pair, shielded twisted-pair and fiber-optic wiring.

100Base-X was pioneered by Grand Junction and jointly developed with members of the Fast Ethernet Alliance, which includes 3Com Corp., David Systems, Inc., Intel Corp., LAN Media, Lannet Data Communications, National Semiconductor Corp., SynOptics Communications, Inc. and Sun Microsystems, Inc. The alliance plans to submit the 100Base-X specification to the IEEE 802.3 committee in November for standards consideration.

While industry observers agreed 100Base-X was a step in the right direction, they said standardized Fast Ethernet products were probably still at least three years away from reality.

This specification is "not a big step or a baby step, but it is a step forward," said Paul Nikolich, a member of the IEEE Ethernet standards committee. "Everyone still has to more or less agree to utilize a partic-

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PC, SQL databases square off

Users debate on best client/server system to deploy when downsizing

By Michael Vizard

LAKE BUENA VISTA, FLA.

The debate over how to choose the right database to deploy when downsizing was in full swing at Microsoft Corp.'s recent FoxPro developers conference here as proponents of PC database systems squared off against supporters of SQL databases.

According to backers of networked PC database systems, information systems managers are promoting a vision of downsizing and client/server computing that requires the adoption of SQL databases at the expense of lower-cost PC databases that provide equal or better performance.

"It's a very hard sell to go into an IS organization. That's why you have to go in at the departmental level," said George Goley IV, president of Micro Endeavors, Inc., a consultancy in Upper Darby, Pa.

For example, Goley deployed FoxPro at the U.S. Bankruptcy Court of Los Angeles even though the national IS organization for the bankruptcy system favors SQL databases.

"The way to compete is to put a rapid prototyping model in front of management instead of fighting over a 600-page system specification. Don't try to compete with the big iron guys in obfuscation," Goley said.

Cost not enough

But it is doubtful that the lower cost of networked PC databases and their solid performance numbers, which Goley said can match SQL databases by supporting as many as 600 transactions per second across millions of records, will turn the tide away from SQL databases.

"The architecture of a DBMS product prevents it from being considered by IS. A traditional DBMS is not going to give you the performance you'd expect to see, and the IS community has come to appreciate the support tools provided in SQL server databases," said Todd Spencer, president of the Great Lakes SQL Server Users Group in Chicago.

Specifically, Spencer said that administrative tools, security, backup-and-recovery capabilities, support for transactions and network performance all favor SQL databases. As such, Spencer said that while products such as FoxPro make excellent front-end query tools for SQL databases, they are not capable of providing the performance of and tools available in a SQL database.

FoxPro users said Spencer is misguided.

"I'd match the performance of FoxPro against any other database on comparable hardware any day. And while it's true that FoxPro doesn't come with the tools that a SQL database has, they can either be bought as add-ons or programmed in," said Menachem Bazian, a senior associate at Flash Creative Management, Inc., a consultancy in River Edge, N.J.

To illustrate, Goley cited a distributed tanker-tracking application be built with FoxPro for Mobil Oil Corp. that tracks 60 vessels all around the world. Goley said he is able to take advantage of FoxPro's local buffer capabilities and efficient use of network bandwidth to keep multiple servers running FoxPro in sync with one another.

Front ends

While PC-based navigational databases can be used as front ends for SQL databases, relational databases such as Paradox from Borland International, Inc. and Access from Microsoft tend to make better front ends because they share the same record-oriented format as SQL databases.

This approach, he said, is significantly more efficient than the distributed update and replication facilities in a SQL database.

"This application was built right after the Exxon Valdez incident, so it has a full audit trail. Originally it was built around a 3090 mainframe and a VAX, but the users sent it back," he said, adding that he delivered that application running on FoxPro for 10% of the cost Mobil incurred to build the same application on the mainframe.

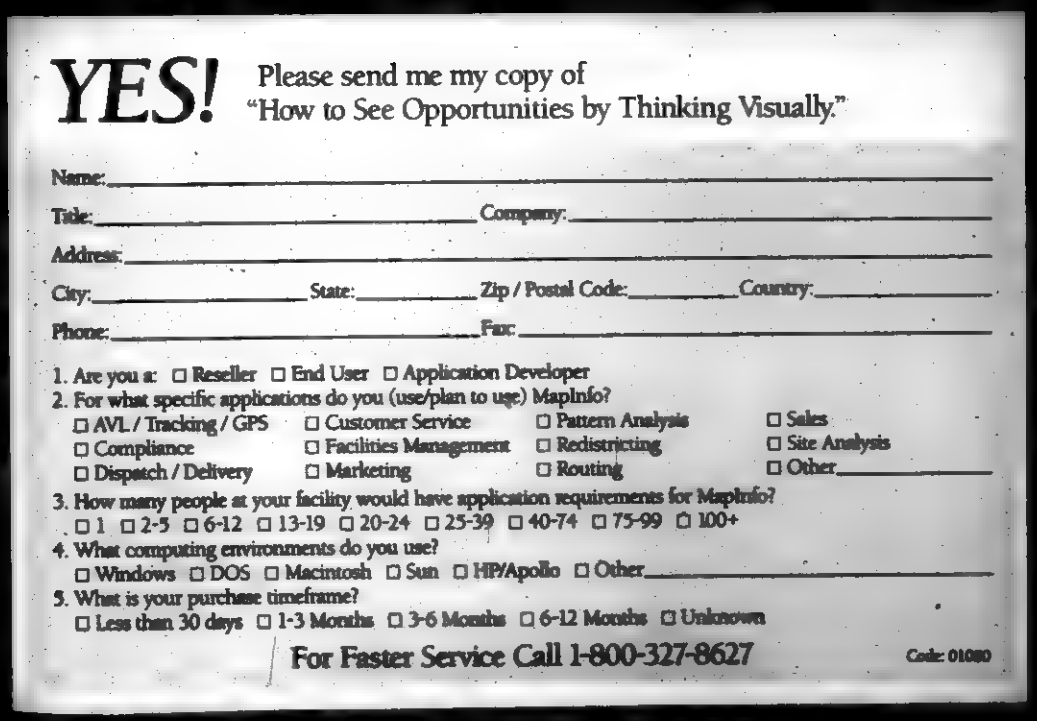
Addressing the front

To get the ear of IS management in large organizations, Goley suggested that developers initially position products such as FoxPro as front-end prototypes for SQL databases that will be deployed at a later date.

"So the magic word is prototype to get by the first-line issues. Then they'll discover you don't need a SQL database," he said.

Bazian said that while network database management systems may not eliminate the need for SQL server databases, they will dramatically reduce the number of SQL databases in an organization.

Think.



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Alliance

CONTINUED FROM PAGE 51

ular architecture, which will take a long time. However, it does help the [alliance] to have an implementation out there to help guide their standardization effort."

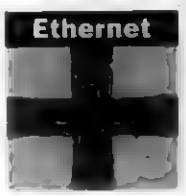
A key benefit that 100Base-X offers users is that it is based on Ethernet's media access control method — called carrier-sense multiple access with collision detection — which means customers can migrate to Fast Ethernet technology without any special training. A vendor coalition, led by Hewlett-Packard Co. and AT&T, is proposing a Fast Ethernet standard based on a new media access control method called demand priority, which would require training and additional cabling [CW, Jan. 11, 1993].

Cabling concerns

The downside to 100Base-X is that it works only with the more expensive, higher-grade Category 5 cabling and not with Category 3, which most users already have in place. The HP strategy, on the other hand, supports Category 3.

This is a major point of contention for Delmarva Power & Light Co. in Newark, Del. "Considering the fact that most of our facility is Category 3 and the high cost of rewiring, Category 5 is not an option for us," said John Scoggin, supervisor of network operations at the power company. Scoggin said he does not see the need for Fast Ethernet on the desktop until at least 1996. However, if he had to make the transition sooner, he said he would probably go with the HP/AT&T strategy because it would preserve the company's wiring investment.

According to Jack Moses, vice president of marketing at Grand Junction, the alliance plans to support additional media, including Category 3, and users can expect to see more specifications published later this year.



The Grand Junction and HP/AT&T camps have been butting heads for more than a year, and it remains to be seen which strategy will come out on top. "The only hope either vendor has is selling a common adapter at a 20% incremental cost over 10Base-T that has the option to switch to a higher speed," said Paul Callahan, senior analyst of network service at Forrester Research, Inc. in Cambridge, Mass.

In the meantime, Nikolich said there is a good chance the IEEE will adopt both Grand Junction and HP/AT&T's proposals as standards. "The process of ironing out an interoperability standard is very confusing and time-consuming," he said. "The IEEE may decide to adopt both and leave it up to the market to pick a winner."

Callahan said this was a viable solution to weaning out a standard but added that both technologies face a small market and the scenario would take several years to play out.

On the fence

The prospect of two standards does not appeal to Scoggin. "Someone's going to end up buying the Betamax and someone's going to to buy the VHS, which is a very scary scenario for network managers," he said. "If I spend a lot of money on a new technology, I need to know it will last at least five years."

Until one overall standard emerges, users appear hesitant to seriously consider either Fast Ethernet technology in their LAN migration plans.

"If we decide to go to a higher-speed topology, we'll probably look at CDDI instead because it's been around longer," said Jim Queen, director of enterprise networking at Enron Gas Services Corp. in Houston. Queen said that if Fast Ethernet takes off and the prices drop, Enron would look at it more closely. "However, we absolutely would not implement [Fast Ethernet] unless it did become a standard," he added.

Briefs

VAX-to-Unix port

Prenia Systems Corp. in Toronto, a 25-year-old provider of manufacturing software, is porting its applications from Digital Equipment Corp. VAX systems to Hewlett-Packard Co. HP 9000 Unix servers. Beta versions will be available around mid-1994.

Software driver support

Disk drive manufacturer Micropolis Corp. in Chatsworth, Calif., added support for Novell, Inc.'s System Fault Tolerance Level III (SFT III) to the software drivers for its Raidion LT and Raidion LS fault-tolerant disk arrays. SFT III provides NetWare networks with the ability to back up data on a redundant server. Raidware, the software driver that provides the SFT III support, will ship next month for $99. The company also announced a high-capacity version of Raidion LT for OS/2, LAN Server and NetWare 3.1x and 4.x that provides up to 54G bytes of storage. The array is slated to ship this month. Prices start at $8,455.

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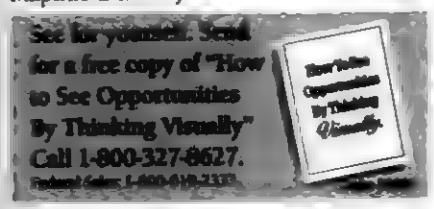

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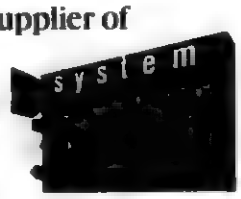

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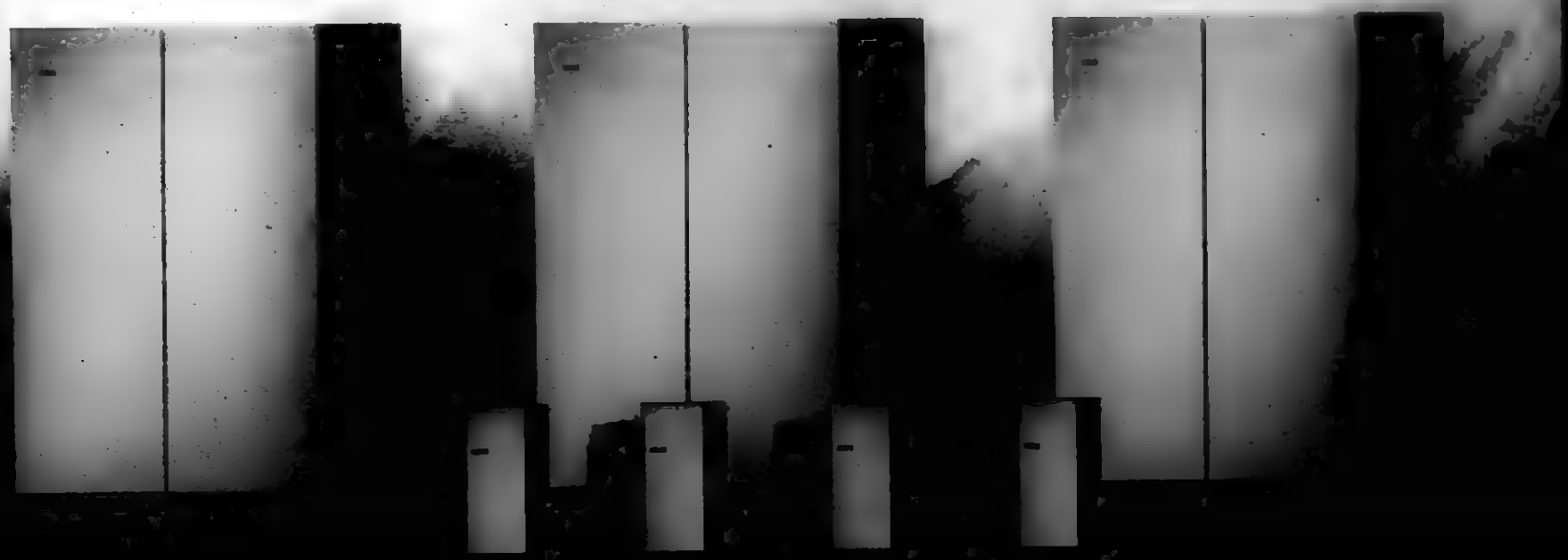

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Wang postpones work-flow offering

By Craig Stedman

Wang Laboratories, Inc., which is trying to find a new identity as a software and services vendor, recently said it has postponed commercial shipments of a promised work-flow product to early 1994 in order to build more functionality into the initial release.

Andre Boisvert, Wang's vice president of imaging and work-flow product marketing, said the Open/workflow software is now due out in the first half of 1994, instead of this year. The delivery schedule "will depend on the feedback we get" from beta testing that is scheduled to start this month, he noted.

Shipping shape

Open/profound, Wang's document management package, is in beta testing and should begin limited shipments on IBM's RS/6000 systems this month, said Andre Boisvert, Wang's vice president of imaging and work-flow product marketing. It is scheduled to become available on Hewlett-Packard Co.'s HP 9000 hardware 30 to 45 days later. It will become generally available during the first quarter of 1994.

Chris Martins, Open/workflow marketing manager, narrowed the timeframe by saying he expects the software to ship by the end of the first quarter. Martins and Boisvert said the product was held back after it was shown to industry analysts and they recommended that additional features be included.

Wang plans to provide more hooks than initially planned for integrating Open/workflow with business and imaging applications, Martins said. It also will now support generation of management reports out of the box, instead of just supplying a tool kit for developing that capability, he indicated.

Fine-tuning

Tom Koulopoulos, president of Delphi Consulting Group, Inc. in Boston and one of the analysts Wang brought in, said Open/workflow's icon-based development environment has been ready to ship for at least six months. But he added that the product's end-user interface is "a bit more primitive."

According to Bruce Silver, a vice president at BIS Strategic Decisions in Norwell, Mass., who also consulted with Wang, the changes needed in Open/workflow are more of "a fine-tuning than a total overhaul. It's just missing some details that would make people stand up and notice it."

Stephen Jung, director of corporate computer services at Fleishman-Hillard, Inc., a St. Louis public relations firm that uses Wang's VS computers, said the Open/workflow delay would not make him shy away from Wang in the wake of the firm's bankruptcy restructuring.

"It would be better for them to wait and ship something that's good," he said.

While noting that revenue could be hurt somewhat, Silver said the change in schedule was a wise move given the status of Open/workflow and Wang's need to rebuild credibility with users. "Wang's got one chance to get it right, so whatever they put out better be good," he said.

However, Ajit Kapoor, a principal at Intelligent Solutions, Inc., a Marshfield, Mass., consultancy, said the delay "is not good news" because Open/workflow is central to Wang's software strategy. "Coming on the heels of Chapter 11, this is the last thing anyone wants to hear."

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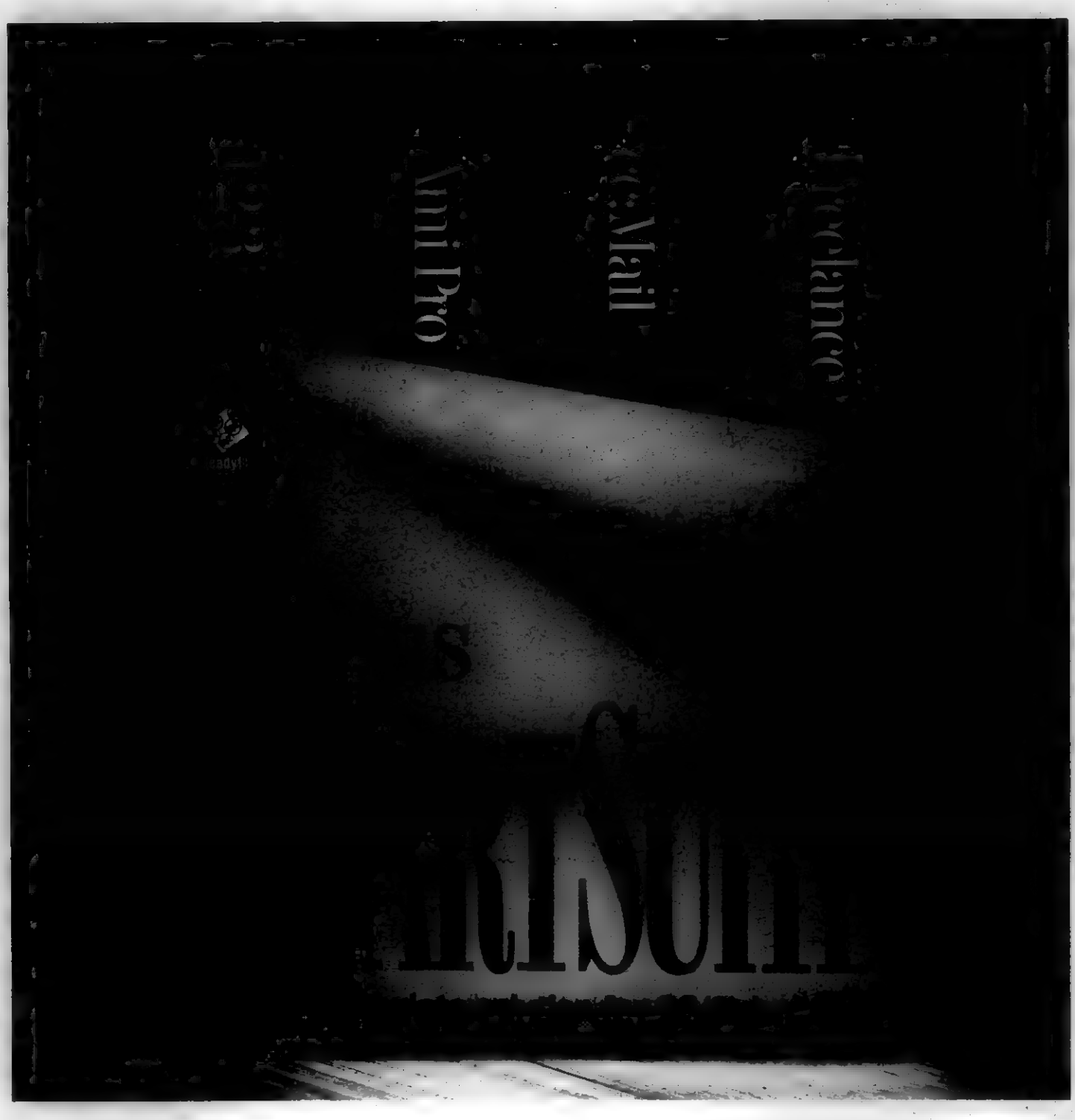

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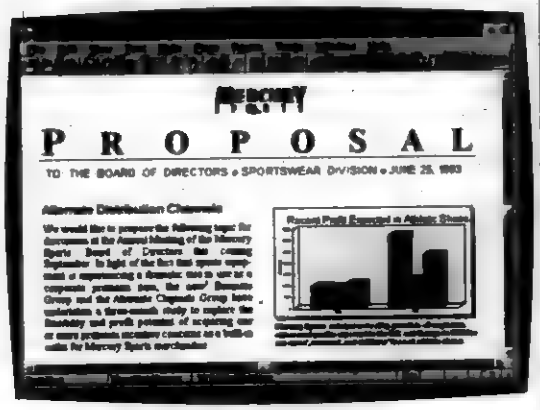

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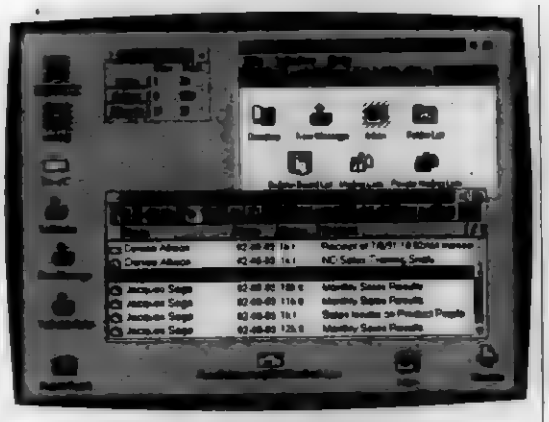

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Wireless device links PCs, peripherals

By Stephen P. Klett Jr.

Start-up Radiance Communications, Inc. has unveiled a wireless communications device designed to allow up to 15 non-networked PCs to share a peripheral device such as a printer or plotter without the hassles and expense associated with cabling.

LightShare-16 is a spread-spectrum, plug-and-play infrared transmitter/receiver that connects to the parallel port of the PC or printer. According to the company, the $200 device has a maximum communication distance of 36 ft. at a data throughput rate of 250K bit/sec.

User-definable group and individual addresses enable up to eight workgroups to share the same office space without interfering with one another's communications.

Mobile connection en route

Radiance plans to ship a PCMCIA interface by the end of the year that will allow users to plug LightShare-16 into portable PCs, according to Youngsoo Ryu, president and chief executive officer of the Santa Clara, Calif., company.

While Jennifer Pigg, a networking analyst at The Yankee Group in Boston, said LightShare was an intriguing technology, she was unsure of its practicality.

"The utility of such a device is marginal," Pigg said. "It's another option for users — wiring users to printers is expensive and time-consuming, but it's a niche market at best." The Yankee Group projects wireless LAN revenue will grow from $48 million this year to $237 million in 1998.

Low cost a boon

However, Pigg pointed to LightShare-16's low price point and forthcoming PCMCIA interface as options that may combine to generate user enthusiasm.

This is already the case at Federal Express Corp. in Memphis, according to Robin Richardson, business application adviser of business logistics services.

Richardson said the addition of the PCMCIA interface may spur Fedex to move LightShare-16 from the laboratory to live applications within a year.

Fedex has been testing the product since August. Richardson said he likes its reliability and low cost. "It's kind of like the Mac — everything's so simple," he said. "It installed in minutes.... If [infrared] replaces the functionality of [radio frequency], which I expect it will, we'll be able to realize considerable cost savings."

According to Radiance, spread-spectrum infrared technology offers a significant security advantage over conventional radio wave technology. Infrared signals are confined to the room in which the transmitters are located, while radio wave signals are not. Ryu said this means the infrared signals cannot be monitored outside the building, and they will not interfere with communications in nearby buildings.

Richardson, meanwhile, said he is excited about the potential of wireless infrared technology.

"I really think that if radio communications supports this technology and we start to see support for routers and hubs, it will be so much easier to install a card to set up a LAN, rather than dealing with wiring," he said.

Pricing froze DEC workstations

Digital Equipment Corp. executives have confirmed that the company held off introducing low-end Alpha AXP workstations as part of its Oct. 12 product introduction after IBM and Hewlett-Packard Co. stayed well above the $5,000 mark in recent workstation rollouts.

"We were sort of watching the market and saying that if we had to, we could rush one out," said Andy Feit, Unix workstation marketing manager at Digital. "But we didn't feel the need to do anything now."

Sources indicated that Digital was ready to add 300LX and 300X models to its DEC 3000 workstation line if necessary [CW, Oct. 4].

The company instead limited itself to the higher-end DEC 3000 models 600 and 800. The low-end boxes are now expected to debut in early 1994.

Despite the addition of the Alpha AXP line, Feit and other Digital officials acknowledged that the company has not yet started to gain back the workstation market share that it has lost in recent years. "But certainly we would expect now that this will begin to happen," said William Demmer, vice president of Digital's computer systems group.

The Alpha machines were held back by a lack of applications but are supported by "an adequate number" at this point, Demmer added.

— Craig Stedman

Telephony Services Group, Inc. has introduced Telephony Messaging Services, an offering that provides intelligent call management services to users of Banyan Systems, Inc.'s Vines networks or Novell, Inc. networks furnished with Banyan's Enterprise Network System.

According to the Old Brookville, N.Y., company, Telephony Messaging Services provides PC networks with the telephony capabilities of IBM's CallPath Services or Integrated Services Digital Network.

The product creates a seamlessly integrated telephony and network environment for PC users.

Prices range from $500 to $800 per seat.

▶ *Telephony Services Group*
(516) 676-0449

TechKnowlogy has introduced Version 2.1 of the Jukebox Management Software.

According to the Salt Lake City company, the software eliminates bottlenecks in imaging system performance frequently caused by jukeboxes, multifunctional drives and robotic devices that load optical disc platters into write-once read-many.

It allows a jukebox to process more than 60 requests per minute.

The software offers an intelligent caching system and retrieves document images 22 times faster from magnetic disk than from optical disc.

A key feature is the ability to support a variable-sized magnetic cache.

Version 2.1 supports more than 55 industry-standard jukebox models.

Prices start at $12,500.

▶ *TechKnowlogy*
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Hitachi America Ltd. has introduced two high-performance storage subsystems, HitCache and HitRAID.

The HitCache caching disk subsystem offers storage capacities of 5.7G bytes to 11.4G bytes. It is a fully integrated system.

According to the Brisbane, Calif., company, HitCache's overall read/write response time is an average of 200% faster than typical component-based systems.

Based on Intel Corp.'s 960CA RISC processor, the subsystem controller has a 32-bit wide, 50M byte/sec. internal bus to eliminate throughput performance bottlenecks and a serial port for field diagnostics and maintenance.

The HitRAID high-performance disk array is available in minitower and cabinet versions; it offers capacities ranging from 5.6G bytes to 68.8G bytes.

The subsystem can achieve an 80 million mean time between data loss specification. It implements either redundant arrays of inexpensive disks (RAID) Level 3 or RAID Level 5 functionality.

HitCache prices begin at $29,900 for the 5.7G-byte model.

On a cost per megabyte basis, evaluation pricing for HitRAID subsystems ranges from $2.20 (for high-capacity models) to $5.32 in lower capacities.

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LANs strike differing DCE relationships

Systems vendors choose 'best of breed' for servers, clients

By Joanie M. Wexler
ROSEMONT, ILL.

IBM recently reiterated its plan to blend the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) services into the next version of its LAN Server network, fueling the question of what role today's network operating systems will play in the DCE world.

DCE is a fledgling set of peer-to-peer computing services from various vendors that have been integrated by the OSF to allow application and communications portability across disparate systems.

Some network operating systems vendors consider it strategic to incorporate what they deem "best of breed" DCE global directory services, time synchronization, file services, security and other features across their servers and clients.

For example, Bill Conklin, technical program manager at the IBM Personal Software Products group, expressed this view to attendees at a Corporate Association for Microcomputer Professionals (CAMP) meeting here last month, reminding them that the next version of LAN Server, due in the second half of 1994, would incorporate all DCE services.

LAN Server's support of the global directory service holds appeal for Ric Rothschild, a distributed data processing manager at Kemper National Insurance Cos. in Long Grove, Ill., and a CAMP attendee.

"I want to know how and when X.500 will be supported so I don't have to keep up with domain administration," he said.

The current version of LAN Server, Version 3.0, breaks into domains of up to 1,016 users each. With X.500 support, domains could extend to cities, states or worldwide enterprises, Conklin explained.

Banyan Systems, Inc.'s Vines is also slated to support the full DCE bundle by an unspecified date, Banyan said, but Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT have less definitive relationships to DCE.

NetWare/DCE link

Conklin asserted that "NetWare doesn't really play in the OSF environment." Indeed, Novell's market-dominating NetWare is slated to link to DCE but will likely integrate just a small subset of its services into its servers, Novell said. This means unsupported services would probably not translate across environments without performance-throttling gateways.

Michael DeFazio, Novell's Unix Systems Group vice president, said at Unix Expo in September that "DCE is not in high demand; as it evolves, we'll support it in NetWare and UnixWare, mostly through third parties."

For example, Novell is working with Carnegie Mellon University to build a NetWare gateway that maps NetWare drives into a DCE distributed file system, said Bob Davis, vice president of marketing at the Unix Systems Group.

"There are services we would look to put directly into NetWare, like [remote procedure calls], in partnership with third parties. But this would be driven by customer demand," Davis said.

Microsoft has said it will support DCE with

LANs and DCE, *page 66*

IBM's Bill Conklin *pushed the next version of LAN Server for its DCE qualities*

AIX on the way

IBM's Bill Conklin told the CAMP group that LAN Server for IBM's AIX flavor of Unix, which runs on the RS/6000 platform, would ship in the next nine to 18 months.

If P, then Q

The role of NetWare and other network operating systems in organizations using DCE will vary depending on user implementation plans. For example:

IF	THEN
You want to keep NetWare but install some DCE applications	Maintain two separate environments if no data sharing; if applications are sharing data, NetWare file server will need a gateway to DCE file services.
You want to install DCE for pure computing only	Get applications that support DCE remote procedure calls only; use NetWare for other functions. Do not use software that uses DCE file services, or you will need a NetWare-to-DCE gateway.
You want to use DCE for access to all distributed computing services	Dump your network operating system, NetWare or otherwise.

Source: CIMI Corp., Voorhees, N.J.

Client/server

Single sign-on nears OK

By Elisabeth Horwitt
BOSTON

A team of determined corporate users and leading vendors can make real progress toward addressing the more stubborn aspects of multivendor client/server computing, as shown by work at the recent Open User Recommended Solutions (OURS) meeting here. One top priority work item: coming up with consistent user sign-on protocols for better security management.

The vendor contingent seemed almost as excited as the users about the results of the meeting. "OURS provides to vendors a setting where a number of users debate and synthesize and, in the end, document sets of requirements for interoperability issues,"

Single sign-on, *page 66*

Building IS from the ground up

By Joanie M. Wexler
CHICAGO

The wielding of technology as a competitive weapon has been discovered by the trade show industry, where exposition centers are growing bigger and network-ready to woo high-paying exhibitors.

Witness, for example, an in-progress revamp at the revered McCormick Place exhibition hall here, where three years ago "there was simply no IS at all," said Bernard J. Dudek, director of management information services.

Since then, however, the center has expanded to 280 LAN-connected PCs spanning four buildings. They serve internal users.

But an internal infrastructure is only the beginning: The center — administered by the Metropolitan Pier and Exposition Authority (MPEA) — is now looking to market data services to exhibitors. To that end, it has begun ripping down walls, expanding skyward and outfitting itself with the latest in data delivery technology such as fiber cabling and high-end wiring hubs.

One goal is to attract the big, data-intensive exhibitors, such as the Radiological Society of North America (RSNA), which will exhibit at McCormick Place late this month. Built-in networking — especially fiber facilities — is important to the RSNA because this year will be the first time it networks its exhibitors on the show floor, said Steven T. Drew, director of informatics at the RSNA in Oak Brook, Ill.

Building IS, *page 70*

McCormick Place's Kent Worrell: *Looking to conserve dollars and shoe leather by consolidating resources*

ON SITE

Metropolitan Pier and Exposition Authority
Chicago

Goal: To create a large, network-ready convention center that attracts foreign and domestic exhibitors.

Technology: Fiber-optic cabling, potential high-end "collapsed backbone" hubs and routers, AS/400 host and 16m controllers.

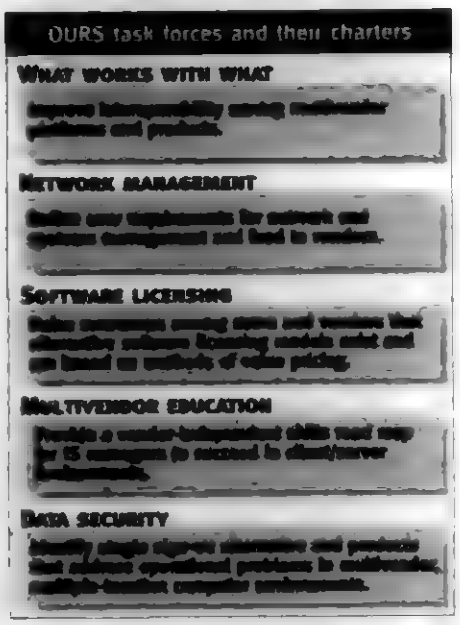
Benefits: Infrastructure that allows network-oriented exhibitors to exchange data and images on show floor.

Single sign-on

CONTINUED FROM PAGE 65

said John Worthen, president and chief executive officer at Mergent International, Inc., a security software firm in Rocky Hill, Conn.

At the meeting, the OURS data security task force reported good progress in getting key vendors to provide standardized user sign-in procedures across a variety of network, server and workstation environments. This is a major issue, particularly for financial services firms that want to administer security across heterogeneous client/server networks, said Stash Jarocki, vice president and director in corporate audit at Citibank NA and a co-chairman of the task force. "That's the real killer."



Cooperation works

The meeting was "the most exciting we've had so far" because so many powerful users and vendors were working together to define a cohesive set of requirements for single sign-on across different platforms, Jarocki said. For example, the group concluded that it had to come up with a methodology, such as key-based password, to ensure that the sign-on procedure itself is secured, he added.

"And we brought up the question of how you traverse from one system to another, [for example] if I'm on Novell and I want to talk to HP or IBM, how to put me on the network with a security server."

The answer the group is now formulating with the help of key vendors is a standardized security application programming interface that all of the important products would ideally support. The result would be a standardized way for a server or gateway to translate the passwords created on one system into the format understood by another, Jarocki said.

The big advantage that this task force provides over typical standards bodies is that it seems to be getting out real, commercially viable solutions to real problems in a short time frame, Worthen said. "It's easy to sit down with your competitors and talk about what the world will be like in five years; [it's] different when you are talking about deliverables in a few months. OURS is about that."

The task force began by "assessing what technology is available today" and developing a matrix of user security needs, Worthen said. It then identified vendors that provide parts of that matrix and began "nudging vendors" to enhance their products to fill in the outstanding gaps in the matrix. Its latest move has been for the user members to address "the vendors in the room, saying, 'Hey, you have a good Unix product; you have a good SNA product. Why not talk to each other?' It's a great breeding ground for cooperation," Worthen said.

For example, Mergent is now cooperating with rival ICL to provide a broader solution set to customers, Worthen said. Mergent specializes in security products for DOS, OS/2, Windows and Novell, Inc. platforms; ICL, in Unix and dumb IBM terminals.

The group is working on a brochure to help vendors implement standardized security, Jarocki said. "The vendors will listen to us," he said, partly because key vendors, such as Novell, attended the meeting and primarily because the task force includes such heavy-hitting customers as American Airlines, Citibank, American Express Co., The Chase Manhattan Bank NA and Chemical Banking Corp.

Mergent initially got involved in the security task force at the urging of some of its major customers, Worthen said.

The group hopes to complete initial objectives for a single sign-on standard in the first half of next year, Worthen said.

On the group's agenda for the OURS meeting in April 1994 is coming up with a standardized way for network management platforms to manage security implementations across heterogeneous networks. The group will work in tandem with the OURS network management task force to ensure that the two groups do not wind up with divergent solutions to overlapping problems, Jarocki said.

Maxm automates management

By Lynda Radosevich

Maxm Systems Corp. in Vienna, Va., recently added increased automation capabilities to its network management integration software.

The Maxm software integrates network management systems from mainframes, mid-range, wide-area network, LAN and voice platforms. This distinguishes Maxm from leading network management vendors that focus on providing software to manage a limited range of systems, according to company president Jack Reis.

The integration software allows users to manage all computing and communications devices from one workstation and add automation routines that cut down on the amount of network manager intervention. In turn, that allows customers to reduce their network management head count by 50%, Reis said.

"That's possible," said Jeremy Frank, vice president of networked systems management service at Gartner Group, Inc. in Stamford, Conn. The ability to deploy client/server systems is well ahead of the ability to manage it, Frank said: "60% to 80% of all new client/server deployments fail to deliver on their promises, mostly because they aren't managed well."

Maxm offers a tactical approach to integrating management of physical networking devices. Strategic solutions that also manage applications are still three to four years down the road, Frank said.

The Maxm software picks up data streams from the managed devices, interprets the protocol (such as Simple Network Management Protocol and Common Management Information Protocol), and translates the information into a standard format. The software can then filter out information that does not require any action, such as messages indicating that a device is alive and well. It can also store information for reports and invoke automatic routines, such as resetting a device.

New features

The latest release adds IBM's Rexx scripting language to both the client and server Maxm portions. Rexx allows network managers to write automation routines that can automatically initiate actions via IBM's NetView family of network management systems. Maxm interacts with NetView, thereby saving on network operator intervention.

Also, the new release increases the level of operator authorization, so users can specify a high-level operator that only receives high-level problems, for example.

Maxm is a privately held company with approximately 70 employees. One of the company's strengths is that IBM picked Maxm as a strategic business partner, Frank said. Other competitors in this niche market include Boole and Babbage, Inc. in Sunnyvale, Calif., Objective Systems Integrators in Folsom, Calif., and Nynex Allink Co. in White Plains, N.Y.

Network General extends LAN analysis

By Elisabeth Horwitt

Network General Corp.'s Distributed Sniffer System can now monitor and diagnose traffic across multiple Ethernet segments that are attached to Alantec's PowerHub line of intelligent hubs, the two vendors announced last week.

The Sniffer, or any LAN analyzer for that matter, can monitor any Ethernet segment attached to an Alantec PowerHub by working with Alantec's Port Monitoring feature, the San Jose, Calif., hub vendor said.

Port Monitoring dedicates one of 12 Ethernet segments on the hub for receiving traffic from all other segments; the traffic is then collected for analysis by a Distributed Sniffer Server.

PowerHub can also collect Fiber Distributed Data Interface frames for viewing by Sniffer, an Alantec spokesman said.

This allows users to monitor multiple LAN segments from one Sniffer console, without the need to move a portable Sniffer from one segment to the next or install a Sniffer Server at each segment, the vendors said.

The Distributed Sniffer Server is priced at $7,495. Also required is a Sniffer console, priced at $4,995, Network General said.

PowerHubs are priced at $9,950 to $27,950, with the Port Monitoring feature thrown in, Alantec said.

Network General already has an alliance with 3Com Corp. to monitor 3Com hubs via Sniffer and the Remote Monitoring standard. Other alliances are in the works, a Network General spokesman said.

LANs and DCE

CONTINUED FROM PAGE 65

its Windows NT-based distributed architecture, Cairo. Also with a charter to support Unix, Posix and DOS shells, "NT will support DCE by matter of course," said Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy.

Meanwhile, IBM's LAN Server can share resources with NetWare through loading LAN Server Requester and NetWare Requester on the same OS/2 machine and allowing different device drivers to give the user access to either platform.

But in the DCE world, users "might have to separately log on to NetWare, NT and the DCE network," Conklin said. This would run contrary to the concept of DCE, which is to coat over heterogeneous systems with common interfaces to create one look and feel for the user.

Users' choice

However, depending on how well DCE flies and what users decide to do with their existing LAN applications, this might not be a big deal, Nolle said. Some companies, for example, might keep their NetWare and DCE environments separate.

Conklin said he is "not sure" yet whether the DCE services in Version 4.0 will be embedded in the IBM OS/2 operating system, off of which LAN Server runs, or in a separate application. Embedded in OS/2, it "would be more accessible for developers but would take up unnecessary resources for OS/2 users not interested in DCE," Nolle said.

If DCE were in a separate LAN Server application "then those users affected are only those who have elected to use it," he noted.

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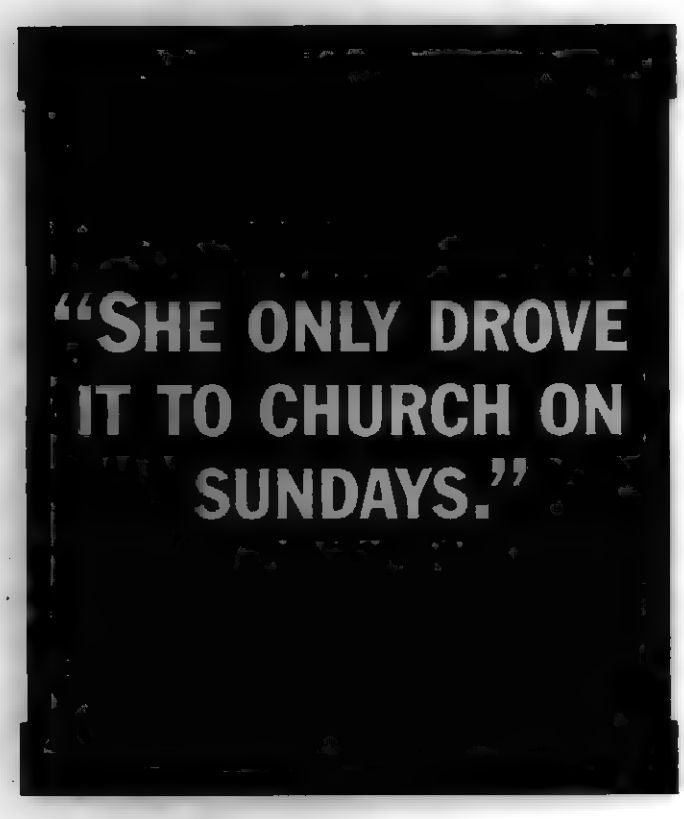


Building IS

CONTINUED FROM PAGE 65

Fifty to 100 of RSNA's 600 exhibitors will exchange bandwidth-devouring applications that combine digital images with associated medical information over different vendors' radiological equipment. This will be the first demonstration of a new medical equipment networking standard, Digital Imaging and Communications in Medicine, Drew said.

Drew, who is collaborating with McCormick Place on its fiber installations in what will be the exhibition hall's first outside support project, said it is important to him that an exhibition hall have built-in fiber to circumvent the 100-meter distance limitations of unshielded copper so exhibitors in the farthest corners can join the network.

JOANIE M. WEXLER

McCormick's Bernard Dudek: *Hopes to attract exhibitors with a network-ready convention center*

To accommodate exhibitors, McCormick Place is immersed in a four-year project that includes the construction of a five-story building housing an extra 2 million sq. ft. of exhibit and meeting space. Fiber links are slated to run within and between buildings in the 2-mile-radius complex — moves that "parallel expansion by other convention centers," Dudek said.

The project will also see McCormick Place following a network trend to collapse many communications functions into one or a few pieces of equipment in a centralized spot that looks strangely like a data center.

The cost factor

One reason this scheme is drawing interest is that it is costly to disperse servers, wiring hubs and other equipment throughout a large distributed enterprise, said Kent Worrell, information center manager at McCormick Place. He said, for example, that he is running multiple hubs, servers and copies of Novell, Inc.'s NetWare that are underused but needed because the users are too far apart to share resources.

And as a municipal entity, he indicated MPEA does not have taxpayers' money to burn.

His cure could eventually include running SynOptics Communications, Inc.'s recently announced System 5000 smart "hub of hubs" [CW, Sept. 27], which aggregates corporatewide traffic. Combined with fiber cabling, which stretches user-connection distances far beyond what copper cabling can do, the 5000 could allow Worrell to link the geographically dispersed users back to it directly.

He estimated that he could cut the price of his 37 wiring closets, some of which only feed the show floor, down from a ballpark figure of $50,000 to $15,000 by not replicating servers and Wellfleet Communications, Inc. routers in every closet. A high-end, traffic-aggregating Wellfleet Backbone Node router plugged into the System 5000 could be in order, he said.

System 3000 shortcomings

Today, MPEA runs about 20 distributed SynOptics System 3000 wiring hubs "when I could probably get away with two" if matching the number of hub ports to the user body count, Worrell said.

This is an issue for many System 3000 hub users today, said Val Sribar, program director at Meta Group, Inc. in Westport, Conn. System 3000 modules contain one fiber connection on a 12-port card; users come into the hub over a fiber link and then attach to just one or two resources, such as a server, over copper.

"You end up burning a 12-port card to use just a couple ports," Sribar explained.

The System 5000 design is intended to remedy this situation. It supports more modules with a fiber link and just four copper ports so that each module is more likely to be fully used.

Software first

MPEA's applications philosophy is to buy off-the-shelf software as often as possible and let the product drive the platform, said Bernard J. Dudek, director of management information services.

He indicated that potential interoperability issues among platforms would likely be less of a headache than installing software that doesn't fit the bill.

So far, that thinking has meant installing an IBM AS/400 D50 — soon to be upgraded to an F70 — to run Denver-based J. D. Edwards' financial package, customized for exhibit booth-by-booth work orders. Fortuitously, an AS/400-based package also administers McCormick Place's internal event management, though a Unix application was a decision finalist.

For interoperability with the AS/400, MPEA largely uses Novell's NetWare for SAA gateway to accommodate managers with PCs. "It's good for terminal emulation, but printing is a problem," said Kent Worrell, information center manager. The AS/400 "really wants" to talk to its own 5250 terminals.

So MPEA uses a controller from Idea in Billerica, Mass., to hook a remote dumb printer and a few 5250 terminals into the host, Worrell said. Idea's Concert product was one of the original products to fill this interoperability gap, though Worrell pointed out that IBM now makes a similar product.

— Joanie M. Wexler

Cellular carriers gain new fraud-detection weapon

By Ellis Booker and James Daly

Estimates put U.S. telecommunications fraud at around $4 billion annually, with fraud on cellular networks alone accounting for between $365 million and $600 million each year.

Recently, however, a handful of cellular carriers have deployed knowledge-based systems to help thwart this nefarious misuse of their networks. While initially focusing on voice communications, the technologies eventually may help secure wireless data transmissions.

"None of us would ever leave a confidential memo lying on a restaurant table," but then we don't think twice about transmitting data electronically without a safeguard," said Bob Geisler, a senior consultant at CCT, Inc., a consulting company in Minneapolis.

One of the new products, FraudBuster, a workstation-based system from Coral Systems, Inc. in Longmount, Colo., watches the calling behavior of users over a period of time and can issue alerts when the calling pattern of an individual subscriber starts to appear suspicious.

FraudBuster accomplishes this with a neural network "inference engine" from Neuron Data, Inc. in Palo Alto, Calif.

Nexpert Objects is "the heart of the system," said Mark Handzel, Coral vice president of development, about Neuron Data's expert system development tool. "The [artificial intelligence] engine analyzes all the multiple levels of alerts and events and decides whether to generate a yellow or a red condition."

The true value of the artificial intelligence engine is that it winnows down possible suspects to a manageable few, Handzel said.

First customers

So far, FraudBuster has been officially deployed with a cellular carrier in Puerto Rico; it has also been installed in several large Bell company cellular networks, according to Coral.

"The approach does appear to be promising," said John J. Haugh, chairman of Telecommunications Advisers, Inc., a Portland, Ore., consultancy that specializes in preventing telecommunications fraud. "Whether it truly represents a breakthrough will depend on further testing and market acceptance."

Haugh, who estimated that cellular fraud worldwide surpasses $1 billion per year, is heartened by the fact that cellular carriers are "finally beginning to take the problem seriously." He said the industry is now investing in hardware and software innovations that promise to get the situation under control — at least domestically.

According to Coral, the Neuron Data inference engine in FraudBuster can build a customer-use profile in as little as two weeks — although 40 days is normally allocated to this process.

Further scrutiny

Additional security efforts are under way at PacTel Cellular in Los Angeles, which is conducting a pilot project. ESL, Inc., a subsidiary of Cleveland-based TRW, Inc., is testing an electronic system that tracks, identifies and blocks calls that people make using stolen telephone access numbers.

The TRW system determines the legitimacy of a call by comparing the unique signal frequency patterns of the device making the call with the pattern on record for that transmission device. Although this early phase of testing for the PhonePrint system is not targeted at the mobile PC, TRW Program Director Jeff Phillips said the technology could be extended into this area.

Phillips estimated that the PhonePrint network access controller system will conclude its test with PacTel Cellular early next year, and the services will then be made available to cellular carriers nationwide.

Cellular technology is seen as the next information highway for mobile computers. Spectrum Information Technologies, Inc. in Manhasset, N.Y., for instance, offers a technology that allows portable computers to transmit data via cellular telephone networks. Such total mobility is crucial to the adoption of personal digital assistants such as Apple Computer, Inc.'s Newton, Casio, Inc.'s Z-7000 and Eo, Inc.'s 440.

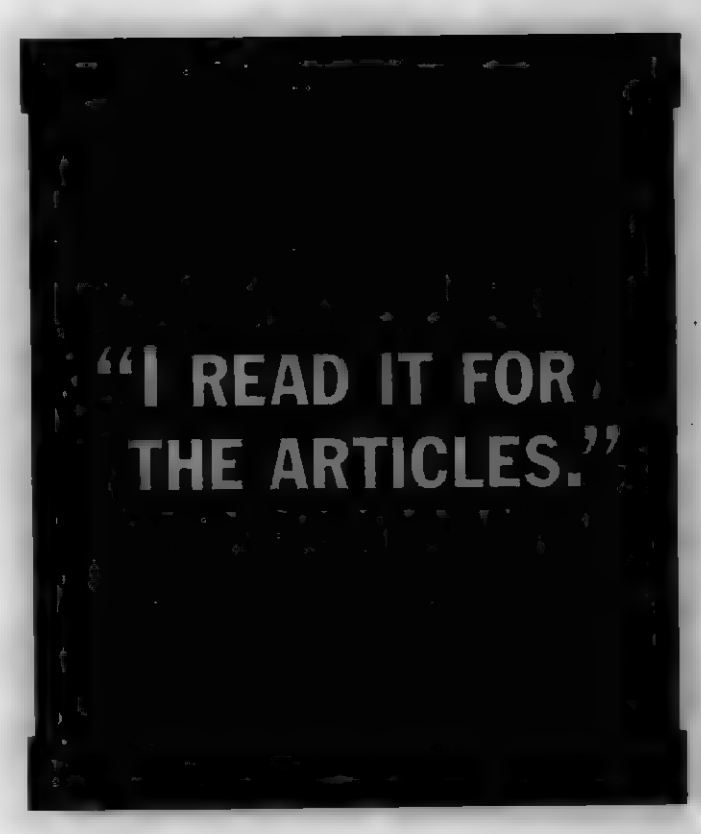
The use of wireless data transmission technology has security managers worried about the potential for abuse. "To tell you the truth, it makes me a little jumpy," said Brian Redler, director of security and operations at National Securities Clearing Corp. in New York.

How safe is wireless? That depends. "Wireless technology is not inherently more dangerous than land-line networking, but you do have to play by a slightly different set of rules," said Ira Brodsky, president of Datacomm Research Co. in Wilmette, Ill.

Ultimately, wireless security awareness must be emphasized at the end-user level. Data encryption, at the very least, should be the first line of defense. "As we distribute the resources, we distribute the responsibility," said Fritz Wagner, manager of corporate electronic information security at Du Pont Co. "The IS guys can't do it all."

Fighting fraud

The topic of toll fraud tops the agenda of the Telecommunications Council of Multinationals user group, which meets in Orlando, Fla., this week. And all last week, Spain played host to a major meeting of security directors and fraud specialists from international telecommunications providers.



CHI/COR Information Management, Inc. has announced TRPS Express, a Windows-based front end for the company's Total Recovery Planning System (TRPS), a DOS-based recovery planning tool.

According to the Chicago company, the product allows network recovery planners to take advantage of the same industry standard relational database planning format as its TRPS.

TRPS Express features an on-line recovery planning methodology that explains recovery planning concepts and principles to the network planner in common management terms.

The product also includes a network topology section, an imaging facility and action icons.

TRPS Express is available at an introductory price of $7,995 for a single-user license.

▶*CHI/COR Information Management*
(312) 322-0150

NetStor, Inc. has introduced automated storage management software for Hewlett-Packard Co.'s HP 9000 systems running HP/UX.

The software includes Hierarchical Storage Management (HSM) software and optional Network (remote) Migration.

According to the Minneapolis company, the HSM software provides full-featured network storage management with automatic file migration, high-speed backup and library management.

Automatic file migration between a remote client and the HSM server is provided by Network Migration.

Prices for the HSM software start at $7,500.

▶*NetStor*
(612) 890-5135

Digital Communications Associates, Inc. has introduced Crosstalk for Macintosh, asynchronous communications software for the Macintosh environment.

According to the Alpharetta, Ga., company, Crosstalk for Macintosh offers a comprehensive set of terminal-emulation and file-transfer protocols.

The product offers full support of Apple Computer, Inc.'s Comm Toolbox standard for connection, file transfer and terminal tools. It also provides cross-platform compatibility to ensure script, QuickPad and keyboard files, in addition to a user interface capability between environments.

The product also includes a built-in text editor.

Crosstalk for Macintosh 2.0 costs $195.

▶*Digital Communications Associates*
(404) 442-4364

MagicRAM, Inc. has introduced the Mercury Card, a voice/fax/modem card based on the PCMCIA 2.0 standard.

The modem was designed to be used for notebook, palmtop and pen-based computers.

The Mercury Card has the ability to integrate voice with applications, providing voice annotations of documents, voice electronic mail, multimedia presentations, remote access of personal voice and fax messages, phone mail and fax-back.

The product operates at speeds of up to 2,400 bit/sec. and can be used in PCMCIA Type II or Type III slots.

To conserve the battery life of portable systems, the Mercury Card also has a sleep mode and wake-up feature. It is available with voice-enabling software that supports either Windows or DOS environments.

The Memory Card has an introductory price of $245.

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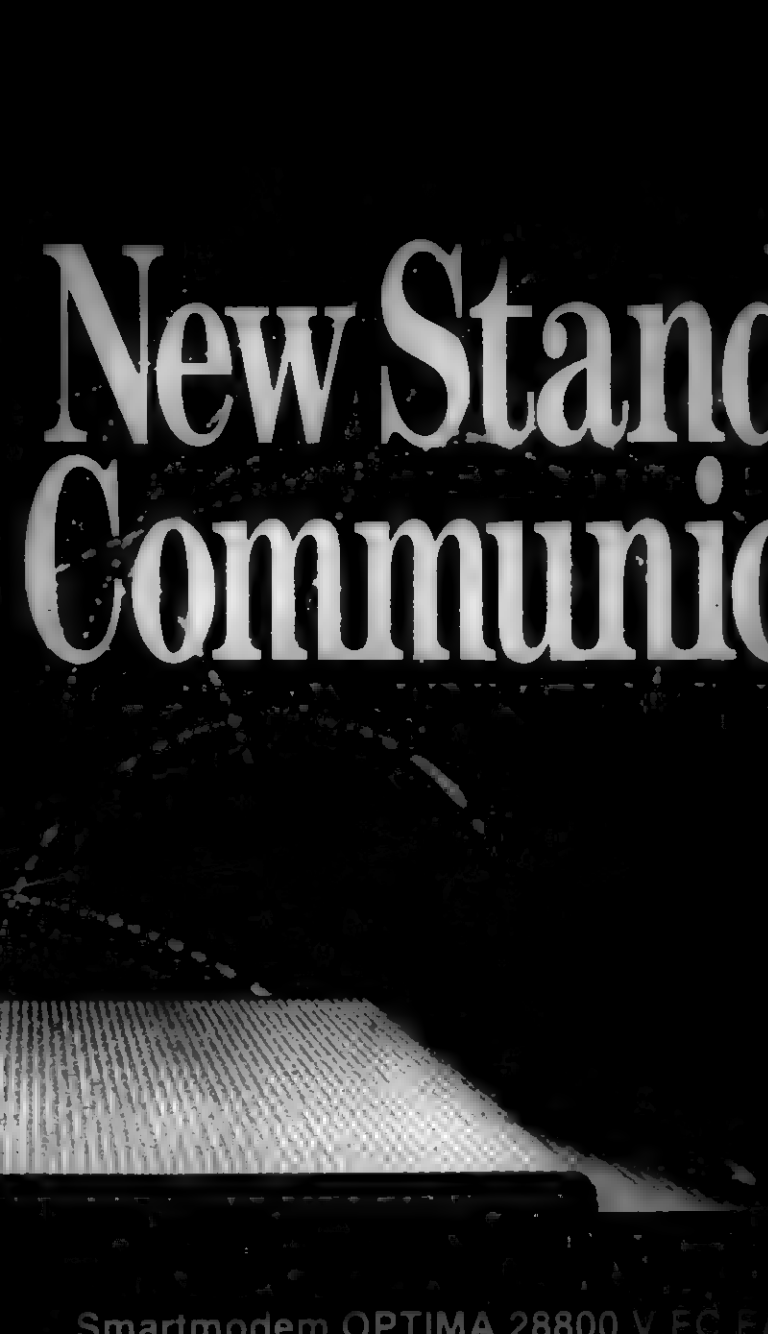

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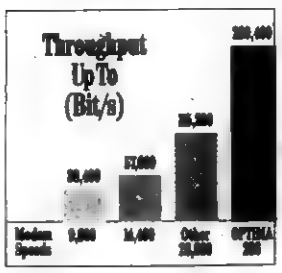

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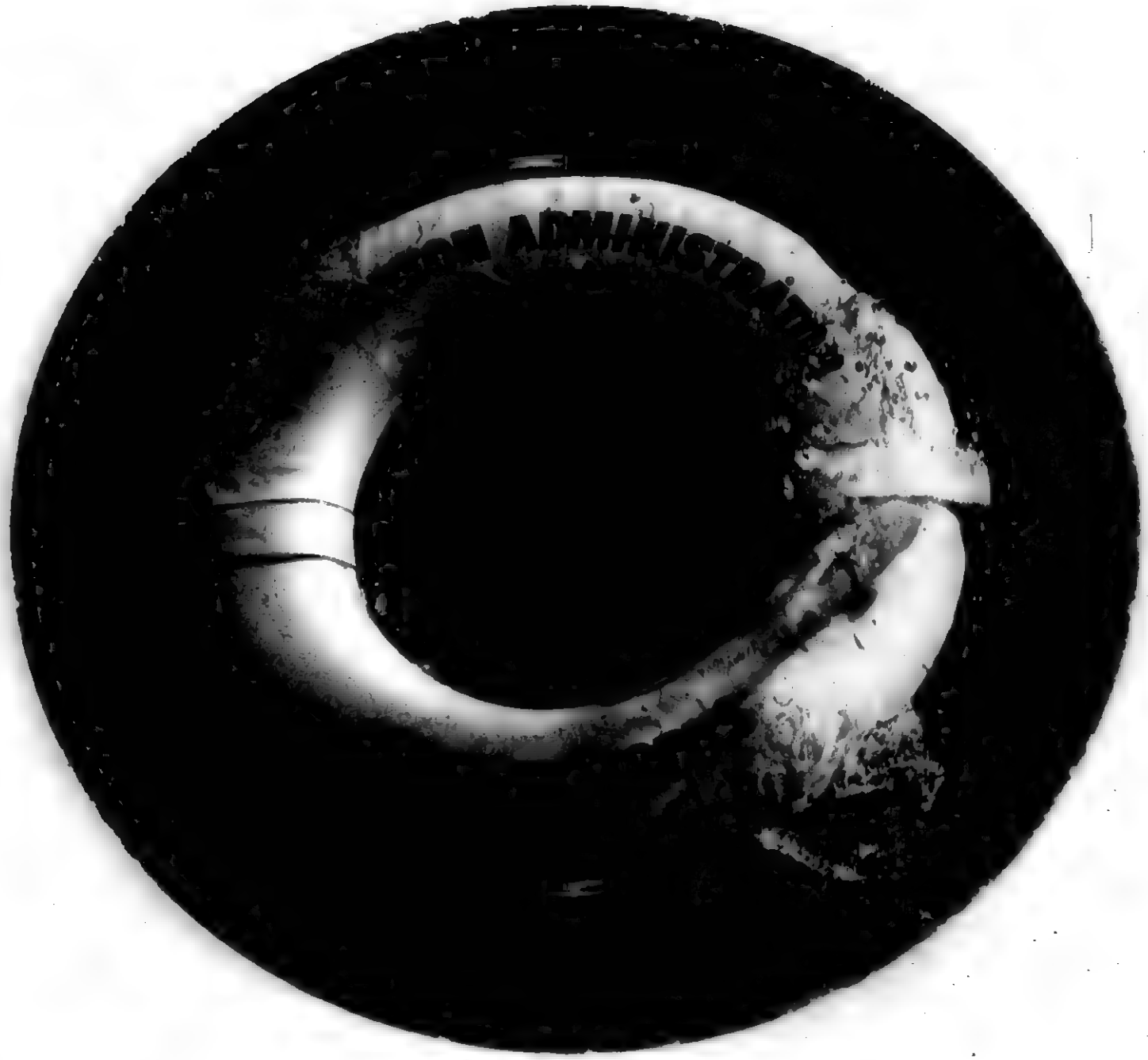

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Experts urge more 'super' in U.S. supers

Government called to head project

By Gary H. Anthes
WASHINGTON

A panel of experts from industry, government and academia has called on the federal government to spearhead development of a $50 million supercomputer able to work at 1 trillion floating-point operations per second (TFLOPS).

The panel, which recently completed a study on high-performance computing for the National Science Foundation (NSF), recommended that the NSF lead the initiative, augmenting in some unspecified way an ongoing effort by the Advanced Research Projects Agency to develop a massively parallel TFLOPS computer by the mid-1990s.

The effort would involve multiple government agencies and the private sector. Started in 1995 or 1996, it could pro-

Supercomputers, *page 84*

Systems futures

Industry sources predict that users will have access and tremendous power at greatly reduced prices within five years

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- $50,000 WORKSTATIONS WILL COMPUTE AT 1 GFLOPS.
- HIGH-END PCs WILL COST $10,000 AND PERFORM AT 200 MFLOPS.

Source: National Science Foundation, Washington

Road to automation bumpy

By Johanna Ambrosio

Too many products without a coherent strategy behind them can almost do more harm than good when it comes time to automate the data center, many implementors agree.

Don Seeker, manager of strategic services at Disney Worldwide Services, Inc. in Lake Buena Vista, Fla., found this to be the case in his shop a couple of years back.

"We had automation everywhere. It was a real hodgepodge, out of control. We had all the tools we needed, but no one was responsible for it all," he said.

But then Seeker's team took some time to look at the whole process and figure out what they were trying to accomplish. The result has been a companywide automation initiative that does more than reduce data center head count and suppress the majority of console messages. Although these goals have certainly been reached, the real benefit has been improved service to end users by the company's having a better handle on what is going on underneath the machine covers.

No cohesive approach

Unfortunately, as Disney and other large companies have found, the path to providing better service through automation is often a bumpy road filled with fits and starts. Products are brought in willy-nilly to solve problems in various parts of the information technology organization, but groups may use the same product in different ways or use the products to measure and control different aspects of the problem.

For example, the people who might tend to one MVS subsystem are a different group than those who are charged with looking after

the CICS transaction processing monitor. These groups have not always communicated with one another, and it is possible they may use a different tool set to accomplish essentially the same job.

Then, too, data centers have suffered from the shoemaker's children syndrome. Although they work around computers, data center people have usually been the last to actually use computers to automate pieces of their jobs. Getting the funding, management commitment and resources in place to do this has not always been easy.

Even when the automation process begins, it can be rocky. Most companies start with products to suppress the never-ending stream of messages that operators have to wade through to determine if anything is going wrong inside the mainframe. These products are generally justified to upper management on the basis that if there are fewer messages to sort, fewer operators will be needed.

One thing at a time

Only when these products have met their targets are other pieces of the automation pie then brought in — to automatically start jobs that must begin each day at the same time, for example. As these other tasks are attacked, there may be different people or different kinds of computers from when the automation project first began, and the willy-nilly mix of products begins in earnest.

"We'd be a lot further along if we had more help," said the operations manager at a Midwest health care facility. "If you're not eliminating people or CPUs, it's hard to get the commitment."

As large shops have proved, however, it is possible to organize an automation effort. The Tennessee Valley Authority in Chattanooga put together a cross-functional team of about 10 people after having already installed a homegrown

Automation, *page 84*

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SAP users turn to host version for transition

By Jean S. Bozman
SAN DIEGO

SAP America, Inc.'s R/3 packaged software applications for open systems are beginning to roll into corporate America, with 40 licenses installed since the product was introduced in North America last year. But users from several multibillion dollar U.S. firms at the Sapphire user group meeting here said they recently purchased the older, mainframe-based R/2 package to replace legacy software and are running only pilot projects on the Unix-based R/3.

Some users said they are waiting for R/3 to gain more functionality and to become comparable in scope to the R/2 product suite. Use of the R/3 product is more widespread in Europe, where SAP AG is based in Walldorf, Germany. There are 4,300 copies of R/2 worldwide and 700 copies of R/3, SAP said. So far, only four North American sites are running R/3 code in production, the company said.

In the works

SAP's R/3 Release 2.1, with new manufacturing modules and enhanced support for client/server GUIs, will ship by year's end.

A joint development agreement with Sun Microsystems Computer Corp.: support for Sun's SPARC-based hardware and Solaris operating system.

R/3 port to Microsoft Corp.'s Windows NT to ship in March 1994; SAP and Microsoft collaborate on OLE 2.0-based client/server applications.

The R/3 Release 2.1 applications suite, with enhanced graphical user interface support and new manufacturing and project-planning modules, is set to ship by year's end (see box). But multinational companies that need financial statements in several languages and currencies said they simply cannot wait.

Goodyear Tire & Rubber Co. assistant controller Joe Gilchrist said he is buying R/2 as a replacement for aging mainframe applications to run the $11.7 billion company and is planning to evaluate R/3 for later use. SAP said a coexistence and migration strategy is under way for R/2 and R/3.

Generally, large SAP users report that their move to packaged applications is driven by a need to reduce information systems costs, replace aging mainframe systems and re-engineer outdated business processes at the same time.

"We decided that we were going to have to change our legacy systems, some of which have been with us for 25 years," said Jack Spurgeon, vice president and director of Systems and Computer Services division at $3.9 billion Eastman Chemical Co., an Eastman Kodak Co. spin-off in Kingsport, Tenn. The firm will install R/2 software on its mainframe "enterprise server" at headquarters and try R/3 for selected international applications.

"We're going to bring up a human resources module of SAP R/3 for decision-support in the international arena," Spurgeon said. "It will help us better understand how R/2 and R/3 coexist together." R/3 will run on Digital Equipment Corp. Alpha machines on top of Oracle Corp. databases, he said.

Convex Computer Corp. in Richardson, Texas, is one of the production R/3 sites. It is running "vanilla" SAP financial packages without change on Hewlett-Packard Co. Unix machines, said Doyle T. Baker, director of information resources. However, Baker said he is also using SAP's Abap/4 tool kit to write code that links the SAP R/3 modules to legacy applications.

Baker said Convex is running R/3 Re-

Continued on page 79

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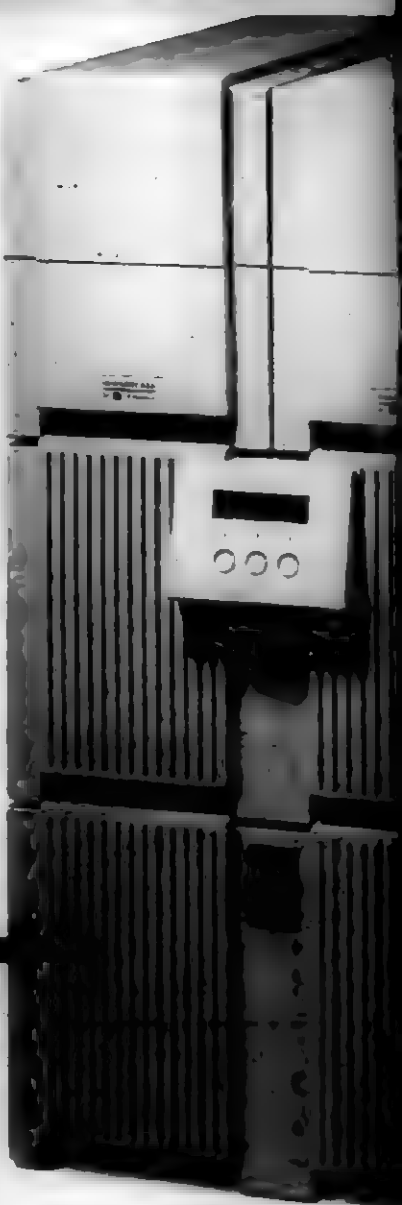

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lease 1.2 applications and that he already has plans to put R/3 Release 2.0 online by year's end.

Chevron Corp., with $40 billion in annual sales, is one of the largest firms planning to move to R/3 on a corporate-wide basis. Chevron is launching a pilot program for Warren Petroleum, a $1.6 billion subsidiary in Tulsa, Okla., that would run R/3 on HP 9000 Unix servers.

If successful, the financial system will be duplicated across the corporation, according to James E. Zell, project manager of Chevron's Advanced Financial Information Systems group in San Ramon, Calif.

Change means savings

"Our goal is to save $25 million a year by changing the business process and installing vendor-supplied software," Zell said. All told, the project to replace Chevron's 30-year-old financial applications may cost $80 million over five years.

The $532 million SAP AG has about $50 million in North American sales, and analysts said it is well-positioned in the open systems application software market because multinational firms may know about SAP AG from their European operations.

"SAP's connection to the chief financial officer community gives it a bit of a lead," said Tom Willmott, a vice president at Aberdeen Group in Boston. "But they're struggling to get R/3 stabilized and in production volumes."

Rival Oracle's Financials applications suite generates about $180 million in revenue, including the use of Oracle consulting services, according to Gartner Group, Inc. analyst John Borelli.

In contrast, SAP, which has a North American division with headquarters in Philadelphia, partners with consulting firms, including Coopers & Lybrand, Andersen Consulting and Price Waterhouse.

Still, SAP must compete with mainframe software mainstay Dun & Bradstreet Software, which is revamping its products for open systems, and PeopleSoft, Inc., which last week announced new client/server-based financial applications software.

Galileo merger/ move complete

By Ellis Booker

Last month one of the world's biggest databases, Galileo International's computerized reservation system (CRS), moved electronically from a data center in Swindon, England, to Denver.

The data transmission was the final leg in the consolidation of the Apollo and Gemini CRS systems. Last March, Covia Corp., the former United Air Lines unit in Rosemont, Ill., that developed United's Apollo CRS, and UK-based Galileo, the CRS owned by a consortium of European carriers, agreed to merge to form Galileo International.

Moving the data across the Atlantic involved six months of planning, two dress rehearsals and nearly 1,000 tapes' worth of download data, according to Galileo, which issued a report on the event earlier this month.

In addition, the Galileo network, which supports about 28,000 travel agency terminals, was redirected to Denver from Swindon. The process took 41 hours.

The 334G-byte database includes 2.25 million passenger files.

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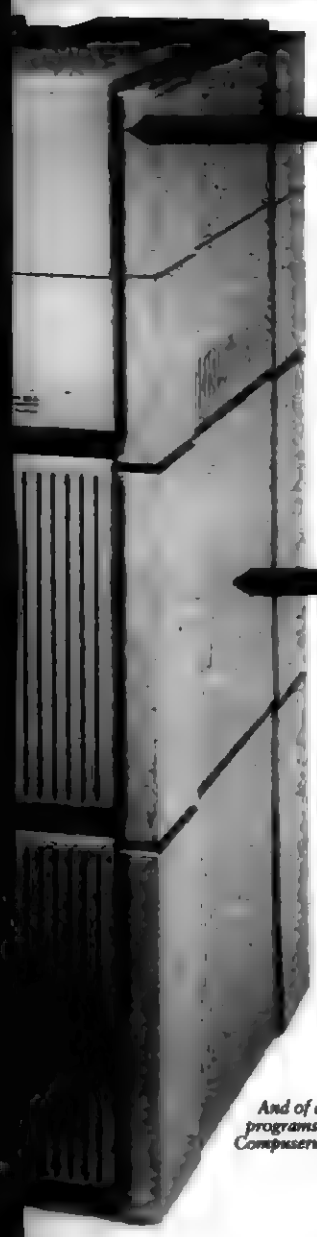

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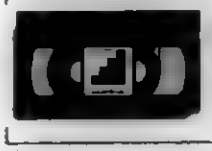

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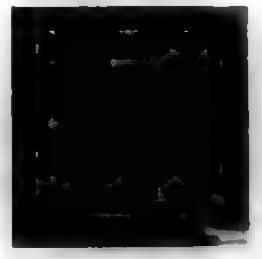

Matrix provides auto-shutdown support of all major network, and midrange OS. The SNMP-compatible Matrix also supports APC's Measure-UPS which meters temperature and humidity, and monitors smoke, fire, water, and security detectors.

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HP addresses user migration to Unix

Explores the option of porting Image to the HP 9000

By Mark Halper
PALO ALTO, CALIF.

With stalwart Hewlett-Packard Co. customers taking a Unix path, it is not surprising that HP is deciding whether to port its proprietary Image/SQL database for the HP 3000 minicomputer to its Unix-based HP 9000.

Giant HP 3000 shops such as Northern Telecom, Inc. and Minnesota Mining & Manufacturing, which operates 150 of the venerable HP 3000s, have declared a long-term goal of migrating to Unix, and there is no guarantee their migration paths will keep them on an HP road.

Users and analysts agreed that if HP were to offer these users the option of walking their database applications from the HP 3000 over to the HP 9000, HP would increase the chance of retaining them as customers, provided the users do not plan to abandon the relatively hierarchical Image/SQL for a more relational engine.

HP is circulating a survey that asks users, among other questions, whether they would like to run Image on the HP 9000 [CW, Sept. 27].

Holly Chapman, director of MIS at mail-order retailer The Hamilton Collection Ltd. in Jacksonville, Fla., said that if she had had a Unix Image alternative three years ago, she may have decided to remain with HP rather than switch to a Sun Microsystems, Inc. platform for the company's order-entry and marketing system.

"By moving, we were basically throwing away 10 years' worth of software," Chapman said. "If there had been the option, I would've liked to have sold it to my boss."

As is the case with many Unix migration decisions, Hamilton's move to Unix was not decided by the information systems shop, Chapman said. It was mandated by a top Hamilton executive who wanted the company to move toward open systems.

Step by step
The Hamilton Collection's Unix conversion has proceeded at a snail's pace. Only one of three geographic divisions, Canada, is live on Unix, while the U.S. and Europe remain on the HP 3000.

Dave Wilde, information management program manager at HP, said HP is monitoring the possibility that Image's lack of availability on the HP 9000 instigated some defections. It is too early to determine survey results, he noted.

Understands the reasoning

One large manufacturing company, like any prudent IS group moving to Unix, plans to shop the Unix market, according to one of the company's database analysts.

In this case, Image is not in question because the company plans to move to a relational database.

Nonetheless, the analyst saw the wisdom of HP's offering Image for the HP 9000.

"There's probably a number of people who would like to do that, but that would be more of a tactical move than a strategic one for them," he said. While the move would spare his shop the money and effort of porting Image applications to the HP 9000, it would not provide the strategic client/server direction that his company has deemed appropriate for its business future.

Birket Foster, president of M. B. Foster Associates Ltd., a Chesterville, Ontario-based vendor of desktop integration tools, noted that offering Image for the HP 9000 would be a potential boon to HP.

"The fastest way to make the transition easy is to offer them Image on a different box, so they don't have to do a conversion," he said. "Otherwise, they could end up on something else, like a Sun."

IVI Travel, Inc. in Northbrook, Ill., is another longtime HP 3000 shop converting much of its operations to Unix.

Manager of MIS operations Jerry Kopecky noted that he will not be waiting for Image on the HP 9000. IVI Travel is installing Informix for its Unix machines, he said.

The Belgian waffle

Hewlett-Packard may be equivocating over whether to offer Image for the HP 9000, but if it decides to take porting action, it already has a development effort by a Willebroek, Belgium-based equity partner.

Three years ago, Denkart NV, a vendor of tools for the HP 3000 and HP 9000 that is 25% owned by HP, developed a version of HP 3000 Image for the HP 9000 with HP.

But for reasons that sources said they believe have as much to do with political sensitivities as with HP's and Denkart's stated explanation — performance shortcomings — HP and Denkart decided not to market the product.

Neither HP nor Denkart will confirm it, but HP is believed to have shelved the product because of the maelstrom of discontent churning through the HP 3000 community at the time.

HP 3000 users were revolting over signs that HP was abandoning the machine and its MPE operating system in favor of Unix; porting the machine's database to the HP 9000 would have further fueled their anger, which has since diminished with subsequent HP 3000 commitments from HP.

Dave Wilde, information management program manager at HP, said that when Denkart developed the product, HP determined there was not a demand for it and that too much money and work would be required to bring performance up to acceptable levels. Among its shortcomings at the time, Image for the HP 9000 lacked a transaction manager, he said.

Denkart general manager Guido Van Brempt estimated that it would take about three months of development to finish the product. The process would entail supporting many of the changes that HP has made to Image in the three years since Denkart stopped work on the project.

—Mark Halper

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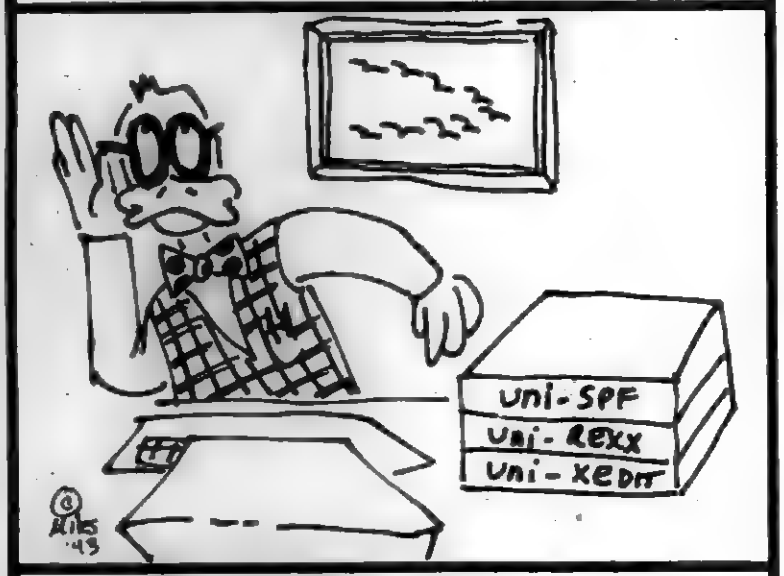

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Briefs

Unisys wins $81M pact

Unisys Corp. will be handling the state of Florida's Health-Care Administration's Medicaid processing under an $81 million, 69-month contract.

Wang hires imaging exec

Wang Laboratories, Inc. hired Andre Boisvert, a former IBM, Cognos Corp. and Synon, Inc. executive, as vice president of imaging and workflow product marketing.

Nasdaq trades mainframes

The Nasdaq Stock Market, Inc. is replacing its Unisys mainframes with newer models. The exchange has signed a five-year, $25 million contract with Unisys for two 2200/900 systems and services designed to support the stock market's 300 million-share daily trading volume.

The mainframes, which will be installed next year at Nasdaq's primary data center in Trumbull, Conn., and its backup data center in Rockville, Md., will replace Unisys 1100/90 mainframes. They will be linked to one another over T1 connections.

NCR support moves

NCR Corp. has established a Customer Focused Business Model designed to provide specific customers with teams of NCR support staffers. As part of the model, NCR named Bill O'Shea, currently senior vice president of NCR's Network and Integrated Systems unit, to senior vice president of worldwide marketing. Tom Mays, a senior vice president of the General Purpose Products Group, has been appointed senior vice president of products and systems.

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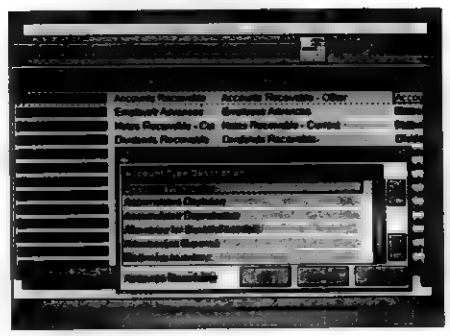

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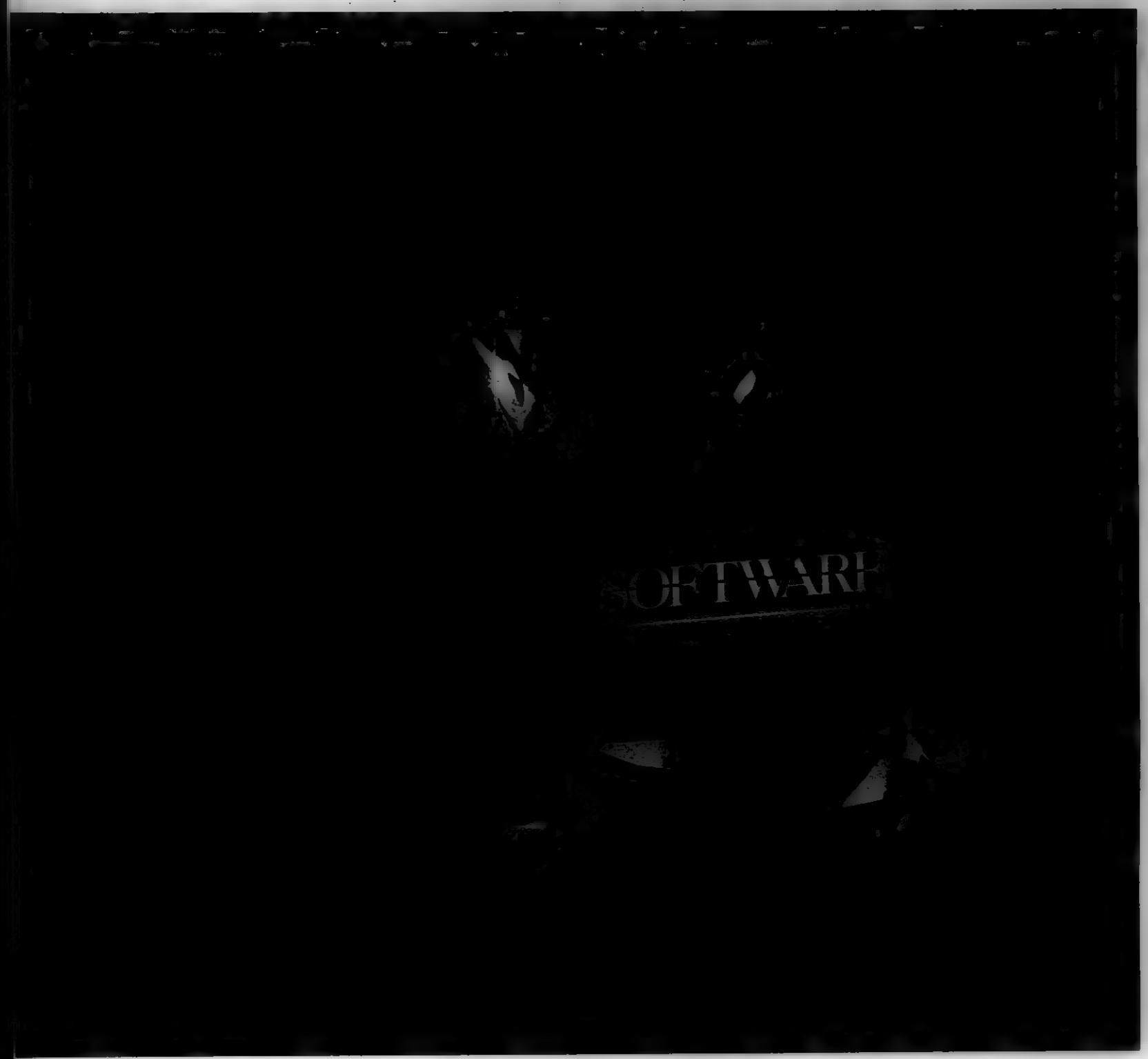

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Automation

CONTINUED FROM PAGE 77

message suppression system.

The people came from technical services, production management and computer operations, among other various areas.

The Church of Jesus Christ, Latter Day Saints in Salt Lake City has also expanded its operations scope on the fly. A few months ago, a cross-functional team started going out into the business units to help end users use automation more effectively. The team helps end users identify and implement projects.

"We've been doing automation for about seven years, from the production and operations sides," said Russ Duncan, information utility consultant for the church. "Now we've broadened it to involve the users."

These cross-functional teams will become even more important in the future, users said.

The next big frontier in operations, to become technologically possible within three years, is to manage operations by application instead of by the technical subsystems involved.

In other words, the operations staff will look at a general ledger or a human resources system to find out how well it is functioning or to fix it if something goes awry. "We're moving to the ability to manage by application," said James Spangler, computer operations manager at United Parcel Service, Inc. in Mahwah, N.J. "We need to take input from all kinds of different sources to find out how an end-user application is doing."

That will require the ability to tie together operations products from different vendors, as well as the cross-training of data center technicians in each others' areas.

Supercomputers

CONTINUED FROM PAGE 77

duce in two years a "nationally shared" supercomputer with a price tag of $50 per TLOPS, plus a similar cost for development, the panel said.

The machine would be used by federal agencies, universities and industry on a broad range of scientific applications.

The report, "From Desktop to Teraflop: Exploiting the U.S. Lead in High Performance Computing," did not lay out a detailed blueprint for action.

"The committee thinks of this as a vision; implementation is an open question," said Marye Anne Fox, a member of the NSF's National Science Board, which commissioned the study.

The report also did not address concerns raised several months ago in a report by the Congressional Budget Office.

The budget office report said the government's high-performance computing and communications program — in which the NSF is a key player — is focusing too much on supercomputer technology and has overly optimistic hopes for massively parallel computers [CW, July 12].

A footnote in the report said some members of the panel dissented from the TFLOPS computer plan, revealing they "have reservations about the urgency of the recommendation, are pessimistic about the likelihood of realizing the [planned] effective performance in applications or are concerned about the possible opportunity cost to NSF of such a large project."

Some new ideas

The panel also recommended that the NSF do the following:

- Take the lead, under White House direction and in cooperation with other agencies, to expand access to high-performance computing by all sectors of the country.
- Double its current level of annual investment — $22 million in workstations — for its 20,000 funded researchers.
- Boost funding for experimental parallel processing technologies such as distributed file systems and message-passing operating systems needed to harness after-hours idle capacity in arrays of PCs and workstations.
- Devote increased effort to systems software, algorithms, models and computational strategies to wring better real performance from high-performance computers, especially parallel systems.

"Now, tell me about client

[redacted]

Sybase, Inc. has announced SQL Monitor Release 10, a software tool designed for distributed client/server database performance monitoring and tuning.

According to the Emeryville, Calif., company, SQL Monitor gives companies mainframelike control over the system performance of their SQL Server-based distributed database environments.

SQL Monitor consists of SQL Monitor Server, which accesses SQL Server shared memory as a background task to capture SQL Server performance statistics; and SQL Monitor Client, which connects to the SQL Monitor Server and displays performance data via a graphical user interface.

SQL Monitor Server prices start at $2,580 for an unlimited-user Unix system license. SQL Monitor Client starts at $595 for a single-user Windows 3.1 license and at $1,380 for a single-user Unix system license.

▶ *Sybase*
(510) 596-3500

Sterling Software, Inc. has introduced Sams:Automate Release 3.1, an IBM MVS storage management automation and reporting tool.

According to the Dallas company, the product delivers on-line, real-time space utilization information that is used to automate routine critical storage management functions.

This version also includes a job submission service to allow ad hoc job creation, which enables users to manually submit a job while on-line without having to leave Sams:Automate.

Release 3.1 monitors the storage environment by selecting, viewing, filtering and sorting messages that are written to a storage message log.

Pricing begins at $24,290 for Group 30 processors.

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Information Builders, Inc. has introduced Focus Report Writer and Focus Interface for SAP on IBM's MVS platform.

According to the New York company, Focus is a complete application development and decision support tool that includes business graphics, statistics and comprehensive reporting along with automatic facilities for producing screens, logic and database designs.

The product offers a scalable database server and portability across mainframe, midrange and microcomputer environments with transparent data access. Focus can create applications ranging from simple reports to large-scale production information management systems.

The Focus Report Writer package is priced from $47,000 to $102,000. Prices for Focus Interface for SAP range from $25,000 to $52,500.

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Software 2000, Inc. has introduced Release 7.3 of its Human Resources 2000 (HR2000), business management software.

According to the Hyannis, Mass., company, HR2000 is an integrated set of applications for managing all aspects of a company's human resources function.

Designed for IBM's AS/400, the series consists of Personnel 2000, Payroll 2000, Flexible Benefits 2000, Defined Contributions 2000 and Industrial Health 2000. Enhancements in Release 7.3 include bi-directional intercompany transfers, enhanced shift processing, a purge applicant data function, data-sensitive transactions within benefits administration and a tax operations module.

Prices for the HR2000 series range from $50,000 to $150,000.

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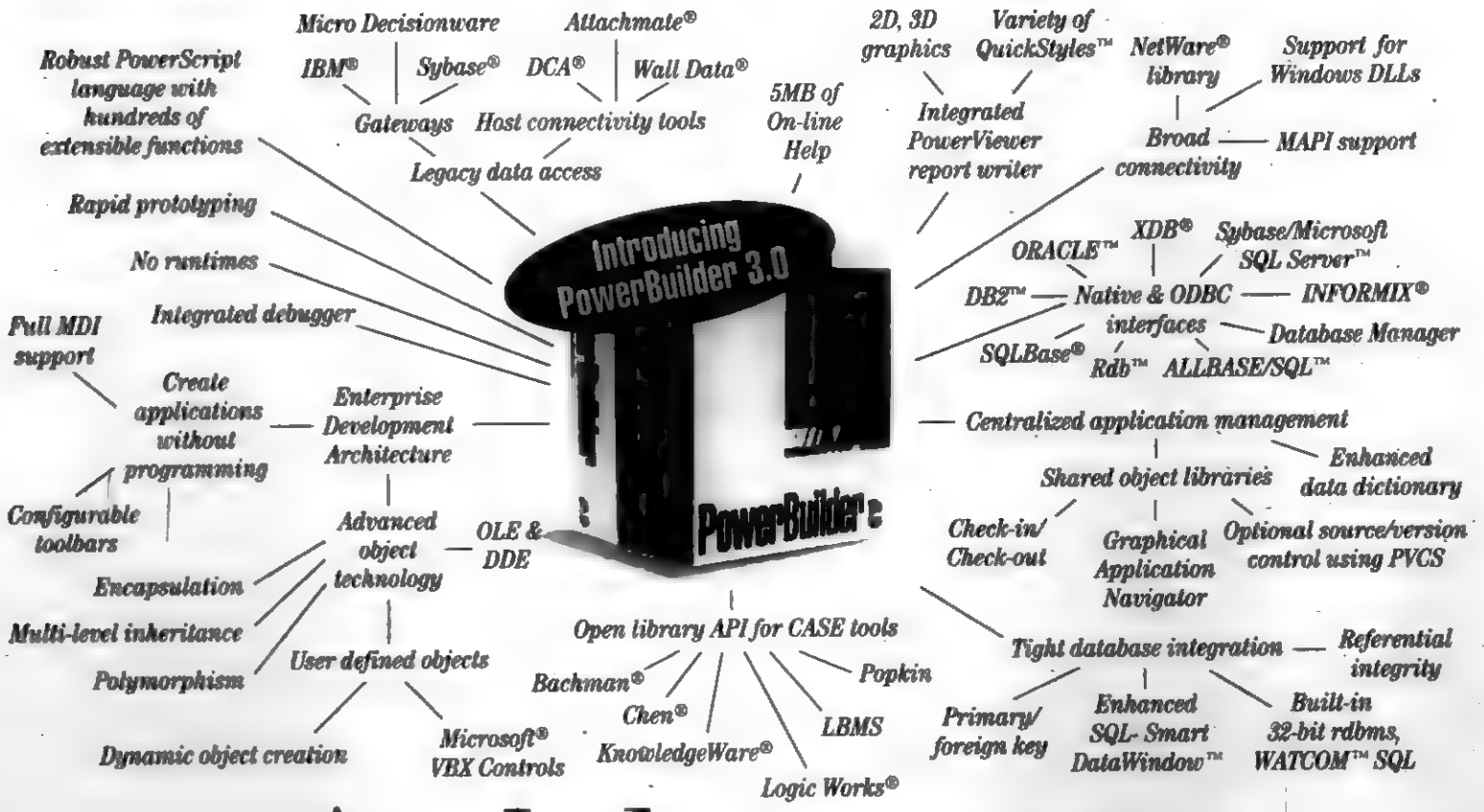

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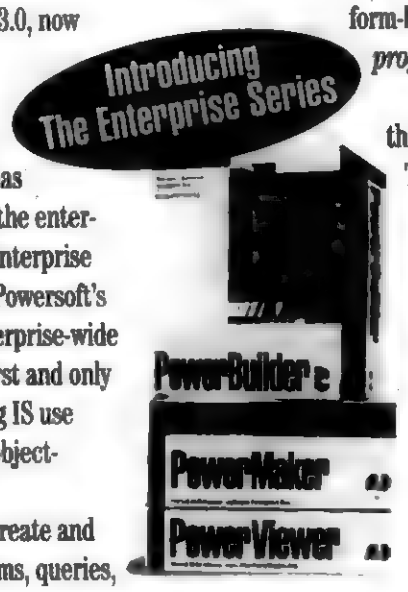

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Application Development

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4GL bridges Unix, Windows

Informix users cite language's flexibility

By Kim S. Nash

Informix Software, Inc. in Menlo Park, Calif., recently shipped a Windows version of its fourth-generation language designed to convert character-based Unix applications to Windows and build single versions of new applications that can be deployed on either Windows or Unix systems.

That kind of flexibility pleased two early users, but they noted that they would like Informix development tools and databases even more if the tools worked with products from other vendors.

"We'd have more freedom," said Terry Walker, senior programmer analyst at Siemens Energy and Automation in Raleigh, N.C. The ability to interchange Informix-made and third-party tools "might lower our costs — who knows?" Walker said. "For now, though, we cannot look into that option."

The next step

After adding Windows support to Informix-4GL, the next step for the company is object-oriented technology. Informix-4GL++, as the follow-on is code-named, should arrive late next year or in early 1995, according to a spokeswoman.

Not a team player

To be sure, users of other databases and tools, including products from Oracle Corp. and The ASK Group, Inc., have voiced concerns over the same matter: Database engines and development utilities work well with sister products but not with those from rival firms.

Informix is expected to break off its development tools, adding support for other databases sometime next year, according to one user. Nancy Li, an Informix product manager, declined to comment.

Here and now, however, Informix-4GL for Windows has saved early users time and money that

4GL, page 88

Tools

LBMS promises effective control

By Melinda-Carol Ballou

Targeting developers who seek to set up consistent development practices across client/server environments, LBMS, Inc. recently announced Process Engineer (PE) Version 2.0.

Houston-based LBMS is a provider of Windows-based client/server computer-aided software engineering (CASE) and process management tools. PE 2.0 is a customizable environment for defining, deploying, measuring and improving the application development process. It now offers full Windows support.

Current LBMS users briefed on the new version talked about the importance of such tools, both for traditional development and in client/server environments.

"Without a tool [like this] you don't have consistency in the development process," said Sharon Cross, a project manager at Boston Edison Co. "If project managers are trying to keep track of

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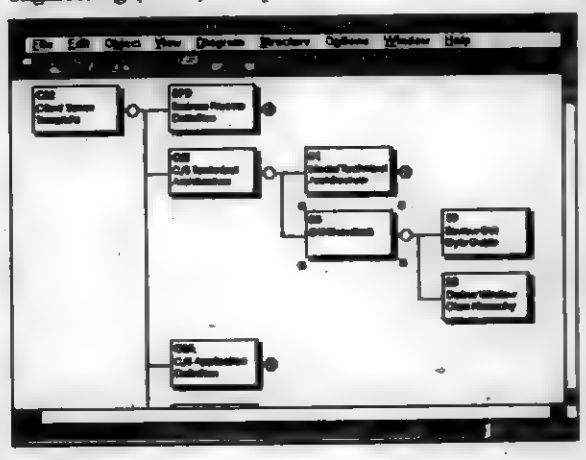


PE 2.0 *is a customizable environment for defining, deploying, measuring and improving application development*

CASE takes its place in client/server universe

By Melinda-Carol Ballou

Computer-aided software engineering (CASE) is overcoming a bad reputation and is beginning to take its place in the brave new world of client/server computing, according to some users and analysts who attended a CASE and Objex World Conference last month.

Several of these users and analysts stated that a steep learning curve and exaggerated expectations of the advantages of using CASE tools have led to disappointment and problems in the past. But they also said that CASE tools are required to act as a compass through the morass of client/server and distributed application development.

"The first generation of CASE tools had problems. It was difficult to use and based on a mainframe model of computing," said Judith Hurwitz, president of Hurwitz Consulting in Watertown, Mass. "The folks that stuck with the good early tools and took the time to really learn and use them got some real value, but there are no magic bullets, and CASE is no exception."

New life for CASE

However, the new face of CASE — with graphical user interfaces to make tools easier to use — and the need to move beyond lower-end client/server tools to take infrastructure and design into account are giving "life to the whole CASE industry," Hurwitz said.

While lower-end client/server tools such as Gupta Corp.'s SQL Windows, Powersoft Corp.'s PowerBuilder and Microsoft Corp.'s Visual Basic offer good back-end code generation and construction, they lack automated front-end analysis and design support, said Gerald Bennett, a senior information systems analyst at Carolina Power and Light Co. in Raleigh, N.C.

Even though Bennett spent much of his time at the show learning about client/server, object-oriented and business process re-engineering issues rather than attending CASE-related sessions, he said CASE will play a key part in his group's move to client/server.

"I see CASE tools playing a role [in this area] but not as big a role as they were originally billed as playing," he said. "You need to have the front-end framework for developing larger [client/server] systems, and the CASE tools will provide that."

He said his organization is just kicking off its client/server production effort and is moving out of pilot mode. CASE tools will play a key role in that transition, he said.

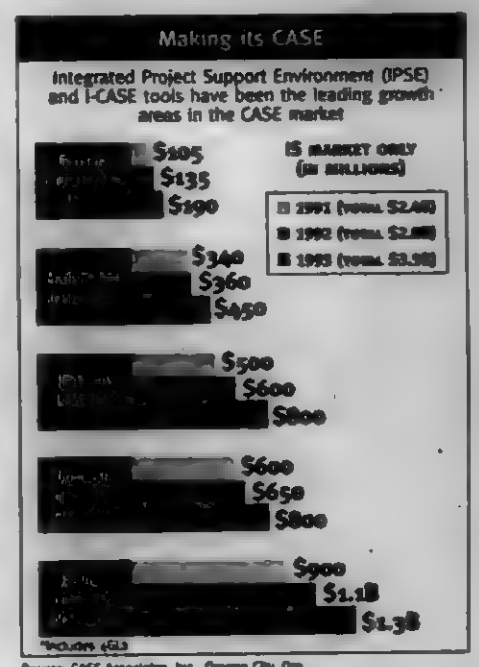
The need for CASE in client/server environments will be even greater than the need for CASE for centralized, mainframe application development, according to several analysts.

"Once you move out of the glass house, there are greater levels of complexity," said Ed Acly, an analyst at International Data Corp. (IDC), a Framingham, Mass., consulting firm. "Only the very naive would think that CASE is dead."

He said research indicates IDC customers plan to continue to adopt CASE, but they want the tools to move outside the traditional data center to handle client/server and distributed systems. And multiple vendors have begun to do just that [CW, Oct. 18].

"Client/server helped bring [the need for CASE] to light," said David Sharon, president of CASE Associates, Inc., a consulting firm in Oregon City, Ore. "Moving applications off the mainframe is the function of tools that lets you do redevelopment and also of tools that let you control and synchronize what you're doing with legacy systems," he said.

He said "CASE-bashing" resulted from both frustrated user expectations and a narrow perspective about the definition of CASE, limiting it to design analysis, requirements analysis and code generation. The real surge for CASE will be in the areas of configuration control, process management and synchronization of development activities, he said (see chart above).



Users are still deciding. A development group at Federal Express Corp. in Memphis is trying to determine the future use for CASE tools. Like Bennett, Ken Preslar, a technical adviser at Fedex, spent little time at the Objex CASE sessions. He said his group will probably continue to use CASE tools, but exactly how and whether they will fit into client/server development have yet to be fully determined.

"I certainly appreciate what CASE tools offer to us [currently] and what they potentially offer us," he said. "I'm anxious for the time when the tools are a little more stabilized. We came into using CASE tools with high expectations, and so far I have found the tools coming up short of what we expected. I'm not sure that it's because the tools are failures, but [rather] that our expectations are too high.

4GL bridges Unix, Windows

CONTINUED FROM PAGE 87

they might otherwise have spent writing new applications. For example, the Florida Association of Court Clerks wants to expand a child-support system from a Unix character-based mode to run on PCs with a Windows graphical user interface.

The association brought in Unisys Corp. to help with the transition and build new features into the system. The first part of the process — porting the existing application to Windows — is done, said Alain Wampouille, a Unisys senior programmer analyst.

Where rivals stand

- ASK's Ingres SQL Windows product runs under graphical Unix and Windows environments with no support for character-based applications.
- Sybase, Inc. does not offer a Windows-based 4GL, and Oracle sells Unix and Windows generation products separately.
- Powersoft Corp.'s PowerBuilder and Gupta Corp.'s SQLWindows run only in Windows setups. They do not support Unix.

"Part of the reason we wanted to beta [test] Informix's Windows product is to get a jump on this stage of the project," Wampouille said. Code recompiling and rewriting is unnecessary, he explained. "You load the Informix tool and then run the application on the target platform. It takes minutes."

Walker said he does not expect a two-minute job, mainly because he has several large applications to migrate, including sales, marketing and engineering systems. By mid-1994, much of the transition to Windows from character- and Motif-based Unix programs should be complete, Walker said.

"That time period probably won't be an Informix consideration but [may result from] running into capacity limits of Windows 3.1," he added.

Informix-4GL for Windows is priced at $1,995 for a development version and $300 for a runtime edition. Among its new features are the following:

- A graphical form painter to let users create and edit fields in predefined forms via drag-and-drop methods.
- A graphical interactive debugger to let users run code and debug existing code in separate windows at the same time.
- Context-sensitive on-line help facilities for Informix tools through pop-up Windows and pull-down menus.

Briefs

Uniface rolls out bridges

Fourth-generation language vendor Uniface Corp. recently introduced its second generation of computer-aided software engineering (CASE) integration with the availability of Uniface CASE Enablement Packs that bundle a new Uniface Model Synchronizer with CASE bridges to 16 leading CASE tools. The synchronizer offers developers integration between the design and construction phases of application development. Also bundled with the packs is CASE Interface Guidelines, a document that details development of the bridge and modification procedures.

Debugger buyout

AIB Software Corp., a developer of productivity tools, has acquired Virtual Technologies, Inc., a purveyor of Unix software and the Sentinel debugging environment.

Protools integration

AT&T/NCR Corp. and Protools, Inc. announced an agreement to integrate Protools' advanced statistical data collection and expert-systems troubleshooting capabilities with the NCR StarSentry enterprise management platform. The integrated release is scheduled for the second quarter of 1994.

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LBMS promises effective control

CONTINUED FROM PAGE 87

things with a method, a bunch of books and a pencil and paper, it just doesn't happen as efficiently. Automating the process makes it easier to gain compliance. We don't hit [developers] over the head with a hammer, but [PE] reminds them of what they are supposed to do."

Cross said her group was looking forward to this release to support the rollout of standard methodology processes for client/server development at Boston Edison. Particularly useful with the new version are its iterative prototyping and easy-to-use visual project planner, intelligent resource assigner, estimator and scheduler interface, she said.

Iterative development lets users create chunks of an application, ship out those portions to users, get reviews back and then revise the code, as opposed to coming out with an entire huge project, she explained.

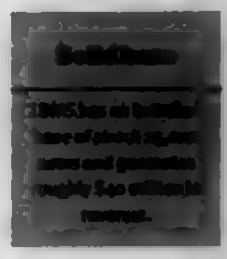
Popular new features

According to Phil Fason, a senior manager at Holiday Inns Worldwide in Atlanta, the new version's ease of use and more effective process management are important features.

"We get feedback from managers using similar processes, then go and make the changes once. This lowers the work load and also lets us measure and manage the process," he said. "Before, everyone just did their own thing."

PE 2.0 offers a suite of LAN-based tools: Process Engineer, PE/Process Library and PE/Process Manager.

Process Engineer targets project managers and lets them rapidly build project plans from methodology templates; define and store information on progress, deliverables, roles and resources; apply multiple estimate models; and create reports and bidirectional interfaces to a range of project scheduling tools. Process Engineer can also invoke other development tools, such as LBMS PE 5.0.



Library of methodologies

The PE/Process Library is a LAN-based repository that offers automated access to development methodologies, LBMS officials said. With this version, the library offers customizable process templates; reusable process components or kernels; and hypertext access to all methodology reference manuals. It also includes configurable metrics models to estimate and measure the development process.

PE/Process Manager, a maintenance tool for PE/Process Library, lets developers define, plan, control, measure and improve the software development process, they said.

Another early user of the project said that his group is able to coordinate processes across multiple projects with PE.

"The tools are important because they allow the rapid assembly of custom project templates to provide consistency," said Glenn Shimamoto, a vice president at Bankers Trust Co., a New York banking and investment firm, about PE 2.0. "We need to do rapid client/server development all the way through traditional development. PE allows you to service a variety of different processes across projects."

Process Engineer 2.0 is shipping now for $2,500 per client. PE/Process Manager costs $2,500 per client, and PE/Process Library costs $35,000 per server.

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Object-oriented languages

Visual language gains ground with programmers

By Andrew Safer

A visual programming language developed by Prograph International, Inc. is making inroads into corporate MIS departments. Companies that have built Apple Computer, Inc. Macintosh-based applications using Prograph 2.5 include The World Bank, J. P. Morgan & Co., Montgomery Securities, Wisconsin Power & Light Co. and Emerson Motors.

As with other object-oriented languages, Prograph defines objects and methods by means of icons instead of text, eliminating the need for C, Pascal or any other textual language. Each major category of operation is assigned a unique pictogram, or icon. By connecting them, the programmer creates the code as a diagram of icons.

Popularity on the rise

At the Halifax, Nova Scotia company's first annual Prographer's Conference recently, Kurt Schmucker, a department manager in Apple's Human Interface group, said, "I think Prograph is currently on some sort of cusp. On the other side of that cusp, it will be a very mainstream player in the generation of the standard double-clickable, document-centered tight applications you see on the Macintosh."

> As with other object-oriented languages, Prograph defines objects and methods by means of icons instead of text.

At Wisconsin Power & Light, the MIS department spent more than $1 million to make engineering models of distribution circuits by customizing an automated mapping system. The models help the utility optimize its 17,000 miles of circuits. Engineering computer analyst Eric Knapp estimates this could save in excess of $20 million annually. But the project was scrapped after 15 months in development.

Knapp, who had been on the team, moved from MIS to the engineering department in order to build the application in Prograph while he worked closely with the distribution engineers. It took six months to create the first engineering model, and four distribution engineers have been beta testing the application since August.

"They're able to look at data for a square mile section a lot easier than they can on the text-based mainframe system. They can know a lot more, a lot quicker," Knapp said.

Knapp credits Prograph for the success, saying the visual language lends itself to graphical display and it is well-suited to the corporate environment, where applications must be developed within six-month time frames. "We now have the tools corporate developers can use to write real applications in-house in a reasonable time frame," he said.

Philip Claringbull, MIS director at Montgomery Securities in San Francisco, selected Prograph to automate the process by which brokers enter orders and forward them to the trading floor for execution. At Montgomery, an IBM AS/400 runs the trading floor and 100 Macintoshes provide the interface.

"Since we have Macs sitting on the desks, the requirement was to make it a more graphical interface, so that it would look like a ticket. The whole idea was to make it as seamless and natural as possible," he said.

Claringbull said the application was developed in-house in two months, using the LU6.2 Advanced Program-to-Program Communications interface between the client and the AS/400. His programmers had not previously written applications on the Macintosh, and Claringbull estimated that it would have taken significantly longer had they programmed in C or C++ language.

The application went through beta testing in October and is scheduled to go live this month.

J. P. Morgan used Prograph to develop a component of a precious metals options trading system, and the World Bank used Prograph to build a fuzzy-logic market analyzer. Both applications have been completed but they are not yet in use.

Paul Harmon, editor of the "Object-Oriented Strategies Newsletter" in Boston, said of Prograph, "It's well put together, the interface works well, and it does what they claim it does in terms of generating code."

Some aspects of Prograph are user-unfriendly, Harmon warned: "The data flow models are almost as intimidating as learning how to write Cobol."

Macintosh and more

Harmon said Prograph International needs to grow beyond the Macintosh platform and support more standardized languages. He said the company will also have to change Prograph's notation structure when a standard object-oriented methodology emerges.

The company began shipping its new release of Prograph, CPX, on Oct. 15. Mark Szpakowski, Prograph International's manager of human interface, said CPX is more powerful and considerably faster than 2.5. He said the class library is comparable to MacApp, and that a multifile project environment makes it easier for a small team of programmers to work together.

The company said it is developing versions for Microsoft Corp.'s Windows NT and Win32s, the PowerPC and Unix for release in 1994.

Safer is a writer in Halifax, Nova Scotia.

[redacted]

Magic Software Enterprises has introduced MagicFrame, a product that enables users to directly access mainframe applications in a transparent process as if they resided locally.

According to the Irvine, Calif., company, MagicFrame consists of a 3270 terminal emulation program integrated with Magic, the firm's rapid application development system.

The combination provides direct communication between PCs and the mainframe, regardless of the database management system, mainframe operating system or transaction system.

The product automatically and transparently updates mainframe data on-line.

Programming is not required. MagicFrame is available for Magic Versions 5.02 and 5.5.

Pricing starts at $1,800 per user for development and $200 per user for deployment.

▶ *Magic Software Enterprises*
(714) 250-1718

Borland International, Inc. has announced the dBase Compiler 2.0 for DOS.

According to the Scotts Valley, Calif., company, the compiler includes 32-bit support that allows users to compile and distribute applications created in dBase that are up to twice as fast as applications developed with dBase IV 2.0 or dBase Compiler 1.0.

An intuitive menu-driven user interface is provided, and the dBase Compiler 2.0 is 100% compatible with the dBase language.

Without modification, users can create stand-alone executable applications from dBase III, dBase III Plus and dBase IV programs.

Other features include AutoCompile and AutoLink, automatic access to 4G bytes of memory through the dynamic Virtual Memory Manager and Manufacturing Automation Protocol file creation that assists developers in documenting and modifying programs.

The dBase Compiler 2.0 for DOS supports 16-bit .EXE generation on all Intel Corp. 80286-based or higher IBM-compatible PCs running DOS 3.3, 4.01, 5.0 or 6.0.

The dBase Compiler 2.0 for DOS has an introductory price of $199.95 until Jan. 31, 1994, after which it will cost $495.

▶ *Borland*
(408) 431-1000

Bluestone, Inc. has introduced DB-UIM/X, a software development environment for building Open Software Foundation (OSF) Motif graphical client/server applications for relational database management systems.

The product is a Unix-based database tool that incorporates the core front-end technology of the UIM/X graphical user interface development tools for OSF/Motif.

According to the Mount Laurel, N.J., company, DB-UIM/X enhances UIM/X's key features with four specialized components collectively known as the Network Object Toolkit.

These components include the Network Object Browser, Network Object Bind Editor, Stored Procedure Viewer and the Network Object Bind Browser.

The product will be available in December. Prices for DB-UIM/X and UIM/X will be $6,000.

▶ *Bluestone*
(609) 727-4600

Software Productivity Research, Inc. has announced the Windows version of Checkpoint, a knowledge-based software management tool.

According to the Burlington, Mass., company, Checkpoint adds value to the management process by suggesting alternate approaches to development; estimating software effort, cost, quality and deliverables; modeling alternate scenarios with a full range of environmental and product features; and providing performance benchmarks based on organization-specific and industrywide standards.

In single quantities, Checkpoint with documentation costs $20,000 per copy, $60,000 for five copies and $99,000 for a 15-copy site license.

▶ *Software Productivity Research*
(617) 273-0140

Viasoft, Inc. has announced Release 3.1 of the Existing Systems Workbench (ESW) Testing facility.

According to the Phoenix company, ESW Testing 3.1 is an interactive testing facility of the company's ESW.

A key option is support for the PL/I language across all IBM environments, including CICS, Batch, IMS/DC and industry-standard database managers.

File Services, an option specific to the CICS environment, extends existing file services and supports DL/I and DB2 environments.

Enhancements include ESW support for all languages and environments and the execution of high-level assembler programs under ESW Testing for Assembler.

Prices for the product range from $21,000 to $146,500.

▶ *Viasoft*
(602) 952-0050

IMRS, Inc. has announced the Hyperion Developer's Toolkit, a set of high-level programming functions that offer open access to Hyperion, the firm's financial information management application.

According to the Stamford, Conn., company, users can create custom applications that interact with Hyperion or link Hyperion to existing third-party applications.

Functions for the tool kit include: updating Hyperion with data from non-IMRS applications, formatting data to move between Hyperion and other applications, allowing access to Hyperion's application processing and maintaining data integrity.

The Hyperion Developer's Toolkit can be licensed for $15,000.

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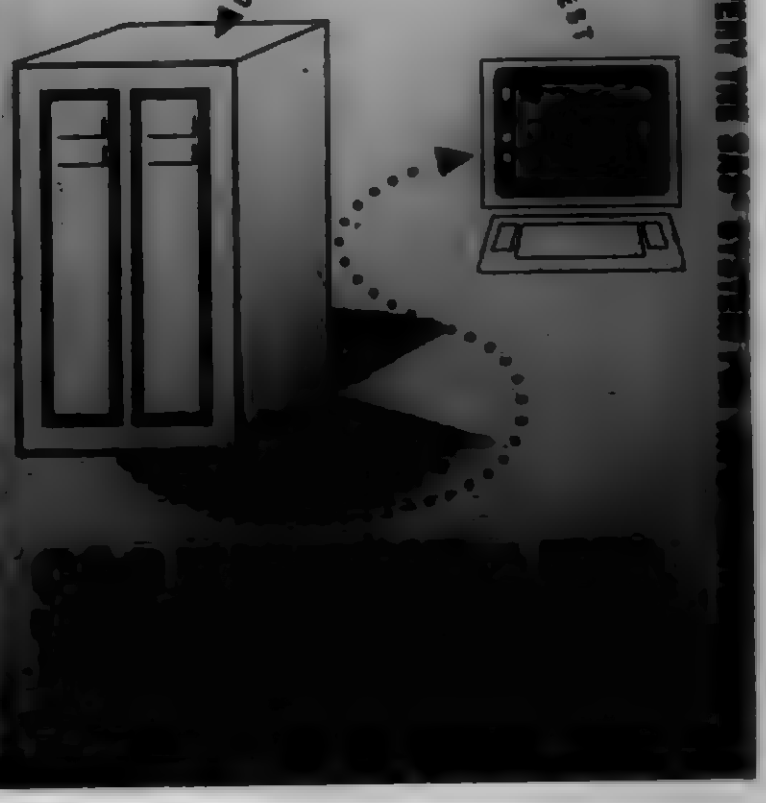

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- User Interfaces: Windows, Motif, Macintosh, Character Mode
- Networks: Netware, LAN Manager, TCP/IP

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Key Client/Server Technologies

- Graphical User Interfaces (GUIs)
- Event-Driven Applications
- Object Oriented Development

Client/Server Software Types

- Database Management Systems
- Network Software
- Tools: CASE, Application Development, and End User
- Application Packages

•

Selected Client/Server Standards

- ANSI/ISO SQL is the industry standard for RDBMS access
- OSF DCE defines specifications for distributed computing, including remote procedure calls, directory services, and security services
- X/Open's XA interface defines a standard interface which provides interoperability between heterogeneous transaction processing monitors

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(1) Client/Server is the dominant deployment architecture for information systems in the 1990s. During the first phase, in the mid 1980s, organizations began evaluating client/server computing, by building prototypes and simple systems to validate the concept. This typically consisted of a small number of homogeneous clients connected to a server for file and print sharing.

Departmental Client/Server

(2) In the late 1980s, as the price/performance and benefits became apparent, Fortune1000 organizations began deploying client/server applications at the department level. LAN-based computing became pervasive and provided the impetus to a host of new technologies, including GUIs, RDBMs, and powerful Unix servers. The typical configuration for these early decision-support systems was PC LANs connected to a departmental server.

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TQM

CIOs ARE LEARNING SOME HARD LESSONS ON THE ROAD TO TOTAL QUALITY MANAGEMENT

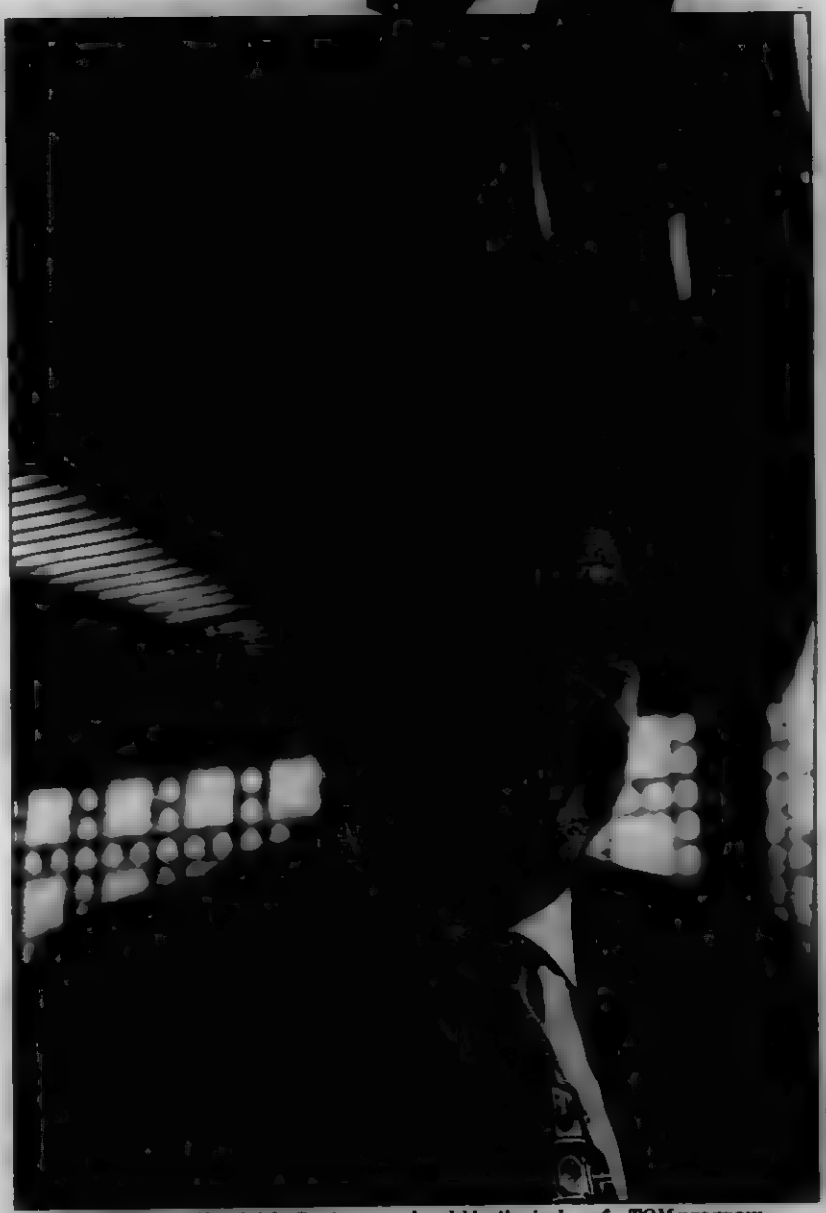
BY AMY BERMAR

"Quality on trial." "TQM: Is it dead or alive?" "Are we falling out of love with TQM?"

When titles like these begin popping up on books, articles and conference sessions, it's clear that the bloom is off the rose with total quality management (TQM).

Virtually every organization rolling out a quality program has encountered significant frustrations along the way. Information systems managers such as Patt Fantetti, vice president of development services at the First National Bank of Chicago, have suffered repeated setbacks. Top IS executives such as Corning, Inc.'s Harvey Shrednick or Bose Corp.'s Warren Harkness have found themselves face-to-face with unexpected

TQM, *page 100*



Bob Peterson/Saba

▶ Corning's Harvey Shrednick: *Customers should be the judge of a TQM program*

Even dead, they're trouble. ◆ Dr. Jack Horner will tell you that. He's the man whose research brought the monstrous dinosaurs back to life in the hit movie *Jurassic Park*. And more than once, he recalls, he nearly lost the fight. ◆ "How did dinosaurs run?" the Montana paleontologist asks. "How fast did they grow? How long did they live? We would have been short of answers without some very sophisticated statistical

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analyses and three-dimensional imaging." ◆ All of which pit the fearsome beasts against Sun™ workstations. ◆ Using images, Dr. Horner was able to envision the eyes, ears, nose, and brain structure of the long-extinct lizards. He

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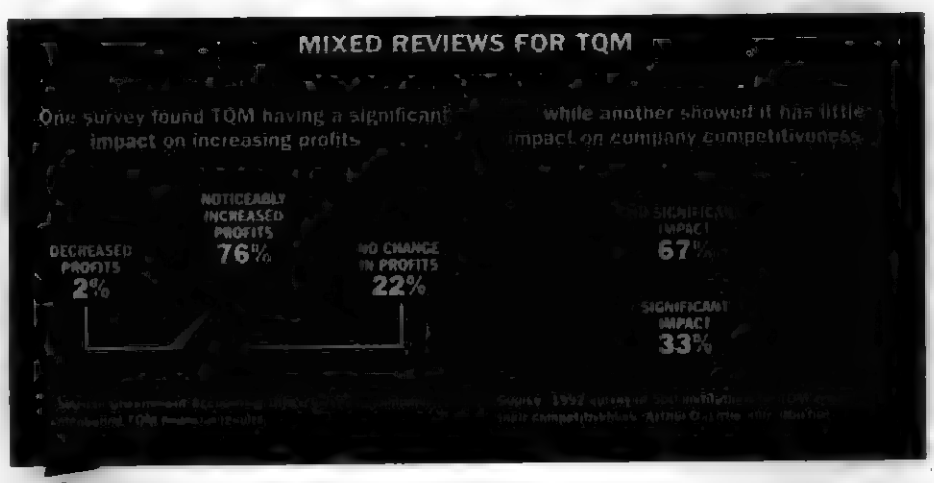
TQ

CONTINUED FROM PAGE 97

and unpleasant surprises.

But because these leaders have persevered with their TQM programs for many years, TQM still has the allegiance of many in the IS community. For every study that questions the value of TQM, another shows it provides a payback (see chart at right).

The question is not whether TQM works but whether a company adopting TQM can avoid the traps and mistakes others have made — and learn from its own experiences and errors.



Tackle specific processes

The Charleston Area Medical Center in Charleston, W. Va., has implemented several quality-improvement projects since 1992. While most have been successful, one sticks out as a failure in the mind of its chief information officer, Charles M. Jones. That was a quality-improvement team that was meant to identify and propose solutions to the difficulties of managing the center's three hospital complexes as a single unit.

It was "too large and complicated an issue for a quality action team to address and resolve," Jones says. By contrast, the successful teams tackled such concrete processes as improving the annual budget development process. Some issues are better left to the regular management decision-making process, Jones says.

Avoid 'sloganeering'

Jones says he is proud of one error he helped the medical center avoid: too much flag-waving for TQM. "I've seen programs rolled out with banners and slogans and logos posted everywhere. That tends to place too much identity on the program itself, instead of on the underlying values."

Jones persuaded the company's quality steering committee to avoid emblazoning memos and letterhead with catchphrases like "Quality counts!" In fact, center executives deliberately chose *not* to call their program a TQM program. "We even dropped the term quality and called it continuous improvement to get away from slogans and banners," Jones says.

Employee resistance

Even when programs are under way, employees can sabotage efforts to revamp outdated work processes.

First National's Fantetti discovered this the hard way. As part of his bank's TQM effort, he tried to launch a function-point metrics program as a way of measuring the productivity of his software development staff. He ran head-on into unexpected opposition from programmers, analysts and mid-level IS managers.

In retrospect, Fantetti says he wonders whether the program's premise was too negative. "We were using [function-point metrics] to identify defect rates." He realized he could have sold the program more effectively if he explained to his project managers how function-point metrics benefit them.

Instead, the first attempt never got past the stage of defining employees' job descriptions, while the second attempt faltered as soon as managers had to measure employees' productivity.

Lack of customer focus

Most IS departments are struggling hard to become more customer-focused. This may be one of the biggest problems confronting IS organizations as they try to reshape their corporate culture.

It's easy to say "OK, guys, we're going to put a TQM program in place, and the two components of the program are focusing on the customer and empowering our employees," says Mike Kohlsdorf, chief financial officer at Brock Control Systems, an Atlanta software firm. But achieving customer focus and employee empowerment is another matter. "That's a radical shift, if you're not doing it already," Kohlsdorf said.

> The challenge is to avoid the TQM traps that others have fallen into.

"I had one employee tell me that this would be a great job if it weren't for the customers," says Shrednick, senior vice president of information services at Corning, the $3.7 billion specialty glass manufacturer in Corning, N.Y. The employee, he says, overlooked one critical fact: "If there weren't any customers, there wouldn't be any need for the IS department."

Customer surveys reveal areas in need of improvement that might not be obvious. For example, surveys told Shrednick his 250-person IS department was perceived as difficult to deal with. The key issue for users wasn't the prospect of coping with unfamiliar technology, but bureaucracy: Customers seeking simple answers got passed off too many times from one IS staff member to another.

Perhaps the most common complaint from senior management, as well as the rank-and-file employees expected to change their work habits, is that quality takes so long to achieve.

"Companies are looking for the quick fix," says Rick Swanborg, principal at Ernst & Young's Boston-based Center for Information Technology and Strategy. Managers "have a year to make change happen and want to go out and find the best practice that will make things better."

TQM requires cultural change, and "you don't reculturalize a company in a year," says Bose's Harkness, director of corporate IS at the $450 million audio manufacturer in Framingham, Mass., and one of the profession's more visible advocates of TQM.

"It wasn't until I got personally involved in meeting, teaching, doing and advising quality teams... [that I] more clearly understood the realities of implementing a TQM program," Harkness adds.

The big picture

Lack of executive leadership is often blamed as the primary reason why TQM programs fail. But sometimes programs fail because leaders are too successful inculcating TQM, and the drive for quality becomes an end instead of a means. This prompted a new chief executive officer at Florida Power & Light Co. to pull the utility's award-winning TQM program.

IS organizations have their own variation on this theme, Harkness says. They can become so obsessed with satisfying their customers that they're reluctant to risk projects based on emerging technologies out of fear that satisfaction ratings will dip. And that's a big mistake.

"The customer is looking for technical leadership," he says. "That's the bottom line. Sometimes you can overemphasize the quest for customer satisfaction and not focus on your core business."

Similarly, adhering strictly to the TQM doctrine of one particular TQM guru can lead to a dead end.

Senior management at Owens Healthcare, Inc. in Houston searched for the definitive quality program. But like others who have sought a TQM Holy Grail, "we found that there was no one system that seemed like a good cultural fit. We ended up hiring a local consultant and cutting and pasting from the best of what we had seen," says David Loebig, CIO of the pharmacy management firm. ■

Bermar is a free-lance writer in Newton, Mass.

LESSONS FOR IS EXECUTIVES

Here's some advice from two CIOs who have lived through a TQM effort:

GOOD MOVES

- ✔ **Help provide an enterprisewide perspective to the TQM effort.**
- ✔ **Volunteer at the outset. Don't wait for someone to ask you to be involved.**
- ✔ **Be a consensus-builder in the corporate effort, a catalyst rather than a driver.**
- ✔ **Be a leader for the IS staff. They will be watching to see if you really support the process or just give it lip service.**
- ✔ **Become a resource for the quality teams in resolving cross-functional conflicts.**
- ✔ **Get the IS staff (your people) trained in the quality process. Many of the skills used in systems analysis will translate well.**
- ✔ **Be realistic with the time frames that you set. People will lose interest if a task can't be accomplished in six months or less.**

BAD MOVES

- ● **Don't try to control information production and use. Encourage end-user access to information, off-the-shelf software, etc.**
- ● **Don't allow IS to be a bottleneck at the implementation phase. Anticipate recommendations to re-engineer systems or support streamlining efforts.**
- ● **Don't be an obstacle to the TQM effort. Look for opportunities to change "can't be done" to "can do."**
- ● **Don't promise more than you can deliver.**
- ● **Work with your people to avoid the "not invented here" attitude.**
- ● **Don't permit the overinvolvement of just one or two individuals in the IS department.**

Source: David Loebig, CIO, Owen Healthcare, Inc., Houston; Charles M. Jones, CIO, Charleston Area Medical Center, Charleston, W. Va.; College of Healthcare Information Systems Executives, Ann Arbor, Mich.

Minority hiring getting more attention, help

By Jean S. Bozman

Federal requirements and greater appreciation of the value of a diversified work force have made minority hiring a priority in the 1990s. Fortunately, there are resources available to information systems managers looking to hire minorities.

Helping to tap the pool of minority group professionals are on-line databases and electronic job postings that are replacing traditional career fairs and resume books.

Large corporations can sign up for access to on-line databases, which hold thousands of names and post jobs electronically. These databases are used by several large corporations, including IBM, Hewlett-Packard Co., Digital Equipment Corp., AT&T, Allstate Insurance Co., Kraft General Foods and Amoco Corp.

A number of recruitment resources are provided by professional organizations with minority group membership. Several national organizations maintain on-line databases, including the Black Data Processing Associates (BDPA), the National Urban League, the National Society of Black Engineers and the National Black MBA Association (see chart at right).

Seeking consultants

IS managers are also turning to diversity consultants to hire a more balanced work force for their information technology operations and software development staffs. The reason, management consultants say, is that the labor pool is changing, becoming a broad mixture of various ethnic groups and age brackets.

Many diversity consultants are independent advisers, prepared to offer in-house seminars and to advise management on diversity hiring resources. But equally important, they offer advice on management issues associated with having a diverse work force.

"I think there's been persistent pressure for corporations to diversify, to look for different human resources," says Antoinette Malveaux, director of operations for the National Black MBA Association in Chicago. "Diversity managers are being appointed, diversity task forces are being put in place, and companies are thinking about what their work force will look like in the year 2000."

Interest in diversity hiring has also picked up because of global competition. In a multicultural world, having a multicultural work force is viewed as an asset.

IS shops in corporations that are federal contractors face an additional challenge: The government requires good-faith efforts to employ a work force reflecting the regional labor pool.

Managers in such firms must hire employees that represent the ethnic mix in their community, as shown by Department of Labor statistics.

"The demand for a diversified work force is written on the wall," says Ollie Morgan, president of the Chicago chapter of BDPA, a national group for minority information technology professionals.

"The most progressive companies have developed relationships with associations to assist them in finding a diverse group of candidates," Morgan says.

"Typically, there's a plan in place that says an organization wants to identify and attract qualified candidates with a variety of backgrounds," says Jeff Loehr, director of human resources at Informix Software, Inc. in Lenexa, Kan.

Stuck in a traditional rut

But many companies still have trouble breaking away from traditional hiring practices to attract a more diverse employee base.

"Many companies have been going after their traditional sources for recruitment," notes diversity consultant Linda G. Cooper at LGC & Associates in Kansas City, Mo. "They may be looking for people who talk like they do, who went to the same schools they did. It does require time and money to identify talented people for a diverse work force."

RESOURCES

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National Black MBA Association
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Suite 1515
Chicago, Ill. 60601
(312) 236-2622

National Society of Black Engineers
1454 Duke St.
Alexandria, Va. 22314
(703) 549-2207

National Society of Hispanic MBAs
P.O. Box 2903
Chicago, Ill. 60690
(312) 856-9130

National Technical Association
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Washington, D.C. 22314
(202) 829-6100

National Urban League
1111 14th St. N.W.
Suite 600
Washington, D.C. 20005
(202) 898-1604

Hitting the books

Job candidates must also keep up their skills, notes Timothy Wilson, president of T. A. Wilson & Associates in Northboro, Mass.

"I talk about being as multifaceted as possible," he says, "so that [candidates will] be prepared for the next technology changes."

For example, computer programmers and systems analysts must make a point of learning about client/server and object-oriented technology, as well as traditional programming languages such as Cobol.

Malveaux notes that a recent survey of the National Black MBA's 3,000 members nationwide showed they are interested in career programs to combat the recent recession. Many attend national conventions and career fairs and try to network with other professionals to find new jobs.

Once a diverse work force is in place, management policies must be refined to support workgroup conflicts and communication problems that may arise.

"You have a work force that has been, for the sake of argument, all green, and people have not known how to deal with yellow, blue and red," said Norris Hite, publisher of the National Society of Black Engineers' magazine in Alexandria, Va. "Mind-sets have to change all the way down the line because managers are used to managing people who look like them." ■

Executive Track

AT&T has announced the appointment of James L. Zucco Jr., to a new position as chief information officer for its Business Communications Services unit. He was senior vice president of strategy and technology at MCI Communications Corp., and earlier he was in a senior management position with Nolan, Norton & Co., a consulting firm with offices in Boston and London.

As CIO, Zucco will lead the information management activities for Business Communications Services and help leverage its information assets to increase customer satisfaction and shareholder values.

He will report to John C. Petrill, president of Business Communications Services, which serves the global business long-distance market, and Ron J. Ponder, AT&T senior vice president and CIO.

Zucco's appointment is the third by AT&T this year in its effort to make innovative use of advanced information technology to enable its communications services employees to be more effective in their work with AT&T's customers, suppliers, alliance partners and with each other.

Also hired recently in this effort were Alan G. Jones, formerly vice president and CIO at Tektronix, Inc., who was named CIO for AT&T's Customer Communications Services unit; and Ponder, formerly executive vice president and CIO at Sprint Corp.

Avis, Inc. has appointed Frank Notarstefano director of systems development for the WizCom International Ltd. subsidiary. Notarstefano will coordinate all development for the subsidiary, which provides reservation services and a variety of other electronic systems products and programs to the hotel and car rental industries.

Notarstefano joined Avis in 1989 as a systems manager in information services.

Kailash C. Khanna has been named the new head of global information technology at the Society for Worldwide Interbank Financial Telecommunication. Khanna will direct all systems staff at the company's headquarters in Belgium and in the U.S. Previously, Khanna served as senior vice president of systems and technology at the CIT Group of Manufacturers Hanover Trust Co.

David B. Cameron has been named CIO at Trivest, Inc. in Coconut Grove, Fla.

Cameron joined the $650 million investment firm from Wackenhut Corp., where he was vice president of information systems.

Michael J. Dooling has joined Witco Corp. as director of the chemical manufacturer's information technology center in Woodcliff Lake, N.J.

Dooling will be responsible for end-user computing, emerging technologies and IS quality assurance. Prior to joining Witco, Dooley was a group manager at PepsiCo, Inc.

Paul A. Brands has been named chief executive officer at American Management Systems, Inc. in Arlington, Va. Brands succeeds Charles O. Rossotti, who will remain as chairman.

Brands also serves as the company's vice chairman and will concentrate on day-to-day operations.

Texas Instruments, Inc. has named J.R. (Bob) McLendon vice president and manager of its global IS and Services Division, at its Dallas headquarters.

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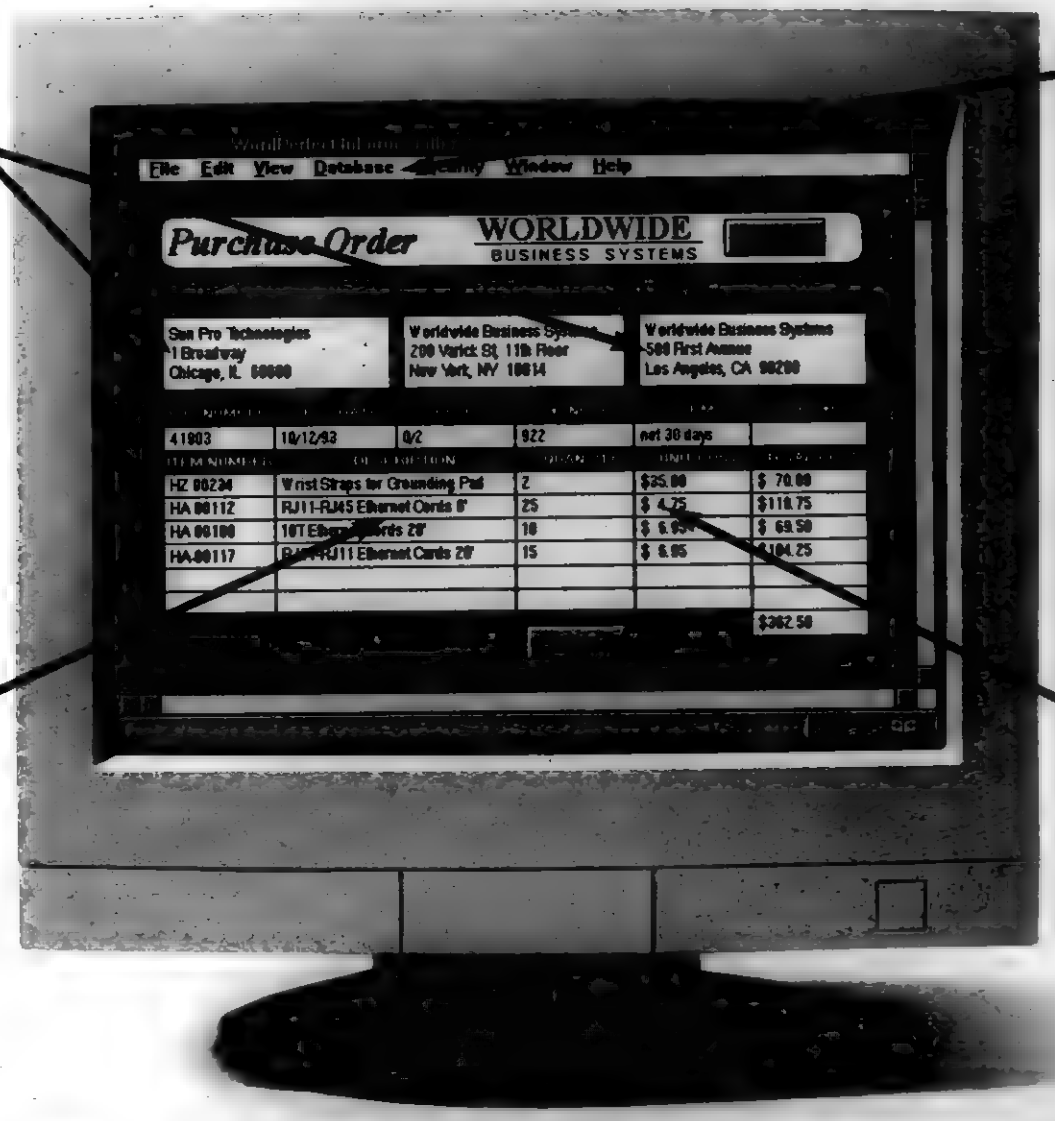

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Calendar

NOV. 14-NOV. 20

Xplor '93. Denver, Nov. 14-19 — Contact: Xplor International, Torrance, Calif. (310) 375-4240.

Comdex/Fall. Las Vegas, Nov. 16 — Contact: Kimberly Companion, Micrografx, Inc., Richardson, Texas (214) 994-8413.

NOV. 28-DEC. 4

E-Comm '93. Atlanta, Nov. 29-Dec. 1. — Contact: E-Comm '93 Conference, Dallas, Texas (214) 424-0562.

Fourth Annual Computer Fax Conference. Monterey, Calif., Nov. 30-Dec. 1 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

DEC. 5-DEC. 11

Database Marketing Conference & Exposition. Orlando, Fla., Dec. 5-7 — Contact: The National Center for Database Marketing, Stamford, Conn. (212) 972-2410.

Lotus Notes Users Conference. Lake Buena Vista, Fla., Dec. 5-9 — Contact: Lotusphere '93, Sudbury, Mass. (508) 443-1457.

Computer Measurement Group (CMG): Managing the Wave of Technology. San Diego, Dec. 5-10 — Contact: Computer Measurement Group '93, Chicago, Ill. (708) 655-1812.

Wireless Datacomm '93. Washington, Dec. 6-8 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

"Outsourcing the IS Function." San Francisco, Dec. 8-9 — Contact: International Quality & Productivity Center, Upper Montclair, N.J. (201) 783-4403.

The Outsourcing Conference: "Opportunities, Strategies, Realities." Boston, Dec. 8-9 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Database World. Chicago, Dec. 8-10 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3880.

DEC. 12-DEC. 18

Lap and Palmtop Exposition and Conference. Toronto, Dec. 13-14 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7968.

JAN. 9-JAN. 15, 1994

ObjectWorld. Boston, Jan. 10-13 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JAN. 16-JAN. 22, 1994

Client/Server Conference & Exposition. San Jose, Calif., Jan. 18-21 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-7460.

JAN. 23-JAN. 29, 1994

CeoNet '94. Washington, Jan. 24-27 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JAN. 30-FEB. 5, 1994

Executive Technology Summit '94. Tarpon Springs, Fla., Feb. 2-4 — Contact: ATI Travel Management, Chicago, Ill. (312) 644-6642.

FEB. 6-FEB. 12, 1994

Building Enterprise Architectures. Washington, Feb. 8-10 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

FEB. 13-FEB. 19, 1994

SIGDA: Workshop on Field Programming Gate Arrays. Berkeley, Calif., Feb. 14-15 — Contact: Association for Computing Machinery, New York, N.Y. (212) 944-1318.

The Sixth Annual Software Support Conference. San Francisco, Feb. 14-16 — Contact: Jan Rosenthal, Institute for International Research, New York, N.Y. (212) 661-3500.

Distribution/Computer Expo '94. West Irvine, Calif., Feb. 16-17 — Contact: C.S. Report, Uwchland, Pa. (215) 458-6410.

Conceppts '94. Orlando, Fla., Feb. 16-19 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

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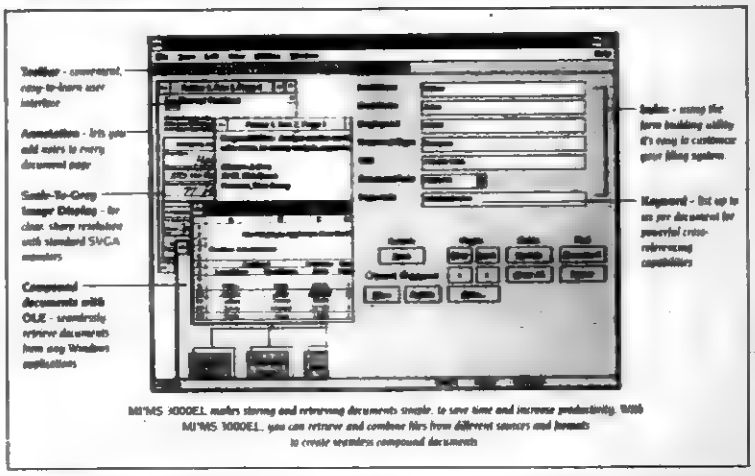

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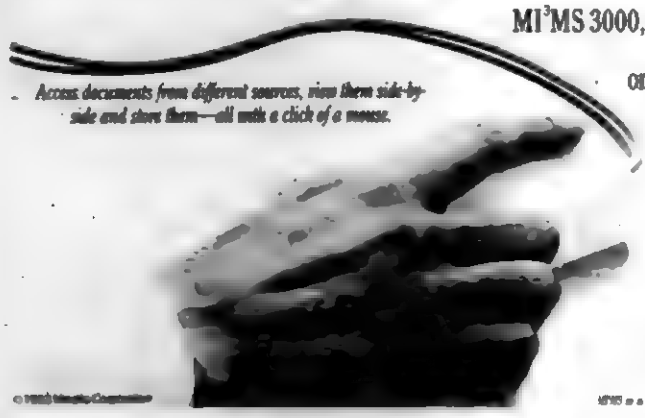

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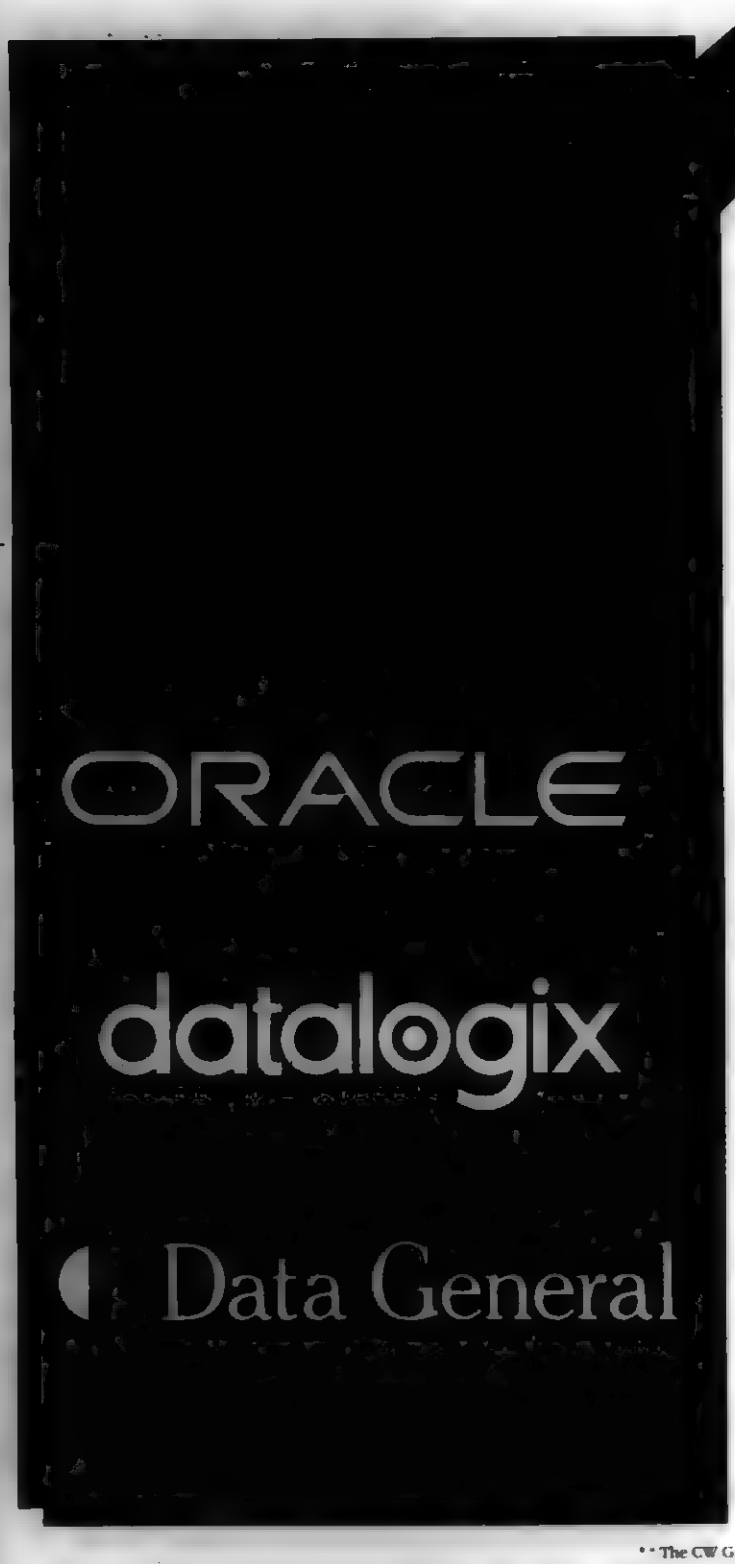

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BEAN COUNTERS BEWARE

CFOs want to analyze real-time accounting information. Client/server applications promise to get them there. But uncertainty abounds, especially in the areas of cost, security and the volume these packages can handle.

BY JULIA KING

Slowly, Federal Express Co. is moving all of its mainframe financial applications to a Novell, Inc. NetWare LAN. Slowly, as in one application and a couple dozen people at a time.

The 25 users in the asset-management department, who will soon have 486-based PCs on their desks, will be able to use up-to-the-minute accounting data to do analysis, without the help of the information systems department. The application logic will reside on a Hewlett-Packard Co. HP 9000 server that will run a Sybase, Inc. database.

At Fedex and other Fortune 1,000 companies, accounting applications are no longer regarded as "untouchable." But even though this grandfather of systems is under strong consideration for dismantling and relocating to smaller and more accessible platforms, many companies are hesitant to entrust it to the current batch of mostly unproven client/server financial software just coming on the market today.

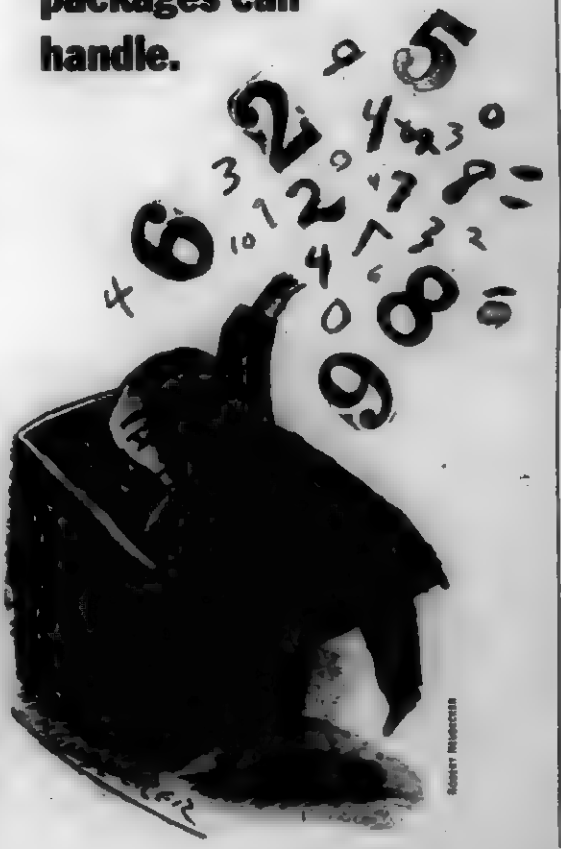
The fact is, most companies are more interested in testing the waters with pilot projects and small sample applications. "The major shift will occur toward the end of 1994 and into 1995," says Tony Percy, vice president of software management strategies at Gartner Group, Inc. in Stamford, Conn. "It will become more mainstream when there's more clarity in the market."

"We're starting... with the idea that you learn from experience," says David Klimetz, manager of Fedex's financial control system. "You pick one thing, concentrate on it and do it well." Fedex is a beta site for Dun & Bradstreet Software, Inc.'s client/server-based Financial Stream system, which D&B started shipping in September; all modules are expected next year.

The impetus for a move to client/server accounting is undeniably strong: With up-to-the-minute accounting information, managers could identify new markets, forecast global

Bean counters, *page 108*

King is a free-lance writer in Ridley Park, Pa.



inside

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Financial functions good, security lacking, say users of PeopleSoft Financials. Page 118

Lessons scores highest of four financial players. Page 117

Bean counters

CONTINUED FROM PAGE 107

buying and selling trends as well as produce management reports as business needs dictate, not as mainframe schedules allow.

In addition, the built-in tools these applications provide allow users to customize their own reports, create one-of-a-kind financial summaries and perform ad hoc queries. Some vendors offer proprietary tools, but some packages use Microsoft Corp.'s Visual Basic and Access programming languages or Powersoft Corp.'s PowerBuilder fourth-generation language.

"The focus of most financial systems in place today is to store information," says Brian Sommer, director of software intelligence at Chicago-based Andersen Consulting. "But you don't run a business by looking in the rearview mirror. What users want now are management-reporting systems to run the business and not to satisfy auditors."

Slow to make a move

But there are solid reasons for the slow migration. Much of the explanation lies in the user sites. "Users are wildly confused about what's happening and what the vendors are telling them," Percy says. "Some just think they should get off the mainframe. Others are drawn to the PC front end. Some want open systems and are heading for Unix. Another direction is relational databases to get to a more strategic platform."

The trouble is that it's very difficult to distinguish among vendor offerings. For one thing, many of the application suites have just started shipping this year, a couple of modules at a time.

PeopleSoft, Inc. will complete its suite in December; D&B is expected to finish shipping next year. SAP America, Inc. has released its applications, but few U.S. sites are using them. After two years of talk, the Dodge Group, Inc. said it will ship its system by first-quarter 1994.

Other notable midrange and mainframe vendors, such as Ross Systems, Inc., J. D. Edwards, Lawson Software Corp. and, next year, Walker Interactive Systems, Inc., are offering client/server versions as an option to early adopters.

Oracle Corp. is the market-share leader in Unix financials, but only a small portion of those 1,400 users are in client/server mode, according to Chris Roon, director of applications marketing.

And the vendors aren't offering much help in differentiating their wares. "They all say they'll be on the same platforms. But in actuality, they all have different strengths," Percy says. "For instance, what model of client/server are they using? To what extent are they optimizing the underlying database? To what extent are they going after the business process re-engineering crowd?"

Another reason for user reticence is the realization that distributed functionality and flexibility does not come cheap. An average system from Platinum Software Corp. — including general ledger, payables and fixed-asset modules to support up to 100 users — costs between $200,000 and $300,000.

This is not out of line with the cost of other accounting client/server packages, which generally are priced according to the number of system modules, number of users or both. Coda, Inc.'s Open Accounting System costs between $30,000 and $350,000 for a complete system supporting between eight and 64 users, according to marketing vice president Brooke Savage. PeopleSoft's suite costs between $100,000 to $300,000 per module.

"You lose some of your audit trail because you're putting input into lots of different hands. It . . . scares the hell out of accountants."

ROBERT CRANE
Former editor of *Accounting Today*

Not so simple

The bottom line, says Heidi Dix, an analyst at Cambridge, Mass.-based Forrester Research, Inc., is that client/server "is definitely not as cheap as people think it's going to be." Moreover, there is no real pressure on vendors to lower their prices, she says.

Vendors say the up-front costs will reap big savings down the road. But the savings have yet to be proved in any quantifiable manner, says Belden Menkus, a Nashville consultant and editor of "Electronic Data Processing Audit Control and Security," a monthly newsletter.

"There's no real cost/benefit analysis being done," Menkus says. "Instead, everyone seems more enamored with the neat technology."

This neat technology, however, can actually slow down accounting processes. At Fedex, users exchange flexibility for slower response times, up to a few seconds. Then again, Klimetz says, "Client/server transactions do a lot more. You add an asset once and the application adds that asset to nine sets of books."

Under the previous IBM IMS system, the same asset would need to be entered five or six times.

There is also no way to tell at this point whether the client/server packages will handle the heavy-duty transaction volume now processed by mainframe systems, especially since users have mostly been implementing one module at a time.

"There are performance and volume issues that need to be addressed," Savage says. But these issues "have little to do with software and everything to do with network topologies and how servers are configured. If you throw enough hardware at the issue, you can solve the volume problems."

Hardware can do little to solve security threats, however. Under client/server solutions, PC-based users as well as other applications have access to financial

Changing financials

Of 100 Buyers' Scorecard respondents, almost half are re-engineering or downsizing their financial applications

What is the status of your financial applications?

Re-engineering with new requirements and functionality	33%
Downsizing to maintain the status quo on a smaller platform	11%
Not changing the application at all	33%
Other	23%

Source: Buyers' Satisfaction Scorecard

Competition is fierce in the booming market for client/server financial software. But the marketing campaigns are even fiercer. It's important to look beyond the vendor claims to see what the promises really mean.

"We have the first true client/server financial software."

This is a very easy claim to make — and justify — simply because so many models satisfy the technical definition of client/server. But most vendors support only one model. If a vendor says its product's application processing takes place on the client and the server, what does that actually mean? Can you split up the processing differently, moving more of it to the client? Or can you move all the processing to the server? You need to know where processing can take place in order to size hardware, assess network traffic and estimate the product's flexibility.

"We offer the only high-end solution."

All vendors — from start-ups to legacy vendors — are struggling to get high-end products out the door. But start-ups and PC vendors don't develop and offer the functions and features one would expect in a high-end solution. Legacy vendors have the functional experience, but they may lack significant LAN and PC skills.

To capture your attention, most vendors are focusing initial efforts on the user interface. Look beyond the gloss, but don't expect to see what you currently have in a more mature legacy system with these initial releases. Often lacking are international capabilities and batch-intensive processes such as allocations, year-end processing, journal entry interfaces and consolidations.

There is another implication for Fortune 500 or other high-end companies: performance. Many of these products will go into full production at customer sites by the end of this year.

Performance capabilities and benchmarks will be unavailable until more companies with high-transaction volumes put these new packages to the test.

HYPE

REALITY

"Our software utilizes truly open technology."

"Open" is a loosely defined term. To many of our clients, "open" means the ability to plug and play any combination of relational databases, network protocols and graphical user interfaces with the financial package they have acquired. In reality, many vendors use one developmental tool set. Some have chosen very exclusive uses of the tools that may preclude easy substitution of other products. Your organization must develop or find the necessary skills to support the hardware and software environment the product requires.

. . . . . .

Although the first releases of client/server financial software may not meet your expectations, don't despair.

Thanks to development tools, you can expect new products and upgrades to this software much faster than in a legacy environment.

Additionally, vendors are teaming with experts to incorporate additional financial and industry-specific functionality into their products.

Finally, many vendors recognize the need to improve the performance and high-volume batch capabilities of their products in order to provide solutions for Fortune 500 firms.

Schuler is a manager in the Software Intelligence Group of Andersen Consulting, the $6.7 billion international management and technology consulting firm. The group provides Andersen's financial competence and solutions expertise.

data in relatively open relational databases.

The idea of open access, explains Robert Crane, former editor of *Accounting Today*, is that accounting records are as current as the most recent entries on the system.

It's a great idea — in theory. "When you move off the mainframe, you lose some of your audit trail because you're putting input into lots of different hands," Crane says. "It's this kind of loss of control that scares the hell out of accountants."

Securing the system

Packages announced so far lean heavily on the back-end relational database to provide the security users want, says Jennifer Scholze, a software analyst at International Data Corp. in Framingham, Mass.

"There still aren't a great number of utilities and tools to address security, and this is one of the big reasons people are hesitant," Scholze says.

"Security and control are a double-edged sword," says Kevin Riegelsberger, executive vice president and co-founder of Platinum. "We want to open data and empower end users, but we want to make sure that end users get only the right data."

Like other observers, Riegelsberger notes that "companies have to institute their own security measures."

Some people are concerned enough about these problems that they're finding alternative ways to get the flexibility they need. "I think it's a lot of hype that client/server is cheaper," says Dennis Croft, director of IS at the state of Florida's controllers office. "Our environment is the single system for corporate records of a $33 billion corporation. I'm not convinced a client/server environment is the way to go with corporate financial records."

"I think it's a lot of hype that client/server is cheaper. I'm not convinced it's the way to go with corporate financial records."

DENNIS CROFT
IS director, state of Florida

Because various state program managers need to make decisions based on mainframe data, Croft has opted to give users host-based query tools while keeping processing on the mainframe. This way, terminal users and PC users can have access to the data. Individual agencies will be given the means to develop unique applications and reports with Natural language tools.

Control and security are Croft's main concerns: "People need data and information. If you can give them that and still protect the application, that's the way to go."

Some companies are satisfied with downsizing to a Unix platform but keeping all processing and application logic on the server. Most of the mainframe and midrange vendors — including D&B, SAP, Lawson, Ross Systems, J. D. Edwards and Skylight Systems — have created Unix versions of their proprietary software. D&B anticipates that only 20% of its customers will move to true client/server in the next couple of years.

Client/server may seem to be the next wave for accounting, but today's leading-edge technology will pale in comparison to what's down the road, according to Andersen Consulting's Sommer.

In a year or so, Sommer says, client/server financial packages will include ties to electronic mail, imaging and work-flow systems. D&B has already progressed toward work flow, and PeopleSoft has announced support.

Vendors will also incorporate exception-based logic, which will automatically alert financial staff members to irregularities or other events requiring immediate attention. The overall trend, Sommer says, is further integrating financial data with other business tools and processes.

"Right now, every product out there is GUI-based with an open SQL database and client/server architecture, and every vendor has the same message that they are God's gift to client/server and open systems," Sommer notes. But in a year or so, he says, the vendors that lead the pack will be those that fit their packages with enabling technology "to allow continuous re-engineering within the finance function." ■

Believe it or not, that's the jargon you'll run into when you start looking into client/server accounting products. Here's what it means.

If the system is built to accommodate most processing on the client, that's a "fat client" product. The "thin client" system puts most application logic on the server. This is a chief distinguishing factor among available packages.

A fat client system tends to require powerful desktop machines that are able to accommodate resource-hungry graphical user interfaces. Thin clients simply give a graphical look to server-based processing.

What's optimal is a system that allows the user to decide the most efficient platform for any given function. A function such as payroll calculations that requires sophisticated mathematical capabilities needs the support of a server. Less complex desktop integration functions, such as data analysis, should be placed on the client.

There are more nuances to the thin client/fat client debate. It's important to analyze vendor strategies to see where they stand.

Client/server players

Many vendors offer client/server financial software. We've listed some of the leading offerings, as determined by International Data Corp. in Framingham, Mass. All software runs on Hewlett-Packard Co., IBM RS/6000 or Sun Microsystems, Inc. servers, and all support PC interfaces.

Coda, Inc. **Manchester, N.H.**	**Open IAS**	**Since 1993**	**Good international presence but small mind share in U.S.**
Computron, Inc. **Rutherford, N.J.**	**Epic**	**Since 1990**	**Developed client/server applications from PC platform.**
Dun & Bradstreet Software, Inc. **Framingham, Mass.**	**Financial Stream**	**Half the modules began shipping in September; others to ship in 1994**	**Built-in work-flow functions set products apart; will run only on Sybase.**
FlexiStore Corp. **Stratton, Conn.**	**FlexiFinancials**	**Since 1993**	**CEO and other higher-ups are former Computer Associates executives; object-oriented from ground up.**
FourGen Software, Inc. **Seattle**	**Enterprise**	**Since 1990**	**One of the first to come out with client/server software.**
Kapre Software, Inc. **Boulder, Colo.**	**Kapre**	**Expected in 1994**	**Started by former J.D. Edwards executives; object-oriented from ground up.**
Lawson Software Corp. **Minneapolis**	**Open Enterprise**	**Since 1993**	**Runs on Oracle, Sybase and Informix; aggressively moving client base to client/server.**
Oracle Corp. **Redwood Shores, Calif.**	**Oracle Financials**	**Since 1989**	**Has the longest standing offering; requires Oracle database.**
PeopleSoft, Inc. **Walnut Creek, Calif.**	**PeopleSoft Financials**	**Since 1992; most modules currently out; more due in 1994**	**Can be more expensive than rivals because development tools and first-year maintenance are bundled; runs on Sybase and Oracle.**
Platinum Software Corp. **Irvine, Calif.**	**Platinum-to-Sequel**	**Since 1993**	**EDI functions expected to be added to financial packages 1994.**
Ross Systems, Inc. **Redwood City, Calif.**	**Renaissance CS**	**Since 1993**	**Bought client/server tools and packages from a UK firm last year; has also ported DEC-specific packages to Unix. Currently supports Ingres and Rdb, with Oracle and Sybase expected.**
SAP America, Inc. **Lester, Pa.**	**R/3 Financials**	**Since 1992**	**Few U.S. sites in production; money-back guarantee is innovative.**

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PRODUCT CHECK LIST

The following checkpoints are provided by Tristan M. Hoag, a manager of the Software Intelligence Group of Andersen Consulting, which provides financial and human resources competence and solutions expertise.

What platforms does the package provide support for and how are they supported?
Support for multiple servers, operating systems, networks, graphical user interfaces and databases is widely advertised, but make sure the combination you need is available. Also, vendors support multiple platforms in different ways. Some vendors use a gateway product. These gateways can add processing steps, slowing performance in high-volume, multiuser environments.

How are server processes addressed?
Many of today's client/server financial software products are sold based on the attractiveness of the GUI. But what large organizations really need are industrial-strength, configurable and manageable server processes. Common routines, report programs, interfaces and large mass-maintenance routines are often placed on the server.

Most vendors do not provide tools to design, build, test and maintain server programs. Instead, they focus on client code such as basic inquiry and update processing. Large organizations often need to place routines either on the server or the client; however, most customization tools produce client or server code, but not both.

How is distributed code managed?
Vendors have not fully addressed this area. The frequent lack of this type of utility can create frustration. Ongoing maintenance and upgrade efforts are complicated by large numbers of client machines that must be updated, tested and maintained. Ask the vendor how it will help you manage products and versions over a distributed wide-area network, which could involve hundreds of client and server processors.

Will one version of the product run on multiple platforms?
Many large users need to standardize operations over a number of plants, companies and business units. When that's true, it would be far easier to buy just one version of the product rather than separate versions for each platform.

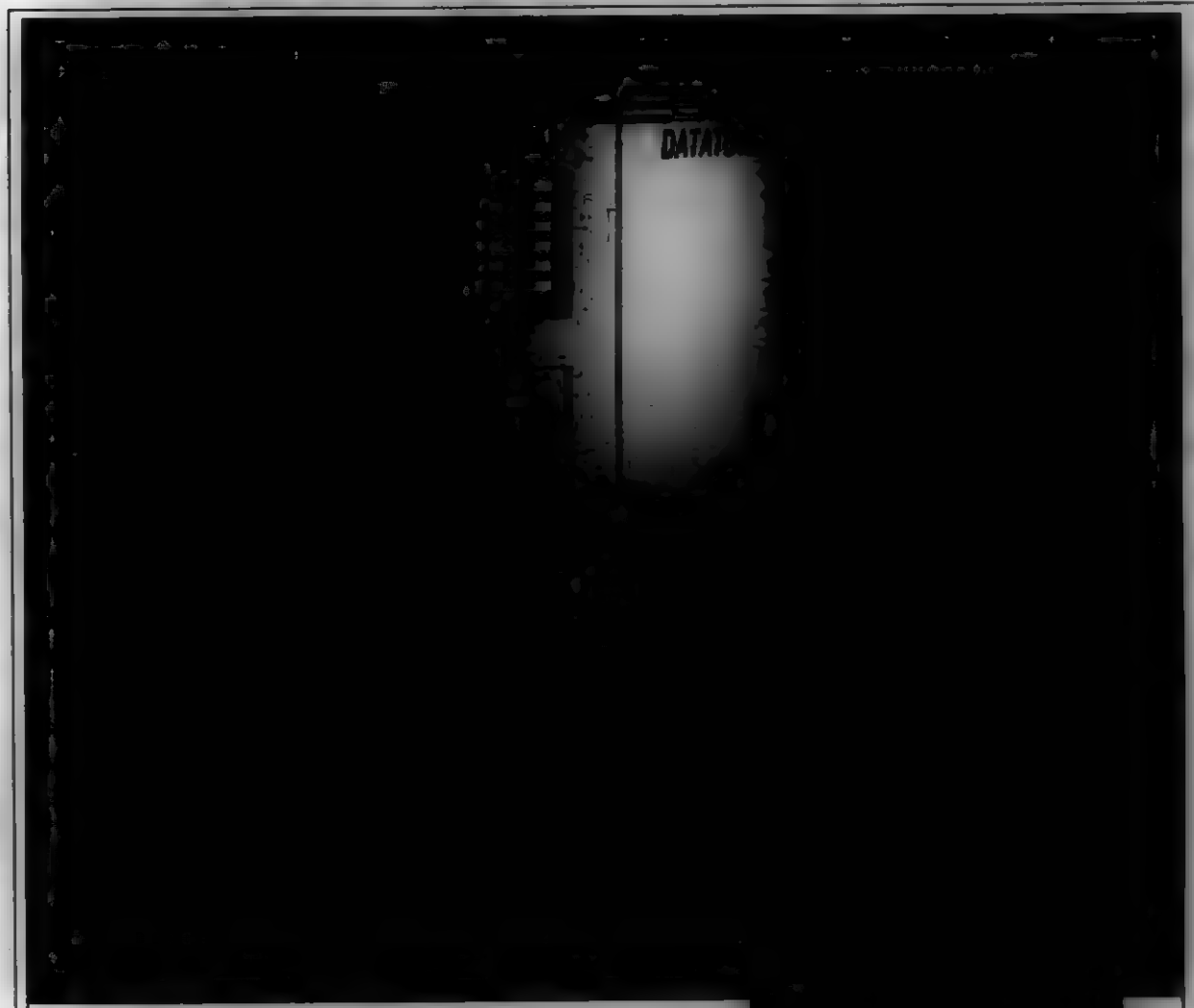
Even if the same product runs on multiple platforms, however, the vendor may release one platform at a time, which will exacerbate your update and version control headaches. If portability is provided by a certain database or tools vendor, you must also consider its platform direction and release schedule.

There's another important point when dealing in multiple platforms. In their decision to focus on high performance, some vendors use stored procedures in the database management system to accelerate data access. This works well. However, different DBMSs have different methods of handling and developing stored procedures.

If financial software vendors wish to support multiple platforms, they must rewrite much of the stored procedure code on the server.

Can report writers, etc. easily access the data maintained by the application?
If you plan to integrate an end-user report writer, spreadsheet or executive information system with your new financial system, make sure the vendor has not limited access to the data maintained by the application.

Find out whether you must use the vendor's special software routines to access and update data. ■



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CASE STUDY

UCLA medical school finds right elixir

As information systems director Stephen Berry tells it, the one good thing to come out of a devastating fire two years ago at UCLA's Department of Medicine was a chance to redesign the department's cumbersome financial system.

Financial data had been maintained on the university's central system. To access that information, users had to download mainframe data to a terminal and then manually retype the information into the department's multiple databases. This unwieldy process was performed once a month, which made it impossible to stay current on funds the university had committed to the department.

However, the department's two VAX-based databases, the Unix workstation-based general ledger database and all the custom financial applications went up in flames, along with the cabling system that linked the department's five buildings.

When it came time to rebuild, Berry envisioned a single database that the department's 250 PC and Macintosh users could access. In addition, he wanted to create a transparent link to the campus mainframe-based financial system, which maintained a separate, centralized record of the accounting activities.

Berry's team began by networking the five buildings' systems to one file server and one Sybase, Inc. database server. Then, using Powersoft Corp.'s PowerBuilder development tools, they custom-built clinical income, payroll and personnel applications.

Reasoning that they were programmers and not accountants, the team decided to purchase — rather than build — a client/server general ledger system. Their choice: FlexiWare Corp.'s FlexiLedger.

Flexibility comes first

Berry picked FlexiWare because it worked with his custom front-end interfaces and third-party application development tools, rather than those offered by the vendor. In addition to PowerBuilder, for example, Berry uses FormFlow, a forms processing package from Delrina Technology, Inc., a Canadian software vendor. FormFlow scans in the department's paper forms, adds necessary fields and points them to the database.

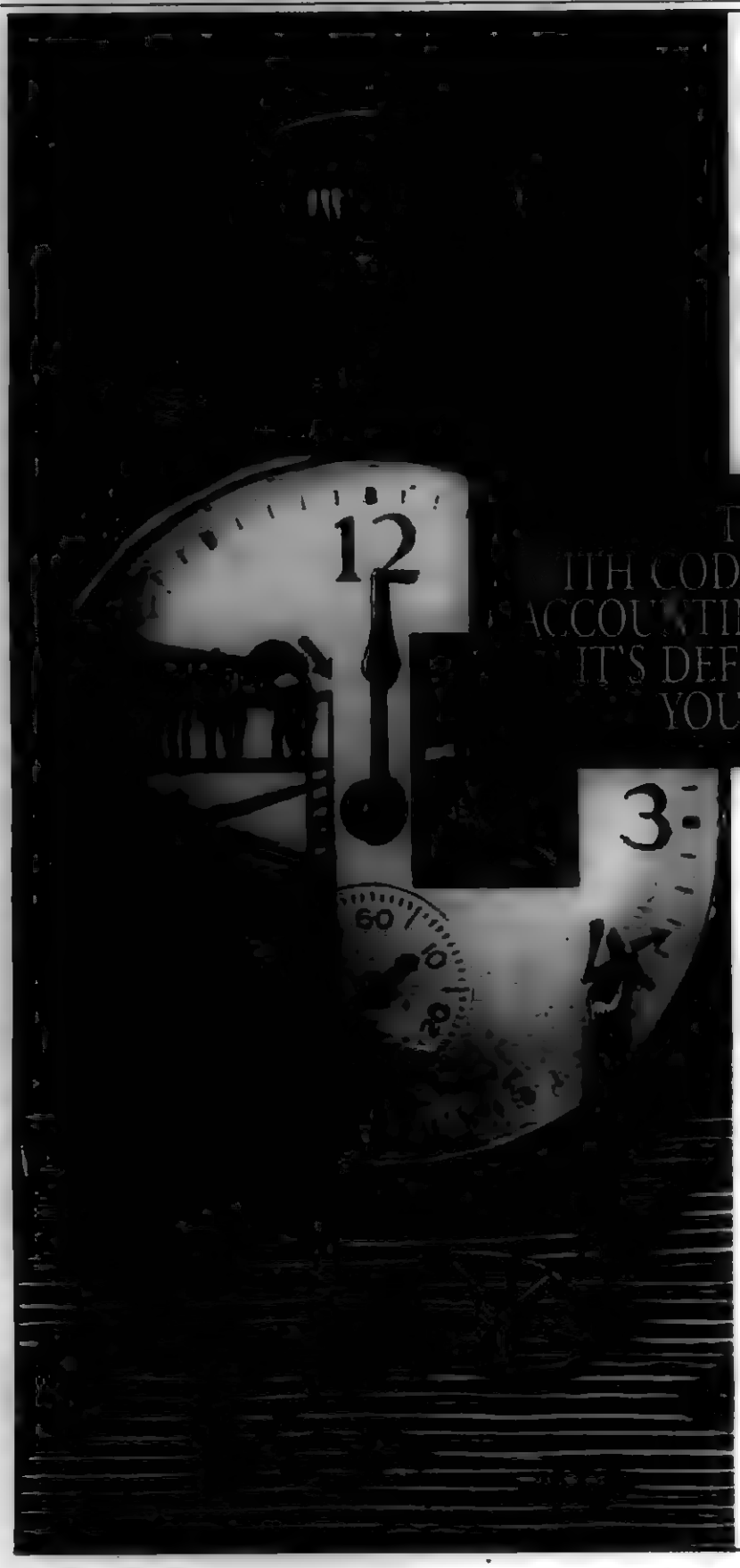
"We used [FlexiWare] as our core system on our database server, but we could define the roll-up structure we wanted and their system would maintain that structure," he notes.

Berry says client/server in general and FlexiWare in particular have helped to rectify many of his department's problems. For example, downloads from the campus mainfame are now much smoother and can be performed daily instead of monthly, which lets the department commit funds to its general ledger system in almost real time.

The client/server implementation cost less than $1 million and took a little over a year and a half. Berry says that time frame could have been shortened because his team expected that the network design and implementation would be quite complex. "We didn't really begin application development until the network was finished," Berry explains.

In practice, the networking effort was not that complicated. Next time, he says, "I would undertake network and application development simultaneously and bring the system on-line even faster."

Now, less than two months after the UCLA system went on-line, Berry will have the chance to do just that. He's recently been promoted to director of IS at the School of Medicine at the University of California, San Francisco. His mission there: Replicate the UCLA client/server system. ■



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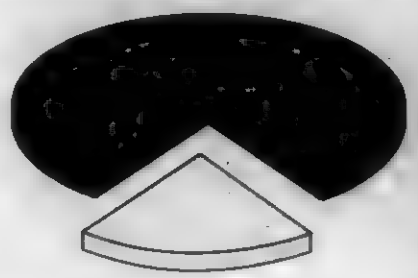

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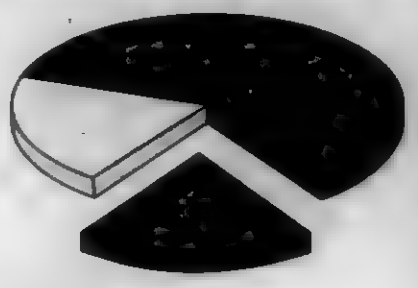

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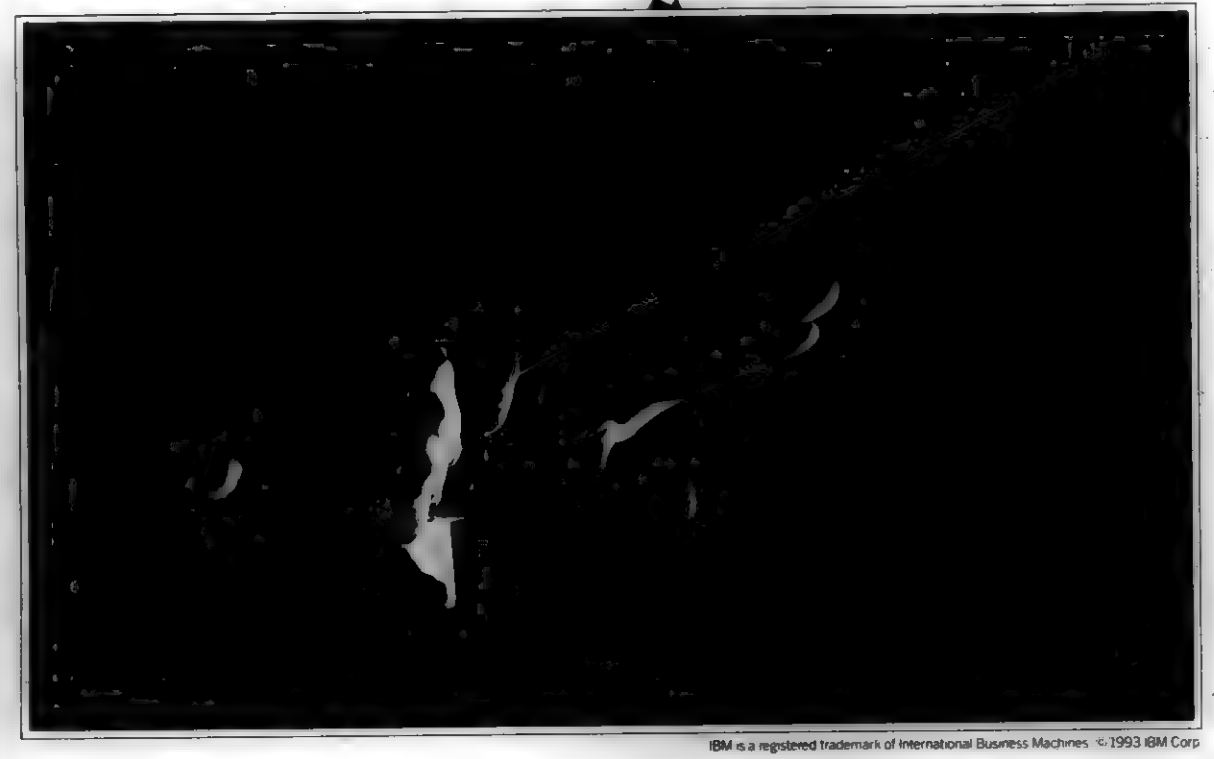

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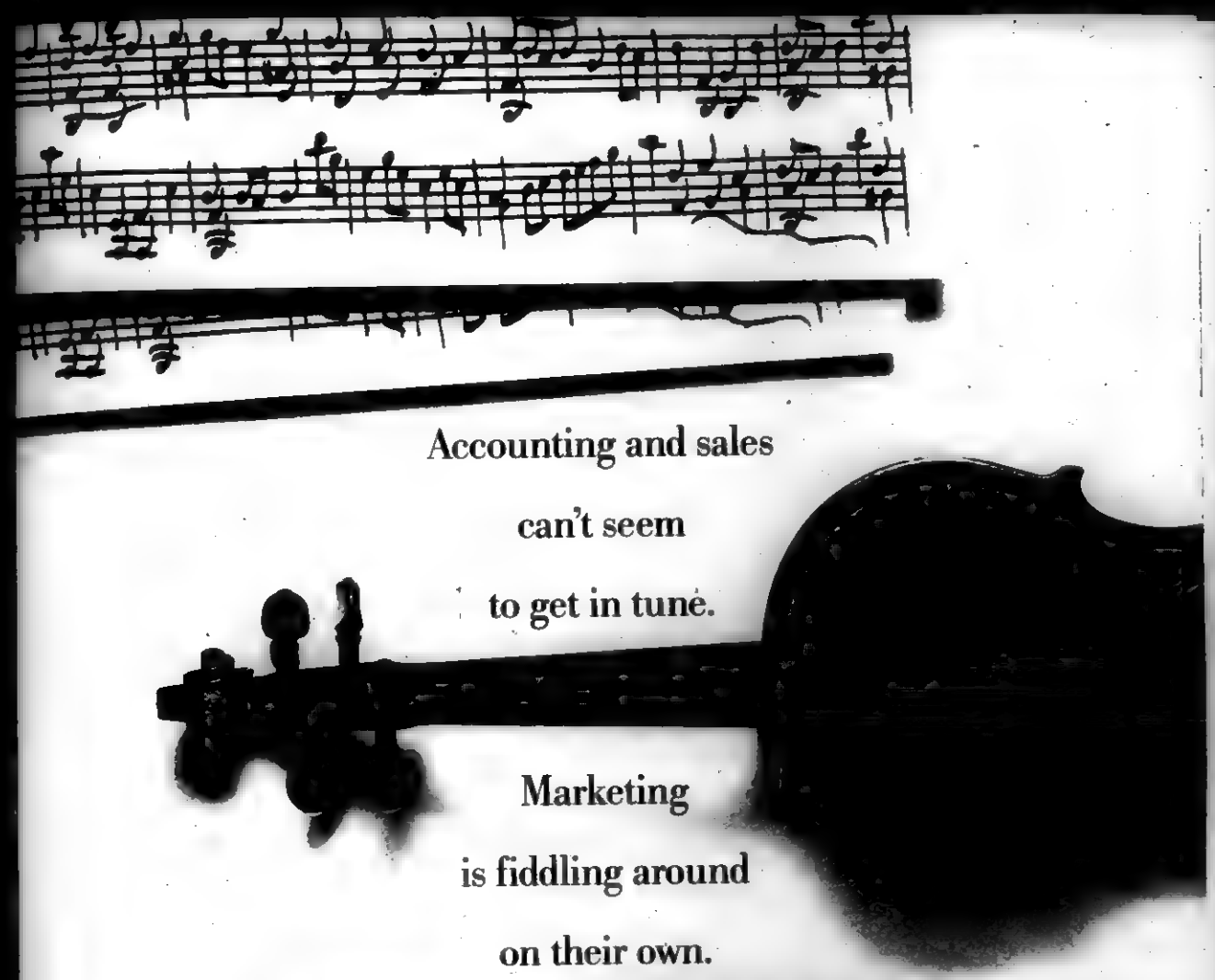

Accounting and sales

can't seem

to get in tune.

Marketing

is fiddling around

on their own.

And basically,

everyone seems to be marching to their own drummer.

Sound familiar?

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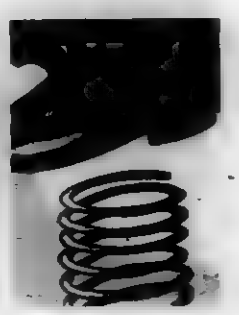

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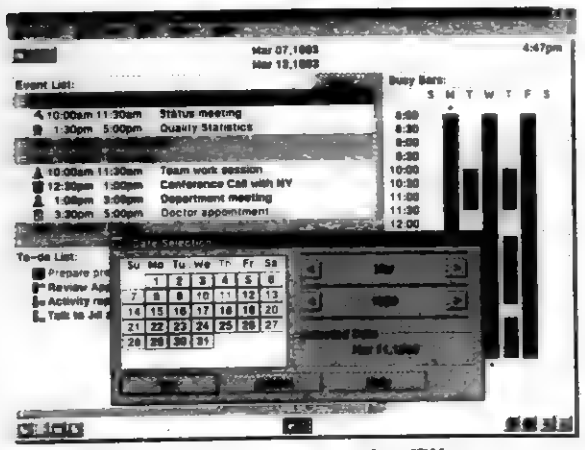

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PHOTOGRAPH BY STEPHEN SHERMAN

EDITOR'S NOTE

Maryfran Johnson

Defining client/server seems to be a new kind of parlor game for the industry

One of the most unnerving questions I am asked these days is "How do you define client/server?"

Even my brother, Garry, who manages a carpet store in Albany, N.Y., and truly shouldn't care, wanted to know. Now, the only technology used in Garry's business is a venerable old Digital VAX 11/73, which the head of the company refers to as "The Brain." Seriously. So we didn't have a lot of common ground here.

What I told my brother went something like this: "It's basically big computers linked with little computers, exchanging information, only now the little computers can do a lot more of the work because they're more powerful, more affordable and easier to use."

Defining client/server seems to be a new kind of parlor game for the industry. I've heard it described as a style of computing, a collection of technologies, an architectural platform, an application development method, a systems integration solution, a re-engineering tool and — heaven help us all — a paradigm shift.

The one point everyone agrees on is that client/server is the opposite of mainframe-centric or host-based computing. But mainframes and data centers absolutely have a role to play. (Check out our "Data Centers to the Rescue" story in this issue.) Gartner Group's Jim Cassell has a wonderful image he invokes when the talk turns to replacing mainframes with PC networks. He likens the move to a farmer replacing his team of oxen with 10,000 chickens.

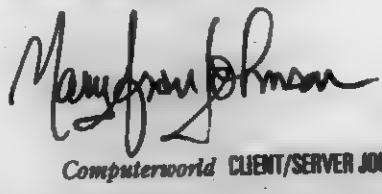
Another place to sample a multitude of views on this subject is the comp.client-server discussion group on the Internet. A few weeks ago, Ravi Kalakota of the University of Texas' department of management science and information systems cataloged a series of different definitions for client/server. "This technology should not be viewed as a silver bullet but as a concept of immense potential if applied correctly," he wrote.

"Client/server has so many different flavors. It won't look the same everywhere you go," adds Joyce Young, director of decision support systems at Helene Curtis Industries. "That's why it's so hard to define — there's no textbook."

While there may be no textbook on client/server, what we hope to provide in *Computerworld Client/Server Journal* is a chronicle of this technology as it unfolds — from the user's point of view.

This issue, for example, includes stories about the importance of managing user expectations during client/server projects and how organizations as diverse as Helene Curtis and Columbia University benefit from the new technologies and learn from their mistakes. Also featured are exclusive interviews with Microsoft CEO Bill Gates and Sun Microsystems CEO Scott McNealy.

In the end, defining client/server is far less important than using it to your company's best advantage. Despite any attempts I've made to define it, only one person has ever been satisfied with my answer. But maybe Garry was just humoring his big sister. ◪



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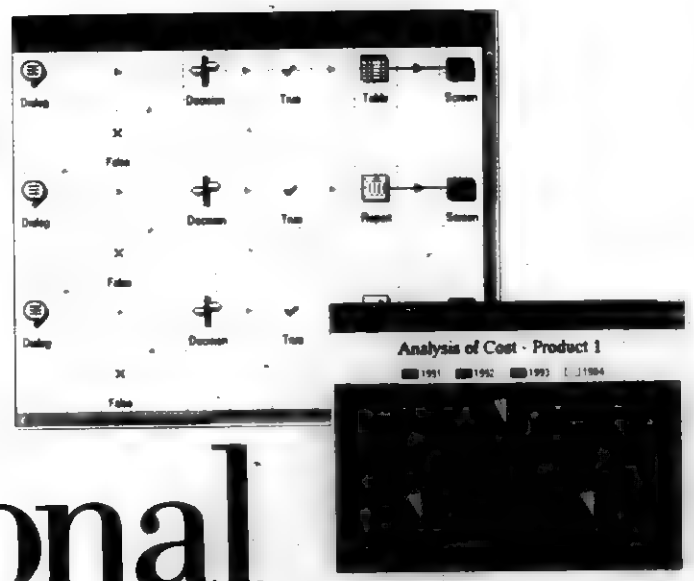

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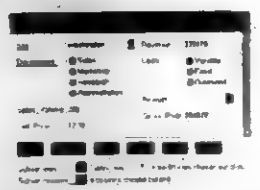

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PERSPECTIVES

A QUARTERLY REVIEW OF CLIENT/SERVER VIEWS AND EVENTS

Reality Check

What does client/server really mean for IS shops?

That question was posed recently in an Internet discussion group by Steve Croft, a database system administrator at the California Department of Water Resources, which is transitioning from older mainframe technologies to client/server.

Some of Croft's observations thus far include:

- **Smaller application development is pushed out to the end user, and often there is no need to rely on IS. This area will likely be the source of the greatest productivity gains.**
- **Options for tools are (or will be) countless. Rather than having IS evaluate and bless each tool, it should set criteria for sanctioned end-user tools.**
- **The IS organization should split applications and data responsibilities, with one group focused exclusively on guarding data integrity while another group takes care of application or integration issues.**
- **The IS department must become more of a facilitator than a controller. This means more planning, a shift in viewpoints and a learning curve to keep data models accurate. The advantage: a productivity boost for end users.**

Croft can be reached at stevec@water.ca.gov via the Internet.

C&NW: A Freightload of Savings and Fewer Errors

When Chicago and North Western Transportation Co. (C&NW) needed to move invoices faster and more accurately, it turned to client/server. The move saved $1 million, mainly by eliminating 30 invoicing-related jobs.

C&NW also reduced errors by 50%, increased productivity and automated its billing system with an environment that links more than 100 users over its Token Ring-based network.

As the eighth largest freight railroad in the U.S., the $1 billion company moves more than 40,000 carloads daily of items such as coal, paper and grain. Tracking and billing were "mistake-prone challenges" before C&NW installed the client/server system, officials said.

C&NW Transportation reduced billing errors by 50% with client/server

The system includes Tricord Systems, Inc.'s PowerFrame 486/33 enterprise servers, Microsoft Corp.'s SQL Server running OS/2 2.0 and Novell, Inc.'s NetWare v3.11.

The cost of the project was recouped in one year, said Jeff Liggett, C&NW's vice president of revenue and disbursements accounting. C&NW can now match most of its billing transactions to existing data and billing information in its SQL database. The billing system automatically generates 80% of 1,200 invoices produced each day, compared with the 20% done on C&NW's IBM 3090 mainframe.

While it has improved business, C&NW's move to client/server was not easy. "The first two weeks, we had a lot of downtime, since we brought a lot of new products together at one time," Liggett said. "If we were to do it again, we probably would have done more user and volume testing.

"At the time the system was designed, our Novell network only had 30 nodes, but we planned on 100," he added. "When we rolled the system out and got over 30 users, we started having problems." ◪

Written by David A. Kelly, a free-lance writer in West Newton, Mass.

Who Cares About Software Standards?

A survey of 50 Fortune 1,000 companies shows that

80%

already have standards in place today and

66%

felt their use would increase during the move to client/server

Source: Forrester Research, Inc.

A disk problem causes you incredible discomfort. A lapse in memory takes its toll on your entire system. It wasn't anyone's fault. But now it's yours. Because if it affects the LAN, you're the one who has to deal with it.

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With the Maximum Availability and Support System/2 (MASS/2) option, the Server 195 provides comprehensive local and remote server monitoring, control, tuning and recovery capabilities.

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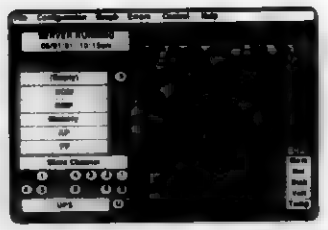
It even tolerates

MASS/2 works with a battery backed-up Remote Maintenance Processor (RMP) option that can notify you of errors, failures, corrective action taken—even provide system access during a power failure. And you can extend fault tolerance to the entire disk subsystem by adding an Orthogonal RAID-5 Disk Array/2.



The MASS/2 option has a user-friendly GUI that lets you distribute computing power across your organization from a central location.

Server 195/295 Comparison

Feature	Server 195	Server 295 Model 1	Server 295 Model 2
Remote Maintenance Processing and Modem	optional	standard	standard
Processors	486/50 MHz	MP-486/33 & 50 MHz	MP-2 486/50 MHz
Available Slots	8 Micro Channel®	12 Micro Channel	12 Micro Channel
MASS/2	optional	standard	standard

Like all PS/2s, the Server 195 is backed by IBM HelpWare®—a range of service and support so complete, it's hard to find fault with. You get a three-year on-site warranty with four-hour average response time*, around-the-clock set-up, usage and service assistance on IBM hardware and software during warranty,** a 30-day money-back guarantee** and more. For more information or an IBM certified dealer near you, call our Personal Systems HelpCenter® at 1 800 772-2227 or TDD ASCII 1 800 426-4238. In Canada, call 1 800 465-7999. The new PS/2 Server 195 is so reliable, why would you tolerate anything less?

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Surviving on the Cutting Edge

JIM STIKELEATHER

Stikeleather is director of systems development at Kash n' Karry Food Stores, Inc. in Tampa. His Internet address is stike@knk.com.

As the American humorist Don Marquis (1878–1937) once observed, "An optimist is a guy who has never had much experience."

With that in mind, consider the confluence of today's technologies — client/server, object-oriented, inference, neural networks and functional programming — that are being used to build the information systems of the future.

While the media and vendor hype is a little premature, the good news is that these technologies really do work. The bad news is that for most of us in commercial IS, the potential for failure is very real and very high. Why? To paraphrase the infamous Clinton campaign sign, "It's the people, stupid!"

These technologies and the information systems that can be built with them are a paradigm shift in the truest sense. And nothing can prepare you for the intellectual, cultural, organizational and people upheavals this kind of shift will inevitably cause.

Human beings as a rule abhor change, and the future of IS is full of change. The users we service are changing. Their jobs are constantly re-engineered and redefined. They have become more knowledgeable, capable and experienced in the IS arts — and therefore more demanding and less tolerant.

The nature of business has changed. It is international. It runs 24 hours a day. It is real time, and old boundaries are gone. Customers, suppliers, governments, communities — even competitors — demand access and contribution to the information used to run the business.

In the first chapter of *Information and Logic*, Keith Devlin tells a story about a 15th-century iron worker. When asked "What is iron?" he would talk about its attributes (hardness, melting point, etc.) and what he could do with it. Not until modern atomic theory, however, could someone truly answer the question "What is iron?"

Human beings as a rule abhor change, and the future of IS is full of change.

Today, we should be asking "What is information?" Until we understand information as well as we came to understand iron, we will not be able to deliver on the promise and potential of these new technologies.

Perhaps even riskier for future information systems is our lack of understanding about cognition: how humans recognize, assimilate and use information. The new information systems will be intelligent, real-time simulations of the business. They will make many of the recurring business decisions and identify patterns and changes, drawing a human's attention to apply the creativity, analysis and planning skills needed.

The technologies, products and services to support the new systems are immature and the techniques for applying them even less developed. Increasingly, we need developers who are businesspeople, analysts, designers, programmers and testers all rolled into one.

The next five years will be spent developing common knowledge and structure toward applying this technology. Until then, we will be feeling our way around, like someone searching for a black cat in a darkened room where there is no cat. Yet we will be hearing the consultants, the vendors and even the trade press shouting, "I've got it!"

For the last two years at Kash n' Karry, we have moved forward with these technologies. In a nutshell, the technologies worked, and the people had difficulty. We had high turnover, we lost productivity, we spent time inventing technology and methodology instead of addressing problems.

Still, we have been successfully and rapidly delivering award-winning systems, though only with pieces of the technology available. Only now we know how much we don't know. ◪

PHOTOGRAPH BY CHARLES TROTTA

Sex, Lies and Selling Software

In this brave new world of open systems and client/server computing, the decisions involved with purchasing software and tools are more difficult than ever.

Decision makers often lack the experience to judge the quality and longevity of client/server technology. This becomes especially tough when users are dealing with a market in transition, where every software vendor is positioning its products in line with the latest trends.

I recently took part in the software evaluation process at a medium-size manufacturing firm that was looking for client/server software to implement an integrated manufacturing system. At least seven major independent software vendors lined up at the door, eager to do business.

Yet what I saw during that evaluation process made me fearful for companies trying to make software decisions that can mean life or death for their organizations. One vendor spent more than two hours describing the sophistication of its client/server software. The pitch was replete with all the right jargon: It was object-oriented, complied with Posix specifications and included mention of the Object Management Group, the SQL Access Group and X/Open Co.

Not until we started asking implementation-oriented questions did reality arrive. It turned out that the software had not actually implemented *any* of these sterling standards. Yet the vendor kept stressing their importance and kept promising to support them when it was feasible . . . someday.

Then the critical question: How many customers are using this software and for how long?

It seems there was one customer about to begin using this product. And naturally, this vendor was very eager to partner with customers on development. What "partnering" meant here was "Help us complete our development work; we've fallen behind." Unless your organization is prepared to accept a major risk in order to have strategic software that no one else has, stay away from systems without customers.

My advice is to purchase a product that already has more than three customers with several years of experience under their belts, if possible. But if what you are trying to do simply can't be done with well-established software and using this new stuff may solve a key problem for you, then take a chance on it.

Another land mine buried in the software vendor community these days comes labeled with the words "object-oriented." Like client/server, the notion of object orientation is so hot that no software developer dares to ignore the 'O' word.

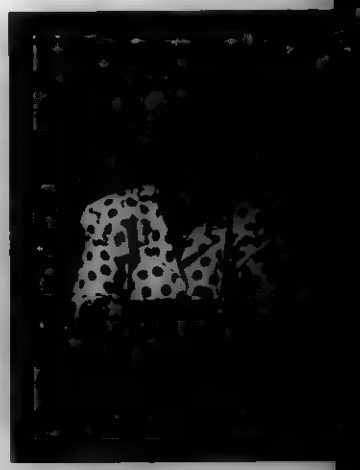
Vendors that are hedging their bets will say their technology is "object-based" or "object-like" — though that doesn't mean much because there is no consistent definition of object orientation. What users should look for from object orientation is flexibility, speed of development and the ability to reuse or link components of software without additional programming.

My advice is to purchase a product that already has more than three customers with experience under their belts.

The bottom line is this: Ask as many questions as possible about the flexibility of the tools and how they make application creation easier. Remember that vendors are not going to acknowledge problems or point out product deficiencies unless you ask.

When vendors talk in extremely technical terms (a ploy sometimes used to intimidate you), make them translate until you do understand what they are saying. Then talk to other customers with experience using the product and, when possible, visit some of those companies to see the software in action. ◪

PHOTOGRAPH BY STEPHEN SHERMAN



JUDITH HURWITZ

Hurwitz is president of Hurwitz Consulting Group, Inc., a Watertown, Mass., consulting firm. She can be reached on the Internet at hurwitz@world.std.com.

Technology Training From The Top Down

When companies begin training staffers for client/server with classes on how to use specific development tools, the effect is akin to "building a house starting with the plumbing," says F. Champe Granger, a senior analyst at the Federal Reserve Bank in Richmond, Va.

"The most experienced client/server managers indicate that a top-down approach should be taken when introducing mainframers to the new technology," said Granger, who recently surveyed 60 IS executives for her University of Virginia's master's thesis on client/server skills and knowledge.

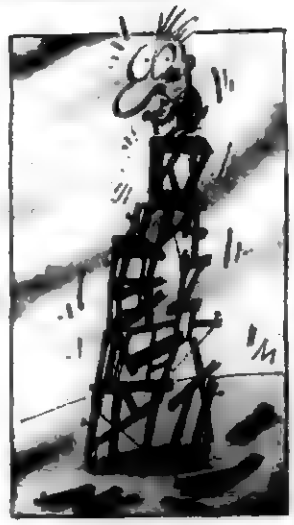
"A training plan must narrow from knowledge to skill," Granger explained. "Knowledge of client/server architecture, cooperative processing, distributed database architectures, telecommunications and networks ranked as the most important knowledge base for developers to have."

Ranked as the most important skills were prototyping, PC programming and GUI design.

"A plan to educate personnel should define long-term, intermediate and short-term knowledge and skills," she said. Suggested topics for such training include the following:

- **Long term (one to two years): PC and workstation use, CASE tools, data modeling and design.**
- **Intermediate (six months to one year): Distributed, cooperative and client/server architectures; relational technology; and Windows use.**
- **Short term (six months or shorter): Programming and design skills.**

Tower of Babel



Large companies working diligently to maximize their newly installed client/server systems are finding that a lack of standardized distributed data dictionaries is a problem with no easy answers.

As departmental information systems groups build applications today, many of these groups do not have a core competency in data modeling, said Jeff Tash, president of Database Decisions, Inc., an information technology consultancy in Waltham, Mass.

"It is creating a Tower of Babel situation in IS," Tash said. "The No. 1 area where IS can add value is coordinating and managing data models throughout the organization."

In a manufacturing environment, for example, a data dictionary might catalog abstract representations of inventory items, thus ensuring consistency in record-keeping across the organization.

"Companies are swimming in a sea of synonyms and homonyms; different words have different meanings," Tash said. One part of an organization may be modeling data in one-to-many relationships, for example, while other parts are modeling data on many-to-many relationships.

While companies such as Sybase, Inc., Oracle Corp., Informix Corp., IBM and Digital Equipment Corp. offer some distributed data development tools, Tash said there are still few viable client/server products able to fill the gap left by older, proprietary data dictionaries such as IBM's Data Dictionary/Direct or Digital's CDD.

To ease the Tower of Babel problem, Tash recommended that IS managers try the following:

1. Coordinate the definition of data. If a company is using five different suppliers, then insist on one process to describe supplier definition across the organization.

2. Provide an electronic bulletin board to show which data exists and the quality of that data. This also encourages corporate-wide data exchange, which is essential in building and maintaining data definitions.

3. Develop dual databases containing two sets of data models. One set would focus solely on production data, while the second would focus on time interval data such as aggregates and summaries.

"The second data model can provide IS with data snapshots. This is essential to spot trends," Tash said.

Dave Hudson, director at market researcher Standish Group International, Inc. in South Yarmouth, Mass., noted that "the whole issue of distributed environments has a long way to go."

Hudson defines "first-generation" client/server as one server plus several LANs. But it is in the second generation, he added, that greater levels of distribution across several server nodes will become critical to the organization. ◪

Written by Sally Cusack, a free-lance writer based in Marstons Mills, Mass.

THE FIFTH WAVE

ILLUSTRATION TOP BY HAL MAYFORTH

The Changing Skill Set

Underlying the themes of client/server computing are the quick delivery of applications and the need to make the user interface attractive by using new technology on the desktop.

The shorter, more flexible life cycle of applications plus the earlier interaction with users in this new environment calls for a broadening of some skills and a replacement of others.

In a purely client/server installation, for example, there is no need for console operators because an increasing number of applications will be on-line transaction processing systems. Keeping these new application systems in step with business changes also requires different types of application programmers.

The former systems analysts from conventional data center environments — once responsible only for the care and feeding of the operating system — today must cope with middleware, back-end server programming and database administration.

One fallacy of client/server is that only front-end programmers are necessary and that a fancy graphical front end means client/server. Yet just as critical to client/server is the back-end processing, which must supply the logical and physical design of databases, monitoring and fine-tuning for better performance and tracking naming conventions.

Increasingly in demand are LAN experts, who handle tasks such as configuration management, troubleshooting and back-up and recovery functions. Also necessary to these new environments is another type of programmer: a tester of GUI programs. This new testing is different and more rigorous than Cobol program testing because most GUI programs will not have the sequential application navigation that Cobol programs do.

The help desk has emerged as a crucial function in client/server environments.

The ratio of programmers to testers also changes. If you have had 10 Cobol programmers and one tester for the programs in a conventional environment, you will probably need two programmers for every one tester for GUI-based applications.

A number of client/server software vendors claim a tenfold productivity increase in application development, implying that one programmer can replace the 10 you had before. This is wrong. Experience with our clients shows an increase of about twice the development productivity, not a tenfold leap.

Last but not least, the help desk has emerged as a crucial function in client/server environments. It must be staffed to provide three levels of support.

The first level of support answers very basic questions. At one company, former kindergarten teachers were hired for first-level support because of their patience in answering the same questions over and over again.

At the second level, help desk staffers should provide answers to more detailed and application-specific questions, while third-level support covers application- and technology-specific questions. In the past, vendors were called on to provide this second- and third-level support, but in today's multivendor world of client/server, it is no longer apparent who to call.

Forging strong partnerships with key vendors is one way to resolve support issues. One of our clients, frustrated in his attempts to solve a problem that involved either Windows, the database engine or the operating system, packed up the machine and sent it to one of his partners — Microsoft — saying, "Solve this and come back to us." The vendor solved it.

That kind of partnership should embody the true spirit of open systems and the client/server environment. ◪

PHOTOGRAPH BY REINHOLD SPIESLER

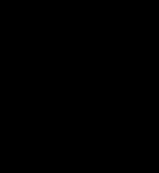
SHAKU ATRE

Atre is president of Atre Associates, Inc., a consultancy in Port Chester, N.Y., that specializes in client/server technologies.

The truth about

Before you decide what client/server platform is right for you, make sure you know what's true, and what's Not True.

Fact: the OS/2® client/server solution preserves your current hardware and software investment,



accessing your mainframes, minis and PCs when necessary and bringing their power and capacity to the desktop level. **Fact:** the Windows NT™ solution is based on PC servers and desktops and *doesn't* embrace all your existing resources. That could mean porting applications and data. The only plus that offers is the cost of porting *plus* the cost of additional PC servers.

Fact: OS/2 2.1 runs DOS, Windows™ and more than 1,200 native OS/2 applications. With LAN Server 3.0 or Novell® NetWare,® OS/2 supports DOS, Windows, OS/2 and Mac clients. Fact: it's not likely NT will support all your existing applications. It won't run existing 32-bit applications like WordPerfect® 5.2 for OS/2 and Lotus® 1-2-3® for OS/2. It *will* require additional software to support DOS, OS/2 and even Windows clients. Worse yet, *Infoworld* sources

The OS/2 ► client/server solution exploits your existing — hardware and software investment. There's No Telling how much the NT solution could cost you.

▲ *All this monkeying around with NT raises lots of questions. OS/2 has the answers.*

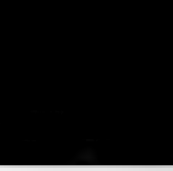
report that Windows 3.x applications run *20% slower* under NT than they do under OS/2 2.1!

Fact: OS/2 delivers powerful, reliable, client/server applications for data storage and retrieval (DB2/2,™ Oracle 7,® InfoPump™), communications (Communications Manager/2, REMOTE OS,™ TalkThru®), transaction processing (CICS, IMS Client Server/2 V2), comprehensive network management (LAN NetView,® CA-UNICENTER,®

clieNT

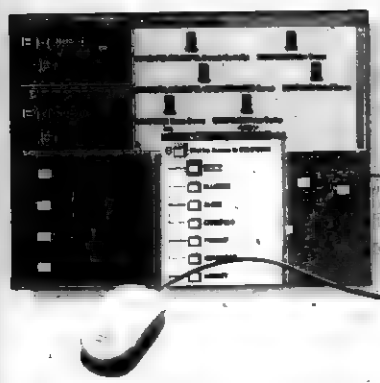
Domain/DACS,™ AlertView,™ Foundation Manager™), and more. **Fact:** The NT strategy is still Not There, and neither are native client/server applications.

Fact: OS/2 is committed to the industry-accepted Distributed Computing Environment (DCE) standards of the Open Software Foundation. **Fact:** NT is NoT.



Who needs first-generation slipups? OS/2 is second-generation solid.

Fact: NT still Needs Time to prove itself in the real world. **Fact:** OS/2 is used by millions world-wide. It's the leading, second generation, 32-bit Intel®-based operating system—a more stable, more developed version of the award-winning March, 1992 release.



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CASE STUDY

Dear Diary

A Two-Year Journey to Downsizing

It's Oct. 15, 1993 — a hot, sunny day in central Florida — and appraiser Beccy Harding is standing in the heat in front of a house with an AST Research, Inc./Grid Systems Corp. Convertible PC. She is collecting data to determine the parcel's taxable value for the Orange County Property Appraisers (OCPA) office in Orlando, Fla.

When Harding finishes, she will touch a single icon on her Windows display, sending the information via cellular radio back to the OCPA's main database for automatic updating. If anything should go wrong at home base or if her supervisor has a question, Beccy can send and receive electronic mail in the same fashion.

At the OCPA's office, supervisor Bob Hahn is analyzing an agricultural area with the assistance of a digital aerial image system. The system displays square mile images of Orange County in 24-bit color. The images are so detailed that Hahn can view a subject property and gather information as if he were on-site.

Mobile computing from his laptop is one of the downsizing benefits for Eric Singleton, IS director at Florida's Orange County Property Appraisers office in Orlando

Nearby, Carol Walker, manager of cadastral mapping, is busy accessing digital images of property deed documents. These document images, along with more than 1.5 million others, are stored in an optical imaging system. As with all other systems here, it is available on the network to the entire user base.

Things weren't always this wonderful. Two years ago, the information technology division and our client base were operating on an IBM 4381 and dumb terminals, costing the county $1.8 million annually to maintain obsolete technology. Yet we increasingly felt the need for color imaging and an open architecture.

Downsizing all processing to a PC LAN environment could open the door to acquiring these new technologies at a realistic cost. But we had to create our own road map, for there was little data available on such a large downsizing project. This is an account of that 24-month journey.

BY ERIC SINGLETON

JOURNAL OF PROJECT 9000

LATE SPRING 1991

After four weeks of discussing the idea to downsize, the staff has agreed to move ahead, and top management has approved the project.

Plans are set for a network architecture, and all acquisition orders are issued for a plethora of hardware and software.

Novell, Inc.'s NetWare is purchased and certified NetWare engineers hired. When building a large microcomputer network, it pays to have the proper talent to design and support it.

Hardware and software are installed and configured. Mainframe processes are analyzed.

The completely downsized systems must do everything the mainframes did and more. Methodology for backups, version control, batch processing, CICS support, etc. has to be developed.

All new PC operations will have to be supported, too.

This massive effort is an opportunity to re-engineer the business. We will carefully study each department, asking questions such as "What does this department do? Why does it do it that way? Is the department itself even necessary?"

SUMMER 1991

Mainframe process analysis is completed. Instead of sheer duplication of these processes, improvements have to be made where possible.

Four and 8mm tape drives should be used for backups, not round reels. Cost-effective, high-speed laser printers can replace huge

Appraiser Barry Harding records data about an Orlando, Fla., law office building on her pen-based computer

footprint, high-speed impact printers. Due to font and spatial controls possible on the laser printers, all batch reports print on 8½- by 11-in. paper instead of green-bar. Further, the reports are printed on three-hole-punch stock, so they fit neatly in three ring binders.

Software selection process is initiated. Cobol legacy systems are being converted.

Computer Associates International, Inc.'s CA-Realia is selected as the target product for the conversion. CA-Realia is able to emulate the traditional editing packages (TSO/ISPF) and CICS interfaces so that the Cobol staff does not have a monumental learning curve.

Novell's Btrieve is chosen as the database record manager.

JUNE 3

The staff is assembled today into teams for database, network, PC software and Cobol source-code conversion. Information technology manager Tom Rebik will coordinate all of the teams, as well as assist me in directing the project.

Not only will the Cobol source code be downsized and converted, but other projects, such as optical imaging, will also have to be installed. These systems must be up and running in the same time frame in which the downsizing is completed.

JUNE 14

Each team is assigned tasks. One of the largest is the conversion of the legacy Cobol systems: More than 700 batch programs and 250 on-line programs have to be converted to work effectively under CA-Realia, our chosen compiler.

The way our office works, we have to have the new systems up and running in one year or we will have to wait an entire extra annual cycle for deployment. If we miss our launch window, the project's success will be seriously jeopardized. We also agree to terminate the use of the 4381 by a certain date.

We develop a strategy to break up the Cobol systems into conversion groups.

Each group has to be ready by a certain date because that is when the system is needed for production. We will deploy the system as it becomes ready, not after everything is converted. This is how we will bring everything in on time.

(Continued on page 16)

PHOTOGRAPHS BY JEFF BLANTON

JULY 31

The first significant batch jobstream is converted! But the job that used to run for one hour on the 4381 mainframe now runs for more than 10 hours on the 486 batch server. Fear strikes us. Several months into the project and our first real conversion has yielded terrible performance. Should we stop now and save our careers?

AUGUST 22

Solution found! By running the batch jobstreams on a separate server and installing a fiber-optic backbone between the batch and database servers, run times decrease to 25 minutes. Faster than the mainframe!

FALL 1991

A staff member resigns, convinced the process will never work and that mainframes are the only future. . . .

The remaining staff members are largely computer science majors with several years of experience and confidence enough to conquer the world. I don't expect any more resignations.

SEVERAL MONTHS INTO THE PROJECT, AND OUR FIRST REAL CONVERSION HAS YIELDED TERRIBLE PERFORMANCE. SHOULD WE STOP NOW & SAVE OUR CAREERS?

The conversion process is honed so each program is run on the mainframe, converted and run again on the PC. Then results are compared, and the next program is processed.

A key step in this conversion process is testing against duplicated database management systems on the mainframe and PC database server. With this technique, we are guaranteed to find both accuracies and inaccuracies.

Fiber-optic cabling is introduced to the network architecture, where a backbone among all servers greatly increases data-sharing performance.

We want a large data highway among servers, and Thomas Conrad Corp. systems are chosen to achieve the bandwidth necessary to satisfy our existing need and yet still leave room for expansion.

OCTOBER 28

A document imaging system is brought on-line by the PC software team. Our parallel development/deployment process allows us to install, test and release the product, write documentation and train end users on the system during legacy systems conversion.

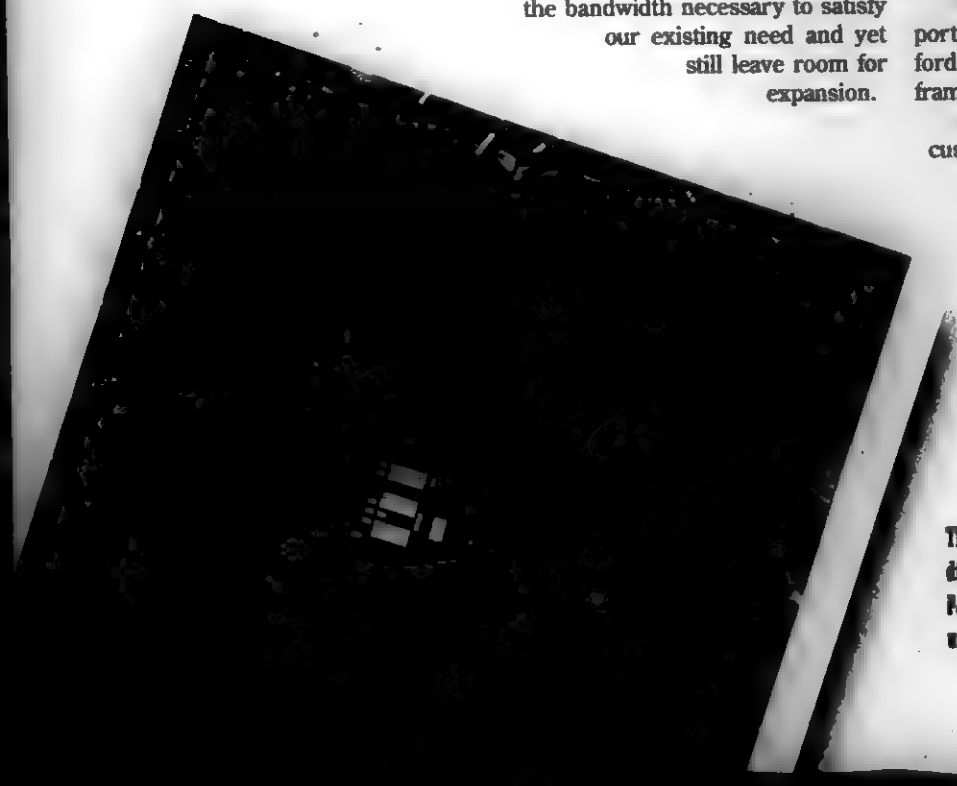
Hewlett-Packard Co. optical-disc jukeboxes are installed to increase storage capacity of images.

NOVEMBER 8

Digital aerial imagery is discussed as a new concept that would allow end users to study property parcels from their desktops rather than from the field.

We now have the network to support the very systems that were unaffordable or unavailable on the mainframe.

Ground-level imagery is discussed as a supplement for the aerial imagery system. Strategies for a low-cost pilot are developed.



This aerial photo showing digital imagery of Winter Park, Fla., can now be called up at an appraiser's desktop

DEC. 10

The first critical group of Cobol programs is converted! After banging our heads against the wall working out the

kinks, the second group goes much faster.

The information technology staffers ask me how they are doing with the timeline dates on Cobol program conversion. They are on schedule, but barely. (The day comes later when I have the joy of telling them they are finishing four months ahead of schedule.)

WINTER 91-92

The development testing team reports less than adequate performance of on-line CICS modules.

The current configuration creates very heavy network traffic, which can slow down performance of the application systems considerably. The solution? We create a 3M-byte RAM disk on each client node and download all appropriate CICS modules to an individual user's machine during login.

A system is built that reads the Novell ID of the user and loads only those modules necessary for them to sign on. All other systems are accessible via Windows.

Now, network traffic is low, and screen-to-screen response time is blazingly fast.

FEBRUARY 3

Design starts today on the aerial and ground-level imaging system.

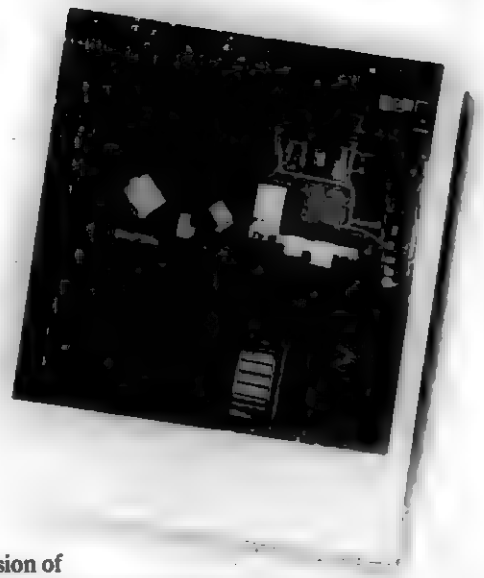
Aerial and ground-level imaging are implemented as a pilot system and proved technology, respectively. The projects occur in parallel with the downsizing, but after being developed, both are put on hold by top management.

SPRING 1992

A LAN interface to the wide-area county network is planned and executed. Meanwhile, a TCP/IP gateway is put into place and tested, performing very well.

One advantage to this expansion

On-line digital images of property lot appraisers perform various analyses that were previously impossible



is accessibility for PC users to the countywide geographic information system (GIS), which is almost completed. But to use the GIS, a high-powered, expensive ($30,000) system is necessary.

I'm considering the possibility of working with the GIS software vendor, Geovision, Inc., to assist us in writing a PC version of its software. If such a system can be developed, hundreds of existing PC network users will be able to access the GIS.

APRIL 31

In San Antonio at a Geovision conference, I reach a verbal agreement with Doug Seaborn, president of Geovision. Work will start on a co-development project that eventually produces Vision Query, the PC platform Geovision product.

MAY 7

The document imaging systems that are on-line and in production are beginning to show signs of performance problems. We begin thinking long-term about the projected life of the product at our site. (Eventually, we do move ahead with a new system.)

SUMMER 1992

Land ho! The conversion of the Cobol legacy systems is completed and tested. We are ready to start running our annual processing jobs, the calculation of more than $33 billion in property value.

Although the system has been tested to the nth degree, top management wants to keep the mainframe as a backup throughout the season in case "anything goes wrong."

Vision Query Release 1.0 begins testing at our site. The product shows extreme promise.

FALL 1992

Election season, and this is an elective office. Our chief executive officer is the elected official, and the race is on. . . .

The 4381 mainframe system has officially been shut down, as annual cycle processing ends in October.

Processing on the new downsized systems is a success.

NOVEMBER 3

The document imaging systems are stable, but we hunger for higher performance to keep up with rapid scanning of documents. So we start searching for a new document image system.

WINTER 92-93

Richard Crotty, newly elected property appraiser, takes office. Crotty decides to immediately move ahead with aerial and ground-level imaging, giving new life to the projects.

(Continued on page 18)

(Continued from page 17)

He also asks about the possibilities of gathering data in the field with portables. This initial discussion leads to the development of "Project Field Link."

SPRING 1993

Hired Alan Mariotti, enterprisewide NetWare engineer — one of the few certified NetWare experts in the state and a consultant to our project.

As the network grows and application systems increase, we pay closer attention to education and training.

Our training budget is usually set at 5% to 10% of the overall information technology budget. During the downsizing, this figure was at the high end due to the flood of new technologies the staff had to learn.

Our strategy is to have a key non-information technology staffer in each department, a "super user" supporting the others in his department. This person's skill set falls between an information technology staffer and an end user who has knowledge of how to use a system.

APRIL 14

Aerial imaging systems are fully in production. Stored on optical discs accessible on the network via the HP jukeboxes are 910 square miles of 24-bit color images. Other agencies have started to visit, each with an interest in our new technology.

The Orange County Sheriff's department and the Environmental Protection Agency (EPA) both visit. The EPA was interested in how such a system could be used to identify tree types at the desktop. In a matter of seconds, a few dying trees are located in a square mile of living ones.

In addition to using the technology for similar studies of trees and shrubs, the Sheriff's department could zoom in on top of houses and study their positions if they are planning an unannounced visit.

FINANCIALLY, WE HAVE COME OUT AHEAD...

Geovision, Inc.'s PC-based software shows how property parcels can be color-coded to display attributes such as comparable sales value

EARLY SUMMER 93

Work begins on Project Field Link. We have designed a system that will take advantage of pen-based computing, Windows and new advances in cellular radio networks. Testing of components of the system has already begun, and the test results shape our strategy.

Development is occurring in very fast strides as the flexibility of open systems is increasingly felt by the staff.

Object-oriented programming systems have cut into the world of new system development in Cobol. Visual C++, Visual Basic and CA-Clipper have joined the ranks as our key development tools.

LATE SUMMER 93

The annual cycle repeats, and Tom Rebik prepares to guide the support team through another assessment season. Ground-level imaging is brought into production, as field personnel armed with still-frame video cameras take pictures that are converted to digital images.

TODAY—

Project Field Link has become a reality. Fifty AST Research/Grid Systems Convertible pen units allow data gathering from the field, where property appraisers stand in front of the subject property.

A quick touch of pen to screen and data is transmitted live to the production data files on the home system.

Financially, we have come out far ahead. Our first year realized an $800,000 reduction from a budget of $1.8 million. Subsequently, we have seen other dramatic gains as we have applied our in-house knowledge and used the tools on hand to build new systems.

Project Field Link will reduce the overall budget by more than its cost in the first year of operation. There are many examples like it.

The user community has adapted amazingly well to such rapid deployment of multiple technologies. As I watch a client using our products under Windows on a 17-in. display, I realize that for the client, it had to be all or nothing.

Technology is unforgiving, and we have learned that in order to instill positive change so quickly on our client base, we have to relentlessly educate ourselves to not only keep up but also look ahead. ◪

Singleton is the IS director for the Orange County Property Appraisers office in Orlando, Fla. He can be reached through his CompuServe ID at 72274,3110 or via the Internet at 72274.3110@compuserve.com.

Prime-time Client/Server

Interactive TV brings high tech to living rooms *By Ted Krum*

Systems vendors portray client/server technology as a tool for re-engineering customers' businesses, but applications now under development may do far more: They may decimate entire industries.

The nation's leading computer and communications companies are building prototype interactive television networks that will provide flexible entertainment and retail services directly to consumers. These networks will bypass the normal channels such as chain stores or catalogs.

The first systems coming on-line at year's end, for example, will allow cable TV subscribers to view popular movies any time they choose. Customers will simply use their remote controls to order films from server clusters run by their local cable or phone company. This new capability usurps video stores' business.

"By late '96, the top 50% of cable businesses will be running 50% of their traffic through fiber optics," said Ray Katz, who covers the cable industry for Lehman Brothers, Inc. in New York. "That will be enough [for interactive services] to have a significant impact on the bottom line."

For one of the first interactive TV networks, Time Warner, Inc., the nation's No. 2 cable operator, is equipping 4,000 homes in Orlando, Fla., with cable boxes designed by Silicon Graphics, Inc. (SGI) and built by Scientific-Atlanta, Inc. in Norcross, Ga.

"There's no way to tell right now what consumer demand for these services will be," said Robert Clark, director of media servers at SGI. "The electronic superhighway is being pushed by entertainment and consumer products companies that want to cut their distribution costs and retain a bigger share of the customer's dollar."

Katz's late 1996 milestone falls within these planning horizons.

STILL WARY OF FUTURE

Yet Clark discussed the future cautiously. "Even after we turn on the switch in Florida this year, marketable solutions for consumers will still be at least two years away," he noted.

Clark said that although the cable companies "are giving us a cost ceiling of $300 per unit" for the cable boxes, they will have the processing power of a midrange box, complete with a RISC microprocessor, a few megabytes of RAM and special hardware for security, video compression and three-dimensional graphics.

Other technology companies, including Intel Corp., Microsoft Corp., Hewlett-Packard Co. and Motorola, Inc., are developing similar offerings with an eye to someday placing their products in every household. Video game companies such as Sega International and 3DO Co. are developing interactive TV products to hedge the potential threat to their businesses.

Despite all the untried technology at work in interactive cable systems, some of the greatest risks fall outside the engineering realm.

"Businesses will use this infrastructure for high-speed networking and to reduce their phone bills by bypassing the local phone company," Katz noted. ◪

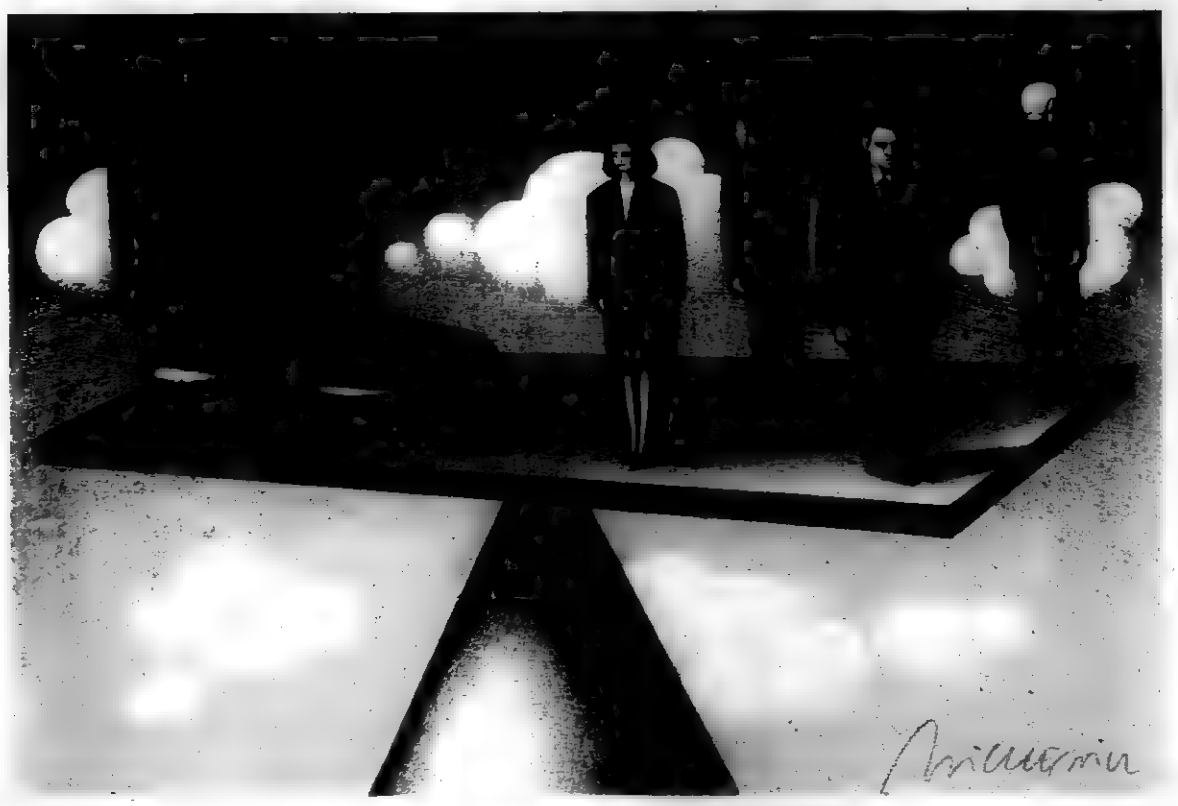
Krum, based in Stamford, Conn., conducts independent research and consulting on computer graphics.

The interactive TV screen in this mock-up image displays one type of interface

INDUSTRY ISSUES

CONFUSION REIGNS OVER COSE

Can four fierce rivals overcome the perennial politics of the Unix business?



BY FRANK HAYES

Eight months after its launch, the Common Open Software Environment (COSE) is shaping up as a technical success — but a marketing fiasco.

The project by IBM, Hewlett-Packard Co., SunSoft, Inc. and Novell, Inc.'s Unix System Group to create a standard Unix platform may be well on its way to official acceptance by the X/Open Co., an international standards consortium. But users said they still have not figured out exactly what COSE is or how it is likely to help them build client/server environments.

"Even today, none of the vendors I talk to have even heard of COSE," said Gail Levesque, manager of special projects at Monadnock Paper Mills, Inc. in Bennington, N.H. "Whoever is driving COSE, they've got to be able to articulate the benefits."

Jim White, vice president of technology planning at Charles Schwab & Co. in San Francisco, agreed. "There's a lot of confusion out there," he said. "A lot of people are beginning to look to X/Open [for standards]. Some clarity would be nice."

EMPTY PROMISES

The confusion is hardly surprising. Since 1987, users have endured a deluge of Unix "unification" plans from AT&T, the Open Software Foundation (OSF), Unix International and the ill-fated Advanced Computing Environment, or ACE. All of them promised standardized user interfaces, uniform systems management and common programming interfaces. None of them delivered.

Then COSE made its debut last March, with all of the industry's leaders united under a single banner to jointly develop a common Unix "environment" spanning not only the desktop but also eventually networking, graphics, object technology and systems management.

"It's the right time, the right circumstances," said Rikki Kirzner, a principal analyst at Dataquest, Inc. "And let's give credit where it's due — this wouldn't have happened without Microsoft."

The competitive threat of Microsoft Corp.'s Windows NT operating system, released in August, is seen by many as the true driving force behind the development of COSE's Common Desktop Environment (CDE). This "common Unix dashboard" promises to integrate a melange of existing products and services, such as the OSF/Motif graphical user interface and SunSoft's ToolTalk software, to produce a user interface that looks and feels the same across various workstation platforms.

Integral to the entire effort is X/Open, which is pumping up its public presence on several fronts.

Last month, Novell handed over the Unix brand name to X/Open in a highly publicized move that makes X/Open the official referee for industry-standard versions of Unix. In September, X/Open was tapped by a group of 75 Unix vendors to shepherd into standardization a comprehensive set of more than 1,000 Unix application programming interfaces (API). The common API effort is intended to eliminate the incompatibilities among multiple Unix variants.

For their part, users seem confident X/Open can carry off its increasingly high-profile role. "There are a lot of high hopes, and X/Open has probably done a more complete job than anybody to date," White said.

Alan Dickman, a member of the technical staff at Bell Communications Research in Piscataway, N.J., agreed. "X/Open is up to supporting it. It's up to the vendors to decide if this is worth it to them."

STATS

NAME: X/Open Co.

FOUNDED: In 1984 by Bull HN Information Systems, Inc., ICL, Siemens AG, Olivetti and Nixdorf.

MEMBERSHIP: Fourteen "shareholder" companies that pay $500,000, along with 13 system vendors and 27 independent software vendors that pay $15,000 to join X/Open's Independent Software Vendor Council. Vendors pay an additional $25,000 to participate in the CDE working group.

Users comprise 58% of X/Open. The 77 end-user companies each pay $22,500 to join the user council.

MISSION: Began in 1984 as an organization of European computer system vendors, focusing on practical requirements for open systems. A U.S. office opened in 1987. In 1989, the mission broadened with the launch of its first "Xtra" user requirements survey to help vendor members determine customer needs.

Promotes the X/Open Portability Guide (XPG), a set of open systems specifications for widely used standards such as SQL, Cobol, C and [redacted] Window System. Also tests and brands products for XPG compliance. To date, more than 800 products are X/Open-branded.

COSE POLITICS

The potential trouble for the COSE vendors lies in getting four fiercely competitive companies to work together — and to do so without a legal safety net. So far, there is no overall cross-licensing agreement formally tying the firms together for COSE development. Instead, the vendors are relying on individual licensing agreements for the technologies involved.

"Clearly, there's a potential for it not to work," observed Ed Hoerner, director of infrastructure implementation and planning at GTE Telephone Operations in Irving, Texas, and a longtime open systems advocate. "If one of these companies gets mad at the others, the whole thing could fall apart."

"Are we bitching and moaning at each other? The answer is yes," said Michael Sears, director of the program office at SunSoft. "Are we getting things done? The answer is also yes. We're meeting and talking all the time. A couple hundred thousand pounds of jet fuel have been expended on this 'virtual corporation.'"

(Continued on page 24)

ILLUSTRATIONS BY ADAM NIKLEWICZ

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SOFTWARE FOR BUSINESS INTEGRATION

IBM

(Continued from page 21)

To speed along the standards process, the COSE players made sure X/Open would use its "fast track" process to consider the COSE specifications and to create a testing and branding program as well (see story below).

At X/Open, a newly created topic group called the Desktop Working Group is handling the formal CDE specification. This desktop group, plus an X/Open "requirements topic group," began meeting in July to feed recommendations to the COSE sponsors and prepare for the finished specification's delivery in December.

Even more significantly, the plan to implement the new COSE specifications reverses the usual process for developing standards. The COSE projects are being jointly developed behind closed doors by IBM, HP, SunSoft and Novell. Only after the four firms have created their products will they extract the common specifications to submit to X/Open.

That reversed approach has prompted suspicions that X/Open's fast track is simply a way of railroading the COSE products through the standards process.

"The fast track process is not used a lot," said Hal Wilson, vice president at systems integrator PRC and the person who sponsored the proposal to fast track CDE before the X/Open User Council. "There was concern among the membership: Exactly what are we buying into here? Will we lose our objectivity?"

The COSE sponsors have vowed to abide by any product changes required by X/Open, but a mantle of silence over the group's work has effectively kept both users and other vendors in the dark.

Meanwhile, technical work on COSE has been moving steadily forward, the sponsoring companies said. In June, they issued a 117-page "functional specification" for CDE. That spec describes a single set of source code for all four primary platforms: SunSoft's Solaris, HP's HP/UX, IBM's AIX and Novell's Unix System V Release 4.2.

The X/Open membership — comprising dozens of system and software vendors plus user companies — will vote on that initial CDE specification next month at a conference in Rome. Still undecided, however, is exactly how CDE will be offered as a product when it finally hits the market in mid- to late 1994.

ON THE FAST TRACK

X/Open's fast track process is similar to the organization's normal standards process — but with the front end sawed off.

Ordinarily, a technical working group composed of X/Open vendor members spends two years or more developing and revising a specification. Vendors can examine draft after draft of the proposed specification before it is submitted to the X/Open membership for a vote.

But in the fast track process, the proposal's sponsor must do most of the development work on the specification. The X/Open working group's effort is largely limited to accepting or rejecting a finished proposal. If a spec is not up to snuff, it is returned to the developers for more work.

"The fast track process will only work as well as the quality of the specification," said Alan Dickman, a member of the technical staff at Bell Communications Research who has worked on past X/Open specs. In addition, Dickman said, a fast track spec "needs considerable industry support behind it," as it must still pass the same number of votes as a conventional X/Open standard.

For X/Open, fast-tracking has the advantage of the sponsoring vendors footing the bill for developing the specification. For sponsoring vendors, fast-tracking may cut the time a proposal spends in a working group to a few months "if everything is perfect," according to X/Open spokesman Jeff Hanson.

However, fast-tracking carries no guarantee. The OSF's DCE, which was returned to developers for additional work, will spend a year in the process. If all goes well, COSE's desktop environment specification will be up for a vote next month and could emerge ready for approval by April. Then X/Open-branded products might be available by mid- to late 1994.

UP AND RUNNING

Yet despite the confusion surrounding COSE, most users said they still like what they have heard — at least as a first step.

"This provides a solid baseline," said Jonathan Vaughan, vice president at The Chase Manhattan Bank NA in New York. "However, other than for purely desktop products, the APIs are just a starting point. In an enterprise environment, you're really going to have to go to the next level with things like security services, naming services and management facilities. It's not clear how that will be resolved."

"It doesn't help us at all to have multiple standards," added Kevin Reilly, vice president of information systems at Richardson Electronics in suburban Chicago. "We're not moving to Unix because the vendors have told us how great it is; we're moving to Unix because we know we need distributed systems and interoperability."

But handling those complexities requires disposing of the incompatibilities among Unix platforms, Kirzner noted. "The quicker you force the operating system into being a commodity, the quicker you can move up to the next level," she said. ◼

Hayes is a Portland, Ore.-based freelance writer who specializes in Unix and open systems. His Internet address is frankhayes@bix.com.

CONSULTANT'S VIEW

Living with the Legacy

The essence of client/server computing is the strategy of distributing computations and data over multiple computers. One of the key challenges is initiating a distributed computation over distributed data while ensuring the integrity of the result.

The need for distributed transaction control is evident in financial management systems, which must ensure that no expenditure is approved without available funds. Other types of systems (scheduling, parts inventory, order fulfillment, etc.) have similar situations in which they have to keep balances consistent across two different subsystems or databases.

The system software that provides this capability — the "transaction processing monitor system" or TPMS — has been used in mainframe shops for more than 20 years.

Now, TPMSs are making their debut in client/server environments to solve the same problems.

For example, IBM, whose CICS is synonymous with mainframe transaction processing, now has versions of CICS for OS/2 and AIX. Hewlett-Packard is implementing CICS under HP/UX, and IBM is even producing a Microsoft Windows NT version.

A recent market research survey by International Data Corp. projects that CICS will control 60% of the TPMS market for the foreseeable future — in both client/server and mainframe environments.

And why not? The characteristics of CICS are well-understood. There are more trained CICS programmers by an order of magnitude than for any other TPMS. CICS will likely provide the most robust way of integrating mainframes into the distributed client/server environment — something that most large organizations want to do.

However, a transaction processing monitor is not the only way to ensure the integrity of distributed computations and data.

Vendors of client/server database management systems are developing their own solutions, providing two-phase commit processing, data replication control and a variety of approaches to include both network- and mainframe-based data in the solution.

Many applications don't require true simultaneous updates (such as a bank credit-card application might) but can deal with databases that get back into synchronization within a few seconds or minutes.

Sybase has been emphasizing the use of its new Replication Server in these cases, claiming they are far more common than those requiring true two-phase commit. Oracle and Sybase also offer capabilities for database two-phase commit, allowing the implementation of large systems with the database split across multiple servers. A good example is a banking system that keeps certain customer files on servers at each branch.

CICS will likely provide the most robust way of integrating mainframes into the distributed client/server environment.

The ideas of two-phase commit and replication processing have also been around for a long time. What is new, of course, is the technology for downsizing and client/server. The fight is shaping up in the space where CICS is moving down and the newer entrants are moving up.

Today's software systems for ensuring distributed transactions are still based on a procedural programming model. But object-based systems will also have to deal with these issues.

Once these systems are able to ensure the integrity of messages passed over a network, we will truly have a contender to unseat CICS from its throne. ◪

PHOTOGRAPH BY KATHERINE LAMBERT

JERROLD GROCHOW

Grochow is vice president and chief technology officer of American Management Systems, Inc. in Reston, Va.

Holmes Curtis' Joyce Young (seated) and Maria Borzych put a powerful decision support system at the fingertips of sales reps

COVER STORY

MAKING WAVES at Helene Curtis

Daily access to constantly updated customer and product information allows sales reps to react to market changes faster

'Twas nearly the night before Christmas five years ago, and Joyce Young was despairing over her first client/server project.

The director of decision support systems at Helene Curtis Industries, Inc. in Chicago had just given 20 salespeople the pilot version of what later became a very successful sales automation system. She was out having a late dinner with Maria Borzych, her sales systems manager and the first employee to join Young's fledgling three-person department.

"Things were not good. We were so upset! We wondered if we'd have jobs when it was over," said Young, who can smile about it all now. "We were using all this beta stuff, and we became our own system integrators. It was awful."

Client/server computing arrived at Helene Curtis Industries not with a bang but a whisper — and long before it became a fashionable buzzword.

"From the very beginning, we had a great deal of involvement with our clients, the sales force," said Young, 40, whose background includes degrees in computer science and business administration plus five years of information systems consulting for KPMG Peat Marwick. "These are very aggressive people, and I had to coalition-build. I couldn't go to them and be 'Ms. Tech Wienie IS' and be successful."

That first client/server project — a circa-1989 sales information system that gave laptop PCs to 170 direct sales representatives and managers nationwide — is scheduled for its second-generation revamp next year. A

(Continued on page 28)

THE COMPANY: Helene Curtis Industries, Inc. Sales of $1.2B in 1993 and net income of $16.6M. Fortune 500 rank: 353. Employs 3,200 worldwide.

THE MARKET POSITION: Ranks No. 1 in U.S. in sales of hair conditioner and mousse/gels and No. 2 in shampoos, behind Procter & Gamble Co.

THE KEY COMPETITORS: Procter & Gamble, Unilever, Alberto-Culver Co., Gillette Co.

THE PRODUCTS: Suave, Finesse, Salon Selectives and Vibrance shampoos and conditioners. Degree antiperspirant. Quantum permanent wave and other salon products.

PHOTOGRAPHS BY ANDY GOODWIN

BY MARYFRAN JOHNSON

Products Then and Now

In 1927, Gerald Gidwitz and Louie Stein founded the National Mineral Co. to sell mud packs to beauty salons. The company was renamed Helene Curtis, after Louie Stein's wife and son, in the late 1940s.

Lanolin Creme Shampoo
1940s

Stopette Antiperspirant
1950s

Suave Shampoo
1950s-90s

(Continued from page 27)

new retail information system — the second major client/server project — began rolling out last month to 150 more members of the retail sales force (see story below). This time, Young's department put pen-based AST Research, Inc./Grid Systems Corp. palmtop computers in the hands of another set of sales reps.

The decision support systems group now counts 30 staffers among Helene Curtis' 137-person Business Information Systems Division. The handful of PCs kicking around when Young joined the company in 1988 is now a network of more than 700 desktops and 21 LANs.

For this $1.2 billion corporation, whose mainstay product lines include Suave, Finesse and Salon Selectives shampoos and conditioners, client/server has come to mean all forms of decision support for sales, marketing and finance. "The scope that my department has is very broad; we support everything that is not part of the data center or the transaction processing systems," said Young, whose budget this year is about $3 million of the overall $25 million IS budget.

Success has been one of Joyce Young's personal hallmarks. Now married and the mother of a 5-year-old son, she once considered careers in dress designing or professional dance. Her first job in the computer industry was as a programmer/analyst at the now-defunct Sperry Univac Corp., where she began working with fourth-generation languages and modeling tools.

"Decision support systems were

FROM PAPERWORK TO PALMPADS

By all rights, Dan Giel should have been exhausted.

Instead, Helene Curtis' customer business development manager was elated as he plowed through a series of 14-hour days last month during the first rollout phase of sales force training on the long-awaited retail information system.

"I've never seen so many people excited about something like this," said Giel, who provides front-line, nontechnical support and acts as a liaison between sales and the decision support systems staff. "These people were clearly here to learn something they consider really important to them."

Based on AST Research/Grid palmpad computers and in-house-developed software, the new system promises to broaden the business analysis capabilities of the retail sales representatives, who serve as "our eyes and ears out in the stores," said Paul Silverman, national field sales manager at Helene Curtis.

"I really believe this gives us a competitive edge," Silverman said. "It lets us get information down to individual shipments of products, right to the retail store level."

In the past, when a new brand of shampoo or conditioner was launched, the only way to track the product's success was through written reports submitted by the roughly 150 direct sales reps spread across the country. Each representative was responsible for a territory that might include up to 250 grocery stores, mass merchandisers and convenience stores.

That paperwork, which took several weeks to process and analyze back at headquarters, covered information such as how many bottles of the new shampoo a store was stocking, its price and how well it was selling.

But in the hotly competitive consumer products market, sales reps in the '90s must be able to analyze and react to situations like business managers rather than like product suppliers.

The sales reps will be able to swiftly input product information into the palmtops and upload it each night to the national database on the Sun servers in Chicago.

"Now we can watch our distribution build almost by day, which helps us with things like when to turn on the media spending," Giel noted.

a big interest of mine from the days of the early PCs and LANs," Young noted.

The sales automation system that Young's department built at Helene Curtis gives the sales force daily access via laptops to constantly updated product and customer information that once took several weeks to assemble and distribute.

Client/server has come to mean all forms of decision support for sales, marketing and finance.

"Our system is very flexible and fluid in what data you pull up," said Paul Silverman, national field sales manager at Helene Curtis and an early evangelist for the technology. "That's a good deal of its power."

For example, a sales rep can fire up his Compaq Computer Corp. Contura SL laptop and ask for all customers with orders over $5,000 as of yesterday. Then he can query specific product distribution information for Suave and Finesse shampoos. When he later connects — through a dial-in modem over X.25 Sprint Corp. leased lines — to the national database in Chicago, he will upload his latest information from the field and drop off requests for additional reports not included in his laptop database.

The laptops run several off-the-shelf software packages, such as WordPerfect Corp.'s WordPerfect, Lotus Development Corp.'s 1-2-3, Software Publishing Corp.'s Harvard Graphics, a Moditech Corp. electronic-mail system and Dealmaker forms software from EASI Co.

EMPOWERING BUSINESS MANAGERS

Direct and retail sales reps perform very different jobs at Helene Curtis.

Direct sales representatives — the ones with laptops — deal at higher corporate levels with the buyers for merchandisers such as Kmart Corp. Retail sales reps, on the other hand, work with individual retail store managers in the roughly 40,000 different drugstores, supermarkets and retail outlets in which customers buy Helene Curtis products.

The new palmpad-based retail system will give sales reps an automated way to collect data, an analysis tool to measure sales productivity and more disciplined planning methods for handling accounts at the retail store level.

"This kind of technology allows us to bring information to the retail sales reps that empowers them to become business managers," said Dan Glei, customer business development manager and a key user liaison between IS and the sales force. "They can analyze information they never had before and make better decisions because of it."

EDGE ON COMPETITION

Making better decisions is an increasingly crucial skill in the viciously competitive hair care market, in which Helene Curtis rose from relative obscurity a decade ago to become one of Procter & Gamble Co.'s most significant rivals.

"Helene Curtis has been very innovative over the years in new product creation and very persistent in reworking brands and supporting them," said Diana Temple, an analyst at Salomon Brothers, Inc. in New York. "But their U.S. sales were off by 7% in the first quarter because of inventory reductions by retailers."

"They're not doing that well right now, but I'd guess they'd be doing a little more poorly if it wasn't for their great information technology," added Andrew Shore, an analyst at Paine-Webber, Inc. in New York.

The new retail information system, which was three years in the making from inception to reality, has a "fairly near-term horizon for payback," Glei said. "We believe this will provide us with a very distinct competitive advantage."

One quick payback from the re-

(Continued on page 30)

Open Systems Evolution

Open systems began emerging as a serious corporate direction for Helene Curtis in the spring of 1992.

"That's when we started a more formal dialogue around open systems," said Tom Gildea, vice president of business information services. "One reason for doing it was educational. The other was just to start the cultural process."

Gildea brought in a consultant to analyze his current computer setup — "We have everything here except Wang equipment," he noted — and then talk about the gradual process of mainframe downsizing with the 137-person IS staff.

"It surfaced a lot of angst on the part of the mainframe people," Gildea recalled. "They've spent their entire careers on this equipment, and a lot of their self-worth is tied up in being systems programmers. But the skills they have are important — and many of them are skills client/server doesn't have yet."

In March, Helene Curtis realigned into two major divisions: U.S. and international. The IS operation remained intact as a corporatewide function, responsible for both the U.S. and international domains. "Our CEO [Ron Gidwitz]'s view is that we're going to be global, and information is the key," Gildea said.

"There's a lot of good stuff available now for client/server, but you look at the product offerings and see a lot that is not there," he added. "Little fundamentals like backup, recovery, security, system management...."

Gildea is making a special effort to bring the operations and technical services staffers into "this revolution for client/server" rather than merely informing them about new technology choices afterward.

"I'm trying to position them so they become experts, so when they come to the table they're prepared to render expert opinions," Gildea said. "I'm trying to elevate them to more of a partnership."

(Continued from page 29)
tail system, Young added, is that it will let the sales reps add one more store to their daily rounds — eliminating the need to hire more salespeople.

POWERFUL ANALYSIS TOOLS

The combination of daily updates from the field with syndicated market data has proved to be a powerful tool for market analysis at Helene Curtis.

When competitor Unilever introduced a new shampoo called Rave, for example, the market research department at Helene Curtis assumed it was aimed at their Salon Selectives line. But an investigation and analysis indicated that the bargain-priced Suave line was the true target.

"We were going to take down the pricing on Salon Selectives as a reaction to Rave, but the system enabled them to avoid doing something very reactive and losing money," Young recalled.

The heart and soul of the decision support operation lies within the 25G bytes of data stored in a relational database on a Teradata, Inc. system in the data center. It stores syndicated market data from A. C. Nielsen Co. about the $20 billion personal care products industry, as well as product information from the field and internal data on logistics, promotions, sales and order entry.

From that data warehouse, information is parceled out to a Sybase, Inc. relational database management system on several Sun Microsystems, Inc. servers and then further down to Novell, Inc. NetWare LANs, IBM-compatible PCs and the Compaq laptops.

The 'Three Rs' at Helene Curtis are rehosting, rightsizing and re-engineering.

Now facing a bill of $400,000 to upgrade storage capacity on the Teradata system, Helene Curtis is actively considering other options for its next wave of technology purchases. The "Three Rs" at the firm now are "rehosting, rightsizing and re-engineering," said Tom Gildea, vice president of business information services.

To identify the vendors that will become strategic partners in the future, a team of 25 IS managers and staffers recently visited several major system and software vendors. NCR Corp., Hewlett-Packard Co. and Digital Equipment Corp. all made the short list as potential partners.

"One thing we've discovered is that nobody has a complete solution out there," Gildea said. "I'm reluctant to say we're going to go to client/server everywhere because then everybody's got a hammer in their hand saying, 'This is what we're going to do,'" he added. "What I want people to do is sit down and develop intelligent applications for the user community."

NO EASY TASK

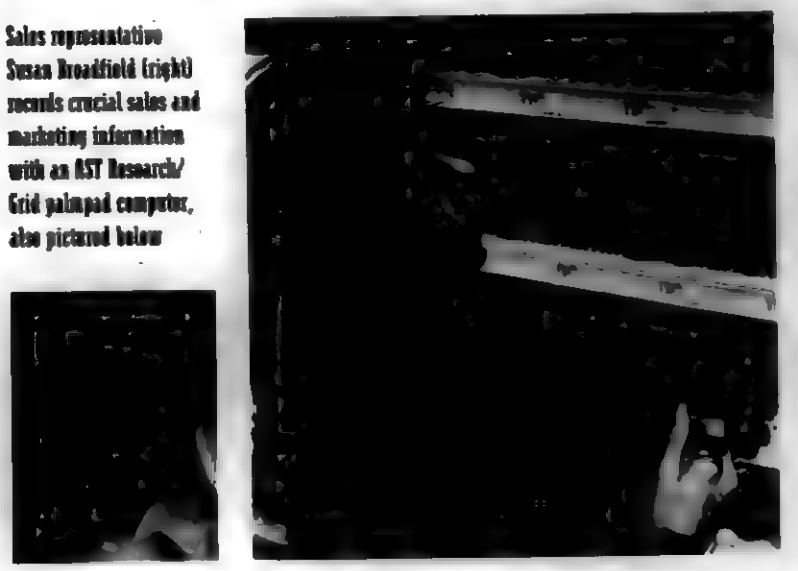
Although client/server systems ultimately provided tangible benefits for the company, there were unnerving pitfalls in the early days — from LAN configuation crises to distributed data synchronization problems.

One big mistake Helene Curtis made with the sales information system, for example, was overzealously distributing databases to the field. "We had the actual database running on the laptops, and it was just a nightmare to support," said Borzych, sales systems manager. "Because we have very sophisticated transactions going on here and sales territories realigning, we have as many as 500 customers that could change from one territory to another. Being able to keep those databases in sync and up to date was a logistics nightmare, as well."

Moving back to a centralized national database on the Sun servers — with only the easily refreshed data distributed on the laptops — was a change the sales reps welcomed because performance improved, Borzych said. "Now if they submit a report at 11 a.m. and wait until 11:30 a.m. to pick it up, 95% of the time their reports are ready."

Aside from introducing a new type of computing to Helene Curtis users, decision support systems also pioneered a closer working relationship with users during application design.

"The crux of the success of Joyce's group is the heavy front-end involvement of users and people like me becoming part of their business," Glei said. "Joyce and her people work real hard to understand our needs and deliver on them." ◩



Sales representative Susan Broadfield (right) records crucial sales and marketing information with an AST Research/Grid palmpad computer, also pictured below

Marylyan Johnson is editor of Computerworld Client/Server Journal.

Columbia Polishes Financial Aid Image

Columbia University's Mark Olson: 'You can survive new technology. . . .

Building client/server applications is a lot like defensive driving: Getting to the destination quickly may be your goal, but you have to be prepared for some mishaps along the way.

Such is the case at Columbia University in New York, where information systems personnel are immersed in a five-year plan to re-engineer key business processes for the school's 15 colleges. They are striving to enable faster turnaround and less paper shuffling for critical activities such as admissions and financial aid.

"You can survive new technology, even bleeding-edge client/server stuff," said Mark Olson, vice president of Columbia's student financial and information services. "But be ready for some surprises."

Those surprises came in many forms, from LAN-to-host communications snags to difficulties with distributed systems management. But Columbia was prepared for the detours and wasn't afraid to call in experts to keep the project moving, Olson noted.

Among the biggest eye-openers, the IS executive said, were the complexities of developing in a heterogeneous environment that included a mix of IBM software and hardware, Novell, Inc. NetWare LANs, an optical jukebox from Hewlett-Packard Co., a scanner from Fujitsu America, Inc. and PC clones from Dell Computer Corp.

"We found that we have to have OS/2 experts, LAN/Novell experts, Ethernet experts to get the gateway working to the IBM mainframe and so forth," Olson said. "We pushed the envelope everywhere we could."

Establishing and following "a rigorous diagnosis to track down problems" was important, Olson stressed. During testing and integration, for instance, a glitch might be traced to a scanning device. That, in turn, could mean the problem was in the front-end applications code, a communications interface, the network or the

(Continued on page 34)

PHOTOGRAPHS BY KENT HANSON

BY DAVID BAUM

witnessing the birth of a new age

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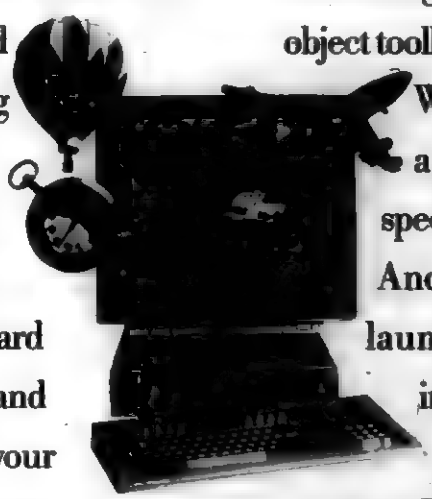


RISC System/6000

	Price	SPEC™int92	Cost/SPECint92
IBM 25T	$9,390	62.6	$150
HP® 715/33	$9,990	24.7	$404
DEC™ 300L	$7,920	45.9	$173
IBM 990	$147,800	126.0	$1,173
HP 160	$136,530	82.0	$1,665
DEC 4000/610	$131,728	94.6	$1,392

Power for a new age.

IBM

(Continued from page 31)
IBM CICS environment.

But the end result was gratifying, he added, as financial aid counselors became "30% more productive" and are now better prepared for audits.

Eight financial aid counselors at two colleges are currently using the system, and by next year, as many as 12 counselors at five colleges will rely on it.

Like other universities, Columbia's financial aid situation is a highly regulated, paper-bound and politically charged process. Yet getting answers to students quickly could sway their decision to attend a particular school — making a smoothly run financial aid system a distinct competitive edge.

The achievement of that goal, however, was encumbered by increased government regulation, a growing student population and reliance on an overworked IBM mainframe for running key programs. Work queues consisted of boxes of folders routed from one desk to another.

All in all, counselors were spending as much as 20% of their time chasing down paper, Olson estimated.

Working with consultants from American Management Systems, Inc. (AMS) in Fairfax, Va., Olson pieced together a new environment that incorporated electronic imaging of documents and a scalable system of OS/2 workstations networked to the mainframe.

Today, snapshots of documents are scanned as soon as the mail is opened, and an attached workstation sends a record to a tracking index on the mainframe. Electronic folders of the documents are maintained there, while the images are stored on optical platters in the HP jukebox.

Each night, a DB2 batch job runs on the mainframe to determine which student folders are complete. Those folders are automatically routed into the local memory of a counselor's PC, where they are queued up for review the next morning.

NO IVORY TOWERS

Columbia University's Mark Olson offered some pointers for successfully managing client/server projects:

- **Devise a scalable architecture to mitigate risk.**
- **Plan to spend extra time on communications issues such as integrating PC processes with mainframe processes.**
- **Designate an administrator to manage day-to-day system activities outside of the data center.**
- **Allow plenty of time for testing in a heterogeneous environment.**
- **Develop applications rapidly, but carefully consider the overall architecture first.**
- **Partner with vendors or consultants that are mutually invested in both the risks and the rewards.**
- **Take ownership of the tools and technology by insisting on a skills transfer to your own staff.**
- **Set up a backup plan to keep business running as usual until the new applications enter full production mode.**

Counselors view images of documents on 19-in. monitors, which also display an active window into the mainframe for accessing the DB2 tracking index and running the needs analysis program under IBM's CICS. Award letters are automatically generated.

"The new imaging system is a huge time saver," said David Charlow, associate director of student financial services. "All the tasks that used to require pulling hundreds of folders from the file cabinet — auditing, verification, needs analysis — are now handled on-line."

All in all, it took staff members about two days of intensive training to become proficient with the new system, he added.

It also took some ingenuity and patience to get all the communications links working properly, Olson said. Devising the connectivity to view mainframe processes in an active session under OS/2 Presentation Manager tied up three programmers for nearly three weeks.

"Eventually, communication parameters between the LAN and the host had to be resolved by calling in an expert from IBM," Olson recalled.

Another problem the staff members wrestled with was how to provide adequate systems management in a decentralized setting.

"We didn't want to help the counselors save time pushing paper only to have them spend time learning to become computer technicians," said Donna Morea, a vice president at AMS who is working with Olson on the re-engineering projects. Columbia solved the problem by insisting on applications that require a minimum of baby-sitting and upkeep.

The university also hired an administrator to manage day-to-day system activities outside of the data center. Staff members avoided distributed data management problems by maintaining information centrally on the host.

"We don't have to worry about data ownership conflicts or synchronization problems or with mirroring data on multiple devices," Morea explained. "These issues can be a thorn in the side of some distributed applications."

Another thorny area of client/server is rapid application development. Working fast is not always conducive to the long-term goal of creating a maintainable system.

Columbia used IBM's Image and Record Management (IRM) system, an imaging system plus a set of tools for building imaging applications. IRM's rapid development methodology was used only after the architectural design had been established.

"To bring it up in one big bang would have been too risky, so we devised a way to roll out the system gradually to add LANs as we go," Olson said. "This way they could show results quickly, while tackling the distributed issues a little at a time." ◼

Baum is a free-lance technology writer based in Santa Barbara, Calif. His MCI Mail address is 554-2167.

Sticker Shock!

The up-front costs of client/server can weigh down the bottom line

ILLUSTRATIONS BY VICTORIA KAHN

Any Wall Street veteran will tell you there is no such thing as wealth without risk. The same holds true for investment in information technology.

Client/server is still a rapidly evolving technology, and the cost guidelines outlined in this article should be considered rules of thumb only. But before you get swallowed up in the costs, it would be worthwhile for you to summarize the benefits of client/server computing. One is that client/server computing puts processing power where it is needed to address the business problem.

For example, consider an application for an insurance company with a complex rating process for underwriting policies. With today's processors, an underwriter can execute this application on the client side with seemingly immediate results — and no drain on the performance of other machines, which is likely to happen in a host environment.

Another benefit is that client/server computing communicates what is happening in the business as it happens.

Let's say the same insurance underwriter is flummoxed by an exceptionally risky policy. Instead of letting days pass while a bulky file is transferred via interoffice mail, the underwriter's assessment and all related data can be communicated immediately to a special risk underwriter on the network backbone.

Many of the benefits associated with client/server arise out of these new classes of applications. Likewise, many of the risks and costs of client/server arise from these same sources. The key to success is to develop plans and deploy people to control the risks and manage the expenses.

By 1997, the client/server integration market in the U.S. alone is expected to grow 28% to more than $13 billion, according to G2 Research, Inc. This might suggest that companies are clamoring for client/server. But in our experience, successful organizations are seeking business applications, not client/server or new

(Continued on page 36)

BY HUGH RYAN

(Continued from page 35)
technology applications.

These demands call for new classes of applications that expand the way companies serve customers and change and manage themselves.

Take thousands of employees and put them in the path of a re-engineering juggernaut. Who wins? Nobody, unless the client/server project includes significant change management efforts at the outset.

CHANGING PROCESSES AND PEOPLE

The benefits of client/server arise from changing the business process.

The UK Department of Social Security used IS to streamline benefits for its citizens

BENEFICIAL CHANGES

Large, enterprisewide projects dramatically show the need for change management. Officials at the UK Department of Social Security (DSS) knew that the quality of its service to beneficiaries was being compromised by obsolete computer systems and manual methods. In local offices, there were no computers at all.

Instead of simply implementing new information technologies, however, the department developed a new vision for delivering benefits and began to revamp the way its 80,000 civil servants do their jobs.

The long-term intent was to focus on the whole person — to move away from older methods of processing claims on a benefit-by-benefit basis. The DSS wanted to be able to display on one screen a "snapshot" of a person's history of contributions and benefits.

One project, for example, installed 2,500 microcomputers in local offices, preparing workers accustomed to manual operations for the upcoming changes. Such short-range successes generated confidence in the program's ability to deliver.

In later stages, change management played a crucial role in educating and training employees, planning the rollout, redefining jobs and establishing a single point of help. During the training period, some 1,400 staff members began the 10-day course at 32 area training centers.

The system, installed in 1989, dispatches 74,000 payments a day. The majority of benefits are distributed through 20,000 post offices in the form of booklets with six months' worth of checks that recipients cash each week. The new retirement pension system handles 99.5% of all cases automatically and is saving the British government an estimated $1.6 billion a year.

One frequently overlooked implication is that the business user and information systems staff must change as well. This notion should raise a red flag or two, for very few of us like to change.

In some cases, even those of us who want to change cannot keep up with technology.

One food product manufacturer I have worked with is finding that its IS staffers can write systems that reengineer the process of food merchandising faster than they can train business users on their systems. Critical to the success of the client/server project is recognizing that the business user feels the greatest impact in a re-engineering project and therefore requires significant time to learn and adapt to new processes.

My experience shows that each business user needs one to three weeks to learn a new system that significantly changes the business process. One large system I worked on required a three-week time frame for each business user to learn the system and have time to evaluate and change it. With thousands of workers, the training costs alone were in the millions of dollars.

In this particular case, because of the number of people who were put through training, the cost to develop training materials was not large in comparison.

However, when you are dealing with more typical efforts of 10 to hundreds of business users, the cost to develop training material is often estimated at 40 to 80 hours per hour of training material.

MASSIVE TRAINING REQUIRED

The IS staff must also go through a significant skills upgrade to deal with the demands of client/server technology. New skills must be learned for new design methodologies and design for graphical user interfaces, as well as for development tools (see story page 38).

By multiplying these times by the head count in one's own shop — and taking into consideration existing skill sets — you can approximate

training costs for your staff.

Be aware that this technology is progressing rapidly and requires a commitment to ongoing training. In general, plan an average of a week per person every year for skills upgrade, in addition to the core training. While each site will vary somewhat, this should provide a strawman for front-end and ongoing training costs.

A NEW TYPE OF STICKER SHOCK

Vendors often tout client/server as the faster, cheaper, easier alternative to mainframe computing. In reality, the up-front cost of building client/server systems carries with it a new type of sticker shock. New infrastructure costs, longer development time and a complex environment can result in a higher initial cost for building a client/server solution.

Client/server requires a solid infrastructure of tools, system software, hardware and network gear. With traditional environments, we have come to expect these tools to be available either as part of the operating system or as part of a selected product.

With client/server, one can buy many parts but not an integrated assembly of the infrastructure. The range of infrastructure products is very wide. For example, productivity tools for window painting may not tie into code generators. And there may not be tools to address remote printing and recovery of lost printed reports. Tools to deliver applications to a local site may not exist at all yet.

The range in infrastructure costs can be startling, even for companies in the same industry. For example, I worked with one U.S. utility that selected and used an integrated tool set to deliver the infrastructure in about 500 work days. Another utility, which chose a heterogeneous mix of hardware and system software and networking, needed 1,500 work days to develop the infrastructure.

Such a wide range indicates that delivering the infrastructure demands that attention be given to the specifics of each site and what is in place before a maiden client/server voyage is launched.

Vendors often tout client/server as the faster, cheaper, easier alternative to mainframe computing. In reality, the up-front cost of building client/server systems carries with it a new type of sticker shock.

In our work, one of the big drivers of time in estimating costs is the number of I/Os. In a traditional environment, this would include screens and reports; with client/server, windows prevail.

Our development effort guidelines show little difference in the time required to create screens vs. windows. This might suggest that development time frames for traditional and client/server environments are similar. Yet the client/server environment has significantly more windows, and our estimates suggest that these new applications therefore take longer to build.

Workstation-based systems are built around the user, requiring more time to design and tailor. This adds longer testing time, due to more functions and options. And the new level of interaction (event, mouse movement, etc.) increases the complexity of the system.

Our internal surveys of where time goes in a systems development effort show that more than 60% of the design effort is spent on testing. This includes submissions and execution of tests as well as problem analysis and revisions of approaches. In some cases, I've seen testing eat as much as 80% of the design budget.

Putting the computing where it is needed means that we can deliver more functionality and better communication among users — one of client/server's strongest benefits. But in doing more, there is more to test to ensure functions work as expected and results are delivered when and where they are needed.

The resulting benefit is that instead of a customer service system with five functions, for example, client/server might deliver 10 new functions. So the system is more useful to the business.

MULTIPLYING COMPLEXITIES

Consider that in an open systems environment, there are four or five major platforms to choose from, four or more database management system providers, five or more communications alternatives, five or six productivity environments and so on. It is easy to conclude that there can be more than 6,000 technical combinations possible for such an open environment. (I have actually seen estimates of millions of combinations.)

This is great news if you are a consultant doing product selection but wildly frustrating if you are a systems builder eager to get on with the job. The number of combinations means the selection process can be greatly drawn out.

System management adds another layer of complexity to the client/server environment.

Traditional systems came wrapped in the comfort of operating system software and complete, integrated service from the vendor. But system management for client/server, which in a first development

(Continued on page 38)

(Continued from page 37)

effort can represent 10% to 40% of the overall cost, means controlling a heterogeneous environment with multiple components.

The industry is beginning to produce partial solutions from vendors such as Computer Associates International, Inc., Hewlett-Packard Co., Sun Microsystems, Inc. and IBM. Compared with what we expect in mainframe environments, though, they are incomplete. They focus primarily on bringing up and running hardware. Capabilities such as performance reporting, failure predication and on-the-fly optimization of resources are in the early stages.

Delivering the network requires painstaking planning. Client/server systems bring about the complex problem of integrating multiple vendors of hardware systems, software and network protocols.

In general, delivering the network involves three stages: planning, designing and implementing. The planning stage should last two to three months with four to six skilled network people. Estimating and managing network delivery costs is difficult for several reasons. Costs and effort are variable based on the site. While installation at a single, well-connected site may not be a big issue, installation at a variety of sites nationwide — or even worldwide — with multiple vendors can gobble up a major portion of development costs.

Also beware of long lead times for ordering the distributed network capabilities needed for client/server solutions, especially where running cable or wires might require approval from local regulatory bodies.

Client/server is taking the computer where no computer has gone before, raising the issue of site selection.

SITE SELECTION ISSUES

Client/server is taking the computer where no computer has gone before, raising the issue of site selection. My only advice here is to expect the unexpected. One very large project I worked on in Europe involved installation in buildings more than a century old. Not surprisingly, the typical 18th and 19th century architects showed very little foresight about the impact of office LANs on their building designs.

In cases like this, site upgrade and implementation can be the single largest line item in a client/server project, especially in cases where multiple sites require significant upgrade. Developing clear rollout standards is critical.

Such standards address issues such as standardized wiring and the need for uninterruptible power supplies as well as air-conditioning and potential air cleaners. For example, I worked at one site that transported loads of carbon black. In warm weather, office workers opened their windows to cool off. When distributed file servers were introduced, the combination of heat from the CPUs and carbon black on the disk drives soon spurred the need for standard air-conditioning and purification.

At other sites, union rules may impose constraints on heating and/or noise, which can greatly increase the need for adequate site preparation and installation. All of this means that you might need electricians and carpenters on-site for one to three weeks — an expense in itself, not to mention the hidden cost of disrupting the work environment.

So with all of its costs and risks, why bother with client/server? Simple: It provides a fundamentally different technology that can provide dramatically new solutions. We are only beginning to tap its potential.

Utilities are investigating the possibility of arming field representatives with handheld machines that record, store and transmit field data, including video and audio. Warehouse workers tote computers that change inventory methods. Farmers armed with computers monitor the effects of new fertilizers and pesticides on their crops.

Do these new classes of solutions involve risk? Yes. Are the rewards worth the risk? Emphatically yes — when they are aligned with your organization's strategy, processes and people.

With smart planning and a firm vision of the business future, you can parlay your client/ server investment into impressive gains. ◪

Ryan is a managing partner at Andersen Consulting in Chicago.

TRAINING TIMES

The cost of change management depends on a number of factors.

For a significant change in the business process, plan on spending two or more weeks for each business worker using the system. For information systems personnel, it generally takes three to six months for the typical IS person to become comfortable with new technology. This includes hands-on and formal training.

Here are some initial guidelines, by position, for formal training, assuming the individual knows the traditional technology:

- Programmer: Two to four weeks of training.
- Designer: One to two weeks.
- Architect: One to two weeks.
- Program manager: One week focused on the differences and risks of client/server implementation.

Just Do RAD

Reebok uses rapid application development for quick catalog creation

By Sally Cusack

While much of the high-tech world is enamored with the cheaper, better, faster promises of the client/server environment, upper management remains a tough sell in most corporations.

At Reebok International Ltd. in Stoughton, Mass., Peter W. Burrows, director of systems engineering, found that one highly effective way to approach the executive suite for funding a client/server effort is to start with a small, easy-to-manage project.

"Implementing some quick, rapid application development on a small, departmental-level system is often the easiest way to demonstrate the advantages of client/server technology," he said.

Companies do not need a large, initial capital investment to start client/server.

Companies do not need a large, initial capital investment to start the client/server process, Burrows said, pointing to the widespread availability of PC LANs and off-the-shelf software. Reebok has had early success in using client/server technology to produce product catalogs combining images, product and text across a PC LAN client/server environment.

Another example is in the company's customer service group, where 120 PCs on a PC LAN were approved after management liked what it saw in a demonstration of in-house-developed database software on a single PC. "People are more apt to approve something if they can see it in action," Burrows noted. The system, used for contact management and account follow-up, subsequently grew to 120 users in four cities.

Rather than tackling more complex areas such as database or document management systems on their first venture into client/server, companies should start with marketing, support or sales systems, he added. Those are often the departments in which executives are already implementing several tasks for themselves on stand-alone PCs.

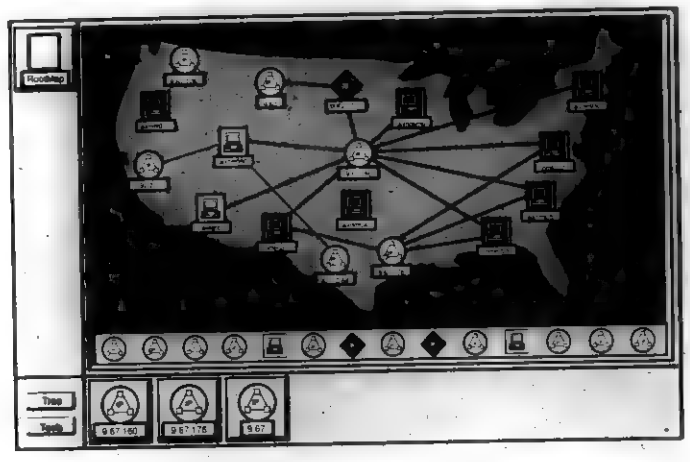
Since Reebok's PC LANs were already installed, cash investment was minimal and using off-the-shelf software allowed systems development to be completed in less than a day for the simplest applications, Burrows noted, and up to three months for more sophisticated projects.

Another good place for information systems departments to experiment with client/server is in the mainframe development backlog found in any large organization. Burrows suggested that IS managers prioritize and evaluate the backlog. "One has to determine if some of the work could in fact be done on a PC or midrange platform," he said, adding that Reebok has done some reporting backlog work using fourth-generation language products on a Unix server running Sybase, Inc.'s relational database, as well as on 486-based PC servers.

With the PC software market setting the rules for ease of use in the industry, Burrows recommended that mainframe shops give the CICS/Cobol development staff some high-performance PCs and migrate them to some of the relatively inexpensive development tools on the market, such as Micro Focus, Inc.'s Cobol, Microsoft Corp.'s Visual Basic and Powersoft Corp.'s PowerBuilder.

Two of Reebok's former Cobol programmers, for example, recently built an order transmittal application in Visual Basic, Burrows said. "Once you put the PC on someone's desk, they get the feel of the LANs and other products," he added. "As a developer, you can't get by anymore with a single language, and companies can't have a single development style when moving to client/server." ■

Cusack is a free-lance writer based in Marstons Mills, Mass.



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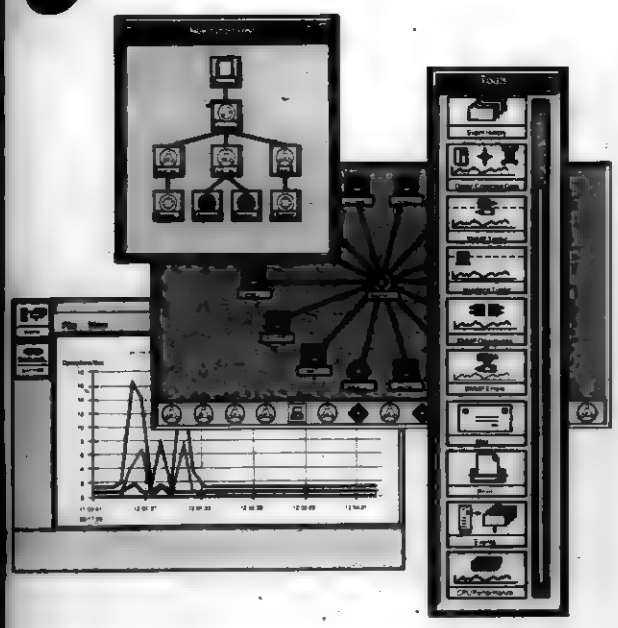

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IBM

Warring Over

The CEOs of Microsoft and Sun talk about client/server strategies, NT

Bill Gates, the software mogul who elicits equal parts of envy and enmity from his rivals, has marked the client/server arena as Microsoft Corp.'s next conquest. The strategy: Windows everywhere. The weapons: Windows NT and an army of more than 2,000 third-party partners. The goal: To chase Unix from its position as server operating system of choice.

PHOTOGRAPH BY SETH RESNICK

CSJ *What kind of client/server strategies are you putting in place to move beyond the desktop and succeed across the enterprise?*

GATES It's not just a question of Microsoft being successful in client/server. It's Microsoft and its partners — software developers and solution providers — being successful. In the solution provider area, we don't see one company being the best at all the pieces. Client/server is a growth area. We have to reach out to solution providers and make sure they understand our products.

CSJ *Many corporate customers don't seem to have a clear idea what Microsoft's client/server strategy is or how they should plan for it.*

GATES Our strategy is the Windows strategy: to connect Windows to all the existing systems, to get more applications and tools running on Windows. Windows NT is the industrial-strength version of Windows.

What do we recommend on the server? Windows NT. What do we recommend on the desktop? If you have applications where you decide you need the features of NT, then have NT. If you don't need those features, then Windows 3.1 requires less hardware and it's the high-volume version of Windows.

CSJ *If NT is appropriate on the desktop, what about Chicago, the follow-on product to Windows 3.1?*

GATES Well, NT does require more memory; it's a much richer system. Taking the worst case, when you're **Continued on page 44**

"People who have learned about Unix over the years will embrace NT very rapidly because it includes all the concepts that were pioneered in Unix."

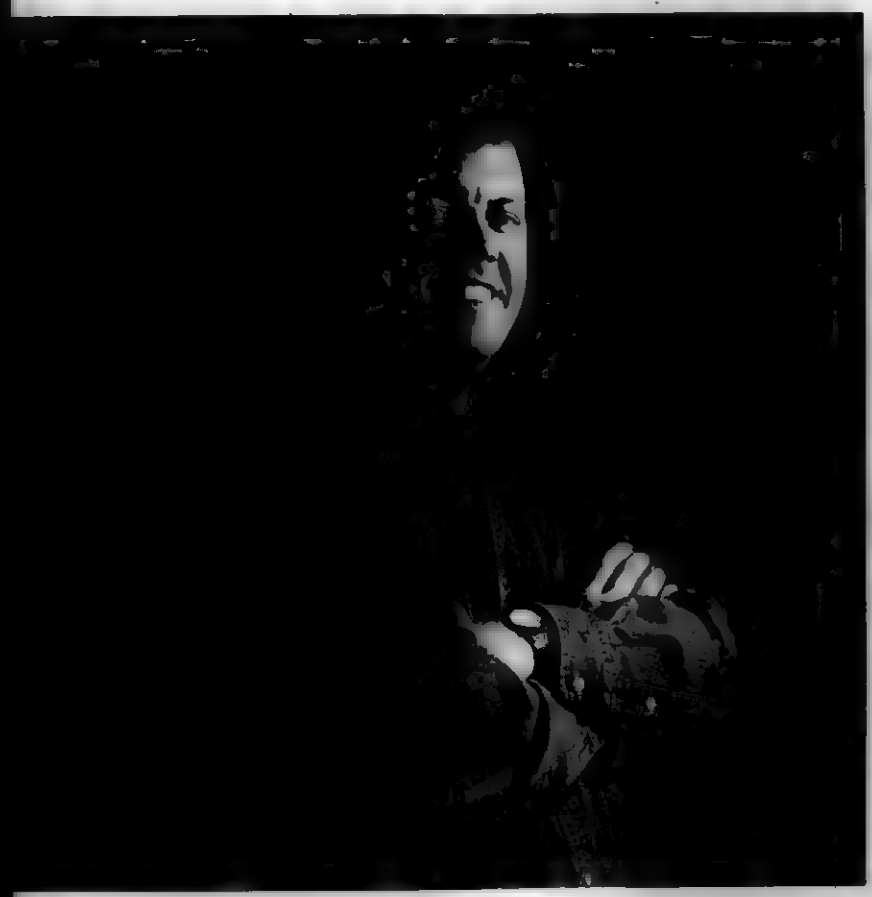
— Bill Gates

INTERVIEW

Windows

vs. Unix and the future of Windows

By Maryfran Johnson



Scott McNealy, one of the Unix industry's most outrageous and outspoken evangelists, loves to compete almost as much as he loves to win. As the Microsoft juggernaut heads into his territory, he is mobilizing Sun Microsystems, Inc. by forging alliances with Unix competitors and preparing to run Windows applications on Unix machines.

CSJ *Microsoft has a simple strategy for client/server: Windows everywhere, and NT on the server. How are Unix vendors competing with that?*

MCNEALY The 32-bit distributed peer computing environment is up for grabs. Unix has a huge lead. There are more 32-bit Unix desktops and servers running businesses than any other environment. We're using the same operating system on the desktop and server. If you want to go Solaris on the server and Windows on the desktop, you can have all the interoperability, database access and the rest. You don't buy anything having Windows running on NT if it's on the server.

"I think if we all eat right and live healthy, long lives, we may see NT become a usable product down the road."

— Scott McNealy

CSJ *But Microsoft has the corporate desktop sewn up, and by putting NT on the server, there is binary compatibility up and down the organization.*

MCNEALY But you run your applications on the desktop, and you run your databases on the servers. Databases run way better on Unix. Why would you want to put a PC company's operating system in as the server operating system? What you want is a company that has a history of doing network administration, system administration, security, authentication, reliability — and has a distribution channel and consulting organizations.

CSJ *Microsoft intends to acquire all of that for NT, which Bill Gates talks about as a new advanced operating system architected "from the ground up."*

MCNEALY I'd love Gates to go to an MIS director and say, "I've got something new for you," and watch the MIS **Continued on page 45**

PHOTOGRAPH BY EDWARD CALDWELL

Continued from page 42

running NT with all the security and running 16-bit applications, you can be as much as 15% to 20% slower than on Windows 3.1. Chicago in no way matches what we've done with NT. It doesn't come out until the second half of 1994.

CSJ *Unix systems own the midrange and server level now, and the Unix vendors are increasingly aligned to hold that ground. How is NT going to work with Unix at the server level?*

GATES Windows NT is an advanced, high-end operating system, and probably a lot of [Unix users] were waiting for a high-end operating system that could run across different hardware and was reasonably priced and had lots of applications. And here it is.

Meanwhile, we connect well into Unix systems through all the different transports and network protocols. We coexist very well.

CSJ *Unix vendors such as Sun, Hewlett-Packard Co. and IBM seem a lot more worried about Microsoft domination than about coexistence.*

GATES That's nonsense. They each push out their own source code. They each have their own APIs. Unix is not compatible from system to system. When you do standard systems, you help customers and [independent software vendors] by being rigid about what the system is — that's our NT strategy.

CSJ *The battleground seems to be shifting now from the Unix to the Windows wars, especially with Sun's Wabi technology, which will allow Unix users to run Windows at much higher performance than under older emulation methods. What impact is Wabi going to have on your business?*

GATES To software developers, the popularity of Windows is reasonably self-evident. Sun giving in to say, "Oops, if we want to sell systems, they have to have

"The question for customers is: Who has the best implementation of Windows? It's up to us to make sure we have the best."

— Bill Gates

the Windows APIs," just further strengthens the Windows message to software developers.

CSJ *The Unix vendors can argue that users won't need Windows to run the most popular desktop applications anymore. Doesn't this undermine Microsoft's unique value?*

GATES People will determine what the best ways to run Windows applications are. Operating system clones will never be able to keep up with our pace of innovation.

CSJ *Are you going to sue Sun over the Wabi technology?*

GATES Once customers have it, then we'll look at it. If they have done things in a clean way, in terms of not using our code or patents, then no, we won't sue them. If they've used some of our intellectual property, we'll look at the situation.

CSJ *Isn't it possible that the Wabi technology could reduce Microsoft's market clout, the way the chip clone vendors did with Intel Corp.?*

GATES It's very different than Intel in the sense that Intel has capacity constraints. So even if the Pentium is the best chip, if they can only make a million of them, they will choose a market-clearing price for those million chips. When we have an implementation of Windows, there are no capacity constraints. And we're very oriented toward high volume, low price.

CSJ *Sun is also attempting to force Windows into the public domain through its Public Windows Interface effort, which will be a document submitted to the X/Open Co. with all the published and unpublished Windows APIs. Why doesn't Microsoft just go to X/Open and do this on its own?*

GATES You can go buy a $9 book at the local bookstore with that information, and all of the publishers in the world have that information already. We have all the documented calls of Windows very well-published, and we work to disseminate that information. I'm not clear what the change would be.

CSJ *How do you think the PC industry and the Unix people see the concept of open systems differently?*

GATES If open means where do you have the most hardware and software choices, then the approach Microsoft has taken in working with lots of partners is the most open. If open means the bigger committee you have, the more open you are, then things like ASCII or the Object Management Group are the most open things in the world.

Why is it that PCs outsell the most popular Unix systems 100-to-1? Remember, we outsold those systems 100-to-1 when our technology was not even comparable. So here we come. We're invading their space in terms of the power of the operating system. We're bringing lots of hardware suppliers, much lower prices for the operating system and a broad set of Windows applications into this space.

CSJ *What do you think of people referring to Microsoft as the "IBM of the '90s"?*

GATES It's not an accurate characterization because we have a whole new industry structure here where I don't think any company will be the best in every area. There's too much innovation, too much happening. ◩

Continued from page 43

director shake and sweat and throw him out of his office. I want him to call it New Technology because what MIS directors want is *not* new technology. They want proved technology that can solve their problems. This is not some experimental playground to go debug a Redmond, Wash., science project.

CSJ *Microsoft's definition of openness emphasizes the sheer volume of hardware and software products clustered around Windows and eventually NT, rather than open interfaces blessed by standards consortiums. Isn't volume a more compelling argument for users?*

MCNEALY If Gates has to play in an open, competitive, multiple implementation arena, he cannot justify his market valuation. To me, openness is public domain or near-public domain interfaces with multiple, competing proprietary implementations.

Microsoft thinks they should own and control where the brake pedal goes and that there should be only one kind of oil in the world. The world will reject that. Mark my words.

CSJ *Microsoft already refers to NT as a "standardized" operating system because of the lineup of hardware and software companies supporting it. How can Unix make that claim?*

MCNEALY Standard operating system means high volume. [Gates] believes NT is standardized, but it isn't because it has nearly no unit volume. So it's a potential standard. We all assumed OS/2 was going to have volume, too. Unix today has a standardized, high-volume Unix, and it's Solaris.

CSJ *Have we replaced the Unix wars with the Windows wars?*

MCNEALY Well, what's interesting is the big flip-flop going on now, with all the Unix vendors working together and cooperating through X/Open, while Microsoft and Novell are the ones at war.

"It will take two or three years to wrest the evolution of the Windows interface away from Microsoft and put it into public management."

— Scott McNealy

CSJ *The view from Microsoft is that Sun's Wabi technology [to run Windows on Unix] tells developers that you can't sell systems without the Windows APIs.*

MCNEALY Most of our customers want to run spreadsheets and word processors as well as run their businesses on their desktops. We might as well use the Windows application floppies that are already out there. But users want to have far more capability than Windows on their desktops when they're trying to run mission-critical business applications.

CSJ *Isn't that where Windows NT weighs in?*

MCNEALY [Gates] can promise that. We're delivering. We've been doing this for years. He announced Windows in 1983, and it was only usable in about 1990-91.

CSJ *How are you going to judge the success of Wabi, which only recently began shipping?*

MCNEALY It will be a gradual thing. Wabi will be a multiyear effort that we are continually enhancing and driving and improving. We have very good development partners with Novell, IBM and SunSoft all working together to make this happen. Our resolve is immense.

CSJ *So you hope Wabi will have the impact on Microsoft's market clout that chip clones did on Intel?*

MCNEALY Bingo. We're stealing the Windows "proprietariness" from Microsoft absolutely the way the chip clones did from Intel.

And Wabi is the worst thing that could happen to Intel. The only reason you bought a high-temperature, low-performance, expensive Intel chip over the last 10 years was to run the Microsoft applications. Wabi will bring those applications to every RISC Unix platform in the world.

CSJ *Gates says a critical, high-volume product such as Windows belongs in the hands of the one company dedicated to its innovation.*

MCNEALY Wouldn't it be great if there was only one publishing company in the industry so we knew what the truth was from one source? Well, Gates is saying, "My interface is the truth, so let's have just one source." Gimme a break.

CSJ *Assuming the COSE alliance accomplishes the creation of a common "dashboard" for Unix systems, won't the sheer volume of Windows and NT make that a small victory?*

MCNEALY No, because we will have the Wabi applications running on all X-based Unix machines. We will have the Common Desktop Environment being supported by IBM on all its Unix machines and on OS/2, and by Digital, HP, Sun, Novell and The Santa Cruz Operation. That is very significant volume.

CSJ *What do you think of the description of Microsoft as the "IBM of the '90s"?*

MCNEALY I think that Microsoft has a much brighter guy at the helm, so it's much more dangerous. ◼

MANAGEMENT

Keeping a Grip on User Expectations

Honest talk about client/server pitfalls can help prevent staff frustrations

Dispelling misconceptions that client/server development is a panacea for dramatically cutting costs, speeding systems into production and boosting worker productivity is among the most challenging management issues of the day.

As information systems managers tell it, too many senior business executives have been seduced by glitzy advertisements and vendor presentations that tout effortless systems integration and state-of-the-art yet easy-to-use development tools. Their unbridled enthusiasm has filtered down to end users, who have come to view a point-and-click environment as a cure-all for system ills.

Amoco Chemical Co. in Texas City, Texas, for example, is in its "very infancy with client/server," said systems development supervisor Fred Christian. "But management goes to [vendor] demonstrations and sees all of this point-and-click graphical user interface magic that's so simple and comes back and says, 'Why can't we do something like that?'"

Christian added, "Management wants things done quickly and to start reaping the benefits of client/

PHOTOGRAPH BY ANDY GOODWIN

Sara Lee's Charlie Walton: Users don't understand real complexity behind point-and-click environments

BY JULIA KING

server as soon as possible. "I have to explain that it won't be painless and that it will take 12 to 18 months to go through the transition."

Mark Factor, MIS director at Au Bon Pain, a Boston-based chain of French bakery cafes, has come up against similar misconceptions.

"Customers out in the businesses have the perception that what they want is something as simple as a flashlight but that when IS gets hold of it, we turn it into some huge sky beam," Factor said. "There's an overall perception that client/server is something that's pretty quick, dirty and easy but gets overblown once IS gets a hold of it."

Moreover, he said, delivering applications often serves to increase expectations even more, which makes meeting those hopes a lot like taking aim at a moving target.

"The real issues with bringing client/server projects to market deal with managing expectations and controlling the scope of projects," said Paul Kanneman, an associate partner at Andersen Consulting in Dallas. "The technology is the easy part."

LOWERING EXPECTATIONS

Disparities between expectations and reality usually begin with cost reductions, which average 15% to 20% — not the 30% to 40% most people want to believe, the consultant noted.

And while well-received by most early users, many of the new applications Kanneman has seen offer neither the performance nor the integrity of mainframe-based systems. Moreover, client/server applications built to give users a graphical user interface — not an unusual goal, he added — rarely yield the long-term productivity gains management hopes to achieve.

For all these reasons, early applications are guaranteed to take longer than initial expectations, frustrating everyone involved, according to both analysts and IS executives.

For IS shops, the key to narrowing the gap between expectations and reality is to include users in client/server projects from the beginning. After that, constant and honest communication is needed between both senior management and end users, who must be reminded of the steep learning curve IS is navigating.

"Managing expectations is merely delivering what you promise," said Mickey Lutz, director of technology management at PHH Fleet America in Hunt Valley, Md. "If I were doing it all over again, the expectations I'd try to put forth would be that our first go-around [with client/server] is not going to be swell and that it will take some iterations to get it right for our environment."

In Lutz's case, it took two developers more than a year to build a client/server vehicle maintenance management application designed to operate in the company's former IBM OS/2, LAN Manager environment. But upon completion, developers discovered that the application could not adequately handle 100 users processing more than 50,000 transactions daily from a 5G-byte database.

"There were gaps in performance and stability," Lutz said. "We underestimated platform requirements, and the mix of hardware and software from multiple vendors was very difficult to manage." Overall, he added, "tuning tools are limited, and there is very little [vendor] guidance for capacity planning."

In the end, Lutz's team scrapped OS/2 and LAN Manager for Novell, Inc.'s NetWare and a Sybase, Inc. database running on Sun Microsystems, Inc. servers. Performance improved but remains less than optimal.

"Now, users call multiple-second response times lightning because of what they got initially with OS/2 and LAN Manager," Lutz noted. And forget looking to vendors for assistance, he added. "There is no finger-pointing because vendors don't even return your phone calls. There is minimal support. The level of product support [for client/server products] is maybe 10% of what you'd get with products in the mainframe world that cost a lot more."

REALITY vs. PERCEPTION

Communication misfires can send the wrong message

IS MANAGER SAYS:	USER HEARS:
Here are prototype screens for the new marketing support applications.	The application is near completion.
In the long run, moving to client/server should reduce our overall IS costs. In the near term, costs will go up because new hardware, software or networks are needed and IS personnel must be retrained.	Client/server computing will decrease IS costs.
Client/server application development is an iterative process in which users design what the final application looks and feels like.	I can have anything I want.

Senior management and end users must also be made aware that the rapid application development times they have been sold on are not all that rapid, according to Charlie Walter, a senior programmer at Sara Lee Corp. in Chicago.

Using tools such as Microsoft Corp.'s Visual Basic, developers can indeed quickly create and then modify prototype application screens according to users' specifications. But what many users fail to comprehend, Walter noted, is that layer upon layer of logic to support database integrity and Windows functionality must be built beneath those screens.

"To users, it all just looks like point and click. It's very difficult to get across the true complexities," Walter said. "Once they see prototype screens, they get the impression

(Continued on page 50)

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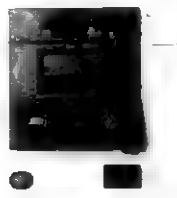

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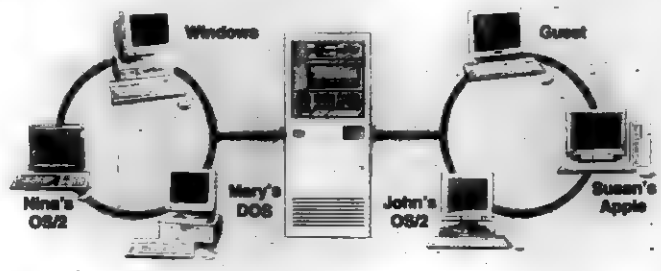
If you're a developer, your job will be easier, too. You'll have popular tools, including Progress/400,™ SQL Windows® and Synon/CSG.® There's also ENVY/400® for object-oriented development, and TRACK for Executive



Whether you're working in OS/2, Windows 3.1, Apple or DOS, AS/400 Client/Server lets you get to data and applications anywhere in the network.

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(Continued from page 47)
an application is just about finished. People say, 'I have a meeting in Europe at the end of the week. Can you whip that up so I can show them?'"

Working with key users from the start, it took three developers eight months to design and construct a new application for use by Sara Lee's 150 divisions to aggregately purchase commodity items, Walter said.

Once the application was deployed, the company's base of "disgruntled VAX users were pleased with anything we gave them," he said. But more experienced users were disappointed with custom applications that behaved much like off-the-shelf Windows applications.

Gail McLinn, a microcomputer analyst and user of another client/server purchasing application at Sara Lee, agreed that involving users from the outset is necessary. As an experienced Macintosh user, she was "pretty specific about how I wanted the new application to work.

"But my take on the expectation thing is that programmers, generally versed in systems and programming languages, take users' requests and interpret them according to their own abilities," she explained. "And there can be quite a gap between their abilities and user requirements."

While end users' expectations for the most part revolve around system performance, senior managers are concerned with costs. Here, too, honesty is the best policy, IS directors noted.

At Pacific Gas & Electric Co. (PG&E), for example, reducing costs is the goal of a multimillion-dollar client/server-based customer information system (CIS) project slated for completion by the end of 1995. By any standards, the CIS is a huge project, involving 24 major subsystems, 216 dialogs and 650 windows.

PKE Fleet America's Mickey Lutz: "Managing expectations is merely delivering what you promise"

"From a performance standpoint, management wants us to provide users with the most efficient system, but not a Cadillac. It's a big concern with something this large that you're not putting any frosting on the cake," said Al Similia, manager of system construction and integration for the CIS development project.

"We've already got higher expectations for the system than we're possibly going to be able to deliver," he added. "If everybody's 'nice-to-haves' were there, we'd be building forever."

FIRM MANAGEMENT COMMITMENT

Similia said the most effective way to rein in expectations about both costs and functionality is to first secure an unfaltering commitment to the project from top management. The chief sponsor of PG&E's CIS project is the vice president of marketing and customer service, who hand-picked the project's manager.

Equally critical to the project's success has been the participation of advisory boards comprised of business users and technical personnel.

Also, Similia said PG&E's IS group divided the project into three phases — analysis, design and construction — and has returned to senior management at the end of each phase to get a renewed commitment to the project as it stands at any particular moment.

As of September, analysis and design had been completed, and IS had received authorization to proceed with construction, Similia said. "By dividing the project into phases and revisiting it each time, we're providing additional information and ensuring that senior managers have the information they need," he explained.

From an end user's perspective, PG&E customer service assistant Bob McDonald, the project's lead business analyst, said the CIS project is exceeding his expectations. "I've been in the field 27 years, and I have never before been on a project like this," he said. "I was around 22 years ago when the current system was designed, and then there was very little input from the business side. Now we hold a lot of user review board meetings, giving users a run-through of how we're designing the system."

In the final analysis, managing the expectations that crop up around client/server hinges on making it clear that the learning curve is a lot higher than you would expect and that tools are immature, said Roy Scutro, a managing partner at Ernst & Young who specializes in client/server projects in the insurance industry.

"The bottom line is it looks fairly easy when you start, but it takes a long time to get right a complex application in a truly distributed environment," Scutro said. ◼

King is a free-lance writer based in Ridley Park, Pa.

PHOTOGRAPH BY JON GOELL

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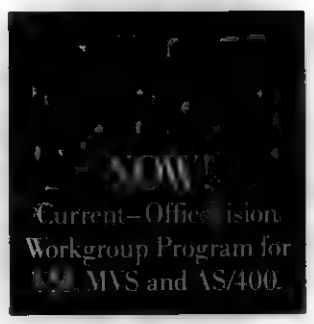

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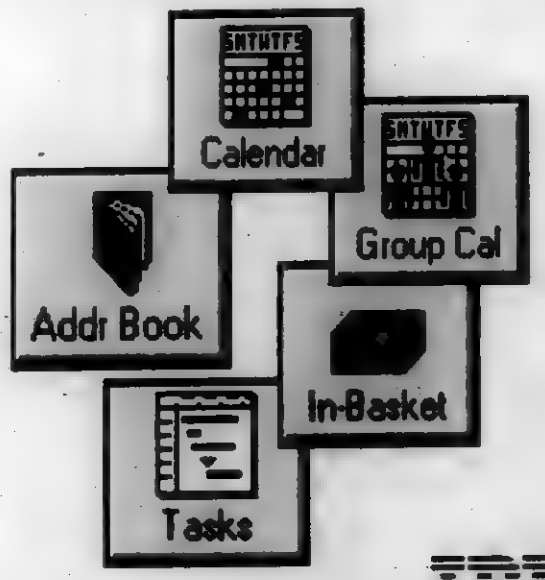

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MAINFRAMES

Data Centers to the Rescue!

In company after company, the people responsible for mainframe and data center computing for the past 20-odd years are being asked to tend servers out in user land.

"All of a sudden, our client community is realizing that servers require care and feeding," said Brian Brookbanks, team leader at Nova Corp., an energy and petrochemicals concern in Alberta, Canada.

"Managers in areas with servers are beginning to see, too, that they need one professional to provide IS kinds of services for every 10 or 15 workstations," Brookbanks added. "These are accountants who don't necessarily want to be IS people."

Brookbanks' group has taken on that task for a couple of end-user groups, doing backups and software upgrades, among other things.

More end-user departments are turning to mainframe staffers for help with service and support

While there is no research yet to support this trend, the anecdotal evidence is mounting. In most cases, the end-user department approaches the information systems group, although some mainframe operations types are starting to survey their user base to find out what needs they have.

Generally, the wave starts as just a ripple with one or two departments coming to IS for help. But as word spreads, it can cause an outpouring of demand, with IS struggling to keep up. At Air Products and Chemicals, Inc. in Allentown, Pa., the data center houses 40 servers — about half of the total used companywide.

"We're installing a server every two weeks," said H. William R. Townsend, manager of computing services operations at Air Products. "We're putting bet-your-business applications on the most fragile technology available. But it will be OK because MIS will make it all right."

But the job is not as straightforward as it might appear at first blush.

End users and IS need to work

BY JOHANNA AMBROSIO

out what IS will do for them. At the same time, the data center folks must shore up their knowledge of PC software and hardware, networking and network operating systems.

Among the issues to iron out are:

- What tasks does IS take on, and what does the end-user group do?
- How will those tasks be performed? If IS handles backup, are the backup tapes stored off-site, given to the end-user group or both? If disaster strikes, does IS recover the server?
- If IS does exactly what and how it is told, who is held accountable?

"A lot of service-level negotiation has to take place," said John Oborne, manager of computer operations at Tennessee Valley Authority in Chattanooga. "Vendors are marketing directly to my end users now," he said. "Systems are showing up at my door that I didn't even know were coming. That's not a good position to be in."

James E. Spangler, computer operations manager at United Parcel Service, Inc. in Mahwah, N.J., advised, "Be straight with users. Tell them the things we can do for them and the things we don't want to do."

That was the approach Air Products took with backup. "Our policy is we don't leave the data center," Townsend said. "So we do everything remotely, or they do it themselves."

RESKILLING STAFF IS KEY

While IS professionals are educating user departments, they must also educate themselves.

"Supporting PCs is a different ball game from what they had been doing," said Len Eckhaus, president of the Association for Computer Operations Managers in Orange, Calif.

Most data center staffers also need to learn LANs so they can assist with data backup and recovery.

"LAN-developed software is the thing challenging us right now," Townsend said. "We don't develop it — the user group does — but they want us to keep the code for them after the application is done." But in most cases, these are the people who are still supporting the mainframe legacy systems on top of new duties.

"Being a good mainframe manager, I've rightsized our operations staff," Brookbanks said. "Now we have all these 8mm manual tape devices [used to back up end-user servers] with nobody to mount the tapes."

"The past two years have been a madhouse," Oborne added. "The number of new systems coming online is continuing to increase, but the number of legacy systems we're supporting has not declined."

The saving grace can be that the mainframe operations have been automated to the point where someone who had been watching a console to track MVS performance, for example, can now be redeployed.

"Know thy staff," said Hampton M. Golsan Jr., an operations analyst at Abbott Laboratories in Abbott Park, Ill. "You certainly can't afford to hire everyone you need. So take a console operator and spend $4,000 to have him or her become a certified network engineer."

Despite the challenges, forward-looking data center managers are volunteering for duty. One reason is survival. As fewer mainframes are brought in or as more are displaced, babysitting the servers means work for at least some of the mainframers.

"Operations people need to view this as an opportunity to expand," said Arnold Farber, president of Farber/La Chance, a Richmond, Va., consulting firm. "A lot of people don't want the additional responsibility, but the smart ones will go for it." ◩

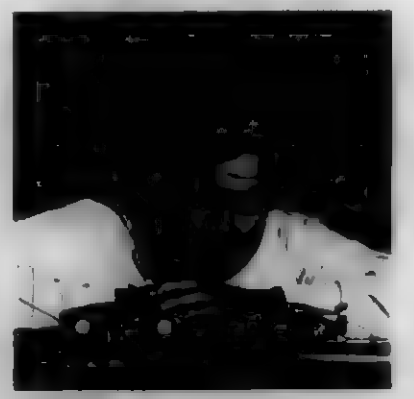
Ambrosio is a Computerworld *senior editor, systems & software. Her MCI Mail address is 599-8003.*

MAINFRAME MAKEOVER

At the Automobile Club of Southern California, the mainframe has quite literally picked up a whole new image.

The American Automobile Association affiliate is using its IBM 3090 mainframe to host a client/server imaging application for 250 insurance adjusters at its home office in Costa Mesa.

The mainframe stores images of the paperwork related to about 550,000 auto insurance policies, as well as photos of the cars. When a new vehicle is registered or a registration is changed, a digital photo is taken and stored on mainframe-controlled optical libraries. The client workstations are mostly MS-DOS-based.



Frank Berezney eyes images for claims area

"We're using the photos now for the inspection process," said Frank Berezney, manager of technical services. "We're looking at using it for the claims area." For that to happen, however, there had to be improvements in the image quality stored and retrieved on-line, and this is just beginning to occur, he added.

This is just one example of how the mainframe is changing its stripes at customer sites around the world. But the metamorphosis of the host machine into a giant database server or file server is happening very slowly.

"The mainframe is just starting to play more of a server role," said Bob Sloan, director of client/server computing at IBM's mainframe group. One way IBM will address this, he added, is to make it easier for data center staffers to manage LANs from the glass house. "I can build you a rack that will hold 100 LAN servers so you can save some space and put some organization around the servers," he noted.

ILLUSTRATION BY KENN BAPP; PHOTOGRAPH BY ALAN LEVENSON

What makes Wall Street touch with the latest dynamics currencies, commodities strange things most of

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SURVEY

Server Market Heats Up

New products such as Microsoft Corp.'s Windows NT promise to stoke the competitive fires at the enterprise server level — one of the few higher-margin server targets remaining. But the NT battle will be an uphill one against Unix platforms, which are firmly entrenched in both the technical and the commercial server environments.

Many sizable operations among the Fortune 1,000 have begun transforming their technology investments to support large client/server-based networks, according to a recent Dataquest, Inc. survey of 250 information systems and network management executives.

Some 85% of the executives surveyed said they use their main computer system as a server rather than as a time-sharing machine. Yet the majority of server platforms are still handling smaller groups of users (see Figure A below).

The fight for a larger share of the Unix/Intel Corp. server market — among operating systems such as SunSoft, Inc.'s Solaris, Novell, Inc.'s UnixWare or The Santa Cruz Operation's SCO Unix — will create some interesting vendor jockeying as these companies stake their claims in the fast-growing "upsizing to Pentium processors" market.

When it comes to spending their money, server CPUs and board upgrades garnered the "highest priority for current expenditures" among the survey respondents (see Figure B), followed by shrink-wrapped application software. Tools and applications are likely to take over in 1994 as the most pressing expenditure for the full transformation to client/server-based computing.

A majority — 76% of the 250 — reported obstacles (see Figure C) to making the move to client/server-based computing in their organizations. Software development costs topped the list of roadblocks for both system software and applications, followed by the user learning curve and other organizational issues such as training costs. ◩

Written by Bradford W. Day, a principal analyst in the client/server systems group at Dataquest, Inc.

FIGURE A

Client/Server Installation Profile

(Respondent base: 250 IS and network management executives)

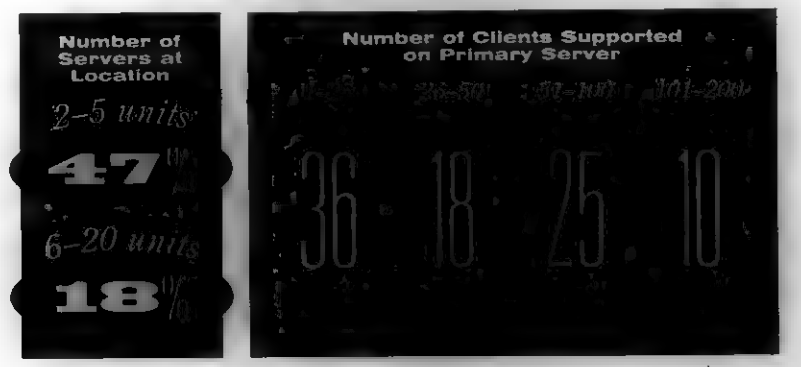


FIGURE B

Current Expenditure Priorities (Key Areas)

(Multiple responses allowed)

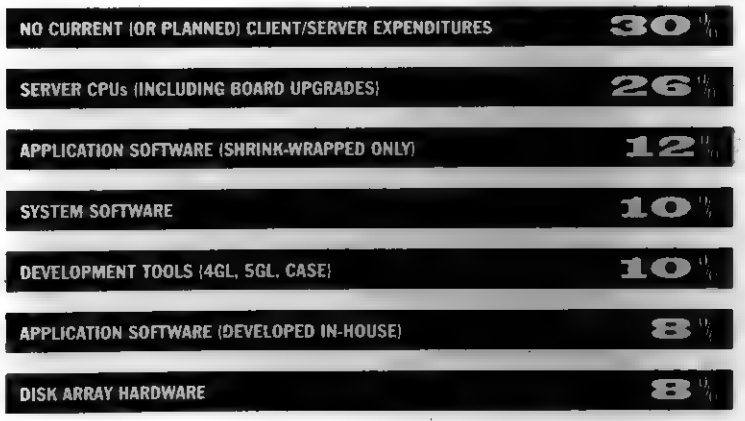
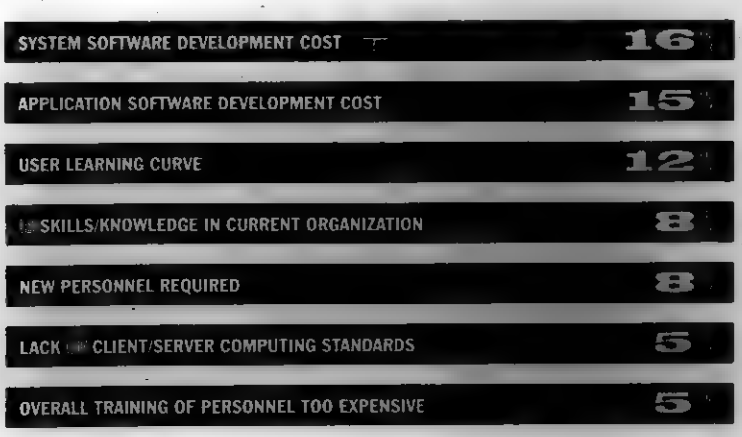


FIGURE C

Current Obstacles in Moving to Client/Server



The client/server computing market, estimated at $11.6 billion in 1992, is projected to hit $23.3 billion by 1997.

Some 25% of 250 IS execs surveyed are planning to downsize their applications base to client/server systems in the near term.

Dataquest estimated that by the first half of 1994, the downsizing trend will accelerate to 40% to 50% of all major corporate IS installations.

PRODUCT REVIEW

Information Builders' EDA/SQL

Cost-effective choice for legacy data access; relies heavily on 4GL

The Client/Server Journal's New Product Review is an evaluation based on interviews with major users at corporate, government and educational installations. The product under evaluation is being used in a production environment.

PROS / CONS

+ Evaluators found EDA/SQL to be reliable and very capable of meeting the promise of cross-platform multiple database access from PC to server to mainframe.

– Rough client/server LAN and PC installations and a reliance on knowledge of Information Builders, Inc.'s Focus fourth-generation language surprised some of the users.

RATINGS

EDA/SQL

Ratings are based on user expectations on a 1–to–5 scale, where 1 is below expectations and 5 is above expectations. Ratings are based in order of importance to users.

OVERALL RATING	4
EASE OF USE	4
EASE OF INSTALLATION (MAINFRAME)	4
EASE OF INSTALLATION (CLIENT/SERVER)	3
EASE OF PROGRAMMING	4
RELIABILITY	5
PERFORMANCE	3
TECHNICAL SUPPORT	4
ACQUISITION AND MAINTENANCE COST	4
VALUE	5
DATABASE SUPPORT	4
STANDARDS SUPPORT	4
NEW FEATURES/ENHANCEMENTS	4

Information Builders' Enterprise Data Access (EDA)/SQL is a rare client/server beast. It accomplishes many aspects of the promise of ubiquitous data access — it can obtain data from nearly any database on any platform and bring it to a workstation — and it has almost no direct competition.

"It's a product that solves a very specific and very critical problem. When you need to obtain data from mainframes, there are very few other ways to do this that are as cost-effective," said Judith Hurwitz, president of Hurwitz Consulting Group in Watertown, Mass.

Four evaluators at large user organizations running a variety of databases, platforms and networks report that it does just that. Once running, EDA/SQL meets ease of use, functionality and reliability goals. But installation and programming provided some obstacles for the sites.

The format for this evaluation was developed by Howard Rubin & Associates, with assistance from Technology Investment Strategies Corp. The questionnaire for EDA/SQL was created with assistance from Hurwitz Consulting Group.

EASE OF USE

The evaluators found EDA/SQL easy to use for Rdb, DB2 and Oracle, but IBM's IMS was harder to access and required more extensive use of Focus than some users expected.

Education 1: "We found it fairly easy to use. Once we got some working examples, the staff picked it up very quickly."

Industrial products: "They advertise that you just need to know SQL and the API, but because the bulk of our data is in IMS, it requires a little more knowledge of Focus than we thought.

"It runs against DB2, but it doesn't work with IMS without a tremendous amount of work. Compared to the other products on the market, it was the easiest to understand."

EASE OF INSTALLATION (Mainframe)

Information Builders' experience on the mainframe helped smooth installation, and the evaluators reported no problems.

Industrial products: "The mainframe was relatively easy."

Education 2: "Our installation on an IBM mainframe was a breeze."

EASE OF INSTALLATION (Client/server)

The variety of PC LAN configurations and relative lack of in-depth client/server experience made installation more difficult.

Industrial products: "We ran into a brick wall when it came to the PC. We don't have a lot of control over what we have on the PCs. So consequently, each installation was a new territory for the Information Builders people, who did the installation."

Education 2: "When we tried to establish the client/server communication, it took at least two weeks before we were able to get it going. There are a lot of people at Information Builders who probably know the mainframe area and some other people that probably know the PC area. But knowledge about the combination of both was kind of hard to find within their organization."

EASE OF PROGRAMMING

Programming and database help are required to get up and running with EDA/SQL, the evaluators agreed. But the experienced Focus users had a shorter learning curve.

Education 2: "We've been using Focus for a long time. From the Focus perspective, it is very simple, very straightforward."

RELIABILITY

No major problems were reported, and minor ones were quickly addressed by the vendor.

Education 1: "It seems to be pretty reliable. We had some small issues with the stability of the VAX server early on, but we seem to have those ironed out."

Industrial products: "I'll give it a good rating because given the complexity of what we installed, we haven't had any serious breakdowns of the product. It's been people-type things and not the product that we've had to settle."

PERFORMANCE

There really aren't any benchmarks for EDA/SQL. Its performance cannot be compared to a single environment on-line access. The evaluators were satisfied with its speed.

Education 1: "It has been really good performance going against the DEC Rdb server. We're still working on IMS and could use more overhead there, but it's

EVALUATORS

SITE PROFILES

Installation descriptions for users who evaluated EDA/SQL

	EDUCATION 1	GOVERNMENT	EDUCATION 2	INDUSTRIAL
PLATFORMS	ES/9000 VAXCLUSTER	IBM 3090 PS/2s	IBM 3084 600 TERMINALS	MAINFRAME HP 9000s
TIME IN USE	8 MONTHS	1½ YEARS	9 MONTHS	5 MONTHS
NUMBER OF APPLICATIONS	1	1	2	1
NUMBER OF IS SUPPORT STAFF	2	1	1	1½

about what I expected."

TECHNICAL SUPPORT
Depth of client/server installation experience was lacking, but evaluators had no problem getting the right people when needed.

Education 2: "Sometimes, when we found some problems running the product, the branch support people received help from [headquarters], and they were very receptive to our problems."

Industrial products: "The support is good once you get to the right person. They do have competent people at the root of their company."

Government: "The support that we have had is probably the best feature of the whole product."

FEATURES

EDA/SQL

Allows programmers to write a single API to access multiple databases.

Supports ANSI-standard SQL, major networking protocols and a large number of databases, operating systems and hardware platforms.

A multitool product, EDA/SQL relies on modular client and server components but provides a great deal of flexibility in dealing with incompatible databases.

ACQUISITION AND MAINTENANCE COSTS
Again, comparison is difficult. Users reported significant savings compared with the re-engineering effort that unifying their databases and platforms would require if they weren't using EDA/SQL.

Education 1: "It was hard for us to know because, actually, it costs less than what I would expect for my alternative, which was to move all of my IMS and all my other machines over to a DB2 environment. It gives us a low-cost option to move into the look and feel of client/server without having to re-engineer my back-end systems."

Education 2: "I think it is a very cost-effective solution for client/server. Our approximate total cost was around $28,000."

Industrial products: "We had to do a cost estimation on this product before we could even bring it in-house. So in terms of the rental and the time that the individuals have placed into it, it ran about $120,000. It's going to be a lot cheaper to plug and play than with the other mainframe products."

DATABASE SUPPORT
With support of most of the major databases, EDA/SQL can go against almost any platform. However, it performs better against SQL engines, the evaluators said.

Industrial products: "This goes back to the Focus issue. We knew the database administration was required, we knew the programming was required, but we just didn't account for the Focus knowledge. Our end users are saying the same thing: 'God, I didn't realize I had to know so much Focus.'"

STANDARDS SUPPORT
Likewise, the major database and networking standards are supported to allow enterprisewide access.

Industrial products: "They don't support the same road map DCE does.

"Given that we have a large engineering environment that is looking strongly at [the Open Software Foundation's] DCE, [the lack of DCE support by certain PC vendors] could cause us some problems with bringing Information Builders' products in-house." ◩

Written by Michael L. Sullivan-Trainor, Computerworld's research director.

INFORMATION BUILDERS RESPONDS

EASE OF USE WITH RELATIONAL AND NONRELATIONAL DATABASES: As a SQL-based product, EDA/SQL inherently supports the native database catalog of the advanced relational database. But nonrelational databases such as IMS were never designed to support SQL and do not support many of the capabilities found in relational databases.

To overcome this problem, EDA/SQL provides the means to set up a relational database-like catalog in which nonrelational meta data information must be stored to provide SQL-based access. The catalog must be set and maintained, however, in addition to any native relational database catalog the customer may be using. This is unavoidable without database vendor extensions for nonrelational data in their catalogs.

KNOWLEDGE OF FOCUS: There is no Focus knowledge required to use EDA/SQL, unless the user chooses to use Focus as the language for writing Stored Procedures. In this case, knowledge of Dialog Manager and the Focus table language is required.

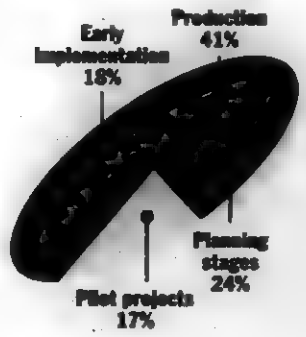
DIFFICULTY OF PC LAN INSTALLS: Client/server applications are inherently more complex than single platform applications, especially in the OS/2 environment. Tuning between synchronous and asynchronous communications environments also requires specialized expertise, which our customers typically do not have. For these reasons, we have enhanced both our field and headquarters technical support staffs to the point where we are confident we can help customers in establishing successful EDA/SQL installations.

DCE DIRECTIONS: As a member of the OSF, Information Builders supports the work of the OSF on DCE and has incorporated many DCE concepts into current versions of EDA/SQL. Unfortunately, DCE is still an emerging standard, and a DCE-based implementation of EDA/SQL would not be viable until most key vendors, on whose operating systems we run, support DCE.

Spanning the Legacy Data Gap

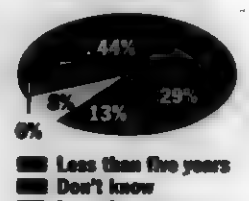
Survey finds users combining offerings from independent vendors with homegrown applications

Client/Server Status

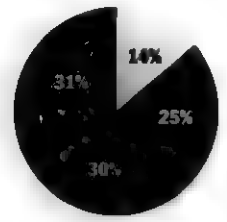


Updating

When do you plan to eliminate old systems in favor of client/server?



Legacy Data Access Method



Top Reasons for Using These Methods

(in order of most frequent answer)

1. *Most compatible with installed systems.*
2. *Best nonproprietary solution.*
3. *Easiest to implement.*
4. *Best price/lowest cost.*
5. *Best functionality.*

Biggest Problems with Accessing Legacy Data

- Staff lacks expertise
- Difficult to integrate
- Time-consuming
- Hard to maintain data integrity

Time to Get Access Up and Running

What Vendors Can Do to Make Things Easier

- Improve ease of use
- Improve functionality
- Provide more expertise

Setting up desktop applications that can access data residing in heterogeneous legacy systems is one of the biggest challenges for users moving to client/server.

Our exclusive *Client/Server Journal* survey revealed that client/server pioneers are relying on a combination of homegrown tools and vendor-supplied systems to make legacy databases work with new applications.

Although there are few tools providing all the necessary functions, 56% of 200 information systems organizations surveyed relied on vendor-supplied tools to gain access to legacy data. The majority, however, chose independent vendor offerings rather than host vendor products.

Among the independent vendor solutions is Information Builders, Inc.'s EDA/SQL, one of the few tools specifically aimed at legacy data access.

Survey respondents reported higher satisfaction levels with vendor tools than with homegrown ones. Compatibility with environments and availability of good, nonproprietary solutions were some reasons cited for selecting certain tools.

Homegrown tool users said integrating components was the most difficult task, followed by the amount of time it took them to develop the system. Users relying on vendor tools said "lack of expertise" on their own staffs was a stumbling block. ◪

The survey was conducted by First Market Research Corp. For further information about the methodology, contact Michael L. Sullivan-Trainor, Computerworld, *(800) 343-6474.*

New client/server offerings from Epoch Systems, Tivoli Systems, Apple and others

TOOLS

INTERSOLV, INC. has announced **EXCELERATOR II**, a new release of its analysis and design tool.

According to the company, additional features in this release include a diagram editor for event modeling, a client/server development application guide for training users and support for data-, process- and event-driven design.

Excelerator II runs under Windows, OS/2 and Unix.

The price is $6,500 per user. For existing customers, an upgrade is available at no cost.

INTERSOLV *3200 Tower Oaks Blvd., Rockville, Md. 20852 (301) 230-3200.*

APPLIX, INC. has unveiled **APPLIXWARE**, a set of applications and tools that allow integration of personal applications and business data.

Applications from the vendor include Applix Words, Applix Graphics, Applix Spreadsheets, Applix Data and Applix Mail.

ApplixWare is available on a variety of Unix-based platforms, including those from Sun Microsystems, Inc., Digital Equipment Corp., IBM, Hewlett-Packard Co. and Silicon Graphics, Inc.

Pricing for the ApplixWare product line ranges from $195 to $995.

APPLIX *112 Turnpike Road, Westboro, Mass. 01581 (508) 870-0300.*

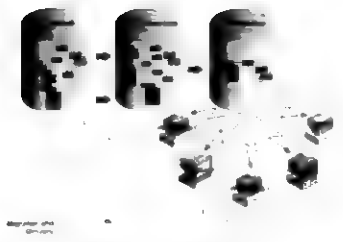
SEER TECHNOLOGIES, INC. has begun shipping **SEER/HPS DEVELOPMENT ENVIRONMENT VERSION 5.2**, an integrated set of software tools for development, deployment and management of distributed applications.

Among the new features are event- and message-based architecture, Advanced Peer-to-Peer Connectivity services for OS/2 and CICS client/server applications and analysis tools for the IBM Financial Services data model, according to the company.

Seer/HPS Development Environment Version 5.2 supports host platforms such as MVS/ESA, DB2, IMS/ESA and CICS/VS. Servers supported include IBM mainframes, PS/2s, RS/6000s and Sun Microsystems, Inc. systems.

Pricing for the product starts at $125,000 for a six-person development environment.

SEER TECHNOLOGIES *8000 Regency Pkwy., Cary, N.C. 27511 (919) 380-5000.*



Seer's HPS Development Environment includes analysis tools for the IBM Financial Services data model

INFORMATION RETRIEVAL

The **APPLE BUSINESS SYSTEMS DIVISION** of **APPLE COMPUTER, INC.** has rolled out **APPLESEARCH**, an information retrieval system.

According to the firm, this customizable product turns unstructured documents stored on a server into an on-line library. It was designed for use in departmental or workgroup settings.

AppleSearch provides users with transparent access to documents in various formats, including word processing, spreadsheets and electronic mail.

The price of AppleSearch is $1,799 for the client/server five-pack and $499 for the client 10-pack.

APPLE BUSINESS SYSTEMS *20525 Mariani Ave., Cupertino, Calif. 95014 (408) 996-1010.*

DATA MANAGEMENT

EPOCH SYSTEMS, INC. has announced **EPOCHSERV 6.0**, a new release of its integrated client/server data management software products for backup, file migration and volume management.

EpochServ 6.0 includes enhancements for support of multilevel staging, the ability for files to span optical volumes and expanded peripheral support for Exabyte Corp., Hewlett-Packard Co., Sony Corp. and Storage Technology Corp. products, the firm said.

Pricing ranges from $20,000 to $40,000.

EPOCH SYSTEMS *8 Technology Drive, Westboro, Mass. 01581 (508) 836-4300.*

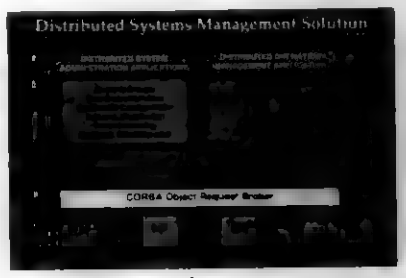
SYSTEMS MANAGEMENT

TIVOLI SYSTEMS, INC. has announced enhancements to its **TIVOLI MANAGEMENT ENVIRONMENT** systems management software.

Enhancements include tools for managing printing and electronic-mail services across distributed computing environments and availability of the software for IBM's RS/6000.

Pricing for the Tivoli Management Environment Release 1.6 is $924 per management station and $625 per managed client.

TIVOLI SYSTEMS *6034 West Courtyard Drive, Austin, Texas 78730 (512) 794-9070.*



Enhancements to Tivoli's Management Environment include electronic-mail services

Old Wine in New Bottles

Fair Juliet asked, "What is in a name?" while swooning over Romeo's name. "That which we call a rose by any other name would smell as sweet."

The denoted content is important, not the denoting name or label. Client/server is yet another label on a bottle of computing concepts that have not changed substantially in the past three decades. The real issues facing chief executive and information officers involve reinventing corporate information systems and the organizations they support.

The trend toward client/server is driven by two forces. First, there are 100+ million PCs, with some 25 million of them networked. This density of computing and storage power has coalesced into a critical mass demand for networking.

Second, the economics are inexorable. Large conglomerations of low-cost components are orders of magnitude less costly than proprietary mainframes and minicomputers. The demon is in controlling the mesh of components because distributed processing distributes errors and points of failure as well. Throw in issues such as security control, synchronization of client environments and distribution of software, and one gets the feeling that difficulties will persist for some time.

The essential central concept in client/server processing is messaging, which is the production, consumption and exchange of information among components of any computing resource. Networks are the vehicles of distributing messages, just as processors are the providers of instruction cycles and storage devices are the containers of data.

At Lehman, we have a sizable global network of some 9,000 Ethernet nodes: 3,000 Unix/TCP/IP, 3,000 PC/Novell, Inc. NetWare and 3,000 duplexed into routers, gateways and other network infrastructures.

Client/server architecture is the rule in all trading floor systems and is guiding development of new back-office systems. PC networked applications are being constructed anew and rewritten using a client/server architecture.

I believe the newness of client/server is in its proliferation, not in its technical fundamentals. This proliferation stems from both the success of Unix workstations and the sheer ubiquity of networked PCs.

With improved PC networks, heterogeneous Unix/TCP/IP/Ethernet and Novell/DOS/Windows environments are quickly becoming commonplace. Most common will be Unix/Windows clients and Unix servers on a TCP/IP/Ethernet network with Token Ring gateway connectivity to legacy applications.

It all sounds amazingly like the open systems scenario. No great surprise. Interoperability is a keynote of open systems, involving the ability of components to easily exchange messages.

Think of open systems, client/server and object-oriented as technologies, while rightsizing is a packaging of products using these technologies. The end game, however, is global enterprisewide computing — the five- to 10-year quest that lies ahead.

Current tools and messaging protocols are too low-level to allow creation of software that operates equally well locally or globally. Powerful development tools and messaging application programming interfaces are needed that can hide the complexities of a global network.

The essential central concept in client/server processing is messaging.

Client/server, open systems, rightsizing and object-oriented are merely labels on the bottles. The message-based wine inside is what really counts in terms of the nose and the follow-through.

Finally, as food for thought: Juliet may think that a rose by any other name would smell as sweet, but would people eat honey if it were called bee vomit? ◪

PHOTOGRAPH BY KENT HANSON

DAVID SHERR

Sherr is a vice president in investment banking technology at Lehman Brothers, Inc. in New York. His Internet address is sherr@lehman.com.

IBM Client/Server

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"IBM helped us move as fast on the ground as we do in the air."

John Harper, Sr. Vice President—Information Services, USAir. USAir wanted to create the terminal of the future at Pittsburgh International Airport. A place where lines would be shorter. Where baggage handling would be quicker and more dependable. And everything from check-in to take-off would be easier and less confusing for travelers.

So IBM helped USAir develop a tailor-made system that makes information more

readily available to employees so they can be more responsive to customers. A system that maximizes the power of PCs and integrates a wide range of different manufacturers' equipment. A classic example of IBM Client/Server.

Information is now distributed from the mainframe to 650 PS/2® workstations running OS/2. These workstations are tied into hundreds of ticket and boarding pass printers, touchscreens, credit card readers and other peripherals supplied by a number of companies.

The result: USAir employees and passengers now get immediate, consistent and reliable updates on pertinent information. Skycaps use touchscreens and bag-tag printers to streamline curbside check-in. And tower operators can make better decisions about managing gate traffic, resulting in fewer delays. In short, the airport of the future.

If you want a custom-tailored solution that gives your people more flexibility and gives you an edge on your competition, IBM Client/Server is the answer. For more information, call 1 800 IBM-0045, ext. 20.

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Introducing IBM DATABASE 2™ OS/2® (DB2/2™) from IBM Software Solutions, the birthplace of relational database technology.

DB2/2 includes an industrial-strength DB engine that supports transaction management, concurrency control, security, integrity, and recovery functions. Designed to exploit the power and open architecture of OS/2, it also supports industry-standard SQL for developing portable applications. And it runs your DOS, DOS Windows™ and OS/2 applications requiring *online* access.

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We've developed an exciting demo diskette to show you just how well new DB2/2 performs – right on your desktop. Call us today for your free demo, or to order DB2/2: 1-800-342-6672; or fax: 1-800-445-2426. In Canada, call 1-800-465-7999, ext. 850. An upgrade from OS/2 Extended Edition or Extended Services is also available.

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COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

Lawson Software's Accounting System nets high scores in features, updates

By Michael Sullivan-Trainor

As the Unix-based financial software market shifts into high gear to meet user downsizing needs, a small cadre of companies is staking initial leadership positions among large Fortune 500 installations. The Top 3 vendors and their products competing at this level, according to installation figures compiled by International Data Corp., are FourGen Software, Inc.'s FourGen, Oracle Corp.'s Oracle Financials and Lawson Software Corp.'s Accounting System.

Though it is the smallest of the three players on Unix platforms, Lawson achieved the highest overall satisfaction ratings from its users. This response included top scores in six areas of highest importance to all users surveyed.

However, each product had a distinct characteristic that users rated highly.

While Lawson shined in advanced features and updates, FourGen excelled in usability and reliability, and Oracle received top foreign site support and multicurrency ratings.

With the majority of Lawson users surveyed moving to a client/server setup with their financial applications, the product received its second highest rating for speed in converting all its modules to client/server. Other top categories for Lawson were numeric consolidation capabilities and timely updates for tax law changes. The company's lowest ratings were in cost and documentation and online help, the only categories in which users gave scores lower than 7.0.

FourGen users gave it high marks for ease of use, customization, documentation and reliability; it scored an 8.0 in these areas. Low ratings were given for interfacing to other applications, service and cost.

Oracle gets bronze medal

Oracle users were most satisfied with the company's ability to provide reporting capabilities and numeric consolidation, in addition to multicurrency capabilities and local support for sites in foreign countries. Users were dissatisfied with cost and with the inability to provide inexpensive updates, giving that category a 3.6.

Overall, users were most satisfied with their software's ability to manage multiple accounts, implement tax law changes and provide local support in foreign countries. Cost and update expense were the least liked aspects of the products.

Buyers' Scorecard is a user survey of market-leading products conducted and tabulated by First Market Research Corp. in Austin, Texas. For a complete methodology, contact Michael Sullivan-Trainor at (800) 343-6474, ext. 229. ■

Standout scores

Converting all modules to client/server

IMPORTANCE: LOW	SCORE
Lawson	8.5
FourGen	7.0
Oracle	6.0

Ease of customization

IMPORTANCE: HIGH	SCORE
FourGen	8.0
Lawson	7.5
Oracle	5.6

Multicurrency capabilities

IMPORTANCE: LOW	SCORE
Oracle	7.5
Lawson	7.0
FourGen	6.0

■ The leading financial packages have different areas of major strength.

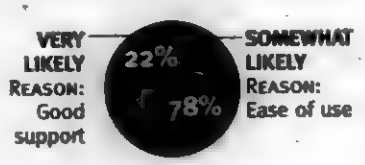
■ Importance ratings are based on a 1-to-10 scale, where 10 is highest. Users were asked to rate the level of priority they place on the category when making a buying decision.

Lawson's Accounting System

TOTAL SCORE 79

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

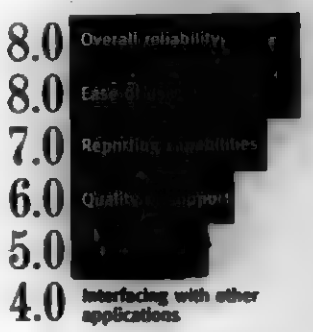
Would you buy the program again?



REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

FourGen Software's FourGen

TOTAL SCORE 68



RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS

Oracle's Oracle Financials

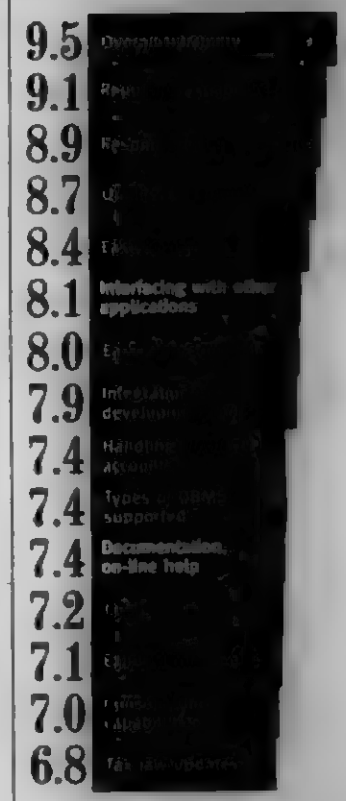
TOTAL SCORE 63

RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Ratings in order of importance



RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

PeopleSoft Financials:
Good reporting, tough installation

Financials

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ Evaluators said PeopleSoft, Inc.'s Financials provides good financial functionality but added that its client/server technology was not easy to install, nor did the software provide desired security features.

Users of PeopleSoft Financials said they encountered more difficulties than expected while implementing the client/server-based accounting software. But they said those difficulties were due largely to their own inexperience. This issue led to low ratings for technical support because users required more assistance than expected. However, the users said PeopleSoft provided high-quality support overall.

Originally released last year, the PS/GL general ledger module of Financials is now supplemented by a full suite of other accounting modules. The modules run on DOS/Windows and a range of database servers.

The evaluators participating in this survey included business and systems analysts from a government agency, a securities firm, a university and a utility company. All participants had been using PeopleSoft Financials for at least six months.

The format for this evaluation was created with the assistance of Howard Rubin Associates.

Reliability

The evaluators said the product's reliability was average. They attributed most reliability problems to either their own inexperience with the product and with client/server technology or to unrelated problems with Windows or their networks.

Performance

All of the evaluators said performance was in line with their expectations. They noted that any performance trade-offs — particularly in comparison with their batch systems — were acceptable given the big gains in report and account customization.

University: "It's not fast, but we knew that when we bought it. In the on-line portion, you trade instantaneous results for reduced errors downstream."

Installation

PeopleSoft played an integral role in installing Financials at all evaluators' sites.

They said the assistance provided by PeopleSoft included data migration from other databases or accounting packages; fine-tuning database servers to deliver optimal response; and training the technical staff in client/server issues and specific use of PeopleSoft tools.

Ease of use

Evaluators said Financials is no more difficult to use than expected. They said end users had little difficulty becoming acquainted with the Windows-based user interface and that most functions were readily utilized by financial and technical analysts.

University: "It's easier than we expected, but you have the same analysis and design constraints that you have with Cobol."

Financial functions

The evaluators agreed that the business analysts in their organizations had driven the decision to use Financials after demonstrations and competitive analyses. They concurred that consolidation and allocation functions worked as expected.

Government: "Budgeting was originally our driving function, but nothing fit our needs. We developed our own [budgeting application] in Microsoft Excel and uploaded it to PeopleSoft using one of their tools."

Securities: "We liked the different tree structures and the roll-ups. The treasurer of the company went for a demo, and he wanted it immediately."

Data entry

Strong in reporting and standard accounting functions, Financials currently lags in batch data entry, the evaluators said. In particular, they said its method for performing field validation and checking sometimes hindered performance. However, the evaluators noted that they were aware of this trade-off prior to the purchase and did not consider it an overwhelming issue.

Government: "Validity and field checking will slow [the data-entry staff] a bit, but it's really not geared for high-level data entry. PeopleSoft is apparently delivering a batch entry module."

Securities: "If you use a lot of codes or multilevel edits, it will be slow."

Utility: "[PeopleSoft] is doing work on the batch functions, but we're going to build our own front-end and batch editing."

Reporting capability

The evaluators gave their highest rating to the reporting functions included in Financials. Indeed, reporting played a critical role in their purchase decisions. Although the evaluators said report creation was still too difficult for casual users, they agreed that it was a faster and cheaper alternative to Cobol or a fourth-generation language reporting tool.

Utility: "The financial folks are the most impressed. What we have today is cumbersome. Information systems won't be in the business of writing reports any longer for the general ledger."

Security

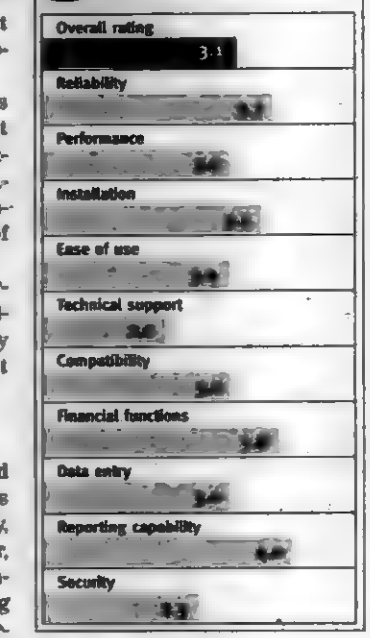
Government: "Security is one of the weaker issues with PeopleSoft. They don't include too much of it."

Education: "It's more difficult to establish than we thought. We'd never seen a package that doesn't tie in with our security package, but this does not."

Written by Computerworld *senior editor Garry Ray.*

PeopleSoft's Financials

Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users.



PeopleSoft responds

▶ **Security: PeopleSoft has recently improved security through features introduced in Financials 2 and PeopleTools 3. We've extended our menu-level security and added our own new query and ad hoc reporting tool, which is included in our existing security system. PeopleSoft also intends to extend the security in our financial applications using the data-level security already available in our human resources products.**

▶ **Data entry: In general, the world is moving away from the extensive need for high-volume data entry, but in some cases it is still required. We have applied new data-entry techniques to our high-volume data-entry requirements in our human resources product line, and we will be applying them to our financial products.**

A Salute To The Next Generation.

There's one lesson that we should never forget.

Computers don't drive the computer industry. People do.

And the features that matter most will always be the human ones.

Like ingenuity. Commitment. And determination.

That's why developing great people is every bit as important as developing great technology.

With that goal in mind, Computer Associates recently established a generous New Leaders College Scholarship Program to help develop the next generation of leaders.

SCHOLARSHIP WINNERS

Martha Blackburn,
Armstrong State College

Albert Crowley,
Villanova University

Peter Foley,
University of Arkansas at Little Rock

Brett Law,
University of California at Fullerton

Mehul Mahimtura,
Pace University

Jonathan Morgan,
Texas Christian University

Eric Remer,
Brigham Young University

Bernard Rice,
University of North Florida

Olga Shumsky,
University of Missouri at Rolla

Anthony Smith,
Pace University

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The first winners of this scholarship, as shown, include top students from colleges and universities throughout the country. They were chosen by a distinguished nominating committee from business and academia.

At Computer Associates, we understand that, now more than ever, it's important to do what we can to develop the future leaders of our country.

After all, if we don't, who will?

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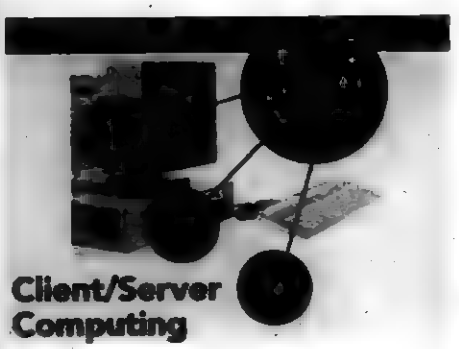

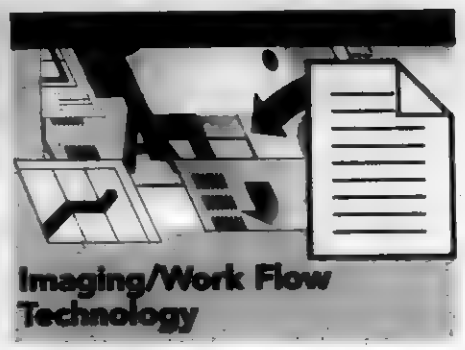

Feb. 2-4, 1994

The Practitioners Forum
Your candid assessment starts here — nine status reports from top practitioners. Computerworld moderators navigate a frank and forthright interchange about these three technology uprisings. Esther Dyson, Charlie Babcock and John Gantz lead practitioners from Kmart, Connecticut Mutual Life, the Royal Bank of Canada, and more. Q & A from the audience of top IS executives and management.

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OFFSHORE PROGRAMMERS:

REMEDY

AT ISSUE: Some people claim foreign programmers are stealing American jobs. Others think they are a boon to the computer industry. Taking sides in this debate, a CEO at an offshore contract house and a U.S. contract consultant go head-to-head.

SOUND OFF!

STEVEN KRUSE: *Hiring foreign workers is good for U.S. and global economies*

Foreign skills put U.S. workers to shame

I am a condemned man. I am condemned by others because I have not only hired foreign programmers but also started a company that acts as a conduit between Russian contract programmers and U.S. companies. According to some people, I may as well be taking food from the mouths of American children, what with the harm I am inflicting on their parents by taking away solid American programming jobs and shipping them overseas.

The thinking is purely nationalistic: If he's not a Yank, don't hire him. A recent *60 Minutes* episode, for instance, made it sound as if U.S. programmers were all standing in the unemployment line because the industry has put millions of non-Americans to work around the world in the past decade.

The point is that hiring foreign programmers not only helps the U.S. compete in the global market but also helps foreign economies, which promotes stability and growth worldwide. And I happen to think there's actually a shortage of good programming help here — a gap that talented foreign labor can fill. If U.S. companies had enough internal staffers to handle their needs, why would the industry spend about $18.2 billion (or 4.4% of the average information systems budget) in 1992 on outside systems management contracts?

Capability, not nationality

At each of the software companies I managed during the past 13 years, I have hired several foreign programmers who immigrated to the U.S. I've hired French, Australian, British, Russian, Mexican, Cuban, Vietnamese and South African citizens. My company paid them the going rates, whether they worked in a U.S. office or overseas.

Companies hire contractors based on capability, not nationality. When a firm such as The Santa Cruz Operation needs someone to handle Unix programming, it's only natural that English contractors end up high on the list. These people are highly skilled because Unix has a huge installed base throughout Europe.

Before founding Red Square Software in March 1993, I helped establish an offshore research and development center in Moscow for Pick Systems' sales and marketing operations in Eastern Europe in 1991. I found Russian engineers, scientists and technicians to be well-trained and innovative.

The average programmer there studies five or six programming languages

or RUIN?

U.S. programmers can't fight low prices and rate fixing

I have weathered recessions, layoffs, diminishing information systems budgets and Section 1706 (tax reform that tightened rules on free-lance programmers) in my 20 years in the information technology industry. Just when I thought the worst was over, I find that I am competing with cut-price foreign technicians from countries such as India, the Philippines, Hong Kong and the former Soviet Union.

I do not want to sound like a complainer. I am a firm believer in the free enterprise system, which has enabled me to earn a living in the last 11 years as an independent contract consultant. But how can I and other American technicians compete with foreign consultants who get paid up to 70% less because the cost of living in their countries is so low?

More dangerous, however, is that this situation has led to more than competition — it has led to rate fixing. In some cases, companies have fixed the rates they will pay American contractors based on the unrealistic rates foreign-based contracting firms charge. One multinational telecommunications firm, for instance, used to pay $400 to $450 a day for a Cobol CICS programmer with four to five years' experience. Now, the company pays only about $225 to $280 a day for that same programmer.

I have on occasion been asked by Fortune 50 companies to reduce the rates of my contract services from the $700 a day range (the going rate for someone with my background and years of experience) to about $425. I was making that as a programmer many years ago!

Those are the situations I know about. Add to that the rumors about contract companies falsifying business visas and resumes just to make cheap labor available in the U.S. and you get a situation that stinks for U.S. programmers.

What really drives me mad is that these same countries that are stealing our jobs are receiving billions of our tax dollars in foreign aid each year. I remember a time not too long ago when consulting firms were afraid to own or rent foreign automobiles because it

Rate fixing, *page 124*

SHOMA VALESKA

▶ LOUIS BUONINCONTRI: *Foreigners steal jobs and still receive U.S. aid money*

and operating systems before graduating from a technical institute. Because computer resources were very limited in the former Soviet Union, only the best have earned the right to enter the profession. They write exceptionally tight code and are very good at maximizing computer resources (disk and memory). It may sound corny, but I think we are obligated to put these people to work developing software for business rather than missile-guidance systems.

The industry is not taking advantage of low foreign wages or sacrificing American jobs; we're doing the world a favor by upping the standard of living in many countries. The more our neighbors make, the more they have to spend on U.S. goods and services, which creates *more* American jobs.

Russia, for example, is now buying nearly 2 million PCs per year, the majority of which are running U.S. software. Registered joint ventures between U.S. and Russian companies have risen from 131 operations in 1989 to nearly 2,500 this year. These sales contribute to high-growth American companies that create jobs both at home and abroad.

It's true that most organizations that use foreign programmers pay less for them. In Malaysia, for instance, a programmer receives $1,000 a month on average. But that is *three times higher* than the average college graduate in that country receives. Our programmers in Moscow earn five times more than the average citizen.

The upshot? By paying what amounts to above-average wages, foreign engineers will be more likely choose to stay home than take jobs in the U.S.

However, using lower-priced labor works only if companies pass on the savings to customers in the form of lower software costs or, for

Foreign skills, *page 124*

Rate fixing

CONTINUED FROM PAGE 123

might hurt their image. Boy, has that attitude changed. In New Jersey alone, for instance, there are at least 50 foreign contractors working in residence.

This situation did not happen overnight. Back in the early 1980s, Burroughs Corp. (now Unisys Corp.), which had signed a sales agreement with Indian conglomerate TATA for hardware, ran into difficulty because of an Indian law prohibiting direct payment to American companies. The two firms agreed on a barter: TATA would provide Burroughs with Indian consultants as payment for the hardware.

SOUNDOFF!

This might seem like a pretty solid business venture, but it ended up as a kind of indentured servant network. Often five or six TATA consultants were housed in two-bedroom apartments, getting paid $14 an hour — about 40% below the prevailing rate at the time — plus free room and board. That legacy continues to this day.

In the long run, companies will get what they pay for. Many foreign coders are technically knowledgeable, but their communication skills leave much to be desired. I worked with some foreign programmers when I was a senior technical manager at a bank years ago, and I found the situation difficult. I know I'm a fast-talking New Yorker, but it's tough doing business when you have to write down all the instructions.

More important, perhaps, is that foreign coders do not have the business or subject expertise U.S. programmers have. How can foreign programmers question a specification without business expertise? How fully do they understand our business terms, payroll deductions, accounting techniques or business practices? They might be good coders, but they don't understand the business purpose of the programs they write.

One large U.S. insurance company found this out the hard way. It hired a group of foreign programmers to handle a CICS project because they were cheap. But about six months into the project, the firm fired the contractors because communication kept getting impaired.

The U.S. has lost the lead in manufacturing. Is the service sector to follow? One way the government has tried to increase the cost of foreign goods is through import taxes. Maybe it should place tariffs on foreign services performed for U.S. firms.

But imposing such tariffs might not do any good. Just as cheap labor keeps the cost of foreign manufactured goods down, so too will it keep the cost of overseas services down, taxes or no taxes.

I urge data processing professionals everywhere to write to lawmakers about foreign service providers. One thing seems certain: If foreign attorneys were taking U.S. lawyers' jobs, Washington would be on the situation in a flash. ■

Buonincontri is an independent contractor at GTND Software Systems and Accounting Services in Valley Cottage, N.Y., specializing in computer-aided software engineering, JAD and structured methodologies. He is currently on assignment for the city of New York's Financial Information Services Agency.

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Foreign skills

CONTINUED FROM PAGE 123

internal IS, faster delivery of software. If that's not happening, then we should be attacking those companies' management — not their offshore programmers.

The problem with foreign programmers is not that they're cheaper than U.S. coders but that they may actually reveal weaknesses in our own work force. Foreigners have the talent, skills and work ethic that put many of their American counterparts to shame. U.S. programmers are afraid. ■

Kruse is chief executive officer of Red Square Software, a Newport Beach, Calif., contract services company with operations in the former Soviet Union. He is also chairman of the Software Council of Southern California.

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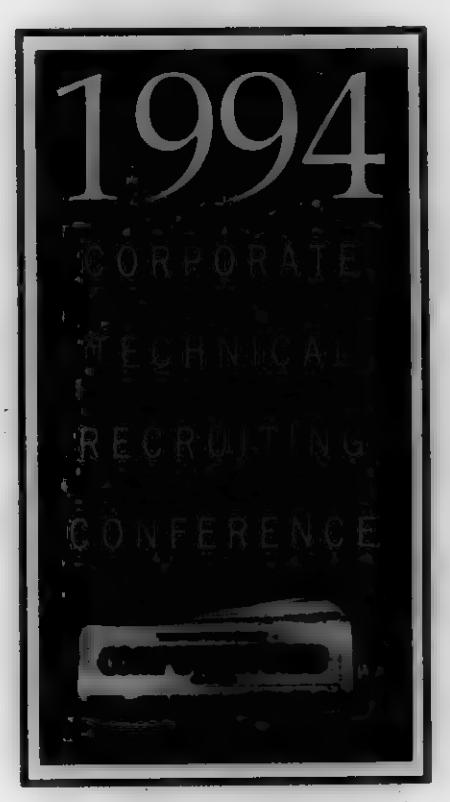

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SQL: Keeping up with the evolving standard

By David Baum

UNIVERSAL DATABASE ACCESS has become a rallying point for vendors in the software industry, focused primarily around the evolving SQL standard.

And as SQL is increasingly implemented in client/server networks as a way of enabling PCs to access corporate databases, knowledge in this area has become essential for application programmers.

Unfortunately, says Jeff Balboni, chairman of the SQL Access Group, each database management system has a slightly different SQL interface. "There have been no restrictions regarding the addition of extensions to the SQL language by vendors," says Fred Zemke, a software architect at Sapiens International Corp. N.V. in Goleta, Calif.

However, this is changing with the rapid acceptance of SQL-92, the newest and most complete SQL specification to date and one that fills the "holes" that prompted so many vendor extensions. It is also good news for corporate programmers because it means fewer differences among relational database products and fewer language variations to master.

If you are just getting started with SQL, don't try to learn the language by reading the specifications documents provided by the standards bodies, advises Joan Sullivan, a computer scientist and project manager at the National Institute of Standards and Technology. "It's better to learn it by experimenting with one of the products that implements the standard," she says, "either through experimentation with the syntax itself or through a menu and forms approach."

The syntax is relatively straightforward. Anyone who is accustomed to formal programming languages and knows how to specify the difference between AND and OR can learn it very quickly.

Both Zemke and Sullivan say a good approach is to spend time with one of the forms-based database development tools that build SQL tables behind the scenes while developers paint screens and create fields through a visual interface. Afterward, you can look at the actual SQL tables and queries the system has constructed and gradually learn by comparing the functional screens with the underlying syntax.

Zemke cautions beginners to stick with one of the established, mainstream relational DBMS products from vendors such as Oracle Corp. or Sybase, Inc. In contrast, many of the PC-oriented databases offer only a small subset of SQL's complete capabilities.

To function in a scaled-down environment, PC database products generally impose limitations on processing-intensive operations such as GROUP BY and ORDER BY.

"To write any type of significant SQL program under DOS or Windows, you have to deal with all the compiler switches and linker switches, and deploying the application involves linking together many separate modules," says Ken Fleming, director of technology at Encompass in Cary, N.C. "The performance is poor since there is no paging and you need lots of memory."

For this reason it is much easier when starting out with SQL to work on a more powerful platform, such as Digital Equipment Corp.'s VAX, IBM's RS/6000 or a similar-level environment. "You can just write flat SQL code and let the operating system manage the memory," Fleming explains.

Looking ahead

A widespread adoption of SQL-92 will iron out many differences in vendor implementations of the language, but it's going to take time, and most vendors acknowledge that variations will still exist. This will force programmers to continue learning new tricks as they move from one DBMS to another.

Meanwhile, standards groups have turned to the next specification, SQL-93, which will attempt to standardize access to abstract data types while incorporating some of the object-oriented concepts with which the relational model doesn't deal.

Baum is a free-lance writer in Santa Barbara, Calif., specializing in emerging technologies.

the SQL specification

The main additions to the SQL language are the following:

SQL86 was a quick standardization of IBM's Structured Query Language.

SQL89 added several important integrity features, including referential integrity, default column values and table check constraints.

SQL92 corrected a few errors in the SQL-89 specification and added many new functions. There are three levels to SQL-92: entry, intermediate and full.

- The entry-level SQL-92 specification includes standardized SQLstate error return codes, date and time data types and variable-length character strings.
- The intermediate SQL-92 specification includes domains, CASE expressions and schema manipulation statements.
- The full SQL-92 specification includes the following: new bit string data types, session management and referential updates.

The future

SQL93 specifications will one day add user-defined abstract data types that can carry object identifiers; flow of control statements so users can define and call external SQL procedures; and generation types such as date and sets and arrays.

* not a complete listing of the evolving functionality

Source: Leonard Gallager, chairman of the International SQL Development Group, Gaithersburg, Md.

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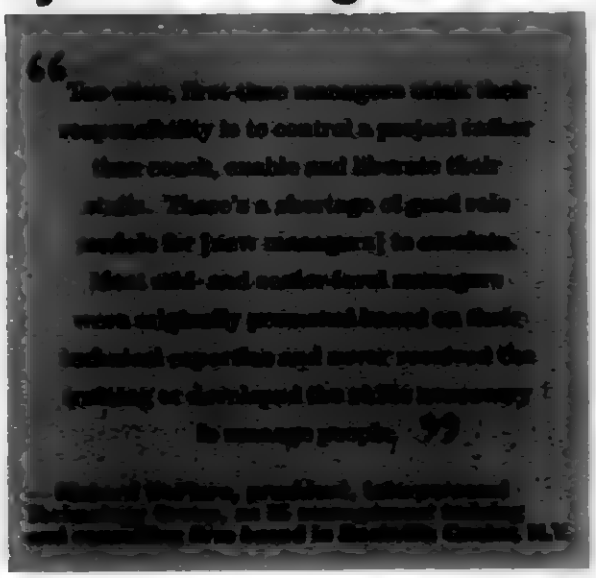

TRAINING

"All those Cobol programmers won't have careers in the future unless they get themselves retooled. The organization of the future won't have the money to retrain them."

— Robert A. Zawacki, professor of management and international business, University of Colorado at Colorado Springs

BUST

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Assessing emerging technology	6	6
Motivating today's IS professional	7	7
Employee empowerment in IS	8	8
Emerging IS organizational interface issues	9	9
Forecasting and measuring benefits of business processor engineering projects	10	10
IS budgets for 1994: establishing strategies and priorities	11	11
Business process re-engineering skills	12	12
Rapid application development in Windows	13	13
Extending the life of legacy systems	14	14
Strengthening the general business knowledge of the IS staff	15	15

Source: Quintus, an IS consortia in Mountain Lakes, N.J. Compiled by Leslie Goff, a free-lance writer in New York.

CO, OR, AZ

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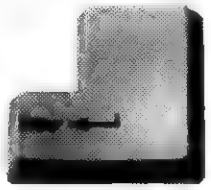

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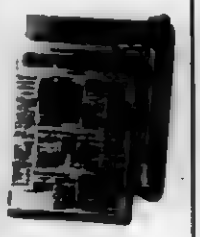

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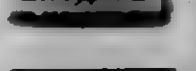

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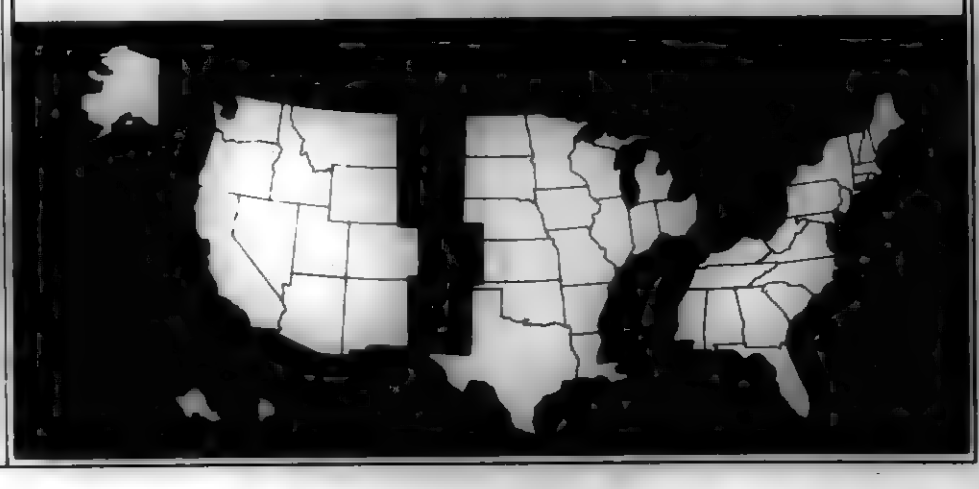

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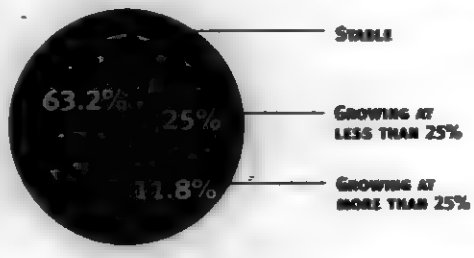

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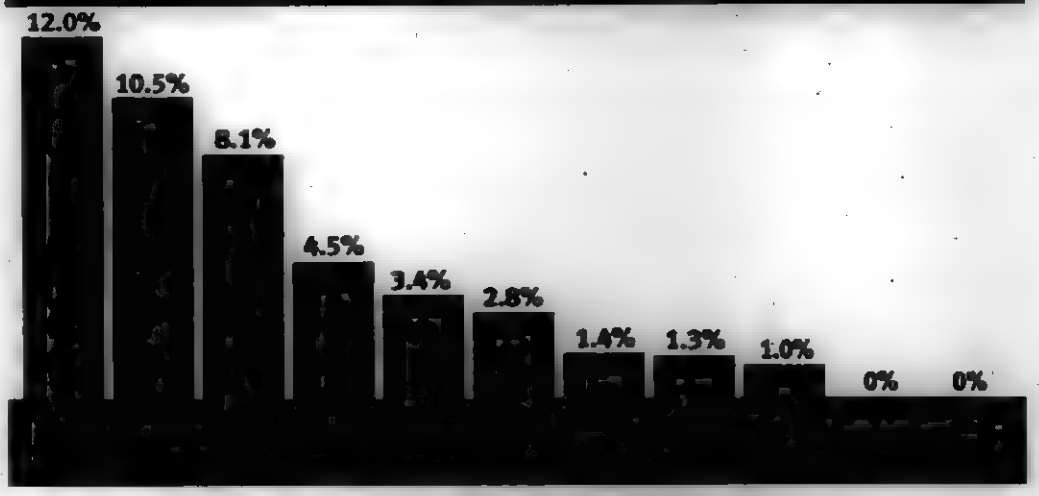

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BEST READ

Project Management Software

Putting it through the p·a·c·e·s

By Julie Hart

With Windows on the scene, project management software is more accessible and affordable than ever before. The problem is that selecting the right package is a hefty responsibility.

Project management consultants recommend the following guidelines for testing Windows-based and most DOS-based project management applications.

The best test data is an existing project, but if you don't have one, develop a model of at least 10 tasks for testing. Using this model, calculate schedule and other results by hand to compare with your candidate project management applications.

Task Scheduling

It's important to determine how the packages handle constraints and "float," a capability that shows if a project is running over schedule.

Designate a finish constraint on one of the middle tasks in your 10-task project. For instance, task five — putting the roof on a new house — must be completed by Dec. 1. Based on this constraint, let the package determine the schedule. Also, perform the test in reverse by putting a start constraint on the same task. Compare both tests to your hand-calculated schedule to identify potential problem areas.

Some packages will schedule the roof for completion by Dec. 1 as constrained, but preceding tasks such as framing the house might not be scheduled until after the roof is completed, says Harvey Levine, principal at The Project Knowledge Group, a consulting firm in Saratoga Springs, N.Y.

Using the same model, you can also verify that the packages properly support forward- and backward-path calculations, which determine both the earliest and the latest possible start and finish dates of each task.

To test this, make the duration of your 10-task project longer than your finish date. After the package calculates a schedule, check the float, which indicates time required or time to spare, to see if it matches your hand calculation.

Resource Leveling

This is where the package schedules your resources (people) in the optimal way. In this area, results can vary greatly among products. "Some packages level so that the results are 30% to 50% longer than the project actually requires," says Daniel Yahdav, principal of Soft Decision, a consulting firm in San Rafael, Calif.

In fact, the same project loaded on a dozen applications may kick out a dozen different answers. "There may be nothing wrong with this, but you need to know which package best fits the way your organization works," says Gopal Kapur, president of the Center for Project Management, a consulting firm in San Ramon, Calif.

To test this theory, add several resources to your 10-task model and determine by hand an optimum schedule. Then ask the packages to perform leveling, spread resources out over the time given and compare the results.

Calculation Speed

Yahdav recommends at least 10 tasks be used to test application speed. To complete this test, perform identical operations, such as resource leveling, and compare the results. You may find a difference of seconds, minutes or hours.

"But there's a trade-off between speed and quality," Kapur says. If the package that requires more time distributes your resources better, weigh what's most important to your organization. Analyze speed results in light of what they really mean to your overall project.

Cost Management

Depending on your organization's needs, there are several areas of concern regarding cost management. For instance, you may need to specify resources at different pay rates, but some packages bill only at a single rate.

Another potential trouble spot is cost distribution. To determine how each package handles this, enter 10 cost items into your model, such as travel, telephone and hardware, then view the package's estimate. The ideal format for estimate distribution, Kapur says, is by task; however, you'll discover that some packages handle distribution only by deliverable or phase.

"A package might give you overall hardware costs but not hardware costs for prototyping," Kapur says.

System Robustness

A good way to test robustness is to key in junk data and see how the application reacts. For instance, instead of typing 12 in the duration field, key in "1a." Or instead of a "y" or "n," try to key in a "z" when the system asks for a yes or no response.

"If most of the junk is taken in, you'll have a lot of problems later on," Kapur says. "A good package won't let you enter wrong information into every field."

Reporting

Make a list of what you want reports to look like and at what degree of detail for four employee levels: team, project manager, manager and executive. Then go into each application, select report features and review the results.

"Too many reports have everything on them, which makes them less useful," Kapur says. For instance, an executive wants to ensure that milestones are being met on budget; he doesn't need to know how many hours Bob and Jane are scheduled to work next week.

Network Access

To test the networking capabilities of candidate project management applications, Kapur recommends that you load 10 LAN nodes for each package you're considering.

"Unless you take the time to run the network version for a couple of weeks and perform backups, you won't really know much about its reliability," he says.

Hart is a free-lance writer in San Jose, Calif.

BEFORE TESTING

Hands-on testing is only a part of the selection process for project management software, consultants say. In far too many cases, information systems managers focus on testing and ignore other critical factors, such as defining constraints and determining needs.

"Most people just load packages and start testing without a predefined list of criteria," says Daniel Yahdav, principal of Soft Decision. "Managers that approach product evaluations in this manner often end up wondering why the product they purchased is shelfware three months later."

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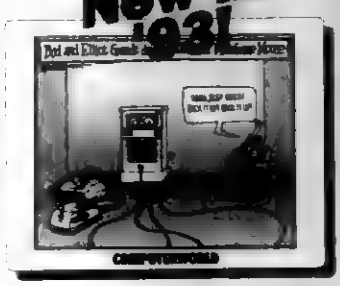

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Harvard Sec.	42.1	Ross Systems	-29.6
Group I Software	28.1	Kendall Square Research	-21.7
Electropolis Corp.	21.6	Cambex Corp.	-17.0
Struct. Dynamics Research	21.1	BMC Software Inc.	-16.7
Harbor Corp.	20.5	State of the Art	-16.7
QMS Inc.	16.7	Tandem Computers Inc.	-15.2
SEI Corp. (H)	14.6	Software Publishing Corp.	-14.0
Bolt, Beranek & Newman	14.0	Platinum Software	-13.0

Dollar

Xerox Corp.	5.38	BMC Software Inc.	-9.50
Progress Software Corp.	4.25	DSC Communications	-4.75
Dialog Inc.	3.75	Kendall Square Research	-4.50
Stratus Computer Inc.	3.50	Autodesk Inc.	-4.00
Motorola Inc.	3.25	Ross Systems	-3.63
Atmel Corp.	3.25	Platinum Software	-3.50
Southwestern Bell Corp.	3.00	Matsushita Electronics	-3.00
SEI Corp. (H)	3.00	Oracle Corp. (H)	-2.88

BMC Software, Inc. fell in spite of a quarterly report that showed growth in revenue and profits; analysts were concerned about the company's sales abroad. Ross Systems' earnings also disappointed Wall Street.

Rough sledding for drive makers

PC disk drive manufacturers have had more tough quarters lately than the New England Patriots.

Conner Peripherals, Inc. (CNR) took a big restructuring charge in the September quarter, adding in an operating loss, the company's net loss for the quarter was close to $400 million. John Dean, an analyst at Salomon Brothers, Inc., noted in a report that the write-off is a constructive step for Conner, which has appealing products in the pipeline but must pare its costs to return to profitability.

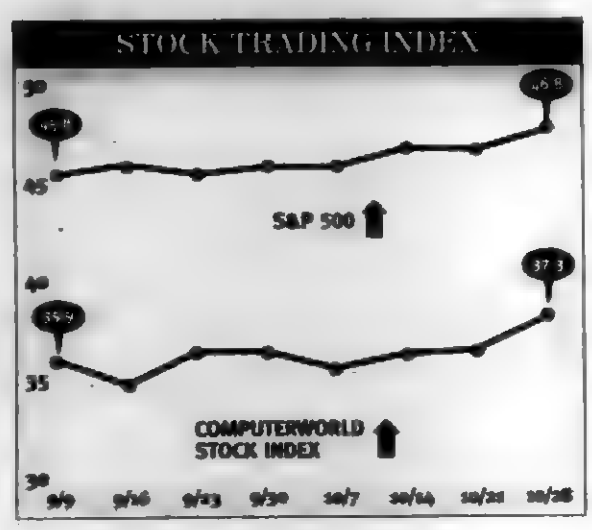
Quantum Corp. (QNTM), **Applied Magnetics Corp.** (APM) and **Maxtor Corp.** (MXTR) also lost money last quarter. Maxtor recently propped itself up with a $150 million cash infusion from an outside investor, as the company's long-term prospects were looking shaky.

Seagate Technology, Inc. (SGAT) provided a little relief by posting a profitable quarter. Seagate appears to be the best-positioned company in the sector because of a broad product line and low-cost manufacturing capability, according to Dean.

Seagate's stock set a 52-week high last week. Most of the other drive makers were trading near their 52-week lows.

Dean noted that the summer quarter is traditionally difficult for this sector. With demand for PC systems expected to remain high for both this year and next, the drive manufacturers should have a chance to turn their fortunes around.

—Derek Slater



Exch	52-Week High	52-Week Low		Oct. 29 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						UP 1.6%
OTC	40.00	19.38	3 COM Corp	30.38	1.75	6.1
NYS	91.13	63.38	American Info Techs Corp.	84.63	1.13	1.3
NYS	65.00	42.38	AT&T	57.63	-0.50	-0.9
OTC	4.44	0.75	Aztec Communication Corp.	3.13	0.00	0.0
OTC	24.50	12.50	Banyan Systems Inc.	19.75	0.75	3.9
NYS	69.13	44.50	Bell Atlantic Corp.	63.75	0.88	1.4
NYS	63.38	46.75	BellSouth Corp.	62.63	0.38	0.6
NYS	14.75	1.88	Bolt, Beranek & Newman	13.25	1.63	14.0
OTC	18.50	9.50	Brooktrout Technology	10.25	-0.50	-4.7
NYS	119.00	66.75	Cabletron Systems	92.75	-0.50	-0.5
OTC	36.50	8.75	Centigram Communications	32.25	2.75	7.9
OTC	55.50	22.25	Chipcom Corp.	47.00	-2.75	-5.5
OTC	59.25	30.00	Cisco Systems Inc.	51.00	2.25	4.6
OTC	17.75	8.00	Compression Labs Inc.	17.38	1.50	9.4
OTC	36.00	20.75	Crosscomm	31.75	2.50	8.5
OTC	4.63	1.88	Data Switch Corp.	2.38	-0.13	-5.0
NYS	19.88	12.38	Digital Comm. Assoc.	18.63	0.00	0.0
OTC	12.75	3.63	Digital Systems Int'l Inc. (L)	3.94	0.06	1.6
OTC	73.13	16.63	DSC Communications	65.63	-4.75	-6.7
OTC	9.50	4.75	Fibronix Int'l Inc	5.13	-0.38	-6.8
OTC	24.00	8.75	Fibernet Corp.	18.50	1.00	5.7
OTC	4.38	1.50	Gandalf Technologies Inc.	3.00	-0.13	-4.0
OTC	2.06	0.69	Gateway Communications	0.88	0.06	7.6
NYS	15.75	3.88	General Datacomm Inds.	11.00	0.75	7.3
ASE	3.75	2.00	Go Video	2.44	-0.25	-9.3
NYS	39.88	32.88	GTE Corp	99.38	1.13	2.9
NYS	94.75	66.75	ITT Corp.	92.50	-0.25	-0.3
DTC	29.88	16.81	MCI Communications Corp.	28.50	0.00	0.0
OTC	6.50	1.50	Microcom Inc.	3.13	0.38	13.6
OTC	24.25	3.50	Netrix Corp.	4.88	-0.13	-2.5
OTC	19.00	6.50	Network Computing Devices	8.25	0.75	10.0
NYS	11.63	5.38	Network Equipment Tech.	9.63	0.63	6.9
OTC	20.13	8.00	Network General	14.63	-0.25	-1.7
OTC	15.75	6.88	Network Systems Corp.	8.88	0.38	4.4
OTC	73.88	11.50	Newbridge Networks Corp.	60.88	0.50	0.8
NYS	46.00	21.38	Northern Telecom Ltd.	28.50	1.50	5.6
OTC	35.25	17.00	Novell Inc.	22.00	0.38	1.7
NYS	68.88	39.50	Nynex Corp.	42.13	-1.63	-3.7
OTC	30.00	18.75	Octel Communications Corp.	24.50	-0.50	-2.0
OTC	6.13	3.75	Pemrel Data Comm Networks	5.75	0.25	4.5
OTC	30.50	14.50	Picturetel Corp.	19.00	1.50	8.6
OTC	11.50	3.63	Proteon Inc.	5.00	0.38	7.0
NYS	38.88	17.75	Scientific Atlanta Inc.	15.25	-2.25	-6.9
NYS	47.00	31.75	Southwestern Bell Corp.	44.25	3.00	7.3
NYS	40.25	24.38	Sprint Corp.	36.00	-0.25	-0.7
DTC	27.00	12.50	Standard Microsystems Corp.	21.50	0.25	1.2
OTC	19.25	10.00	Stratacom Inc.	16.00	0.00	0.0
OTC	42.75	19.59	Synoptics Communications	27.75	1.13	4.2
OTC	9.88	2.88	Telebit Corp. (H)	8.00	0.38	4.5
OTC	17.88	4.63	Telematics Int'l Inc.	15.25	0.63	4.3
OTC	35.25	17.00	US Robotics	26.63	-1.38	-4.9
NYS	50.63	35.25	US West Inc.	49.88	0.38	0.8
OTC	56.00	25.88	Wellfleet Communications	52.88	-0.38	-0.7
OTC	19.50	7.25	Xircom	16.75	0.00	0.0
PCs and Workstations						UP 1.6%
OTC	5.56	2.50	Advanced Logic Research	3.25	-0.13	-3.7
OTC	65.25	22.00	Apple Computer Inc.	30.50	0.50	1.7
OTC	24.25	12.75	AST Research Inc.	20.75	1.75	9.2
NYS	9.25	2.50	Commodore Int'l	3.13	0.00	0.0
NYS	67.38	38.50	Compaq Computer Corp. (H)	67.38	1.88	2.9
OTC	49.88	13.50	Dell Computer Corp.	20.13	0.88	4.5
NYS	89.25	54.50	Hewlett Packard Co.	73.88	1.63	2.2
NYS	46.75	23.50	Silicon Graphics	43.75	-1.25	-2.8
OTC	41.00	21.13	Sun Microsystems Inc.	25.50	0.75	3.0
NYS	41.75	24.63	Tandy Corp. (H)	41.00	0.25	0.6
OTC	7.00	2.50	Zeos International Ltd.	3.00	0.00	0.0
Large Systems						UP 1.1%
ASE	8.75	4.38	Amdahl Corp.	4.56	-0.25	-5.2
NYS	8.75	3.63	Convex Computer	5.38	0.13	2.4
OTC	6.13	2.25	Cray Computer	3.13	0.00	0.0
NYS	30.88	20.38	Cray Research Inc.	27.38	1.88	7.4
NYS	13.88	7.75	Data General Corp.	9.50	-0.63	-6.2
NYS	49.25	30.38	Digital Equipment Corp.	35.75	0.00	0.0
NYS	45.88	32.50	Harris Corp. (H)	45.88	1.00	2.2
NYS	69.88	40.63	IBM	46.00	1.25	2.8
OTC	25.75	7.50	Kendall Square Research	16.25	-4.50	-21.7
NYS	141.50	83.00	Matsushita Electronics	134.50	-3.00	-2.2
OTC	23.75	12.75	NetFrame	15.75	-0.75	-4.5
OTC	26.00	9.25	Parallan Computer (H)	21.00	-1.25	-5.6
OTC	21.25	8.50	Pyramid Technology	14.88	-0.38	-2.5
OTC	24.00	11.25	Sequent Computer Sys.	17.00	0.13	0.7
OTC	5.50	1.38	Sequoia Systems Inc.	4.50	0.19	4.3
NYS	41.25	20.25	Stratus Computer Inc.	29.25	3.50	13.6
NYS	16.88	8.50	Tandem Computers Inc.	11.13	-2.00	-15.2
OTC	25.75	10.63	TriCord Systems (H)	24.50	2.25	10.1
NYS	13.88	8.38	Unisys Corp.	11.50	-0.25	-2.1
Software						UP 0.9%
OTC	37.00	14.50	Adobe Systems Inc.	21.63	-0.88	-3.9
OTC	25.25	11.75	Aldus Corp. (H)	22.75	-0.25	-1.1
OTC	11.25	5.50	American Software Inc	7.38	0.50	7.3
OTC	28.13	9.50	Asd Computer Systems	13.88	1.13	8.8
DTC	56.75	38.75	Autodesk Inc.	43.25	-4.00	-8.5
OTC	7.75	2.50	Bachman Info. Systems	3.25	-0.13	-3.7
OTC	43.00	24.00	BGS Systems Inc.	26.50	0.88	3.4
OTC	84.13	38.75	BMC Software Inc	47.25	-9.50	-16.7
OTC	28.25	20.38	Boole & Babbage	26.00	1.75	7.2
OTC	34.75	12.75	Borland Int'l Inc.	17.25	1.50	9.5
OTC	5.00	2.75	CE Software	3.56	0.06	1.8
ASE	40.25	16.41	Cheyenne Software Inc.	33.50	-0.63	-1.8
OTC	19.50	8.25	ChipSoft	14.75	0.75	5.4
OTC	10.00	5.63	Cognos Inc. (H)	9.88	0.75	8.2
NYS	39.38	14.50	Computer Associates (H)	38.00	-0.13	-0.3
NYS	7.00	2.13	Computervision Corp. (L)	2.75	-0.38	-12.0
OTC	34.25	19.25	Computware Corp.	26.00	-2.00	-7.1
OTC	14.75	5.75	Comshare Inc.	11.00	0.75	7.3
OTC	37.00	10.75	Corel Corp.	34.75	2.75	8.6
OTC	15.25	4.88	Easel Corp (L)	5.50	0.25	4.8
OTC	25.25	15.75	4th Dimension	22.25	1.63	7.9
OTC	19.25	5.25	Frame Technology	9.75	0.88	9.9
OTC	17.50	8.00	Group I Software	10.25	2.25	28.1
OTC	35.25	14.00	Gupta	15.75	-0.75	-4.5
OTC	12.00	4.88	Mogan Systems Inc.	11.13	0.88	8.5
OTC	27.75	12.25	MRS	25.25	0.00	0.0
OTC	44.75	25.50	Information Resources	37.50	-0.25	-0.7
OTC	27.25	13.38	Informix Corp.	18.88	-2.00	-9.6
OTC	14.00	8.50	Intergraph Corp.	11.13	0.88	8.5
OTC	13.63	4.88	Interleaf Inc.	5.50	-0.25	-4.3
OTC	15.50	4.75	Intersolv Inc.	7.75	-0.75	-8.8
OTC	18.25	7.75	Knowledgeware Inc.	16.00	-0.50	-3.0
OTC	54.75	15.50	Legent Corp	24.25	0.13	0.5
OTC	50.75	18.75	Lotus Development	48.38	2.50	5.4
OTC	23.00	4.25	MathSoft	5.38	0.13	2.4
OTC	21.25	4.50	McAfee Associates	5.75	0.00	0.0
OTC	11.63	2.50	Meca Software	6.50	0.00	0.0
OTC	12.88	6.50	Mentor Graphics (H)	12.00	-0.38	-3.0
OTC	46.00	19.75	Micro Focus	22.63	-1.38	-5.7
OTC	13.25	4.38	Micrografx Inc.	8.56	0.94	12.3
OTC	98.00	70.38	Microsoft Corp.	80.00	0.25	0.3
OTC	64.63	18.88	Oracle Corp. (H)	58.63	-2.88	-4.7
OTC	44.75	22.50	Parametric Technology	40.00	-1.88	-4.5
OTC	40.50	22.50	Peoplesoft	38.25	2.25	6.3
ONC	7.13	3.75	Phoenix Technologies	4.00	-0.13	-3.0
OTC	40.00	22.00	Powersoft	32.00	-0.25	-0.8
OTC	39.75	13.50	Platinum Software	23.50	-3.50	-13.0
OTC	25.00	7.25	Platinum Technology	8.63	0.88	11.3
OTC	61.50	32.25	Progress Software Corp.	55.25	4.25	8.3
OTC	6.75	1.94	Quarterdeck Office Sys.	2.31	0.06	2.8
OTC	32.00	16.00	Rainbow Technologies Inc.	21.25	0.50	2.4
OTC	11.38	4.25	Rasterops	8.00	0.50	6.7
OTC	15.25	4.63	Ross Systems	8.63	-3.63	-29.6
OTC	28.75	15.25	Sapiens Intl. Corp. N.V.	26.88	-0.25	-0.9
OTC	14.50	5.50	Software Publishing Corp.	6.13	-1.00	-14.0
OTC	17.25	3.88	Software Toolworks Inc. (H)	15.50	-0.38	-2.4
OTC	2.75	0.75	Spinnaker Software	1.88	0.13	7.1
OTC	13.75	5.75	State of the Art	8.13	-1.63	-16.7
NYS	32.13	17.63	Sterling Software Inc. (H)	32.00	1.38	4.5
OTC	21.63	9.63	Struct. Dynamics Research	16.50	2.88	21.1
OTC	77.50	38.25	Sybase Inc	71.25	2.50	3.6
OTC	20.50	9.25	Symantec Corp.	20.00	1.63	8.8
OTC	25.50	10.00	System Software Assoc	14.75	1.75	13.5
OTC	6.50	2.75	Triplex Corp.	5.63	-0.38	-6.3
OTC	26.50	13.50	Viewlogic Systems	21.75	0.63	2.7
OTC	23.50	5.50	Walker Interactive Systems	8.75	0.25	2.9
OTC	3.19	0.84	Woodstar	1.25	-0.03	-2.4
Semiconductors						UP 1.4%
NYS	37.88	14.25	Advanced Micro Devices	19.88	-0.13	-0.6
NYS	28.00	11.63	Analog Devices Inc.	21.75	-0.38	-1.7
OTC	38.63	13.25	Atmel Corp.	27.75	3.25	13.3
OTC	6.25	2.75	Chips and Technologies	5.50	0.25	4.8
OTC	39.75	13.00	Cirrus Logic	35.00	1.00	2.9
NYS	16.75	8.69	Cypress Semiconductor Corp.	11.75	0.13	1.1
NYS	19.00	11.13	Dallas Semiconductor	16.63	-0.50	-2.9
OTC	74.50	33.25	Intel Corp.	63.75	-0.75	-1.2
NYS	19.25	7.75	LSI Logic Corp.	14.50	-0.13	-0.9
OTC	26.75	11.75	Lattice Semiconductor	15.25	-1.00	-6.2
NYS	63.63	16.25	Micron Technology	47.50	1.50	3.3
NYS	107.50	47.38	Motorola Inc.	105.13	3.25	3.2
NYS	21.75	10.13	National Semiconductor	16.75	0.38	2.3
OTC	15.75	6.50	Sierra Semiconductor	8.00	0.63	8.5
OTC	52.00	25.75	SynOpsys	51.75	2.25	4.5
NYS	84.25	45.13	Texas Instruments	66.25	1.00	1.5
OTC	18.88	6.50	VLSI Technology	14.13	-0.13	-0.9
OTC	14.38	4.38	Wafertech	10.00	-0.38	-3.6
ASE	9.63	3.63	Western Digital Corp.	7.75	0.00	0.0
OTC	54.50	17.88	Xilinx	39.75	0.75	1.9
OTC	60.75	18.00	Zilog Inc.	38.75	3.75	10.7
Peripherals and Subsystems						UP 0.4%
OTC	24.75	9.25	American Power Conversion	22.25	0.50	2.3
OTC	22.75	15.50	Banctec Inc.	19.50	-1.25	-6.0
OTC	18.00	3.50	Cambex Corp.	5.81	-1.19	-17.0
ASE	18.38	3.88	Cognitronics Corp.	5.75	-0.63	-9.8
NYS	25.50	9.00	Conner Peripherals	12.00	1.00	9.1
OTC	38.50	17.25	Creative Technologies Inc.	22.25	-0.13	-0.5
OTC	30.75	6.50	Data Race Inc.	8.25	-0.50	-5.7
ASE	13.25	7.13	Dataram Corp.	10.38	0.75	7.8
NYS	39.00	7.88	EMC Corp.	34.13	-0.13	-0.4
OTC	10.50	5.25	Emulex Corp.	6.50	-0.25	-3.7
OTC	19.00	14.00	Evans & Sutherland	18.50	0.00	0.0
OTC	20.63	7.50	Exabyte	15.88	1.88	13.4
OTC	34.00	10.41	Intelligent Info. Systems	25.13	2.13	9.2
OTC	8.88	2.50	Iomega Corp.	3.63	0.00	0.0
OTC	14.25	5.75	IPL Systems Inc.	8.50	-0.25	-2.9
OTC	24.00	13.75	Komag Inc. (L)	15.88	1.25	8.5
OTC	19.63	4.38	Maxtor Corp.	5.88	1.00	20.5
OTC	10.00	5.75	Micropolis Corp.	7.75	1.38	21.6
NYS	117.00	97.25	3M Corp	103.63	-2.25	-2.1
OTC	8.00	4.00	Printronix Inc.	7.25	0.25	3.6
NYS	17.25	7.50	QMS Inc.	10.50	1.50	16.7
OTC	17.88	9.38	Quantum Corp.	12.63	1.13	9.8
OTC	7.13	3.13	Radius Inc.	6.75	2.00	42.1
NYS	17.75	11.75	Recognition Equipment	16.63	-0.38	-2.2
OTC	13.88	3.63	Rexon Inc. (L)	4.38	0.38	9.4
OTC	22.50	13.13	Seagate Technology (H)	22.25	1.25	6.0
NYS	45.00	18.00	Storage Technology	25.75	-0.13	-0.5
NYS	27.88	17.63	Tektronix Inc	23.13	-0.25	-1.1
NYS	88.88	69.88	Xerox Corp.	78.75	5.38	7.3
Services						UP 1.4%
NYS	4.88	1.13	Allerton Inc.	2.88	0.13	4.2
OTC	23.75	14.88	American Mgmt. Systems	21.63	0.00	0.0
NYS	6.75	2.38	Amrcomp Inc.	3.13	0.00	0.0
OTC	23.84	13.16	Analysts Int'l	17.50	0.00	0.0
NYS	56.13	46.88	Auto Data Processing	53.50	0.63	1.2
NYS	19.88	13.00	Ceridian Corp.	18.63	0.63	3.5
NYS	20.38	13.13	Comdisco Inc. (H)	20.38	1.50	7.9
OTC	13.38	4.50	Computer Horizons	11.75	-0.25	-2.1
NYS	95.50	68.38	Computer Sciences	92.75	-1.75	-1.9
NYS	9.25	6.00	Computer Task Group	6.88	0.25	3.8
NYS	39.25	19.00	CompUSA Inc.	22.88	-1.38	-5.7
OTC	14.13	8.00	Control Data Systems Inc.	9.25	-0.38	-3.9
OTC	15.50	7.00	Corporate Software (H)	15.50	0.75	5.1
OTC	12.75	6.63	Egghead Discount Software	7.25	0.00	0.0
NYS	35.88	26.00	General Motors E (EDS)	30.50	0.13	0.4
OTC	25.50	12.75	Ibacon Corp.	17.25	0.00	0.0
OTC	24.38	8.13	Intelligent Electronics	21.88	-0.38	-1.7
OTC	17.00	9.63	Mrdsel	15.63	1.50	10.6
OTC	29.50	6.50	Micrognge Inc. (H)	29.00	0.50	1.8
NYS	35.25	21.50	Paychex	35.25	1.50	4.4
NYS	87.25	21.63	Policy Management Sys.	28.38	2.75	10.7
NYS	43.63	22.56	Reynolds and Reynolds	39.00	0.88	2.3
OTC	23.50	13.38	SEI Corp. (H)	23.50	3.00	14.6
OTC	26.00	17.50	Shared Medical Systems	25.00	0.00	0.0
OTC	12.63	5.75	SHL Systemhouse	9.50	-0.75	-7.3
OTC	30.75	20.00	Software Spectrum Inc.	23.88	2.38	11.0
OTC	42.75	26.25	Sungard Data Systems	37.25	-0.75	-2.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Smaller deals paying off for EDS

By Mark Halper

■For the fourth consecutive quarter, Electronic Data Systems Corp. has reported sluggish revenue growth, a trend that some analysts last week attributed to a hiatus in the market for huge outsourcing deals, but EDS explained otherwise.

Revenue for the third quarter that ended Sept. 30 barely budged, moving from $2.06 billion in the same period a year ago to $2.08 billion. Layoffs and other cost-cutting maneuvers, however, did enable EDS to score a 14.5% profit increase to $191.6 million.

The Plano, Texas, outsourcing giant said it expects to return to double-digit growth next quarter. In a conference call with financial analysts, EDS painted a bright long-term outlook, noting it is a finalist for a giant outsourcing deal with Lufthansa German Airlines. The deal could be worth as much as $2 billion to $3 billion, said Merrill Lynch & Co. analyst Stephen McClellan.

EDS also cited an additional estimated $11 billion in business prospects. It is a finalist for potential multibillion-dollar deals at British Aerospace and Inland Revenue Service in the UK. Both British Aerospace and Inland are expected to make a final outsourcing decision by year's end. EDS is also one of four bidders at Xerox Corp., although a Xerox decision on whether it will even outsource could take six months to a year, McClellan noted.

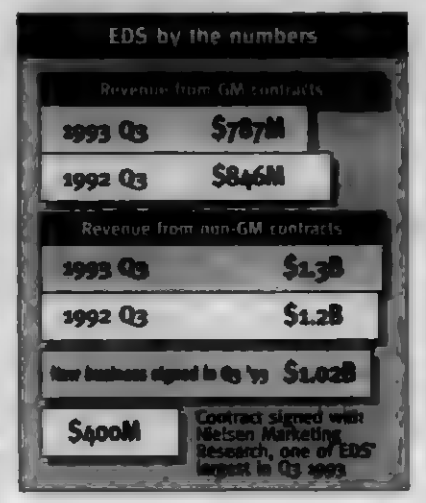
EDS attributed the present stagnation to several factors: a 7% decline in income from business with its parent company, General Motors Corp. (GM), unfavorable foreign currency exchange rates, a high number of contracts winding down and a reclassification of a Korean joint venture that effectively eliminated revenue from EDS books.

Fewer megadeals

Analysts said that while EDS has racked up a string of small and midsize contracts, in the last year it has won fewer of the $100 million-and-over megadeals than it has in the past.

Alex. Brown & Sons analyst Cato Carpenter said one reason for the slowdown is that EDS is less able these days to "buy" outsourcing deals by purchasing computer assets from customers in exchange for longer term processing commitments.

While EDS' cash holdings are up from $587.9 million a year ago to $687.1 million, Carpenter suggested that loss-troubled parent GM is "sucking up all the cash [EDS] generates."



He further pointed out that customers in general are not as cash-strapped as they were in the recent past because many corporations have stanched losses through their own regroupings. "The whole momentum of megaoutsourcing is currently on hold," Carpenter said.

EDS said it is racking up enough small to midsize deals to compensate, pointing to bookings of $4.3 billion in new business this year to date. A spokesman said EDS is on a pace equal to its record booking of $5.7 billion in new business in 1991.

"There were quite a few in the $10 million to $100 million range that don't generate a lot of publicity, but we're very interested in those," the spokesman said.

The company said its non-GM business grew by 7% in the third quarter, from $1.20 billion to $1.28 billion. The share of business represented by GM projects, once close to 80%, continued to decline to 38%.

The EDS spokesman said unfavorable currency rates connected to the strong dollar caused a $70 million hit on revenue. At the same time, EDS continues to feel the impact of having completed long-term projects at the end of 1992 that had been generating $129 million in annual revenue. Normally, project completions represent the termination of about $50 million in revenue, the spokesman said.

Select calendar third-quarter financials

Company	Revenue 6-93 - 9-93	% Change from 1992	Net income 6-93 - 9-93	% Change from 1992
The Acer Group				
Aldus Corp.	$62.2M	37%	$4.3M	330%
AST Research, Inc.				
Auspex Systems, Inc.	$20M	30%	$2.4M	37%
Banyan Systems, Inc.				
Computer Sciences Corp.	$622.3M	1%	$18.3M	7%
Control Data Systems, Inc.				
Convex Computer Corp.	$43M	(25%)	$6.3M	707%
Cray Research, Inc.				
Data General Corp.	$278.4M	(3.4%)	$(37.2M)	NM*
Easel Corp.				
Electronic Data Systems Corp.	$2088	NM*	$192M	15%
IBM				
Informix Corp.	$90M	31%	$14.5M	20%
Microgratx, Inc.				
Proteon, Inc.	$28.4M	(8.3%)	$(1.8M)	(6.2%)
Pyramid Technology Corp.				
Ross Systems, Inc.	$19M	15%	$(1.2M)	NM*
Stac Electronics, Inc.				
Stratus Computer, Inc.	$127M	2%	$14.4M	23%
Symantec Corp.				
Tandem Computers, Inc.	$553M	4%	$3.2M	88%
Wall Data, Inc.				

*Not meaningful

The third quarter saw once-captains of the industry continue the struggle to restructure their ranks and right their listing financials while also setting out into unchartered waters. Navigating through client/server straits has proved tricky for many, particularly for those also buffeted by unfavorable currency translation, slow European sales and weakening demand for proprietary systems.

IBM, Data General Corp. (DG), Computer Sciences Corp., Control Data Systems Corp., Stratus Computer, Inc. and **Tandem Computers, Inc.** all posted less than impressive, albeit mostly expected, earnings for the third quarter. In many cases, the revenue needle stuck or barely budged on a year-to-year quarterly basis.

Although its revenue was flat on a year-to-year quarterly basis, IBM managed to keep its losses for the third quarter to $48 million, a vast improvement over its $2.8 billion loss in the third quarter of 1992.

Revenue was down slightly at Control Data from the same period a year ago, but it did see a small profit. Unappeased, President Jim Ousley said continuing "economic and marketing challenges in Europe" will impact results in the fourth quarter and into 1994.

With a barely perceptible change in revenue between fiscal 1992 and 1993, Tandem reported a $517.7 million loss for the year, $451 million of which was a restructuring charge. The fourth quarter of 1993 was profitable — barely — which Tandem President James Treybig attributed in part to significant cuts in costs, personnel and salaries.

DG may have bailed more woes than its compatriots as it announced plans to lay off "several hundred" of its 6,550 employees in the face of its seventh annual loss in the last eight years. Its $37.2 million fourth-quarter loss already includes a $25 million charge to cover the cost of the work-force reduction and unspecified other restructuring actions.

Also suffering losses for the quarter were **Convex Computer Corp.** and **Easel Corp.** Easel is late with a product that unites its client/server tools with those of acquired subsidiary **Enfin Software Corp.**

HONORING the BEST

One hundred and forty-eight well-dressed IS executives, corporate sponsors and guests were honored for their achievements at the sixth annual *Computerworld* Premier 100 Awards banquet last Monday in the Pegasus Suite high atop the 64th floor of New York's 30 Rockefeller Center.

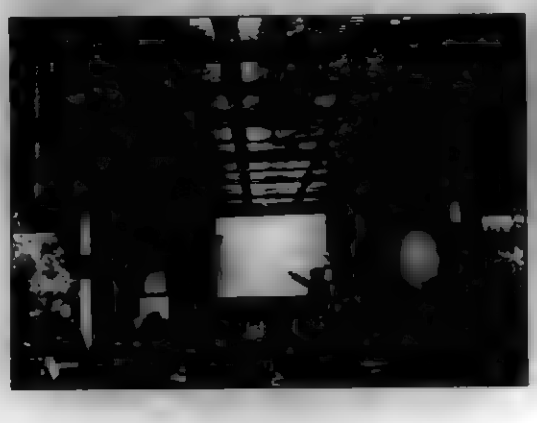
Scott Cooper, senior vice president of technical services at Home Shopping Network, Inc., won the Sun "IS Visionary of the Year" award for overseeing the development of an innovative Pay-Per-View/Video-On-Demand system that will allow households to access movies via an 8oo telephone line.

Pictured below, Premier 100 dinner attendees listen as Harvard Business School Professor Richard Tedlow describes the mistakes that even good companies make if they misread the market

The dinner, which honors the 100 companies and their IS organizations deemed the most effective in using technology, featured an awards presentation to each of the first-place finishers in 10 industry groups. The top finishers were: The Boeing Co., Dibrell Brothers, Inc., Banc One Corp., Rubbermaid, Inc., Air Products and Chemicals, Inc., Alexander and Baldwin, US West, Cummin Engine Co., Abbott Laboratories and Winn-Dixie Stores, Inc.

Elaine DeLappe, director of human resources, represented The Boeing Co., which finished first in Aerospace

Robert Barrett, president and COO at Banc One Services Corp., accepted the award for Financial Services



Ray Hoving, director of the MIS Process Systems Group at Air Products and Chemicals, Inc., topped the Petroleum and Chemicals category

PHOTOGRAPHY BY JERRY VALENTE

The 5th Wave *by* Rich Tennant

Inside Lines

Giving consent

The Justice Department's new antitrust chief, Anne Bingaman, last week assigned its investigation of IBM's outsourcing practices to Ralph Giordano in its New York office. At issue is whether IBM and its Integrated Systems Solutions Corp. subsidiary are in violation of a 1956 Consent Decree. IBM said Justice has transferred all Consent Decree cases to regional offices. Meanwhile, more questions swirled following IBM's services reorganization in which ISSC was intermingled with other IBM groups. The Consent Decree requires arms-length operation of a "service bureau" unit.

Chapter 11 redux?

Memorex Telex Corp., the U.S. subsidiary of Dutch Memorex Telex N.V., plans to file for Chapter 11 bankruptcy protection this month, the second time in two years. The storage products maker, which pulled in more than $500 million in sales last year, cannot meet interest payments on $600 million in debt held by financiers Carl Icahn and Leon Black, said a source close to the company. Memorex Telex does not expect to be in Chapter 11 for more than the minimum 30 days required to restructure the debt and convert it to common stock, which Icahn and Black will own, the source said.

Microsoft to say "OLE" to Corba?

Dec. 8 is the deadline for those responding to the Object Management Group's (OMG) request for technology for the interoperability standard for Corba, and sources close to Microsoft and Digital said the two companies are likely to make a joint announcement on Dec. 7 with a major third-party relational database vendor to link OLE with Corba on. Digital already offers interoperability support between Microsoft's OLE and Corba, and Microsoft is likely to announce its intent to offer OLE's object interfaces to the OMG for Corba, the sources said. Microsoft officials said they have no current plans to do so.

Back on board

A rejuvenated Everex Systems will next Monday introduce a bold new line of desktops, featuring on-board support for Ethernet and 10Base-T, video acceleration, SCSI-2 and sound, as well as the more common on-board I/O and integrated drive electronics support. While graphics acceleration is built-in, Everex handles sound and SCSI via an on-board socket that allows users to pop in Adaptec, Inc.'s SCSI-2 chip. An intelligent BIOS automatically senses which components are on the machine and configures it appropriately. The cost for a fully configured system will range from $1,299 for a 25-MHz 486SX chip to $2,249 for a 33/66-MHz DX2 chip.

The more things change . . .

A slide that Novell presented at a recent analyst meeting lays out one piece of its strategy for selling enterprise computing systems to corporate IS. Titled "Extending strategy to deliver full IT solutions: Systems reseller channel second to none," the slide talked about upping the overall quality of Novell's value-added reseller support. Between 1991 and 1994, Novell will up the number of high-quality Platinum resellers from 225 to 700.

Value days are over

Two months after refreshing the low end of its PC line, Digital is ready to upgrade higher-end models. Models based on Intel's microprocessors and Digital's own Alpha AXP devices are expected to be introduced next week, in both EISA and Peripheral Component Interconnect flavors.

In the "state of the industry" department, Dave Duffield, head of client/server software maker PeopleSoft, said he didn't want to be introduced as "chairman" at a product announcement last week (see story page 20). " 'Chairman' generally means you're on your way out," Duffield said, referring to several recently departed computer company chairmen, such as John Sculley from Apple and John Akers from IBM. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76597,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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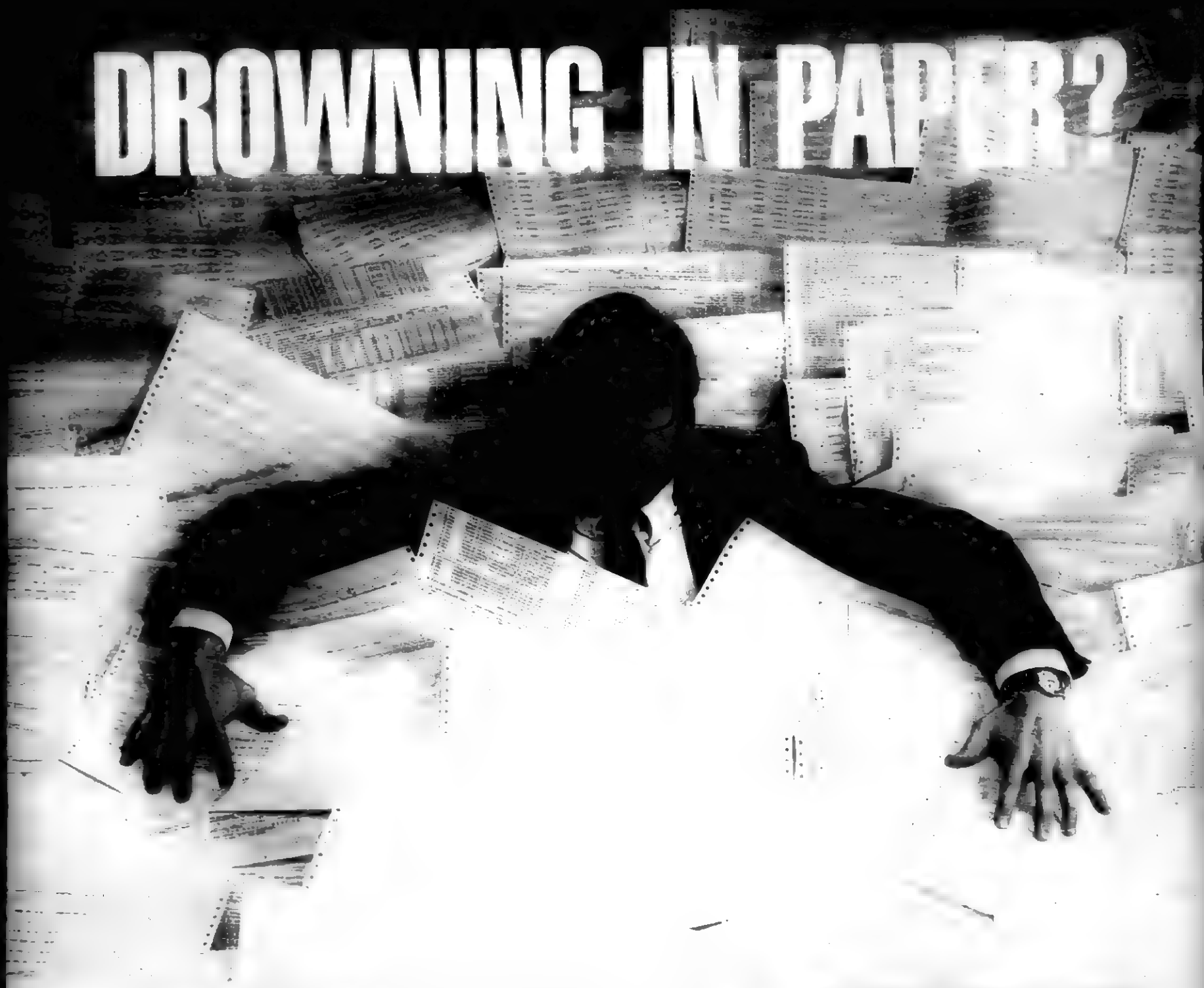

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COMPUTERWORLD

NCR to boost MPP system with help from Sybase query server

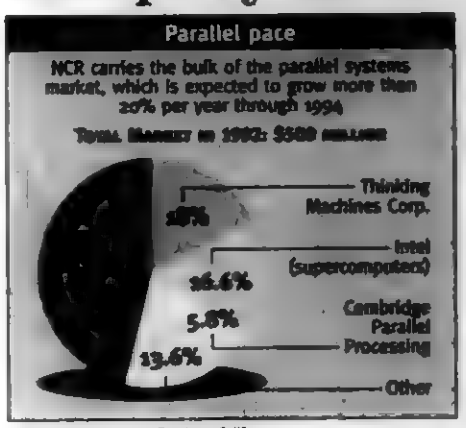
By Thomas Hoffman and Kim S. Nash

■ NCR Corp. will this week show off several performance enhancements to its 3600 massively parallel processor. The effort will pump more life into the system while customers wait for NCR's twice-delayed next-generation MPP, now scheduled to hit the market in mid-1995.

The announcement will include the disclosure by Sybase, Inc. that it will begin beta shipments of its Navigation Server, database technology designed to manage large-scale client/server data queries for the 3600 and other MPP machines. NCR will also detail improvements to its Teradata database server and reveal an enhanced upgrade path to the NCR 3700, NCR's next-generation MPP machine (see box page 12).

NCR's strategy to deliver performance boosts to the NCR 3600 seeks to maintain customer satisfaction with the scalable environment before the NCR 3700 — and competitive products from IBM, Unisys Corp. and other vendors — reach the market in 1995, said

NCR, *page 12*



Source: Dataquest, Inc., San Jose, Calif.

IBM this week will unfurl its moderately parallel computer. See story page 12.

NT to blend in X.500

Pending Siemens deal to provide directory services

By Lynda Radosevich and Ed Scannell

Microsoft Corp. will add X.500 directory service capabilities to its Windows NT Advanced Server next year through a licensing agreement with Siemens AG, according to sources close to the companies.

The goal behind the partnership is to enable Microsoft to provide a common directory service for messaging and other network applications similar to what Banyan Systems, Inc. offers with its StreetTalk directory. The pact is expected to be announced by year's end.

X.500 directory services include a hierarchical information tree across different servers that enable each entry to have a unique name.

Microsoft hopes that by beefing up NT Advanced Server's directory capabilities, the network will be better equipped to compete with Banyan's Vines, Novell, Inc.'s NetWare Directory Services and IBM's LAN Server, the sources said.

X.500 is the Open Systems Interconnect standard for distributed directory services. Although associated with the X.400 electronic messaging protocol, the X.500 directory information base can contain information about users, devices and network resources.

Needed support

Without X.500 support, some observers said they believe Microsoft will be unable to provide the glue that large corporate accounts need to build cohesive enterprise-wide strategies and solutions.

"Announcing X.500 directory services [will] put Microsoft in the enterprise game. Given what the competition has, they can't go very far without it," said one analyst familiar with the company's plans.

The X.500 addition "will be worthwhile to take a look at, especially if it hooks into the mail system," said Bob Holmes, a research technologist at Southern California Gas Co. in Los Angeles.

NT, *page 15*

Will API wars spur wireless chaos or use?

By Lynda Radosevich and Joanie M. Wexler

In a frenzy to fuel wireless network use, key industry players are colliding in their efforts to serve up "standard" application programming interfaces that span multiple network types.

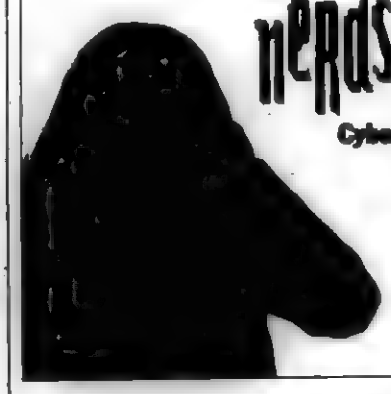
Conflicting APIs surfacing from such disparate sources as Motorola, Inc., RadioMail Corp. and vendor consortia could quickly spur wireless use in vertical or contained environments by easing application development. But they could also cause application interoperability problems for users looking for broader connectivity, analysts said.

API efforts in the works today from the likes of RadioMail, which announced a multinetwork interface last week at the E-Mail World show in Santa Clara, Calif., are good news for Donna Farchione.

A partner at systems integrator Strategic Communications Corp. in Bethesda, Md., Farchione said she does not want to worry about the underlying networks during application development. She said the RadioMail API will eliminate network-specific concerns in her company's efforts to develop a wireless service for a large San Francisco-based bank.

The service, which will enter pilot stage by January, will allow wholesale residential real estate loan brokers to access lending information and enter sales orders using what-

API wars, *page 14*



nerds with an AttiTude

Cyberpunks are influencing art, music, literature and even supercomputer design. More importantly, they're in your IS department. Should you be worried?

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PC management

Cheaper, sleeker integrated PCs gathering steam

By Michael Fitzgerald

Integration of key PC technologies — such as graphics, networking, SCSI and sound — onto the motherboard is coming to the desktop in a big way. And its impact may come sooner than expected.

The potential payoff for PC managers includes better memory management, increased functionality, fewer configuration headaches and lower costs. How much lower will depend on system configuration and vendor cost structure, according to Randal Giusto, a senior analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

A single PC costs $2,000 a year to administer and support, according to a Gartner Group estimate.

For example, PC managers who want to increase their PCs' functionality currently have to add cards, which typically range in price from less than $100 to over $1,000. But tomorrow's PCs will either have these functions on the motherboard or will give users the option of adding them on the motherboard.

Integrated parts also mean lower manufacturing costs that will likely be passed on to users — through smaller systems, for example — and, in some cases,

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■ **Informix** users will get a **Windows NT option** in January, when the company releases a kit that bundles NT with Informix-SE database and connectivity tools. *Page 7*

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Executive Briefing

Remote network management is a headache. In a recent study, 70% of the 180 companies contacted by research firm **Business Research Group** identified management of distributed computing as a critical concern. *Page 59*

Is it any wonder some folks decide to just stay put? That's exactly what chemical company **Rodel** did recently — settling for an upgrade to its HP 3000 mini — after flirting briefly with Unix. Reason: HP promises Unix and MPE will merge in a couple of years, and the company figures it is safer to stick with what it knows than to take a risk on just-emerging systems management tools for Unix. *Page 69*

Or that others seek some outside assistance? There's lots of activity on the outsourcing front these days. After listening to informal proposals for close to a year, **Chrysler** is reportedly about to issue a **formal invitation** to bidders that want to help it develop and manage a massive LAN, linking some 13,000 PCs throughout the organization. *Page 6* In the meantime, **Nielsen** and EDS may qualify for a speed award. Six weeks after EDS won the contract last July, Neilsen's Green Bay, Wis., data center was shuttered and EDS was processing product and sales data for Nielsen market reports. *Page 67* But the prize for most innovative pricing agreement may belong to the **Canada Post** and **SHL Systemhouse, Inc.** contract, which established a "fee-for-service" structure similar to that of a monthly telephone bill. *Page 25*

Deliver us from gateways was Internet pioneer **Einar Stefferud's** message in his address to attendees of **E-Mail World**. Using gateways to translate messages into different formats at each messaging system intersection is not acceptable, he said, and customers ought to demand a way of sending messages intact through all their systems. *Page 14*

Mixed messaging that does work: E-Mail World saw the introduction of a scanner/software combination that permits documents with graphics to be scanned and dropped into E-mail and computer-based fax software. *Page 14*

Tailored training gains popularity as companies try to adapt to the very different requirements of new system development tools and methods. **3M** even links technical training with specific projects. *Page 92*

One good subject for training? Windows GUI development might be a good bet. Columnist David Bernard points out that while Windows application development has become much easier, it's still very possible to mess up on interface design. *Page 76*

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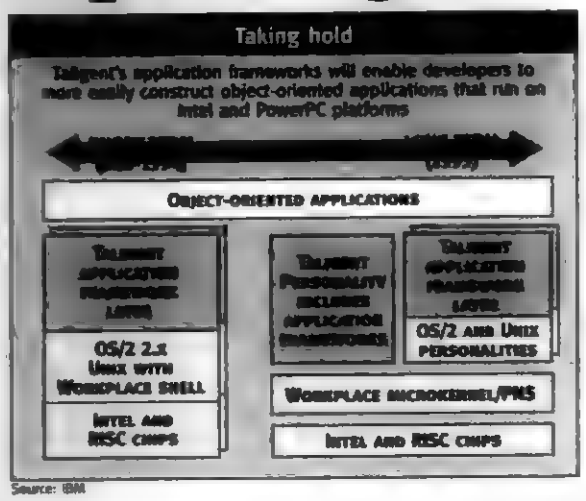
OS/2 developers to get first whiff of Taligent

By Ed Scannell and Jim Daly

With IBM ready to roll out its first set of application frameworks from its Taligent, Inc. joint venture with Apple Computer, Inc., software developers have little knowledge of what the technology can do.

This first set of frameworks, scheduled to be sent to a limited number of developers next month, gives OS/2 developers their first taste of the Taligent technology. It will also make it easier for them to port their existing applications to multiple platforms including IBM's AIX and Windows [CW, July 26]. Broader distribution will occur early next year.



Source: IBM

Meanwhile, IBM will release a second set of application frameworks in late 1994 that exposes the entire Taligent programming model to developers, who can then sculpt applications that take full advantage of Taligent's interface and that inherently work in a collaborative fashion with any other application.

Mix-and-match technology

IBM will also use next week's Comdex/Fall '93 to show how some of the stand-alone Taligent components can be mixed and matched with an array of existing programs to piece together applications that collaborate across multiple platforms.

"We'll be showing off the stand-alone components used in a cross-platform [graphical user interface] framework and combined with [IBM's Systems Object Model] and [IBM's Distributed Object Model]," said Kathy Bohrer, IBM's lead architect for object frameworks.

Although the company will deliver application frameworks first, Taligent remains committed to producing a shrink-wrapped version of the full Taligent operating system in the 1995 time frame, noted Mike Potel, Taligent's vice president of technology development. "Both projects are proceeding in parallel," he said.

Application developers, however, have been left to uncover what specific advantages they will gain over competitors by incorporating the Taligent technologies.

"Once word about the frameworks' content gets out, we can then stew about what we should take advantage of and how," said Randell Flint, president of Sundial Systems Corp., a Seal Beach, Calif., OS/2 application developer.

With the introduction of Apple's PowerPC platform looming, Taligent officials have been particularly circumspect with key Apple developers. "The last thing Apple wants to do is add another choice for developers to think about," said Pieter Hartsook, editor of the Macintosh-specific "Hartsook Letter" in Alameda, Calif. "I bet they won't say peep about Taligent until after the PowerPC Macs come out early next year."

Many Apple developers said their chief concern is getting their applications over to the PowerPC platform, but they are still curious about Taligent.

"You talk to developers who might be interested, and it seems that nobody has put this thing on the front burner at this point," said Mark Macgillivray, managing director at H&M Consulting in Sunnyvale, Calif.

Because Taligent is not expected to have its full platform available until 1995 at the earliest, developers are not panicking. "I don't think it will be any big thing if we're not there on Day 1 with a Taligent product," said Chuck Boesenberg, president and chief executive officer of Central Point Software, Inc. in Beaverton, Ore.

Not that Apple developers are twiddling their thumbs. Most are up to their ears working on versions of Macintosh System 7 applications for the upcoming PowerPC line, and they're cautious about where they put their money and manpower.

"Look at the people who put their efforts into OS/2. They wasted their resources," added an Adobe Systems, Inc. spokesman. Companies such as Adobe said they do not have resources to hit several platforms at the same time.

More opportunities

The first set of application frameworks for OS/2 will let developers infuse their existing applications with features such as advanced data manipulation and two- and three-dimensional graphics.

The second set of frameworks, due later next year, will give developers the opportunity to write applications that fully exploit the Taligent operating system. One of the biggest advantages touted by both Potel and Bohrer is the ability to create genuinely collaborative applications that easily share data across environments.

One of the benefits of the Taligent application programming interface, Potel explained, is that the system software automatically knows how a particular application is structured and it can present the same document or memo to another application across a network.

"If two people are working on a letter, they could open up any old word processor and over the phone argue about what changes to make," Potel said. "You can get some of that today, but the nice thing with Taligent is that any app you write is automatically built that way."

Power-packed

Using a low-level example to show developers the power they can get with the second set of frameworks, IBM said it created a calculator program that has undo and redo features and allows two people to collaborate on the same set of data simultaneously. It took only 70 lines of code to create the program using the Taligent technology, compared to 3,000 to 4,000 lines of code to do the same program under Windows or Presentation Manager.

OS/2 is making headway in the corporate arena. *Page 37*

IBM taps Cannavino as top tech exec

By Johanna Ambrosio and Ed Scannell

IBM strategy guru Bernard Puckett resigned unexpectedly last week. He will be replaced by James A. Cannavino, currently general manager of IBM's Personal Systems division.

Puckett, 49, is leaving the company to "explore opportunities to go into business for himself," according to a statement issued late Friday. Puckett had been named senior vice president for strategy only in June.

Some analysts said Puckett's selection was a mistake from the start. "Gerstner picked the wrong guy for a key position; he has now reversed himself," said Bob Djurdjevic, president of Annex Research in Phoenix.

Many observers were taken by surprise. "The whole thing is very strange," said Jay Stevens, an analyst at Dean Witter in New York.

"I can't figure out why a guy who appears to be a rising star in the firm gets a key position and before he gets a chance to do anything right or wrong, is gone," said Curt Rohrman, a vice president at First Boston Corp. in New York.

Cannavino has presided over a resurgence in IBM's PC business over the past year — particularly in the PC Co. and the recent success of Personal Software Products' OS/2. But some note that he was also in charge when the company's hardware market share slid precipitously in the late 1980s and early 1990s.

IBM's James Cannavino: *Still unsure of his new role*

Maverick technologist

What appears to be in Cannavino's favor, however, is his thorough understanding of technologies ranging from mainframes to PCs and, perhaps, his reputation as a maverick within IBM.

"Cannavino is one of the few guys who, given enough power, can make some of these Jurassic Park inhabitants come to the 20th century," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington.

Cannavino reportedly told consultants last week that he was unsure of the scope of his new duties and would spend the next few months in a "discovery phase." Cannavino, through a spokesman, said a successor is expected to be named in a few weeks.

Cannavino, also 49, started with IBM 30 years ago as a customer engineer. He was appointed president of the company's Data Systems Division in 1987 and named president of its PC business in 1988, assuming responsibility for all Personal Systems business in September 1989.

PowerPCs roll

IBM's Power Personal division this week will debut its first series of long-awaited PowerPC-based servers and desktop systems.

One of the highlighted features of the new systems, according to one analyst briefed last week, is built-in voice recognition that allows them to intelligently converse with users.

IBM will also detail support for a broad range of 32-bit operating systems for the PowerPC-based machines, including Microsoft Corp.'s Windows NT, IBM's AIX and WorkPlace OS, and Taligent, Inc.'s operating system [CW, Nov. 1].

—Ed Scannell

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Where Sculley's vision blurred

"After Sculley, Apple lacks key visionary," read the headline in the *San Jose Mercury News* after John Sculley's departure. Personally, I think the same could have been said for Apple *with* Sculley.

"Visionary" was the term Sculley repeatedly used to describe himself in his book "Odyssey," a self-absorbed account of how he unseated Steve Jobs. Jobs, of course, was a genuine visionary even if he was an abysmal businessman. Having deposed him, Sculley felt obligated to take on the mantle himself.

But it was never clear to me how Sculley's "vision" benefited Apple. I heard him address Novell's user group in Salt Lake City last March when he shared his vision of the future with a hushed audience. I may have missed some of the details, but I recall him saying that the $80 billion PC industry, the $1 trillion consumer electronics industry and the $1.3 trillion media publishing industry were going to merge into a new industry worth a pentaquadzillion dollars by the year 2001.

Wow, I thought, this Sculley can really see over the horizon, and he's got the charts to prove it. But right now, Microsoft is selling 1.5 million copies of Windows a month, while Apple is selling 1.5 million Macintoshes a year. I wonder where that leaves the Mac by the year 2001? I tried and I tried to figure it out, but the prospect of all that money waiting to be made dazzled me too much to think about it.

John Sculley was better at marketing himself as a visionary than he was at marketing Apple.

Charles Babcock

Sculley led Apple into overinvesting in the future with gadgets. The Newton personal digital assistant can tell you where Elvis is located on any given day, but it still can't spell your name right.

While it pursued the Newton, Apple passed up other, surer opportunities. Six years ago, with Windows still on a shakedown cruise, Sculley kept Macintosh prices high, satisfied with Apple's 11% market share and high margins. As Windows improved and the PC market exploded, Mac prices stayed too high for too long. What had been a huge lead in the graphical user interface was frittered away with no market share gain for Apple.

No more "1984"

With Apple's fundamental strategy in retreat, Sculley rushed into a hollow embrace with IBM. Instead of forging the hammer that would smash Big Brother, Sculley made Apple into a company more like IBM, too distant from its customers and too dependent on an overweening pride and self-image to respond to changes in the marketplace.

But what Sculley did that is hardest to forgive was name himself chief technology officer at Apple, as well as chairman and CEO. Sculley, the marketing personality, insisted on taking the title to which he had the least legitimate claim. I mean, this is a man who admitted telling Jobs, while being recruited, "Steve, why are you talking to me? I don't know anything about computers."

Chief technology officer is usually a title held by someone who has shown leadership in driving the product line. What did Sculley do for the Mac besides sue Hewlett-Packard and Microsoft?

"It was outrageous to name myself chief technology officer," he agreed on Charlie Rose's TV show this year, but he said he had to do it to boost his effectiveness as a Silicon Valley spokesman.

So when Bill Clinton wanted to polish his high-tech connection, there was Sculley at his elbow — during the campaign, the inauguration and the State of the Union. It was hard to tell what Clinton knew about technology, but it was clear Sculley knew something about politics.

Sculley's wish to be a high-tech statesman overwhelmed his interest in running Apple as a business, and Apple missed out on the bulk of the second PC revolution — the explosive growth in the use of the graphical interface that it almost single-handedly launched.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Corporate decentralization

CIO ousted from Bank of Boston

By Joseph Maglitta

Michael Simmons, the highly paid and highly visible technology chief whose fast-track career advanced through many prestigious banking posts in the late 1980s, was forced to resign in a high-level shake-up that eliminated his post at Bank of Boston Corp.

His departure came as part of a dramatic corporate decentralization, cost-cutting and executive shuffling announced Oct. 29 that surprised the financial community and left uncertain the fate of several long-term information systems initiatives at New England's second largest bank.

Bank Chief Michael Simmons *managed IS staff of 3,100*

Since joining Bank of Boston in 1990 from BankAmerica Corp., Simmons, 54, had embarked on an ambitious five-year plan to streamline the bank's disjointed IS operations and electronic-mail systems. As group executive vice president for technology and operations, he commanded a centralized IS staff of 3,100 and a $160 million annual budget.

Simmons, who reported to Chairman Ira Stepanian, also sat on the five-member board of the bank holding company.

Split in half

Under the new structure, IS functions will be split between two smaller organizations reporting to Executive Vice President Edward A. O'Neal, a former Simmons peer who heads the New England Banking Group division of Bank of Boston. A well-regarded consumer banking executive, O'Neal is considered extremely technology-savvy. Before coming to Bank of Boston a year ago, he served as vice chairman at Chemical Banking Corp., where he managed several technology units.

As part of the restructuring, O'Neal and Chief Financial Officer William Shea were promoted to vice chairmen in a new four-member chairman's office. O'Neal will also serve as liaison between the two IS groups and a new 29-member "corporate working committee" made up of senior executives.

A bank spokeswoman said no further IS cuts are planned. Simmons could not be reached last week. His future plans are unknown.

Observers and bank insiders said they do not view Simmons' ouster as a sign that he had failed to meet lofty performance expectations. Instead, many agreed with the official explanation: that realignment and flattening would better position IS to serve each of the bank's newly empowered 15 core businesses.

"Simmons was very well-respected," explained an IS manager at the bank who requested anonymity. "It just didn't make sense to have so many people at that high a level," the manager said, referring to Simmons' ouster and the departure of two other high-level bank executives.

Joseph Ziskin, an Ernst & Young analyst who follows chief information officer issues, said: "They made the decision that [the four-member team] is the group who will run the bank. The other guys didn't need to stick around."

Although his current salary is unknown, Simmons told *Computerworld* in 1990 that his compensation exceeded $400,000 a year at Bank of America.

Art Gillis, a veteran banking technology consultant, said Simmons' big paycheck may have made him a more attractive target for layoff. "He may be the greatest guy in the world," Gillis said, "but there's a certain cap on the value of one man's contribution."

Chrysler weighs outsourcing plan

By Mark Halper

■ Chrysler Corp. is considering outsourcing a PC LAN development and management project that would improve communications among some 13,000 PCs throughout the organization, according to outsourcing vendors.

The $28.1 billion automaker has been informally soliciting LAN schemes from outsourcers for almost a year and is now close to issuing requests for proposals (RFP), according to sources at prospective bidders.

One source close to the company who asked not to be identified said the deal could be worth between $20 million and $30 million annually over three years and that Chrysler will issue its RFP on Nov. 15.

"They solicited input from a number of companies earlier this year — a what-if type of thing," said Harvey Cohen, director of commercial operations at Unisys Corp.'s system support operations. "It is our understanding that they are ready to go forward with an RFP."

Chrysler wants to improve the interactivity among its base of proliferating PCs, many of which have been acquired on a departmental basis without the coordination needed to enable useful connectivity, Cohen said. Chrysler probably needs to standardize on applications and electronic-mail programs, he observed.

A Chrysler spokesman said only that PC management "is under review as it is under review every year."

As in all outsourcing evaluations, Chrysler may decide to leave the job up to its own information systems department.

Chrysler is believed to have held conversations with Unisys, Digital Equipment Corp., which provides PC maintenance to Chrysler, IBM's Integrated Systems Solutions Corp. (ISSC) and Memorex Telex Corp. The automaker has also talked with a Chrysler subsidiary, Chrysler Systems, Inc. in Oak Brook, Ill.

"They are talking about putting out an RFP, and we expect to get one," said Jim Lindner, president of the networks group at Memorex Telex, which supplies 3270 terminals, PCs and services to Chrysler.

Digital, ISSC and Chrysler Systems all declined to comment.

Informix to sell Windows NT with its database

Release aims to challenge similar bundling of Oracle and NetWare

By Kim S. Nash

Informix Software, Inc. is expected to release in January a kit that bundles Microsoft Corp.'s Windows NT, Informix-SE Server and sundry Informix connectivity tools at a price less than half the cost of buying the products separately.

Targeted as a platform for department-level client/server systems, the bundle will compete head-on with a similar database/operating system package offered by Oracle Corp. and Novell, Inc. [CW, June 7].

Bundled up

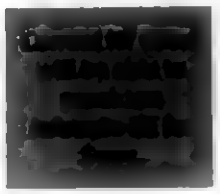
The $1,795 Informix/Microsoft bundle is available through Microsoft resellers, Informix VARs and directly from Informix. Bought separately, the products would cost about $5,000. The bundle includes the following:

- The Microsoft Windows NT operating system.
- The Informix-SE 5.0 database.
- The Informix-SQL suite of development tools, including forms and report writers and schema editors.
- The Informix-ESQL/C third-generation language for building applications that access databases through standard SQL.
- Q+E ODBC Pack, an Open Database Connectivity (ODBC) driver that Informix resells from Q+E Software.

Informix is reselling NT under an agreement with Microsoft, which in turn will allow its 3,000-plus solutions providers to resell the SE Server database. Microsoft will continue to aim its SQL Server database at low-end LAN users.

Talking to NT

The theory behind the Informix/Microsoft partnership is that users will be able to get Unix applications running against an Informix database to talk to potential Windows NT-based setups. "Coexistence of NT and Unix is probably what most big companies will find most useful," said Fred Hubbard, president of the Northern California Informix User Group.



Such scenarios have yet to arise, Hubbard noted, "but it's good to know in the back of your mind that Informix users have that option."

What NT users will get is access to more than 10,000 applications currently available for Informix databases. But porting Informix packages to NT is viewed mainly as a safety net by Informix resellers afraid of being left in the dust should NT blossom into a viable enterprise-level operating system.

"No one is beating our doors down saying they gotta have NT, but users are starting to get excited about it. So we'll be there when they want to buy later on," said Bob Bearden, president of Munico Information Systems, Inc., an Informix value-added reseller (VAR) in Clifton, N.J.

"We haven't gotten anyone committed to NT today, but we have seen interest," agreed John Woolsoncroft, director of marketing at Concepts Dynamic, Inc., a VAR in Schaumburg, Ill.

The Informix/Microsoft package is priced at $1,795 (see box). The Oracle/NetWare bundle is priced at about $250 per user, according to Larry Ellison, chief executive officer at Oracle. However, that kit does not include utilities such as an Open Database Connectivity driver, which is part of the Informix package. Informix plans to port its high-end On-Line database to NT next year.

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	—AFTER-CPK-->		365	3	32251			7574	1	7574	0.000	48	416	3242	15	47	3.9	0
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News Shorts

Apple cleans house

Spring cleaning is coming a few months early at **Apple Computer, Inc.**, which has scheduled three large auctions to clear tens of millions of dollars worth of old, excess inventory from its warehouses. Apple plans to offer more than 18,000 discontinued Macintoshes and peripherals at the auctions, scheduled to occur in the next month in Des Plaines, Ill.; Framingham, Mass.; and Washington.

Globex struggles and restructures

After 16 months in operation and no profits to show, Chicago's $100 million, after-hours futures trading system, **Globex**, is being restructured. The major change will be to open the computerized system to two powerful European futures exchanges, one in London and the other in Paris. The concessions are seen as a last-ditch effort to save Globex and increase its trading volume — now at about 29,000 contracts daily.

Software pirates sentenced

One man is in prison and another serving home detention in what is believed to be the first software piracy case in U.S. history to result in a jail sentence. Benny S. Lee and Norman Chan in Fremont, Calif., are serving time after pleading guilty to misdemeanor copyright infringement charges in connection with a software counterfeiting ring. The operation allegedly manufactured and distributed at least 25,000 copies of Microsoft Corp.'s DOS operating system, causing an estimated $1.8 million in lost sales.

AT&T and 3Com team for fast Ethernet

3Com Corp. last week announced a joint development pact with **AT&T Microelectronics** aimed at bringing 100M bit/sec. Ethernet products to market quickly. The two firms will codevelop physical-layer devices for 100Base-T, 100M bit/sec. Ethernet products incorporating the IEEE 802.3 carrier-sense multiple access with collision detection media-access control standard. The transceiver silicon will support Categories 3, 4 and 5 twisted-pair cable.

Study singles out successful CIOs

Many chief information officers are being forced to retrench their technical expertise to rebalance their roles as technologists and businesspeople, according to a study released by **Ernst & Young, Heidrick & Struggles, Inc.** and **Boston University**. Two distinct types of successful CIOs were detected: the company careerist and the professional CIO, who is often brought in from the outside to turn around a company. Successful CIOs balance their role as technologist, utility manager, research and development director and infrastructure builder, the report pointed out.

SHORT TAKES **Montgomery Ward**, the giant Chicago retailer, is installing 130 Novell, Inc. LANs and assorted NCR Corp. workstations and servers in a project valued at $4.5 million. The retailer will use **Entex Information Services** in Rye Brook, N.Y., as the integrator. ... **AT&T Communications** has restructured its internal information systems operation, naming Rino Bergonzi — former CIO at United Parcel Service, Inc. — vice president of AT&T's Information Management Services organization. ... **BSG Consulting, Inc.**, a Houston systems integrator, last week established a subsidiary to help companies manage the transition to client/server computing. ... Intel Corp. will announce a 3.3V, 50-MHz DX2 chip this week, which it claims is its highest performance chip to date. The new SL Enhanced Intel 1486DX2 is reportedly twice as fast and consumes half the power of the 5V 486DX chip, while costing about the same.

More news shorts, *page 16*

Microcomputers

Digital PCs to support Intel, Alpha

By Craig Stedman

STOW, MASS.

In a continued effort to increase its PC presence, Digital Equipment Corp. this week will introduce an upgradable premium line that uses the Peripheral Component Interconnect (PCI) bus and will eventually support either Intel Corp. microprocessors or Digital's own Alpha AXP devices.

However, the Alpha option is not scheduled to be available on the DECpc XL machines until next spring, Digital said. The company previously confirmed it had postponed the launch of Alpha-based systems equipped with the PCI bus in order to wait for a lower-cost microprocessor [CW, Oct. 18].

All DEC'd out

Product	Chip	Availability	Price*	Pentium upgrade/cost
XL 433DX	33-MHz 1486DX	Late November	$2,899 (XL 433DX)	60-MHz/$1,199
XL 466DX2	66-MHz 1486DX2	Late November	$3,299 (XL 466DX2)	66-MHz/$1,999
XL 560	60-MHz Pentium	Mid-December	$3,999	Not applicable
XL 566	66-MHz Pentium	January	$4,599	Not applicable

*Price includes 8M bytes of memory, 340M-byte SCSI disk drive, S3-928PCI local-bus video, dual-SCSI CD-ROM, MS-DOS and Windows. Monitors start at $299.

Upgrade offerings

Positioned above the DECpc LPv/LPx value line introduced in August, the XL systems are initially being offered with Intel 1486 and Pentium chips. In-box upgrades are possible via a daughtercard swap, and Digital said upgrades from the Intel devices to Alpha will also be supported.

The dual-path strategy is meant in part to erase Digital's image as "a me-too [PC] company, and probably a slow one at that," said Lex Dekkers, XL product line manager. The XL's minitower enclosure can handle clock speeds of up to 200 MHz and should accommodate both the second and third generations of Pentium, he added.

The upgrade capabilities appeal to Andre Hallam, senior office automation analyst at Children's Hospital of Eastern Ontario in Ottawa. "We go through a lot of PCs here, and [upgrading] is obviously cheaper than replacing a box with a whole new system," he said.

Digital's promise that an Alpha upgrade will cost less than $2,000 "sounds great," Hallam said. He added that his interest at the high end lies more with Alpha than with Pentium. "If I want a power-user PC, there's no sense buying a middle-of-the-road Pentium," he said.

However, Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass., said he views the XL systems as Pentium boxes first and foremost since it remains unclear how much single-user demand there will be for the Alpha versions running Microsoft Corp.'s Windows NT.

High performance

Digital's pricing is not especially aggressive, but the 80 million WinMarks rating on the 60-MHz Pentium-based XL 560 qualifies it as "a screamer," according to Zwetchkenbaum.

"You've got to give them their due in that respect. They managed to put together a very high-performance platform," he added.

One lingering issue, though, is Digital's lack of sales through indirect channels. The company's PC business unit signed several distribution deals last summer, but Winnie Briney, U.S. marketing director for PCs, acknowledged that a channels support infrastructure is still in the formative stage.

"We don't even have full-bore sales teams in place on each of the channels yet to make sure we're fully exploiting them," said Briney, who joined Digital in September. She added that she expects Digital to be more competitive in the channels area by the first quarter of 1994.

Novell tightens NetWare links to VAXs, Alpha

By Craig Stedman

Trying to fill a hole in its enterprise systems line, Novell, Inc. last week introduced a set of NetWare Loadable Modules said to enable PCs on NetWare LANs to access Digital Equipment Corp. computers through their servers.

Due to ship in December, the software implements Digital's Local Area Transport (LAT) protocol on a NetWare server. That makes the server the point of contact with VAX and Alpha AXP systems and eliminates the need to install protocol stacks other than Novell's IPX code on individual PCs.

While NetWare-to-VAX software is available from third-party vendors, loading LAT or other transports at the PC level was the only approach Novell could recommend to its customers until now. However, that method eats up PC memory and also can require dedicated bridges or routers within wide-area networks.

NetWare for LAT "gives Novell the DEC connectivity that it didn't have before," said Nancy Meachim, a senior analyst at International Data Corp. in Framingham, Mass.

No holdups now

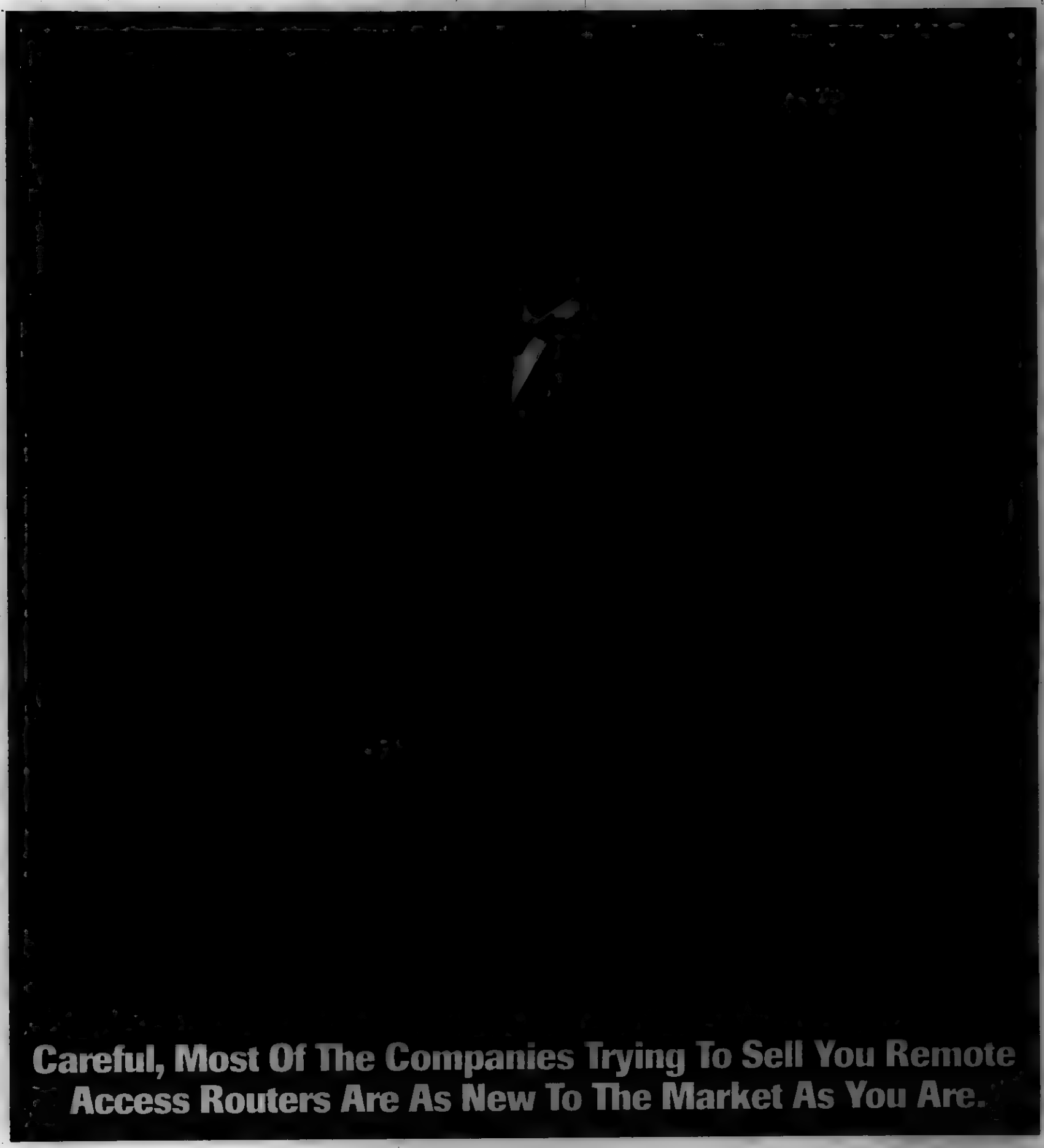
Mike Thompson, information systems manager at Integrated Device Technology, Inc. (IDT), said TCP/IP network traffic "is considerably less" now that he no longer has to connect PCs to his VAX systems via direct TCP/IP gateways. The Santa Clara, Calif., semiconductor vendor is beta testing NetWare for LAT.

IDT also uses InterConnections, Inc.'s NetWare connectivity software with some of its PCs. That lets users access VAX applications in native DOS or Windows mode rather than via the terminal emulation supported by NetWare for LAT.

Still, the Novell product "is very inexpensive and straightforward," Thompson said.

Steve Williams, network administrator at Santa Clara Valley Medical Center and another NetWare for LAT beta tester, said he expects to be able to implement it for about $300 per user in a 64-PC installation. That compares with a cost of $800 per port using terminal servers to provide VAX access, he noted.

Digital plans to ship in January a new version of its Pathworks LAN software that will allow NetWare clients to get at VAX files and print services via IPX [CW, Oct. 18]. Nearly a third of VAX sites use NetWare, according to Computer Intelligence/InfoCorp figures.



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Amdahl tries to rightsize its business

By Jean S. Bozman
SUNNYVALE, CALIF.

Responding to continued heavy losses, Amdahl Corp. last week said it will lay off 24% of its 7,400-member work force by midyear and cancel two open systems development projects.

The IBM-compatible mainframe maker has been struggling for some time to cope with the impact of sinking mainframe demand (see chart). In August, the company announced it would reorganize into five independent lines of business, creating units with separate profit-and-loss responsibility. Last week the firm restructured again — this time dropping internal development of Unix machines, closing 650,000 square feet of manufacturing and again cutting the payroll.

As expected, Amdahl will fill the Unix void by selling systems from other vendors such as Sun Microsystems, Inc. [CW, Oct. 25].

Some users and industry analysts see the restructurings as reactionary and too little too late. Omri Serlin, president of Itom International, Inc. in Los Altos, Calif., called these new moves "clearly a rear-guard action" and characterized reselling Sun equipment as a "short-term solution."

John B. Jones Jr., a vice president of research at Salomon Brothers, Inc. in San Francisco, said the company put itself in its current fix by taking too long to develop its open systems strategy. "They missed the boat in being able to do it themselves."

Amdahl's latest comeback strategy is two-pronged: It will respond to IBM's next generation of mainframes with a more cost-effective design based on CMOS chips and simultaneously try to boost software and services revenue.

These new revenue streams will be critical because CMOS chips will further reduce already tightened mainframe profit margins. The company has a long way to go in these areas, however. Mainframe services, such as maintenance and technical education, represented 17% of the company's 1992 $2.5 billion revenue, while software sales accounted for a mere 3%.

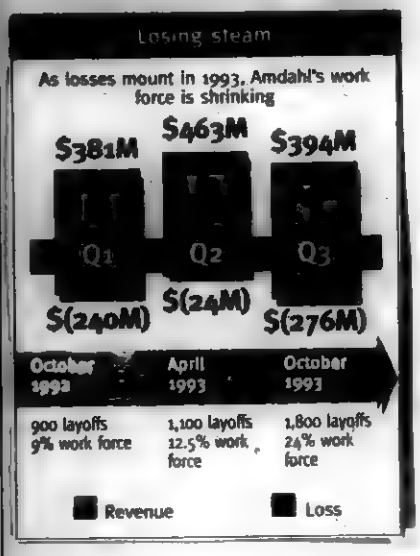
One thrust of the new structure is providing re-engineering services, such as linking legacy mainframe systems to applications running on Unix servers.

Although Amdahl Chief Executive Officer Joseph Zemke insisted for over a year that downsizing was overhyped, Amdahl is now finding that its installed base is moving very fast in that direction.

"This may very well be the last of the old-line mainframes we ever buy," said Peter Bauer, director of information systems at the 400-physician Marshfield Clinic in Marshfield, Wis.

The clinic just added a second Amdahl 5995 mainframe, which runs the Amdahl UTS Unix operating system, and is expanding a campus fiber-optic network with the help of Amdahl consultants. But the next generation of Unix machines may include many vendors' platforms, he said.

"I think a lot of people are in a holding pattern [with mainframes]," said Frank Stromboe, information services director for the city of San Antonio. "Moving applications off the mainframe buys us cycles as we make a transition from mainframes to client/server and Unix."



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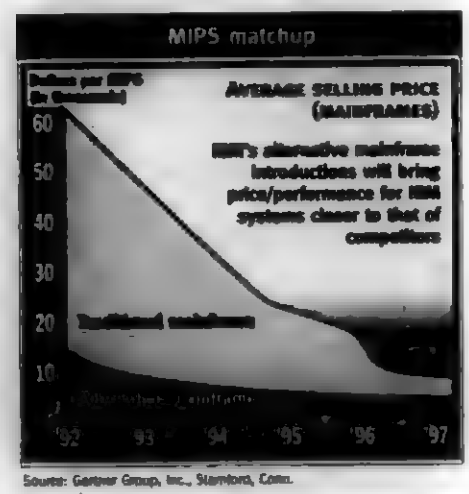
Massively parallel processing

Simultaneous querying ushers in mainframe future

By Johanna Ambrosio

IBM will officially start the race toward its mainframe future with the announcement tomorrow of its first parallel processor aimed at the general-purpose market. While the machine's initial scope will be limited, it will serve as the basis for IBM's next generation of mainframes.



Source: Gartner Group, Inc., Stamford, Conn.

The machine, dubbed the Highly Parallel Query System (HPQS), will allow customers to off-load their DB2 database from their mainframe, thus saving regular mainframe horsepower for other applications [CW, Jan. 18]. The initial HPQS version will support DB2 queries only, but later models will add updating capabilities as well as other databases to the mix.

As such, HPQS will compete head-on with computers from Kendall Square Research Corp., Encore Computer Corp., Sequent Computer Systems, Inc., Hewlett-Packard Co. and the newest wares from NCR Corp. (see story page 1).

Sources said HPQS, which directly attaches to the ES/9000 family and to some models of the 3090 line, will be delivered in quantity in March. A modular architecture will support a minimum of 50 MIPS and a maximum of about 200 MIPS. Pricing is expected to be around $18,000 per MIPS.

Separated then united

The system will come bundled with special versions of DB2, the MVS operating system and other software that allows SQL queries to come into HPQS and be broken into pieces that are given to whichever processors are available. A utility will take the DB2 data on the general mainframe and move it to HPQS. Storage devices and services will complete the mix.

IBM spokesmen did not return phone calls seeking comment, but Nick Donofrio, the head of IBM's Large Systems business, talked about HPQS earlier this year [CW, Feb. 15]. At that time, he promised it would require little work to make the transition from the mainframe to the parallel versions.

It is a vow that users are counting on. "We have a lot of interest in this product — if the pricing is aggressive," said James F. Sutter, vice president of information systems at Rockwell International Corp. in Seal Beach, Calif. "The key question is how easy it will be for us to move our applications."

However, it is still unclear to what extent existing applications will be able to take advantage of the parallel architecture. It is also unclear to what extent users will be able to customize the machine once it is installed.

Third parties courted

But IBM trying to get third-party software vendors to support HPQS. Vendors signed up so far include Candle Corp., Oracle Corp. and Information Builders, Inc.

HPQS will likely appeal to data-intensive shops in financial services, insurance, consumer goods and other industries, observers said. Allstate Insurance Co. in Northbrook, Ill., helped IBM develop the machine; at least one other beta version of the machine is running at a site in Europe.

Jim Cassell, an analyst at Gartner Group, Inc., estimated IBM will sell perhaps 200 to 300 HPQS machines during the next few years. By that time, IBM will follow HPQS with other parallel models for transaction processing and other tasks. By the end of the decade, the parallel architecture will be the basis of IBM's entire family of general-purpose mainframes, Donofrio has said.

Some users are withholding judgment, at least for the time being. Doug Underhill, vice president at CSX Technology in Jacksonville, Fla., said, "The premise is if it speeds things up, it's good. But doing database queries quickly does not address whether you should be doing it. You have to have a very strong business case as well."

NCR to boost system

CONTINUED FROM PAGE 1

David Frankel, director of technology at The Smaby Group, Inc., a Minneapolis-based research firm (see story at left).

While they wait, several customers said they wanted to see enhancements to the 3600, including parallel query capabilities, which they said would further entice them to remain loyal to the NCR architecture rather than shop elsewhere for future MPP systems.

Several NCR 3600 customers said they were eagerly awaiting the parallel query feature of Oracle Corp.'s Oracle 7.1 Parallel Server and Sybase's Navigation Server, both of which will run on the MPP machine next year. Delta Air Lines, one of three Sybase Navigation Server alpha testers, plans to use Navigation Server to prototype a new application for tracking baggage, gate agent information and other airport operations, said David Cochran, technical coordinator of architecture at the Atlanta-based airline.

Ready for beta

Berl Hartman, vice president of product marketing at Sybase, said formal beta testing of Navigation Server will begin next month with volume shipments slated for mid-1994. NCR and Sybase codeveloped Navigation Server, the last of 12 System 10 products that Sybase announced a year ago.

Owen Robertson, a database administrator at Invesco Funds Group, Inc. who was among 400 customers attending an NCR briefing in San Diego last month, said his company plans to upgrade its Oracle 6.036 database to Oracle 7 by year's end to attain several new features.

For example, Oracle 7 provides shared SQL and multithreaded server capabilities, which Oracle 6 lacks. Oracle 7.1 will come equipped with a parallel query engine, a capability similar to Sybase's Navigation Server, which divides and guides queries through SQL server databases running on parallel processors.

After various pieces of a query are broken down and sent across by the parallel processors, Sybase's Navigation Server and Oracle 7's parallel query components will reassemble the query and send a single response to the user. Those capabilities have caught Robertson's attention because his company's burgeoning decision-support systems would be able to read through data more quickly with such technology, he said.

Others see the 3600 as a stopgap along the way to the 3700. "The 3600 is going to carry us for another three to four years, so we'll see what the marketplace brings with the 3700 and other systems," said Forrest Grapes, manager of technical services at Kansas City Power & Light Co. in Kansas City, Mo.

David Barrett, a vice president of information technology at Invesco, a Denver-based mutual funds group that installed the NCR 3600 in August 1992, also said he can wait on the NCR 3700 and alternative systems. "I don't have great concerns that [the 3600] won't keep pace for some time," Barrett said.

Like other NCR 3600 customers, he said his company opted for the Intel Corp. 486-based machine because it is field-upgradable to the Pentium-based NCR 3700 and beyond.

"The 3700 will have better speed and [direct-access storage device] performance than the 3600, but I'm thinking that an upgrade is a 1995 decision since we just put in the 3600," said Mark Davis, director of data management at Union Pacific Railroad in Omaha.

To help smooth the migration to the NCR 3700, the Dayton, Ohio, computer maker this week will also announce the immediate availability of Pentium upgrades to the NCR 3600, according to Andre Dahan, assistant vice president of strategic planning and customer alliances.

NCR 3600 and Teradata DBC 1012 enhancements include the following:
- **Pentium processor upgrades for the NCR 3600. Available now.**
- **i486DX/2 microprocessor upgrades for the NCR 3600 that run the Teradata DBC 1012 database. Available now.**
- **Teradata DBC 1012 database Release 5.0. Available now.**
- **Immediate beta availability of Oracle 7.1 Parallel Server database with parallel query option.**

Vendors are pushing Unix toward high-end machines. See story page 67.

Oft delayed

NCR's 3700 was originally slated for delivery earlier this year. But after announcing plans last year to delay the system to early 1994, NCR told analysts in August that shipments of the multithousand microprocessor machine would be further delayed until mid-1995.

The Pentium-based NCR 3700 has been delayed to incorporate several technical enhancements, including the optimization of the Unix operating system to run commercial parallel processing applications, said Andre Dahan, assistant vice president of strategic planning and customer alliances. Industry observers, however, said that scalability rather than the scalability of the highly parallel systems has contributed most significantly to its delayed debut.

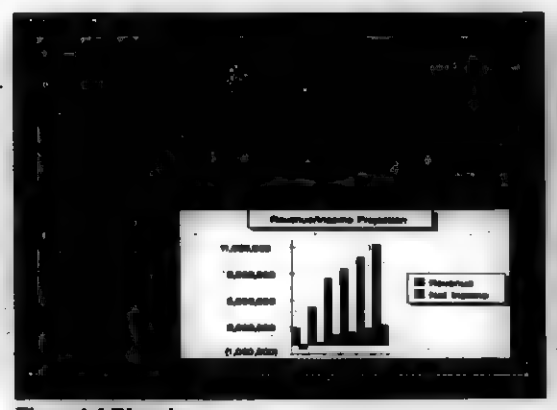
"Most companies with MPP systems today are only running dozens, or at most, a few hundred parallel processors," said David Frankel, director of technology at The Smaby Group.

"The need for an MPP system with thousands of processors, such as the 3700 will have, isn't really there yet," Frankel added.

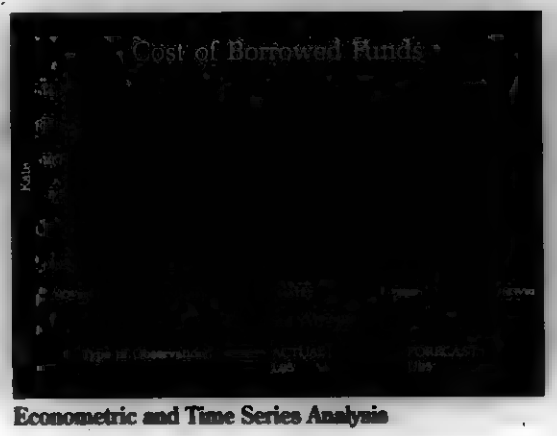
Agreeing with Frankel, NCR 3600 customers interviewed last week said they have only just begun to harness the processing power of their machines and probably will not be ready to upgrade to a 3700 before 1995.

Meanwhile, NCR continues to optimize the performance of the NCR 3700. When the machine is delivered, it will be price/performance competitive with forthcoming MPP machines to be introduced in 1995 by IBM (see story at left), Unisys Corp. and other vendors, according to Robert G. Simko, executive director at International Technology Group, a Los Altos, Calif., market researcher.

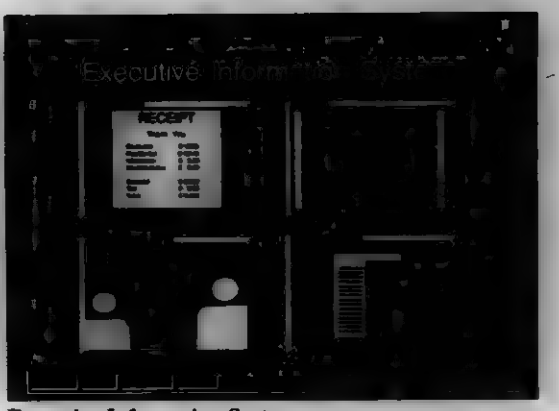
— Thomas Hoffman



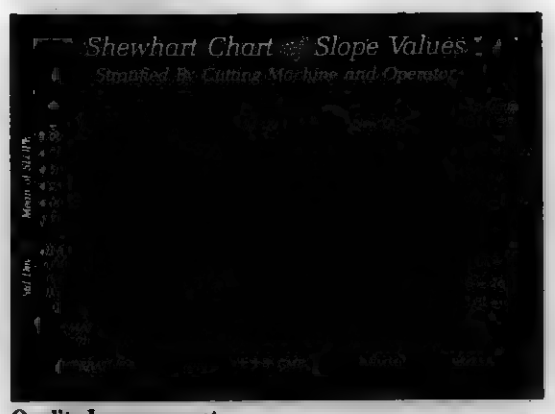
Financial Planning



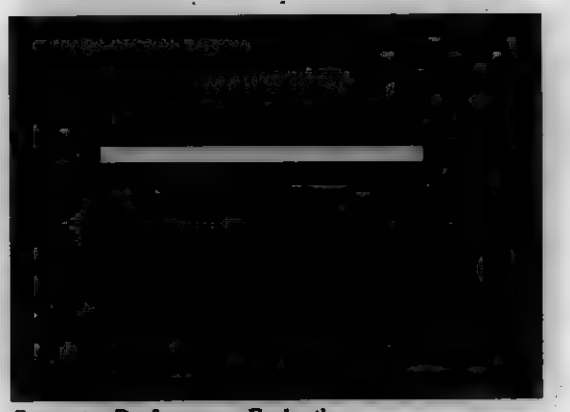
Econometric and Time Series Analysis



Executive Information Systems



Quality Improvement



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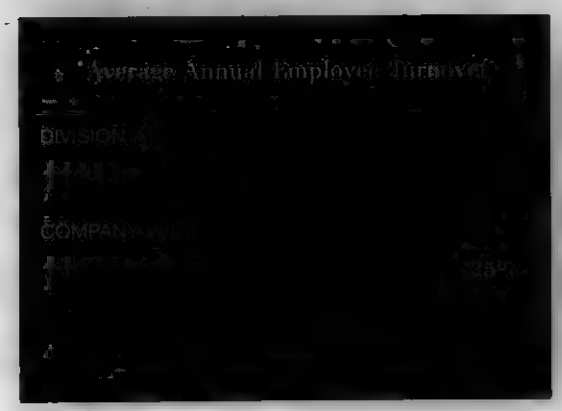
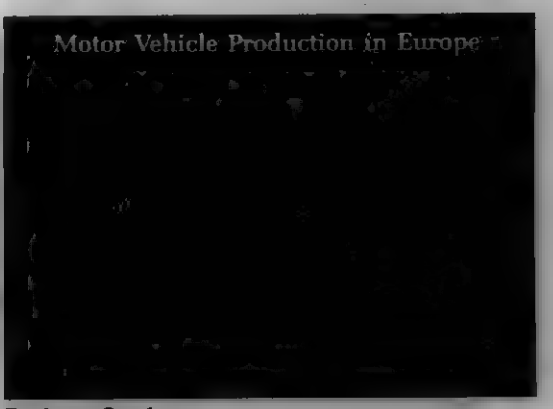
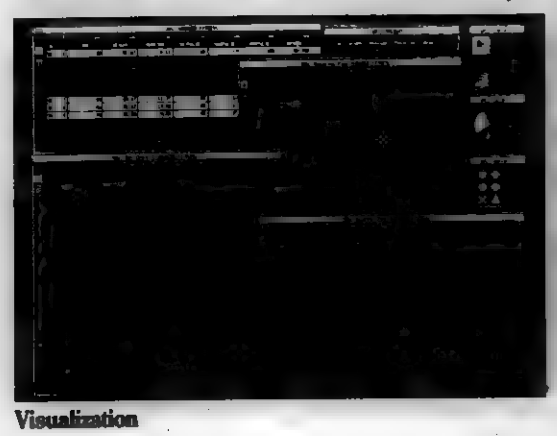


Reporting

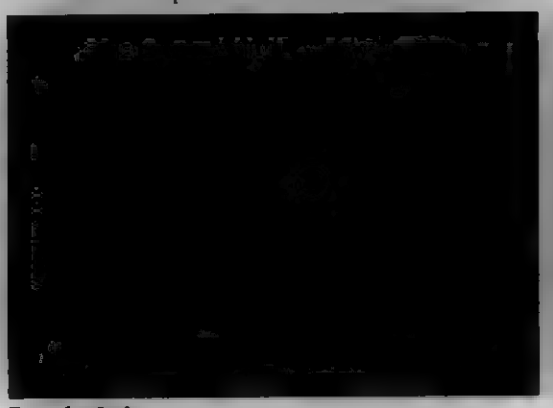
Market Research



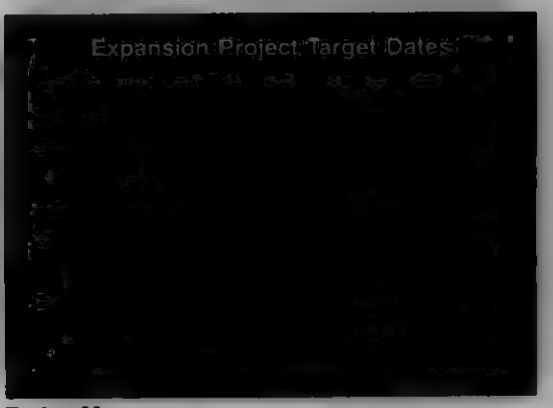
Business Graphs



Visualization



Data Analysis



Project Management

Networking

Will 'fast LAN' technology thrive on its own?

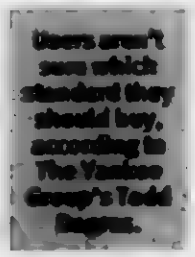
By Joanie M. Wexler

■ Even as the first 100M bit/sec. Ethernet products from inventor Grand Junction Networks, Inc. start hitting the streets today, the future of the so-called "fast LAN" technology will remain a question mark.

It is not clear whether the pumped up LAN technology, which preserves entrenched Ethernet investments in expertise, router ports and protocol analysis tools, will wind up functioning primarily as a pre-Asynchronous Transfer Mode (ATM) bottleneck-reliever or thrive as a LAN in its own right.

"Users are confused; they're not sure which 'standard' to buy," said Todd Dagres, vice president of communications research at The Yankee Group, a Boston consultancy. He was referring to competing fast LAN standards from two camps, one led by Grand Junction and the other by AT&T and Hewlett-Packard Co.

Meanwhile, Atmel Corp., a semiconductor firm in San Jose, Calif., has been a beta site for Grand Junction's products for about a month, using them to alleviate server traffic jams. The installation comprises Grand Junction's FastSwitch 10/100 switching hub, which supports many dedicated 10M bit/sec. Ethernet links, two dedicated 100M bit/sec. connections and corresponding FastNIC 100 Extended Industry Standard Architecture adapters in the servers.



The scenario allows Atmel to dedicate 10M bit/sec. to certain workstations using existing adapters and to deliver 100M bit/sec. to the oft-tapped servers, effectively tripling the amount of bandwidth available, Atmel said. This scheme is "cheaper than trying to get FDDI interfaces into all the servers," said Tom Gilbeany, communications engineer.

FDDI, or Fiber Distributed Data Interface, is a fairly established 100M bit/sec. LAN. Interface cards hover around the $1,000 mark, however, whereas the Grand Junction cards cost $399.

While 100M bit/sec. Ethernet is in its infancy in the standards process — the Grand Junction version is being submitted to the Ethernet standards body this month [CW, Nov. 1] — "standards didn't play so much of a role here," given the high-speed links are confined to a fixed number of centralized servers, Gilbeany said. He said the role of 100M bit/sec. Ethernet is uncertain in his firm. "It could change to ATM, something else or catch on and take off. But this will hold us a few years till we see what develops."

API wars

CONTINUED FROM PAGE 1

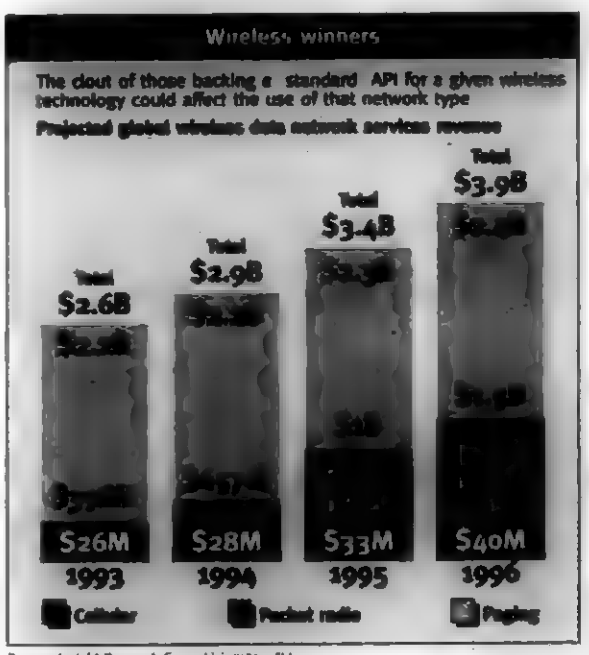
ever wired or wireless communications service they choose, she said.

However, competing activities, including an expected initial demonstration of Motorola's Mobile Networks Integration (MNI) specification at next week's Comdex/Fall '93 show (see box below), could eventually hinder wireless use if efforts do not coalesce before wireless demand ramps up.

Incompatible interface methods mean that "some applications built for one network may not be available on another," said David Coursey, editor of the "P.C. Letter" newsletter, published in San Mateo, Calif. That, in turn, could impinge on horizontal, widespread wireless-enabled application use, he said.

On the other hand, as in the case of Farchione's initial project, "vertical markets don't care," he said. "They pick a protocol, often which is best suited for their application, and that's it." He predicted that wireless use will stay largely vertical — or at least confined to a finite population of users — for several years to come.

Indeed, Chevron Information Technologies Co. in San Ramon, Calif., is currently content to use just RAM Mobile Data's network services, said Dale Reed, a personal systems analyst. "So for development purposes, we'll stay with application interfaces that work on that carrier," Reed added.



Source: Insight Research Corp., Livingston, N.J.

Paging APIs!

Expected announcements from Motorola at Comdex/Fall next week include the following:

▶First application rollouts and partnership announcements for its Site Message product [CW, April 19], which allows mobile workers with alpha pagers to download E-mail, calendaring, PC-based faxes and other data when away from their desks or offices.

▶First live demonstration of its MNI specification, which allows developers to write applications that interface to Ardis, RAM Mobile Data, CDPD and paging networks.

▶Enhancement of the Flex paging protocol to boost paging network throughput from 2,400 to 9.6K bit/sec.

Network enabler

MNI, announced last spring [CW, May 3], is an API and gateway effort by Motorola to create what it hopes will become an industry standard. The spec allows developers to network-enable message-based applications for a variety of wired and wireless networks with one interface. Initial products were due in the third quarter but have slipped to first-quarter 1994, a Motorola spokesman said.

Slated to allow developers to add hooks into Ardis, RAM, Cellular Digital Packet Data (CDPD) and paging networks, MNI will be an alternative to RAPI. And yet a third spec is under construction by Intel Corp. for a consortium called the Asynchronous Protocol Standards (APS) alliance.

Analysts said they expect other vendors, such as AT&T with its huge McCaw Cellular Communications, Inc. interest, to also hop on the API bandwagon with their own specifications.

The upshot of multiple APIs is hazy. With all contributing efforts considered in an equal light, competing APIs would "bring forth the best possible solution for the end user," said Robert Rosenberg, president of Insight Research Corp. in Livingston, N.J. This is because developers could evaluate and choose an interface on technical merits, he said.

The problem, Rosenberg said, is that "the playing field is not level, and vendor clout will certainly play a factor when independent software vendors choose their API."

The $250 RAPI kit is available for DOS PCs, and versions for the Hewlett-Packard Co. HP100LX palmtop, Windows PCs and Apple Computer, Inc. PowerBooks are due to ship in the first quarter of 1994.

In the meantime, the APS alliance, which includes Intel, Isocor, Microsoft Corp., Apple, Advantis and other vendors that agreed to work together on the standard in October, has not yet set a date for a draft specification, according to a member of the alliance.

Reporter's Notebook

Speaking at E-Mail World in Santa Clara, Calif., Internet guru Einar Stefferud challenged users to demand from vendors the ability to send messages intact across all their systems.

Today's solution of using electronic-mail gateways that translate messages into different formats creates very serious problems when the translations go awry, which they often do. "We don't want letters that are opened by the post office and rewritten for us," said Stefferud, a principal at Network Management Associates.

Nathaniel Borenstein, a member of the technical staff at Bellcore, echoed this challenge in his session on the future of messaging but added a warning to vendors working on standards today to remember the installed user base. "The problem with X.400 was it was designed to replace everything," he said.

Back in the present, users on the show floor crowed over a personal scanner and related Windows and Macintosh software from Visioneer, a software start-up in Palo Alto, Calif. In demonstrations, the $499 scanner, which is a little larger than a roll of aluminum foil, scanned a one-page document with graphics in about six seconds. The software can convert the scanned images into text formats and drop the pages into E-mail and computer-based fax software. "It's the other half of fax software because you don't have to create documents on the PC in order to fax or mail them around," said one attendee, who envisions equipping his organization's secretaries with the devices.

A partnership between E-mail integration powerhouses SoftSwitch and Hewlett-Packard had less clear benefits. The duo said they will co-market their X.400-based messaging products, SoftSwitch's multiprotocol EMX switch and HP's OpenMail. While SoftSwitch's product lacks message storing capabilities and HP's lacks multiprotocol support, their product lines compete in many other ways, analysts said. The companies said one benefit is that HP's OpenView network management system could be used to manage both platforms, but they did not provide details or time frames for the

NT to blend in X.500 directory services

CONTINUED FROM PAGE 1

One of the problems with running multiple server networks lies in synchronizing the messaging directories. If Microsoft implements X.500 correctly, the NT server should help do that and should interface well with other vendors' X.500 directory products, he said.

If it licenses Siemens' X.500 code, Microsoft will assure itself of compatibility with the emerging industry standard. It was Siemens' X.500 submission that was accepted by the Open Software Foundation for inclusion in its Distributed Computing Environment (DCE).

Siemens was unavailable for comment at press time.

Head start

IBM has already announced that LAN Server will comply with DCE, which inherently means it will work with X.500. IBM has already shipped LAN Server client software that works with DCE and is expected to ship a DCE-compliant server portion soon.

> Microsoft is not likely to make [X.500] commercially available in Advanced Server until the next update, slated for next year.

While Novell's NetWare 4.x series also provides directory services, the services are not based on the X.500 standard.

"The importance of this is that Advanced Server starts to deliver parity with the network operating systems already in place from Novell and Banyan," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C.

Microsoft is not likely to make the technology commercially available in Advanced Server until the next update of the product, which is slated for sometime next year. While Microsoft could deliver it as an add-on to Advanced Server, most observers predict Microsoft will wait so it can more tightly weave it in.

"If they make it an add-in, it would be defeating the purpose of some of the product's advantages. No other vendor has tried to just plug it in," Dzubeck said.

However, even with the addition of sophisticated directory services, some users said they would not view NT as an enterprisewide solution because of its immaturity.

"We'll probably use it more as application server," said Brian Moura, an assistant city manager in San Carlos, Calif., a NetWare site.

Although Microsoft officials declined to comment on the company's X.500 plans, one executive acknowledged the company's interest in directory services.

"We want to ensure that NT is the ultimate open platform, and we are certainly looking at X.500," said Dan Shelly, a Windows NT product manager.

Microsoft has said its forthcoming Enterprise Messaging Server will support X.500 directory services, but it is unclear how that will be done. One logical option is that Enterprise Messaging Server will operate as a module on the NT Advanced Server and that it will use the server's directory services, analysts said.

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management capabilities.

Another HP partnership promised to allow OpenMail users to exchange messages, documents and binary files with IBM mainframe and AS/400 users. LinkAge, Inc. in Ottawa will provide the gateway software that will enable these functions, beginning in the first quarter of 1994.

Meanwhile, Z-code Software in San Rafael, Calif., announced a new version of its Unix-based E-mail that uses the Multipart Internet Mail Extension (MIME) standard. MIME allows multimedia messages to pipe through the Internet unscathed. Unipalm in Cambridge, England, demonstrated its new Unix-based E-mail software that uses MIME and Microsoft's MAPI to send multimedia messages.

—Lynda Radosevich

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IBM

News Shorts

Markey seeks more data protection

U.S. Rep. Edward J. Markey (D-Mass.) last week introduced a bill called the Telephone Consumer Privacy Protection Act, which would prohibit the disclosure of telephone transactional data, regulate Caller ID services and establish a "bill of rights" for telecommunications privacy. The bill also would require businesses that use automatic number identification to inform consumers when they reuse or sell information gleaned from those services.

Compaq unveils midrange, other PCs

As expected, **Compaq Computer Corp.** rolled out 46 desktops this week, including a midrange line called the DeskPro XE based on Intel Corp.'s Pentium microprocessor [CW, Nov. 1]. Compaq also announced price cuts of up to 12% on its ProLinea line and 29% on Pentium versions of the DeskPro/M. Pricing for the lines will now start at $1,149 and $4,099, respectively. The Houston company also announced a new price point of $3,899 for its Compaq Portable 486/66 notebook.

Unisys to boost client/server emphasis

Unisys Corp. is slated today to roll out 10 PW2 ADvantage Series PCs and six CTOS client/server systems featuring Intel's Pentium and Energy Star compliance. Also set to debut is software designed to provide tighter integration between Unisys' Unix-based U6000 Series systems and mainframes running IBM's SNA. Unisys also announced plans to integrate Windows into its CTOS architecture in the first half of next year.

Sybase employee charged in theft

Oracle Corp. has filed a civil complaint against a **Sybase, Inc.** employee, alleging theft and possible misappropriation of trade secrets. William Brumiller was arrested in late September for allegedly stealing hardware and software from Oracle's Redwood Shores, Calif., offices. Brumiller was a programmer at Oracle until June, when he joined Sybase's Gain Technology application development tools unit. An investigation of Brumiller's home turned up a PC, disk drives and several other items reported missing from Oracle both before and after Brumiller went to Sybase, according to Juana Sherman, senior corporate counsel at Oracle. A search of Brumiller's office at Sybase, witnessed by both Sybase and Oracle representatives, found no proprietary Oracle information at Sybase, spokeswomen from both firms said.

SHORT TAKES **Microsoft Corp.** has announced a program to allow developers each quarter to automatically receive the company's Development Platform package, which includes current versions of MS-DOS, Windows, Windows for Workgroups and Windows NT as well as all of Microsoft's software development kits necessary to create Windows applications. The one-year cost is $95.... **Mail-order PC maker Zeos International Ltd.** in Minneapolis and **CompuAdd Corp.** in Austin, Texas, said they are discussing a possible business combination.... **Kean, Inc.** in Boston has signed a letter of intent to acquire systems consultancy **AGS Computers, Inc.** from **Nynex Corp.** in White Plains, N.Y. ... In the largest theft of computer chips to date in the U.S., masked armed robbers stole $2 million worth of computer chips from an **Oki Semiconductor** plant in Tualatin, Ore.... On Dec. 1, **Hewlett-Packard Co.** will launch an express financing and leasing program through which computer customers receive a financing decision within 24 hours.... As expected, **Kendall Square Research Corp.** announced the KSR-2 parallel computer with up to 5,000 processors.

Portables

Toshiba shrinks notebook line

By Stephen P. Klett Jr. and Michael Fitzgerald
IRVINE, CALIF.

Attempting to prove that great things can come in smaller and smaller packages, Toshiba America Information Systems, Inc. is expected today to unveil a subnotebook line sporting features previously found in the company's full-size brethren.

Toshiba's Portege T3400CT is powered by an Intel Corp. 33-MHz I486SX and features an active-matrix color display and a three-hour battery life in a 4.4-pound package. A monochrome version weighs 4.1 pounds and has at least a four-hour battery life, according to Toshiba.

The relatively long battery life comes in part from lithium-ion battery technology, which Portege is the first portable to use. It is also the first subnotebook-class machine with local bus graphics, including a built-in Western Digital, Inc. Rocket graphics chip.

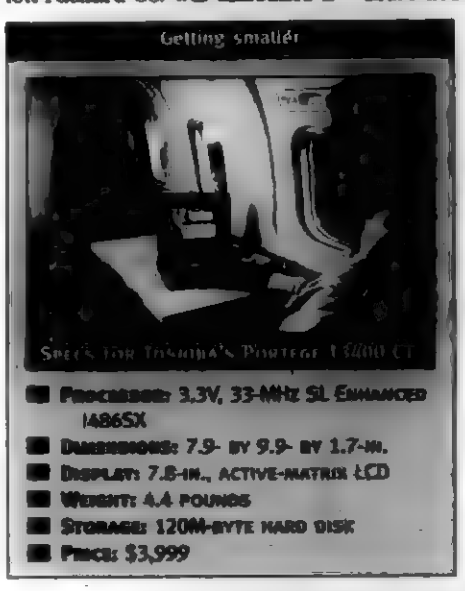
"They've come out with a well-engineered product," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass.

Portege incorporates a single PCMCIA Type II slot and a version of the TrackPoint II pointing device built into the IBM PC Co.'s ThinkPad. Bundled with Traveling Software, Inc.'s CommWorks, a monochrome version will ship in January for $2,599; a color model will ship later this month for $3,999.

Analysts said the new products will help Toshiba retain its position as the No. 1 notebook vendor worldwide in the face of ferocious competition. For example, Epson America, Inc. is reportedly readying a 486-based notebook for display at Comdex/Fall '93, and Hewlett-Packard Co. will announce a 486 version of its OmniBook today.

Epson's ActionNote 700 will sport an active-matrix screen, a 33-MHz 486DX processor and weigh in at 5 pounds, positioning it to compete with subnotebooks at roughly $3,000. HP said the 2.9-pound OmniBook will be based on a 25-MHz 486SLC chip from Texas Instruments, Inc. and start at $2,125. The machine's reflective LCD screen and 40M-byte hard drive will keep it a step behind the competition, analysts said.

Portege is more expensive and heavier than competing products, such as Zenith Data Systems' Z-lite, IBM's ThinkPad 500 and HP's OmniBook, all of which start at roughly $2,000 and weigh less than 4 pounds. However, Toshiba officials said they are banking on users' need for more functionality.



"Wow! It really sounds like they have a killer machine here," said William I. Lodge, project director at Turner Corp., a multinational construction company in New York. Lodge said he has ordered ThinkPads but has pretty much given up on receiving them in quantity because of IBM'S delivery woes and reported battery problems (see story below).

Alex Zlotnick, assistant director of marketing systems at Random House Publishing, Inc. in New York, is also interested. "Before Toshiba, we were looking at the [ThinkPad] 500C, which looked nice, but you can't get it," Zlotnick said. He said Random would consider Toshiba and Epson.

Borland takes on Microsoft

By Melinda-Carol Ballou

Borland International, Inc. will take a stab at rival Microsoft Corp. next week when it announces its C++ 4.0 development environment for Windows and DOS.

Borland expects to ace Microsoft by providing support for 16- and 32-bit application development for Windows within the same tool set, as opposed to requiring developers to purchase separate tools for both environments — as Microsoft does.

One tool kit will simplify migration to Microsoft's Windows NT and upcoming Chicago environments, Borland officials claimed. While Microsoft offers separate tools — Visual C++ for 16- or 32-bit development priced at $599 each or $749 for both — Borland will offer an integrated 16- and 32-bit C++ environment for $499.

Next month, Microsoft reportedly will release its Visual C++ 1.5 and Microsoft Foundation Classes 2.0. The company will seek to ease the pain of Object Linking and Embedding (OLE) development by offering class libraries for OLE 2.0, along with Object Database Connectivity support and other features [CW, Oct. 25].

Borland hopes to deliver OLE 2.0 support in its Object Windows Library (OWL) early next year.

Major improvements to OWL 2.0 include a set of predefined visual objects, source-code compatibility between 16- and 32-bit Windows and high-level controls. C++ 4.0 features include new visual programming tools, exception handling and templates.

Power shortage

Advice to users waiting for back-ordered ThinkPad 500s: Don't hold your breath.

IBM has temporarily pulled the plug on production of the subnotebook due to technical problems with the battery, according to a spokesman.

The 500 uses a new lead-based battery technology designed to provide longer life and easier recharge at a lighter weight than conventional batteries. The spokesman said several customers reported that the battery lost its charge very quickly. Some machines lost power immediately after they were turned on.

IBM plans to announce a fix in two weeks; it could come in many forms, including a product recall or shipment of new batteries to customers. "You'll see the 500 back soon," the spokesman said. "This is not a situation where the model will be canceled. It's a temporary halt."

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DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
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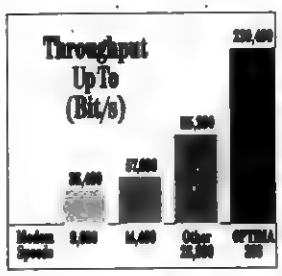

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CA ships OS/2, Windows graphical tool

By Thomas Hoffman

Computer Associates International, Inc. last week began shipping what analysts said is the first graphical development tool kit to work with Windows and OS/2.

CA-Realizer 2.0, a Basic programming environment, was designed to enable developers to write applications in Windows and easily recompile them into OS/2 and vice versa, early beta users said. It is the first upgrade of Realizer since CA inherited the technology in its May 1992 acquisition of Within Technologies, Inc. Within had hoped to take on Microsoft Corp.'s Visual Basic.

CA-Realizer 2.0 combines industrial-strength application development capabilities that take advantage of OS/2's 32-bit operating environment for high-level programmers while meeting the more simplified graphical user interface needs of novice developers, according to John Dunkle, president of WorkGroup Technologies, Inc., a Hampton, N.H., market research firm.

"What Realizer provides for both line-of-business developers and more sophisticated end users is a robust set of tools," Dunkle said.

"It's the best development tool I've used," said Joseph A. Tibollo, manager of PC development at Back Information Services Ltd., a Toronto-based data service provider to the aviation industry.

Less chance for error

Tibollo said he has found it easier to develop applications using CA-Realizer 2.0 than Microsoft's Visual Basic or Boriand International, Inc.'s Paradox programming environments because CA-Realizer requires fewer lines of code to write applications, thus reducing the risk for errors.

More to come

CA's upcoming delivery plans for Realizer for Windows NT break down into a Comdex/Fall '93 demonstration next week, with beta testing slated to kick off by Comdex/Spring.

CA-Realizer includes CA-RET 2.0, a WYSIWYG report writer CA will begin shipping within the next month, and CA-BLE, a Basic language engine subset already embedded in CA-SuperProject for Windows, an automated project management package that began shipping earlier this year.

Tibollo said that in his testing since January, CA-Realizer 2.0 has outperformed Visual Basic and Paradox in several areas, including debugging and data arrays-handling capabilities. For example, Tibollo said CA-Realizer can manage 64K-byte "strings" of data arrays, a function Visual Basic does not provide.

CA had planned to ship a Windows-only version of CA-Realizer 2.0 in June but decided to hold off to integrate cross-platform OS/2 development functionality into the Basic package, said Marc Sokol, CA's director of product strategy.

Several CA-Realizer 2.0 beta testers said it was worth the wait. "I like the ability to develop under Windows or OS/2 while doing it for both," said Chris Moore, president of Moore Consulting, a Mesquite, Texas, computer consulting and customized application development firm. Realizer "does not force me to limit my clients to one operating environment," Moore said.

Another CA-Realizer 2.0 advantage, Tibollo said, is that applications built with it can be distributed free of royalty or license fees, unlike competitive development tools such as Paradox. "If you use Paradox, you can't have multiple users for an application developed without paying a licensing fee. For $99, with all the products we can build, [Realizer] is great," Tibollo said.

CA-Realizer 2.0 carries an introductory price of $99 through March 1994. After that, it will be priced at $247.

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Client/server outsourcing

Canada Post pays as it goes

By Mark Halper

Outsourcing vendors and customers searching for a cost/price mechanism for client/server deals might take a page from the recent $1 billion Canada Post Corp./SHL Systemhouse, Inc. contract, which established a fee structure similar to that of a monthly telephone bill.

The 10-year contract allows the Ottawa-based Canada Post to make monthly service change requests and to pay accordingly. Just like a phone customer may decide to add or discontinue a service such as call waiting, Canada Post can add or subtract software services available to any of the 9,000 PC users that SHL Systemhouse will support.

If, for instance, a department that normally has no need for a spreadsheet suddenly requires one for end-of-the-year accounting, SHL Systemhouse would deliver the program. It would then increase the user's monthly charge for access to one of the 1,000 LANs SHL Systemhouse is installing, a move that would factor in licensing fees.

The wave of the future?

This "fee for service" setup represents one answer to the bedeviling question of how to price outsourcing in a distributed computing environment in which the outsourcer is more a service provider than a data processor, Merrill Lynch & Co. analyst Stephen McClellan noted.

"That's the way some of the client/server deals work, and it may be the way more of them go in the future," he said.

In another recent example of client/server pricing, Freeport-McMoRan, Inc. and IBM's Integrated Systems Solutions Corp. devised a labor-based pricing formula [CW, Oct. 11].

"We're buying services, not hardware or people," said Ron Keating, Canada Post's director of information technology strategy. "Within defined parameters of due notice, we can order things up or discontinue service. If we decide we no longer need distributed processors in the Yukon, we can turn off those services."

Underwriting your outsourcer

In an unusual "partnership," Canada Post is backing loans that SHL Systemhouse needs to purchase computer and communications assets from Canada Post. Sources said the outsourcing deal would never have transpired without Canada Post's financial leverage.

Keating further explained that the "due notice" varies depending on the scope of the requested changes.

The deal calls for SHL Systemhouse to move many of Canada Post's operations off of two IBM 3090 600 mainframes and onto about 400 as-yet undetermined distributed computing platforms [CW, Nov. 1]. The two parties have not yet settled on a server architecture, although SHL Systemhouse said it expects to install about 4,000 LAN nodes by the end of next year.

Also under evaluation are both the Unix and the Microsoft Corp. Windows NT operating systems, according to Greg Jacobsen, president of network services at SHL Systemhouse's U.S. subsidiary.

The deal puts SHL Systemhouse in charge of the entire information utility at Canada Post, including mainframe and distributed services, networking, desktop systems and support, voice, imaging and multimedia.

Profit seekers

As a Canadian crown corporation, $4 billion Canada Post is expected to make a profit and undertake commercial enterprises. SHL Systemhouse is expected to improve internal operations and will help move Canada Post into the electronic-mail business, which is undermining the postal service.

On the internal side, Keating said SHL Systemhouse will first move E-mail, report writing software and database analysis and application development tools from the mainframes to a client/server scheme. That phased migration will take three years, after which SHL Systemhouse will move other programs to the distributed environment, he said.

Keating said "a very high percentage" of Canada Post's 235 information technology workers are transferring to the SHL Systemhouse payroll.

SHL Systemhouse bought most of Canada Post's information technology assets, including the mainframes and about 50 Digital Equipment Corp. VAXs, as well as Canada Post's nationwide communications network comprising Northern Telecom, Inc. packet switches, Motorola, Inc. Codex T1 and T3 packet switches and Cisco Systems, Inc. routers. Neither party told the exact cost.

Kemper melds data centers, picks IBM as backup vendor

By Ellis Booker

Kemper Corp. last week completed a two-month data center consolidation that not only closed its Chicago center and moved its contents, including an IBM ES/9000, into its Kansas City, Mo., facility, but also involved relocating its networking center.

Kemper had a IBM 9021 Model 580 in Kansas City and a 3090 Model 600J in Chicago. Both have been replaced by a two-processor ES/9000, which has been logically split to run the existing software code. The operating system on the ES/9000 is MVS CICS.

The moves are expected to result in an immediate net savings of about $1 million for Kemper Service Co., which provides data processing and other services to its business units.

But there will be greater, noncomputing-related savings down the road, according to Frank Diaz, president of Kemper Service. His unit has an annual budget of about $140 million.

The move was prompted by several additional factors, including Kansas City's lower sales and real estate taxes and the fact that Kemper enjoys lower local telecommunications costs in Kansas City, where it has a fiber bypass network. Kemper's network center was also shifted to Kansas City.

Not a people mover

Networking, in fact, played a significant role in the data center consolidation. For instance, thanks to the extended channel capability of the ES/9000 mainframe in Kansas City, Diaz was able to keep most of his technical staff in Chicago. "It really became more of an equipment than a people move," he said. The staff in Chicago will use local consoles to log on to the host in Kansas City.

The consolidated Kansas City center will process more than 4 million transactions per week, handling data processing for two Kemper divisions. As before, it will operate on a 24-hour-a-day schedule.

In a related move, Kemper announced last week it had selected IBM Business Recovery Services as its disaster recovery provider. IBM outbid Comdisco Disaster Recovery Services, Inc. and Sungard Recovery Services, Inc.

Until now, Kemper has handled backup/recovery in-house, using its Kansas City center to back up both its Chicago center and a smaller site in Milwaukee.

When the Kansas City center was built five years ago, "there was really no good backup scenario" from outside disaster recovery firms, Diaz said. No external service provider, he explained, was able to support Kemper's need for recovery of its mission-critical applications within an hour. But updates in IBM's VM system software have made it more flexible from a disaster recovery standpoint, he said.

However, fully outsourcing the data centers to an outside firm is not in Kemper's foreseeable future, said Diaz, who described his 300-person information systems shop as "already very lean."

"Basically, [no outsourcing proposal] has come close to us in staffing or cost per CPU," he said.

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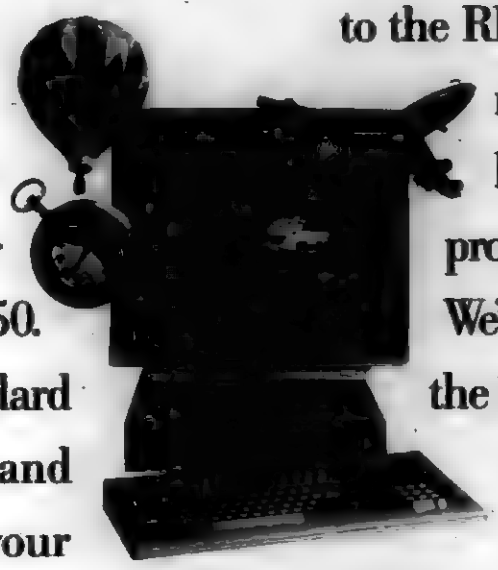

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IBM 990	$147,800	126.0	$1,173
HP 160	$136,530	82.0	$1,665
DEC 4000/610	$131,728	94.6	$1,392

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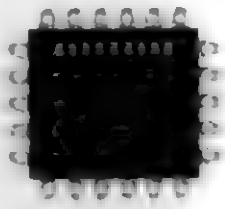
IBM

Integrated PCs gathering steam

CONTINUED FROM PAGE 1

simplified system upgrades. It may also mean that due to the improved reliability of chips, PCs will need less support and maintenance, which today constitute a high percentage of a PC's overall cost.

Also, built-in sound and SCSI could in turn prompt a surge in the use of CD-ROM drives and perhaps multimedia in PCs.



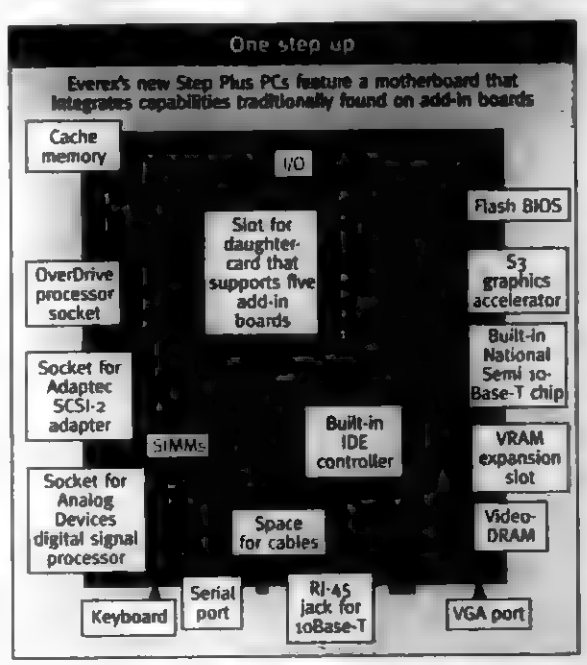
Helping nudge this trend even further along is the Plug and Play initiative backed by Intel Corp., Microsoft Corp., IBM, Compaq Computer Corp. and Phoenix Technologies Ltd. The endgame of this initiative is to make configuration of a range of I/O components and subsystems with operating systems easier and significantly less expensive (see story below).

"The more standardization there is on the motherboard . . . the better and the easier it is for corporate IS," said Andrew M. Seybold, editor in chief of "The Outlook on Professional Computing" newsletter in Brookdale, Calif. Seybold also cited the historical trend toward integrating add-in cards that have achieved a critical mass.

Companies such as Compaq, the IBM PC Co., Hewlett-Packard Co. and Zenith Data Systems kicked off the trend by shipping systems with built-in networking, sound, graphics acceleration and even PCMCIA support on the system motherboard.

The PC Co. will soon add an MWave digital signal processor to PS/2 motherboards and give PS/2 buyers the option to have Ethernet or Token Ring built onto the motherboard as well.

"If you're trying to serve the general market, putting it on the motherboard gives you better reliability and lower costs, and that's what you want," said T. S. Jen, senior technical analyst at the PC Co. Jen cautioned that the PC Co. will likely handle integration differently in its various product lines.



Other offerings

Compaq's newly introduced DeskPro XE line has built-in sound [CW, Nov. 1], and even the new portables from Toshiba America Information Systems, Inc. have built-in graphics acceleration.

But these vendors have limited their integration efforts to certain models and certain features.

Hoping to leapfrog the competition, Everex Systems, Inc. will today announce its Step Plus line of desktops, which come standard with Ethernet, sound, SCSI-2, integrated drive electronics (IDE), I/O and graphics acceleration on the motherboard.

In a nifty design twist, users can configure the system more or less how they want it. While IDE, graphics acceleration and I/O are built-in, users can choose whether they want networking, sound or SCSI. Sound and SCSI are handled via on-board sockets that allow users to pop in the processor of their choice. An intelligent BIOS automatically senses what components are on the machine and configures it appropriately.

Must-haves

With the preponderance of networked PCs that use system-slowing graphical software, providing networking and video acceleration are generally a must. On-board SCSI means users can easily add SCSI peripherals such as CD-ROM; built-in sound allows them to build in multimedia support as it becomes more prevalent. Also, digital signal processors can be programmed to work as modems.

"That's a neat trick — it's a surprisingly innovative design, especially since it's configurable," said Dean McCarron, analyst at Micro Design Resources in Scottsdale, Ariz. He said Everex will take the integrated PC concept further than other vendors at Comdex/Fall '93.

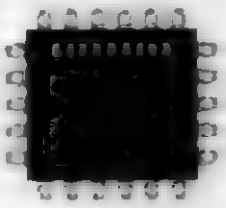
Motherboards with various functions integrated on them now appear to be an inexorable trend, according to observers such as Giusto. "This is a solid trend — desktops are inherently leapfrog products, and you can bet that as soon as this is out, the other vendors are going to do it and try to do more," Giusto said.

Corporate users applauded the trend but said vendors must give them the flexibility to gain features without losing current add-in investments.

"Putting it all together makes sense if you can get the overall price down, simplify things and get it into a smaller package," said Robert McLoughlin, assistant vice president of PC procurement at New York Life Insurance Co. He also said integrating technology on the motherboard should eliminate the troubleshooting nightmare caused by add-in boards that have come loose or lack driver support.

Adding functions to the motherboard cuts not only direct costs for end users but indirect costs as well. For example, manufacturers can make smaller systems, which in a highly competitive market such as desktop PCs means still lower prices for end users.

Also, users are expected to realize bigger savings from reduced labor costs and fewer configuration problems. Consider that for every feature built into the motherboard, a PC manager does not have to assign personnel to rip the lid off PCs to add cards. According to many consultants, the lion's share of a PC's true cost comes from labor and other costs.



Gartner Group, Inc. in Stamford, Conn., estimated that a single PC costs roughly $2,000 a year to administer and support.

Abraham Chait, project manager at Pacific Gas & Electric Co. in San Francisco, agreed that on-board integration of system components has typically meant lower costs and smaller footprints. While increased levels of integration are "a fantastic idea," Chait said he worries about potential replacement costs.

"The downside is what it costs to replace the motherboard after warranty," Chait said. Adding features to the motherboard means that the motherboard may have to be replaced if a component goes bad, he said, adding that would be palatable only if motherboard replacement costs fell under $1,000 after warranty.

Senior editor Ed Scannell also contributed to this article.

New models

Everex's Step Plus models include the Video Electronics Standards Association's VL local bus, in a fully loaded configuration, with National Semiconductor Corp.'s Ethernet networking chip, SCSI-2 and sound included. List price ranges from $1,299 for a 25-MHz 486SX to $2,249 for a 33/66-MHz DX2, without hard drives. Everex officials and analysts said this would save users at least 10% more than buying add-in boards, plus leave users five open slots. For instance, the Analog Devices sound chip costs $8, compared with a Creative Devices, Inc. SoundBlaster Card, priced at $149.

Everex climbs back

Everex finds itself ahead of the market in desktop design with its Step Plus family, which features integrated motherboards. The question is, can it make the most of it?

First, as Everex surfs the crest of the integration wave, the competition is paddling furiously to catch up. Most vendors have started to build more functions onto motherboards, and the rapid pace of development cycles has led most analysts to give Everex at best a six-month window on the market.

Having just emerged from Chapter 11 bankruptcy protection, the company knows it must first convince users it is a viable firm with a viable product. Then it has to prove it has the manufacturing capability to produce the product.

If it has problems manufacturing its new line, its window of opportunity would probably slip to four months. Everex cannot afford an encounter with the backlog problems that have plagued market leaders this year.

Everex acknowledged the obvious: Its future rests on how the market receives the Step Plus. "We know we probably only have one shot at this, so we had to make it good," said Chet Dayal, senior product manager of desktop systems at Everex in Fremont, Calif.

Everex acknowledged it will likely need additional manufacturing capacity, which it said it expects to find, though it declined to say where.

—Michael Fitzgerald

Switched on

Last week, the Plug and Play coalition, now backed by 20 companies, delivered the final specification for its BIOS. The spec is a set of instructions embedded in PCs that will make it easier to configure and install more advanced system designs.

Microsoft said its first operating system to take advantage of the spec will be the next version of Windows, expected in the second half of next year. The first PCs to take advantage of the Plug and Play BIOS spec should reach the market early next year.

"The final Plug and Play specification brings us a lot closer to resolving device conflicts and making PC configurations hassle-free," said Dale Buscaino, vice president of research and development at Phoenix Technologies. *—Ed Scannell*

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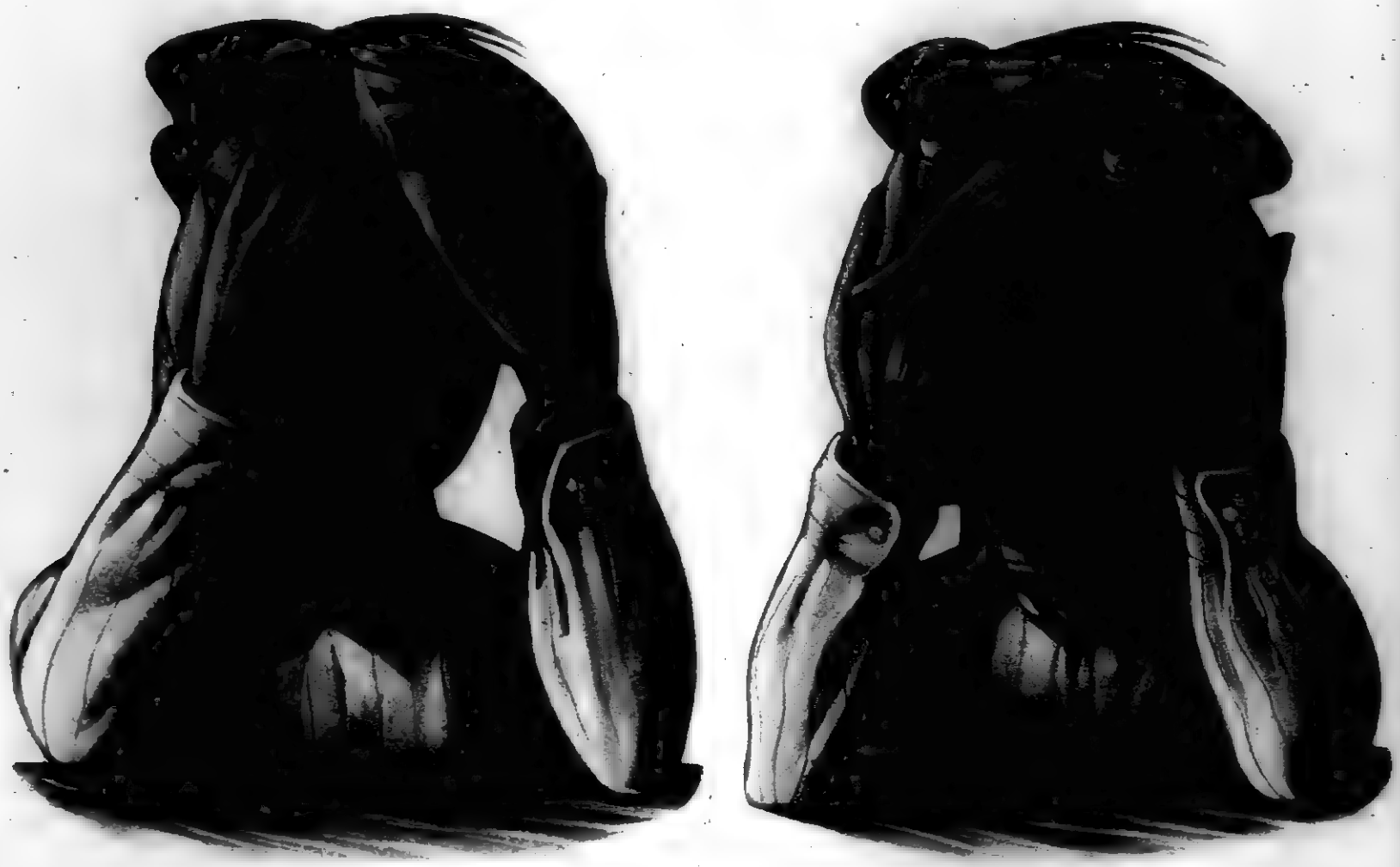

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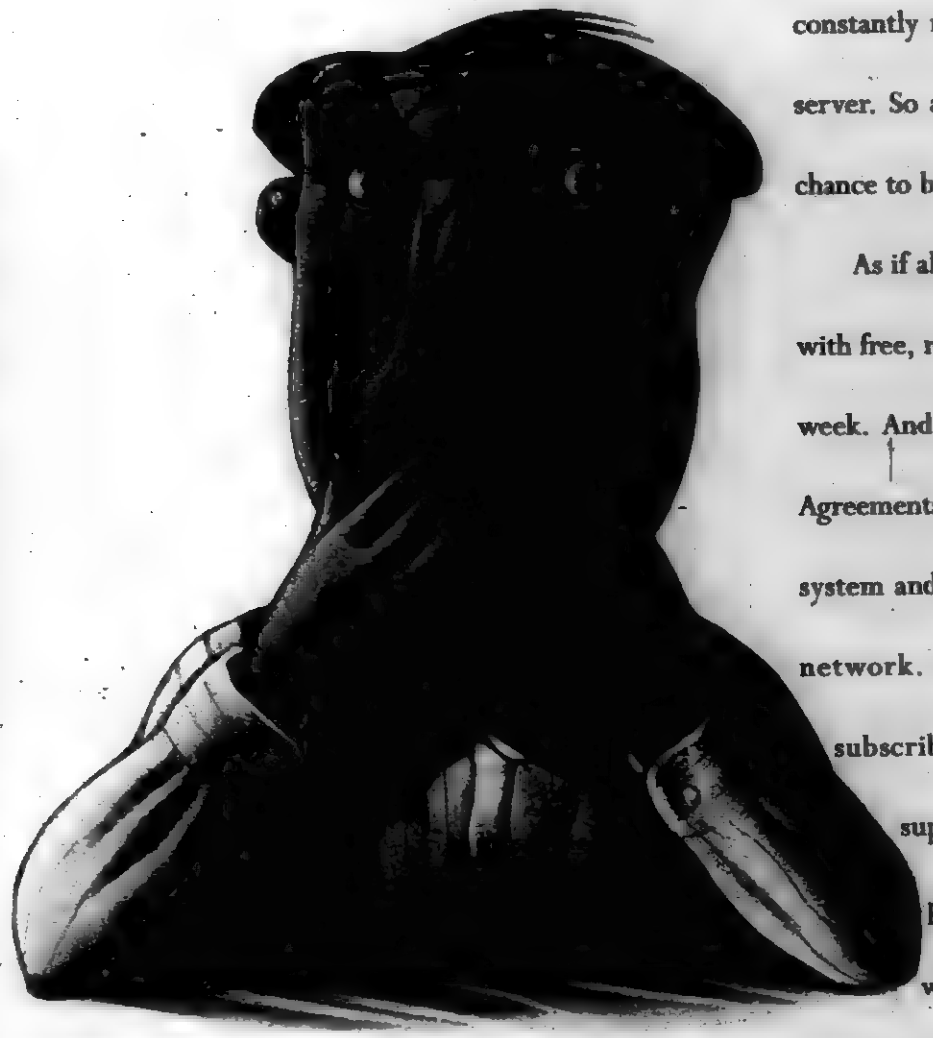

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Multimoola

Next week is Comdex, the big tamale of all computer trade shows and the one the industry looks to for the trends to watch in the coming year. You can bet that one mega-theme this year will be multimedia.

That's not surprising. The incredible shrinking margins in hardware and software have vendors groping for a reason to get users to spend money. A lot of them see salvation in the eye-popping investments computer and communications firms are making in interactive multimedia.

So maybe now's a good time to think about how multimedia is going to affect you, the IS professional. It seems like every vendor I meet lately has a plan for incorporating multimedia into its products. But when asked to define how that costly capability is going to be used, they always mention the same examples: computer-based training, sales presentations, airport kiosks, maybe some user interface stuff.

Hardly the stuff of which revolutions are made. For all the excitement about multimedia, I've still seen precious little justification for its high cost. And it is expensive stuff.

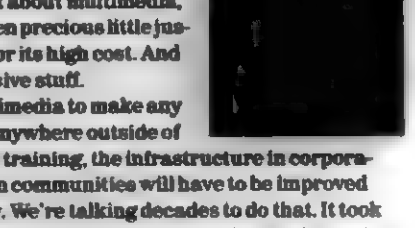
For multimedia to make any headway anywhere outside of games and training, the infrastructure in corporations and in communities will have to be improved drastically. We're talking decades to do that. It took cable TV more than 20 years to reach 70% of American homes. How long will it take corporate America to upgrade to one of the new high-speed technologies that supports multimedia? (Hint: Don't hold your breath.)

And who's going to create all these nifty presentations? There's a dearth of multimedia authoring software out there that doesn't require an engineering degree to use. Corporations are not going to spend the bucks to train business professionals to be amateur television producers. Nor will they sink a lot of money into building multimedia production departments unless the payback is clear. Which it isn't.

And consider support requirements. The last thing corporate IS wants to tackle right now is maintaining a complex, multigigabit network shooting sound and video files to the far reaches of the world. Heck, I'm still struggling to get my SoundBlaster card to work with most of my stand-alone Windows applications. Multimedia requires far more powerful hardware and communications capabilities than most corporations can muster today. The upgrade costs will be staggering, but they'll pale in comparison to the support problems.

I won't even mention the copyright issue.

If you're going to Comdex next week, prepare to be impressed by the dazzling multimedia demos on display. But if you want to plunk down your credit card to invest in the multimedia revolution, better have a long talk with your CEO first.



Paul Gillin, *Editor*

Fighting only half the client/server battle

The fine article "TI tools will keep legacy systems going" [CW, Oct. 18] describes how to migrate code from legacy mainframe applications to client/server environments.

That's great, but it's only half the battle.

These tools don't address the migration of the actual legacy data — data mired by format inconsistencies, mixed domains such as free-form comment fields that fail to map to relational tables, anomalies in names, addresses and other entities that must be identified and consolidated and sundry other data contaminants.

Gartner Group, Inc. warns that most re-engineering efforts will fail because of a lack of attention to data quality. When raw legacy data is migrated to a new environment it exposes your new system to data contamination that will destroy the value and integrity of your information.

A successful strategy places data re-engineering — the automated conditioning, standardization and consolidation of legacy data — directly on the critical path of business process re-engineering.

George Burek
Chief technology officer
Vality Technology, Inc.
Boston

The answer is people, not tools

Your article "Think big picture for client/server" [CW, Oct. 25] correctly identifies the overwhelming variety of technologies, vendors and users involved as the major obstacle to successful implementation of client/server systems. The solution proposed, however, seems like more of the same: more tools and even more technical knowledge.

Salvation lies not in the tools but in the people. In a word, the answer is teamwork.

Systems development life cycle methodologies such as Method/1 and Information Engineering were successful only to the degree to which they were able to subdivide complex, interdisciplinary projects into portions that could be completed by autonomous groups with homogeneous skills.

However, it seldom worked well and will soon not work at all. The relentless advance of new technologies such as client/server is rending this artificial task structure. The requirement today is to help groups that *must* work together.

Do it for the productivity, do it for the satisfaction or do it for the health of your staff. Do it.

No grousing here

In your article about Banyan third-party developers, "Third parties grouse over Banyan's GUI plan" [CW, Oct. 4], you implied that LANshark Systems, Inc. was one of the "disgruntled" third-party developers upset with Banyan for competing with those developers.

We are *not* upset with Banyan about this particular issue.

In fact, Banyan solicited our input for this project more than three months before and was very up front with us about its development plans. All of the third parties that were invited to bid on the graphical user interface development project were similarly informed.

We appreciated Banyan's solicitation and were very happy that it shared its development plans with us far enough in advance to prevent any problems.

Other third-party developers, knowing that Banyan was pursuing this development path, chose to continue development on their products and may indeed now be upset with Banyan. We are not among them.

Scott Sharkey
President
LANshark Systems, Inc.
Reynoldsburg, Ohio

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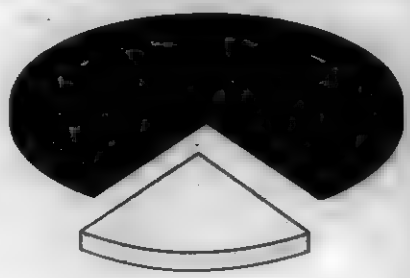

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❑ OS/2	(c)	❑ DOS Windows	(g)
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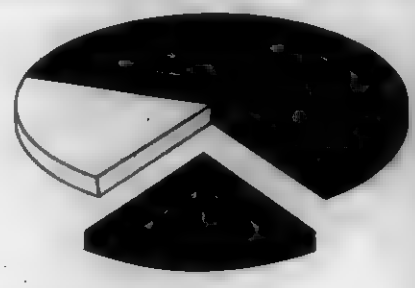

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Think twice before you say 'open'

Joanne Kelleher

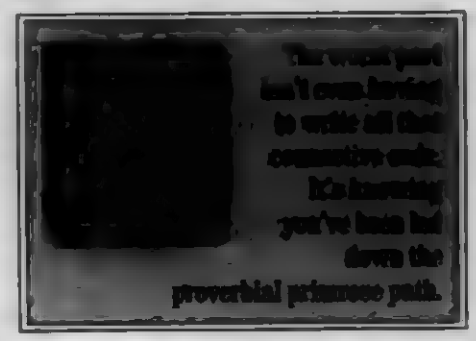
A word to all wise computer systems sales personnel: If you use the word "open" these days, you'd better be talking about the office door or trade policy or seating on the shuttle flight you're about to catch. Openness is a fine adjective in any of those contexts, but it's poison as a selling point. A couple of stories from a conference I recently attended:

A few hours before his speech, one of the presenters worried about whether the phrase "client/server" in his session title might actually turn out to be a turnoff for the audience. "Nah, I guess that's OK," he said, deciding that there were probably a few good miles left in that concept. "The really important thing is that I *never* bring up 'open systems.'"

Fast forward a few hours. Sessions are over, and a top IS executive from a major consumer products company jokes about how he's simply fed up with that damned description, especially as it emerges from the mouths of system vendors. "You know what I do?" he confesses gleefully. "I give each of my vendors a stack of six colored chips — like the ones in casinos — and I tell them, 'Every time you say it, you have to give back one chip. Run out of chips and you're gone.'"

Next day, another CIO pridefully describes a new LAN-based system being rolled out at his organization. It's a great system. He's very proud of it and sure it will bring major productivity benefits. His only regret? His organization could have planned better and gotten the application on stream faster if he'd known just how much connective code had to be written to get all the pieces to work together.

That's the thing, you see. It's hard enough to accurately estimate how long a development project is going to take and how much it is going to cost without having to contend with inflated claims and unrealistic promises. And the worst part isn't even having to write all that connective code; it's knowing you've been led down the proverbial primrose path. It's also having to listen to the same supplier insist that nothing like this has *ever* happened with its system before.



Sure. Just like your mechanic can't hear the nonstop engine clanging that just happened to start as you pulled out of his service bay.

The thing is, there's been so much hype and abuse that people pay about as much attention when a vendor trumpets the openness of its product as the average New York pedestrian pays to a car alarm. OK, maybe just a little more. Because, after all, there *is* one way that a claim of open systems can dependably benefit a purchaser. Here's how one IS exec explained it to me:

"All I do," he said with a wide grin, "is tell my vendors, 'Since your systems are open and work with everything, I decided I should check out the prices of some other systems. I had no idea how cheap things were these days.'" He swears it works even better than the fabled Amdahl mug waved in front of an IBM sales rep.

So maybe, on second thought, you vendor types ought to keep it up. Times are tough, and it's kind of nice to see IS executives enjoying a good laugh.

Kelleher is *Computerworld*'s features editor.

Rapid development melts nasty buildup

Patricia B. Seybold

Bureaucracy can't stand up to rapid application development. The two are mutually exclusive.

If you don't believe that, talk to Bill Kilmartin. Kilmartin is the comptroller of the Commonwealth of Massachusetts, where the budget is more than $20 billion per year, more than 75,000 employees are on the payroll and bureaucracy has been elevated to a fine art.

Kilmartin has problems — very large problems. He has millions of dollars worth of legacy systems that don't give his end users or his stakeholders the information they need and can't even pay his bills in a timely fashion.

Armies of consultants or contract programmers can't dissolve years of fossilized practices. The only thing that will is exposure to fast, interative development.

The current systems aren't very good at contracting for goods and services, either. Procurement procedures are so ossified that it takes 90 days just to gain approval to do business with a vendor and 28 laborious steps to award a contract. Then it takes at least three months to process one once it's been awarded.

To compound the situation, user departments are each mired in their own bureaucratic morasses. None of them can fathom moving quickly, and each runs its own duplicative systems because none would trust the information or the procedures put in place by another.

It's hard to know where to begin trying to make a dent in 20 years' worth of fossilized practices. But Kilmartin took 55 of his top people and their key users off-site for a four-day exposure to state-of-the-art business process redesign and rapid application development.

He broke his troops into high-performance teams and seeded each team with people from the private sector who had been instrumental in leading their organizations through large-scale change.

For the first two days, the teams acted the same way they do in state government. They deliberated. They debated. They blamed the other guy for the current state of affairs and scoffed at these high-tech tools. But gradually, with a great deal of prodding and a set of impossible deadlines, they began to experiment. They rolled up their sleeves and actually designed streamlined processes.

By the end of the four days, the teams had accomplished the unbelievable. They had built a fairly comprehensive process and object model of the state's financial systems. They had built and delivered a first-pass, working employee information system. They had designed a new business process for the daily disbursement systems and mapped out the game plan for piloting systems in four major departments within the next six months.

They had redesigned the entire procurement process, designed a pilot kiosk-based application for giving citizens access to government information and kicked off a pilot project to deliver welfare payments via electronic funds transfer. They had mapped out an architectural strategy for migrating to distributed computing. And they had wrestled with the organizational changes that must be made for any of these reforms and pilots to take root.

Can this kind of catalytic experience produce lasting change? I believe it can. I know that in the usual course of things, lessons learned and vows made while away from the office are often swallowed up by the bureaucratic pull of routine. But show people what's possible with rapid, iterative development and they'll never be happy with two- to five-year development cycles and the status quo again.

Seybold is president of the Patricia Seybold Office Computing Group in Boston. Her Notes address is Patricia Seybold@PSOCG. Her Internet address is PSeybold@MCImail.com.

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intel inside

OS/2 makes headway in corporate arena

Deals show Version 2.1 giving Windows NT a run for its money

closer look OS/2

By Ed Scannell

With an uncharacteristically gritty determination, IBM's Personal Software Products group recently knocked some holes in the wall of user skepticism that has kept OS/2 off most corporate desktops.

When Personal Software Products delivered OS/2 2.1 this past June, the company delivered a product that crystalized a six-year ambition: a 32-bit desktop operating system that reliably runs DOS, Windows and OS/2 applications side by side with the thousands of mission-critical applications developed by corporate accounts.

In the last couple of months, Personal Software Products has signed a handful of impressive licensing deals for OS/2 2.1 in the U.S. and overseas totaling more than 200,000 copies. Sales of the OS/2 2.x series are between 2.5 million and 2.8 million copies, according to most industry researchers, and should surpass 3 million by year's end.

While reliability and more robust features have helped in Version 2.0's success, the fact that some large accounts say it compares favorably to Microsoft Corp.'s Windows NT has also contributed.

"The truth is that OS/2 is the only 32-bit desktop operating system that runs reasonably well on the hardware that is out there," said Neal Hill, a former senior software analyst at Forrester Research, Inc. in Cambridge, Mass. "These corporate deals are bubbling up because [OS/2 2.1] can do things like maintain three or four communications sessions reliably out of a client back end."

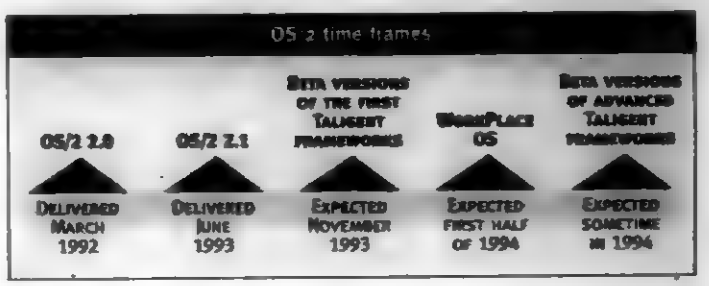
Ferengi debuts

With the Comdex/Fall '93 introduction of the Windows-less version of OS/2, code-named Ferengi, IBM hopes to keep up Version 2.1's momentum.

Because it works seamlessly on top of DOS and Windows and is expected initially to cost $50, Ferengi should give IBM some teeth in its battle against Microsoft in the very lucrative Windows market.

"There are a hell of a lot of PCs out there without OS/2, and the only shot IBM has to get users to make [the conversion] is to make it painless and inexpensive. I think Ferengi deals with that issue," said one Windows developer.

If Ferengi can yank large numbers of Windows users into the OS/2 camp, more large software suppliers might be interested in writing OS/2-specific applications, something the system has always needed badly. And if large independent software vendors write more applications, there will be more pressure on large systems makers to exclusively bundle the operating system, something OS/2 needs even more.



"You have to provide an OS/2 kicker at virtually no cost to OEMs; otherwise, they have to replace the stuff they are shipping [DOS and Windows] and pay double licensing fees," said Randell Flint, president of Sundial Systems Corp., a maker of OS/2 productivity applications in Seal Beach, Calif. "This way, OEMs can just

OS/2, *page 42*

Object-oriented software

Borland technology chosen for electronic trade network system

By Michael Vizard

It looks like some of Borland International, Inc.'s investment in object-oriented application development is finally beginning to pay off.

Thomson Financial Services, a Boston-based unit of Thomson Holdings Ltd., is less than two months away from going live with Anvil, its electronic trading system for variable-rate municipal securities that is based largely on Borland technology.

Currently in beta testing at more than 20 securities firms, the financial industry's first municipal trading system calls for the installation of Borland's Quattro Pro for Windows spreadsheets and Paradox relational databases at every trader's desktop, Thomson executives said.

Those applications, which will process about $10 billion worth of trades a day, will be linked to an Interbase relational database running on a fault-tolerant local server from Stratus Computer, Inc., which in turn will be linked to another Stratus system in the company's Boston office. That server will then forward transactions to a SQL database from Sybase, Inc. that runs on a cluster of servers from Sun Microsystems, Inc.

Source: Thomson Financial Services, Boston

Good news

Since lowering the price of Quattro Pro for Windows to $50, Borland has sold more than 500,000 copies.

. . . and financial concerns

While Borland's recent spate of financial instability may have given other users pause, Fred Cohen, Thomson's director of technology, said that Borland's technology is strong enough to guarantee it would be acquired by another vender if the firm were not able to recover itself.

"I think the biggest problem Borland has with Paradox is that it's priced so inexpensively that nobody takes it seriously. All the databases on the network will be synchronized, and the Stratus systems will guarantee delivery of the trades to the Sybase database," said Fred Cohen, Thomson's director of technology. Paradox's base price is $149.95, while the Workgroup Edition, which includes SQL links and Borland's Object Exchange (Obex) technology, is priced at $495.

Shared technology

Due to the synchronization requirement, Cohen said he opted to deploy Borland products on client desktops and local servers because they share the same underlying database engine technology that Borland acquired from Interbase. As such, it is easier to share data across Quattro Pro spreadsheets and Borland databases.

Cohen said Borland has done a substantially better job in terms of integrating SQL calls seamlessly into its Quattro Pro spreadsheet by encapsulating them in objects. In contrast, other products, such as Excel from Microsoft Corp., essentially require users to exit their spreadsheet application to query databases, according to Cohen.

At the same time, Cohen credited Borland with providing a more robust application development environment in the form of ObjectPal than the Visual Basic environment that Microsoft provides with its Access database.

"It's taken Borland a while to bring products to market, but it's really starting to pay off now. We originally were building the clients in C and were into hundreds of thousands of dollars of overtime and weeks behind schedule. The problem was that the original approach was archaic from the start and much too labor-intensive. Now we cut that development time by 80%," Cohen said.

Since Thomson had already established network links to brokerage houses as part of its other financial services, Cohen said the project has cost the company about $3 million to implement, which will be recouped by charging customers for access to data in the Boston office.

Thomson plans to expand the service to 100 securities firms and will adopt Borland's Obex technology to link its applications with other desktop applications.

"We'll provide some high-powered analytical tools, but the traders will have other applications on their desktops that we'll want to tie in to," Cohen said.

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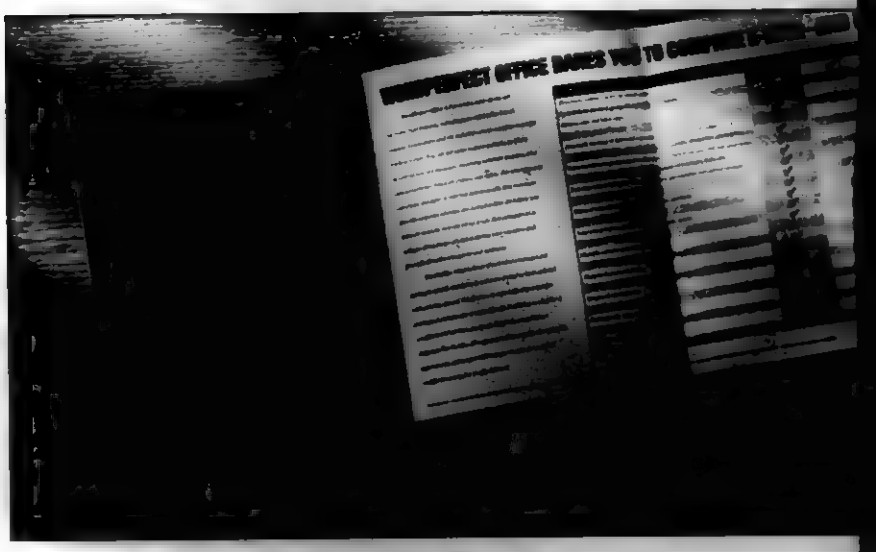

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WordPerfect Office

Carole Patton

Organizing your time

You can set heads nodding in any American corporation by talking up good management practices like setting goals and giving employees feedback. Trouble is, many managers are stretched so thin they can barely remember where they are or where they are supposed to be, let alone track all the people and projects under their supervision.

Software tools can help. I'm not talking about traditional project management packages like Project, Timeline or Super Project. Those are all fine for what they do, but sometimes what's called for is something of a more personal nature.

One product tailored for busy managers on the go that is definitely worth a second look is ManagePro 2.0 from Avantos Performance Systems in Berkeley, Calif. A rare bird indeed, this program is one of my favorite finds.

Written by former management consultants Norm Wu and Gerald Huss, ManagePro defines a whole new software category: It can actually help you manage people better, delegate more effectively, set clearer goals and provide needed feedback.

In its earliest iteration, Version 1.0, ManagePro was more of a high-level planner. But the latest version, which shipped last month, includes a daily calendar and to-do list, making it a really nice "home base" for managers.

The program's well-designed interface centers around a View Bar (like a tool bar) divided into Goals, People and Actions. Double-clicking on a name calls up pertinent job information (rate of pay, date of hire, etc.) and a personal data section lets you record other handy facts like a mobile phone or beeper number.

All entries are in chronological order and all notes are time-stamped. A Goal Planner surveys goals in Gantt-chart form and includes a Status Board, where colored triangles flag specific problems.

The best part of this program is its "people" orientation. ManagePro contains an on-line Advisor — it's like having your own management consultant.

ManagePro Version 2.0 supports groups of people working together through levels of access based on permissions set up by the administrator. For example, employees can see their "Progress" file, but not the supervisor's notes from a counseling session. You can extract your database, work with it on the road and come back and integrate your work on a record-by-record level.

Managepro 2.0 lists for $395, but the street price should be closer to $249.

Personal management

If you're interested in a full-featured personal information manager (PIM), Packrat from Polaris Software in San Diego may be your first choice. But for now, make sure you're buying Version 4.1.

In August, I alerted you to problems with the Packrat upgrade (Version 5.0) and reported that a fix was on the way. But even the latest fix (Version 5.011) is giving users major problems, especially those who use Stacker. Polaris' testing confirms that temporary Packrat files have to be written to RAMdrive or to an unstacked drive or they'll be lost.

But if you bill time on an hourly basis and a full-featured PIM like Packrat is overkill, look at Time Logger from Responsive Software in Berkeley, Calif. With it, you click a button when you start a task and when you finish and type some information about what you did in that time. Time Logger keeps track.

This program provides reports but not invoices. (You can copy data in tab-delimited format into Microsoft Excel, Word or even your favorite DOS-based accounting package.) Time Logger can be used for billing purposes, to track an office full of people or to keep tabs on corporate resources like computers or conference rooms. The product shipped last month and is sold directly from Responsive Software for an introductory price of $99.

Patton is president of the Mendham Technology Group in Mendham, N.J., which produces Client/Server Summits for corporate strategists. Her MCI Mail address is 401-4869.

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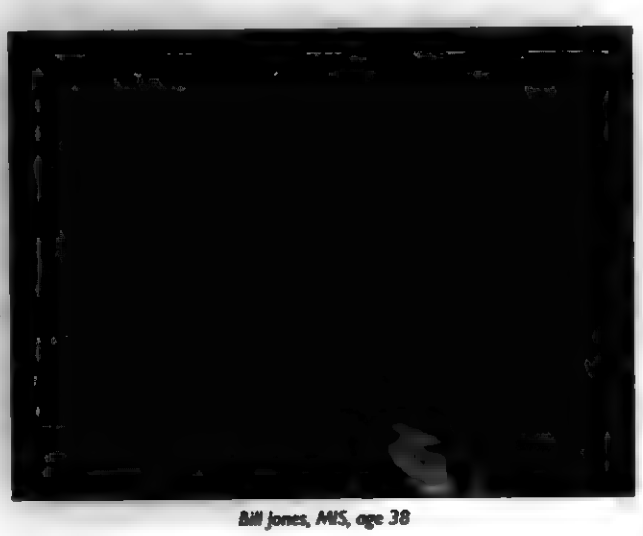
Frown lines *appear as the hardware you've chosen for field workers proves difficult to use.*



Hair loss *occurs as users complain the system is costing them time, not saving it.*

Bags under eyes *take shape from long hours spent attempting to connect your wireless network and LAN.*

Bill Jones, MIS, age 38

New technology is never easy to implement. Period. And we don't intend to convince you that a wireless data system is any different. That's why you need ARDIS. ➢ ARDIS has implemented more wireless data systems than anyone. We offer proven end-to-end solutions that include hardware, software, airtime, maintenance and training. ➢ We handle everything — connectivity issues, software compatibility questions, even training difficulties. You're not forced to organize and work with multiple vendors, so your system gets installed on budget, in less time and with no glitches. ➢ When you choose a wireless data network, go with ARDIS. And look wise beyond your years, not worn beyond them. For worry-free wireless data implementation, call 1-800-662-5328 ext. 200.

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intel
pentium
PROCESSOR
INTEL '92

HOW WE'RE GIVING PCS ELECTRIFYING POWER.

There is a new source of computing power. It's capable of executing two instructions at once. It's produced processing speeds over 100 MIPS. It's the next generation of compatible power. It's called the Pentium™ processor. And this brief will tell you how its technology is making PCs run faster today.

THREE WAYS TO MAKE FASTER PCS.

Faster PCs start with faster microprocessors. And there are three ways to make faster processors:

1. Increase the number of transistors. Today, the use of sub-micron components lets designers fit more than 3 million transistors on a single chip. So we can integrate components such as math coprocessors and caches right onto the CPU—dramatically cutting access time.

2. Increase the clock speed. Twelve years ago the clock speed ticked along at a measly 4.7 MHz. Today we can run at an astonishing 66 MHz—and we're still pushing for more.

3. Increase the number of executions per clock cycle. Using new superscalar technology, our processors are now capable of executing two instructions per clock cycle.

WORKS IN PRINCIPLE AND IN PRACTICE.

Employing the techniques above, we've created the new Pentium processor. A processor that is over 300 times faster than the first PC microprocessor.

THE PENTIUM PROCESSOR. A MODEL OF EFFICIENCY.

The Pentium processor can be described as a super-efficient factory. Its main assembly line is its superscalar technology—which enables information to be processed simultaneously through dual pipelines. To accomplish this, the pipelines divide up an instruction, then send it through five stages. As it passes from one stage to the next, the pipeline is free to begin another instruction. Speeding up operations substantially.

PUMPING DATA THROUGH.

The rest of the features on the processor are designed to keep that main assembly line working at peak capacity *(see diagrams)*. These features, along with the superscalar technology, help the Pentium processor to crunch more than 100 MIPS at a clock speed of 60 MHz.

HOW FAST DID YOU SAY?

Twice the performance of our own Intel486™ DX2 66 MHz processor. Plus, the redesigned floating-point unit on the Pentium processor offers up to five times the performance of the Intel486 DX2-66 CPU for math-intensive applications.

THE NEW PENTIUM PROCESSOR IS FULLY SOFTWARE-COMPATIBLE WITH OUR INTEL ARCHITECTURE FAMILY.

A PHOTOGRAPHIC MEMORY RIGHT ON BOARD.

NOW THERE ARE SEPARATE 8K CODE AND DATA WRITE-BACK CACHES THAT REDUCE CACHE CONFLICTS AND INCREASE SYSTEM PERFORMANCE. WITH AN ON-CHIP CACHE, WE KEEP ESSENTIAL INFORMATION WITHIN AN ARM'S REACH OF THE MAIN ASSEMBLY LINE. SO THAT INSTRUCTIONS AND DATA CAN BE FETCHED WITHOUT WASTING ANY TIME. AND A FULL 95% OF THE TIME, THE INFORMATION IS RIGHT AT HAND.

THINK OF IT AS A 64-LANE FREEWAY INSIDE YOUR CPU.

TO GET DATA REALLY MOVING, WE DOUBLED THE SIZE OF THE BUS ON THE FIRST PENTIUM PROCESSOR. THIS ALLOWS TWICE AS MUCH INFORMATION TO BE FETCHED AT ONCE. THERE IS EVEN A BURST MODE FOR HIGH-SPEED INFORMATION TRANSFER—SO MORE INFORMATION GETS TO WHERE IT'S GOING QUICKER. PLUS, AUTOMATIC DATA INTEGRITY CHECKING TO BE SURE THE RIGHT DATA IS BEING MOVED.

WE PROGRAMMED THE CHIP TO BE CLAIRVOYANT.

WE'VE GIVEN THE PENTIUM PROCESSOR AN INTELLIGENCE OF ITS OWN—A SMALL CACHE KNOWN AS THE BRANCH TARGET BUFFER, WHICH PREDICTS WHICH WAY AN EXECUTION WILL BRANCH. WHEN THE PREDICTION IS CORRECT (AND IT IS OVER 90% OF THE TIME), THE BRANCH IS EXECUTED WITHOUT DELAY—ENHANCING PERFORMANCE.

WHO SAID YOU CAN'T DO TWO THINGS AT ONCE?

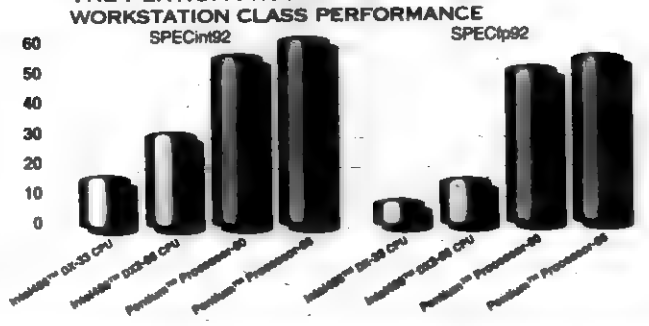
THE FIRST PENTIUM PROCESSOR HAS TWO SIDE-BY-SIDE PIPELINES FOR INTEGER INSTRUCTIONS. THIS ENABLES THE PROCESSOR TO EXECUTE TWO INSTRUCTIONS AT ONCE. AFTER GRABBING AND PARTIALLY DECODING AN INSTRUCTION, THE PENTIUM PROCESSOR DETERMINES IF THE INSTRUCTION CAN BE EXECUTED IN PARALLEL WITH THE NEXT INSTRUCTION IN LINE. IF IT DOESN'T DETECT ANY DEPENDENCIES, THE TWO INSTRUCTIONS ARE SENT ALONG THE PARALLEL PIPES FOR EXECUTION.

A BIG POINT OF DIFFERENCE IN MATH-INTENSIVE FUNCTIONS.

WE'VE ADDED SPECIALIZED PIECES OF HARDWARE TO SPEED UP THE THREE MOST COMMON FLOATING-POINT INSTRUCTIONS—A MULTIPLIER, A DIVIDER AND AN ADDER. WITH THESE FEATURES, MOST FLOATING-POINT INSTRUCTIONS CAN BE EXECUTED IN A SINGLE CLOCK CYCLE. GIVING YOU UP TO FIVE TIMES THE FLOATING-POINT PERFORMANCE OF INTEL486 DX2-66 CPU-BASED COMPUTERS.

BASED ON SPEC 92, THE INDUSTRY STANDARD WORKSTATION BENCHMARK, THE PENTIUM PROCESSOR IS IN THE SAME PERFORMANCE CLASS AS THE BEST WORKSTATION. BUT THE PENTIUM PROCESSOR ■ RUNNING AT ONLY HALF THE CLOCK FREQUENCY, AND SYSTEMS BASED ON THE PENTIUM PROCESSOR COST ONLY ONE-HALF AS MUCH.

THE PENTIUM PROCESSOR PROVIDES WORKSTATION CLASS PERFORMANCE



THE INTEL iCOMP™ RATING INDEX*

*The iCOMP index is an Intel microprocessor "horsepower" rating. It is a composite of selected performance measurements from SPEC 92, ZD Bench, and Power Meter. Source: iCOMP™: A Simplified Measure of Relative Intel Microprocessor Performance, Intel Corp., 1992.

WHAT DOES THIS TECHNOLOGY REALLY MEAN?

It means Pentium processor-based PCs are now as fast as workstations. It means faster Intel486 microprocessors, because our experience with Pentium processor technology allows us to improve them. It means new software horizons being brought to more and more users—such as 3-D design, multimedia, handwriting and voice recognition, virtual reality and more.

OBTAINING THE POWER.

Almost all leading PC vendors have introduced high-performance Pentium processor systems at affordable prices.

As we increase the production of Pentium processors from hundreds of thousands in 1993 to millions in 1994, there will soon be scores of Pentium processor systems to choose from. These systems will be available in a wide variety of configurations, from high-performance desktops more powerful than existing engineering workstations to servers containing multiple Pentium processors and capable of replacing mainframes.

TECHNOLOGY YOU TRUST.

For over 20 years, Intel has led microprocessor design, development and manufacturing. So with Intel technology inside, you can be assured of unprecedented power and unquestioned compatibility.

BESIDES RUNNING EVERYDAY APPLICATIONS BETTER, THE PENTIUM PROCESSOR PROVIDES THE POWER NECESSARY FOR NEW MULTIMEDIA APPLICATIONS LIKE DESKTOP VIDEO CONFERENCING.

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intel.

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Telecommuter quandary: Who buys the PC?

By Mitch Betts
ARLINGTON, VA.

Lurking behind glowing telecommuting reports is an issue for corporate managers that gets down to the nitty-gritty: Should the company buy two PCs for telecommuters — one for office use and one for days worked at home?

That was one of the great debates featured at the recent Telecommute '93 conference here. Edward Kirk, manager of telecommuting at Bell Atlantic Corp. in Silver Spring, Md., argued that telecommuters, who typically work two or three days at home and the other days at the office, should buy their own PCs. He cited the following reasons:

- Duplicate PCs make it harder to cost-justify telecommuting.
- Cost exposure is limited if telecommuting does not work out.
- It is harder to track or police off-premises equipment.
- Duplicate PCs for telecommuters appear wasteful to other employees.
- From a telecommuter's perspective, it is easier to upgrade and tailor his system without the corporate bureaucracy.

TELECOMMUTER:
A COMPANY EMPLOYEE WHO WORKS AT HOME DURING NORMAL BUSINESS HOURS, PART-TIME OR FULL-TIME.

TOTAL U.S. (1993)
7.6 MILLION

MEN: **54%** WOMEN: **46%**

PC OWNERS:
55%

EMPLOYER AND EMPLOYEE EXPENDITURES FOR TELECOMMUTER TECHNOLOGY
$4.7 BILLION PER YEAR

Source: Link Resources Corp., New York

Each year, telecommuting expenditures total $4.7 billion for PCs, fax machines, phones and network services. These costs are shared equally by telecommuters and employers, according to Link Resources Corp., a market research firm in New York.

"Just as workers buy their own cars to commute to work, now they are buying their own computers to telecommute," said analyst Thomas E. Miller, who conducted the Link study.

Drew Deskur, director of telecommuting and manager of telecommunications at Shiva Corp. in Burlington, Mass., took the other side of the debate. He argued that if companies do not pay for the home-based PCs, telecommuting will never be broadly adopted and companies will lose their productivity and employee-retention benefits.

In other words, Deskur said, employer stinginess will turn telecommuting into an executive "perk" for upper-class employees who can afford their own PCs.

Darold Jackson, director of information systems at Monsanto Co. in St. Louis, said he decided to supply PCs and software to his firm's telecommuters partly because it would ensure a standard set of hardware and software to support.

Jackson, a speaker at the conference, said Monsanto strikes a fair deal with its telecommuters: The company provides the PCs and telecommunications, while the telecommuter provides an ergonomically acceptable office at home. "No PC on the dining room table," he said.

Some companies may be concerned that the home PC will be used only 20% of the time, doubling the technology investment. But in Jackson's opinion, "Since we're getting more productivity [from the telecommuters], I don't really care."

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December 14, 1993
World Trade Center
Boston, MA

Anxiously awaiting Taligent

Personal Software Products' long-term role in the hole-in-the-component technologies, and eventually, the finished operating system that Taligent, Inc. is expected to deliver in 1995.

The finished Taligent operating system, on paper, is more ambitious than Microsoft's Windows NT or its successor, Cairo.

A joint venture of IBM and Apple Computer Inc., Taligent is intended to be portable and object-oriented — from its user interface down to the hardware.

"What IBM is trying to do is leapfrog Microsoft to set the next-generation operating system standard," said John Dunkin, a vice president at WorkGroup Technologies, Inc., a consultancy in Hampton, N.H.

Long before the shrink-wrapped version of Taligent is available, the company will ship much of the operating system's technology in what it calls application frameworks.

The first beta version of the application frameworks is scheduled for delivery this month to a limited number of developers. The technology allows OS/2 2.1 developers, for instance, to start programming Taligent-like capabilities into their applications.

A problem for some OS/2 developers in terms of generating interest is not knowing specifically what features the frameworks will allow them to mold into their applications.

Some of those capabilities include making OS/2 applications more portable across multiple environments or the ability to include three-dimensional graphics.

"If you can easily deliver the client portion of your application across all operating systems in your enterprise, your life is easier because you are not seen as the Big Brother dictating what sort of hardware someone has to run," said Bob Holmes, manager of evaluation technology at Southern California Gas Co.

The next set of application frameworks, the beta versions of which are expected sometime in 1994, will expose more of the Taligent programming model to OS/2 developers.

"The document framework [main programming model] around Taligent is where applications get the ability to collaborate with other applications in real time," said Kathy Bohrer, Personal Software Products' lead architect for object frameworks. "They will also get all the substructures for the user interfaces."

— Sid Sennwald

OS/2 makes headway

CONTINUED FROM PAGE 37

throw a CD [Ferengi] in their boxes for $50."

A version of OS/2 that could cut into sales of Windows 3.1 would be one that runs comfortably in 4M bytes of memory (the product currently needs at least 8M bytes to do so).

Company officials promised earlier this year that such a version would be available by year's end. It appears, however, that Personal Software Products is bogged down in the project, and sources say not to expect it until next year.

"There was some older code [from earlier versions of OS/2] that was never changed from 16- to 32-bit," said one developer familiar with the project. "I believe it is mostly code written by Microsoft."

The Microsoft challenge

But while IBM now has OS/2 rolling, it must still remain light on its feet to avoid the logs Microsoft will inevitably throw across its path.

Microsoft is already beating the marketing drum for Windows 4.0, code-named Chicago. Whether or not the product turns out to be a reliable 32-bit operating system on the order of OS/2 2.1, the marketing efforts may serve to distract some potential OS/2 users.

And in an attempt to bolster the hundreds of bundling deals it has with OEMs for DOS and Windows, Microsoft this week is expected to announce that a large number of OEMs will bundle its Windows for Workgroups 3.11 on both server and desktop machines. Version 3.11 adds a 32-bit file system and peer-to-peer networking to Windows 3.1.

More importantly, Windows for Workgroups 3.11 continues to support Microsoft's 32-bit virtual device driver (VXD) model, which OS/2 and Ferengi do not support.

Even though few Windows applications support VXDs, this feature remains another grenade Microsoft can lob toward IBM's claims that OS/2 is a better Windows than Windows.

Continued on page 43

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Audio. Scanner. Floppy. 165,000 Xstones.

The new line of HP ENVIZEX stations is shaking other X terminal makers with its sophisticated features, raw speed and low prices.

It offers unsurpassed multimedia readiness and PC interoperability, with an internal floppy drive, scanner support and CD-quality audio. A selection of local clients are also available.

Typical cost: $4,695* for the 165,000 Xstones, 19″ color X station. No wonder we're the world's #1 X terminal vendor.† For more details, call 1-800-637-7740, Ext. 7881. In Canada call 1-800-387-3867, Dept. 2308. Then get your company on a roll.

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*CD-quality audio, local scanner support and internal floppy drive available as options. Speakers not included. †International Data Corporation, X Business Group, January 1993, by sales revenue.

Two future products that could help Personal Software Products be an effective moving target against Microsoft are Taligent and WorkPlace OS, the microkernel version of OS/2.

WorkPlace OS, based on an adaptation of Carnegie Mellon University's Mach microkernel, is a scalable operating system designed to run, eventually, on every class of system from IBM's PowerPC-based servers down to handheld devices.

Split personality

It will support symmetrical multiprocessing and have multiple "personalities," or the look and feel of several environments including OS/2, Windows, DOS and Unix. The product is expected to be available by mid-1994.

WorkPlace OS figures to be the first line of defense against Windows NT and is also targeted at multiple hardware platforms. Windows NT has gotten off to a fast start, shipping a little more than 200,000 copies in the first 60 days.

If large corporate accounts continue to order products at this pace, it is expected to place enormous pressure to succeed on WorkPlace OS.

Databases

Kodak organizes photo CDs with image manager software

By Michael Vizard

Eastman Kodak Co. in Rochester, N.Y., recently began delivering its Photo CD image manager software for Windows, which gives users a database that can reference more than 30,000 files containing 35mm slide film.

Called Kodak Shoebox, the $345 database is intended to give users an on-line method for accessing slides stored in any type of format on a CD drive. Shoebox is intended for slides that previously had to be archived manually in file cabinets.

Once stored, these images can be incorporated into other applications and documents. For example, Living Rooms Associates, Inc. in Parsippany, N.J., is building a plant catalog on top of Kodak Shoebox.

This catalog will make use of the database's ability to attach 30,000 characters of text to each image stored, which means that images can be easily reused and tailored across multiple catalogs.

"We've got about 200 images in our initial catalog to which you can attach descriptions of the plants, height, color and care instructions," said Tom Creeden, who along with Joe Sialone founded Living Rooms Associates.

Based on a Btrieve database architecture, Kodak Shoebox includes an indexing tool that allows a user to search for specific types of images across the database. For example, a user can specify that he would like to see all photos with children.

Multiple uses

Given its capabilities, Creeden said he expects to see Kodak Shoebox adopted across a wide range of industries.

"You can use this catalog on everything from wine to medical supplies. As a teaching reference tool it's unbelievable," Creeden said.

In addition, Kodak Shoebox can be linked with other applications, such as presentation graphics and word processing packages, through the Clipboard facility in Windows. In the coming year, Kodak also plans to add support for Version 2.0 of the Object Linking and Embedding interface, which will allow users to call images from Kodak Shoebox without having to exit their programs.

As part of a special introductory offer, Kodak Shoebox can be purchased for $99 through the end of the year.

Briefs

Products bundle up

WordPerfect Corp. and IBM's Personal Software Products group have agreed to a product bundle for European markets that combines WordPerfect 5.2 for OS/2 with OS/2 2.1. The three-month agreement begins this month. The deal is the first phase of an agreement that includes cooperation among sales forces of each company's European offices. Pricing on the two-product bundle will vary in each country, but it will be similar to the unbundled WordPerfect for OS/2.

Verity chooses OS/2

Verity, Inc. recently announced it has begun shipping its document retrieval software for OS/2 2.1. Earlier, Verity shipped its software on Sun Microsystems, Inc.'s Solaris 2.2 operating system.

petition.

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Software

Software Illustrated has announced MapLand for Microsoft Corp.'s Excel for Windows, spreadsheet mapping software.

According to the Pleasanton, Calif., company, users are able to chart data in a map inside a spreadsheet.

Users can also create pie maps, shaded maps, column maps and pin maps of their data. Spreadsheet Mapping allows users to link data to maps.

Fourteen geographic workbooks with major cities and country boundaries are provided.

MapLand for Excel for Windows costs $99.95.

▶ *Software Illustrated*
(510) 463-9898

Age Logic, Inc. has introduced XoftWare/32 Version 3.0, part of the XoftWare/32 line of 32-bit PC X Window System server software. Version 3.0 is available for Windows and OS/2.

According to the San Diego company, XoftWare/32 for Windows is optimized for the Windows operating platform and allows users to concurrently access and display Windows, DOS and network-based Unix applications on the same PC. Version 3.0 of XoftWare/32 for OS/2 enables PC users to simultaneously access and display network-based Unix applications with Windows, OS/2 and DOS applications.

Highlights include Network File Manager (NFM) local printing capabilities, NFM graphical file browser, a concurrent Windows Manager Mode and 32-socket support.

The Windows and OS/2 versions of XoftWare each cost $395.

▶ *Age Logic*
(619) 455-8600

WordPerfect Corp. has introduced 20 Language Modules for WordPerfect 6.0 for DOS.

According to the Orem, Utah, company, Language Modules allow users to unite international versions of a hyphenation module, spell checker, thesaurus and/or keyboard with WordPerfect.

Features include a WordPerfect Coach feature, full WYSIWYG editing, built-in spreadsheet functionality, scalable font support, dialog boxes, button bars, drag-and-drop text and graphics and fax, sound and electronic-mail capabilities.

The DOS Language Modules cost $99.

▶ *WordPerfect*
(801) 225-5000

Comshare, Inc. has announced the Arthur Allocation System, a platform-independent client/server retail application.

According to the Wilmington, Del., firm, the Arthur Allocation System delivers high-value decision-support capabilities to allocation teams in medium to large-size retail organizations.

The product works with the company's Arthur Performance Tracking, Arthur Merchandising Planning and retail processing systems.

The Arthur Allocation System is platform-independent and can perform in multiple-server environments.

System requirements include a 33-MHz 486-based PC or above, 4M bytes of RAM, a Video Graphics Array monitor and a mouse.

Pricing is expected to begin at $50,000 for a 10-user license.

▶ *Comshare*
(302) 479-5454

Hardware

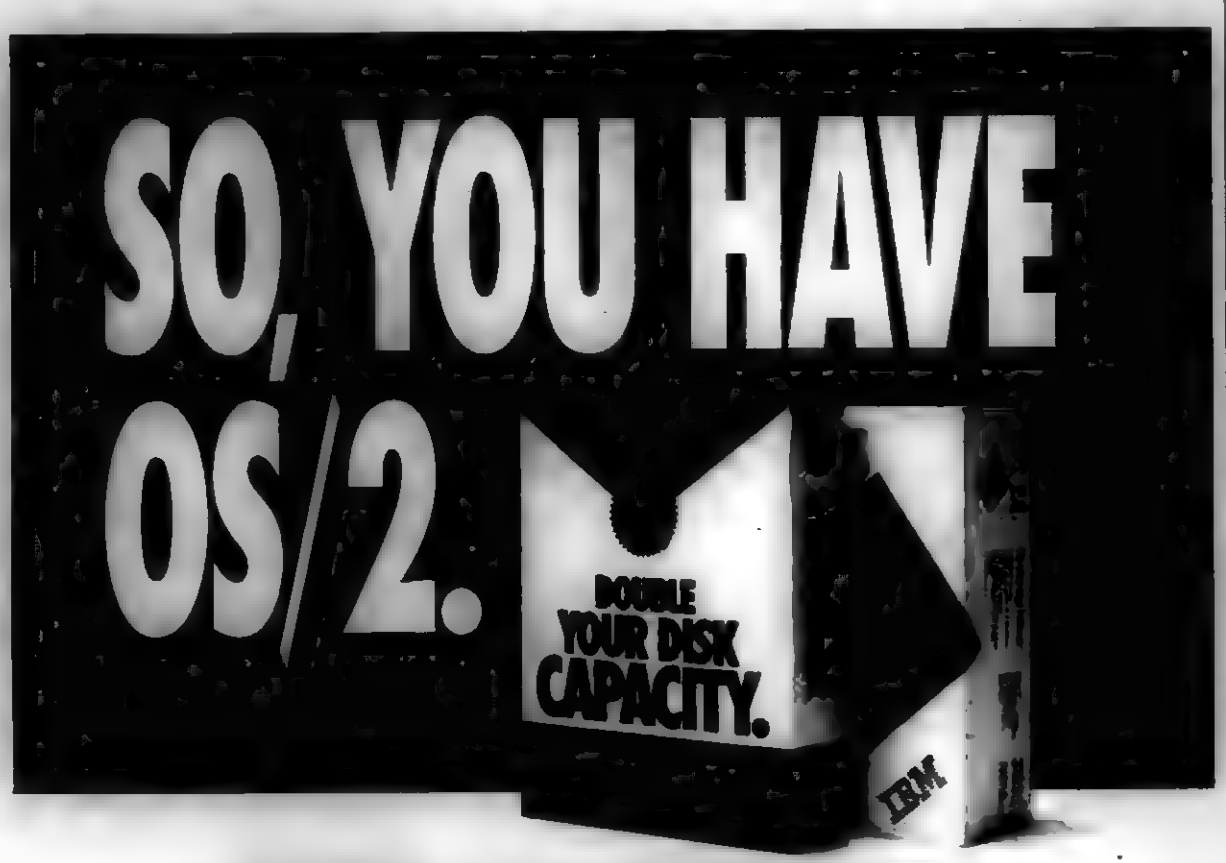
Opus Systems, Inc. has announced Incognito Unix application engine, a software and hardware package that lets Windows, DOS and OS/2 users run the same applications that run on Sun Microsystems, Inc.'s SPARCstations.

According to the Santa Clara, Calif., company, the application engine lets PC users continue to work in a familiar PC environment, share information between their Unix and PC applications and receive transparent access to a variety of 32-bit Unix applications.

Users need to install a PC/AT add-in board, a hard disk drive and PC software.

The base configuration for the Incognito application engine, including the InBoard-Engine/MS1, Incognito/QuickStart and Incognito/Share, costs $995.

▶ *Opus Systems*
(408) 562-9340



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The Intel Inside Logo is a trademark of Intel Corp.

Before You Commit To High Availability Computing, Maybe You Should Take A Closer Look.

First, the bad news. No matter what you've read, heard or hoped, high availability solutions are not what they appear to be. If you're dealing with critical, large transaction volume applications, high availability systems simply can't protect you from downtime. They might recover eventually. But recovering is not the same as not failing. And the real cost of computer downtime to American business is staggering. In terms of lost revenue. In terms of lost productivity. In terms of lost data. In terms of lost customers.

And the news gets worse. Even if high availability were a proven solution for mission-critical applications in other respects, which it's not, it runs on garden variety UNIX.® Based on that alone, its reliability has to be questionable.

If you're looking for availability in an open system, be prepared for another disappointment. The special programming a high availability solution requires almost always turns it into a proprietary system. No one can tell you what it's really going to cost to implement or how many vendors it will take.

And when the system fails, who do you call? The hardware vendor? The software vendors? Your consultants? It all gets very, very complicated, very, very fast.

Now, for the good news. Stratus® is exactly what it appears to be. A complete, proven solution that delivers continuous availability for critical, large transaction volume applications. Not high availability. Continuous availability. And when you're dealing with mission-critical applications, you can't afford anything less.

Stratus is also simple and easy to install and maintain. Unlike high availability systems, Stratus requires no special programming or system administration. You won't have to hire consulting or software firms to configure Stratus for availability. You won't have to pay for two or more software licenses.

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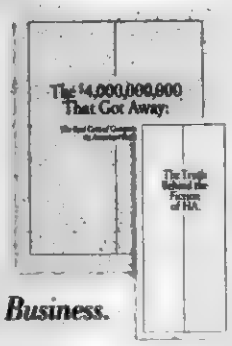

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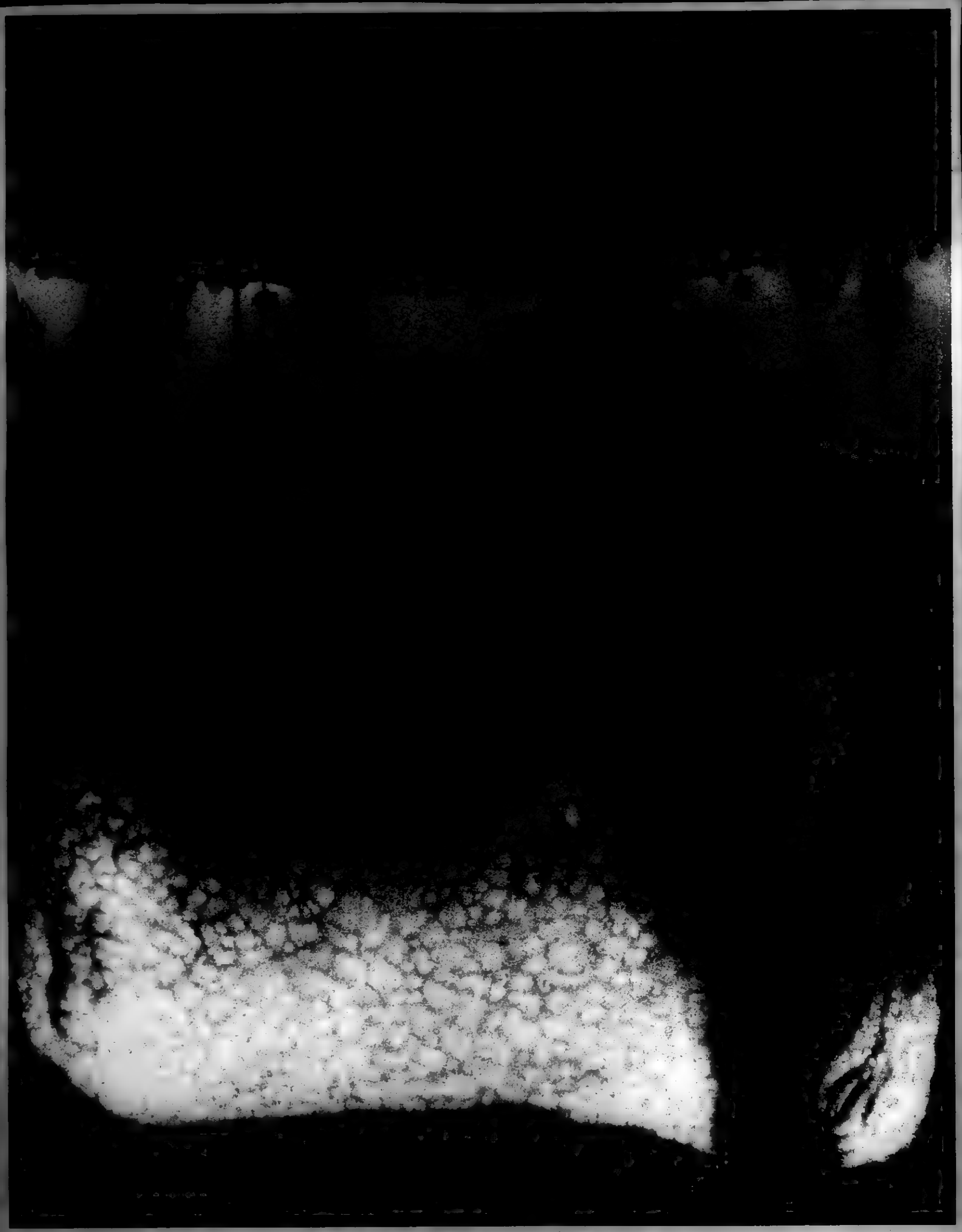

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Elisabeth Horwitt

Why go with peer-to-peer?

You know that old story about the guy who boasted he could make delicious stone soup? His friends said, "Right!" So he said, "Watch!" He put these big stones in a pot of water and then added a few seasonings, a few carrots, a chunk or two of beef, a potato and an onion, and behold: stone soup!

Microsoft and Novell have been making stone soup lately with the latest releases of their so-called peer-to-peer networking products.

The idea behind peer-to-peer networking was to provide a low-cost way for a few users to share files and printers without the trouble and expense of setting up a full client/server system, along with network management, security and central administration. In a peer-to-peer system, each PC is both a client and a server, with users calling up whatever files or peripherals are designated as sharable on other PCs.

Such systems apparently fill a need among small businesses. Artisoft has done quite well selling its LANtastic peer-to-peer network to such firms. But Artisoft decided it wanted to sell LANtastic to corporations, too. Novell apparently had the same idea with NetWare Lite, as did Microsoft with Windows for Workgroups.

Cool to the idea

But corporate network administrators reacted with strong aversion to the idea of letting their users share resources without the security, centralized administration and network management provided in a server environment. And corporations said peer-to-peer users should also be able to get at corporate files residing on NetWare servers. So the current versions of Windows for Workgroups, LANtastic and NetWare Lite (renamed Personal NetWare) have all of the above capabilities.

So if your users insist on all of the capabilities of a client/server system, why bother with peer-to-peer at all? If you're adding onions, beef and potatoes anyway, why put in the rocks?

Managers interviewed at some corporate sites recently said they were considering putting in a peer-to-peer system as a way for workgroups to share a few files on local disks.

But of course, the real strategic significance of the Microsoft and Novell peer products is that they are being bundled, basically free, with Microsoft's Windows 3.11 and Novell's DOS 7.0.

This seems to be the most useful way to deploy peer networking — as an inexpensive way to make strategic desktop products network-ready and as one more arena in which Microsoft and Novell one-upmanship can flourish.

Horwitt is a *Computerworld* senior editor, networking.

Qantas takes off with Notes

By Michael Vizard

Qantas Airways has become one of the first players in the highly competitive airline industry to adopt Notes from Lotus Development Corp. as a communications infrastructure for coordinating the activities of multiple departments.

As part of an overall redesign of its business process, Qantas has deployed Notes as a tool that will allow 13 departments to more effectively collaborate on the creation of airline schedules.

Called the Schedule Planning Network, or Planet, the Qantas implementation of Notes is built around a client/server model that seeks to augment the airline's existing information systems resources.

Qantas is using Notes *to coordinate the activities of its different departments as part of a re-engineering effort*

Inefficient processes

Initially, the airline plans to use Notes in place of a central administrative resource that was charged with manually coordinating input from the various departments affected by airline schedules.

However, that process frequently proved inefficient because it required central administrators to verbally communicate with each department.

"We found ourselves changing schedules too much or too late. We needed to get information for the departments earlier and build in an ability to be flexible," said Richard Head, a member of the chief information office at Qantas in Sydney, Australia.

Deployed primarily as an interactive discussion database that runs on top of the airline's proprietary QMail system, the Notes environment has been enhanced with an application that Head calls the Balanced Scorecard. Using this application alongside Notes, users can evaluate proposed schedule changes against a set of business rules that contain optimum scenarios created by the airline's experts.

"The nice thing about Notes is now we have an audit trail of discussion that allows us to see where we might need to make changes," Head said.

Once the optimum schedule is created, the actual schedule is manually keyed into the Airline Trips, Loads and Schedules system running on an IBM IMS database deployed on a mainframe.

Immediate goal

Head said his next goal is to acquire schedule development tools that will create applications that span both the IMS and the Notes environment.

Thus far, Head estimated that Qantas has spent about $300,000 to build a Planet system that currently supports about 50 users. This does not include costs associated with a review of the company's overall business processes, which took place last spring.

"We had to examine the whole process because most of the areas of the company are touched by the scheduling system. It drives the cost and revenue of the business," Head said.

In the long term, Head said he expects to see other departments at Qantas adopt Notes. However, undertaking such an effort without reviewing the business processes in those departments would probably prove futile, he added.

"Notes is a great tool provided you re-engineer first. It's the glue for knitting everything together to create a whole new way of working," Head said.

Chase seeks technology advantage

By Thomas Hoffman

The Chase Manhattan Bank NA in New York is in the early stages of developing an $85 million distributed trading floor for 456 traders, and it is counting on Unix workstations and videoconferencing to improve access to market data and speed decision-making.

While the Sun Microsystems Computer Corp.-based Unix trading environment is hardly the first of its kind, industry pundits said Chase's plan to implement desktop-to-desktop videoconferencing over an Asynchronous Transfer Mode (ATM) backbone network is certainly leading-edge.

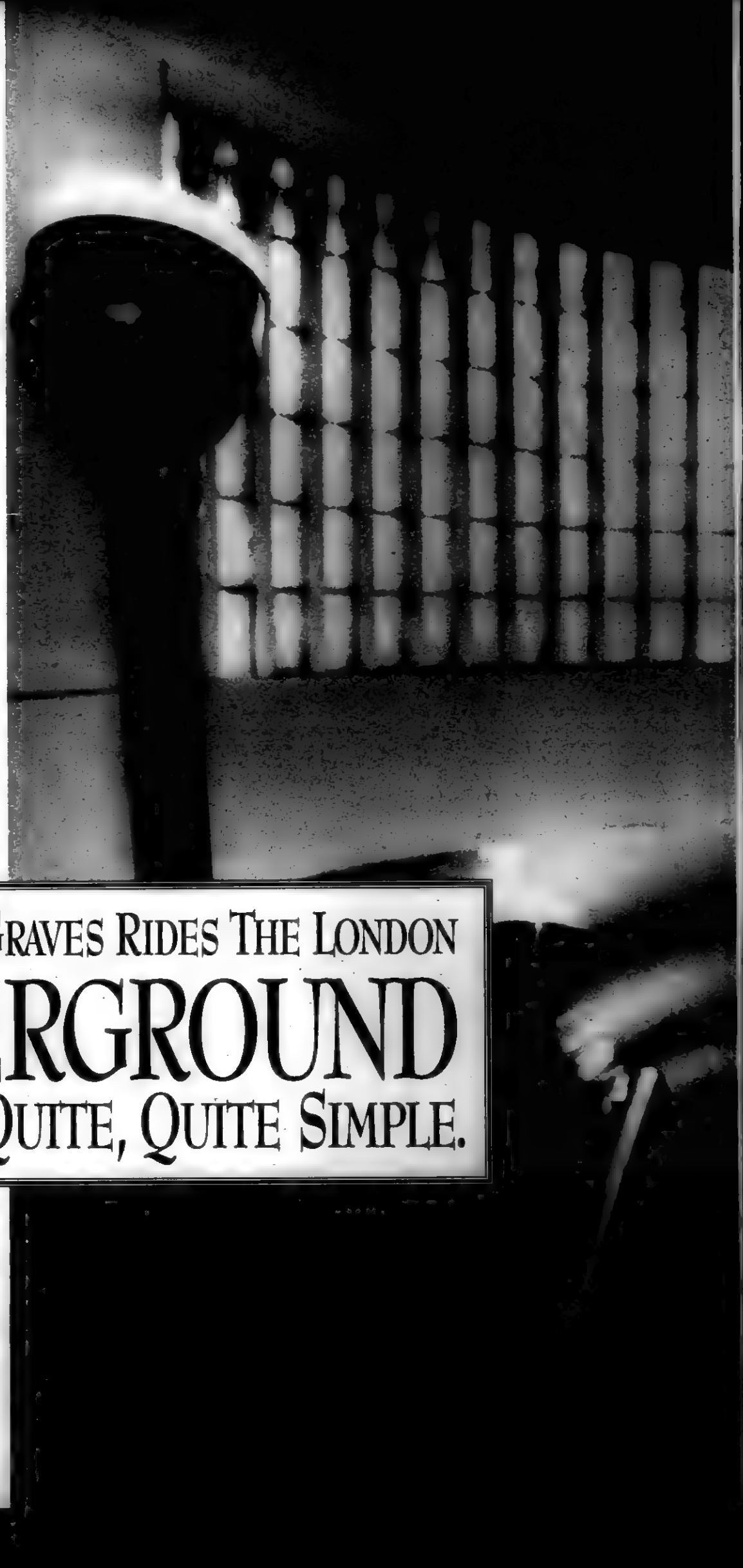
"This is the first commercial example [of trading-room ATM deployment] that I've heard of," said James Moore, president of Mentis Corp., a Salisbury, Md., banking technology market research firm.

Citibank NA has also been reviewing ATM for its trading rooms for the past year and is considering the fast-packet technology for its trading floors, including its recently developed fiber-equipped trading room in Tokyo, according to Debra Williams, a former Citibank technologist who recently became an analyst at The Tower Group, a Wellesley, Mass., research and consulting firm that focuses on banking applications.

Chase Manhattan Bank *will be among the first to employ ATM technology in trading-room environments*

Both Moore and Williams said ATM's high-

Chase, *page 64*



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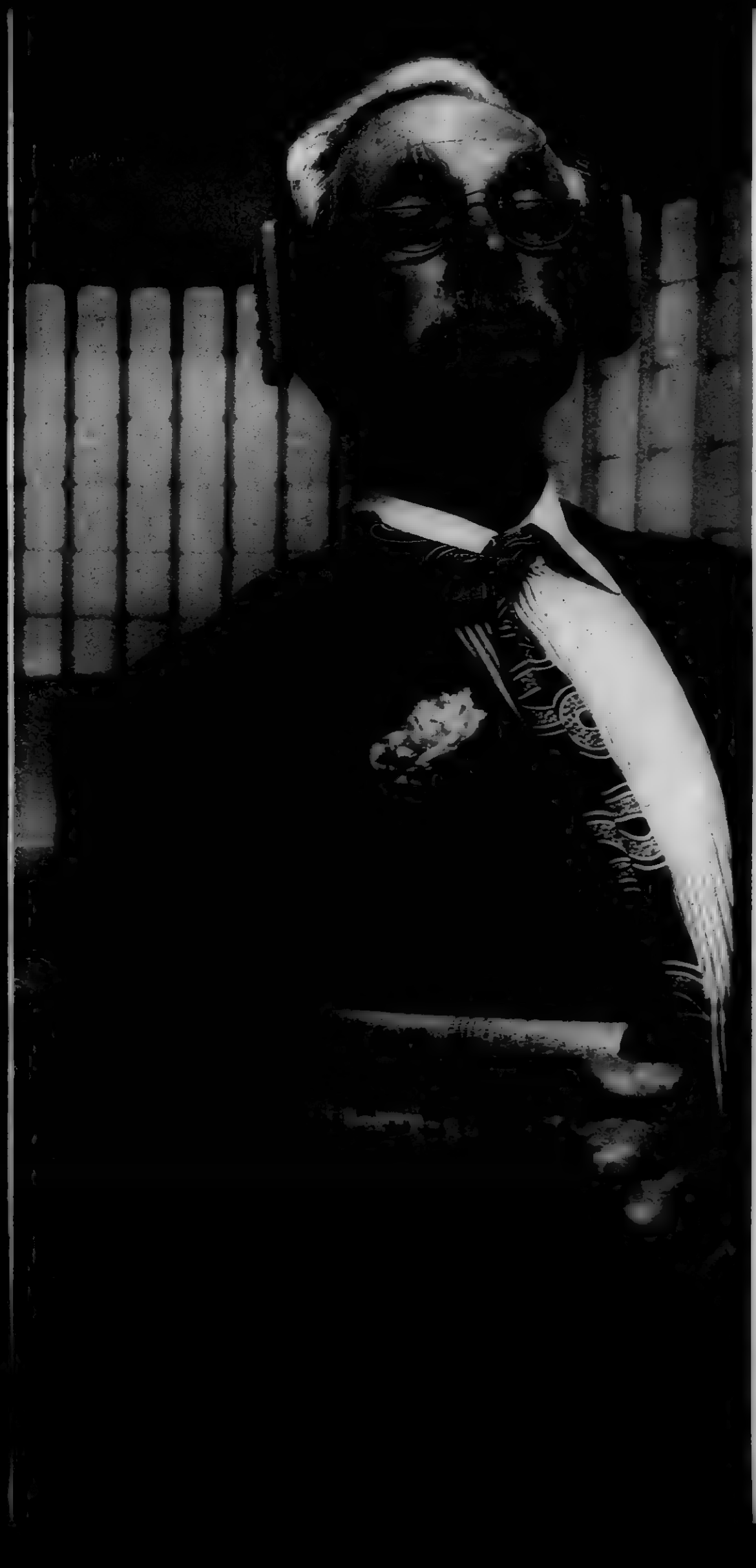

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Corel wastes no time in offering Ventura upgrade

By Michael Vizard

Less than a month after acquiring the Ventura desktop publishing package from Xerox Corp., Corel Corp. late last month announced Version 4.2.

With Version 4.2, Corel has combined the Ventura Publisher and Ventura Database Publisher packages into a single entity called Corel Venture. It also added font, photo and clip-art libraries.

Priced at $249, the package also now includes faster font-loading capabilities and support for Acrobat fonts from Adobe Systems, Inc. in Mountain View, Calif.

However, while Ventura users generally welcomed Corel's acquisition of the product, which had foundered under Xerox, users will not see any substantial improvements to the core Ventura technology line until Corel unveils Release 5.0 sometime next year.

"Ventura users are starving for an upgrade. They haven't seen any substantial improvements made since Version 2.0. People are just going to have be patient through another release of the software. But I think most users are willing to cut Corel some slack at least until they see Version 5.0," said Rick Altman, a Ventura user and an independent editor and publisher in Cupertino, Calif.

"The Corel acquisition couldn't help but do good. Ventura had been sort of floating around in never-never land under Xerox," added Frank Gilbane, president of Publishing Technology Management, Inc., a consulting firm in Arlington, Mass.

Competition from within

At the same time, the Ventura publishing package has been facing stiff competition from Corel's QuarkXPress desktop publishing package and the rival PageMaker offering from Aldus Corp. In addition, companies such as Frame Technology Corp. have been merging word processing technology with desktop publishing packages, and word processors have added more sophisticated features.

Ironically, Altman noted that with Corel's acquisition of Ventura, the company has now gone full circle. "Not many people remember that Corel got its start as a provider of add-on products for Ventura," Altman said.

But whether Corel will be able to breathe new life into the Ventura product set remains to be seen.

And the company has yet to divulge any product strategy for integrating Ventura with QuarkXPress.

"No matter whatever reputation it has lost, Ventura is still one of the most powerful programs ever delivered for desktop publishing. It may not be as flexible as some, but its strength is in the structure it provides," Altman said.

Corel's drive into the desktop publishing market is being driven by changing market dynamics.

"Since most graphics packages today have the ability to work with text, most people aren't distinguishing between graphics packages and desktop publishing packages anymore," said Michael Cowpland, president of Corel.

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SMC seeks Token Ring coup

Vendor brings prices closer to those of Ethernet

By Stephen P. Klett Jr.

Standard Microsystems Corp. (SMC) last week kicked off a Token Ring strategy aimed at chiseling away IBM's dominance in the market and bringing Token Ring prices more in line with Ethernet.

While Token Ring is faster than Ethernet — the technologies run at 16M and 10M bit/sec., respectively — the extra speed comes at a significantly higher price. For example, Ethernet adapter cards typically sell for between $100 and $200 while Token Ring cards start at roughly $500. For users facing shrinking information systems budgets, this price disparity often makes Ethernet the most viable network topology.

To make Token Ring more palatable, SMC cut $100 off the price of its 16M bit/sec. Token Ring adapters, which now retail for $299, and slashed prices of the company's Multistation Access Units (MAU) by 30%. For example, SMC's 12-port 4000 Elite Series MAU now sells for $1,199 or roughly $75 per port.

"These price cuts are very aggressive," said Chip Pettirossi, an analyst at International Data Corp. in Framingham, Mass. "They have got to be one of the lowest price points."

SMC is also focusing on making Token Ring easier to use. For example, SMC ported EzStart, an autoconfiguration and diagnostic program for its Ethernet adapter product line, to its Token Ring line. In addition, every card will include SMC's Simple Network Management Protocol (SNMP) agent, PC Agent/SNMP, which provides network managers with inventory management, remote configuration checking and network troubleshooting capabilities.

"Our goal is to make Token Ring technology more accessible and affordable to the end user," said Lance Murrah, vice president of marketing at SMC's System Products Division in Hauppauge, N.Y. "We want to be the No. 2 player behind IBM and see no reason why we can't be with this program."

While SMC is well-known in the Ethernet world, it has only been in the Token Ring market for 18 months. Murrah said SMC's share of the market stands at roughly 4%, and the company's goal is to bump that up to 10% within a year, which would make it a very distant second to IBM.

Analysts said they were pessimistic about SMC's chances of achieving this goal. "Seeing as they're not even among the Top 7 players right now, that would be a lot of jumping they'd have to do, and there are many hurdles to clear," said Stan Schatt, an analyst at market researcher Computer Intelligence/InfoCorp. in Santa Clara, Calif.

Its "biggest challenge is overcoming the compatibility issue — convincing people they are not going to get fired for buying SMC cards," Schatt said. "But these prices will get their foot in the door."

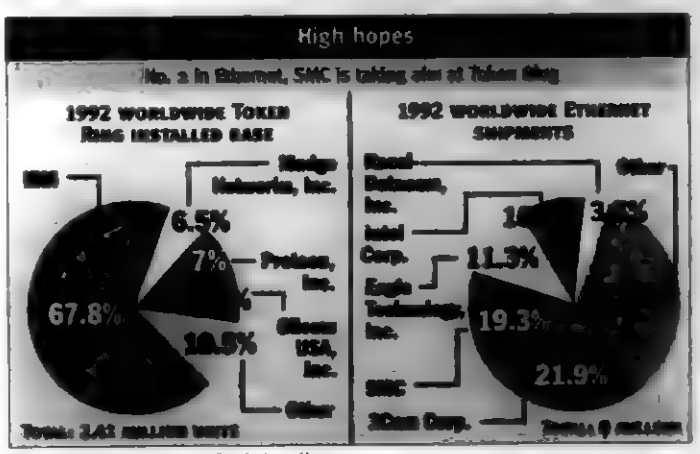
Initial impression

Laura Deets, LAN manager at Aon Specialty Group, a predominantly IBM customer shop in Chicago, said she was impressed with SMC's price points and was interested in evaluating the cards.

However, Deets said she would probably not go with SMC's MAU. "When it comes to the [network interface card], I'm open to other vendors," Deets said. "However, on the MAU level, while I'm sure there are other products that are compatible, IBM is probably a little more reliable."

To help overcome this mindset and ensure that its products are compatible with IBM networks, SMC has licensed IBM's LAN Support Program, which provides the NetBIOS and 802.2 Logical Link Control code for Token Ring networks, Murrah said.

In addition, Murrah said the company will provide free IBM connectivity consulting, and its products will carry a lifetime warranty and 30-day money-back guarantee.



Source: International Data Corp., Framingham, Mass.

Briefs

NCR announces free offer

NCR Corp. announced that all buyers of its NCR 3400 and NCR 3500 servers with Unix client/server and network file server environments will receive a specially packaged, five-user English version of NCR's StarGroup LAN Manager software product for free when their new systems are delivered. Shipments of this package will begin with the release of Unix System V Release 4 Version 2.02 this month.

Fujitsu unveils drives

Fujitsu Computer Products of America, Inc. has announced four disk-drive families that include drives incorporating magneto-resistive (MR) recording head technology. Pioneered by IBM, MR technology allows more data to be recorded on a single drive through the use of separate read/write heads. Magneto-optical drives typically store 200M bits of data per square inch. Fujitsu said its MR drives, due to ship in the first quarter of next year, will be able to store 300M bits of data per square inch and will eventually exceed 1G bit of data per square inch. Volume pricing for a 3.1G-byte MR drive is estimated at $1,595.

LAN Manager upgrade ready

Microsoft Corp. announced immediate availability of an upgrade for LAN Manager Version 2.0C and higher to Windows NT Advanced Server. The product is said to smooth the transition with automated tools and on-line Help. Pricing is $595.

NetWare release

Novell, Inc. has begun shipping its NetWare for SAA Version 1.3B with run-time versions of NetWare 4.01 and 3.12. NetWare for SAA is a gateway that lets NetWare clients access IBM hosts.

Open/Image put to use

Wang Laboratories, Inc.'s Open/Image imaging software is being used in new manufacturing applications released by Effective Management Systems, Inc. in Milwaukee and Earnest & Associates in Glen Burnie, Md.

Digital and US West deal

Digital Equipment Corp. was chosen by US West Communications, Inc. to supply Alpha AXP-based video server technology for use in a broadband communications trial that US West is planning for next year in Omaha, pending approval by the Federal Communications Commission.

Digital, which is seeking similar deals with other telecommunications companies, said its systems will support video-on-demand and other interactive programming for the US West trial. The interactive capabilities are scheduled to be provided by The 3DO Co.

C++

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Comshare strengthens Excel link

By Michael Vizard

Comshare, Inc. in Ann Arbor, Mich., this week will launch Version 2.0 of its Commander Financial Data Control (FDC) software, which will add Windows support and tighter integration with Microsoft Corp.'s Excel spreadsheet.

Based on the same multidimensional database used in Comshare's Commander Prism executive information system, FDC is a consolidation and reporting tool tailored to financial managers who need to analyze data stored in any Btrieve database. FDC will be announced at the Comshare user's conference in Dallas.

Using query tools that Comshare has added into Excel or Lotus Development Corp.'s 1-2-3, these managers can download data from a Btrieve database into the Comshare database, where it can be analyzed by client systems using a variety of drill-down tools provided in FDC.

In the background

To facilitate gathering that information, FDC can be run as a background task until the data is downloaded from the Btrieve database.

Among the companies adopting FDC 2.0 is truck manufacturer Freightliner Corp. in Portland, Ore., which is currently in the process of replacing a custom financial reporting application that runs on an IBM mainframe.

Using query tools that Comshare has added to Excel and 1-2-3, financial managers can download data from Btrieve to a Comshare database, where client systems analyze it using a variety of drill-down tools provided in FDC.

As part of that effort, Freightliner will deploy FDC alongside custom applications it is building using PowerBuilder tools from Powersoft Corp. and Microsoft's Access relational database, according to information systems analyst David Sinner.

However, while Freightliner will work with the current version of FDC, Comshare said it plans to deploy FDC running in conjunction with the SQL Server relational database from Microsoft, as opposed to the Btrieve databases currently supported by Comshare.

According to Comshare officials, the company will accomplish this initially by supporting Microsoft's Open Database Connectivity interface, which will be followed by plans to more tightly integrate the Comshare multidimensional database with SQL databases.

An FDC site license is priced at $120,000.

Chase

CONTINUED FROM PAGE 49

bandwidth capabilities will likely catch on in trading-floor environments in the next few years as the technology matures and standards are enacted. "For the most part, trading floors are pretty much running at capacity in terms of their data feeds," Williams said.

While visions of fast-packet switching dance in the heads of Chase technologists, quick and easy access to market data is the bottom line for its traders, who last quarter handled a bank record $186 million in trading volume.

"We're not interested in how the feeds are made or what the equipment consists of as long as the information we need gets to us," said Kathylynn O'Donnell Galbraith, a Chase executive vice president responsible for the bank's global capital markets activities.

Global village

In an attempt to address the increasing global nature of the capital markets it invests in, Chase last summer consolidated its international and U.S. capital markets operations into a single reporting structure.

To meet the global information technology requirements of its investment managers, Chase needed faster, more flexible graphical user interface (GUI) and analytics tools that would simplify the value of investments to investors, according to Galbraith.

"Our investment managers have to be able to interface with our investors, and they can't do that without state-of-the-art technology on the desktop to break down and simplify the relative value of the investment," she said.

To meet those and other trading-floor requirements, the bank is developing an Open Software Foundation (OSF) Motif-based graphical front-end package called Chase Advanced Trader Systems (CATS). CATS was designed to provide Chase traders with access to several Sybase, Inc.-based trading databases — including those used to house data for capital markets, commodities, derivatives, foreign exchange and treasury — while maintaining a consistent look and feel among different environments, according to William F. Schimoler, a Chase vice president.

The goals

Chase Manhattan has identified four key strategic business requirements for its forthcoming distributed trading environment to address:

- Identify trading opportunities.
- Capture transaction-specific information.
- Help the bank manage trading positions in fluctuating markets.
- Understand the exposure and opportunities the new environment creates.

CATS is slated for full production in Chase's foreign exchange trading within six months, Schimoler said. CATS implementation in other trading areas will follow shortly thereafter.

CATS "is more integrated than what exists today and will provide us with more and faster analytical tools," Galbraith said.

For example, only 115 of Chase's 456 New York traders are currently equipped with Sun workstations. Furthermore, Galbraith said, most of the market analysis handled by Chase traders today is conducted — after the trades are made — on VT100-type terminals linked to a Digital Equipment Corp. VAX computer.

In contrast, the CATS system, she said, will enable the bank's brokers to analyze its trades on the fly with additional Sun SPARCstations running Tekenkron Software Systems, Inc. market data distribution software under Motif GUIs.

The Sun workstations being installed on the trading floors here will be linked to one another over TCP/IP LANs.

Chase's trading floors in New York and London are connected to the bank's back-end IBM ES/9000 mainframe in Bournemouth, England, via T1 connections, according to Gordon Davies, a Chase vice president.

Decision time

Chase plans to decide on an ATM hardware vendor in the next two months but will likely wait until the technology matures and standards arrive before deploying the backbone devices in 1995, according to Schimoler. Between the time the trading floor goes into full production by November 1994 and that 1995 date, an Ethernet-based Fiber Distributed Data Interface backbone will support data distribution.

Chase is also planning to equip its New York and London traders with desktop-to-desktop videoconferencing capabilities. To date, only a handful of brokerages have addressed videoconferencing on their trading floors, including Morgan Stanley & Co., Moore said.

Chase expects to choose a videoconferencing software vendor by early next year, Schimoler said. In the meantime, the bank is testing software from Insoft Communique. Moore said desktop videoconferencing systems typically cost about $15,000.

Module facilitates storage for word processing files

By Michael Vizard

BRS Software Products, a division of InfoPro Technologies, Inc. in McLean, Va., last week added support for a word processing document conversion module to its text-retrieval database.

Offered under a reseller pact with Keyword Office Technologies Ltd. in Calgary, Alberta, the module is intended to allow word processing users to access any document stored on a BRS/Search database regardless of the document's original format.

In addition, the BRS/Search database can be linked to SQL databases.

The module supports more than 20 word processing applications running on either DOS, Windows, Macintosh, Unix or OpenVMS platforms. The BRS/Search engine runs on Unix or Novell, Inc. NetWare servers.

Pricing starts at $750 for a stand-alone version of BRS/Search.

Epoch Systems, Inc. has announced Epoch Enterprise Backup, a client/server backup/restore product that accommodates PC-based platforms, relational databases and Unix file systems across the enterprise.

Epoch Enterprise Backup can be used for PC LANs, stand-alone or networked Unix workstations and servers and mainframe storage subsystems. According to the Westboro, Mass., company, support for PC LAN client/server environments with Novell, Inc. NetWare clients is provided.

Features include intelligent schedule management, comprehensive reporting, heterogeneous client support and database backup support.

Epoch Enterprise Backup pricing ranges from $2,200 for five nodes up to $50,000 for 500 nodes.

▶*Epoch Systems*
(508) 836-4300

XDB Systems has introduced a distributed relational database architecture (DRDA) server for the desktop.

According to the Laurel, Md., company, the XDB-DRDA Server enables a DB2 for MVS, DB2/VM (SQL/DS) or SQL/400 application to initiate a dialogue to access data stored on an XDB-Server database running on a desktop, LAN or "mobile computer" via the DRDA protocol.

The process of importing and exporting data to and from the LAN is controlled by features that include security, audit, job scheduling and report distribution.

Third-party proprietary middleware is not needed, and application developers can use standard SQL requests.

The XDB-DRDA Server requires 200K bytes of RAM on a 386- or 486-based microcomputer.

Pricing is $8,500 for one to 10 users, $12,000 for 11 to 20 users.

▶*XDB Systems*
(301) 317-6800

PlanView, Inc. has introduced Version 2.0 of PlanView, Windows software for client/server work management solutions.

According to the Austin, Texas, company, Version 2.0 builds on the functionality of previous PlanView products and adds the ability for various classes of users to interact in the database, including work sponsors or requestors, functional, project or executive managers and time reporting staff.

Prices range from $1,800 to $4,200 per concurrent user.

▶*PlanView*
(512) 346-8600

SunSolutions has introduced ShowMe 2.0, a desktop videoconferencing product that lets workstation users collaborate interactively with video, audio and screen-sharing tools in real time.

According to the Mountain View, Calif., company, ShowMe 2.0 lets users display, discuss, annotate or edit images, documents and videos, as well as share applications via a graphical user interface.

Version 2.0 consists of ShowMe Audio, ShowMe Video, ShowMe SharedApp and ShowMe Whiteboard.

Prices start at $3,270.

▶*SunSolutions*
(415) 336-4567

ICL has announced several additional features for its DRS 6000 300 series of Unix servers.

According to the Irvine, Calif., company, these enhancements include a new technology enabling the maximum memory limit to be increased to 512M bytes and a 40-MHz SuperSPARC processor module that provides power upgrades.

The 300 series includes two I/O combination adapters and a dual SCSI-2 adapter.

The products come preinstalled in DRS/NX Version 7.0, which is ICL's implementation of Unix System Laboratories, Inc.'s Unix System V Release 4.2.

Prices range from $9,900 to $30,650.

▶*ICL*
(714) 855-5500

MTI has announced StingRay II, a storage server technology designed to meet the I/O demands of CPUs such as Digital Equipment Corp.'s Alpha.

According to the Anaheim, Calif., company, the StingRay II offers an advanced algorithm cache that supports up to 1.8G bytes of high-speed dynamic RAM. The results are said to be performance-rated at 3,600 I/Os per second and a bandwidth of 8M byte/sec.

StingRay II offers 160 MIPS of processing power for ultrahigh speed and performance. Other features are load balancing with the parallel processor.

Pricing begins at $25,000.

▶*MTI*
(714) 970-0300

NCR Corp. has announced the NCR 7450 retail workstation, a point-of-sale system.

The NCR 7450 features NCR's DynaKey technology, a combined display and keyboard that assists users through a transaction.

The workstation provides a key lock control for security and printer support. The NCR 7450 is an open systems-based workstation that can run Windows 3.1, MS-DOS 6.0 or OS/2 2.1.

According to the Dayton, Ohio, company, the product complies with the U.S. Environmental Protection Agency's Energy Star program.

The NCR 7450 is priced starting at $2,500.

▶*NCR*
(513) 445-5000

The RBS Group, Inc. has introduced Softrax integrated business software.

According to the Braintree, Mass., company, the product is Unix-based and hardware-independent. It can track installations, support calls, licenses, prospects and inventory and process orders.

Softrax is priced at $1,000 to $1,500 per user.

▶*The RBS Group*
(617) 848-3927

Product shorts

Pixelink Corp. has introduced OS/2-compatible high-resolution displays, options for its 120XD6 Xcelerated document imaging systems running 17-, 20- and 21-in. color monitors. The systems can display 256 colors at resolutions of up to 120 dot/in. The 120XD6 runs with Windows and Unix/X Window System-based host systems. Cost: $4,095. Pixelink, Hudson, Mass. (508) 562-4803. . . . **The Mark Williams Co.** has introduced Release 4.2 of the Coherent operating system. Features include the ability to run more than 50 third-party software packages, a Unix System V-style print spooler and support for SCSI and floppy tape drives. Cost: $99.95 for one to four users. Mark Williams, Northbrook, Ill. (708) 291-6700.

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- Do you use program interfaces such as HLLAPI, APPC/LU6.2, and LUA/LU0?
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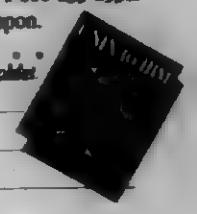

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EICON TECHNOLOGY

WAN gives focus to World Vision

Connectivity software helps channel resources to relief

By Joanie M. Wexler

Sometimes a simple technology can translate into benefits that transcend plus signs on the bottom line of a corporate financial statement.

In the case of World Vision Canada, a partnership within World Vision International, a global nonprofit relief organization, communications software linking remote PC users to a central database and LAN-like services on an IBM AS/400 is ultimately helping channel more resources into food, training and care for needy Third World countries.

One way Package/PC software from Telepartner International in Farmington, Conn., is helping around the world is by beefing up the ability of Toronto-based World Vision Canada fundraisers to quickly extract and manipulate key information from a host database to encourage donations, said Michael Boivin, technical analyst.

It is also streamlining operations by letting remote users become IBM OfficeVision participants. This eliminates much faxing and other manual processes and transfers funds out of the operations area and into relief aid, World Vision said.

Without the package, which the organization installed about six months ago in its 30 small offices throughout Canada, fundraising users could only perform terminal emulation and were unable to access LAN services, such as remote printing, that are available with the IBM PC Support software that comes bundled with the AS/400 operating system.

Package/PC, however, extends the functionality of PC Support to asynchronous dial-in users over X.25 packet-switched lines and precludes the need for terminal emulation hardware, Boivin said.

World Vision Canada President Don Scott *holds Ali Mohammed, 4, at a hospital in Mogadishu, Somalia*

"Terminals were just too expensive, because you have to buy a terminal controller that costs

World Vision, *page 64*

Distributed systems

Managing costs proves difficult

By Thomas Hoffman

Many organizations have drawn quantifiable benefits from moving data and applications into the hands of end users via geographically distributed systems, such as improvements in customer service response times.

But the ability to gauge the costs of ownership and support for these widely dispersed systems are often elusive and difficult to manage, according to a recent study compiled by Business Research Group (BRG), a market research firm in Newton, Mass.

Training losses

A key element in the cost of computing is training. Users told BRG that they are spending between $8,718 and $15,470, depending on platform, over the course of three years.

For example, according to the BRG white paper "The Cost of Geographically Distributed Computing," more than 70% of information systems executives surveyed at 180 U.S. organizations said remote network management has become a critical concern for their companies.

"That's a topic near and dear to my heart right now," said Donna Maria Krasner, a manager of technical services at Chesebrough-Pond's USA Co. in Trumbull, Conn.

The company is involved in several networking projects right now, including the establishment of a frame-relay connection between its Trumbull data center and Jefferson City, Mo., manufacturing plant. The connection is planned for completion by the end of this month.

A closer look

Kevin O'Neill, vice president of research and consulting at BRG, said the firm used the survey to look more closely at some of the hidden costs of geographically distributed computing, such as ongoing training.

"What we found is that you really have to take a look at the costs of maintaining these environments throughout their life cy-

Managing costs, *page 60*

Client/server E-mail comes in from cold

By Lynda Radosevich

ISA Corp., a systems integrator in Edmonton, Canada, last week introduced client/server electronic-mail software for the Internet and Open Systems Interconnect (OSI) networks.

Originally developed for the city of Edmonton, the software has three service components that run over both TCP/IP and OSI transport protocols: message handling services, directory services and library services.

The server software runs on major Unix platforms, and client software runs on Windows, Macintosh, DOS, OS/2, Unix and Microsoft Corp.'s Windows NT-based computers.

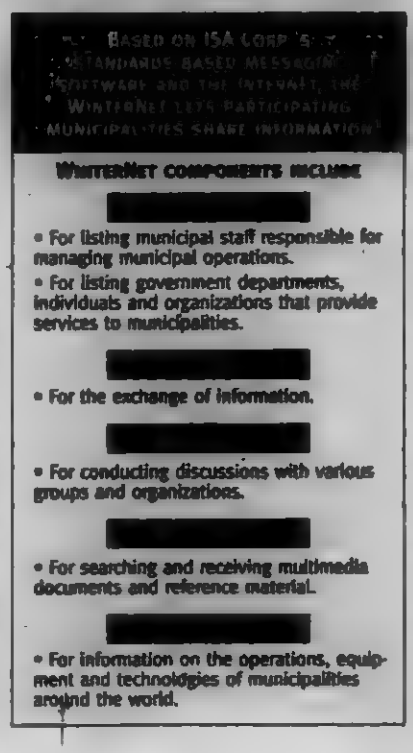
Called Enterprise Communication Services, the product is different from market-leading file-based E-mail systems such as Lotus Development Corp.'s CC:Mail and Microsoft's Mail in that the mail access protocol directly accesses the network protocols rather than writes to files on a network drive.

The result is that the workstation can operate independently and users can access messages from any geographical location as long as there is a TCP/IP or OSI network around, according to Steve Hole, director of research and development at ISA. Unlike plain Internet mail, the client software has a graphical user interface and is available on non-Unix platforms, he added.

The software is at the heart of the WinterNet, an information exchange program developed by the city of Edmonton for the International Winter Cities Association. The association consists of cities that have a mean January temperature of minus five degrees Celsius.

Using WinterNet, municipal employees can share information on winter technologies, such as snow removal compounds. The city of Edmonton is rolling out WinterNet to 295 municipalities.

When Edmonton began developing the WinterNet in 1990, no commercially available software met its needs for international standards-based communications and user-friendly PC interfaces, said Joni Mines, director of systems for the city of Edmonton.



"The problem with using CC:Mail and Microsoft's Mail is they were local, not enterprise-based, and it was difficult to connect up the networks. And the Internet is wonderful, but it is designed for fairly sophisticated users," Mines said.

So the city hired ISA to develop Enterprise Communication Services. The E-mail software uses the Interactive Mail Access Protocol, a prototype standard that is expected to reach full Internet status soon; the Simple Mail Access Protocol; and the Multipurpose Internet Mail Extension. The global directory service is based on the X.500 protocol and Internet Lightweight Directory Access Protocol (LDAP).

The city wanted to run OSI and Internet services over any network type, Hole said. Because TCP/IP networks are so much more common, the developers decided to run the OSI protocols on top of TCP/IP. To reduce the overhead, they used the LDAP, which is a slimmed-down version of OSI for TCP/IP networks, he explained.

Enterprise Communication Services is available now from ISA; however, pricing information was not available.

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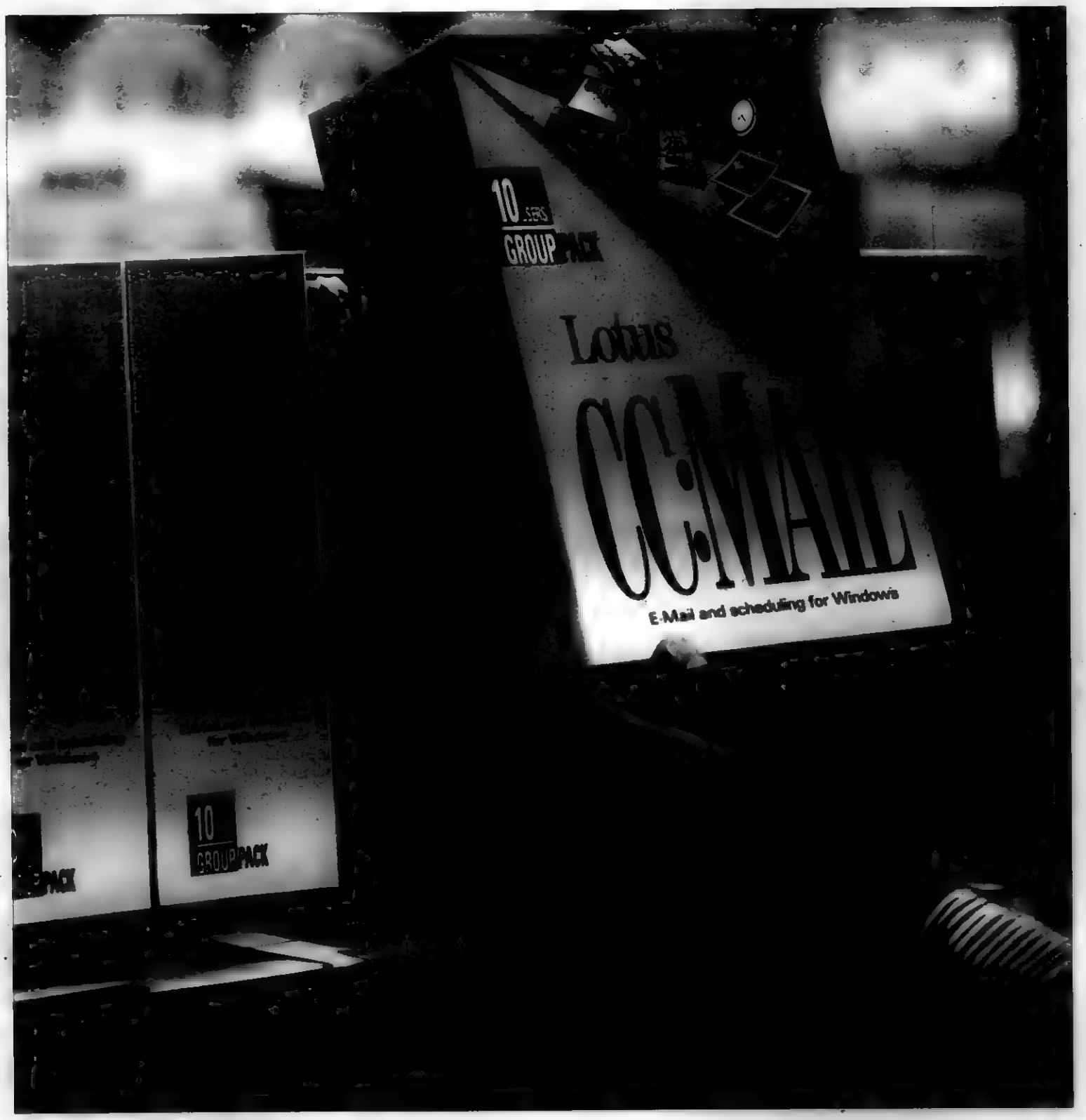

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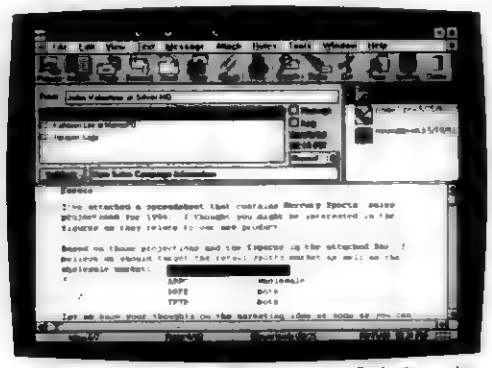

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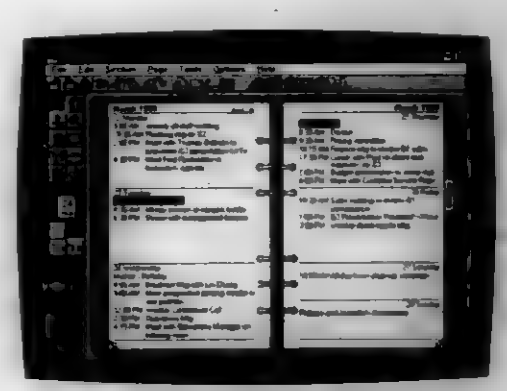

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Managing costs proves difficult

CONTINUED FROM PAGE 57

cles," O'Neill said. "Some of these environments — like early revisions of NetWare and different types of Unix — are manpower-intensive, and many organizations with multiple remote sites don't have the [people or] resources to manage them."

Finding a balance

Further complicating the issue, O'Neill said, is that most IS managers walk a fine line trying to balance the proper technical skill sets of their staffers while their departments are continuously forced to downsize. Survey participants were required to have at least seven remote sites with connections to legacy systems, O'Neill said.

One common concern among IS managers, he said, was the lack of mature software tools to help them administer and manage distributed environments, whether locally or remotely.

O'Neill said many of the nascent network management and distributed systems management tools show promise, such as IBM's NetView/6000, Hewlett-Packard Co.'s OpenView and Computer Associates International, Inc.'s CA-Unicenter. But, he said the deployment of these products to manage mission-critical applications over the next several months and the resulting user feedback will determine their mettle.

Measuring resources, costs

Gauging the costs and resources required to manage distributed systems has been a trouble spot for Patrick B. Carney, director of IS at ABB Power Generation, Inc. in North Brunswick, N.J.

"It's great to have distributed applications, but I'm not sure the management of those applications always follows. That's a hidden cost most companies aren't aware of," said Carney, whose shop runs several Novell, Inc. NetWare LANs between its offices in New Jersey and Richmond, Va. [CW, May 17].

The BRG report examined the costs of distributed systems ownership in four primary network operating system categories: NetWare, Unisys Corp.'s CTOS, IBM's LAN Server and several Unix environments.

In nearly all of the survey findings, the Unisys CTOS environment proved to be the most cost-effective.

Although Unisys commissioned the BRG study, the survey was handled objectively, according to O'Neill. "We surveyed 40 to 50 sites for each of the four environments and we gave no hint of who sponsored the study or what the other environments were," he said.

The average annual cost of supporting administration and maintenance at distributed CTOS sites came to $25,322 per site. The annual cost of supporting distributed NetWare sites averaged $37,399 per site.

Those figures came as no surprise to Dirk Faegre, a systems administrator at Concord General Mutual Insurance Co. in Concord, N.H., which runs a large CTOS network. "The reliability of this equipment is just amazing," said Faegre, who said his annual network maintenance costs run close to zero.

Staying the course

Though Faegre said he would like to see more third-party CTOS applications on the market given what's available for the DOS and Windows environments, he said his company's analyses of OS/2, Unix and Microsoft Corp.'s Windows NT operating systems fell short when compared with CTOS.

In fact, he said CTOS' resilient client/server capabilities are head and shoulders above other systems he has seen. Faegre said he would rather stick with CTOS than follow the latest client/server technology craze.

"I can see the lemmings walking over the cliff, and I don't want to be any part of it," he said.

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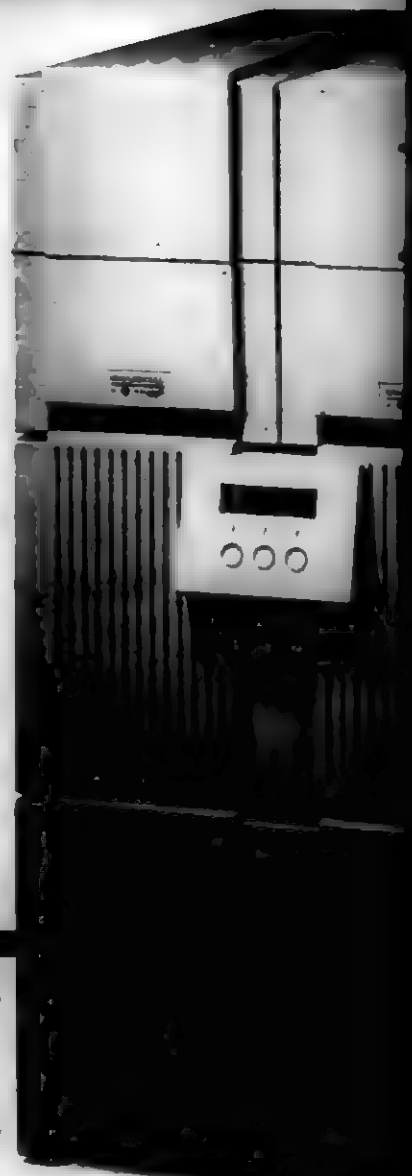

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Patent searching gets faster

Advanced text searches could appeal to large corporations, law firms

By Lynda Radosevich

For organizations looking to research patent information, Rapid Patent in Arlington, Va., and Electronic Data Systems Corp. in Dallas will announce this week an information service said to expand and speed up patent searching.

Called the Patent Analyzer, the service is expected to appeal to large corporations and law firms. It allows advanced text searches rather than the simple keyword and Boolean searches that other electronic patent-searching services provide, according to Michael Toohey, president of Rapid Patent.

For example, users can scan a draft patent application into the Patent Analyzer, and the system searches all of the document's words against the 1.7 million patents in a database containing 20 years' worth of patent records. The system then statistically determines which patents are most related.

Ivor Kaklins, a project manager at Hamilton Consultants in Cambridge, Mass., said that a simple Boolean search misses much of the related patent information because lawyers who author patents try to avoid using standard terms in order to keep their patents safer.

"The more the true meaning is obfuscated, the more likely that the unique aspects are harder to find," Kaklins said.

Now, when companies need sophisticated patent searches, they typically hire expert patent searchers who manually search through boxes of paper-based patents stored in the U.S. Patent and Trademark Office in Arlington, Va.

"Until recently, the patent world was one of the least automated and least 20th-century information-rich industries there is," Kaklins said.

Whither the wait

Vendors such as EDS and the patent office plan to change this [CW, Nov. 1]. Patent Analyzer will cut the three-to-four week turnaround time of a manual search to 48 hours, Toohey said.

EDS is providing the processing power to complete the mammoth searches via an in-house system that has been in development since 1985. The system has 32 parallel processors and parallel processing database software, also developed in-house, according to Carl Waite, division manager at an EDS research and development division.

The Patent Analyzer is currently available for customers making requests by fax or phone. Next year, Rapid Patent plans to add remote access via dial-up and dedicated workstations.

Pricing ranges from $45 to $495, depending on the service, which is roughly equal to manual search costs, Toohey said.

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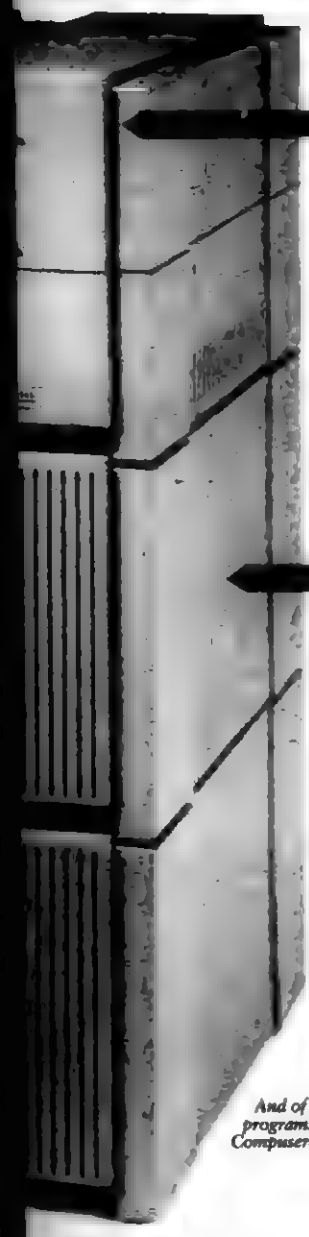

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Matrix provides auto-shutdown support of all major network, and midrange OS. The SNMP-compatible Matrix also supports APC's Measure-UPS which meters temperature and humidity, and monitors smoke, fire, water, and security detectors.

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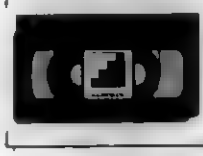

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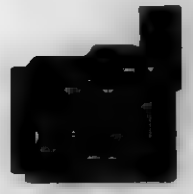
The truth about

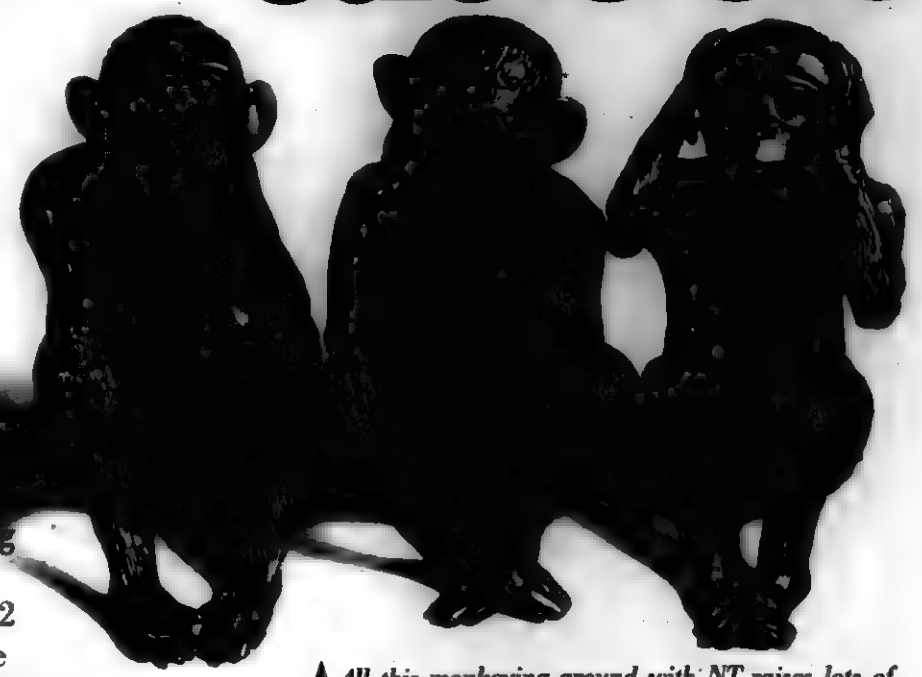
Before you decide what client/server platform is right for you, make sure you know what's true, and what's Not True.

Fact: the OS/2® client/server solution preserves your current hardware and software investment,

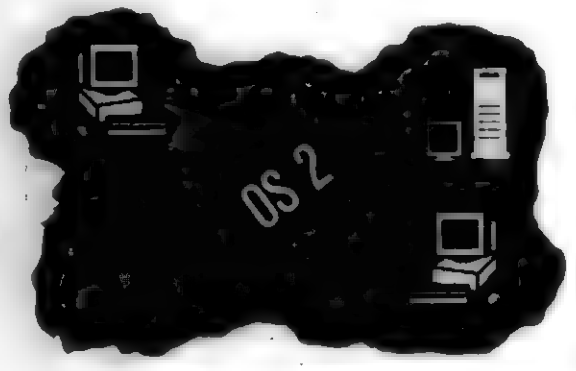


accessing your mainframes, minis and PCs when necessary and bringing their power and capacity to the desktop level. Fact: the Windows NT™ solution is based on PC servers and desktops and *doesn't* embrace all your existing resources. That could mean porting applications and data. The only plus that offers is the cost of porting *plus* the cost of additional PC servers.

Fact: OS/2 2.1 runs DOS, Windows™ and more than 1,200 native OS/2 applications. With LAN Server or Novell® NetWare,® OS/2 supports Windows, OS/2 and Mac clients. It's not likely NT will support all your existing applications. It won't run existing 32-bit applications like WordPerfect® 5.2 for OS/2 and Lotus® 1-2-3® for OS/2. It *will* require additional software to support DOS, OS/2 and even Windows clients. Worse yet, *Infoworld* sources report that Windows 3.x applications run *20% slower* under NT than they do under OS/2 2.1!



▲ *All this monkeying around with NT raises lots of questions. OS/2 has the answers.*



The OS/2 client/server solution exploits your existing hardware and software investment. There's No Telling how much the NT solution could cost you.

Fact: OS/2 delivers powerful, reliable, client/server applications for data storage and retrieval (DB2/2,™ Oracle 7,® InfoPump™), communications (Communications Manager/2, REMOTE OS,™ TalkThru®), transaction processing (CICS, IMS Client Server/2 V2), comprehensive network management (LAN NetView,® CA-UNICENTER,®

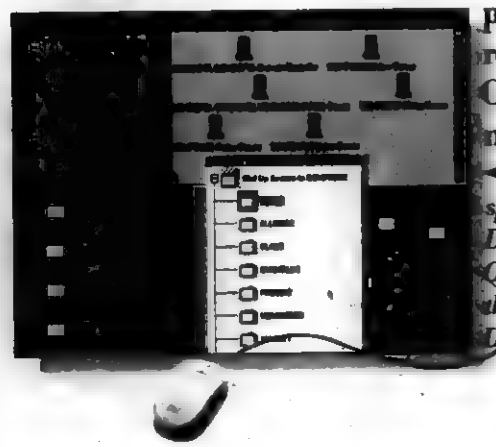
cliel NT

Domain/DACS,™ AlertView,™ Foundation Manager™), and more. **Fact:** The NT strategy is still Not There, and neither are native client/server applications.

Fact: OS/2 is committed to the industry-accepted Distributed Computing Environment (DCE) standards of the Open Software Foundation. **Fact:** NT is NoT.

▲*Who needs first-generation slipups? OS/2 is second-generation solid.*

Fact: NT still Needs Time to prove itself in the real world. **Fact:** OS/2 is used by millions world-wide. It's the leading, second generation, 32-bit Intel®-based operating system—a more stable, more developed version of the award-winning March, 1992 release.



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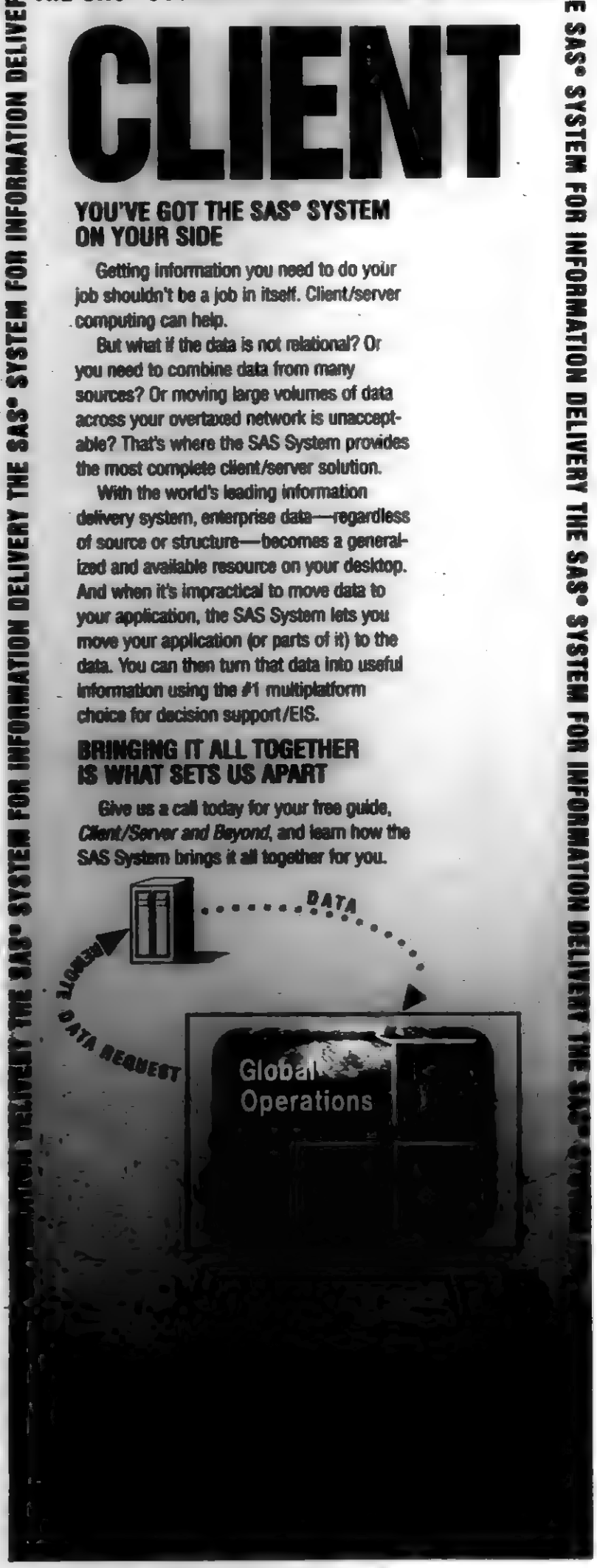


THE SAS® SYSTEM FOR INFORMATION DELIVERY THE SAS® SYSTEM FOR INFORMATION DELIVERY THE SAS® SYSTEM FOR INFORMATION DELIVERY

Briefs

Phones to get smarts

Tandem Computers, Inc. has agreed to sell imminent VeriFone, Inc. "smart screen" telephones to act as intelligent interfaces to Tandem servers. The phones, expected in mid-1994, will include a screen display, keyboard, modem, magnetic stripe card reader and system software for automating card-based transactions.

Eye on the sky

Two companies with planned worldwide low-earth satellite networks recently petitioned the Federal Communications Commission to accelerate the licensing process for this technology. Motorola Satellite Communications, Inc. and Loral Qualcomm Satellite Services, Inc. filed a joint proposal with the FCC.

No. 43786, call home

The city of New York's Department of Correction has introduced the Automated Inmate Call Management System, a computerized telephone program that will allow inmates at Rikers Island to make calls at their own expense. Inmates will be able to draw from their commissary accounts to pay for telephone calls using personalized bar codes stamped across their identification cards and personalized identification numbers.

World Vision

CONTINUED FROM PAGE 57

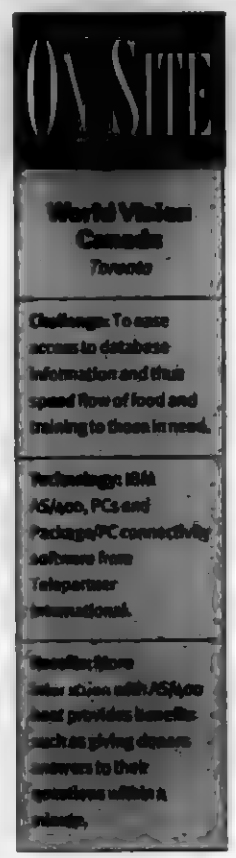
thousands of dollars to link — in our case — just one or two terminals in each remote location" to headquarters, Boivin explained.

According to Tim Mills-Groninger, program director of the Information Technology Resource Center, a consultancy for nonprofit organizations in Chicago, most organizations such as World Vision can put together LANs out of the box, "but WANs are trickier. There are not yet a lot of standards, and [telecommunications] costs are not well-understood" by these organizations. Many nonprofits "come in through the backdoor" by developing a LAN and then installing remote access, he said.

Boivin said not having a product like Package/PC diminishes the ability to have information on hand for donors, such as what is happening with a child they are sponsoring, where their money is going and what World Vision projects are under way. This can get an organization "the reputation of being fly-by-night," which hurts donations and their eventual beneficiaries, he said.

In World Vision's case, these are largely needy children in underdeveloped countries. The care and feeding of donors, which is increasingly dependent on database and communications technologies, is the path to delivering famine relief, medicine, shelter, training and other aid.

To get a better grip on donor-related information, World Vision Canada used its eight full-time developers and brought in another 10 to develop a customized database called the Donor Centered Support System, which houses child and World Vision project histories and manages marketing, donations and receipting for tax purposes. It was developed under a fourth-generation language program called AS/Set from Systems Software Associates in Chicago.



Quick answers

Having better interactive capabilities with the host "is a great help, because if a donor has a question, I can have the answer in less than a minute," said system user Paul Huston, the 30-Hour Famine Representative for World Vision's Eastern Ontario territory, based in Kanata. The 30-Hour Famine project is a pledge-based "starvathon," in which participating students raise money for hungry children.

In a development environment, "access to accurate, timely information by people who need it, regardless of location, is a benefit that leads to less overhead and better solicitation of resources; fundraisers can target prospects better and less expensively," Mills-Groninger said.

Currently, individual World Vision partnerships do not access each other's databases directly, though Boivin said a need is emerging to get faster information via automation.

For example, Huston cited the recent earthquake in India: "The more quickly people know World Vision activities and status in a disaster, the more quickly they can react with a donation."

However, there is an interoperability problem in that "we're all on different platforms in all the countries," Boivin said. Canada, though — which Boivin said tends to set the information systems pace for the whole organization — is looking to port its homegrown applications to C, which would render it available for other platforms.

[redacted]

Xyplex, Inc. has announced the 3350 Fiber Distributed Data Interface (FDDI) Concentrator, an eight-port, fixed-configuration FDDI hub.

Interfaces for standard fiber-optic cabling or low-cost twisted-pair wiring are available with the product. According to the Boxboro, Mass., company, the concentrator was designed to connect powerful network servers and "power users" who use high-speed workstations that produce a lot of network traffic.

The hub offers configuration options that include single or dual attachment to an FDDI backbone or dual homing.

The product provides a Simple Network Management Protocol (SNMP) agent that enables full network management from any SNMP-based management system.

The 3350 FDDI Concentrator with fiber-optic interfaces costs $9,750; the 3350 with copper interfaces costs $6,750.

▶ *Xyplex*
(508) 264-9900

LANQuest has introduced FrameThrower, a multiprotocol packet generator for testing bridges, routers and hubs.

The product was designed to address the need for fast, affordable network component testing and performance analysis.

FrameThrower provides traffic generation capabilities and can generate high packet-per-second output.

According to the San Jose, Calif., company, a single FrameThrower can fully saturate an Ethernet network by mixing as many as 1,000 combinations of protocols and packet sizes in a single transmission script. A sample library of packets and protocols is provided.

FrameThrower supports Ethernet, Token Ring and Fiber Distributed Data Interface networks and runs on any IBM-compatible host PC.

Prices range from $1,995 to $5,995.

▶ *LANQuest*
(408) 894-1000

Alcom Corp. and **TRS Technologies** have announced a software link integrating Alcom's LanFax Redirector network fax server with several software packages. They include Lotus Development Corp.'s CC:Mail and Notes, WordPerfect Corp.'s WordPerfect Office 4.0, Microsoft Corp.'s Microsoft Mail and any Message Handling Service-compatible electronic-mail system.

According to the Mountain View, Calif., company, FaxMail Gateway enables users to achieve greater returns on their networking investments by extending the functionality of their E-mail systems and LanFax Redirector servers.

The product offers compatibility with popular network operating systems, multiple inbound routing methods and the ability to handle heavy fax traffic.

The FaxMail Gateway package costs $995 for up to 50 users and $1,995 for an unlimited number of users.

▶ *Alcom*
(415) 694-7000

Micro-Integration Corp. has announced the 5250 Local Gateway for Windows.

According to the Cumberland, Md., company, the product is a local gateway that lets LAN workstations access IBM's AS/400 or System/3x hosts under DOS or Windows, with or without PC support.

On the same gateway, users can combine DOS and Windows sessions. To take advantage of increased speed and flexibility, users can also configure the network interface at runtime to Banyan Systems, Inc.'s Vines, Novell, Inc.'s NetWare or NetBIOS network protocol.

Supported Windows features include Dynamic Data Exchange; configurable, sizable and TrueType fonts; a flash pad to activate frequently used functions or macros; hot spots to select options from the screen; copy and paste; and Paste Link.

The product costs $2,495.

▶ *Micro-Integration*
(301) 777-3307

Digicom Systems, Inc. has introduced Sound Connection, a software-upgradable sound and modem card.

According to the Milpitas, Calif., company, the device mixes 16-bit stereo sound and 14.4K bit/sec. data/fax/modem functions on a single internal PC card using advanced Digital Signal Processing technology.

The product is fully software-upgradable, enabling users to dial into Digicom's bulletin board service to receive recent audio and modem-code revisions.

Other features include a built-in speaker for line monitoring, autobaud and automatic speed negotiation, flow control selection, an extended AT command set and CCITT V.32 bis modulation.

Sound Connection costs $299.99.

▶ *Digicom Systems*
(408) 262-1277

MicroAccess, Inc. has introduced the San Francisco Series family of Pentium and 486-based nonstop, fault-tolerant servers. The servers feature Advanced Network Operations Design engineering architecture.

According to the Fremont, Calif., company, the series provides an extensive real-time network management system, known as MIS Manager, that emulates Simple Network Management Protocol-type elements with a Windows graphical user interface.

The standard configuration for the San Francisco 466DS dual-server, 486DX-based 66-MHz system consists of two completely redundant file servers in one chassis.

Each server comes standard with 16M bytes of RAM on each motherboard (upgradable to 256M bytes), two 500M-byte hard disk drives, 1M byte of cache (with OptiMiser caching software), two dual-channel SCSI interfaces, five network interface cards, two modems, dual video cards, two uninterruptible power supplies with 30-minute battery backup and MIS Manager software.

The 466DS dual server costs $9,999.

▶ *MicroAccess*
(510) 249-9988

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It's the solution a giant U.S. manufacturer used to create a just-in-time maintenance program that reduced machine downtime by 25%.

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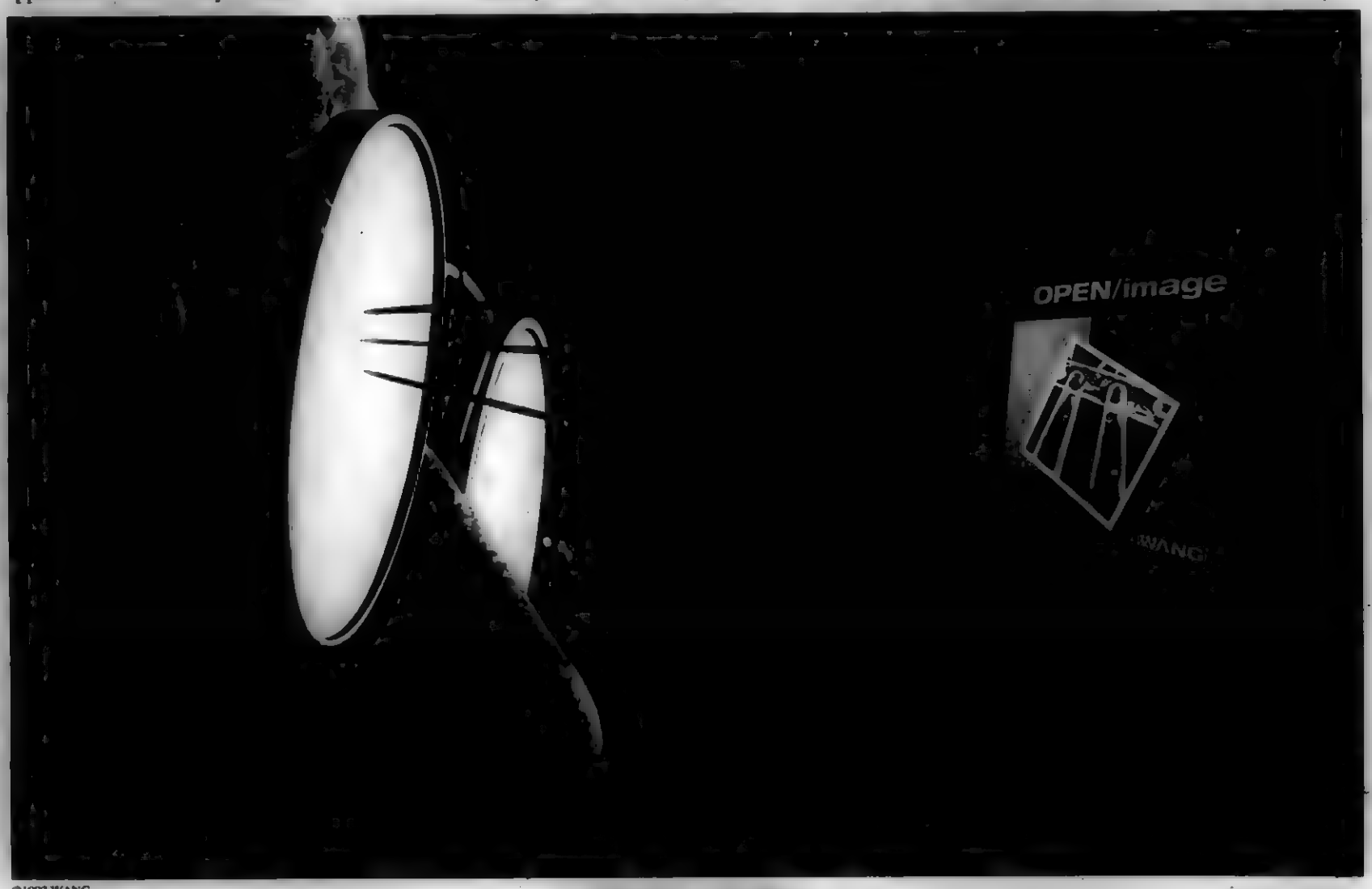

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WANG

THE POWER OF IMAGINATION.

Vendors push Unix to high-end machines

By Jean S. Bozman

■ Something big is happening on the high end of Unix server product lines. Today's top-performing commercial Unix systems are being edged out by symmetrical multiprocessor and cluster configurations.

Some vendors even plan to build parallel processors and alternative mainframes from conventional Unix workstations.

Many Unix vendors, including Sun Microsystems, Inc. and Silicon Graphics, Inc., have already fielded symmetrical multiprocessor machines; others, including IBM and Digital Equipment Corp., plan to ship symmetrical multiprocessor machines and "clustered" systems in 1994 (see chart).

The point of these parallel development efforts is to provide powerful servers for commercial applications, not the scientific and technical ones long associated with Unix superminis and supercomputers.

"The economics of workstations will move upscale to mainframe-class systems," said Gary Smaby, president of Smaby Group, Inc. in Minneapolis. "They will allow users who have topped out with their existing systems to migrate to higher levels of performance."

The future is not so far away, judging from vendor demonstrations of the next level of RISC-based systems. IBM is actively marketing its SP/1 parallel processor, which can run big relational databases for commercial or scientific applications. It also recently announced its ability to link up to four RS/6000 servers in a fault-resistant, "high-availability" cluster. And, it has installed an early-release version of an alternative mainframe called the Power 4, said Phil Hester, vice president of IBM's Advanced Workstation and Systems Division in Austin, Texas.

High-end RISC-based Unix servers

Vendor/Product	Type	Chip/Operating system	Price
[illegible]	[illegible]	[illegible]	[illegible]
Hewlett-Packard Series 800 T500	Stand-alone, SMP data center	99-MHz PA-RISC/ HP/UX	$165,000
[illegible]	[illegible]	[illegible]	[illegible]
Power Parallel SP/1	Stand-alone parallel processor	62.5-MHz Power/ AIX	$329,200
[illegible]	[illegible]	[illegible]	[illegible]
Power Challenge XL	Stand-alone SMP	75-MHz MIPS TFP/ IRIX	$169,900 to $889,900
[illegible]	[illegible]	[illegible]	[illegible]

The Power 4 can support users' parallel queries against large databases and connect with IBM's MVS-based mainframes through on-line processing monitors such as CICS, Hester said. It can outpace a typical symmetrical multiprocessor machine that uses shared memory and a single copy of the operating system. And, to prevent message-passing overhead among CPUs, it is not a "distributed memory" machine that has a copy of the operating system on each RISC chip.

The Power 4 is positioned somewhere between the two computing models, he said. "[Symmetrical multiprocessing is] great, but it does have finite scalability limits. For [on-line transaction processing] operations that share data, a lot of the communications overhead and latency associated with true, distributed systems becomes a limitation," Hester said. "We clearly see the demand for performance in both the technical and the commercial marketplace."

Sun plans to sell its symmetrical multiprocessor machines as high-volume computers and to leave the high-end designs to business partners such as Cray Superservers, Inc. [CW, Nov. 1]. Amdahl Corp. has agreed to resell the Sun symmetrical multiprocessor servers to accounts that have IBM-compatible mainframes. But installation of the eight-way SPARCserver 1000 or the 20-way SPARCcenter 2000 will depend on whether users want to create a large, integrated database system to support multiple applications, Sun said.

"It's going to be a question of the amount of throughput you need on the system," said Carl Stolle, manager of server product marketing at Sun Microsystems Computer Corp. "The more complex your application is in terms of the amount of data, the different types of data and the number of users, the more you want to load the data into a single database."

Scalable systems

However, key Unix vendors are not waiting for widespread user demand. They are moving to build a "scalable" series of RISC-based machines that will run binary-compatible code on all platforms in the series. "Because of the Lego-block approach these companies are using to build their next-generation machines, it will be easier to custom-configure systems for certain application sets or user groups," Smaby said.

Some users said the hardware technology is arriving ahead of the software that would support centralized process-

Unix, page 68

Nielsen outsourcing plan races to the finish line

By Mark Halper
NORTHBROOK, ILL.

Sometimes it seems that only glaciers move slower than outsourcing deals, that Pleistocene yields to Holocene in the time it takes to first negotiate a deal and then implement the cutover in information systems operations.

In some well-known examples, Electronic Data Systems Corp. closed its Continental Airlines deal well over a year after announcing it; The Hertz Co. signed with IBM's Integrated Systems Solutions Corp. nearly a year after word leaked out about negotiations.

And then there are the occasional time warps, like the one that kicked in after Nielsen Information Services signed a 10-year outsourcing agreement with EDS, estimated at $400 million, in late July.

By Labor Day weekend, only six weeks after the signing, Nielsen had shut down its own Green Bay, Wis., data shop, and EDS was churning 3T bytes of product and sales data into market reports for Nielsen clients out of its Plano, Texas, data center.

Price tag

Nielsen pays EDS on a "per drink" basis, incurring charges when it uses a CPU cycle or direct-access storage device. Charges vary depending on:

- **Time of day:** 7 a.m. to 7 p.m. is most expensive.
- **Volume:** Nielsen Marketing gets discounts as usage grows. Usage by other Nielsen and D&B operations goes toward marketing discounts.
- **Economics:** Pricing is adjusted downward as costs decline.

The pace actually picked up before the signing: Nielsen issued its request for proposals in April and told candidates that it wanted the job done within a month and a half.

"We put that stake in the ground early on," recalled Richard Derr, president of Nielsen Information, a division of Nielsen Marketing Research USA owned by The Dun & Bradstreet Corp.

Outsourcing analyst Cato Carpenter at Alex. Brown & Sons, Inc. in Baltimore pointed out that projects can move quickly if, as in the case of Nielsen and EDS, the goal is simply to move the customer's IS operations to a new site without major platform changes.

"It can be just like moving furniture, in a way, if the customer is willing to move quickly," Carpenter noted.

To keep things moving after Nielsen selected EDS, Derr yanked about 25 Nielsen staffers from their regular jobs to devote full-time attention to the migration. And to make sure they fulfilled their mission in a timely manner, he offered them that old reliable motivator: the almighty dollar.

"There were people who gave up their vacation, who delayed days off because they had a chance to get a monetary incentive," Derr said. "It was a team approach. If one person missed a key deadline, the whole team lost."

Working overtime, Nielsen and EDS adjusted code, addressed software licensing issues and undertook other technical and business issues to make sure all was running by Sept. 7, Derr said.

And then there was the cutover weekend.

"We physically transported the data with Lear jets and trucks," Derr said, explaining how the company moved mountains of data tapes to Plano.

Deal has paid off

In fact, truck drivers left Green Bay on Saturday and stayed at an overnight rest area in St. Louis, waiting until Sunday morning for two-way radio confirmation that Plano was ready for them. Otherwise, they were prepared to return to Green Bay.

So far, the deal has been worth it, Derr said.

Nielsen has used EDS to speed up the time it takes Nielsen to deliver reports to its roughly 650 clients, who are packaged goods vendors to the retail industry and retailers.

In fierce competition with its archrival, Information Resources, Inc. in Waltham, Mass., Nielsen sells reports that discuss how various products are faring in different stores and markets, with insights on the effects of merchandising

Nielsen, page 68

Multimedia

GUI to ease AS/400 coding

By Craig Stedman

IBM plans next year to start streamlining the development of AS/400-based multimedia applications so code can be written to run directly on a PC client.

Currently, AS/400 users interested in multimedia have to develop a standard character terminal application and add a PS/2 front end via IBM's Ultimedia Host Support/400 software — a two-step approach that IBM officials acknowledge is not optimal for positioning the AS/400 as a multimedia server.

Mark Even, manager of application technology introduction for IBM's AS/400 Division in Rochester, Minn., said graphical user interface (GUI)-based tools that will eliminate the need for the first step are scheduled to be available in 1994. "We're getting away from the separate stand-alone [PC] product," he noted.

Tool set

The tools will support direct application development for PS/2 clients "to some extent," Even said. However, he indicated that it will be another two or three years before the AS/400 has a full tool set and user interface for doing native multimedia development.

Even would not comment specifically on which tools would be available first except to say that "base enablers" such as multimedia editors will be included. Rather than developing its own tools, IBM is trying to persuade third-party vendors to build AS/400 hooks into their products, he added.

Sherry Rood, MIS manager for the Minnesota Twins baseball team in Minneapolis, which has sold tickets at 30 remote multimedia kiosks tied to an AS/400 for the past two seasons, said the direct PS/2 support should ease the development process in the future.

The Twins ran into "a few little glitches" putting the multimedia front end on an existing AS/400 ticketing application, "but overall it turned out very well," Rood said. The team plans to add a video merchandise catalog to the kiosks in the next few weeks and is also working with a third-party firm to offer job listings and government services, according to Bill Mahre, marketing vice president for the Twins.

Enterprise Rent A Car Co. in St. Louis will likely look at tying a PS/2-based multimedia application, now in development for use at its rental sites, to AS/400 back-end servers, said Marc Cohn, senior vice president of information services.

However, he described that as "kind of a loose concept" at this point. The application, scheduled to go live in December, will first run under OS/2 as a pure PS/2 application.

Source: IBM

Other AS/400 users said they have little interest in multimedia. "It's a great technology, but we don't do technology just for its own sake," said James Bailey, senior vice president of data processing at Massachusetts Financial Services in Boston.

Teresa Elms, president of Elms Information Services Group, a San Diego consulting firm, said she sees "virtually no demand" for multimedia on the AS/400 at present. "It's a push from IBM's side to make it look like they're competitive" with Unix systems in advanced technologies, she said.

Mark Peterson, director of market research at ADM Consulting, Inc. in Cheshire, Conn., said AS/400 multimedia sales will likely remain limited for at least another year. The issue is not the technology itself but the lack of immediately obvious business uses for multimedia, he added.

That is a gating factor IBM has to overcome, Even acknowledged. "The challenge is finding uses that can be justified from a business point of view," he said.

Nielsen deal

CONTINUED FROM PAGE 67

and marketing gimmick campaigns. The company gathers its information from scanned and manual data that it buys from retailers.

According to Derr, the average time of report delivery has dropped from about 15 days to about 11 days since EDS took over.

The main reason for this advance is EDS' technology wherewithal. Leveraging its stable of mainframes, EDS provides up to 1,500 MIPS of power during Nielsen's peak demand hours. In Green Bay, Nielsen's power topped out at about 700 MIPS on two IBM ES/9000 computers and IBM 3090 600J, Derr said. Storage at Plano is set to expand to about 4T bytes.

Practice operations

Before going live on EDS systems, Nielsen and its customers on two different weekends practiced sending data from Plano to client sites.

Perhaps one of the reasons the outsourcing project moved along so quickly was Nielsen's ambitious plans for moving to client/server computing. Completing the outsourcing logistics helped clear the way for those plans.

Derr said Nielsen has not yet decided whether EDS will play operational roles and provide PC and LAN support, for example, in the client/server scheme or whether the EDS data center will house the Hewlett-Packard Co. HP 9000 that will host the new system.

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Unix vendors

CONTINUED FROM PAGE 67

ing for distributed Unix applications, particularly software that handles job scheduling. Others said they see no immediate need for the high-end machines. Machines like Sun's SPARCcenter 2000, introduced a year ago, still provide excess capacity for some.

Users at large Unix sites are accustomed to spreading work among many workstations on a network. "Wall Street may need to have [a symmetrical multiprocessor] on one machine," said David Truch, a senior technical specialist at BP Exploration, Alaska, Inc. in Anchorage, "but, for a lot of what we do, there is a virtual [symmetrical multiprocessor] machine on the network."

Incoming work gets parceled out to remote workstations for processing. Truch's group has more than 100 Unix machines, including nine Unix servers.

But if additional capacity is needed, the BP Exploration unit is more likely to match one of its current RS/6000 Model 580 servers, Truch said.

Developments

Recent developments in the high-end Unix server arena include the following:

- Sun's September announcement of the SPARCcluster 1.
- Cray Superservers, Inc.'s introduction of a symmetrical multiprocessor machine with up to 64 SuperSPARC processors and SunSoft, Inc.'s Solaris 2.3 operating system.
- IBM's announcement of general availability for its SP-1 RISC-based parallel server and early-release installations of its Power 4 alternative mainframe.
- Digital's October announcement that Alpha machines running the DEC OSF/1 operating system will be shipped as symmetrical multiprocessor and clustered machines starting in 1994.
- Silicon Graphics' introduction of the Power Challenge series of supercomputers, due to ship in 1994.

Chemical maker in brief Unix romance

After mulling solutions, Rodel elects to upgrade proprietary HP 3000

By Mark Halper
NEWARK, DEL.

Before September, Rodel, Inc. had barely looked at Unix, but by the end of the month, the chemical company found itself flirting briefly with a Unix solution — though it settled on an upgrade to its proprietary minicomputer.

Rodel, which supplies polishing chemicals to semiconductor manufacturers and other industries, was deciding how to replace its aging Hewlett-Packard Co. 3000 Model 70.

So many options

Rodel's off-on-off affair with Unix exemplifies the schizophrenic decision-making many managers endure as they sort through the cornucopia of available solutions.

The company's objective was to install a box that would run Spectrum, Inc.'s Point.Man client/server order-entry software and boost communications among various Rodel sites.

Rodel data processing manager Paul Stark recalled that he had pretty much made up his mind to upgrade to an HP 3000 Model 947. Unix had been out of the question because of a perceived "lack of standards, lack of security and a lack of management tools," he said.

But at a Spectrum user conference in New Orleans in September, Stark had a revelation that made him think twice about sticking with a proprietary solution — and with HP.

What sent Stark back to the drawing board was a visit he made at the Spectrum gathering to a Computer Associates International, Inc. booth, where a demonstration of CA's Unicenter systems management software relieved some of his concerns about Unix.

"I saw Unicenter, which provided systems management tools and security, and at that point, Unix was a possibility," Stark said.

As it turned out, it was a short-lived possibility. During a later session at the conference, HP sales representatives reminded Stark and others that HP's road map for the 3000's MPE/IX operating system calls for adding more Unix features.

ON SITE

Rodel, Inc.
Newark, Del.

Challenge: To enhance networking and records entry and access at five sites in Delaware, one in Scottsdale, Ariz., and eventually at three international sites.

Strategy: Replace HP 3000 Model 70 with a more modern model that supports Novell networking and Spectrum's Point.Man.

Status: Upgrades expected in December.

"Unix and MPE are going to merge in a couple of years into a single operating system, so I'm going to stick with what I know," Stark said.

So, within a day, Stark agonized over throwing open his evaluation to a Unix implementation — a possibility that meant considering ditching HP — and then reverted to settling on a bigger HP 3000 box, the Model 947.

"It's strange, the kind of mental gymnastics you go through," Stark said.

Now Stark is readying Rodel for a December move to the 947 box.

Key to the switch will be the implementation of Novell, Inc. NetWare on the 947, which will act as the server for the LANs at Rodel's five sites in Newark and to the wide-area network connecting to Rodel's sales and marketing office in Scottsdale, Ariz.

Eventually, the company hopes to link its foreign sales offices in Tokyo, Seoul and Munich into the system.

Limited capabilities

With its Model 70 today, the company has limited networking capabilities. Connectivity software from Walker Richer & Quinn, Inc. ties PCs acting as terminals into the 3000; each of the company's 110 PCs can access information sent from another PC to the 3000.

Rodel already runs a small, 16-node Novell network, supported by an Intel Corp. 1486 PC, for its engineering group. That department would be the first to tie into NetWare on the 3000, Stark said.

In tying together the PCs, Stark hopes to improve customer support by giving staffers on-line access to old invoices, shipping details or other documents now stored on paper or individual PCs.

Stark estimated the upgrade will cost about $1 million — roughly $100,000 for the HP 3000 Model 947, about $450,000 for a 100-user license for Point.Man and about $80,000 for installing 100 486-based PCs either through upgrades or new purchases. Stark said the balance of the cost would come from rewiring Newark locations and from retooling the company's WAN.

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Manufacturing software

Planning tool links factory floor, engineering

By Ellis Booker

The widget, designed to perfection on a high-end workstation by an industrial engineer, reaches the factory only to face an engineering change before it can be built.

From an automated planning standpoint, that's when all hell breaks loose.

The change "is done either through paper or a phone call," said James M. Wejman, associate partner and senior product director for industrial software products at Chicago-based Andersen Consulting. "That whole process can take weeks, or months . . . and it uses people as message carriers."

Late last month, Andersen introduced a manufacturing planning tool designed to bridge this gap between design, engineering and production activities.

Called Computer Aided Process Planning (CAPP/D), the Unix-based workstation is the latest addition to Andersen's MAC-PAC/D manufacturing software line. According to Andersen, the tool is aimed squarely at complex manufacturers such as United Technology Corp.'s Sikorsky Aircraft Division in Stamford, Conn.

In fact, Andersen jointly developed the tool with Sikorsky and two Rockwell International Corp. units: the Space Systems Division and Rocketdyne Division in Canoga Park, Calif.

Good-bye paper chase

Through the use of a variety of vertical tools, big manufacturers such as Sikorsky have managed to boost quality and squeeze waste from factory design departments, Wejman said.

"But we think the new frontier will be gaining competitive advantage through project data management," he said.

At Sikorsky, the software has eliminated the paper chase, resulting in quicker revisions.

"We can automatically incorporate any process changes on the shop floor on-line," said John Delaney, Sikorsky's manager of manufacturing systems. The software has been in place for about a year and a half.

Both Sikorsky, which runs its entire manufacturing system on CAPP/D, and Rocketdyne have had the product in production for more than a year.

CAPP/D runs on IBM's RS/6000 and Hewlett-Packard Co.'s HP 9000 Unix systems. It features a graphical front end and uses a mainframe data repository. The software ranges in price from $135,000 to $300,000, depending on the server and the number clients.

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Brief

One DBT price fits all

Utility software vendor The DBT Group, Inc. has gone with the industry flow and abolished tiered software pricing for its Compress family of database utility packages as well as for its other software. The Gurnee, Ill., company has instead adopted a one-price-fits-all CPU size policy. At the same time, DBT announced it will no longer collect fees from users who want to upgrade CPUs.

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Software

Sterling Software, Inc.'s System Management Division has introduced the Solve suite of systems administration products.

According to the Reston, Va., company, the suite comprises four products designed to address key information systems management disciplines: Solve: Problem, Solve:Change, Solve:Asset and Solve:Configuration.

Key functions include the ability to identify and eliminate high failure rate hardware, unreliable software and inadequate maintenance service.

The software includes an enterprise model that is common to all the Solve products.

Prices begin at $25,000.

▶ *Sterling Software*
(703) 264-8000

Micro Decisionware has announced its Database Gateway for SQL/400 with IBM's Distributed Relational Database Architecture.

According to the Boulder, Colo., company, the gateway runs on an OS/2 platform. It provides users with access to IBM AS/400s from development, query and spreadsheet applications written to the industry-standard DB-Library and Open Database Connectivity application programming interfaces.

Prices start at $18,500.

▶ *Micro Decisionware*
(303) 443-2706

Compuware Corp. has introduced DBA-Xpert DB2 Release 3.0, which includes remote DB2 subsystem management capabilities.

The product enables database administrators to simultaneously access and administer multiple DB2 systems on separate CPUs from a single DBA-Xpert session, according to the Farmington Hills, Mich., company.

Features include automatic propagation of referential integrity changes to dependent keys and indexes; a fully integrated utility/direct-access storage devices management facility; a facility to import and implement new object definitions created by computer-aided software engineering tools, data dictionary tools or Dynamic Data Link tools provided with DB2 application software packages; and user-customizable job control language skeletons.

Prices start at $49,000.

▶ *Compuware*
(313) 737-7300

Generic Software, Inc. has announced BookReader for IBM's AS/400.

According to the Madison, Miss., company, BookReader provides AS/400 users with the ability to view and print IBM BookManager-compatible soft cover books at any AS/400 display station.

Other features include multiple-user support and advanced, automated methods for accessing and searching books.

BookReader costs $395 per CPU.

▶ *Generic Software*
(601) 853-1189

Cincom Systems, Inc. has announced six additional Control:Manufacturing modules for the Unix environment.

According to the Cincinnati company, Control:Manufacturing is a comprehensive business system that includes integrated support for manufacturing, distribution and financial management.

The Unix modules include accounts payable and receivable, actual cost system and project cost control.

Prices begin at $150,000.

▶ *Cincom Systems*
(513) 662-2300

Hardware

Computer Power, Inc. has introduced Computersave Mark II, an uninterruptible power supply for line conditioning and voltage regulation.

According to the High Bridge, N.J., company, Computersave comes fully equipped with galvanic isolation, which provides a physical shield against lightning strikes and isolation from power line noise. The product was designed for industrial and institutional applications.

Computersave Mark II capacities range from 900VA to 19kVA.

Prices begin at $1,600.

▶ *Computer Power*
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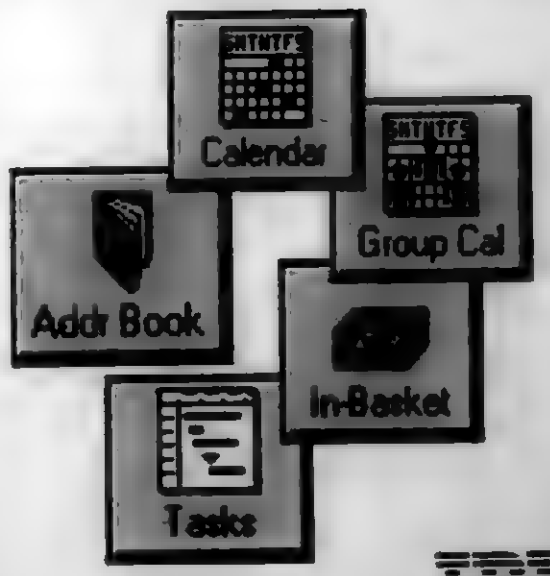

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CLIENT/SERVER

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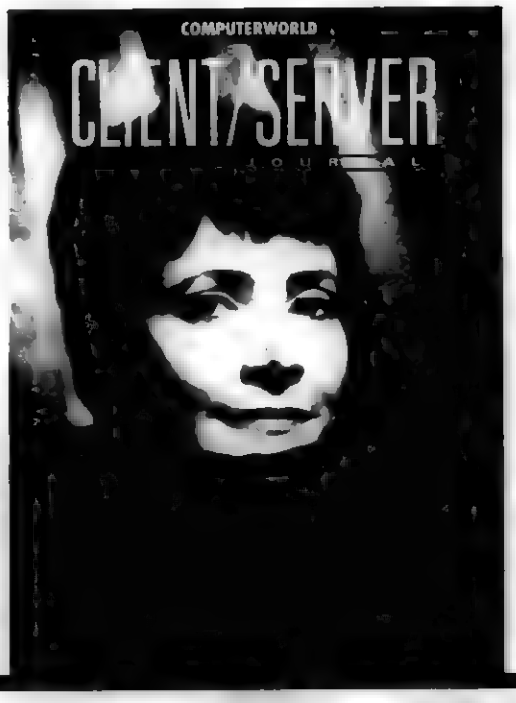

Warring over Windows — exclusive interviews with Bill Gates and Scott McNealy.

A new role for the mainframe — "babysitting" Unix servers and assisting with LAN service and support.

Columbia University brings productivity up and bureaucracy down by implementing a new application system that incorporates electronic document imaging.

JOURNAL

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PowerPC developers get kit from Apple

By James Daly

Software developers itching to build Macintosh applications for the upcoming PowerPC platform are getting a leg up from Apple Computer, Inc.

A small number of software development kits designed specifically for crafting applications on the upcoming line of RISC-based Macintoshes have been seeded in development shops running prototype PowerPC machines, according to sources within Apple.

A beta version of the Macintosh on RISC Software Development Kit is available from APDA, Apple's source for development tools. Apple says it expects to issue at least two updates between now and when the first PowerPC Macintosh is introduced. Updates will then be released approximately every quarter, sources said.

In January, Apple is expected to announce several models based on the PowerPC 601 chip, which is a collaborative effort by Apple, IBM and Motorola, Inc. Several models employing the new chip are expected to ship by March.

The APDA development kit consists of tools for Apple's Macintosh Programmers Workshop environment as well as a PowerPC-ready assembler, a C++ compiler and a debugger. The kit also includes a MacApp application framework designed for PowerPC Macintoshes.

Apple is still scrambling to get developers to craft native applications for the platform, which represents the company's future in hardware. Ten weeks before the expected unveiling

Apple, *page 74*

Object-oriented applications

Objects spell service for AAA

ON SITE

American Automobile Association
Heathrow, Fla.

Goal: To coordinate and centralize access to AAA's travel data for geographically dispersed AAA clubs.

Method: To re-engineer existing TravelMatch software using Lucid's object-oriented development tools, XVT Software's multiplatform tools and Informix's relational database management system to create an object-oriented application running on Sun workstation servers.

Benefits: Faster access to updated travel information for AAA clubs and easier maintenance.

By Melinda-Carol Ballou

It ain't just for flats and dead batteries.

The American Automobile Association (AAA) is often thought of as a provider of emergency road service. But AAA officials said they want people to know that their group is also one of the largest travel agencies and sources of travel information. The organization is now trying to make travel data more accessible for 137 local AAA clubs across North America.

AAA's travel service application, TravelMatch, previously ran on AT&T's 3B2 minicomputers hooked up to dumb terminals. Over the past two years, the Travel Delivery Systems staff at AAA's main office in Heathrow, Fla., has been re-engineering the software to create an object-oriented application for Sun Microsystems, Inc. workstations. They have been using Lucid, Inc.'s object-oriented Energize tools, XVT Software, Inc.'s graphical user interface (GUI) painter tool kit and portability library and an Informix Corp. relational database management system.

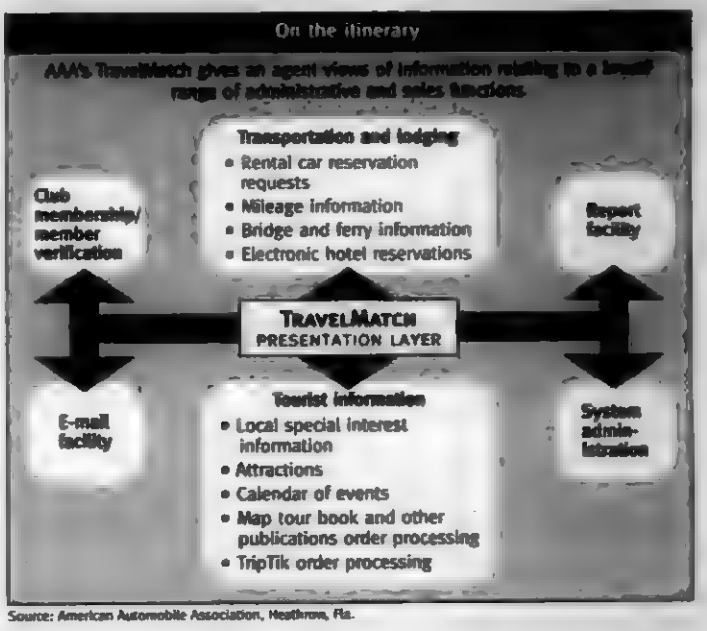
While the new TravelMatch will initially run on dumb terminals and PCs attached to Sun file servers, this is the first step in a move toward client/server, according to Armando Ramirez, senior systems analyst at AAA. However, plans for that transition have not yet been finalized.

In two initial offerings, the clubs will be able to either purchase their own Sun server to run the application locally or use the Florida office as a TravelMatch service bureau and connect to the Sun servers over a frame-relay network, he said.

"This will save the clubs the cost of having to purchase a big box," Ramirez said.

In addition to providing easier access for the clubs, the re-engineering effort seeks to make

AAA, *page 74*



Source: American Automobile Association, Heathrow, Fla.

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AAA

CONTINUED FROM PAGE 73

the application easier to maintain and enhance since the object-oriented structure is more modular, Ramirez said.

"Because [the application] is object-oriented, it is easier to break the systems apart if we want to provide subsets, and it's easier to add new sections to it," he said.

For instance, Ramirez's group was able to add bridge and ferry information to the new version of TravelMatch. A primary purpose of the software is to provide access to information that would normally be in tour books and can quickly become outdated. It is important to be able to easily incorporate changes as the information shifts, Ramirez said.

Trivia for travelers

"We include data that's important to people but not widely known, such as when the state fair happens in a small town, the local calendar of events, where bridges and ferries cross or when leaves turn color in Vermont," he said.

Making the shift to an object-oriented environment was facilitated by Lucid's Energize development tools, which offer a C++ compiler, good browsing capabilities and an underlying object-oriented database for incremental compiling and linking. XVT Software's tools made it easier to create the user interface because they allowed Ramirez's group to do both character mode and GUI mode: "It's the same source code; you don't have to change it," Ramirez said.

Several members of the development group had previous training in object-oriented development, which Ramirez said was helpful since they were able to act as mentors. An extra week of training for the development staff along with a presentation to upper management helped create the appropriate culture to support the move to an object-oriented environment.

TravelMatch also includes an electronic booking system for hotel reservations. This and the entire system are likely to move to client/server with Unix servers for PC/LAN clients in order to provide greater interoperability within the various TravelMatch applications (see chart page 73) and to allow clients to communicate with one another, Ramirez said. End users of the application at AAA headquarters spoke about the advantages of the new system vs. the old one.

Easy access

"The redesigned TravelMatch now is a menu-driven application which allows you to access information quickly without using function keys. You can move from screen to screen so that you can walk yourself through the application even without formal training," said Candace Christman, training technologist at AAA.

An expanded accommodations search lookup allows end users to do combined searches to determine customer lodging needs such as whether pets are allowed, whether the pool is handicapped-accessible or which Diamond rating a hotel has, she added.

She said beta users of the application are receptive to the pull-down menus and the additional information that was only available before in printed form. AAA travel agents can also order TripTiks, or customized maps for specific destinations, on the new system. The system then prints a work ticket with a peel-off label, and travel counselors assemble TripTiks.

Apple pushes PowerPC

CONTINUED FROM PAGE 73

of the PowerPC-based Macintosh, less than two dozen vendors have committed to providing native applications.

Apple spokeswoman Betty Taylor said many of today's Macintosh applications should run without modifying PowerPC, but the real advantages of the technology will be with applications that exploit the RISC performance. Older applications employing emulation code could run at half the speed of those running native PowerPC code, Taylor said.

Analysts said that number should increase, especially with the APDA development kit. "It's starting to get very busy," said Steven Eskenazi, an analyst at Alex. Brown & Sons, Inc. in New York. "Most hard-core development work gets done in the few months before a product comes out."

Working those applications

Third-party developers are also working hard to bring existing applications over to the new platform. At WordPerfect Corp., engineers are using Echo Logic's Flashport porting tool to port WordPerfect's Assembly code over to C, according to spokesman Dave Teran. Other companies, such as Microsoft Corp., are using their own porting tools.

Product manager Don Pickens said Microsoft plans to bring its complete Macintosh applications suite over to the PowerPC, with the rollout of native applications of Word and Excel by the first half of the year.

Apple is also optimizing parts of System 7 to improve performance on the PowerPC processors. Macintosh programs spend a lot of time calling procedures from the Toolbox. Apple has modified the Toolbox procedures that consume the most computation power to take advantage of RISC.

David M. Bernard

Windows of choice

Click . . . drag . . . drag . . . click . . . click . . . drag . . . double-click . . . click . . . drag . . . PRESTO!!!

These days, this is all you need to do to write a Windows application. Once a test of programming expertise, Windows development is now so easy that almost anyone can do it. Of course, sophisticated projects do require some programming, but basic Windows development is no longer the task it was.

Choosing Windows as a development environment doesn't guarantee a good interface, however. Windows applications can be just as awkward, counterintuitive and ill-conceived as the worst DOS programs. Whether you are using Powersoft's PowerBuilder or SQL Windows in a client/server environment or Microsoft's Access or Visual Basic in a standard environment, you should keep the following guidelines in mind:

▶ **Choose controls based on the type of data to be displayed.** Vertical controls such as up/down arrows or vertical scroll bars work well for skipping through records, while horizontal controls are better suited for scrolling through additional detail for the same record. Most users "see" data in terms of a spreadsheet — rows contain records, columns contain fields.

Combo boxes should be provided so users can make a selection from a predefined list of values.

List boxes should be used to display many values related to the current record.

If selection of choices for a specific attribute follows a consistent pattern of numbering or lettering, spin controls should be used rather than combo boxes.

Check boxes are best suited for yes/no situations. Radio buttons should be used when a user has a finite number of choices to make for a finite attribute. An example would be a college administration system offering the choices "freshman," "sophomore" and so on.

▶ **Use aesthetics to communicate information about the data.** Using different background colors is a good way to differentiate changeable from nonchangeable data. Three-dimensional effects can help distinguish fields, labels and titles. For example, data fields can be displayed as sunken, labels as normal and titles as raised. 3-D also has the advantage of making an application appear more "real" and impressive.

▶ **If the application performs lengthy tasks that lock the keyboard, provide users with progress feedback.** For operations that are logically finite, such as copying files, a progress indicator such as a "thermometer" is a good way to accurately show the operation's progress.

For open-ended operations, such as processing a text file with an unknown number of records, a Macintosh-style clock with hands that move is a better choice. Never use both.

▶ **Avoid information overload and layered frustration.** Users want everything, and often programmers are only too happy to oblige with very informative and very cluttered screens. Information should be grouped into sets, based on how users actually work with the data. Related information should be a mouse click away, usually in a dialog box accessed by a button.

Think long and hard before hiding functionality more than two levels deep. (The classic example of what *not* to do is the printer setup dialog in Excel 4.0.) Excessive layering makes users angry. You can never have too many paths to a function.

▶ **Reduce, rather than enhance, users' dependence on pull-down menus.** Although a great advance over the cryptic "dot prompt" command sets common in character-based applications, pull-down menus have their own problems. They layer functionality, increasing complexity and ultimately frustrating users.

Developers should provide pull-down menus only as a last-resort method for users to access functions.

▶ **Code all possible ways of selecting data.** For example, when users need to select information from a list, they should be able to do the following:

- Click on the item, then press Enter.
- Double-click on the item.
- Click on the item and then click "OK."

Or, if the operation can be executed in batch, the user should be able to select several choices at once, using Shift and the arrow keys for contiguous choices or Ctrl and mouse clicks for noncontiguous ones.

There are lots of mature, high-level development environments available for Windows, which means you should be able to spend less time getting programs to work and more time advancing the usability of your applications. Take advantage.

Bernard is a technology management consultant at Omicron Consulting in Philadelphia.

PC/Icon: English-speaking tool

Natural Language tool lets users speak English

By Melinda-Carol Ballou

■ For developers seeking to allow users to query databases in native English, Natural Language, Inc. in Berkeley, Calif., last month introduced a Windows version of the company's Natural Language database query and development tools.

The Natural Language tools were available on Unix, but the development of natural language applications with that version was time-consuming, company officials and users said. PC/Icon, the new graphical Windows product, facilitates the process, they said.

PC/Icon lets developers build, test and debug natural language applications by creating the semantics and structure of a specific database. Developers are aided by four main windows that let them describe key business entities and relationships in English. PC/Icon can manage and track development of applications using a visual "global view" feature, and help and reference information is integrated into the tool.

End users type in an English query; PC/Icon parses the English query and performs a syntactic analysis to determine what is being asked. The product then generates the appropriate SQL statements.

"We're a long-distance telephone company and we're using [a Natural Language application] to detect fraud on our network," said David Luinstra, telecommunications development analyst at Wiltel, the telecommunications subsidiary of the Williams Cos. in Tulsa, Okla. "We also get performance data from our switches and provide that to our traffic engineering group so we can look at how the switches are performing."

User-friendliness and user-acceptance are key for the Wiltel application, which is used by fraud detection analysts and traffic engineers. "It is an absolute that they don't know how in any shape, form or fashion to speak SQL," Luinstra said. "They don't know anything about the database."

Another user said the Windows interface is fairly straightforward and that nontechnical developers can create applications, though "the more they know about their business, the better."

SMI, Inc., a medical data services company in Port Jefferson, N.Y., used Natural Language's tools to create an automated data-collection scheme that incorporates information from 12 hospitals, according to John Napoli, a partner at the company. The SMI application allows hospital users to perform complex English queries across a range of data.

"It's like Lt. Colombo — you may know what the first five questions are, but based on those answers, you need to drill down further, and it's impossible to anticipate what those follow-up questions are going to be," Napoli said.

The new Windows release is less expensive, offers more deployment options and allows users to integrate data with other Windows desktop applications, such as spreadsheets or word processors, Napoli said.

Industry analysts said the lack of success of other natural language tools, such as one from Intelligent Business Systems, has to do with price and difficulty in creating applications.

Some other analysts said they feel Natural Language now stands a chance to successfully target the market with lower-priced Windows tools.

"There's a limit to the complexity of what you can put into a point-and-click interface, and natural language interfaces are more suitable where users want to ask more complex types of questions," said Colin White, president of Database Associates International, a Morgan Hill, Calif., consulting firm.

Plenty of choice

Natural Language tools are available on Unix workstations and support all major RDBMSs, including Oracle, Sybase, Ingres, Informix and Rdb.

Information problem

But while PC/Icon hides the complexity of the database, developers must insert the business knowledge and vocabulary into the Natural Language application for it to be of use.

"The problem with [Natural Language] is that they haven't built up a good methodology for capturing information in a methodical way," said Rich Finkelstein, president of Performance Computing, Inc., a Chicago consulting firm.

Natural Language officials said the new Windows release offers a tutorial and methodology for incorporating the business information that will go on-line in the next release of the product.

PC/Icon is shipping now and is priced at $2,500 for a developer's version and $595 for a runtime license. PC/Icon allows developers to deploy applications on single Windows client platforms and to access database servers on Novell, Inc.'s NetWare, IBM's OS/2 and Microsoft Corp.'s Windows NT.

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95 Server

Liant Software Corp. has introduced C++/Views 3.0, an object-oriented development tool.

According to the Framingham, Mass., company, the product speeds up and simplifies the creation and porting of graphical user interface (GUI) applications among Windows, OS/2 Presentation Manager, the Open Software Foundation's OSF/Motif, Macintosh and DOS character-mode environments.

The product unites more than 100 ready-to-use classes with programmer productivity tools. The library contains data, event, interface, printer and extended GUI classes.

C++/Views 3.0 prices range from $490 to $1,999.

▶ *Liant Software*
(508) 872-8700

Cadre Technologies, Inc. has introduced Ensemble Viewer, an interactive two- and three-dimensional graphical tool for visualizing C programs.

According to the Providence, R.I., company, the tool provides highly interactive views of key program aspects by displaying program information and test results stored in the Ensemble database.

Ensemble Viewer offers browsing capabilities for program flow, data structure and physical file structure program aspects.

Users can interact with the software design code and files by looking at a graphical representation of the actual program structure.

Ensemble Viewer will be available for Sun Microsystems, Inc.'s SPARCstations next month and for Hewlett-Packard Co.'s HP 9000 and IBM's RS/6000 in February.

Ensemble Viewer prices start at $2,400.

▶ *Cadre Technologies*
(401) 351-5950

Software Maintenance & Development Systems, Inc. has announced Aide-de-Camp Version 9.0.

Aide-de-Camp is a software configuration-management system for Unix and Digital Equipment Corp.'s VAX/VMS platforms.

According to the Concord, Mass., company, this version offers an improved command language and supports an optional DOS client, allowing PC users to work with the Aide-de-Camp system over a network to a Unix server.

Temporary data can be stored in memory, and Version 9.0 will support existing customer macros through a "Version 8.0 compatibility mode."

Aide-de-Camp Version 9.0 costs $3,500 for a single user.

▶ *Software Maintenance & Development Systems*
(508) 369-7398

Ernst & Young has introduced Navigator System Series 2.1, an application development environment.

According to the Irving, Texas, company, the product consists of five major components: handbooks offering methods, techniques, tool guidelines and project-management techniques; an expanded monograph series providing additional information on core themes of the methodology; the Automated Methods Environment; education, including interactive desktop training and videos; and implementation services and support for adopting Navigator Systems Series.

HyperProject, a tool for customizing the methodology for specific projects, is also included.

A basic license costs $65,000.

▶ *Ernst & Young*
(214) 444-2100

Hitachi Software Engineering America, Ltd. has introduced PenAnalysis Data Modeling, pen computer-based business process re-engineering tools.

According to the San Bruno, Calif., firm, PenAnalysis Process Modeling is used for developing entity-relationship models during the business area analysis phase of enterprise re-engineering.

Users can collect and model business information and for further analysis, upload the data models into computer-aided software engineering systems.

Prices range from $845 to $24,495.

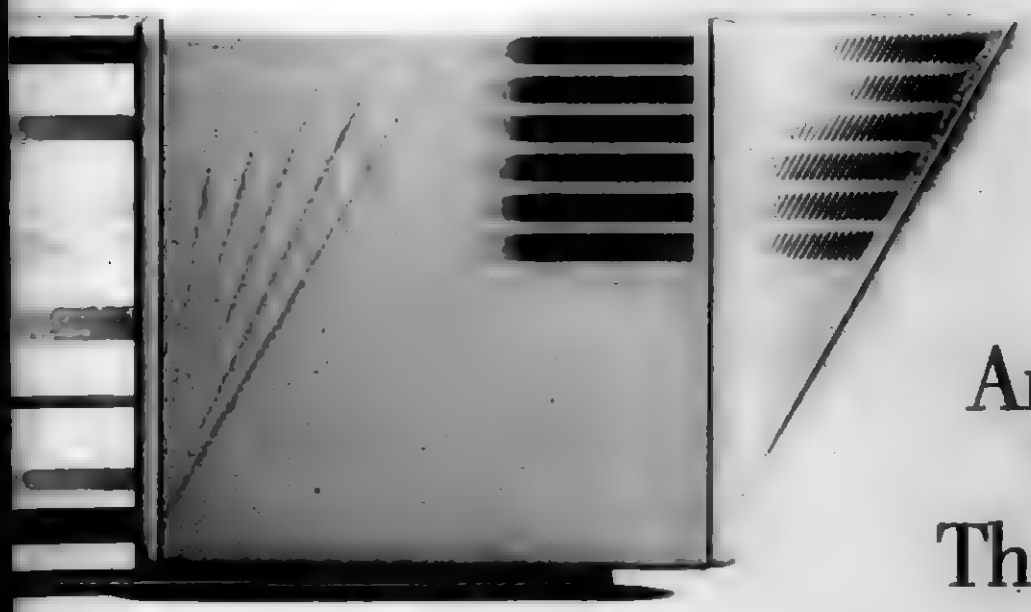
▶ *Hitachi Software Engineering America*
(415) 615-9600

The Alsys CASE Division has announced Object CM, an object-oriented configuration-management system designed to improve management of software development processes and increase programmer productivity.

According to the San Diego company, the product integrates an object base that is compliant with the Portable Common Tools Environment (PCTE) and provides a configuration-management system that includes a PCTE-based object-oriented repository, an object browser, a graphical user interface, a system administration facility and an assortment of personal productivity tools. Object CM can be extended to support process control over activities, including coding, documentation, software design, project management and software reuse.

Through year's end the introductory price for a five-user license is $9,995.

▶ *The Alsys CASE Division*
(619) 457-2700



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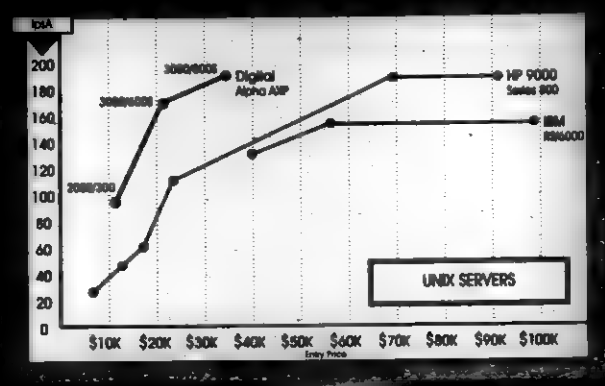

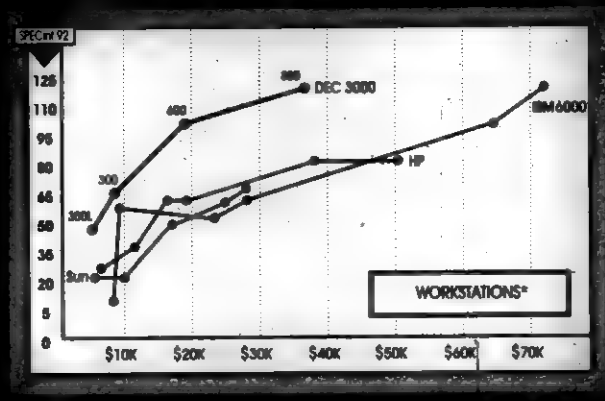

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The cyberpunk movement is influencing art, music, literature and even supercomputer design. Are cyberpunks creative visionaries or merely

nERds with an AttiTudE?

by candee wilde and david weldon

When employees in the information systems department start coming to work with a copy of *Wired* or *Mondo 2000* under one arm and begin showing "cyberpunk" traits, should you quickly change your computer passwords, or do you invite the employee to lunch?

The cyberpunk movement is changing as fast as technology itself, and today's cyberpunker is as hard to pin down as, well, cyberpunk. But IS managers may want to keep a close eye on those cyberpunks working in their midst: They may provide a valu-

Cyberpunks, *page 80*

Some argue that real-life cyberpunks are technology prophets, recognizing the mass-media opportunities of tomorrow, today

CONTINUED FROM PAGE 79

able window to tomorrow's IS frontiers.

Or, they may be someone with a hackerlike attitude you should be very worried about.

Or, then again, they may be no more valuable or threatening than anyone else in the IS department.

The answer depends on who you talk to.

Tainted images?

Cyberpunk often conjures up images of social misfits dressed all in black with far-away stares, spiked or long hair and electronic gadgets hanging from their belts. Not only is that image "hopelessly outdated," say sources close to the movement, but it betrays what may be the value of these technovisionaries to the IS manager.

A positive view of cyberpunkers is held by Paul Saffo, a research fellow at the Institute for the Future in Menlo Park, Calif. Saffo is a recognized expert on the cyberpunk movement and has written extensively about it. He says IS managers should credit the cyberpunkers in their departments as being among their most creative employees and the ones who recognize where technology is heading.

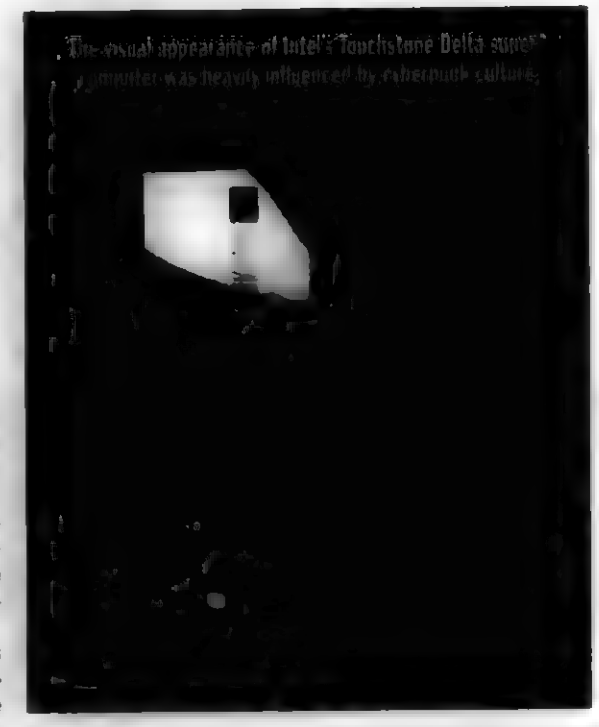
"IS managers are going to have a hell of a time keeping up with the changes in technology," Saffo says. "They had better find out what direction the cyberpunk crowd is going in and latch on. The impact is likely to be significant, and it can be summed up by the term 'reinvention'" of new ways to do old things or new applications of existing technologies.

Up to no good

Holding a negative view is David Vaskevitch, director of enterprise computing at Microsoft Corp. "It's the same culture that 15 years ago was buying the blue boxes for free phone calling. It's a large anti-establishment subculture made up of mostly hackers."

A third view is reflected by Justin Rathner, director of technology at Intel Corp., who sees the movement in a mixed light. He says cyberpunkers may be focusing "on some pioneering practices" for information sharing, but he has doubts about how much the movement will influence IS staffs.

"I don't think they'll have any more impact on mainstream information systems than the Nintendo kids," Rathner says. "In fact, the Nintendo users will have had more impact."



cyberpunk \'si-ber-'pungk\ (n) 1: a late 20th century techno-revolutionary or someone who poses as such; 2: a hard-boiled hacker with anarchist inclinations; 3: a computer geek who likes Ministry; 4: as seen in *Time* magazine, a member of a countercultural "movement" of the same name, characterized by a combination of technological savvy and a rebellious lifestyle; 5: Billy Idol's comeback album; 6: someone who has delusions about living in the future; 7: someone who maintains that mirror-shade sunglasses (last seen on *CHiPs*) never went out of fashion.

Source: *Mondo 2000*, Issue No. 10

The movement, did, however, influence the design of Intel's newest supercomputer, according to Michael Barry, vice president of analysis at GVO, Inc., a Palo Alto, Calif., product design firm. The computer, called Touchstone Delta, is encased in a wall of light-emitting diodes. When the machine is running a program, lights blink on and off, representing communication between the computer's "nodes."

"It is like a dance of light, a ballet," Barry said.

To help design the product, Barry said the marketing team studied cyberpunk culture, science fiction novels and movies such as *2001* and *Star Trek*. It also visited a lot of computer centers to talk to programmers.

"We were seeing a lot of *Mondo 2000* T-shirts," he said. "The cyberpunk stuff is heavily in those centers, and the people are involved."

The movement was spawned by William Gibson's darkly futuristic novel *Neuromancer*. Gibson coined the term "cyberspace," which he describes as a "consensual hallucination...a graphic representation of data abstracted from the banks of every computer." In his novels, computer jockeys actually enter cyberspace and move around in the network.

Since its beginnings just a few years ago in the San Francisco Bay area, the cyberpunk movement has explored many technological frontiers. Born in the underground, cyberpunk has also been "surrendering" to the mainstream, and the 100 or so original "hard-core" cyberpunkers have now been replaced by legions of computer-literate people in the establishment.

While the movement toys with such topics as virtual sex and smart drugs that enhance intelligence and creativity, it has helped advance serious topics to the mainstream, such as virtual reality and wireless technology.

Cyberpunk is also having a real impact on aspects of the visual arts, music and technology. Hollywood has already borrowed from cyberpunk for several successful science fiction thrillers.

Saffo says the benefit of the cyberpunk movement is the creative way it looks at where technology has been and how things can be reapplied for new uses. These are "people with crazy ideas, and not a lot of adult supervision, who seize the technologies available and create something new of it," Saffo says.

Vaskevitch sees true cyberpunkers as computer cowboys roaming the Internet in search of the next IS frontier. They live by their own rules in a world where the PC is everybody's "equalizer."

Editors of magazines that pander to cyberpunks take an understandably benign view.

Queen Mu, *Mondo 2000*'s self-proclaimed "domineditrix," who sometimes goes by the name of Alison Kennedy, describes cyberpunkers as "digital dandies who are enchanted with technology and its possibilities."

Double identities

Many of the most avid cyberpunkers are highly successful IS employees by day and technogroupies by night, according to Queen Mu. Some are IS managers themselves. Others are free-lance computer consultants, holed up in their apartments overlooking Silicon Valley perhaps, communicating with the outside world by modem and electronic bulletin boards such as The Well.

Wes Thomas, the "futurist" for *Mondo 2000*, says the cyberpunk in any IS organization may be the one most in tune to the new technologies that the company should be tracking. "There's always an in-house visionary."

So, should IS managers remain calm if they see employees carrying the latest issue of *Wired* or wearing a *Mondo 2000* T-shirt? Or if they hear the word "cyberpunk" bandied about the office, does it mean their computer programmers are learning how to break security codes or "borrow" a little free telephone time?

The answers are most likely yes and no, respectively.

Familiarity with the cyberpunk subculture probably means an employee is highly computer-literate and open-minded and spends a lot of time thinking about how tomorrow's technology can shape today, according to Richard Wonder, vice president of IS at Robert Half International, Inc., a Menlo Park, Calif.-based recruiting firm. (Wonder is not involved in IS recruiting.)

Wonder acknowledges, however, that some abuse of corporate resources, particularly if a company is linked to the Internet, is probably taking place. Rather than taking a coffee break or talking to a friend down the hall, a cyberpunk employee might take 10 minutes to send an electronic-mail message across the country or browse through an on-line news service.

But *Mondo 2000*'s Thomas draws a sharp distinction between hackers, who "manipulate computer and telecom technology for the sheer joy of mastering it," and crackers, who are "criminals who engineer network pranks or steal or tamper with data."

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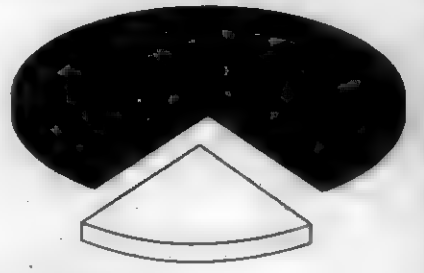

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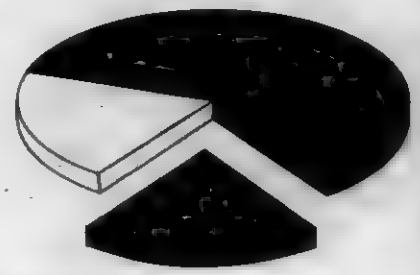

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Others see them as a threat to information privacy who delight in "hacking" information systems for selfish gain or even destruction

Many cyberpunk novel heroes are crackers, but few real-life cyberpunk wanna-bes cross that line, Thomas insists.

And Thomas says the cyberpunk offshoot, cypherpunk, has positive political and social agendas.

"The cypherpunk movement consists of encryption programmers and activists who are fighting to preserve electronic privacy on the nets through the creation and distribution of secure personal encryption standards. The cypherpunks are transforming the spirit of the original cyberpunks into practical and political action," he says.

Rathner feels the imminent interactive TV revolution will quickly offer up anything cyberpunkers can dream of in the way of high-tech multimedia communications. And with that, cyberpunk may find itself unable to keep pace.

But that view isn't shared by Alexis Rosen, a partner in Panix Public Access Internet, a New York-based company that provides access to the Internet to individuals and corporations. "The same ideals that drove cyberpunk — to make information more available and omnipresent, the goal of connecting everything to everything else — are the same things that drive the Internet."

Not so long ago, the Internet, which links about 2 million computers throughout the world, via phone lines, to data banks and E-mail systems, would have seemed like science fiction. Cyberpunk, for all its flaws, encourages people to think about technology and push the limits of current use. And that's the stuff new realities are made of. ■

Wilde is a free-lance writer in Easton, Conn. Weldon is associate editor, management.

Poster concept and styling: Marcy Weisert; Photographer: Heide Foley; Model: Chris Hudak.

Calendar

NOV. 28 - DEC. 4

E-Comm '93. Atlanta, Nov. 29-Dec 1 — Contact: E-Comm '93 Conference, Dallas, Texas (214) 424-0582.

Fourth Annual Computer Fax Conference. Monterey, Calif., Nov. 30-Dec. 1 — Contact: BIS Strategic Decisions, Norwell, Mass. (617) 982-9500.

Retooling '93. Atlanta, Dec. 1-3 — Contact: Ziff Institute, Raquette Lake, N.Y. (800) 348-7246.

The Electronic Superhighway. Washington, Dec. 2-3 — Contact: Telecommunications Conference Department, Washington, D.C. (202) 842-3022.

DEC. 5 - DEC. 11

Database Marketing Conference & Exposition. Orlando, Fla., Dec 5-7 — Contact: The National Center for Database Marketing, Stamford, Conn. (212) 972-2410.

Lotus Notes Users Conference. Lake Buena Vista, Fla., Dec. 5-9 — Contact: Lotusphere '93, Sudbury, Mass. (508) 443-1457.

Computer Measurement Group: Managing the Wave of Technology. San Diego, Dec. 5-10 — Contact: Computer Measurement Group '93, Chicago, Ill. (708) 655-1812.

Wireless Datacomm '93. Washington, Dec. 6-8 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

First International Newton Industry Platform Development Conference. Santa Clara, Calif., Dec. 7-8 — Contact: Knowledge Industry Publication, White Plains, N.Y. (914) 328-9157.

Internetwork Management Technology Conference. New York, Dec. 8 — Contact: Beaupre & Co., Portsmouth, N.H. (603) 436-6690.

"Outsourcing the IS Function." San Francisco, Dec. 8-9 — Contact: International Quality & Productivity Center, Upper Montclair, N.J. (201) 783-4403.

The Outsourcing Conference: "Opportunities, Strategies, Realities." Boston, Dec. 8-9 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Database World. Chicago, Dec. 8-10 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3880.

Strengthening the IS/Client Relationship. Minneapolis, Dec. 9-10 — Contact: Ouellette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

DEC. 12 - DEC. 18

Lap and Palmtop Exposition and Conference. Toronto, Dec. 13-14 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7968.

JAN. 2 - JAN. 8, 1994

Third Annual Showbiz Expo. New York, Jan. 6-8 — Contact: ShowBiz Expo, Los Angeles, Calif. (213) 668-1811.

JAN. 9 - JAN. 15, 1994

ObjectWorld. Boston, Jan. 10-13 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JAN. 16 - JAN. 22, 1994

Usenix Winter 1994 Conference. San Francisco, Jan. 17-21 — Contact: Usenix Association Conference Office, Lake Forest, Calif. (714) 588-8649.

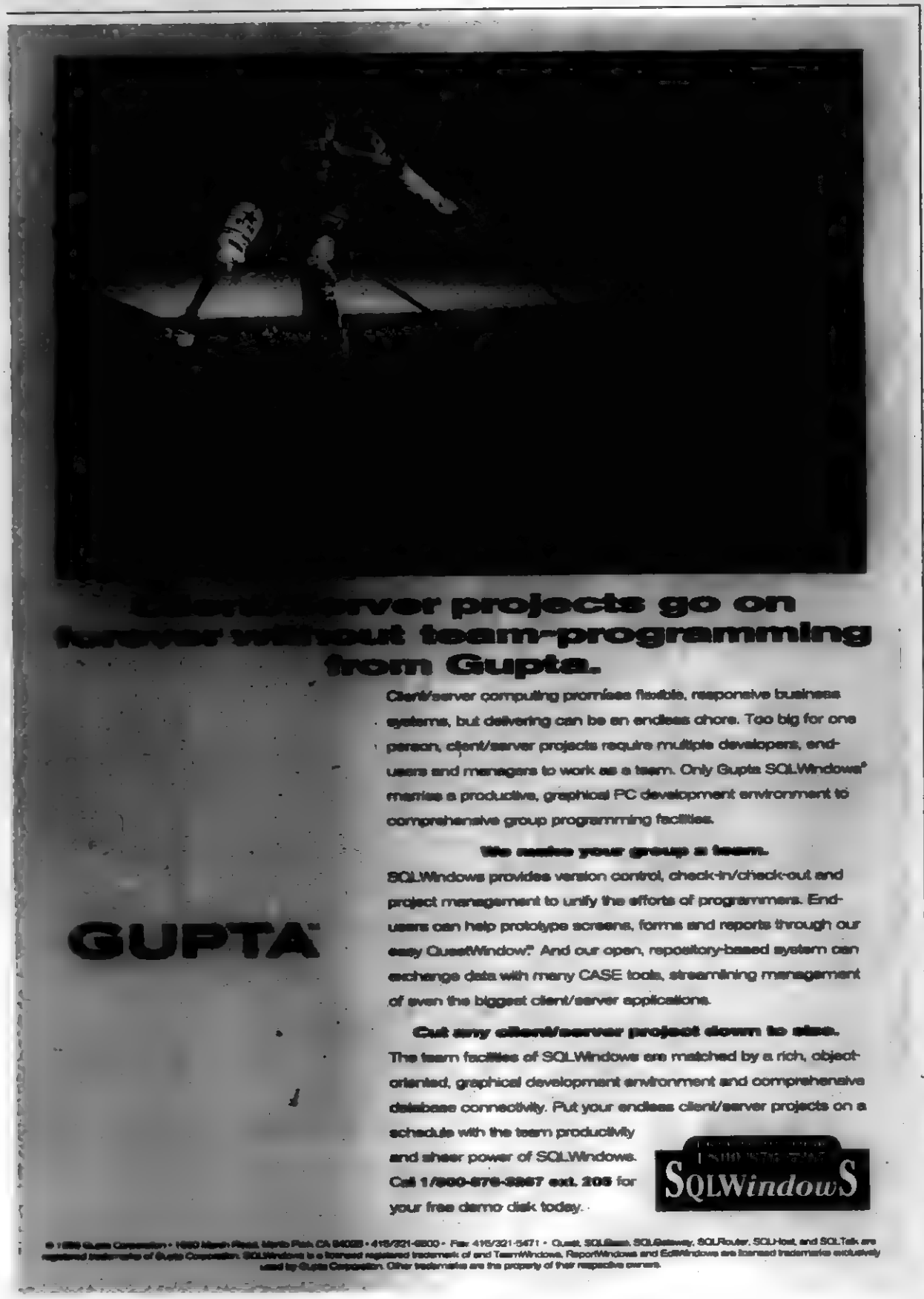
Client/Server Conference & Exposition. San Jose, Calif., Jan. 18-21 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-7460.

JAN. 23 - JAN. 29, 1994

ComNet '94. Washington, Jan. 24-27 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JAN. 30 - FEB. 5, 1994

Executive Technology Summit '94. Tarpon Springs, Fla., Feb. 2-4 — Contact: ATI Travel Management, Chicago, Ill. (312) 644-6642.



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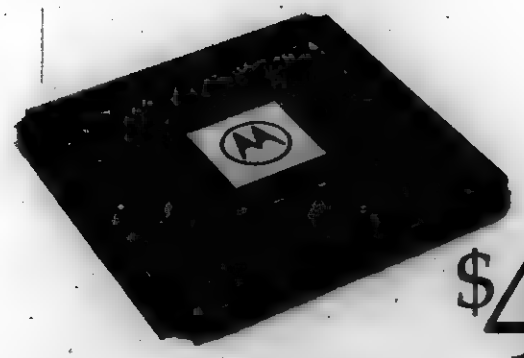

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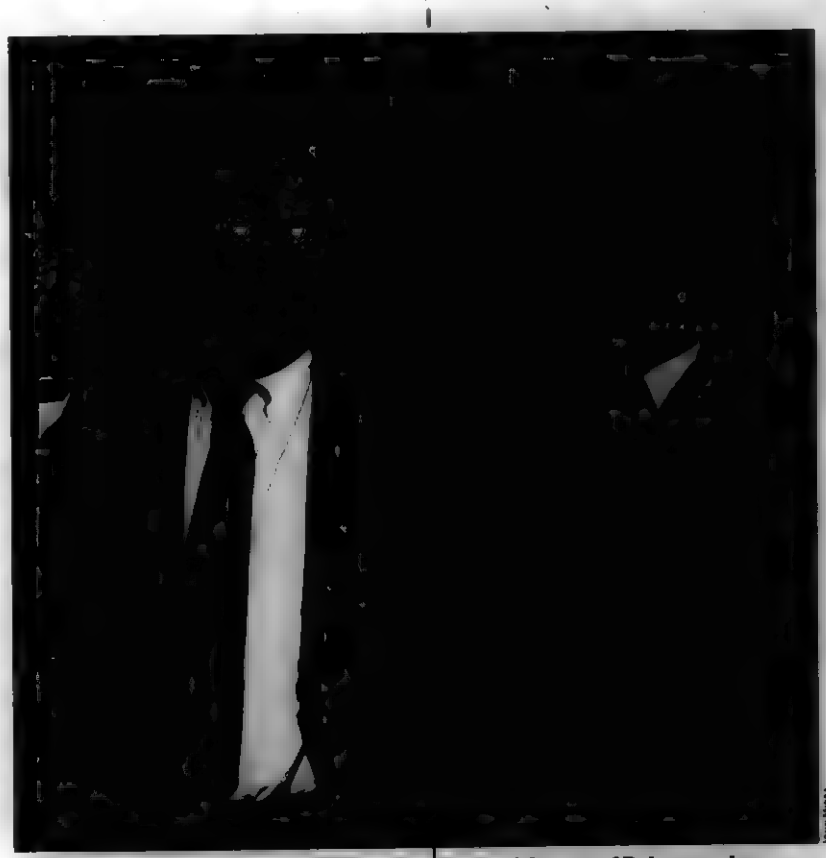
Putting LAN and WAN traffic on a single backbone can decrease the cost of supporting multiple networks. But United Parcel Service and The Medical Center of Delaware are finding bumps on the road to internetworking, including iffy net management.

INTERNETWORK MANIA



STAN FIEDOR AND BOB DAVIS *at The Medical Center of Delaware have fought broadcast storms and agonized over net management for their internetwork*

Companies that maintain separate SNA and LAN internetworks are getting sick of the high costs of supporting these networks individually. A survey by Forrester Research, Inc. pegs the typical yearly support cost for a 5,000-user LAN internetwork at $6.4 million and at about $2 million for an SNA network.

To curb such expenses, companies are moving to consolidate and integrate wide-area network and LAN traffic on a common network backbone. Easier said than done. Issues such as SNA session response time, network integrity and reliability, SNA and LAN interoperability and network management come into play.

On the following pages you'll find the stories of two organizations — United Parcel Service, Inc. and The Medical Center of Delaware — that are slogging through internetwork projects. The medical center chose to build its backbone from scratch and bridge its multiprotocol traffic, while UPS is migrating to a router-based setup and awaiting IBM's Advanced Peer-to-Peer Networking with high-performance routing.

What's more, we've asked communications industry consultant David Axmer to walk through the projects with us and offer strategic and technical takes on what the companies are doing.

Interviews with The Medical Center of Delaware and UPS were conducted by free-lance writer Joanne Cummings. David Axmer, who provides the consulting advice in this piece, is president of DAX Associates, a LAN internetworking and security consulting company in Oreland, Pa.

THE HESITANT TRAILBLAZER

UNITED PARCEL SERVICE

Laying the groundwork for a souped-up APPN

STRATEGY: UPS had been using X.25-based Token Ring LAN bridges and software gateways providing 3270 emulation when the majority of wide-area traffic was host-based. To enable LAN-to-LAN communications and to support distributed applications, the firm plans to move to Advanced Peer-to-Peer Networking routing based on IBM 6611 network processors by year-end 1994.

UPS knows that IBM's forthcoming APPN is a solution tailor-made for its heavily IBM internetwork. It's figuring out how to get there that keeps the information systems staff up at night.

A lot of companies are cautious about how they migrate to a router-based APPN setup, says Tom Ferro, project manager at the Mahwah, N.J., package delivery giant. But not UPS. "Right now, because of business needs, we have to move ahead," he says.

Two years ago, UPS internetworked its SNA and LAN traffic using a LAN bridging architecture. That option, which took advantage of UPS' private X.25 packet network, UPSnet, was designed to enable the company's increasing number of LAN users to communicate with IBM hosts in two data centers.

For that environment, the logical choice seemed to be LAN software gateways that provided 3270 emulation and linked up to the host via Token Ring X.25 bridges. After all, LAN traffic was primarily local, LAN-to-LAN traffic was virtually nonexistent, and the bulk of LAN-to-host traffic occurred in batch mode at night.

But about 18 months ago, UPS began deploying more LAN-based applications, which increased LAN-to-LAN and distributed application traffic.

The company has 13 regions in North America, which are divided into approximately 80 districts, explains John Bruno, telecommunications analyst at the company. "By pushing a lot of applications down to our lowest level — the districts — we can reduce costs and share services. That's a significant cost benefit."

Placing more applications at the LAN level lets the company consolidate several functions, such as communications, routing and file and print services on the server, which makes them easier to manage.

The file servers also support the company's distributed database applications, including critical ones that track automotive parts and the status of UPS trucks and vans. Data moves throughout 100 buildings and between the host and offices. Bruno says consolidating data on file servers makes it easier to manage across the network.

At first, UPS looked at scaling up the bridged architecture to accommodate the new traffic. But that plan proved unworkable. "We went to routing because we needed a solution that was scalable," Ferro says. "Sheer numbers told us we needed an intelligent device to manage our traffic."

"With bridging, we had problems with control," Bruno says. End users, for instance, had to have their own configuration capabilities on the bridges because Bruno's group could not scale them up to meet connectivity requirements.

"We wanted to give users something that would let them navigate through the network without having to worry about how to get to that next LAN," he says.

Bruno says the network also experienced broadcast storms and network loops, usual problems encountered when users try to scale up a very large bridged network.

The company has decided to go with a bridge/router hybrid network this year, deploying approximately 300 routers and integrating them with existing network bridges.

It hopes to move to a fully routed environment once APPN is available with high-performance routing. (IBM says this will likely be next year.)

In addition to avoiding problems inherent in large bridged networks, UPS hopes to gain cost advantages with routers because it will be able to deploy a host of new applications without incurring any new WAN costs.

Ferro's thinking is that once UPS moves to routers, the percentage of SNA traffic will go down while the number of applications using other protocols (IPX, LU6.2) not bound for the host will increase. "By taking the mileage down and pushing all those applications to where they need to be at a district level, we don't have to deploy more 56K lines. It's cost avoidance," he says.

Why APPN?

UPS has locked on to APPN as a goal for several reasons. Its customer service network, which is based on 80 IBM AS/400 minicomputers, is currently meshed together using APPN, which enables the machines to communicate as peers. In addition, UPS uses Advanced Program-to-Program Communications (APPC)-type applications that could take advantage of the peer-to-peer capabilities of APPN.

Ferro says the company has OS/2 database servers that could natively run APPN and OS/2 PCs running APPC applications. "Add that to the AS/400 network and you have a lot of requirements for APPN out in the network."

In addition, APPN should cut down on some network overhead.

But there are still problems, including prioritization, Ferro says.

For example, because SNA sessions are liable to time out if they incur any delay across the network, multiprotocol backbones need to assign a higher priority to routing SNA, rather than LAN, traffic. Although it is easy to customize the network so SNA users receive this higher priority, it's more difficult to change priority according to the individual application.

"You'd like the application to know that the SNA user is running a batch job and so should automatically be throttled back," Bruno says.

He'd like to see the industry move faster toward Asynchronous Transfer Mode (ATM). Right now, no protocol is robust enough for UPS to standardize on.

The company has had to contend with running SNA, APPN, TCP/IP, IPX and Banyan Systems, Inc. NetBIOS. "I'd love to have ATM to the desktop.... It would be like ISDN on steroids," Bruno says.

"We're blazing new trails," Ferro says. "We'd just like some input on whether we're doing it right."

Bridges do not provide a firewall between network segments to halt broadcast storms. As bridged networks scale up, there is more of a chance of storms because all bridges receiving broadcast frames replicate them and pass them on. Although routers introduce complexity to the network, they prevent broadcast storms because they provide greater operating flexibility. Routers enable dynamic routing over the best path and look for alternate or redundant routes to eliminate or reduce traffic or outages.

Routers are more difficult to set up and configure than bridges and require a routing protocol which to push protocol up on the network. Configuring a router can be very time-consuming, and debugging them may be elaborate. However, router-based networks are available.

Loading router vendors have implemented priority control on their routers, enabling users to assign top priority to SNA traffic over LAN traffic. This control improves SNA response time and eliminates timeouts. But current measures tend to be proprietary and don't focus on different types of SNA sessions, such as interactive and batch.

Having applications on the server eliminates unnecessary network traffic and improves response time.

Bridges do not offer a scalable solution because they are limited by hop count. Hop count is the number of bridges a LAN frame must "hop" over from end to end. The current hop count limit is seven.

ATM represents low LAN/WAN internetworking latency, more flexible network architecture providing bandwidth for power applications, support for an increasing number of users and support for high-performance backbone servers or applications.

THE MANAGEMENT DILEMMA

THE MEDICAL CENTER OF DELAWARE

Where, oh where, are the net management tools?

STRATEGY: Currently bridging multiprotocol traffic using encapsulation. Installing T3 links among three main sites — a data center and two hospitals. Moving from bridging to routing.

"Implementing a multiprotocol net is possible — we're doing it," says Stan Fiedor, manager of data communications at The Medical Center of Delaware in Wilmington, the largest health care provider in the state. "Managing it? That's another story."

In the past five years, the medical center has graduated from a ragtag network of 50 PCs and about 225 IBM and Data General Corp. terminals linked to hosts via 9.6K bit/sec. lines to a robust multiprotocol backbone. The setup enables users in its two primary hospitals to seamlessly access applications residing on LAN servers, minicomputers or mainframes.

Rather than having to cope with melding separate SNA and LAN backbones, the center built the new network to support diverse protocols such as SNA/Synchronous Data Link Control (SDLC), Novell, Inc.'s IPX, Xerox Corp.'s Xerox Network Systems (XNS) and TCP/IP.

Although the center was successful in implementing its universal workstation concept, managing the driver and gateway software was a monumental task. "One of the things we've slowly been working on and has been a challenge for us is managing those multiple protocols," says George Brenckle, director of computer services at the center.

In the end, the information systems group, led by information center manager Bob Davis, built its own server-resident software that checks each PC when it is booted to ensure it is configured properly. If it is, the PC is allowed to boot. If it's not, the software wipes out the old or inappropriate software, loads the correct configurations and allows the PC to boot.

"If you don't have something like that," Fiedor says, "you're stuck with manual updating, which is resource-intensive. You can't get it from a vendor because I don't think most vendors understand the problem well enough."

The medical center supports SNA traffic over the network through encapsulation. For the 200 or so terminals on the network, the SDLC packet gets encapsulated within the XNS protocol for bridging to the data center, where it is stripped out and passed to the CPU. The PC-based SNA traffic is encapsulated in IPX and stripped out at its destination.

According to Fiedor, neither method has caused any problems, and response time has been very good: 0.6 to 0.8 seconds.

The center has experienced broadcast storms typical of large bridged networks but tracked the problem to an automated session reconnect feature and modified it.

What IS found was that whenever there was a network problem, the autoconnect feature would constantly try to reconnect every session, resulting in a broadcast storm. Brenckle says IS modified the feature so users would get prompted to hit a key that would reconnect them. "It's more random that way, rather than with the PCs, which tend to do it once a second."

The fact that the medical center has not experienced problems with prioritization and bulk file transfer likely has to do with its network configuration. The company decided to centralize its cluster controllers and gateways instead of following the traditional SNA approach, which consists of linking a front-end processor via low-speed lines to distributed remote cluster controllers. With controllers local to the mainframe, users get subsecond response time.

The firm used the same approach with its LAN gateways, which consist of a PC connected to a 16M bit/sec. Token Ring network at the data center and an Ethernet connected to the T1 backbone. The gateway connects SNA users to the IBM mainframe via a local cluster controller attached to the Token Ring. Here, also, LAN users got subsecond response time.

An added benefit is that equipment is easier to maintain because it is centrally located. For instance, the company is able to resolve hardware problems quickly by substituting on-line spares.

The next phase of the multiprotocol network implementation calls for replacing T1 lines with T3 lines between the two hospitals and the data center, as well as moving to a router-based architecture. One T3 link is already in place.

"We're looking at going to routing in order to make the T3s more efficient as far as what information goes across," Fiedor says. "We'll also use them as a firewall against broadcasts."

But even with the increased throughput from the T3/router scheme, the medical center is facing several challenges. True network management tools — on par with the system management tools found in minicomputer and mainframe environments — are just not there, Brenckle says. "Distributed network management is a challenge."

Fiedor agrees. "We need to manage everything from mainframes, with products like NetView, all the way down to managing the wiring infrastructure," he says. "We've gone as far as taking all our blueprints and putting them on a CAD system so we could manage our wiring a little bit better."

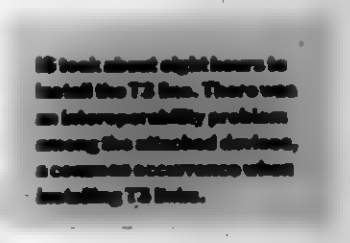
The center is planning to implement native management systems for each platform and tie them together with a "manager of managers." It has chosen Ungermann-Bass, Inc.'s NetDirector.

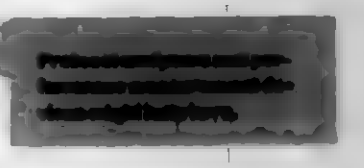
This setup would enable IS to control all platforms from a single workstation. Fiedor says he would also like to eventually implement a rules-based system that would enable him to automate repetitive management processes, such as maintaining print queues and ensuring terminal availability.

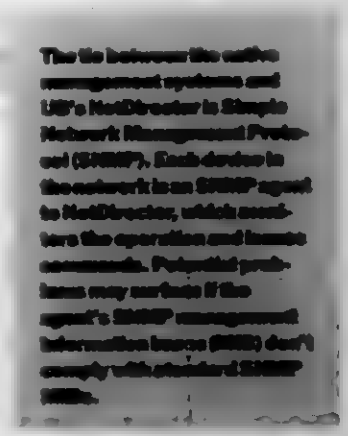
Another challenge facing the medical center is that changes in health care practices have begun to put pressure on it to tie more remote sites, such as doctors' offices, into the network.

The organization is looking at several options to do this, including Integrated Services Digital Network services and high-speed modems based on Vfast technology.

"Our aim with the foundation we have is to be able to accommodate whatever comes down the pipe," Brenckle says. ■







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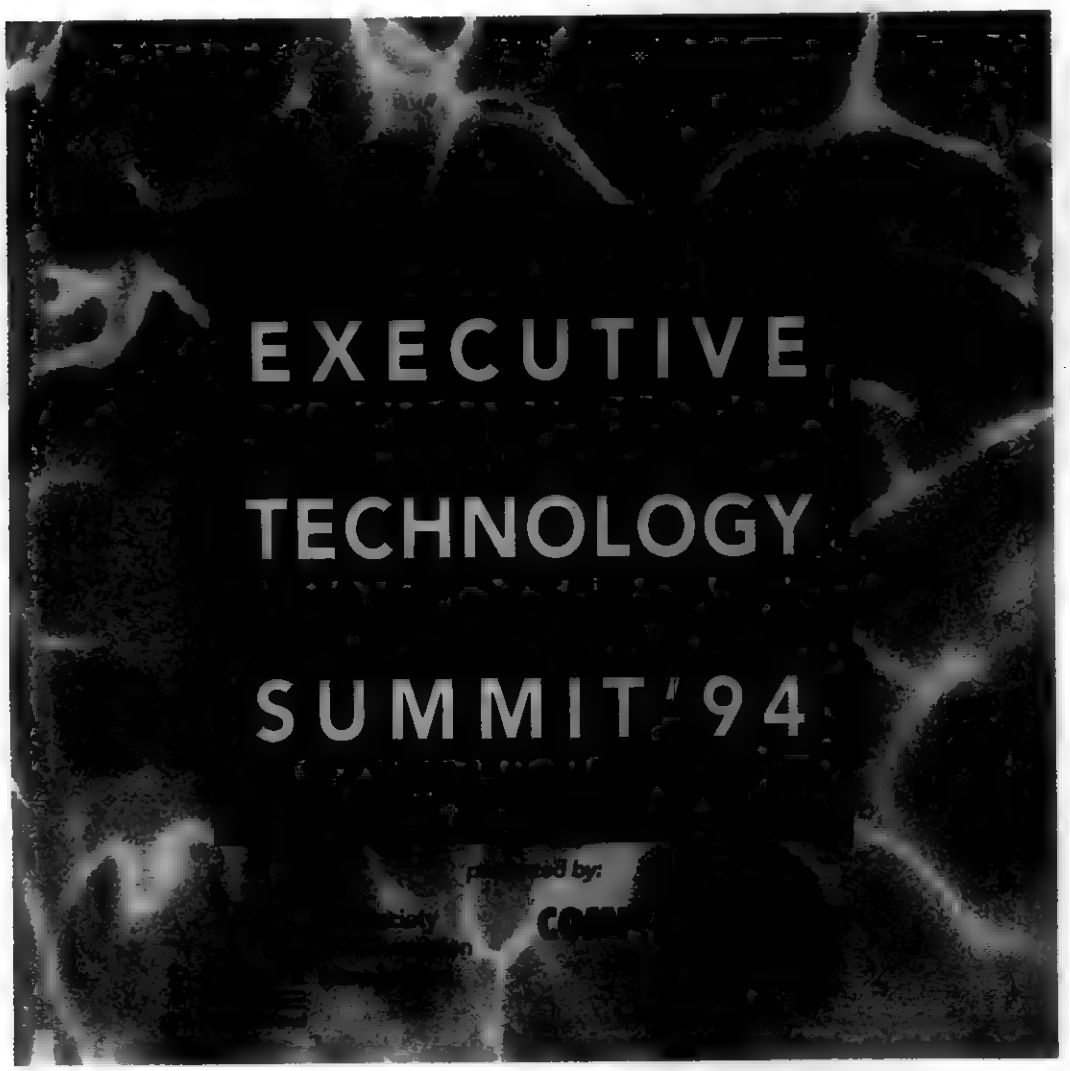

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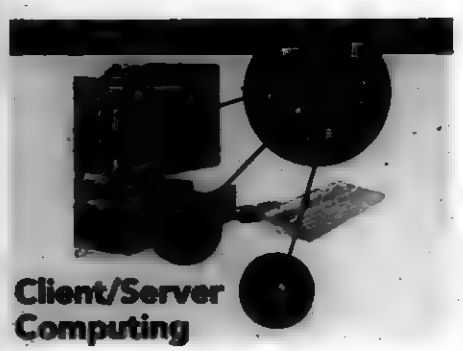

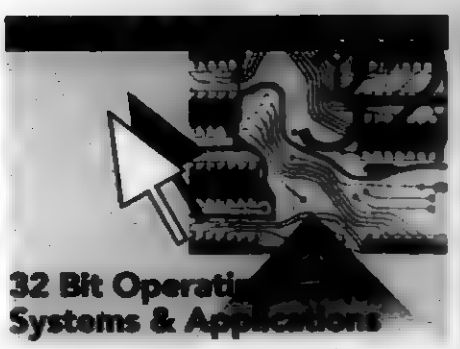

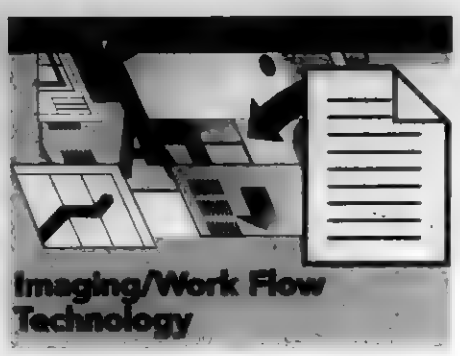

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Training expectations

Some companies are meeting the significant information systems training needs head on

By Joe Panepinto

WHEN 3M CO. put together its Design/Developer Learning Laboratory in St. Paul, Minn., it was responding to pressures on corporate training departments and attempting to arm information systems staffs with up-to-date skill sets.

"In the past, when you were dealing with traditional Cobol development, for example, there weren't a lot of design choices," says Bob Roepke, manager of information technology education services at 3M. "That whole world is changing, and we have to work with people in developer/designer roles to help them evaluate the choices they have."

The broad changes afoot in the way IS professionals are being trained include changes in timing, methods and the relationship of training to working in an organization. A look at IS training in several organizations with large training needs can shed light on current trends at large companies.

At 3M, training is taken very seriously. Roepke's education services unit employs 31 trainers and consultants and has been involved in training more than 11,000 of its own employees so far this year.

Like many large companies, 3M is revamping the training it provides. In contrast to traditional methods where staffers take courses they think they need, training is integrated more tightly with overall business goals and initiated by the needs of specific projects.

According to analysts, it is impossible to estimate the amount of time IS personnel can expect to spend in training, but they agree that training is now provided at different points in an IS career.

"We think the day of stand-up classroom training months in advance of any project is not enough in a time of rapid technology change," Roepke says.

3M Co.

Training is driven by departmental projects, allowing tight integration with planning and development. This way skill requirements are addressed much earlier in the project lifecycle.

At 3M, department projects are likely to drive the timing of an IS employee's training.

For example, once a project management team for developing an application is in place, the project leader will bring in a consultant or trainer from Roepke's organization. Project needs are then identified in three key skill areas: human dynamics, business knowledge and technical skill.

Once roles have been identified and the appropriate level and skill type set, the trainer and project leader attempt to map personnel into those roles. Along the way, skills gaps are identified, and a training regimen is tailored to close those gaps, Roepke says.

Carolina Power & Light Co.

Annually maps out a training plan for each IS employee. Identification of training needs generally comes from the core course curriculum required of each job classification developer and specific project-based training needs.

A similar project-driven training process is part of overall employee training and education at Carolina Power and Light.

Every year, a training plan for each IS employee is mapped out and supplemented by specific project initiatives, says Cindy Smith, manager of computer services at the Raleigh, N.C.-based utility. In general, the identification of training needs comes from two sources: the overall corporate core curriculum of courses required for each classification of employee, such as analyst and developer, and more specific project-based training needs.

For example, an application developer may be required to take a course in soft skills, such as negotiation, by virtue of his employee classification. The company specifies core courses for each job classification, and those courses must be completed within a few years of promotion to a classification.

At Deere & Co. in Moline, Ill., the IS department is moving toward self-directed work teams, which shifts the emphasis from training to education, says Ron Sonnenburg, director of IS.

A training program for every IS employee is laid out in an annual training review and is evaluated on three levels: business, cultural and skill.

Traditional training has focused on technical skills, emerging technologies, standards and new tools packages. Education is focused on cultural and business information and includes classes that span Deere's lines of business, such as sales operations, manufacturing, team building, group problem solving and empowerment.

Deere & Co.

Annually maps out a training plan for every IS employee. Evaluates skill levels in three areas: business, cultural and technical expertise. Includes classes on everything from Deere's lines of business to team building and group problem solving.

"A key thing happening at Deere is that application development is becoming less and less a part of our jobs," Sonnenburg says. "We are becoming more and more systems integrators."

Panepinto is a free-lance writer in Amherst, Mass.

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A recent survey of 512 companies found that more than [illegible] predicted they would increase use of interactive video, computer-based training or other digital training technologies over the next three years, while only [illegible] predicted an increase in classroom training. Part of the reason for the shift in emphasis is the high cost and nontailored nature of classroom training.

Source: James Martin/National Education Training Group, Naperville, Ill.

By Joe Panepinto

Training opportunities are being identified more proactively and tied more closely to specific project needs at some larger information systems organizations. Changes are also happening in the way training is being delivered.

Most large IS organizations have long since moved beyond the traditional classroom education model toward a mixed-media approach that relies on tools such as computer-based training, remote teletraining via interactive television and electronic performance support systems. The reason for this approach is a desire to close the gap between training and working.

At 3M Co. in St. Paul, Minn., for instance, the newly built Design/Developer Learning Center allows hands-on development in a more realistic technical environment. Similarly, Carolina Power & Light Co.'s desire for hands-on training often has it bringing in vendors instead of sending people out to train because it wants developers to have hands-on experience in the same computing environment in which they work.

"We prefer to teach people using their own machines because it works better than sending them off and having them bring [technical information] back and apply it," says David Keys, manager of data resources and the development center at the utility.

For example, developers working on a project using Foundation, Andersen Consulting's computer-aided software engineering product suite, needed a minimum of 16M bytes of RAM for actual development — far more than one finds at most training centers. So Carolina Power & Light brought in on-site trainers from Chicago-based Andersen Consulting to work on the pilot in what would be the actual deployment environment.

Pupils become teachers

Not all changes in IS training involve high-tech problems and solutions, however. For example, when developers and analysts at Carolina Power & Light are sent off-site for training, the organization views it as an opportunity to instill a sense of group responsibility. If a technical area is deemed appropriate for a particular group of analysts, one will be sent to the off-site training with the understanding that the information gathered will be shared.

The analyst presents a report on the new technology tailored to Carolina Power & Light's needs and, in the process, is practicing soft skills and enhancing the feeling of group responsibility.

"It is pretty much ingrained in our culture now that training is not so much to go off and entertain yourself but to learn something you're going to share with your peer group," says Jay Brown, manager of operating system client services and coordinator of training programs at Carolina Power & Light.

Panepinto is a free-lance writer in Amherst, Mass.

Electronic performance support systems

In an atmosphere thick with acronyms, one stands out as the most often invoked in terms of corporate education and training: EPSS.

Electronic performance support systems go beyond computer-based training and attempt to embed training directly into software packages and systems so there are not separate domains for each activity.

"The essence of EPSS is to eliminate the need for training," says Gloria Gery, president of Gery Associates and the expert who coined the phrase "electronic performance support system" in 1988.

In contrast to computer-based training applications, which are essentially stand-alone electronic courseware, the goal of EPSS is not to provide a separate help environment but to embed within applications tutorials, reference materials and other information that will support a work process. For example, in Microsoft Corp.'s Profit application, users have a single interface through which they are connected to items such as spreadsheets, tutorials and on-line references. At no time, however, do users leave task mode.

Even though EPSS has more obvious utility in end-user, shrink-wrapped applications, Gery says everybody — including IS staffers — is an end user of software.

IBM, for instance, has been emphasizing EPSS, says Barry Arnett, education consulting executive at Skill Dynamics, IBM's Thornwood, N.Y., training subsidiary.

Because IS personnel have less time to spend in formal training, developers are building directly into applications features such as tutorials, on-line databases and expert systems shells that act like coaches.

— *Joe Panepinto*

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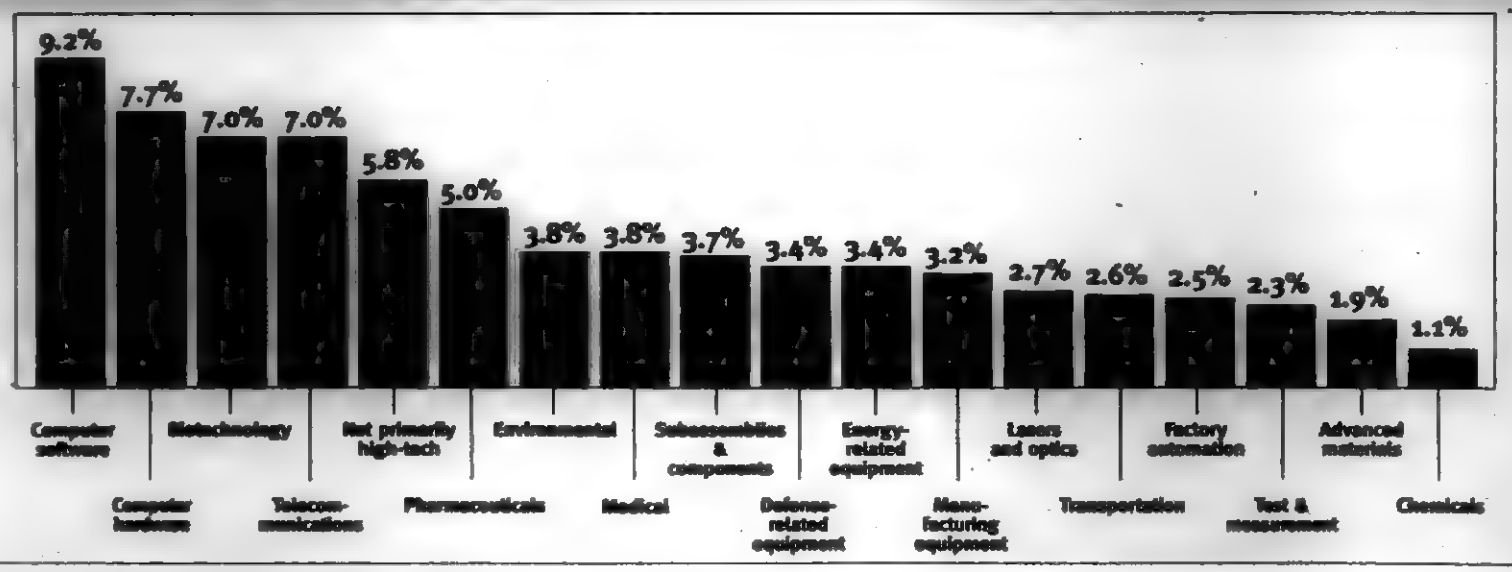

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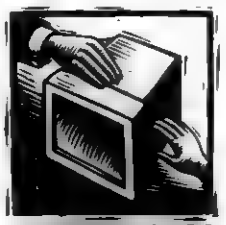

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SOFTWARE CONTRACTS

Reduce risk by haggling over contract verbiage

wheeling & dealing

By Joe Auer and Mark Demboski

Would you lease a $20,000 car for $20,000 down and a $3,000-a-year maintenance fee if you were the only one allowed to drive it, look under the hood or read the owner's manual? If not, then why would you sign a vendor's standard form software license, which limits you in the same way?

Almost all software licenses contain provisions that, either on their own or in conjunction with copyright law or other contract provisions, place undue risk on the licensee.

The following are examples of common provisions often left unchanged during software contract negotiations. In many cases, these provisions can be adjusted to benefit the licensee.

Choice of Law

When drawing up software licenses, watch out for contract wording that reduces your ability to defend yourself if the contracted relationship fails and the vendor threatens to sue.

The best leverage is to specify in the contract "choice of law" — the state whose laws you will abide by in case of litigation. Ideally, this should be your company's home state.

While most companies specify the choice of law, they do not establish the specific venue and jurisdiction, leaving the choice of location open to the action's initiator. For instance, if you specify California as the choice of law when the vendor brings suit in New York but you neglect to choose the venue and jurisdiction, you could be required to have attorneys familiar with California law present for New York court appearances — a potentially expensive situation.

To prevent vendors from forcing you or your attorney to commute to their venues, add wording to the provision to the effect that "any action or proceeding brought by either party against the other arising from or related to the software license shall be brought in a court of competent jurisdiction located in your home state and even your local area." Both parties must also agree to recognize the jurisdiction of the specified court.

Warranties and Remedies

A breach-of-contract suit occurs when one party fails to perform its obligations. Generally, this does not occur when responsibilities and specific solutions for failure to perform are clearly defined. Therefore, it is up to you to ensure that no gray areas exist in the contract in terms of warranties and remedies.

For instance, a warranty could state that the "vendor warrants that the software, if installed as specified, will operate substantially in compliance with the specifications. Verified program errors will be corrected if they can be recreated on the vendor's system with customer data, or if not corrected, the customer's sole remedy is to receive a refund for the software containing the error."

This warranty, however, poses problems if the "software containing the error" is not stand-alone. In fact, if the software is coupled with a modular software license where the additional modules are just as important to the system, the results can be costly.

As is, this provision potentially allows the vendor to fulfill its obligation by refunding the cost of, say, a $10,000 add-on module, while the remaining $200,000 piece of the system is unusable or provides limited benefit.

An adequate warranty is one that provides for a total refund at the customer's option and the ability to terminate the license if the vendor cannot make any part of the software comply with the specifications spelled out in the agreement.

Confidentiality

Many standard license agreements place total and absolute responsibility for software confidentiality on the licensee. Standard contract language may also restrict the software's use to company employees, which is generally unacceptable.

A revised confidentiality provision should state that contract personnel, consultants and other persons performing work for you or on your behalf will have access to the licensed software and materials.

You should also take steps to relieve the "absolute" nature of the clause to the effect that you will use your "best efforts" to protect the confidentiality of the licensed software and materials, as well as use your "best efforts" to prevent the creation of unauthorized copies. If you don't and the vendor learns there has been unauthorized access, it could sue for breach of contract or, more likely, threaten to sue if you don't pay an additional fee.

Maintenance

Some vendors use a "required maintenance fee" clause that guarantees only that maintenance which "substantially complies with specifications." Unfortunately, vendors can technically get out of this responsibility by changing the specifications.

For instance, when the software does not perform according to the agreement, a vendor may change the documentation to reflect the difference and blame it on a documentation error rather than the software. More commonly, vendors may fail to provide maintenance that keeps the product in step with changes in operating systems and hardware.

Recognize the "maintenance required" provision for what it is: annual rent. Often, vendors that do not want to give up this guaranteed annual revenue stream or allow customers to customize maintenance periods will restrict a company from using the software when maintenance fees are not paid.

An alternative is to agree on a length of time to pay for maintenance, with the understanding that afterward, your company can continue to use the software without a maintenance provision.

Auer is founder and president and Demboski is a senior consultant at International Computer Negotiations, Inc., a Winter Park, Fla.-based firm that assists companies in facilitating better deals and executing better contracts.

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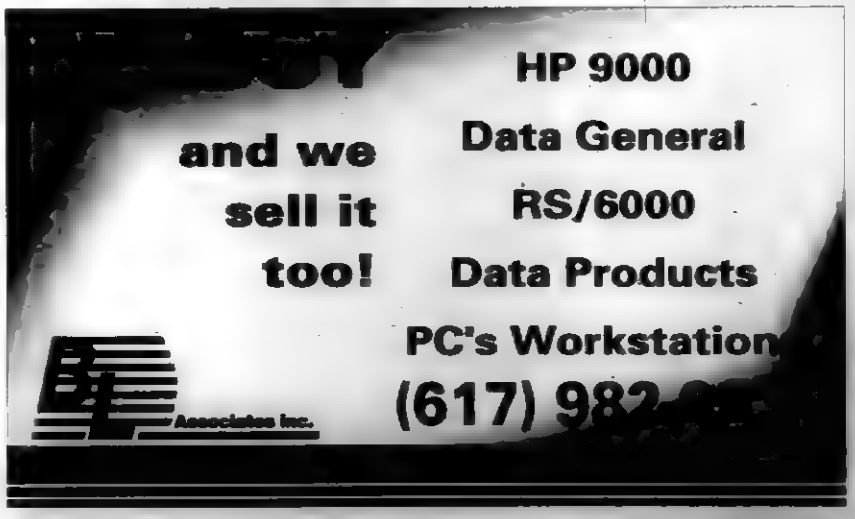

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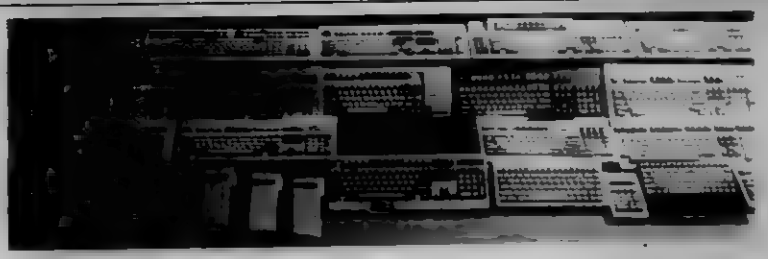

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Gainers / Losers

Percent

[illegible]	5.13	Data Switch Corp.	-21.1
Zeos International Ltd.	25.6	Cambex Corp.	-28.4
Parcplace Int'l, Inc.	27.8	Kendall Square Research	-36.2
Synoptics Software	20.0	Network Technology	-16.1
Adaptec Inc.	68.8	VLSI Technology	-19.9
State of the Art	13.8	Parallan Computer	-13.1
Intellicall Inc.	13.6	Micropolis Corp.	-12.8
GS Robotics	11.6	Avatar Systems Inc.	-12.1

Dollar

Tandy Corp. (H)	5.25	Texas Instruments	-4.00
IBM	6.00	Wang Laboratories	-7.63
US Robotics	3.63	Motorola Inc.	-6.88
CompUSA Inc.	8.00	DSC Communications	-5.88
Cheyenne Software	3.25	Lotus Development	-4.00
Intelligent Info. Systems	2.25	Autodesk Inc.	-4.88
Powersoft	2.00	Cabletron Systems	-4.38
Cisco Systems Inc.	2.00	Peoplesoft	-4.13

Commodore is poised to launch a game system called the CD32 to compete with Nintendo and its ilk. Kendall Square Research announced its next-generation KSR2 system but sank in reaction to legal problems. Investors filed several class action lawsuits after the company announced a loss for the last quarter.

Relational risks, rewards

Though the valuations are sky-high for Sybase, Inc. (SYBS) and Oracle Corp. (ORCL), both stocks may have room to grow.

Salomon Brothers, Inc. analysts John Jones Jr. and Theresa Lie were impressed with Sybase's new Replication Server technology, which beefs up the product's ability to handle mission-critical applications. The Replication Server synchronizes multiple copies of distributed data, providing two key benefits: Users gain fast local access to the distributed data, and a level of fault tolerance is provided in case one server crashes. Sybase announced revenue growth of 67% for the most recent quarter and underwent a 2-for-1 stock split.

Jones and Lie also noted in a recent report that Oracle 7.0 is gaining momentum. Oracle is moving aggressively into reseller channels as well, which may put the squeeze on rival Informix Corp. (IFMX). But Informix reported healthy growth last quarter. Progress Software, Inc. (PRGS) is another relational database management system vendor that is flying high on the market.

Of course, with many database issues already at high price/earnings multiples, there is some downside risk.

"The database guys are rich, and there's the chance of a price cut," said Curt Monash, publisher of the "Monash Software Letter." Monash said the safest of these stocks is Oracle. "They have the most other businesses [outside of the RDBMS market], and they are positioned at the high end, which is the last place a price cut would hit," he said.

— Derek Slater

The lion's share

Oracle is the leader in Unix systems, the bread-and-butter platform for "open" relational database vendors

1992 Unix RDBMS market share

Source: International Data Corp., Framingham, Mass.

Each	52-Week High	52-Week Low		Nov. 5 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						
OTC	40.00	19.63	3 COM Corp.	31.63	1.25	4.1
NYS	91.13	63.38	American Info Techs Corp.	83.00	-1.63	-1.9
NYS	65.00	44.25	AT&T	56.00	-1.63	-2.8
OTC	4.44	0.75	Astel Communication Corp.	2.75	-0.38	-12.0
OTC	24.50	12.50	Banyan Systems Inc.	20.75	1.00	5.1
NYS	69.13	44.50	Bell Atlantic Corp.	63.75	0.00	0.0
NYS	63.88	46.75	BellSouth Corp. (H)	60.00	-2.63	-4.2
NYS	14.75	4.25	Bolt, Beramek & Newman	12.63	-0.63	-4.7
OTC	18.50	9.50	Brooktrout Technology	10.50	0.25	2.4
NYS	119.00	66.75	Cabletron Systems	88.38	-4.38	-4.7
OTC	36.50	10.25	Centigram Communications	34.50	2.25	7.0
OTC	53.50	22.50	Chipcom Corp.	46.00	-1.00	-2.1
OTC	59.25	32.75	Cisco Systems Inc.	53.00	2.00	3.9
OTC	17.75	8.00	Compression Labs Inc.	16.50	-0.88	-5.0
OTC	36.00	20.75	CrossComm	29.25	-2.50	-7.9
OTC	4.63	1.88	Data Switch Corp.	1.88	-0.50	-21.1
NYS	19.88	12.38	Digital Comm. Assoc.	18.63	0.00	0.0
OTC	12.75	3.63	Digital Systems Int'l Inc.	3.88	-0.06	-1.6
OTC	73.13	17.25	DSC Communications	59.75	-5.88	-9.0
OTC	9.50	4.75	Fibronix Int'l's Inc.	6.25	1.13	22.0
OTC	24.00	8.75	Fibronix Corp.	18.25	-0.25	-1.4
OTC	4.38	1.50	Gandalf Technologies Inc.	3.38	0.38	12.5
OTC	2.06	0.69	Gateway Communications	0.81	-0.06	-7.1
NYS	15.75	4.25	General Datacomm Inds.	10.50	-0.50	-4.5
ASE	3.75	2.00	Go Video	2.31	-0.13	-5.1
NYS	39.88	32.88	GTE Corp.	37.63	-1.75	-4.4
NYS	94.75	66.00	ITT Corp.	90.88	-1.63	-1.8
OTC	29.88	17.19	MCI Communications Corp.	27.00	-1.50	-5.3
OTC	6.50	1.50	Microcom Inc.	2.81	-0.31	-10.0
OTC	24.25	3.50	Netrix Corp.	5.13	0.25	5.1
OTC	19.00	6.50	Network Computing Devices	8.00	-0.25	-3.0
NYS	11.63	5.38	Network Equipment Tech	9.88	0.25	2.6
OTC	20.13	8.00	Network General	14.00	-0.63	-4.3
OTC	15.75	6.88	Network Systems Corp.	8.38	-0.50	-5.6
OTC	73.88	13.00	Newbridge Networks Corp.	57.00	-3.88	-6.4
NYS	46.00	21.38	Northern Telecom Ltd.	27.13	-1.38	-4.8
OTC	35.25	17.00	Novell Inc.	22.00	0.00	0.0
NYS	48.88	39.50	Nynex Corp.	41.88	-0.25	-0.6
OTC	30.00	19.00	Octel Communications Corp.	23.50	-1.00	-4.1
OTC	6.13	3.75	Peripheral Data Comm Networks	5.31	-0.44	-7.6
OTC	30.50	14.50	Picturetel Corp.	18.25	-0.75	-3.9
OTC	13.50	3.63	Proteon Inc.	5.25	0.25	5.0
NYS	38.88	17.75	Scientific Atlanta Inc.	37.50	-2.75	-7.8
NYS	47.00	31.75	Southwestern Bell Corp.	42.13	-2.13	-4.8
NYS	40.25	24.38	Sprint Corp.	34.00	-2.00	-5.6
OTC	27.00	12.50	Standard Microsystems Corp.	21.50	0.00	0.0
OTC	19.25	10.00	Stratacom Inc.	15.75	-0.25	-1.6
OTC	42.75	20.00	Synoptics Communications	26.75	-1.00	-3.6
OTC	9.88	2.88	Telebit Corp.	7.63	-0.38	-4.7
OTC	17.88	4.88	Telematics Int'l Inc.	14.75	-0.50	-3.3
OTC	35.25	17.00	US Robotics	30.25	3.63	13.6
NYS	50.75	35.25	US West Inc. (H)	48.25	-1.63	-3.3
OTC	56.00	28.13	Wellfleet Communications	51.25	-1.63	-3.1
OTC	19.50	7.25	Xircom	15.75	-1.00	-6.0
PCs and Workstations						
OTC	5.56	2.50	Advanced Logic Research	3.25	0.00	0.0
OTC	65.25	22.00	Apple Computer Inc.	31.75	1.25	4.1
OTC	24.25	12.75	AST Research Inc.	20.75	0.00	0.0
NYS	9.25	2.50	Commodore Int'l	4.13	1.00	32.0
NYS	69.38	39.25	Compaq Computer Corp. (H)	65.63	-1.75	-2.6
OTC	49.88	13.50	Dell Computer Corp.	22.00	1.88	9.3
NYS	89.25	54.50	Hewlett Packard Co.	74.00	0.13	0.2
NYS	46.75	23.50	Silicon Graphics	40.75	-2.50	-5.8
OTC	41.00	21.13	Sun Microsystems Inc.	24.88	-0.63	-2.5
NYS	46.25	24.63	Tandy Corp. (H)	46.25	5.25	12.8
OTC	7.00	2.50	Zeos International Ltd.	3.75	0.75	25.0
Large Systems						
ASE	8.75	4.38	Amdahl Corp.	4.75	0.19	4.1
NYS	8.75	3.63	Convex Computer	5.13	-0.25	-4.7
OTC	5.38	2.25	Cray Computer	2.88	-0.25	-8.0
NYS	30.88	20.38	Cray Research Inc.	27.00	-0.38	-1.4
NYS	13.88	7.75	Data General Corp.	9.38	-0.13	-1.3
NYS	49.25	30.38	Digital Equipment Corp.	36.00	0.25	0.7
NYS	47.25	32.50	Harris Corp. (H)	45.38	-0.50	-1.1
NYS	68.88	40.63	IBM	50.00	6.00	8.7
OTC	25.75	9.50	Kendall Square Research	13.63	-2.63	-16.2
NYS	141.50	83.00	Matsushita Electronics	131.50	-3.00	-2.2
OTC	21.75	12.75	NetFrame	15.75	0.00	0.0
OTC	26.00	9.25	Parallan Computer	18.25	-2.75	-13.1
OTC	23.25	8.50	Pyramid Technology	14.00	-0.88	-5.9
OTC	24.00	11.25	Sequent Computer Sys.	17.25	0.25	1.5
OTC	5.50	1.38	Sequoia Systems Inc.	6.88	0.38	8.3
NYS	41.25	20.25	Stratus Computer Inc.	27.13	-2.13	-7.3
NYS	16.88	8.50	Tandem Computers Inc.	11.00	-0.13	-1.1
OTC	25.75	10.63	TriCord Systems	24.13	-0.38	-1.5
NYS	13.88	8.38	Unisys Corp.	10.88	-0.63	-5.4
Software						
OTC	37.00	14.50	Adobe Systems Inc.	19.00	-2.63	-12.1
OTC	25.25	11.75	Aldus Corp.	21.00	-1.75	-7.7
OTC	11.25	5.50	American Software Inc	8.13	0.75	10.7
OTC	28.13	9.50	Ask Computer Systems	13.50	-0.38	-2.7
OTC	56.75	38.38	Autodesk Inc.	38.38	-4.88	-11.3
OTC	7.75	2.50	Bachman Info. Systems	3.00	-0.25	-7.7
OTC	43.00	24.00	BGS Systems Inc.	25.50	-1.00	-3.8
OTC	64.13	38.75	BMC Software Inc.	46.13	-1.13	-2.4
OTC	28.25	20.38	Boole & Babbage	26.25	0.25	1.0
OTC	34.00	12.75	Borland Int'l Inc.	16.88	-0.38	-2.2
OTC	5.00	2.75	CE Software	3.81	0.25	7.0
ASE	60.75	16.41	Cheyenne Software Inc.	32.00	-1.50	-4.5
OTC	19.50	8.25	ChipSoft	15.50	0.75	5.1
OTC	10.50	5.63	Cognos Inc. (H)	9.00	-0.88	-8.9
NYS	40.75	16.50	Computer Associates (H)	37.50	-0.50	-1.3
NYS	6.88	2.13	Computervision Corp.	2.75	0.00	0.0
OTC	34.25	19.25	Compuware Corp.	24.00	-2.00	-7.7
OTC	14.75	5.75	Comshare Inc.	10.75	-0.25	-2.3
OTC	37.00	10.75	Corel Corp.	32.75	-2.00	-5.8
OTC	15.25	4.88	Easel Corp.	5.13	-0.38	-6.8
OTC	25.25	15.75	4th Dimension	22.00	-0.25	-1.1
OTC	19.25	5.25	Frame Technology	9.75	0.00	0.0
OTC	17.50	8.00	Group I Software	10.25	0.00	0.0
OTC	35.25	14.00	Gupta	15.00	-0.75	-4.8
OTC	12.00	4.88	Hogan Systems Inc.	10.88	-0.25	-2.2
OTC	27.75	11.25	IMRS	24.75	-0.50	-2.0
OTC	44.75	26.50	Information Resources	35.50	-2.00	-5.3
OTC	27.25	13.38	Informer Corp.	16.75	-2.13	-11.3
OTC	14.00	8.50	Intergraph Corp.	10.75	-0.38	-3.4
OTC	13.63	4.88	Interleaf Inc.	6.25	0.75	13.6
OTC	15.25	4.75	Intersolv Inc.	8.00	0.25	3.3
OTC	18.25	7.75	Knowledgeware Inc.	15.00	-1.00	-6.3
OTC	54.75	15.50	Legent Corp.	23.75	-0.50	-2.1
OTC	50.75	18.75	Lotus Development	43.50	-4.88	-10.1
OTC	23.00	4.25	MathSoft	5.63	0.25	4.7
OTC	21.25	4.50	McAfee Associates	6.13	0.38	6.5
OTC	11.63	2.50	Meca Software	6.50	0.00	0.0
OTC	12.88	7.13	Mentor Graphics	11.88	-0.13	-1.0
OTC	46.00	19.75	Micro Focus	22.63	0.00	0.0
OTC	13.25	4.38	Micrografx Inc.	7.75	-0.81	-9.5
OTC	98.00	70.38	Microsoft Corp.	78.50	-1.50	-1.9
OTC	64.63	18.88	Oracle Corp.	58.25	-0.38	-0.6
OTC	44.75	22.50	Parametric Technology	38.00	-2.00	-5.0
OTC	40.50	22.50	Peoplesoft	34.13	-4.13	-10.8
OTC	7.13	3.88	Phoenix Technologies	4.00	0.00	0.0
OTC	40.00	22.00	Powersoft	34.00	2.00	6.3
OTC	39.75	13.50	Platinum Software	24.50	1.00	4.3
OTC	25.00	7.25	Platinum Technology	9.25	0.63	7.2
OTC	81.50	32.25	Progress Software Corp.	54.00	-1.25	-2.3
OTC	6.75	1.94	Quarterdeck Office Sys.	2.19	-0.13	-5.4
OTC	32.00	16.00	Rainbow Technologies Inc.	21.00	-0.25	-1.2
OTC	11.38	4.25	Rasterops	7.13	-0.88	-10.9
OTC	15.25	5.38	Ross Systems	8.00	-0.63	-7.2
OTC	28.75	16.63	Sapiens Int'l. Corp. N.V.	25.25	-1.63	-6.0
OTC	16.50	5.50	Software Publishing Corp.	6.13	0.00	0.0
OTC	17.25	4.13	Software Toolworks Inc.	13.88	-1.63	-10.5
OTC	2.75	0.75	Spinnaker Software	2.25	0.38	20.0
OTC	13.75	6.50	State of the Art	9.25	1.13	13.8
NYS	33.63	17.63	Sterling Software Inc. (H)	30.75	-1.25	-3.9
OTC	21.63	9.63	Struct. Dynamics Research	15.88	-0.63	-3.8
OTC	77.50	38.25	Sybase Inc.	67.75	-3.50	-4.9
OTC	20.50	9.25	Symantec Corp.	18.13	-1.88	-9.4
OTC	25.50	10.88	System Software Assoc.	14.75	0.00	0.0
OTC	6.50	2.75	Trimin Corp.	5.25	-0.38	-6.7
OTC	26.50	13.50	ViewLogic Systems	22.50	-1.25	-5.3
OTC	23.50	5.50	Walker Interactive Systems	8.88	0.13	1.4
OTC	3.19	0.84	Wordstar	1.31	0.06	5.0
Semiconductors						
NYS	32.88	14.25	Advanced Micro Devices	19.25	-0.63	-3.1
NYS	28.00	11.63	Analog Devices Inc.	20.50	-1.25	-5.7
OTC	38.63	14.00	Atmel Corp.	26.13	-1.63	-5.9
OTC	6.25	2.75	Chips and Technologies	5.25	-0.25	-4.5
OTC	39.75	13.00	Cirrus Logic	33.63	-1.38	-3.9
NYS	16.75	8.63	Cypress Semiconductor Corp.	11.75	0.00	0.0
NYS	19.00	11.13	Dallas Semiconductor	15.13	-1.50	-9.0
OTC	74.50	33.50	Intel Corp.	60.00	-3.75	-5.9
NYS	19.25	8.38	LSI Logic Corp.	13.63	-0.88	-6.0
OTC	26.75	13.66	Lattice Semiconductor	15.25	0.00	0.0
NYS	63.63	16.25	Micron Technology	39.88	-7.63	-16.1
NYS	107.50	47.38	Motorola Inc.	98.25	-6.88	-6.5
NYS	21.75	10.13	National Semiconductor	15.88	-0.88	-5.2
OTC	15.75	6.50	Sierra Semiconductor	7.50	-0.50	-6.3
OTC	52.75	25.75	SynOptsys (H)	48.75	-3.00	-5.8
NYS	84.25	45.13	Texas Instruments	58.25	-8.00	-12.1
OTC	18.88	6.50	VLSI Technology	11.88	-2.25	-15.9
OTC	14.38	4.38	Weitek	9.88	-0.13	-1.3
ASE	9.63	3.63	Western Digital Corp.	7.63	-0.13	-1.6
OTC	54.50	18.25	Xilinx	38.38	-1.38	-3.5
OTC	40.75	18.00	Zilog Inc.	36.75	-2.00	-5.2
Peripherals and Subsystems						
OTC	24.75	9.75	American Power Conversion	20.75	1.50	6.7
OTC	22.75	15.50	Banctec Inc.	20.00	0.50	2.6
OTC	18.00	3.50	Cambex Corp.	4.63	-1.19	-20.4
ASE	18.38	3.88	Cognitronics Corp.	6.00	0.25	4.3
NYS	35.50	9.00	Conner Peripherals	11.50	-0.50	-4.2
OTC	38.50	17.25	Creative Technologies Inc.	25.75	-1.50	-5.5
OTC	30.75	6.50	Data Race Inc.	7.75	-0.50	-6.1
ASE	13.25	7.50	Databar Corp.	9.63	-0.75	-7.2
NYS	59.00	8.34	EMC Corp.	32.88	-1.25	-3.7
OTC	10.50	5.25	Exabyte Corp.	6.25	-0.25	-3.8
OTC	19.80	14.00	Evans & Sutherland	17.63	-0.88	-4.7
OTC	20.63	7.50	Exabyte	15.75	-0.13	-0.8
OTC	56.00	10.61	Intelligent Info. Systems	27.38	2.25	9.0
OTC	8.88	2.50	Iomega Corp.	3.25	-0.38	-10.3
OTC	14.75	5.75	IPL Systems Inc.	7.50	-1.00	-11.8
OTC	24.00	13.75	Komag Inc.	15.50	-0.38	-2.4
OTC	19.63	4.38	Maxtor Corp.	6.00	0.13	2.1
OTC	10.00	5.75	Micropolis Corp.	6.75	-1.00	-12.9
NYS	117.00	97.25	3M Corp	103.88	0.25	0.2
OTC	8.00	4.00	Printronix Inc.	7.25	0.00	0.0
NYS	17.25	7.50	QMS Inc.	10.63	0.13	1.2
OTC	17.88	9.38	Quantum Corp.	12.38	-0.25	-2.0
OTC	7.50	3.13	Radius Inc. (H)	6.50	-0.25	-3.7
NYS	17.75	11.75	Recognition Equipment	15.25	-1.38	-8.3
OTC	13.88	3.63	Rexon Inc.	4.13	-0.25	-5.7
OTC	23.00	13.13	Seagate Technology (H)	23.00	0.75	3.4
NYS	45.00	18.00	Storage Technology	26.38	0.63	2.4
NYS	27.88	17.63	Tektronix Inc.	23.13	0.00	0.0
NYS	88.88	69.88	Xerox Corp.	79.50	0.75	1.0
Services						
NYS	4.38	1.13	Allegion Inc.	2.88	0.00	0.0
OTC	29.75	14.38	American Mgmt. Systems	21.63	0.00	0.0
NYS	6.75	2.38	Analogic Inc.	3.63	0.50	16.0
OTC	23.84	13.66	Analysis Int'l	17.00	-0.50	-2.9
NYS	56.13	46.88	Auto Data Processing	51.13	-2.38	-4.4
NYS	19.88	13.00	Ceridian Corp.	17.88	-0.75	-4.0
NYS	21.00	13.13	Comdisco Inc. (H)	18.75	-1.63	-8.0
OTC	13.38	5.16	Computer Horizons	11.88	0.13	1.1
NYS	99.50	70.00	Computer Sciences	93.63	0.88	0.9
NYS	9.25	6.00	Computer Task Group	6.88	0.00	0.0
NYS	37.25	19.00	CompUSA Inc.	25.75	2.88	12.6
OTC	14.13	8.00	Control Data Systems Inc.	9.38	0.13	1.4
OTC	15.75	7.00	Corporate Software (H)	15.13	-0.38	-2.4
OTC	12.75	6.63	Egghead Discount Software	7.50	0.25	3.4
NYS	35.88	26.00	General Motors E (EDS)	30.50	0.00	0.0
OTC	25.50	13.25	Inacom Corp.	17.13	-0.13	-0.7
OTC	24.38	8.13	Intelligent Electronics	21.38	-0.50	-2.3
OTC	17.00	9.63	Wiersel	14.50	-1.13	-7.2
OTC	29.75	6.50	Norcrage Inc. (H)	26.25	-2.75	-9.5
OTC	36.50	21.50	Paychex (H)	35.25	0.00	0.0
NYS	87.25	21.63	Policy Management Sys.	27.13	-1.25	-4.4
NYS	43.63	24.13	Reynolds and Reynolds	40.25	1.25	3.2
OTC	24.00	13.38	SEI Corp. (H)	23.25	-0.25	-1.1
OTC	26.00	17.50	Shared Medical Systems	22.63	2.38	9.5
OTC	12.63	5.75	SHL Systemhouse	9.50	0.00	0.0
OTC	30.75	20.00	Software Spectrum Inc.	21.50	-2.38	9.9
OTC	42.75	26.25	Sungard Data Systems	36.50	-0.75	-2.0

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Changing channels

Resellers eye outsourcing rescue

By Michael Fitzgerald

■While the bulk of PC systems sold to corporate America still go through a reseller at some point, that is no longer enough to ensure profitability. A beleaguered channel is therefore pushing as hard as it can to metamorphize into a different and more profitable role as an outsourcer.

However, it may face an uphill battle. Although the handful of users who currently outsource through resellers seem pleased, others appear reluctant to give it a try. But when they do, it may signal the end of traditional, one-stop outsourcing.

This latest attempt at repackaging the channel is driven by the squeeze on reseller profitability today, from plummeting prices and margins to direct selling from vendors and product backlog.

Focusing down

Reseller executives do not see themselves directly challenging traditional outsourcers such as Electronic Data Systems Corp. or Andersen Consulting. Rather, the new "resourcers," as they might be called, would focus on the niche areas the giant outsourcing companies are less likely to pursue — PC implementation, service or support, for example.

Outsourcers "can't afford to compete at the low end," said Ed Anderson, chief operating officer at CompuCom Systems, Inc. in Dallas. "[They] represent the old outsourcing model, where it was 'Let us do everything for you.' We do things a la carte," said Alan Hald, vice chairman and co-founder of MicroAge, Inc., a billion-dollar reseller chain in Phoenix.

It may take time for resourcing to catch on, as evidenced by Computerland Corp.'s sale of its franchise and distribution operation to Merisel, Inc. [CW, Sept. 27]. Computerland's efforts to join the PC outsourcing business strained its cash flow, sparking the sale.

Unfazed, reseller executives point to studies by consultancies such as Gartner Group, Inc. that show that hardware and software purchase prices represent less than 20% of the actual cost of implementing a PC. Gartner estimated that support personnel, maintenance time and other costs ratchet up to form the rest of an estimated $40,000 cost per PC over a five-year period.

Outside business

Resellers are aggressively seeking outsourcing contracts to broaden their revenue stream

Company name	Revenue from outsourcing: Now	1996	Key accounts
Entex	6%	10%	Eastman Kodak, ITT Hartford Life Ins. Co., Microsoft
Computerland	20%	33%	Microsoft
Microage	Declined to give numbers		Columbia Engine Co., Consumers Power Co.
CompuCom	<10%	Expects to exceed significantly	Southland Corp., Microsoft

According to Computerland Chairman William Tauscher, as corporate users discover how much PCs cost, they are reassessing how they manage them. "What it costs to manage [PCs] is growing, and it's a problem," he said.

The question is whether users will find outsourcing to be the solution. Not many reseller customers currently do.

John McKenna, president of reseller Entex Information Services, Inc., said only 30 Entex customers use its outsourcing services, although they represent 35% of Entex's sales when their hardware purchasing is thrown in. Resourcing is Entex's most rapidly growing area of business, and McKenna said he expects that a year from now, Entex will have doubled its number of outsourcing customers.

New but welcome

"The basic problem is that customers are not conditioned to pay for services on personal computers," said Lee Levitt, an analyst at International Data Corp. (IDC) in Framingham, Mass.

Still, users who have outsourced some or all of their PC management to resellers seem pleased.

Eastman Kodak Co., whose landmark outsourcing deal with several vendors, including Entex, is up for renewal next year, fully intends to continue outsourcing its PC maintenance, configuration and help desk support, according to Vaughn Hovey, director of information processing services.

"We don't have to carry inventory; we have access to an [Entex] customer executive council, and the training and support they do is better than we could do," Hovey said. He also cited employee cost savings. Kodak originally transferred 50 employees from its PC group to an outsourcer; Entex has more than double that number at Kodak.

The Star Tribune Co. in Minneapolis saves direct costs on personnel by outsourcing labor-intensive tasks such as PC configuration and maintenance to local resellers, as well as training in generic software programs such as WordPerfect Corp.'s WordPerfect.

Robert Lewis, the Tribune's systems leader, said outsourcing has become more important as the Star Tribune has put essential operations, such as elements of its classified advertising and its subscriber database, on a LAN. "We don't have the time to load software on PCs — it's not a good use of our ingenuity," he said.

Savings to be had

Even Microsoft Corp. has outsourced some of its PC operations. Entex and Computerland split a list of value-add services within Microsoft, including technical service, repairs and PC deployment.

"We can handle a much higher volume of PCs with a much lower internal overhead than if we did not have them on site," said Jeffrey Patton, corporate procurement manager at Microsoft.

"What we find is that generally, [outsourcing] costs customers about two-thirds of what they would pay for running their own PC IS services," McKenna said. Hovey disputed this number, saying Kodak has not saved one-third of its costs, though it did save money and deems the effort worth it.

Still, even the most optimistic resellers acknowledge that as in enterprise outsourcing, corporations frequently balk at the idea of letting a third party handle items such as training, phone support and PC management. And given the reseller channel's mixed history of providing corporate support, it could take some time to win over corporate accounts.

No cure-all

Even if successful, resourcing may not be a panacea for the channel. Lee Levitt, an analyst at IDC, says that even with services figured in, the traditional reseller channel will see revenue grow only from $17 billion to $20 billion in 1993 and to $23 billion in 1997.

Name changing

Diversity recently led the Better Computer Dealers to adopt a new name, the Computing Technology Industry Association.

If at first you don't succeed . . .

Resourcing is not the first attempt by the reseller channel to remake itself. Battered for commodity pricing and vendor competition, resellers have long sought to diversify.

They first ventured into the services and support arena after the arrival of clones forced down prices, kicking PCs into the commodity market. Those efforts met with mixed success, depending on the extent to which resellers followed through on support commitments.

The more recent year-old price war has helped make the PC outsourcing route compelling. Resellers today find themselves in the business-threatening position of having both their selling prices and profit margins on boxes dropping dramatically and simultaneously.

The reseller mainstays — IBM PC Co., Apple Computer, Inc. and Compaq Computer Corp. — led this trend, cutting prices more than 30% in the last year, while also cutting once-generous dealer margins.

"You can outrun that trend with volume, but that's kind of like outrunning lava," said Bruce Stuart, president of Channel Corp., a consultancy in Vancouver, British Columbia. The other way to beat it, he said, is to sell other things to make money, such as services, training and integration, all of which are part of the outsourcing strategy at places such as MicroAge, Computerland and Entex (the latest incarnation of Businessland). But the volumes may not be there, period.

Also threatening is the fact that the PC Co. and Compaq have aggressively expanded their channels, going into direct sales, mail-order, catalogs and warehouse clubs while also starting to offer custom configurations that otherwise might be done by resellers.

This in turn is compounded by a series of seemingly endless product shortages. Even in the last 18 months, a period of double-digit market growth, resellers were hurt when vendors were unable to supply them.

As a result of these factors, IDC predicts stagnant unit sales through the traditional channel and a drop in overall market share, from 43% this year to 36% in 1997. And even outsourcing may not save some sectors of the channel. — *Michael Fitzgerald*

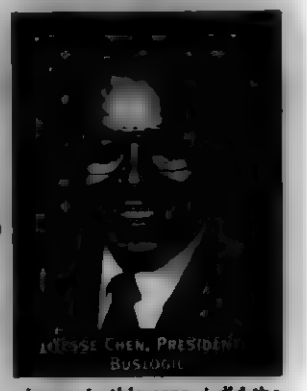
Wysiwyg

What is your BEST/WORST job interview experience?

▲ Extended Memory

"I met with Judith Hurwitz shortly after I became CEO of Micro Decisionware. I discovered that we were old friends from my days as IBM's vice president of Midrange Systems. The really great news was that I still had credibility with her despite my past efforts to convince her that the IBM 9370 was going to be a real winner in departmental computing. . . ."

Tale of the ► Cocky Candidate



"One candidate was making statements about almost everyone in the industry and how they were doing things wrong. He said that with his help, any company could become the superpower of the industry. He went on to tell how all of his previous employers underappreciated his experience. In this case, I did the same as the rest of the industry — passed on this one!"

▼ Picking up the Pieces

"One interviewee for a product marketing job came into Toronto anxious about relocating and jet-lagged. We had recently won an award for Winfax, and the interviewee picked up the award, dropped it and proceeded to turn scarlet from embarrassment. I spent most of the time calming the person down. The interviewee got the job, but we don't discuss awards."

The 5th Wave *by* Rich Tennant

"It was at this point in time that there appeared to be some sort of mass insanity."

Inside Lines

Now you tell me!

There's talk around the Valley that Apple's ex-CEO, John Sculley, is having second thoughts about his new position as head of Spectrum Information Technologies. Despite good core technologies that allow portable computers to transmit data via cellular telephone networks, Spectrum has been involved in several court actions. "Sculley didn't do his homework on this one, and he's going to suffer for that," said one source. Dae Chang, director of marketing at Spectrum, dismissed the rumors as ridiculous. Chang quoted Sculley as saying, "I'm more excited than ever about the opportunities at Spectrum."

Why so shy?

Michael Spindler's reign as Apple's CEO is already marked by secrecy and issue-dodging. His keynote at this week's MacIS conference was suddenly declared off-limits to the press. Spindler has said he won't speak if there are any press people in the room and will stop speaking if any are discovered. During a brief Q&A period after his keynote at last month's Seybold publishing show in San Francisco, he dodged a question about Apple's future directions with a curt "this is not the forum to talk about those matters." Huh? If not in front of thousands of users, then where?

The line forms to the left

Word circulated last week that the $56.5 billion Philip Morris conglomerate is considering outsourcing its information utility. According to Merrill Lynch analyst Stephen McClellan, if the company did a total outsourcing deal, it would be "one of the biggest in history, if not *the* biggest." General Dynamics Corp.'s $3 billion deal with Computer Sciences Corp. and McDonnell Douglas' similar-size deal with ISSC are considered the granddaddies of all outsourcing deals. By the way, Philip Morris is currently without an MIS director.

The ax man cometh

Unisys Corp., which has cut its staffing to 58,000 after reaching a high of 120,000 in 1986, is planning to ax at least 200 engineering positions at its Great Neck, N.Y., Unisys Government Systems Group (formerly Paramax) facility, according to several employees there who also said they anticipate further cuts down the road.

All on board

Borland plans to announce at Comdex/Fall '93 that Office 2.0 will add support for Borland's Object Exchange facility to WordPerfect 6.0, according to sources close to the company. The two firms reportedly plan to outline long-term plans for using Borland tools as a common macro language to drive all suite applications.

Does Berlitz do Intel?

Digital plans at Comdex/Fall '93 to demonstrate software for translating Win32 applications written for Intel's microprocessors to run on its Alpha AXP architecture under Windows NT. However, Digital has not decided whether the translator should be marketed to software vendors or end users, said Michel Gambier, its director of Windows NT evangelism. That issue should be resolved within the next couple of quarters, he added. The translator would provide less performance than a native Alpha port, but Digital hopes it will let applications run faster than on Intel's Pentium chip.

Faces in the crowd at Digital's annual meeting last week included Jack Smith, former senior vice president, and Domenic LaCava, another expatriate who until recently had been heading the Power PC-affiliated PowerOpen Association. Smith said he has spent his year off scuba diving, taking flying lessons and starting a home construction business; he is still mulling the idea of "getting back in the swamp" of the computer industry, he added. LaCava was mum about his plans. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 620-8555.*

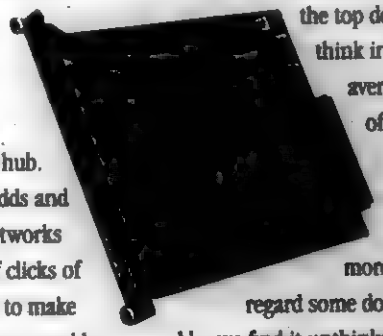
Given Chipcom's track record, no wonder the others have to sell on price.

OCTOBER 18, 1988

We created the first truly fault-tolerant hub. And we've been building high levels of fault tolerance into all our new hubs, modules and transceivers ever since. Because when you're talking about big mission-critical networking, any downtime is too much downtime.

JANUARY 29, 1990

We were the first to introduce a multi-protocol, multi-network intelligent switching hub. Suddenly, it became possible to run up to 3 Ethernet, 7 Token Rings or 4 FDDI networks, software configurable, in a single hub.



APRIL 29, 1991

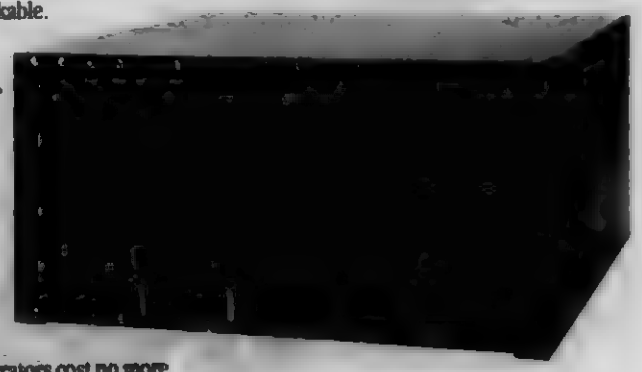
We were the first to put Port Switching into an intelligent hub. With it, you can do moves, adds and changes, within or across networks or segments with a couple of clicks of a mouse. Without it, you get to make trips to the wiring closet and move cables. A lot of trips.

MAY 13, 1991

First with network self-healing. With our Network Control System software, our built-in fault tolerance and our Port-Switching technology, your network can not only tell you there's a problem, but is also smart enough to route itself around it automatically. Network service continues without interruption, while you schedule the fix at your convenience.

Chipcom has always seen networking differently than its competitors. Which, given the difference in our backgrounds, isn't surprising.

Instead of building products aimed at departmental LANs, Chipcom has always designed and engineered its products for networks of thousands of nodes. So it's only natural that while others see networking from the bottom up, we view it from the top down. While they think in terms of an average network life of three years, we see a corporate asset good for ten years or more. While others regard some downtime as acceptable, we find it unthinkable.



Because we see the network as a whole, we recognize that, while installation price is important, it really represents only 10–20% of overall networking cost. So even though Chipcom's ONline System Concentrators cost no more to buy than less functional hubs, we encourage our customers to ignore outdated formulas like price-per-port, and to think instead about long-term savings, concentrating on the 80–90% represented by network operation and maintenance.

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Or what the heck, ask for all three.

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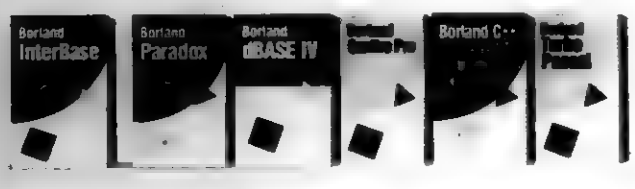

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COMPUTERWORLD

Informix plots parallel DBMS, monitoring tools

Major architecture overhaul aims to improve query time

By Kim S. Nash

Following rivals Sybase, Inc. and Oracle Corp., Informix Software, Inc. plans to disclose later this month a major revamp of its database architecture that supports parallel processing, sources close to the company said last week.

The firm is also expected to outline plans for management tools for monitoring client/server systems at its announcement, which is scheduled for Nov. 29.

Due to ship in the first quarter of 1994, On-Line 6.0 will inaugurate Informix's Dynamic Scalable Architecture, which will lay the groundwork for growing the database from a single-processor product to one that supports loosely and tightly coupled machines.

The goal is to improve query processing time at least tenfold, said a source close to Informix.

Sequent Computer Systems, Inc. is building the product with Informix.

Relational databases on parallel hardware are attractive to users looking to move big, companywide applications off mainframes and other monolithic systems to client/server setups, users and analysts said. "Parallelism is going to be key for us," said Stephen Skinner, senior

Informix, *page 15*

IBM humanizes PCs

Future PowerPCs to accept commands via voice, touch, pen and gestures

By Michael Fitzgerald and Ed Scannell

■ IBM's Power Personal Systems division last week unveiled a sweeping PowerPC systems road map for 1994 replete with ground-breaking technology that promises to change the way people work.

The RISC-based PowerPC system will accept commands via voice, touch, pen or gestures, as well as through a keyboard, IBM said.

One intriguing piece of the interface is a so-called "conversational surrogate," a Max Headroom-like virtual person who will pop up on the screen and respond to commands from the user. It will have facial expressions and human features to make it more user-friendly.

"[IBM wants] to be the Mac of the '90s," said Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

Other observers pointed to the new systems' potential market impact.

"This is the first thing that's come along that has any chance at all of creating a serious challenge to Intel as a standard," said Joseph Schoendorf, a partner at the San Francisco venture capital firm Accel Partners, Inc. "But keep in mind that a new platform is hard to do and will take some time. The industry should welcome it because it levels the playing field [against Microsoft and Intel]."

Case Simonds

COMDEX

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▶ NetView to manage NT. Page 4
▶ More suite moves. Page 20
▶ User PC strategies. Page 28
▶ Product parade. Page 29

IBM will display the interface running on PowerPC prototypes, including two desktop offerings and a notebook, at Comdex/Fall '93 in Las Vegas this week. Officials said the company will begin shipping developmental systems to software vendors in early 1994 and make the products generally available in the second half of the year. Prices will fall into the middle to high end of the PC market and are projected to range from $3,000 to $5,000.

IBM officials cautioned that the initial implementations of PowerPC will feature only some elements of the human factors research. Included will be IBM's Continuous Speech Series,

IBM, *page 25*

NT starts slow as users seek more meat

By Ed Scannell

As Microsoft Corp. enters the business of industrial-strength operating systems with Windows NT, it is likely to discover that its relentless marketing machine can take it only so far.

In the first 100 days of the product's availability, Microsoft has persuaded some key large accounts to center the development of mission-critical applications around NT. But most users are proceeding cautiously and asking tough questions about what it is that NT offers above and beyond the capabilities already provided by advanced networking and operating systems from Novell, Inc. and a variety of Unix suppliers.

"The MIS community is extremely driven by business pressures and trends and can't afford to wait for technology," said John Donovan, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "While NT matures in public, we are finding a lot of people focused on Unix server-based applications in client/server environments. While NT gets ready, Hewlett-Packard, Sun Microsys-

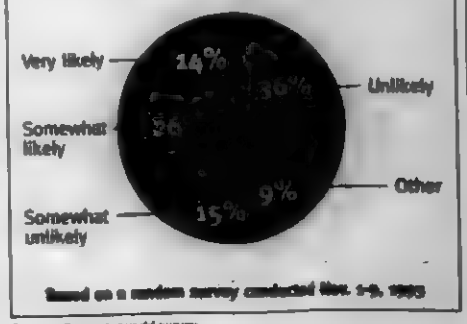
NT, *page 16*

WINDOWS T

While 72% of high IS managers said they plan to move to 32-bit operating systems, only 15% said they would do so next year.

Nonstandard

We asked 238 corporate users: How likely are you to adopt Windows NT as a corporate standard on the server?



Based on a random survey conducted Nov. 1-5, 1993

Source: Computerworld survey

Noorda sets exit date

By Elisabeth Horwitt

Ray Noorda

After many false alarms, Raymond J. Noorda late last week said he will step down as chief executive officer of Novell, Inc. — by next June, his 70th birthday.

The announcement, which comes as Novell's revenue growth is beginning to slow, is Noorda's response to pressure from the board of directors to bring someone in who can move the company to "the

Noorda, *page 8*

High-speed networking

Utility powers up ATM to cut costs, increase capacity in deregulated era

By Joanie M. Wexler

■ Amid a business climate of relaxing regulatory shackles, Northeast Utilities is making an industry-pioneering commitment to Asynchronous Transfer Mode networking to ensure success in a newly competitive arena.

The utility is turning first to the emerging high-speed network for its sheer capacity and bandwidth-management capabilities, said Tod Dixon, vice president of information resources. The move represents a bottom-line effort to pare costs in an era when utilities for the first time are facing competition, he said.

Because it owns its transmission facilities and rights-of-way, the three-state power company, based in Berlin, Conn., is building a mainly private ATM network. The project is being launched at a time when ATM activity has barely gotten off the ground and most companies are tending to turn to public services in lieu of private networks.

Utilities are on a general kick to save money with technol-

ATM, *page 10*

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Executive Briefing

Anyone who doubts how important **speed to market** really is need only look at what's happening to OSF with its **Distributed Management Environment.** The market isn't waiting for the organization to get all the pieces in place and DME may wind up out of the running. *Page 4*

Interface convergence. In her column this week, **Esther Dyson** points out that all the hoopla about handwriting recognition is misleading, because **no single interface method** is really sufficient. *Page 37* **IBM** seems to agree, given its announcement last week of plans for a RISC-based PowerPC system that will accept commands delivered in a multitude of ways, including gestures. *Page 1*

The inevitability of client/server: Marc Dodge, columnist and corporate communications executive, contends that, although client/server still has lots of rough spots, it is really the **only game in town** and IS execs had better get used to the idea. *Page 37* And Bill Laberis suggests that CIO **avoidance of PC-based technologies** has become darned near suicidal. If you aren't reading this at Comdex, he says, your successor may be. *Page 36*

What do outsourcing customers want? Not necessarily business process re-engineering expertise, judging by one recent contract. When **Southern Pacific Railroad** decided to entertain bids from outsourcers, it listened to pitches from **Perot, EDS and ISSC.** The first two stressed re-engineering; ISSC stuck to processing and walked away with the 10-year $415 million contract. *Page 12* For lots of other customers, **the motivation is financial assistance** with the up-front costs of moves to new environments. That's what cash-strapped **Air Canada** says is its major motivation in requesting bids from outsourcers. The airline has a dozen or more applications earmarked for client/server and is seeking assistance in spreading out the investment. *Page 12*

SOUNDOFF!

▶ *Papows*

▶ *King*

Can end-user developers help beat the backlog?

Yes, says Lotus' Jeff Papows, because they build systems they need. But developer Joe King says no way: Users create a mess IS has to clean up.

For more on the debate, see In Depth on page 180

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Host connectivity

SNA Server ships

By Elisabeth Horwitt

The good news is that Windows NT picked up IBM host connectivity last week as Microsoft Corp. shipped its SNA Server. But the bad news is that it appears Microsoft has reneged on its attention-grabbing promise to price the product at about 20% below a competitive offering from Novell, Inc.

Microsoft's SNA Server pricing

Number of users	Previous price	Current price
[illegible]	$1,495	$995 (up to 10 users)
[illegible]	NOT APPLICABLE	$5,995
[illegible]	$5,995	$14,995

Specifically, SNA Server costs more than twice what Microsoft originally said it would cost for the high-end, 250-user, 500-session version. The company upped the price in response to "feedback from our [reseller] channel that they needed more margin," a spokesman said. In addition, Microsoft reworked the pricing structure to better align it with existing Windows NT applications such as SQL Server's structure, he added.

The pricing of the high-end product is particularly onerous since a given server can support only 250 users, said a beta user at one major energy company, who asked not to be identified.

On the plus side, the product's graphics-based setup and administration procedures do deliver on Microsoft's ease-of-use promises, beta users said.

Windows users have been able to download files from the mainframe to Windows PCs much more quickly via the SNA Server as opposed to directly through Microsoft's Access for Windows, according to Judy Shank, senior technical analyst at King County Medical Blue Shield in Seattle. One main reason is that the server allows users to set bigger block sizes for transfer than Access does, she added.

Several leading PC-to-host connectivity vendors last week announced software to work with SNA Server, including Digital Communications Associates, Inc. in Atlanta, Eicon Technology Corp. in Montreal, Network Software Associates in Laguna Hills, Calif., OpenConnect Systems in Dallas and Attachmate Corp. in Bellevue, Wash.

In addition, Micro Decisionware, Inc. in Boulder, Colo., released its Database Gateway for Windows NT, which is said to support bidirectional data transfer between relational and nonrelational mainframe databases and SQL-based databases running on Windows NT. The product runs over SNA Server. Prices start at $2,000 and are based on the number of user connections.

Windows NT closes in on network independence

By Elisabeth Horwitt

Microsoft Corp. last week said it expects to realize its goal of making Windows NT the first truly network-independent client in the first half of next year. This would allow users and applications on an NT workstation to transparently access resources across the enterprise, independent of what network operating system or transport they happen to reside on, said Microsoft product manager Dwight Krossa.

Microsoft and third parties are coming out with NT redirectors for Banyan Systems, Inc.'s Vines, Novell, Inc.'s NetWare and Sun Microsystems, Inc.'s Network File System in the first half of next year, vendor spokesmen said. Digital Equipment Corp. will provide DECnet client software for NT in Pathworks for NT Version 4.1, due out by year's end, a Digital spokeswoman said. NT support for Digital's Local Area Transport will come later.

Ill will

Competition between Novell DOS 7.0 and Microsoft's Windows family is behind the recent bickering between the two vendors.

Furthermore, NT will have access to the full range of IBM networking environments with the shipment last week of Microsoft's SNA Server (see story at left).

The redirectors will work in combination with Microsoft Dynamic Link Libraries and Network Driver Interface Specification (NDIS) 3.0 to allow NT users and applications to browse seamlessly across various network operating system environments — a capability no other client system offers, said Claude King, senior systems analyst at the University of Florida's College of Journalism and Communications.

Microsoft has also positioned its clients to be network transport-independent through NDIS, which currently supports a range of protocols, including TCP/IP, SPX, NetBEUI, XNS and Open Systems Interconnect, Krossa said. When an application initiates a request across the network, NT software tries each transport protocol in turn until it finds the right one to access that particular resource, he added.

Furthermore, the next version of Windows, code-named Chicago, will have the same network capabilities as NT, King said. "This is making Novell worried because it makes NT and Windows universal clients," he said.

Novell still refuses to license to Microsoft the code that would allow Windows for Workgroups — a network-ready predecessor to Chicago — to access NetWare services, Krossa said. Novell fears that Windows for Workgroups will beat out Novell's own network-ready client, DOS 7.0, he added.

Novell claimed, however, that Microsoft lost the license because it was unwilling to comply with all the terms. The two vendors are said to be close to agreement.

The license would have allowed Microsoft to bundle NetWare access into Windows for Workgroups; however, users can still download the code from a NetWare server or get it from Novell.

Competition between Novell DOS 7.0 and Microsoft's Windows family is responsible for the recent bickering between the two vendors about Novell's licensing of NetWare redirectors to Microsoft, King and Krossa indicated. Novell has agreed to license to Microsoft the support code to give Windows 3.11 easy access to NetWare services; however, users will still have to get the redirector from Novell.

Another hopeful development is the recent release by Novell of an updated beta version of its redirector for NT, which fills in several key missing features such as support for NDIS; for DOS applications under NT; and for Digital Alpha and Mips Technologies, Inc. versions of NT, Novell product manager Jeff Turner said.

Wireless technology gets Lotus vote

By Lynda Radosevich

An emerging form of wireless computing that can potentially alleviate some of the existing wireless services' speed and coverage gaps will receive a boost at Comdex/Fall '93.

Lotus Development Corp. and wireless service provider McCaw Cellular Communications, Inc. will reveal today that they are working together to enable Lotus' electronic messaging products to work over Cellular Digital Packet Data (CDPD) technology networks.

CDPD wireless networks will operate over cellular telephone channels and compete with wireless data services such as the RAM Mobile Data network and the Advanced Radio Data Information Services (Ardis), a joint venture of Motorola, Inc. and IBM.

McCaw will launch its first CDPD network in Las Vegas this week and will demonstrate Lotus CC:Mail operating over that network at its Comdex booth. Although Lotus backs CDPD technology, it will not provide any specific plans until 1994, according to a Lotus spokesman.

Top penetrators

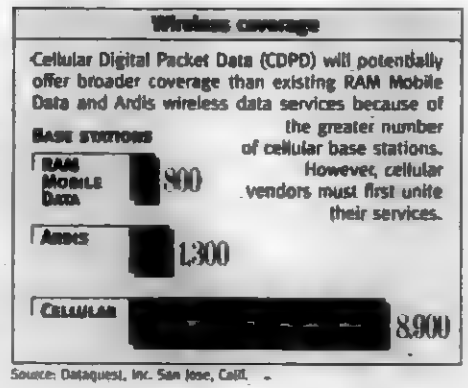
One issue with wireless coverage is how well it works indoors. Ardis and cellular services penetrate buildings better than RAM Mobile Data's network, according to analysts.

Lotus currently offers CC:Mail products that work over the RAM Mobile Data network. The McCaw arrangement is not meant to compete with that partnership but to give users more choice in their wireless network services, according to a Lotus product manager.

Lee Nolan, a senior telecommunications engineer at The Travelers Corp. in Hartford, Conn., said he is interested in using CDPD technology to provide wireless access to mobile executives who currently use RAM Mobile Data network wireless services.

"CDPD has the potential to solve the coverage problems that RAM [Mobile Data] has, and I'm hoping it will operate faster," Nolan said. Other vendors will also demonstrate CDPD technology at Comdex [see roundup page 29].

A McCaw spokesman said the service will operate at 19.2K bit/sec. — a speed that Ardis said will reach initial markets beginning this week. RAM's data network operates at 8K bit/sec., but the difference in operating speeds does not translate to a difference that end users see because of the variety of ways that technologies use channel bandwidth, said Eric Zimits, an analyst at Volpe, Welty & Co., a San Francisco consultancy.



Source: Dataquest, Inc. San Jose, Calif.

McCaw also said its CDPD network will cover 42% of the U.S. population by the fall of 1994 and that arrangements with other CDPD providers will cover the remaining 58%. That level of coverage is possible because CDPD uses existing cellular telephone networks, according to McCaw.

While the potential exists, there are still outstanding issues surrounding CDPD services. It remains to be seen how long it will take to provide nationwide coverage, Zimits said.

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Overdue DME pieces arrive

IBM, HP are noncommittal; both push their own frameworks

By Jean S. Bozman

The Open Software Foundation (OSF) shipped five distributed components of its long-awaited Distributed Management Environment (DME) last week, but OSF founders Hewlett-Packard Co. and IBM stopped short of committing to incorporating all of the DME services into their systems management frameworks.

DME 1.0's shipment comes as sources close to the OSF contend the group is about to undergo organizational changes (see story at right). It also comes as questions linger over whether a full-bodied version of DME will ever see the light of day.

The OSF's DME 1.0 is a set of five distributed applications for systems management. They handle software distribution, license management, event notification, PC services and subsystem management services, said Lance Travis, DME business area manager at the OSF in Cambridge, Mass. The services will allow users to manage distributed resources as if they were installed on central servers.

Still missing, however, is the DME "framework," which was originally expected this year but is now due by 1995 [CW, Oct. 4]. The framework is being redesigned to comply with the Object Management Group's Common Object Request Broker specification.

In the meantime, HP and IBM are not waiting. They are selling their own Unix network management product suites — HP's OpenView and IBM's NetView/6000 — which would have to be retrofitted to support DME 1.0. HP and IBM will not reinvent their existing products, both companies said. IBM is evaluating DME technology but may not commit to all the DME 1.0 modules. Ron O. Williams, manager of IBM's client/server executive programs at the company's Marketing and Services Division in Raleigh, N.C., said IBM has tried to keep NetView compliant with DME.

Up and running
As DME 1.0 begins to ship to systems vendors, Charles Schwab in San Francisco last week put its first distributed applications into production in Phoenix, allowing users to log on to the corporate network and pick computing services off remote mainframes and Unix servers. Six or seven so-called Distributed Computing Environment cells will be in place nationally by next year's end, according to Jim White, vice president of technical planning.

Work to be done

Even though HP supplied much of the technology used in DME 1.0, it would have to fix some of its OpenView applications to work with the framework, said Larry Robinson, marketing manager for OpenView platform products at HP's Network and System Management Division in Fort Collins, Colo. HP is also concerned about paying what it says is a "relatively expensive" license fee, he added.

IBM and HP "are now far down other roads toward the provision of distributed services," said Paul McGuckin, a Gartner Group, Inc. analyst in Santa Clara, Calif. "It stretches the imagination that [the two companies, the independent software vendors] and the users are going to throw it all away in favor of DME."

Some users, meanwhile, have forsaken DME and are jury-rigging their own solutions. "We've looked at what DME is, and we've tried to mimic that functionality," said Jim White, vice president of technical planning at Charles Schwab & Co. in San Francisco, which is moving to enterprise open systems. Prices for the DME 1.0 source code range from $25,000 to $250,000.

Cha . . . cha . . . changes

The emergence of the Common Open Software Environment as an open systems developer and X/Open Co. as a Unix standard bearer has made the OSF appear out of sync, observers said.

"OSF has done what it was supposed to do to a very large extent," said Steve Wendler, a Gartner Group open systems analyst. "I think they're going to adopt a different request-for-technology process. The organization will change and the process will change within the next 90 days." Wendler and others said the OSF will coordinate Unix vendors' research and development programs.

The DME delay has had some benefits. It is allowing users to get comfortable with network management frameworks from HP, IBM and Sun Microsystems, Inc. that can be enhanced with systems management services, analysts said.

"These suppliers would be perfectly satisfied to simply continue providing their own solutions based on DME and to let OSF play the role of architect and visionary rather than platform supplier," said Thomas Willmott, a vice president at the Aberdeen Group in Boston.

An OSF spokesman, meanwhile, said the organization's board has proclaimed that the OSF's technology will be preserved by the outfit's founders, no matter what the future brings.

—Jean S. Bozman

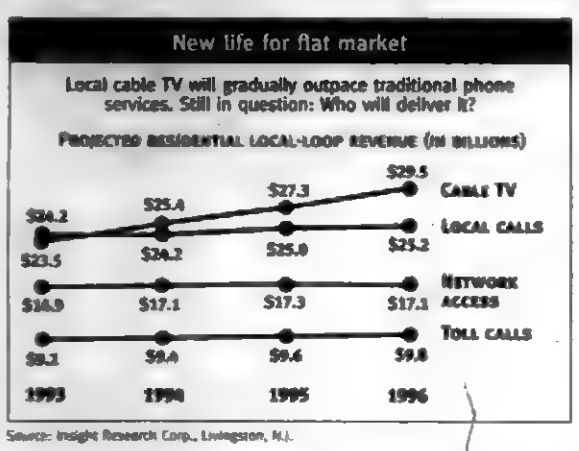
Pac Bell begins superhighway trek

By Joanie M. Wexler

Another chunk of the U.S. information superhighway got spoken for last week when Pacific Bell said it will begin work on a $16 billion, seven-year overhaul of its statewide network in California aimed at reaching 5 million businesses and residences by the year 2000.

An initial 1.5 million homes will be served by the high-capacity network by the end of 1996 in parts of the San Francisco Bay, Los Angeles, Orange County and San Diego areas.

The goal is to outfit the state with an infrastructure supporting integrated communications, information and entertainment services, said Lee Camp, vice president of consumer broadband services at Pac Bell.



Source: Insight Research Corp., Livingston, N.J.

Network construction, which parallels recent moves by phone companies and cable TV companies to team up on broadband service delivery [CW, Oct. 18], "will begin in earnest" early next year in conjunction with equipment partner AT&T, Camp said. AT&T will provide central office switching and media conversion equipment.

The revamped Pac Bell network will look much like a cable TV network, comprising a fiber backbone stretching into neighborhoods. From there, coaxial cable will run to the side of the home and hook into twisted-pair copper wiring inside.

The idea is for Pac Bell to support a mix of high-speed communications services such as Integrated Services Digital Network and Asynchronous Transfer Mode on one infrastructure, while providing a competitive alternative to cable companies by "renting" portions of the Pac Bell network to companies wishing to deliver on-demand video service.

Should there be a reversal of the regulations currently barring regional Bell telephone companies from delivering such services in their own regions, Pac Bell would have the infrastructure in place to get into the act. Most analysts agreed it is only a matter of time before those regulatory constraints go away.

Meanwhile, "they want to hold on to businesses in the defense, entertainment and high-tech areas," said Robert Rosenberg, president of Insight Research Corp., a consultancy in Livingston, N.J.

According to Rosenberg, these companies have nearly unlimited bandwidth needs.

Network management

Microsoft's Hermes to run on NetView/6000 platform

By Lynda Radosevich

Users considering weaving Microsoft Corp. Windows NT-based nodes into their enterprise networks will receive two good pieces of network management news today.

IBM, Digital Equipment Corp. and Microsoft will announce that Microsoft's as-yet unshipped Hermes management software for NT will run on IBM's NetView/6000 network management platform.

The NetView/6000 software will run on NT-based servers, including Digital's Alpha line, according to analysts briefed on the companies' plans.

Also, Hewlett-Packard Co. will announce that it is porting its OpenView network management platform to NT and that OpenView will integrate with Hermes, a company spokesman confirmed.

"Although there is not much demand for NT yet, this certainly strengthens NT prospects for an enterprise rollout," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo. (see story cover 1).

The arrangements mean that users will be able to integrate NT management with other management domains such as routers, hubs and Novell, Inc. networks under a centralized monitor, analysts said.

However, it does not necessarily mean that Hermes will be able to exchange information with other management domains that operate on the NetView platform.

"If Hermes finds more client nodes, does that information get shared through NetView/6000 to the routers and reverse? That's a level of integration you may not have," McConnell said.

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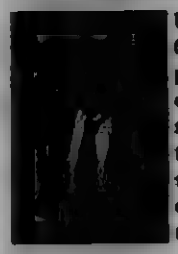
More to use, less need to choose

With the advent of Microsoft's Windows NT, it may appear that the choices involved in serving the needs of PC users are becoming increasingly complicated. But, in fact, I would submit that they are getting simpler.

Unix, OS/2 and Windows NT are going to serve as focal points for integrating the desktop at the server level. Three operating systems in this space may be a couple too many for some people, but three is the minimum number of alternatives that competitive areas in any industry tend to spawn.

Look at it this way: The picture is already less complicated than it used to be for those trying to link up end users in proprietary environments. A short while ago, an all-Blue site might have included MVS, VM, OS/400, DOS/VSE and PC DOS.

This growing simplification may not be immediately apparent to those in the trenches coping with the continued onslaught of PCs. But that's the point. PCs are taking over so many end-user desktops that they are screening out proprietary operating systems from Wang, Data General, Digital, Burroughs, etc. End users by the millions are being tied to servers running one of serverdom's Big 3. (Unix, of course, may be counted as many times as one wishes.)



Unix, NT and OS/2 are displacing dozens of older proprietary systems and, in the long run, will simplify the task of connecting end users.

Charles Babcock

Nor should it go unnoticed that these operating systems have become the focal point for third-party development. Firms are offering application development languages and tools that cut across the Macintosh, Windows and Unix, much as experienced database vendors offer tools and gateways that cut across relational databases, regardless of operating system. At some point it should be possible for developers to turn to libraries of objects and configure an application that will run (with proper compiling) under Windows NT, Unix or OS/2.

Competition is a sign of vigorous activity. Such activity attracts resources, some of which are devoted to sorting out the restrictions and barriers to interoperability. Competition is not the same as confusion and may, in the long run, be an antidote to it. In the end, any operating system that survives on the server will have to function as an integrating force, connecting to rival operating systems and legacy systems.

Unix already *is* an integrating force at the server level, particularly in dealing with network protocols. It is a strong candidate to become the application server of choice to large, heterogeneous desktop groups. Software developers coming out of the DOS or Windows environments find dealing with the many variations of Unix an endless irritation. Nevertheless, there is a widely shared body of knowledge on Unix that is transportable across versions.

Windows NT remains a force to be reckoned with, but not necessarily a complication. With its requirement for 16M bytes of memory, NT is a heavy-duty server operating system, not a desktop operating system. As such, it will need a nod from IS managers before it can be widely installed. But NT was designed to work well with IBM environments and will one day sport a full suite of management utilities. It will eventually interface to all the major PC LANs and take on more of Unix's strengths.

Unlike Unix, all of NT's versions will be binary-compatible, so an application will have to be developed only once.

That brings us to OS/2. At the moment, OS/2 is something like kudzu: no one's favorite organism but spreading out anyway. One possible reason is because it can both satisfy a power user and gracefully serve a large group of PCs. The thing to keep in mind here is that IBM is skilled at building a stable operating system and will improve OS/2 until it takes on a universal character.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Corporate downsizing

IBM mulls sale of federal unit

By Gary H. Anthes and Johanna Ambrosio

IBM said last week that it is considering selling all or part of its federal systems integration division, which though profitable and growing, faces stiff challenges amid severe government spending cuts.

If the unit is sold, it would mark a change of heart for IBM's new chairman, Louis V. Gerstner, who has so far resisted calls to break up the troubled computer giant. Other units may well follow, according to published reports. The storage division and printer company have been named as candidates.

In the running

IBM declined to say who might buy its Federal Systems Co. (FSC), but Hughes Aircraft Co. is allegedly in the running, along with others. An IBM spokesman confirmed last week that these companies "had approached us, and not the other way around." Analysts said FSC might attract a defense contractor that has been hit by Pentagon downsizing. Such a buyer would be seeking "instant credibility and capability in the civilian world," said Robert Dornan, senior vice president at Federal Sources, Inc., a marketing services firm in McLean, Va.

But Dornan questioned why the computer maker would sell one of its better-performing units. Last year, the unit earned $71 million on sales of $2.2 billion to the U.S. Air Force, NASA, the Internal Revenue Service, the Federal Aviation Administration and other agencies.

Cash pipeline

IBM's Federal Systems Co. boasts a number of prized contracts, including the following:

Contract	When	Amount
NASA Space Shuttle Orbiter Software Support	July 1993	$359M
Air Force Satellite Control Network	October 1991	$100M
IRS Integrated Collection System	December 1990	$340M
Federal Aviation Administration	July 1988	$3.6B

Source: Federal Sources, Inc., McLean, Va.

Tarnished jewel

But Jay Stevens, an analyst at Dean Witter Reynolds, Inc. in New York, saw FSC as a tarnished jewel. "Federal Systems is not in the mainstream of what IBM is doing," he said. "Basically, it's not going to grow anymore because of declining federal budgets." He predicted IBM would sell FSC for half the division's annual revenue, or about $1 billion.

Sam Albert, a consultant in Scarsdale, N.Y., said, "It makes good sense to me that IBM is looking for cash, and also is continuing to scrutinize every function to determine what is making the grade and not making the grade."

Restructuring

Big Blue splits network unit into two divisions

By Joanie M. Wexler

Some outstanding pieces of IBM's corporate reshuffling fell into place last week when the company announced that it has divided its Networking Systems group into hardware and software divisions.

The move is indicative of IBM's continued efforts to better compete with smaller, more nimble companies, in part by "divorcing hardware from software so each group has to stand alone to make its revenue," said Frank Dzubeck, an IBM watcher and president of Communications Network Architects, Inc., a Washington consultancy. "If your competition is structured that way, why not organize yourself that way, too?"

The Networking Systems fissure follows a restructuring a couple months ago that included the formation of a cross-divisional council as part of Chairman Louis V. Gerstner's efforts to increase cross-boundary decision-making among IBM divisions [CW, Sept. 20].

Three divisions

That move bumped up Ellen Hancock from her position as Networking Systems general manager to IBM senior vice president and group executive. With the restructuring, three divisions — Networking Software, Networking Hardware and Software Solutions — report to Hancock.

The idea, analysts said, was to help the company leverage its traditional strength in turnkey solutions rather than by competing product-by-product on price or time to market — traditionally not IBM's forte.

"IBM's strength was never in individual products but in putting together whole scenarios for customers," said Robin Layland, principal at Layland Consulting in West Hartford, Conn. "They had it fragmented all over the place, and they're trying to put it together more logically now."

Unified force

"We are becoming a unifying force to provide single solutions to customer problems," said Donald A. Haile, new general manager of the Networking Software Division. Previously he headed up Networking Systems' network access business.

For example, Haile said, he and Steve Mills, who heads the Software Solutions group, "are interacting much more on specific solutions than before Ellen got him."

As an example, Haile pointed to his work with one of his division's products, Communications Manager on OS/2, which implements various network interfaces. He said he and Mills are joining forces to "put together development tools that will use those interfaces."

Haile's new counterpart on the hardware side is William R. Johnson, a former vice president of corporate marketing at Digital Equipment Corp. He will head up activity in network adapter, hub, router and Asynchronous Transfer Mode development as well as in older IBM equipment, such as the 3745 front-end processor and 3174 and 3172 cluster controllers.

A picture is worth a ~~thousand~~ 25,000 lines of code.

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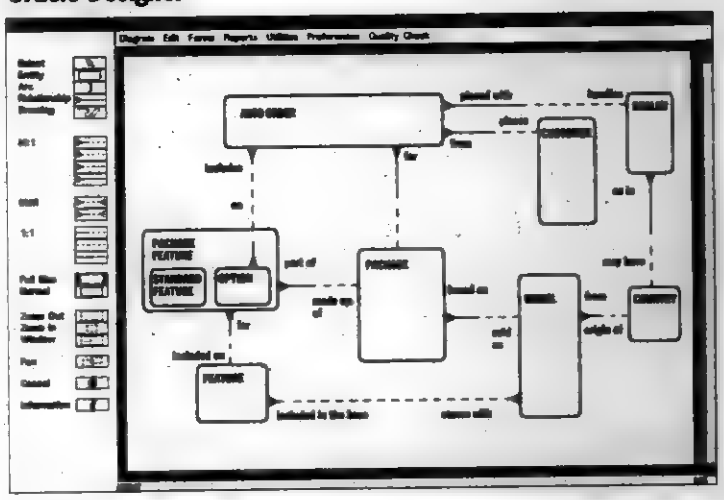
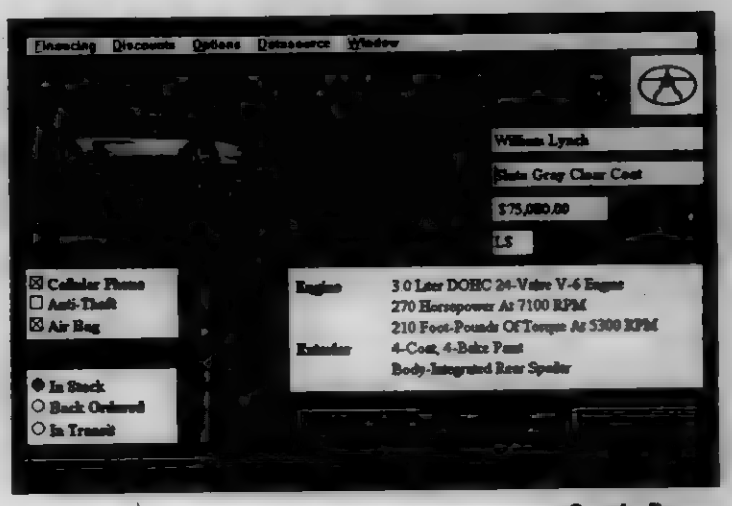
Robert Conway
Director, IES
Hartford Insurance

Oracle Designer



Oracle Forms



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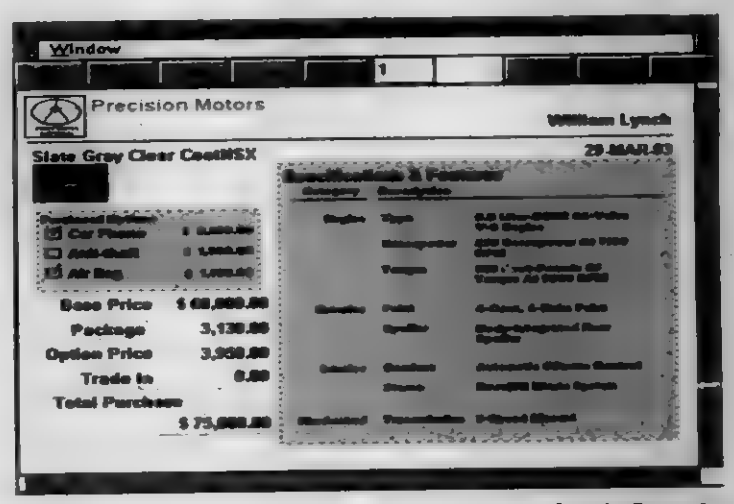

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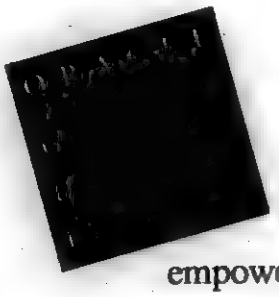

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News Shorts

Novell loses a round in court

A federal judge has denied a motion filed by Novell, Inc. to declare invalid a patent infringement charge that an inventor brought against the company. The ruling advances toward trial a 2-year-old, $220 million lawsuit that inventor Roger Billings and the International Academy of Science brought against Novell. The suit alleges that NetWare infringes on Billings' patented Functionally-Structured Distributed Data Processing System, which is said to be a key piece of client/server systems.

Bell Atlantic gets $12.7M DOD contract

The U.S. Department of Defense's **Advanced Research Projects Agency** awarded a four-year, $12.7 million contract to **Bell Atlantic Corp.** to build an experimental high-speed network linking six federal agencies in the Washington area. It will consist of a 2.4G bit/sec. Synchronous Optical Network fiber-optic ring and will connect at 155M bit/sec. to Asynchronous Transfer Mode hub switches in Bell Atlantic central offices and at government sites.

IBM introduces low-end PC

The **IBM PC Co.** unveiled a low-end PS/2 and made broad price cuts on its PS/2 server Models 85 and 95. The PS/2 Model 53 has a 25/50-MHz 486SLC2 processor and starts at $2,065. Updates to the PS/2 Models 56, 57, 76 and 77 have been delayed due to short supplies of IBM's clock-tripling 486SLC3 chips. Price cuts of up to 26% on server models bring the high-end Pentium-based PS/2 Server 95 560 down from $13,935 to $11,335 and the 486-based Model 95s to under $10,000.

SHL to post Q4 loss

Still reeling from the collapse earlier this year of a giant outsourcing deal with **Bell Canada**, Ottawa-based distributed systems outsourcer **SHL Systemhouse, Inc.** late last week said it will report an operating loss for the fourth quarter, ended Aug. 31. The company is also taking a $135 million restructuring charge, including $50 million for "winding down" mainframe contracts. The outsourcer said it is exiting the mainframe business — the Bell Canada deal was to have brought it mainframe resources. The write-downs include a devaluation in SHL Systemhouse's ComputerLand Canada trademark.

SHORT TAKES **Hewlett-Packard Co.** said it has suspended a program that brought 100 programmers from India, China and Russia to the U.S. as temporary workers, citing complaints that the foreign workers were being paid daily living expenses only. Such wages are far less than the U.S. rate of $50,000 to $60,000 annually for similar work. . . . **AT&T** last week became the latest interexchange carrier to introduce Asynchronous Transfer Mode (ATM) services. The company said it would begin controlled introduction of its InterSpan ATM Service during the second quarter of 1994; general availability will follow in the second half of the year. Initial AT&T ATM services will run at T1 (1.5M bit/sec.) and 45M bit/sec. rates. . . . **Hub maker Cabletron Systems, Inc.** will unveil today an $8,995 module for its Multi Media Access Center smart wiring hub that combines Ethernet switching, bridging and routing. . . . **Polaris Software** in San Diego is offering a free update to fix bugs in PackRat 5.0. . . . **Tektronix, Inc.** has appointed Robert L. Vance to fill the chief information officer slot recently vacated by Alan Jones. . . . **Lexicus Corp.**, a small Palo Alto, Calif., maker of handwriting recognition software, has been acquired by **Motorola**. The deal is expected to be the final piece in Motorola's wireless handheld strategy. Lexicus will join Motorola's Paging & Wireless Data Group.

Apple finally bolsters support

By James Daly
ORLANDO, FLA.

Apple Computer, Inc. last week moved to repair rough relations with corporate users by rolling out a multitiered support program designed to ease the headache of maintaining large mixed-platform computing environments.

The introduction of the Support Professional Program at the Mac-IS conference marked a victory in the user group's lengthy battle to have Apple provide an "industrial strength" support package.

"We've been at them for five years to do this, and it looks like they've gotten it right," said Jack Gillenwater, manager of client assistance at Union Carbide Chemicals and Plastics Co. in South Charleston, W. Va.

Additional help

Some users said they would not rely on the Support Professional Program as their sole means of end-user support but would use it to buttress existing programs.

"A lot of our resources are used in just keeping the machines up and running," said Robert Anderson, a senior analyst at A. O. Smith Automotive Products in Milwaukee. "Anything that gives us a hand in that area is welcome."

The Support Professional Program offers four levels of service:

•**The Infrastructure Development program** is designed to get new support staff quickly up to speed. It includes development tools and a self-paced learning system as well as a subscription to Apple's support journal.

•**Support Briefing** alleviates the need for travel — and its associated costs — while reducing the time spent poring over journals or reading bulletin boards. Subscribers receive a quarterly briefing delivered on CD-ROM. After previewing the information, subscribers can submit questions for follow-up during a toll-free conference call.

•**Support Automation** helps cut troubleshooting time by providing a search capability of Apple's entire technical information library and product manuals. The system then returns with the most relevant articles. Type in "How many Nubus slots are there in a Mac IICX?," for instance, and the system digs up manuals in which that information can be found.

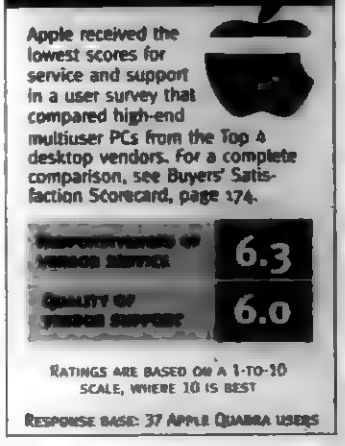
•**Technical Response** is a phone-based assistance package. It includes direct priority access to support engineers, a 60-second response time to all calls and problem resolution through research and development engineers, if necessary.

Introductory prices for these configurations vary from $2,900 to $14,500, said Bret Hydorn, manager of Apple's Enterprise Support Programs.

Earlier this year, Apple unveiled Apple Assurance, much of which is designed for the everyday user [CW, April 12]. The program provides general start-up assistance and troubleshooting as well as toll-free support and a one-year service warranty.

Suffering service

Apple received the lowest scores for service and support in a user survey that compared high-end multiuser PCs from the Top 4 desktop vendors. For a complete comparison, see Buyers' Satisfaction Scorecard, page 174.



RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST

RESPONSE BASE: 37 APPLE QUADRA USERS

Uniface OS/2 tools debut

By Melinda-Carol Ballou

Uniface Corp. last week brought out a graphical version of its Uniface tool kit for building 32-bit, multitasking OS/2 applications.

The Uniface tools provide developers with an enterprise-level tool set for OS/2 that had been lacking previously, analysts said. "This gives the developer who's looking for a platform something solid to sink his or her teeth into, with its 32-bit support," said Judith Hurwitz, president of Hurwitz Consulting in Watertown, Mass.

With this release, the Alameda, Calif., developer is offering a model-driven development environment that can be used to create applications in the native look and feel of WorkPlace Shell, OS/2's object-oriented user interface. In addition, the tools, also dubbed Uniface, work with OS/2 to act as a gateway to IBM's DB2 and other major commercial relational, flat-file and text-based database management systems, Uniface officials said. Users get full read/write access to IBM's DB/2, DB/22 and DB2/6000 databases, as well as to IBM's Dynamic Data Exchange.

Hurwitz noted that the high cost of Uniface development and runtime licenses is an issue, but she added that the company is aware of this problem.

Uniface for OS/2 Version 2.1 and WorkPlace Shell is available immediately. It is priced at $2,495 for a single-user license.

Noorda

CONTINUED FROM COVER 1

next dollar level," said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington research firm.

Novell's revenue in the first nine months of fiscal 1993 grew 20% to $813.7 million. This compared with 50% sales growth in the like period the previous fiscal year.

Noorda, who owns roughly 10% of Novell, joined the company in 1983 and built the tiny hardware provider into a $1 billion networking giant.

However, "There's a perception right now that Novell has been flopping around for a couple of years and needs someone with real experience at running a billion-dollar company" to help turn it in the right business direction, said David Coursey, editor of "P.C. Letter," a San Mateo, Calif., newsletter.

Noorda will stay on as chairman and will continue to steer Novell's strategic direction, according to a company statement.

Novell's board of directors has already begun to search both inside and outside for a successor, the statement said. The board will be looking less for a technological visionary than for a financially-savvy person — preferably an outsider — who can think in terms of a return on equity, rather than technology, Dzubeck said.

One key area where Novell needs to be more bottom-line-oriented is acquisitions, Dzubeck said. "They invested $500 million in Digital Research and Unix System Laboratories, and they're still not seeing returns."

The strongest internal candidates for the job would be the three members of the office of the president, which Noorda formed last August. These include: Mary Burnside, chief operating officer; James Tolonen, chief administrative officer; and Kanwal Rekhi, executive vice president of corporate technology.

Gentlemen, start your snails.

PC Magazine independently defined and ran a battery of real world performance tests to compare database server software. PC Magazine states, "Oracle7 was the hands down winner on our performance tests, outperforming the others by a wide margin."

LOAD AND INDEX

"Oracle7 finished the entire test suite in less time than most took just to load and index our data."

PC Magazine

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"Oracle7 completed the queries in a blistering 47 minutes, three times as fast as...the other products."

PC Magazine

CONCURRENT RANDOM WRITE

"Even with the many new features that were added, we found Oracle7 to be exceptionally stable"

PC Magazine

CONCURRENT RANDOM READ

"Oracle7's read-consistent model and record level locking helped it breeze through the test."

PC Magazine

Just to be fair, here's what PC Magazine had to say about the other guys:

Informix OnLine *"Only after days and days of repeated crashes were we able to obtain a full set of results."*

Ingres Server *"...we would not recommend it because of the showstopping multi-user bug we encountered."*

Gupta SQLBase *"...took an unthinkable 60 hours to load the tables and then crashed on the index builds..."*

For your copy of the complete PC Magazine article, including test results call 1-800-633-1071 Ext.8129.

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ATM

CONTINUED FROM COVER 1

ogy and downsizing, said Morris Jacobs, a senior manager at Ernst & Young's utilities consulting group in Atlanta. Their efforts stem from the 1992 Energy Act, which mandates that utilities allow the "wheeling" of power across their transmission lines to competitors. This means independent power producers can now provide competitive services for large customers.

Part of Northeast Utilities' cost-containment effort recently included reducing its 400-plus information systems staff by almost 60 people. Still, the company is marching ahead with its ATM plans, which will include the installation of two 155 bit/sec. ATM switches in Connecticut during the first quarter of next year. The nodes will represent upgrades from the company's StrataCom, Inc. T1 network to a backbone comprised of StrataCom's BPX ATM switches.

Competitive prices

The granular network reconfiguration and bandwidth allocation features inherent in ATM technology play into the theme of reducing operating expenses to help compete on price. ATM "allows me to very efficiently dynamically allocate bandwidth. This reduces the overall bandwidth needs we have by minimizing waste," Dixon said.

Northeast Utilities plans to upgrade two other StrataCom T1 nodes later in the year and eventually replace the 24 remaining T1 nodes with BPXs as fiber gradually gets installed, said Rich Kubica, manager of network planning and engineering.

The company is also looking at the Motorola Codex 6950 SoftCell ATM Networking Node switch for accepting many diverse incoming LAN interfaces and converting that traffic to ATM, said John Boyd, communications director [CW, Oct. 25].

Northeast Utilities' awakened interest in operations streamlining and customer service parallels the near-decade-old deregulation of the long-distance telephone market. "We're afraid what's happening with the phone companies will happen in the utilities," Dixon said. He was referring to customers' potentially turning to less expensive or more customer service-oriented suppliers.

Northeast Utilities

1992 financials:
Revenue: $3.2B
Profit: $256M
IS setup:
PCs: 6,200
RISC workstations: 25
Total number of desktop MIPs: 7,500

Cost savings from consolidating voice, video and data traffic onto one redundant network are key to price-based competition, Kubica said. Yet the goal is not to reduce overall communications costs but to "get the cost per megabit delivered down."

That is where ATM comes in, Kubica said. The IS department will be judged on the cost per megabit of network delivery to make sure costs are controlled, Dixon said.

More bandwidth

While Kubica said that "pure, raw bandwidth is what I need right now" — largely for aggregating traffic — he did cite several new applications that will also munch on network capacity. One is the creation of an image-based file for each Northeast Utilities customer.

Also, nuclear power plant support applications, geographical information systems of the utility's transmission facilities, videoconference-based training and corporatewide information kiosks are figuring into the bandwidth picture.

While ATM is often touted as the optimal technology for mixing voice, video and data, Northeast Utilities is already able to compress the mix "beautifully" on its StrataCom multiplexers, which run a frame-relay interface. However, the speeds only go up to T1 (1.5M bit/sec.), which cannot begin to sustain the utility's traffic volume.

While the plant doesn't expect many local-area ATM applications to emerge for a good 18 months, another appeal of ATM is that it "allows you to go from the desktop all the way through the WAN with a common architecture," which has management and cost-saving benefits, Kubica said.

“The move to the desktop by our mainframe-based clients is an excellent first step in the transition to client/server computing.”

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“With your own mainframe, you also save by deferring long-term upgrade costs. Productivity gains even continue after development is over, because you can test the end product to such a fine level of detail, the result is fewer defects during maintenance.”

“We find that the use of the COBOL makes it a lot easier for mainframe programmers to feel comfortable with the environment on day one. The interesting side-effect is that once they start to use the tools, they become more comfortable with the workstation and begin to explore how to get the best from it. It works out to be a very good way to transition from a mainframe-oriented programmer shop into something that can tackle client/server development.”

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Outsourcing

Air Canada floats $1 billion RFP, seeks cash

by Mark Halper

Information systems outsourcing may be shifting from mainframe to distributed computing, but a freshly printed request for proposals (RFP) from Air Canada demonstrates that one constant still applies in mega deal-making: Clients continue to seek cash up front.

The financially recovering $3 billion Montreal-based airline is seeking proposals for a seven- to 10-year $1 billion takeover of its information utility. The job includes client/server transition efforts and mainframe operation.

The outsourcer would also run LAN and database management, the help desk, application development and PC acquisitions and implement new technologies.

Two weeks ago, the firm sent RFPs to Electronic Data Systems Corp.; IBM's Canadian subsidiary, ISM Corp.; SHL Systemhouse, Inc.; and Bell Canada's Bell Sygma, Inc. arm.

Financial help, too

Given the expenditures required to migrate to a client/server environment, Air Canada is hoping as much for financial assistance as it is looking for technical help from its would-be outsourcer.

Air Canada eeked out a $43 million profit in its third quarter ended Sept. 30. It lost $454 million last year. In another cash-raising move, the company late last week issued $250 million in stock, lowering its debt/equity ratio from 31-to-1 to 7.6-to-1.

Experience counts

Air Canada is not new to outsourcing. Early this year it hired Andersen Consulting to build a Sun Microsystems, Inc.-based revenue management system; it also outsources computerized reservations to Genisel Automated Information Systems, a company it jointly owns with Canadian Airlines and Covia Corp. It is currently embroiled in court over Canadian Airlines' attempt to withdraw from that operation.

"One of the things we're looking for from an outsourcer is to help manage the cash requirements for us so we can move into the new environments and not have to bear the large upfront investments," said Norm Roberts, Air Canada's outsourcing project director.

Payroll, human resources, weather data and flight plans are among the dozen or so operations that Air Canada has earmarked for client/server architectures, and none of those will come cheap, Roberts noted.

"Human resources and payroll would cost about $5.5 million [Canadian], and there's probably 10 or 12 of those [applications]," Roberts said.

The eventual outsourcer would finance more than the client/server transition. The RFP specifies that the outsourcer would acquire computing, communications and possibly real estate, a move that would provide the airline with a much-needed cash infusion.

Roberts did not specify how much cash Air Canada is seeking for those assets. The sale of its computing resources would cover six mainframes — two IBM, three Unisys Corp. and one Bull HN Information Systems, Inc. machine — a private Bell Canada T1 communications network and some 4,200 PCs sitting on Novell, Inc. NetWare LANs.

Roberts said Air Canada expects to receive proposals by mid-December and to reach a decision by April. The company will also weigh a proposal from its own IS department.

The "lock, stock and barrel" RFP solicits outsourcers' plans for taking over "virtually every aspect of information processing," Roberts said.

The outsourcer would assist in dismantling the Bull HN mainframe that supports Air Canada's maintenance and inventory operations as well as some of its passenger revenue system, crew planning, scheduling, fuel and payroll.

Mainframe takeover

In addition, it would take over operations of the IBM mainframes that support general-ledger applications, some market planning, flight plans and frequent flier programs. It would run the Unisys systems that support Air Canada's integrated cargo booking system and take charge of backup and recovery.

Roberts said some operations are simply too data-intensive to move to client/server platforms in the foreseeable future. For instance, some of the airline's marketing programs, as well as its flight planning operations that gather weather data from around the world, are wedded to mainframes.

The Air Canada RFP also asks the outsourcer to offer jobs to all of Air Canada's roughly 375 IS staff members and encourages the hiring of the 250 contract workers in its IS operations.

ISSC tapped to run railroad's systems

Business re-engineering proposals rejected in favor of processing plan

By Mark Halper
SAN FRANCISCO

Southern Pacific Lines last week ended its year-long-plus outsourcing evaluation by selecting a 10-year, $415 million bid from IBM's Integrated Systems Solutions Corp. ISSC got the nod over rival proposals that emphasized business process re-engineering.

The San Francisco-based rail company tapped ISSC to take over mainframe operations, application development, new technology implementation and disaster recovery.

The pact marks the first major outsourcing deal in the railroad industry, and others are expected to follow as rail companies seek technology leverage that would improve interrail logistics and ward off trucking industry competition.

Bids on the table

In a related development, sources noted that IBM is making a bid to acquire the railroad's sister company, SP Telecommunications, Inc., from parent company Anschutz Corp. in Denver and that cash from that transaction could help finance the outsourcing deal.

Southern Pacific's Tom Matthews *says most IS staff jobs will be transferred to ISSC*

Safety benefit

By transferring the data center from San Francisco to ISSC's Boulder, Colo., site, Southern Pacific is removing its mainframes from a major West Coast fault line.

ISSC will offer about 300 of the 350 Southern Pacific's information systems staffers jobs, according to Tom Matthews, Southern Pacific's vice president of administration. Most of them will remain in San Francisco; mainframe operators will be asked to relocate to ISSC's Boulder, Colo., data center.

ISSC will initially run existing operations as they are while it identifies areas in need of a technology overhaul.

More information

Those areas are likely to include car and locomotive tracking and scheduling processes. Under current mainframe procedures, yard masters do not have as much access to information about train location and cargo content as they could have in a client/server arrangement, explained Roy Carlson, Southern Pacific's vice president of MIS.

"The mainframe is a big sucking machine pulling all the data in and spitting it out according to what inquiries have been preprogrammed," Carlson observed. A client/server program would not only provide readier access to data stored locally, but would permit yard workers greater manipulation of the data to determine availability of cars and engines, he explained.

While ISSC may develop client/server processes on its own, it may also purchase technology from other railroads that are marketing their own modernized systems. Union Pacific Corp., for instance, is offering a car and locomotive tracking system.

Rejected bids

Southern Pacific rejected a bid from Perot Systems Corp. that had included a large dose of corporate restructuring, an approach that is becoming a Perot trademark. Likewise, Southern Pacific turned down an Electronic Data Systems Corp. bid that pitched a good deal of re-engineering, according to Bill Malin, an Annapolis, Md., consultant who advised Southern Pacific.

"Business process re-engineering might be very important to the company, but there's always the question of how much your corporate culture can absorb at any one time," Carlson said. "Also, it's an investment."

Corrections

Due to a reporting error, a story in the Nov. 8 issue incorrectly stated the responsibilities of Richard Wonder at Robert Half International, Inc. Wonder is national director of the information systems division and is actively involved in recruiting.

Due to a reporting error in a recent story (CW, Oct. 18), it was omitted that minorities and women hold several high-level management and professional positions in the 150-person systems department at Elf Atochem North America, Inc. Elf Atochem is a corporate sponsor of the Black Data Processing Association.

A story on Team Software, Inc.'s discussion database for Windows was pulled from page 4 of the Nov. 8 issue to make room for a late-breaking story. It is on page 75 of this week's issue.

Due to a reporting error in the Nov. 8 issue, QuarkXPress' supplier was incorrectly identified. It is owned by Quark, Inc.

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Users must upgrade to get IBM parallel goods

By Johanna Ambrosio
NEW YORK

IBM executives last week confirmed that only about one-fifth of the ES/9000 base will be able to connect to forthcoming System/390-based parallel processing machines because of technological limitations.

As a result, those customers will have to choose between buying most of the new parallel computers as stand-alone processors or upgrading to newer ES/9000 models in order to access the new parallel capabilities.

While IBM did provide more technical details, it will not make available pricing or performance data — or the parallel processors — until next year. These limitations may narrow their appeal.

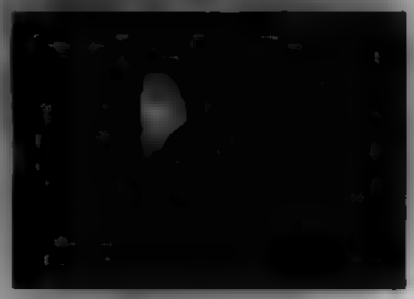
"I don't see it fitting into our plans in the immediate future," said Albert Collins, vice president of information services at Home Box Office, Inc. in New York. "We'd have to get a whole new mainframe."

Still, many observers noted that IBM sent a second message informing customers that they will be able to move to the parallel machines with most of their software and applications in place.

"This makes a lot of sense," said Steve Josselyn, an analyst at International Data Corp. in Framingham, Mass. "You don't have to change applications or do a lot."

Down the road

IBM will roll out its System/390-based commercial parallel processors in phases



Q1 1994
- A 48-engine DB2 query machine. Includes new versions of DB2, MVS and other software.

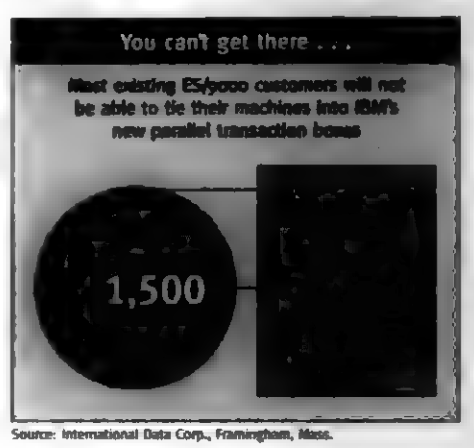
Q2 1994 (pictured)
- A 48-engine transaction processing computer. First implementation supports the DL1 database management system (also known as IMS) and either CICS or the IMS transaction monitors.

1995
- A second version of the query machine that can either stand alone or be attached to selected ES/9000 mainframes. It may also support other IBM databases and non-IBM databases.
- A new transaction server that can support DB2.

In good hands

Allstate Insurance Co. in Northbrook, Ill., which was the development site for the transaction server, has more than 10% of its claims processing running on a prototype machine. Donny Lippard, director of information technology at Allstate, characterized as "trivial" the 30-day effort his shop needed to change the application to run on the new machine. In essence, he said, the company needed to remove a parameter of the program that required the job to run on a specific processor.

As expected, first out of the parallel chute will be a 48-processor query engine that can connect to any Escon-capable processor built around advanced CMOS technology [CW, Nov. 8]. Subsequent versions of that machine, as well as all of the parallel transaction servers — which permit updating as well as querying of data — will connect only to models of the ES/9000 family that IBM announced last February. These are the so-called 511- and 711-based processors.



Source: International Data Corp., Framingham, Mass.

Company executives insisted the decision to connect the parallel machines to only these ES/9000 models was based on the technical limitations of the older machines. "We just couldn't use the older machines," said Nick Donofrio, senior vice president of IBM's large systems group. "They can't support the speeds and densities we need."

Key to the transaction server is technology called the Coupling Facility, which will also be used in later versions of the query machine. This hardware/software combination will track which data is being used at any particular time so two users do not unwittingly call up and change the same piece of information at once.

Data sharing is another important concept going forward and one that IBM executives said differentiates their parallel processors from others on the market. In this scheme, the processors in the parallel computer can access all data.

Also new in IBM's parallel world is load balancing. This allows the machine to automatically adjust each processor to achieve the performance objectives of the user organization. With each transaction server, IBM will include a systems management package that allows users to point and click on icons to bring a machine down or repower processors.

Both the transaction server and the query machine will be bundled with software, storage devices and installation services. Most analysts peg the bundled price at about $20,000 per MIPS, about half that for a regular ES/9000 mainframe.

By 1996, there will be enough additional functionality on the transaction server — including DB2 in 1995 and VSAM after that — to allow it to take over as the core machine in IBM's mainframe lineup. Although IBM will devote most of its large systems research dollars to these CMOS processors, additions to the traditional bipolar host family will continue, Donofrio said.

Charlie Burns, an analyst at Gartner Group, Inc. in Stamford, Conn., said he expects both 9- and 10-way ES/9000 models to be announced in February.

Applications

NCR readies parallel software for multiprocessing systems

By Thomas Hoffman
NEW YORK

NCR Corp. is formulating a program designed to widen the availability of commercial "parallelized" software applications that will run on its multiprocessor machines.

Word of the plan, called Genesis, came last week when the company showed off hardware and software enhancements to its 3600 massively parallel processing system and Teradata DBC/1012 database servers. The plans include first-quarter 1994 availability of Intel Corp. Pentium microprocessor upgrades to NCR's I486-based 3600 and DBC/1012 application processors [CW, Nov. 8].

The software effort, which combines in-house and third-party development, is in response to customer and prospective user grumblings over the lack of off-the-shelf parallel applications. Most massively parallel processors are Unix-based and as such are equipped to run Unix applications, but the bulk of those applications have not yet been optimized to run across dozens, even hundreds, of parallel microprocessors.

Since June, NCR has been working with third parties to create customized software for its six key target markets: financial/insurance/banking, retail, manufacturing, transportation, telecommunications and public sector.

Genesis is a key ingredient of the customer-focused team concept NCR introduced last month as part of a company-wide reorganization. The program's aim is to deliver both parallel and nonparallel vertical-specific applications to target markets, said Mike Mason, a team member of the Genesis group.

Mason said NCR is working with two software vendors he declined to name to create client/server-based parallel marketing software for its 3600 machines. Though he would not name the software partners, Mason did say the initial packages, slated for January delivery, would be designed to run in Teradata and Oracle Corp.'s Oracle 7 database environments, followed eventually by Sybase, Inc.-compatible versions.

Meet the specs

But the only major requirement imposed on applications vendors seeking to run their software on NCR's massively parallel processors is to comply with the Teradata and Oracle database specifications, according to Elaine Meis, an NCR assistant vice president.

In the beginning
As part of its Genesis program, NCR last month completed an extensive five-month worldwide study of 600 NCR and non-NCR customer accounts whose operations make them prime targets for massively parallel processing systems.

NCR's support of several SQL gateway technologies helps to smooth that path, Meis said. For example, NCR supports Oracle's SQL/Connect, Micro Decisionware, Inc.'s MDI, Apple Computer, Inc.'s Data Access Language, Gupta Corp.'s SQL/Router and Microsoft Corp.'s Open Database Connectivity gateways, among others.

While some NCR 3600 customers said they are interested in viewing the vendor's parallel applications offerings, other users have taken matters into their own hands. "Most of our major [purchasing] applications are in the process of being replaced or rewritten using Oracle 7," said Forrest Grapes, manager of technical services at Kansas City Power & Light Co., a Kansas City, Mo., utility that installed an NCR 3600 system to replace a Unisys Corp. 2200 mainframe.

NCR's parallel application development efforts, however, still lag those of Thinking Machines Corp. and Intel, according to Derek Stubbs, a consultant at Advanced Forecasting Technologies, Inc., a Vicksburg, Mich., consultancy. In contrast to NCR's approach, Thinking Machines and Intel have been building their own packages without third-party help, Stubbs said.

Informix plots

CONTINUED FROM COVER 1

applications analyst at Citicorp Mortgage, Inc., an Informix customer that has evaluated offerings from Sybase and Oracle.

The St. Louis division of Citicorp plans to move a mission-critical mortgage banking application off a Pick Systems platform to a Unix multiprocessor.

"Users want faster processing of more and more complex queries against ever larger databases. The only way you can do this is parallel processing," said Dave McGoveran, president of Alternative Technologies, Inc. a Boulder Creek, Calif., consultancy.

Taking the leap

Hot spots to watch when migrating to parallel processing-enabled OnLine 6.0:

- Archive copy of Version 5.0 database will not automatically run under 6.0.
- OnLine 6.0 will not include many performance planning tools; utilities will ship separately.
- Migration will take 30% to 50% longer than moving from 4.1 to 5.0.

Also on the agenda are management tools, such as network monitoring and planning capabilities built into the OnLine database. Such products would help users set up and track client/server configurations.

Dynamic Scalable Architecture will also feature the ability to automatically reconfigure the space available in the database as information is moved, inserted and deleted. The next version, 6.1, is expected to implement Parallel Database Query, which breaks down a complex end-user query into several chunks and distributes them to available processors.

Informix declined to comment.

Sybase last week formally unveiled a similar technology, dubbed Navigation Server [CW, Nov. 8]. Oracle plans to add its own parallel query processing features in early to mid-1994, the same time frame in which the Informix and Sybase products are expected to ship.

Beta testing of OnLine 6.0 is slated to start at the end of the month, with delivery scheduled for two longtime Informix users, said another Sequent employee, Afsaneh Eshghi, program manager for the Informix relationship.

Migrating from OnLine 5.0 to Version 6.0's Dynamic Scalable Architecture "won't be as jarring as going to Sybase or Oracle parallel databases," McGoveran said. Oracle, for example, approaches parallel processing through a loosely coupled architecture, meaning that the database and applications must weed through separate machines tied together, he explained. Informix parallelism, which is based on tightly coupled systems, is less of a leap from a traditional uniprocessor platform, he said.

ASK enhances Ingres database

The ASK Group, Inc. plans to announce today object-oriented and connectivity enhancements to the Ingres database, features designed to kick new life into what some observers call a stagnant product line.

Renamed OpenIngres, the follow-on to Ingres 6.4 will include support for binary large objects, Open Database Connectivity standards and a distributed transaction processing monitor, the company said. The products are slated to ship in April 1994.

Ingres' share of the $2 billion worldwide Unix database market has virtually stood still for the past three years, according to International Data Corp. in Framingham, Mass. With a 1992 stake of 9%, the product stands a distant fourth in share, behind Oracle Corp.'s 44%, Informix Software, Inc.'s 18% and Sybase, Inc.'s 12% slices.

ASK hopes to sign up systems management tool makers such as Legent Corp. and BMC Software, Inc. to port backup and recovery and other utilities to Ingres, said Beverly Brown, vice president of product marketing.

Also part of OpenIngres is a gateway to IBM CICS/VSAM systems and a database replicator announced in June.

—Kim Nash

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Big boys parry, thrust for 32-bit advantages

By Ed Scannell

Trying to get to "Chicago" before Microsoft Corp. does, IBM's Personal Software Products group last week formally announced OS/2 for Windows, software that gives Windows 3.1 users all the 32-bit advantages of OS/2.

The new version, which contains all the functions of OS/2 2.1, can be installed directly over existing versions of Windows 3.1 without changing a user's existing hardware or software configurations [CW, Sept. 13].

With Microsoft not expected to deliver Chicago — a 32-bit version of Windows for the desktop — until late next year, IBM believes OS/2 for Windows is its best chance to yank away a good hunk of Microsoft's desktop operating system market share.

Microsoft officials in recent weeks have declined to comment on OS/2 for Windows except to say that they strongly suspect it will not satisfactorily work with Windows for Workgroups 3.11, which shipped last week. Specifically, they said OS/2 for Windows will not support the 32-bit virtual device drivers in their product.

Personal Software Products countered by saying that it will announce at Comdex/Fall '93 support for Microsoft's Win32s application programming interface, which should make OS/2 for Windows compatible. IBM declined to say when the OS/2 2.x series would gain Win32s compatibility.

IBM declined to discuss how OS/2 for Windows will seamlessly attach itself to Window 3.1 without any Windows source code.

"We hope to deliver [in OS/2 for Windows] what Microsoft promised but failed to do for Windows users," said Lee Reiswig, president of Personal Software Products.

To attract as many Windows 3.1 users as possible in the next few months, Personal Software Products is pricing the program at $49 until Feb. 9, 1994.

Reiswig said OS/2 for Windows should double the current monthly run rate of OS/2 2.1 beginning this month and extending to the first quarter of next year.

IBM officials also declined to discuss precisely how OS/2 for Windows will seamlessly attach itself to Windows 3.1 without the presence of any Windows source code. But they said they are confident the techniques used in the product do not violate the "divorce settlement" between IBM and Microsoft signed in June 1992.

NT starts slow

CONTINUED FROM COVER 1

tems and IBM are delivering solutions and capturing market share."

His observations appear to be backed up in a recent survey of *Computerworld*'s Premier 100 user companies.

Among the 238 respondents from large corporate accounts interviewed by the *Computerworld* Database Division, only 20% have even tested NT. Moreover, consistently more of these users see themselves as unlikely to standardize NT on either the desktop or server (see chart cover 1).

Most of the 2,500 to 3,000 MIS managers and chief information officers interviewed by WorkGroup Technologies for a series of surveys indicated they are still in the evaluation stage. "There is a high degree of awareness and interest in NT, but we couldn't find any substantial or immediate deployment plans or implementations," Donovan said.

The Top 6 pieces of NT advice users would like to give Microsoft

1. Improve support and documentation.
2. Cut down NT's overhead and memory requirements.
3. Cut back on the need for debugging.
4. Improve interoperability between systems.
5. Improve performance and speed.
6. Don't set unrealistic deadlines.

Source: Computerworld survey

Fast out of the gate

Moreover, while Microsoft claims to have shipped 200,000 copies of Windows NT in its first 60 days of commercial availability, a leading national software distributor said dealer requests from NT fell sharply in October after it filled a substantial number of back orders.

"OS/2 is cleanly beating NT for now," said an executive at one major distributor who requested anonymity. "OS/2 has been around for a while, and some IS types are getting more comfortable with it," she said.

This all adds up to a warning for Microsoft. The company is faced with convincing corporate America that Windows NT is a better print and file server than Novell's NetWare and a better applications server than Unix.

The product may accomplish both in the long term, but Microsoft has a long road to travel to get there.

While there are many corporate accounts proceeding with due caution, some have faith Microsoft and its partners will deliver a richer variety of development tools and utilities.

"[Windows NT] doesn't have nearly the number of utilities available you can get for NetWare. It is probably 10 to 1 right now. But as Microsoft gets more copies of NT out there, people will start doing more things like utilities," said Bill Cornfield, president of the New York-based Windows Support Group.

Full speed ahead

Some corporations are already proceeding with the development of mission-critical applications that will tie in with their existing Windows 3.1 applications. Companies that are either standardizing on NT or already deploying the product in various areas are Nordstrom, Inc., BankAmerica Corp., Sanford C. Bernstein & Co., Freightliner, Inc. and Paragon Trade Brands, Inc., among others (see story below).

Fence-sitting users, on the other hand, want to see more development tools and many more 32-bit server and desktop applications that fully exploit NT's power. As did OS/2 proponents three or four years ago, information systems departments today contemplating NT need to show their bosses proof of productivity gains before they can justify more widely deploying Microsoft's 32-bit offering (see chart). Even Microsoft is not expected to deliver 32-bit versions of Excel and Word until first-quarter 1994.

"It's not so much waiting and seeing if [Windows NT] succeeds as much as it is waiting to see when the 32-bit applications come," said Mike Drips, an NT beta user and consultant in Tampa, Fla. "Corporate departments are going to need a lot of them to justify large purchases."

"NT does not bring much to the table now," said one corporate beta user of the product. "But with enough supersonic applications, managers will be more likely to buy off on it across the board. That is where our bottleneck is right now," said another beta tester at a major Midwestern telecommunications company.

One stumbling block to getting major developers to create fully exploitive 32-bit applications is that many are just now beginning to realize significant profits from their Windows 3.1 applications. Some may be reluctant to quickly begin another major development project.

Please come to Chicago

"Why would [independent software vendors] want to do another expensive rewrite, with Chicago [the 32-bit Windows version] coming right behind NT?" asked Bill Bluestein, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

Rich Tong, Microsoft's general manager of corporate and network systems, responded that "some companies, like Microsoft, will release 16-bit OLE-enabled apps and then do 32-bit versions. Others will use Win32 [application programming interfaces] to go to 32 bit and still be able to run [their applications] on systems running both Windows 3.1 and Windows NT."

Microsoft will showcase dozens of software developers demonstrating 32-bit, NT-based applications at Comdex/Fall '93 (see stories pages 16-29) this week. At this week's show, company officials are expected to announce that 220 applications are now shipping that take advantage of Microsoft's Win32 APIs.

However, a richer variety of 32-bit applications from each of the major applications categories is not expected to be available until next year.

Environmental differences

Users gave Windows NT higher interoperability marks than OS/2 and Unix but were less positive in other categories

	NT	OS/2	UNIX
Interoperability	3.6	3.4	3.0
Features	3.5	3.5	3.5
User friendliness	3.3	3.3	2.1
Manageability	3.1	3.4	2.6
Performance	3.2	3.3	3.9
Cost-effectiveness	3.2	3.4	2.8
Service and support	3.0	2.7	2.8

Computerworld survey

Customer apps take bow on NT stage

Looking to give its fledgling Windows NT effort a little boost, Microsoft last week demonstrated several custom applications developed by information systems shops that integrated Windows clients with NT servers.

Highlighting customer applications from Freightliner Corp., Paragon Trade Brands, Inc. and Voest Alpine, Microsoft executives stressed Windows NT as a credible server platform capable of running native 32-bit applications that share the same set of application programming interfaces as Windows.

This capability will translate into substantially lower maintenance costs compared with mixed environments where Windows clients are supported by Unix or OS/2 servers, according to John Lazarus, vice president of systems strategy at Microsoft.

At the same time, Microsoft reiterated its plans to build more robust system services on top of NT. They include an Electronic Messaging Server that will provide an intelligent electronic-mail backbone with facilities for finding documents on the network and a distributed system management facility called Hermes.

In addition, Lazarus stressed that Microsoft Office 4.0, which includes a programming language, will function as a platform for integrating third-party PC applications into the Microsoft client/server model.

—Michael Vizard

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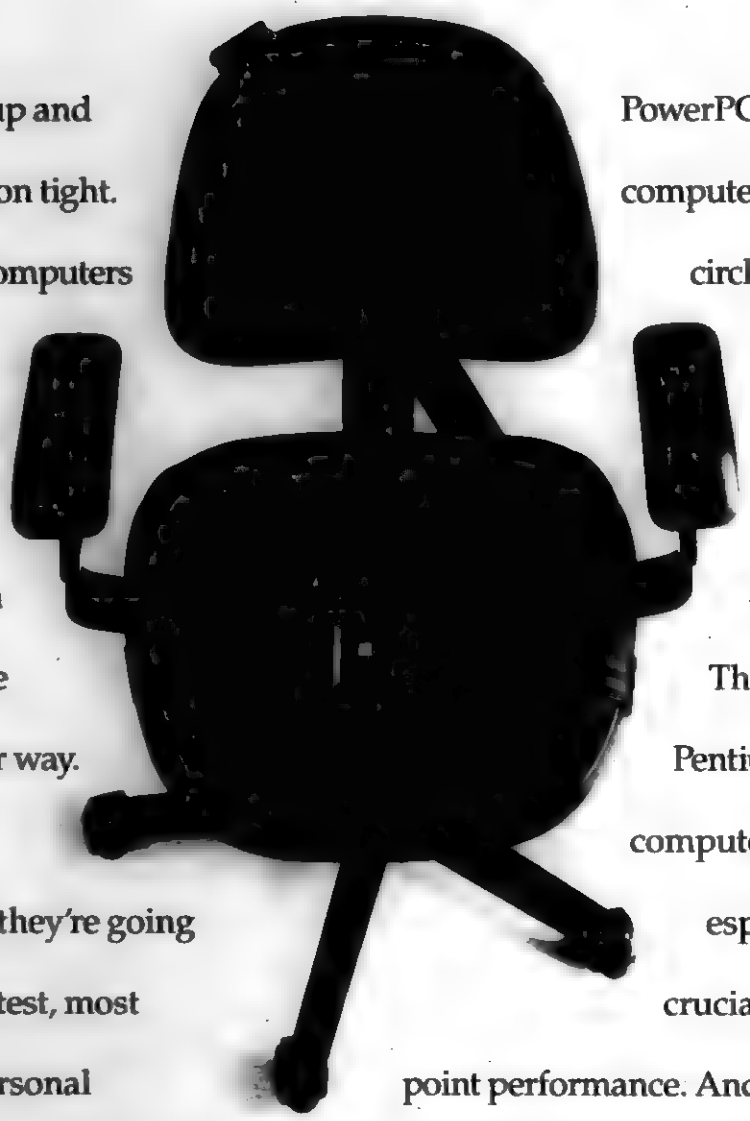

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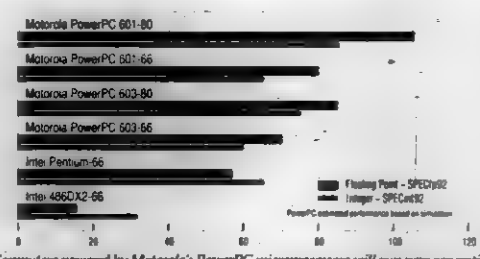

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—Jerry Barber,
Chief Technical Officer,
Aldus Corporation.

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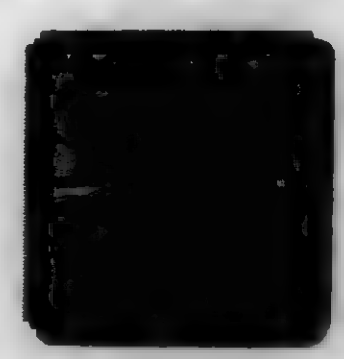

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Borland weighs in on office suite role

By Michael Vizard

Borland International, Inc. will take the stage at Comdex/Fall '93 this week to announce plans to integrate its Object Exchange (Obex) facility, which makes it easier to integrate data across applications, into WordPerfect Corp.'s word processor packaged with Borland Office 2.0.

Borland will also talk about long-range plans for providing a common macro language that can address all elements of the suite and will showcase some of the work being done to give Borland and WordPerfect products a more common look and feel. Then Borland will look to invite other software vendors to support Obex and Borland programming tools.

But industry analysts said they doubt Borland will make any substantial headway in this category against the dominance of Microsoft Corp. and Lotus Development Corp.

"I'm skeptical because there are degrees of integration. Lotus has SmartIcons, while in Microsoft Office all the applications literally look the same," said Mike Heylin, an analyst at Creative Strategies, Inc. in San Francisco.

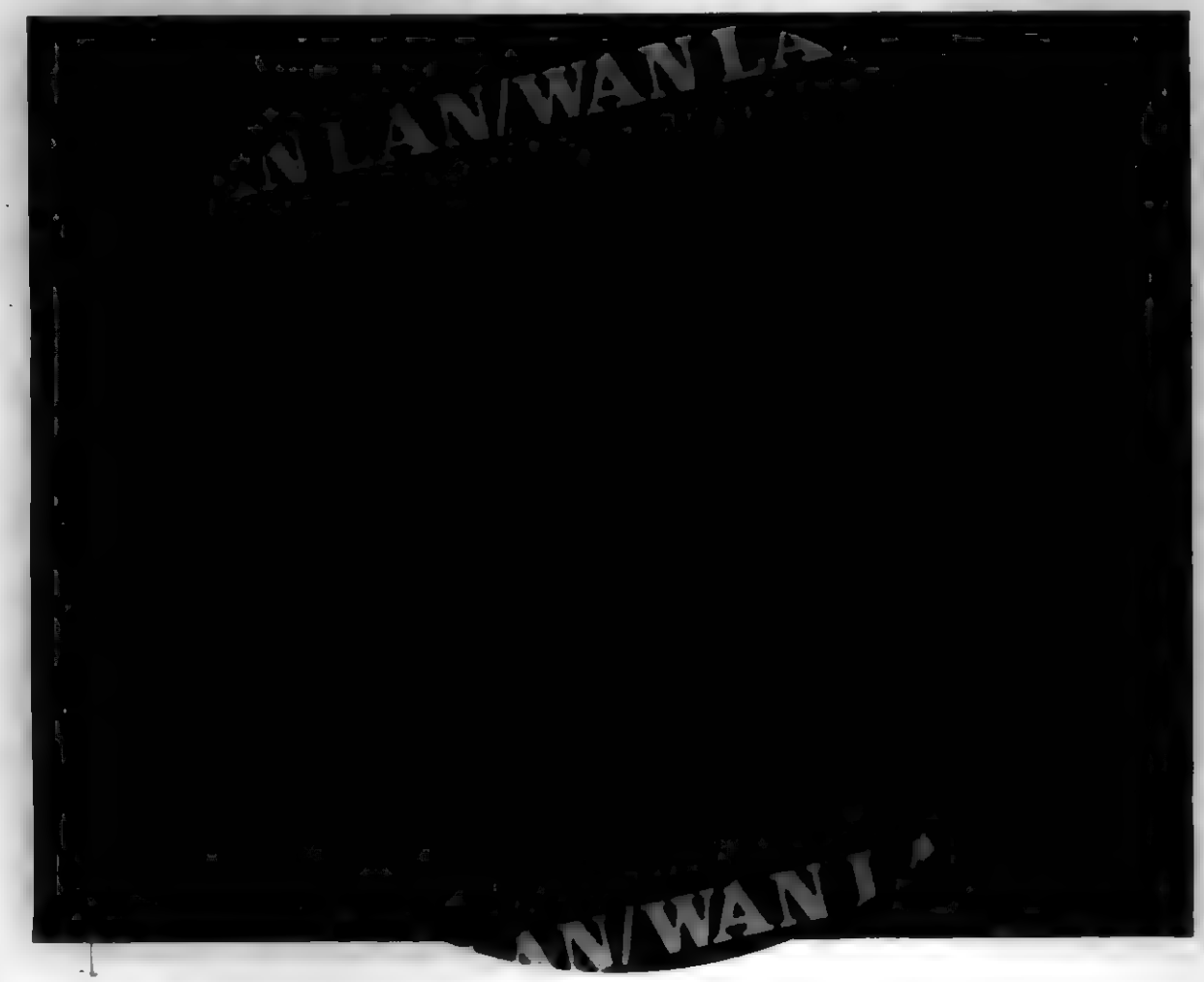
"Only people who have a mission-critical need for Paradox are really going to look at the Borland suite," said Krystyna Filistowicz, an analyst at Dataquest, Inc. in San Jose, Calif.

Meanwhile, Microsoft and Lotus will be pushing their respective suite stories at Comdex. Microsoft will demonstrate 35 third-party applications that support Object Linking and Embedding (OLE) 2.0 and Visual Basic.

Under the Microsoft model, information systems managers can drive these third-party applications from within the Excel spreadsheet and Word word processing package in Microsoft Office.

Lotus, meanwhile, plans to map out a similar strategy for its SmartSuite offering that calls for integrating a common macro language and OLE 2.0 support.

"OLE 2.0 isn't going to be a slam dunk just yet. But you will see vendors begin to expoit it on your behalf. Full tribute to OLE 2.0 will be paid over time," said David Coursey, editor of the industry newsletter "P.C. Letter." (see story page 29).



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WordPerfect to buy into document software

By Michael Vizard

Looking to jump ahead of its major rivals, WordPerfect Corp. last week agreed to acquire SoftSolutions Technology Corp., a document management systems provider in Orem, Utah. The terms of the deal were not disclosed.

WordPerfect hopes to get a leg up on both Microsoft Corp. and Lotus Development Corp. as the PC applications arena moves toward compound document architectures using object technology, noted Priscilla Emery, an analyst at New Science Associates, Inc. in Westport, Conn.

Earlier this year, Microsoft divulged its intention to deliver a document management system. Lotus is pursuing a course that invites third-party suppliers to layer their offerings on Notes [CW, Oct. 11].

The plan

WordPerfect's strategy calls for adding some elements of the SoftSolutions technology to the company's namesake word processor and then linking that technology to WordPerfect Office.

This effort will satisfy demand for a document management system while buttressing the firm's workgroup computing strategy, said David Moon, vice president of technology at WordPerfect.

Meanwhile, SoftSolutions will be able to leverage WordPerfect resources to keep up with its own growth, which users said has begun to outpace the firm's ability to provide support (see story page 76).

SoftSolutions will also be able to tap WordPerfect's marketing resources to counter efforts from PC Docs, Inc. in Tallahassee, Fla., and Saros Corp. in Bellevue, Wash. But Moon stressed that SoftSolutions will remain an independent business unit of WordPerfect.

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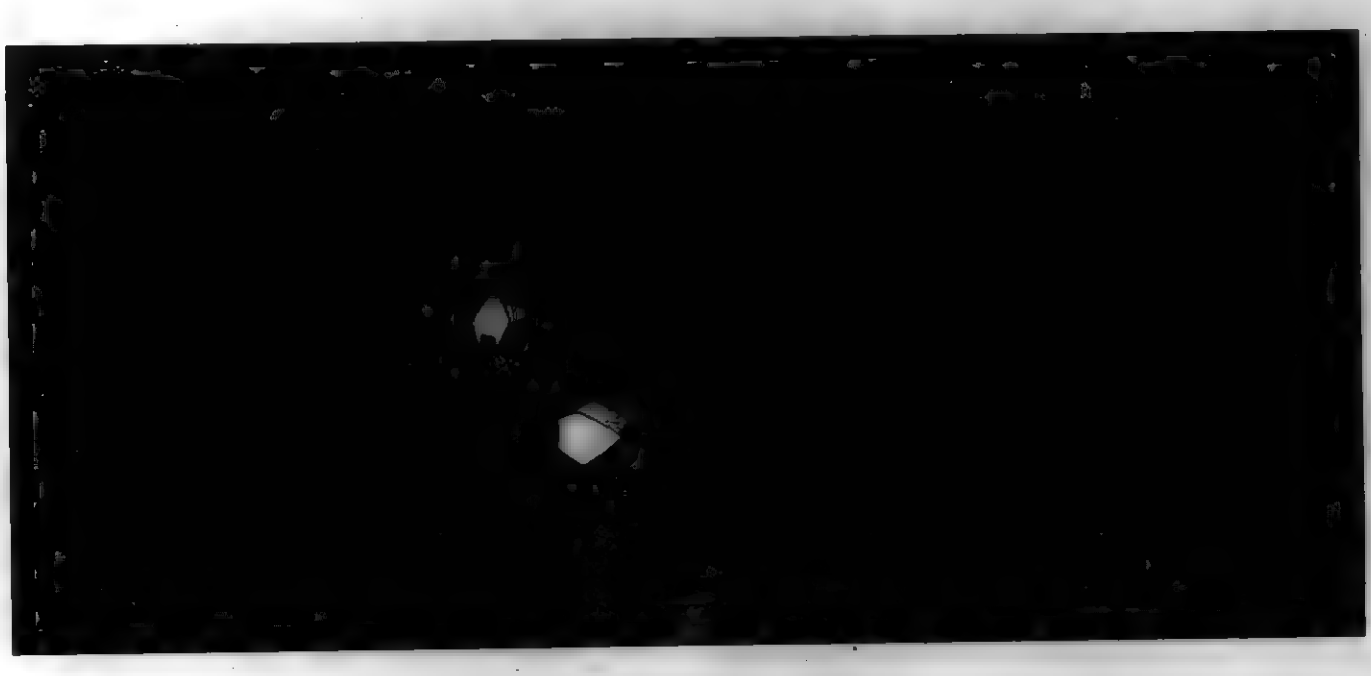

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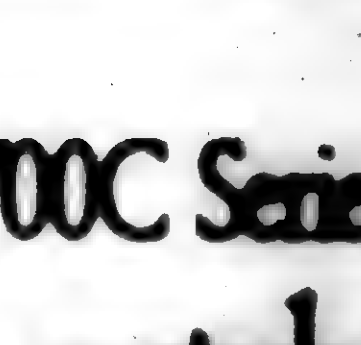

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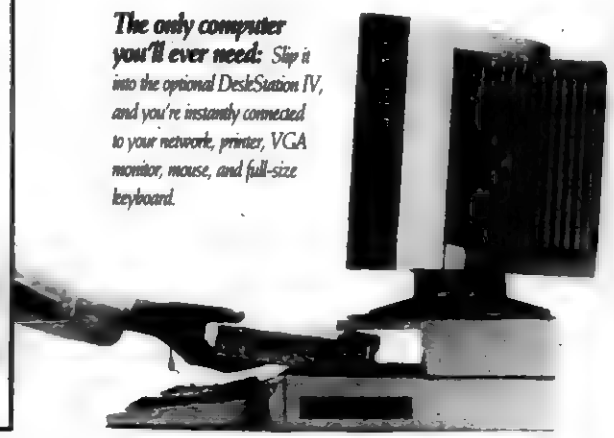

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IBM humanizes PCs

CONTINUED FROM COVER 1

a command and control component, some intelligent agent technology and a two-dimensional version of the conversational surrogate. IBM officials said they hope to see third parties offer their own agents and surrogates as well.

IBM is also close to finished with a PowerPC Reference Platform (PREP), a 184-page document used for developing a PowerPC clone. PowerPC partner Motorola, Inc. is helping to create PREP, though partner Apple Computer, Inc. is not. IBM also plans to sell PowerPC components and will even sell full systems to vendors wishing to remarket them.

PREP was designed to make PowerPC systems as widely available as possible and to encourage software makers to build applications for the processor, said Richard A. Guardino, Power Personal Systems Division general manager.

"We want to seed another PC-compatible market," he said. IBM officials said that by opening the reference designs, IBM hopes to immediately create a stable PowerPC clone market, unlike the two to three years it took for the clone market to stabilize around the IBM PC AT.

While saying that IBM could foster a new standard without Apple's clear support, Guardino conceded that "if they come with us, it'll help us."

Apple officials refused to comment on their plans for the PREP design, but observers said the company is engaged in a "gut-wrenching" process of ending its days as a proprietary vendor, which is expected to include supporting PREP. As part of this, Apple will make the Macintosh operating system generally available to PowerPC vendors next year, according to sources close to Apple (see story at bottom).

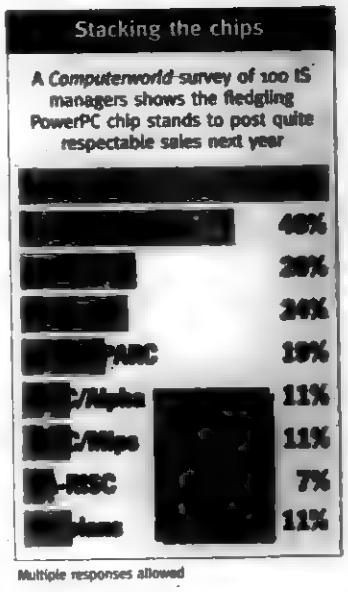
Meanwhile, Microsoft Corp. and Motorola officially announced last week that Windows NT will be ported to PowerPC [CW, Nov. 1]. This week, Sun Microsystems, Inc.'s SunSoft unit will announce a PowerPC port for Solaris. With AIX, WorkPlace OS, Taligent, Inc. and OS/2 either running on or planned for PowerPC, the chip is building broad operating system support.

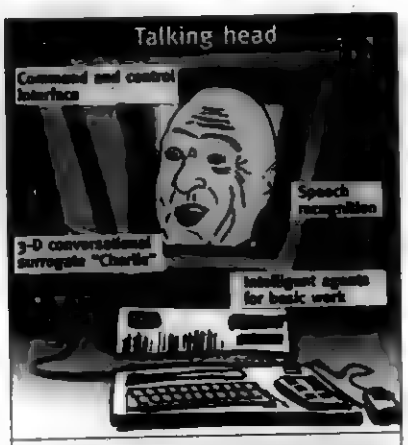
The moves should give PowerPC significant momentum, observers said.

Down the road, PowerPC systems will blend computing and telephony technologies, IBM officials said (see chart below). The gee-whiz aspect of the interface, which uses intelligent agents to convert verbal commands to machine languages, leaves users skeptical, though some said they are open to the possibilities.

"We'll have to wait and see," said Justin Alexander, manager of advanced technology at SmithKline Beecham, Inc. in Philadelphia. "My previous experience with voice-activated systems suggests it won't work."

John Woods, a PC systems specialist at Chevron Information Technology Co. in San Ramon, Calif., said, "We'll test PowerPC systems next year. I think voice recognition is neat and . . . I think it could help Chevron. If you can make the user interface as user-friendly as possible — a lot easier to drive than VCR or phone mail — it could allow the professional worker to spend more time thinking and less time doing the mundane tasks."





Once telephones are built into PCs, IBM's intelligent agent technology will enable users to ask Charlie to find a phone number. It will automatically search the database, find the number and make the call.

IBM leads the pack

While the PowerPC will be built around standard PC components such as the Peripheral Component Interconnect, XT/AT bus and PCMCIA buses, its human-like features are driven by the floating-point properties inherent in RISC processors such as the PowerPC.

IBM's prowess and patience in human factors research — the company's voice-recognition project began 22 years ago — has it ahead of most competitors in the hardware realm. Apple is also developing intelligent agent technology, and Compaq Computer Corp. sells limited voice recognition on its DeskPro/I, but most vendors have nowhere near the skill of IBM in this realm.

"IBM is carving a market before competitors are even acknowledging its existence," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H.

—Michael Fitzgerald

All for one and one for all

The PC for the rest of us is about to become the PC for all of us.

Fiercely proprietary Apple Computer, Inc. is readying plans to license its operating system concurrent with the release of its first PowerPC-based PCs, due out in the first quarter of next year, according to sources close to the company.

Apple's System 7 operating system is expected to be renamed and marketed broadly for other processors and other versions of the PowerPC, said sources familiar with the company's plans. System 7 should run on Apple's PowerPC-based systems when those machines arrive in March.

Systems built thereafter are expected to use the PowerPC Reference Platform (PREP), a hardware design specification that is an attempt to make PowerPC a widely available and open standard (see story above).

Apple engineers have also been working since this spring on a modified version of System 7 that would run on DOS-based machines using Intel Corp.'s 1486 processor.

Apple, meanwhile, is expected to use Comdex/Fall '93 to introduce its Houdini technology, an Intel 1486-based board that can be popped into a Macintosh and can then run Windows. Houdini will work on most high-end Macintoshes and could cost as much as $800, sources said.

Sources said Apple's move is also driven by the Plug-and-Play effort led by Microsoft and Intel. That initiative aims to take away a key Macintosh advantage over the PC: its close integration of hardware and software.

An Apple spokesman declined comment, but insiders said company executives recently came to the conclusion that they must open up. "Deep in their hearts, they know they have to do it," one source said.

Compaq Computer Corp., NEC Corp., Sharp Corp. and Toshiba America Information Systems, Inc. are reportedly talking with Apple about making Macintosh compatibles targeted at niche markets that do not directly compete with Apple's current business, according to sources.

—James Daly and Michael Fitzgerald

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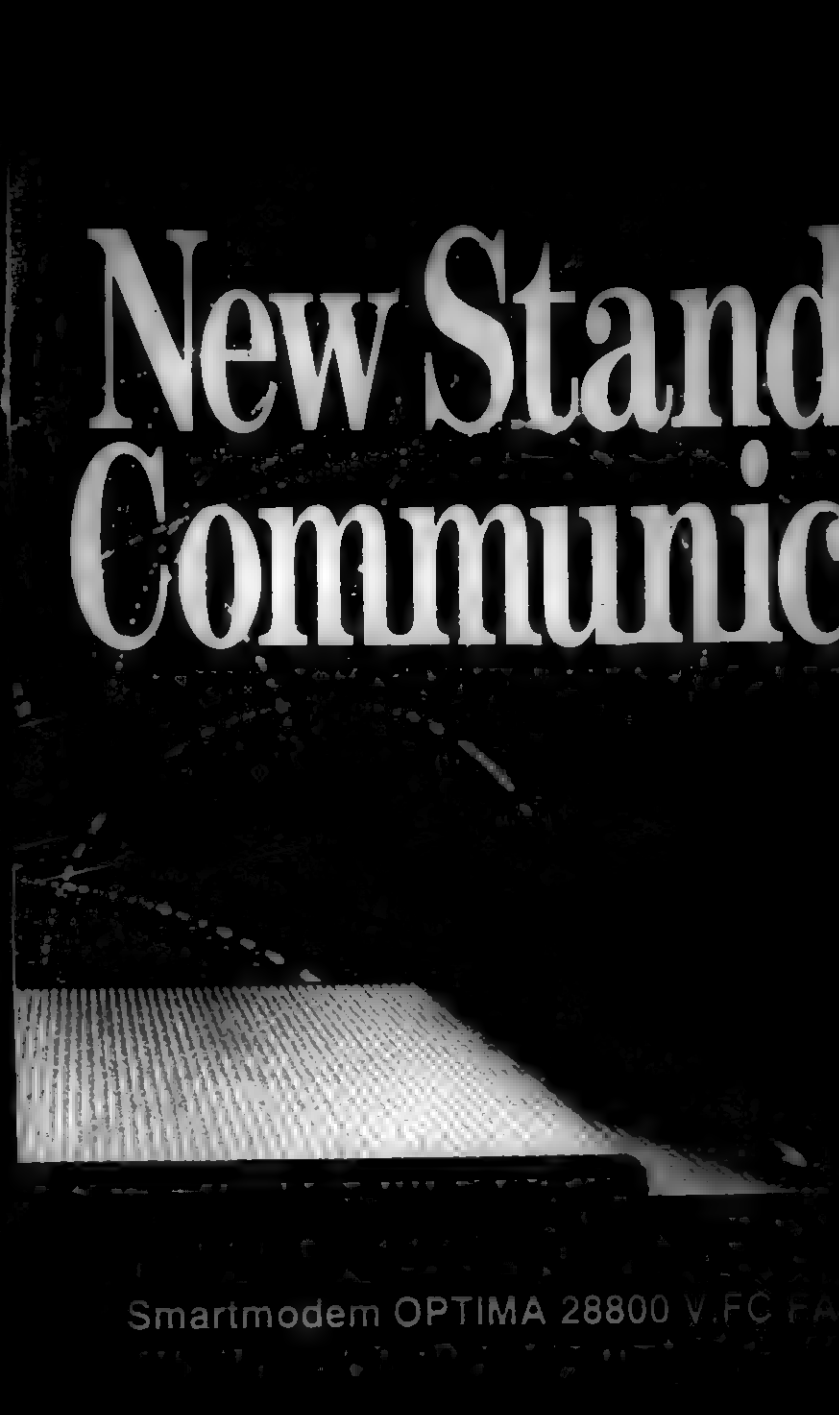

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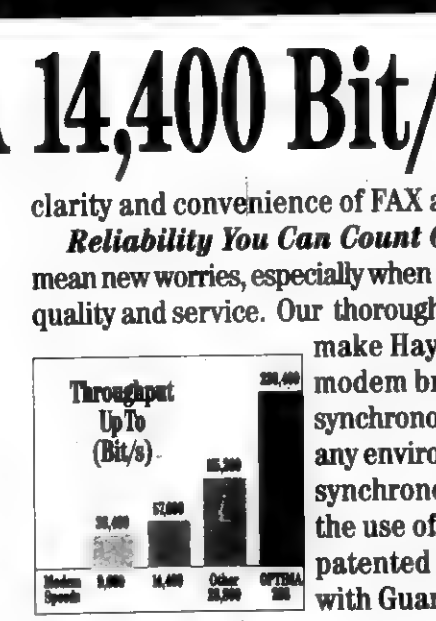

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Comdex '93

Desert braces for desktop fest

Product avalanche will highlight development, processor trends with an emphasis on integration

By CW Staff

If show sponsor estimates of 170,000 attendees is on target, this week's 15th Annual Comdex may be the biggest yet. But with few major announcements on tap, most users will satisfy themselves with technology demonstrations and discussions, which will primarily emphasize some aspect of system or software integration, mobile computing, multimedia or application development.

Attendees with connections might find their way into behind-the-scenes briefings on forthcoming technologies such as Microsoft's Electronic Messaging Server, Hermes, Chicago and Cairo or Intel's 486DX3 machines.

Also expected to predominate at the Las Vegas confab are applications supporting OLE, a raft of 486 clones and laptops, Cellular Digital Packet Data wireless technology, multiprocessor machines and network management announcements focusing on Windows NT and Hermes.

Comdex will also feature the Las Vegas OS/2 User Group; the Video Electronics Standards Association ("Demystifying 3-D Technology"); the Association of Personal Computer User Groups, which among other things will present the 1993 Data Preservation Awards; and the fifth annual Micrografx Chili cookoff.

Chris Sinclair

The Las Vegas Convention Center, *one of the sites of Comdex/Fall '93*

The chili cookoff, Tuesday night at the Thomas & Mack Center, is in its third year raising money for the National Center for Missing and Exploited Children. Tickets are $50 for a Texas hoedown that attracted 9,000 last year.

"Sponsors expect 170,000 attendees — the largest crowd ever."

The sprawling desktop technology conference will feature 2,200 vendors spread out over two convention centers and two hotels — Bally's and the Hilton — in a city where cabs are at a premium. Show highlights include a Monday morning keynote at The Aladdin Hotel by Apple's Michael Spindler; 90 seminars spread out over five tracks, including Corporate Solutions; and three vendor CEO perspectives.

Comdex has traditionally formed a stage for operating system fireworks between market leaders Microsoft and IBM. This year's joust should be fairly low-key as both vendors concentrate on demonstrating products designed to boost growing sales momentum for OS/2 and NT (see stories pages 1 and 29).

Microsoft will next week demonstrate a range of third-party tools at Comdex and together with Intersolv will announce the upcoming gateway between Visual Basic and Intersolv's PVCS version control software, industry sources said.

IBM will announce Ultimedia Video IN/2, OS/2 Version 2.1 software that enables users to capture, store, manipulate and play video clips taken off a camcorder, VCR or laserdisc player, according to a preliminary IBM release.

PC hardware strategies

Users adjust to market dynamics

By Michael Fitzgerald

■ The PC hardware sector is just now moving back to technology basics after a year in which usability issues such as backlogs, faster product life cycles and ownership costs dominated the market, development efforts and purchasing strategies.

While technology did not exactly stagnate — note the advent of Intel Corp.'s Pentium processor, personal digital assistants and increased system integration — much of this year's news has centered on major vendors expanding their brand strategies, aggressively pursuing new channels and, for the first time in the 1990s, re-establishing market position at the expense of the clone makers.

Ferocious market battles have led to compacted product life cycles as short as six months, which in turn have meant big headaches for users deciding whether to buy or wait.

Steven Ades, director of information systems at States Nitewear, Inc. in New Bedford, Mass., said "It's hard to figure out where to jump in anymore because you might miss something [technology-wise]."

Brian Ritberger, network engineer at the *Sacramento Bee*'s publishing systems department, pointed out that six-month product life cycles have outstripped the newspaper's depreciation cycles, slowing its ability to deploy new technology.

Customer complaint

Customers have complained that products are becoming obsolete almost before they can be approved for purchase. In response, IBM PC Co. and Compaq Computer Corp. have moved their respective PS/2 and DeskPro/M lines into a more sedentary life cycle. Both companies explained that large corporations want to roll out major, year-long projects with the same hardware from start to finish.

Vendors have also started to give more advance notice about future product plans, some users say, which allows for more effective planning.

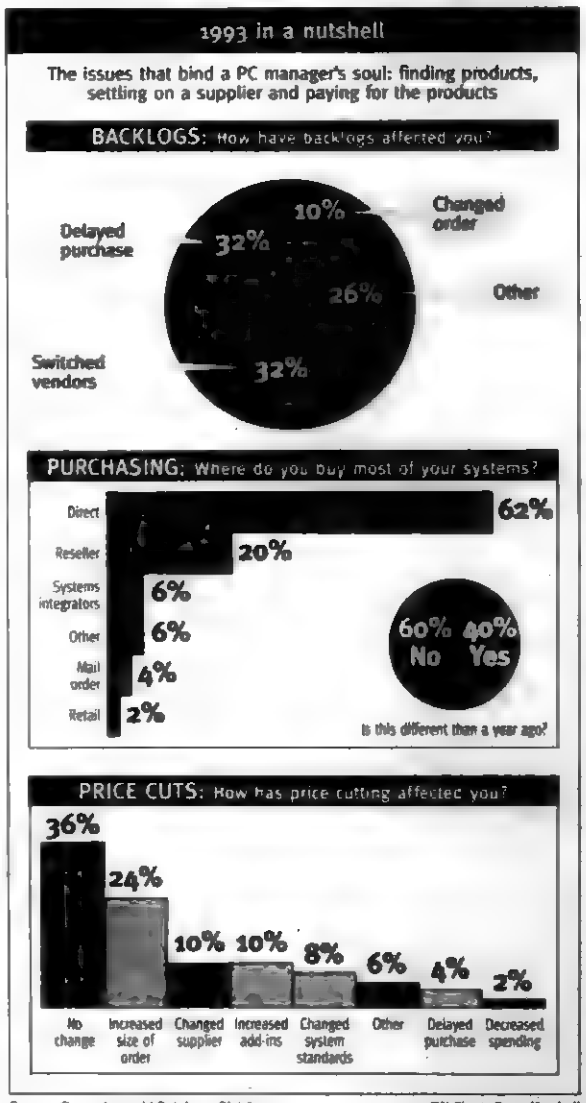
The re-emergence of IBM, Compaq and Toshiba America Information Systems, Inc. as aggressive competitors has also made many corporate buying processes shorter. Users say they have turned away from testing large numbers of vendors in every buying cycle and are instead going with a short list of well-established companies that look sure to survive.

Despite the price wars' rattle and hum, a recent *Computerworld* Database Division survey showed that only 10% of companies switched vendors because of pricing in 1993. Backlogs, however, caused some 32% to change vendors, though many users who shifted sales from a top-tier supplier said they planned to go back to that vendor when it could deliver products.

The price wars, meanwhile, have subsided into skirmishes this year. The more than 50% drops seen in 1992 have settled into a more normal 15% to 20% range. "It would've been nice to see the price wars continue," Ritberger sighed.

1992's high-end system was a 33-MHz 486DX with 4M bytes of RAM and a 120M-byte hard drive for $3,189. A mainstream system in 1993 offers a 33/66-MHz 486DX2 with 8M bytes of RAM, a 200M-byte hard disk and a local-bus or graphics accelerator for $2,800.

Continued on page 29



Source: *Computerworld* Database Division

CW Chart: Dave Marshall

Windows, wireless, portables set pace

System software

By Ed Scannell

IBM will bring more ammunition to its annual desert shoot-out with **Microsoft Corp.** when it shows today, for the first time, OS/2 for Windows. The Windowless version of OS/2 2.1 frees IBM from paying royalty fees to Microsoft.

Also known as "Ferengi," the product lets Windows 3.1 users simply layer it on top of their systems without changing any of their hardware or software configurations [CW, Sept. 13].

Look for Microsoft to claim that OS/2 for Windows is not fully compatible with Windows for Workgroups and therefore remains a moving target for IBM's claim of providing "a better Windows than Windows."

Microsoft will counterpunch with one of its first public demonstrations of Windows for Workgroups 3.11. At the formal unveiling last week, Microsoft said several large OEMs would bundle Version 3.11 in place of its best-selling Windows 3.1 [CW, Oct. 4]. But most of Microsoft's time will be spent hawking Windows NT.

At today's press briefing, Microsoft will provide an update on the "first 100 days of NT distribution."

Showgoers curious about 32-bit operating systems will find the show floor littered with the following:

▶ Almost 180 software developers will show Windows NT applications and tools alongside value-added resellers and OEMs that take some advantage of the 32-bit operating system.

▶ A "Scalability Wall" in the Microsoft booth will show the company's Windows family of products that can run on the lightest weight portables all the way to a 30-processor minicomputer from Sequent Computer Systems, Inc.

▶ Also in the Microsoft booth, a **Digital Equipment Corp.** co-hosted demonstration will show Windows NT running programs from 40 software developers and working on clients and servers.

▶ **IBM** will sponsor an OS/2 vs. Windows NT shoot-out at a Wednesday morning breakfast.

Communications

By Lynda Radosevich

Users trying to weave together and manage stationary and portable devices with wired and wireless networks will find some answers at Comdex/Fall '93. Contributing to the wireless buzz are the following:

▶ Eleven telecommunications firms will gather in the **GTE** booth to demonstrate soon-to-be-delivered equipment using wireless Cellular Digital Packet Data technology. The vendors include **AT&T, Motorola, Inc., IBM** and **Advantis.**

▶ **Xircom, Inc.** has rounded up executives from **IBM, Microsoft Corp., Compaq Computer Corp.** and **SystemSoft** for a Tuesday morning discussion of issues facing PCMCIA-equipped portable users at the Las Vegas Country Club; there will be demos.

▶ San Antonio-based modem maker **Data Race** will introduce wireless PCMCIA adapters, software and repeaters said to let users roam the office and connect to Ethernet LANs to transfer and synchronize files between their laptop and desktop PCs without floppy disks or cables. Separately, **Ardis** will show a 19.2K bit/sec. network in its booth and others.

▶ **Intel Corp.** will demonstrate its mobile products, including wireless modems used to let Intel-based PCs send and receive messages via **Lotus Development Corp.**'s CC:Mail, **Microsoft**'s Mail and **AT&T**'s Easylink over **RAM Mobile Data** networks.

▶ Sources said **RadioMail Corp.** will unveil its wireless electronic-mail service for **IBM** ThinkPad users.

▶ **Digital Equipment Corp.** and **IBM** will announce NetView/6000 network management applications for managing Microsoft's Windows NT using the latter's Hermes Windows applications manager.

▶ **Dolphin Software Systems, Inc.** in Montreal will introduce a suite of software tools said to manage PC networks from a central host.

Hardware

By Michael Fitzgerald

The PC desktop hubbub rising from the Las Vegas desert this week will center around finally available **Intel Corp.** 60-MHz Pentium systems and Peripheral Component Interconnect (PCI) buses, subnotebooks and PCMCIA cards. Adding their two cents will be RISC chip makers announcing new PC customers.

▶ **Pentium.** While Intel continues its struggle to produce its 66-MHz Pentium chip, 60-MHz Pentiums are widely available. **IBM PC Co., Compaq Computer Corp.** and **Dell Computer Corp.** now have the chip in volume and are readying systems. Dell, for example, will unwrap the Pentium-based Dimension V XPS along with a Pentium version of its OptiPlex desktop line [CW, Oct. 18]. Pentium systems still appear to be priced 50% above the Intel 1486.

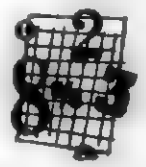
▶ **PCI.** Many of the new Pentium systems will appear with Intel's PCI high-speed bus. **IBM**'s **Ambra Computer Corp.** subsidiary will introduce its first PCI system, the DP60 PCI, priced at $2,799. Look for other PCI introductions from **IBM PC Co.** and **AST Research, Inc.,** among others.

▶ **Subnotebooks. Olivetti Group** will add Analog Devices, Inc.'s digital signal processor to its Quaderno subnotebook today. Numerous vendors announced subnotebooks last week. They will be on display for the first time at Comdex/Fall '93, where the Taiwanese cloners are also expected to be out in force. Look for new subnotebooks from **Toshiba America Information Systems, Inc.** and **Hewlett-Packard Co.**'s OmniBook 425 to lead the way. **Epson America, Inc.** will also show three models of its ActionNote 700, a full-size notebook that weighs in at a subnotebook-like 4.4 to 4.9 pounds.

▶ **PCMCIA.** PC cards that map to the PCMCIA standard will blanket the show floor. Announcements will include **Apex Data, Inc.**'s Ethernet adapter and **MagicRam**'s SCSI adapter. Epson America will also introduce memory cards.

Applications

By Michael Vizard



Comdex/Fall '93 attendees will find software vendors serving up a raft of multimedia applications, help desk management and Object Linking and Embedding (OLE)-compliant intentions.

Besides the usual flock of OS/2 and Windows applications demonstrations near the **IBM** and **Microsoft Corp.** booths, the following will be on tap:

▶ **Lotus Development Corp.** is looking to take multimedia applications mainstream with the release of a multimedia edition of its 1-2-3 spreadsheet for Windows. The product features a SmartHelp facility that provides an animated guide through 1-2-3 and an audible proofreader. Also featured is a ScreenCam utility that captures screen activity, cursor movements and sound into a file that can be shared. Pricing for the multimedia edition of 1-2-3 is $495.

▶ **SPSS, Inc.** in Chicago will show one of the first application development tools that supports OLE 2.0. Priced at $495, the kit was designed to make it easier to integrate applications with SPSS' statistical analysis software, which will support OLE 2.0 in a forthcoming release.

▶ The only available non-Microsoft application that complies with the OLE 2.0 specification is the Visio charting and drawing tool from **ShapeWare Corp.** in Bellevue, Wash. It will be on display with more than 30 forthcoming OLE 2.0 third-party applications in the Microsoft booth.

▶ **Magic Solutions, Inc.** in Mahwah, N.J., will preview an innovative help desk package for Windows that features statistical information-retrieval tools that can identify calls stored in a database that have similar problems.

▶ Also on display will be a database from **Micro-Frame, Inc.** in Ontario, Calif., for users of Microsoft Project management software. The idea is to bring workgroup computing to project management using a centralized database.

Users may not be thrilled by the demise of price wars, but one benefit has been fewer backlogs. The price wars caused huge backlogs that some vendors never fully caught up with, creating ironies such as the PC Co. introducing its third-generation notebooks before some users and resellers had seen the first generation.

Money tends to buy more now, though, than it did a year ago. The 486SX is now the base processor for all systems, save handhelds. Although this will be status quo through 1995, Intel's luxurious reign alone atop the 486 world should end, as competitors such as Advanced Micro Devices, Inc. and Cyrix Corp. expand capacity next year.

One change in 1993: Vendors now at least pay lip service to the notion of developing technology in order to meet customer needs, rather than for the sake of technology.

The year's major technology trend — local-bus graphics — has helped make graphical user interfaces easier to deal with.

While 1993 saw the Video Electronics Standards Association's VL-local bus supersede proprietary approaches, users are curious to see how pervasive Peripheral Component Interconnect (PCI) will become, both in boxes and add-ins.

By this time next year, PCI should be ensconced as a new standard. Several other technology efforts may well follow suit, including the following:

- "Green" PCs; environmental designs will be a focus for 1994.
- Further integration of features onto the motherboard [CW Nov. 8].
- Pervasive use of CD-ROM drives in desktops.

How can computers ever that does the computi

Chances are, you don't care about which microprocessor is inside your computer. And why should you?

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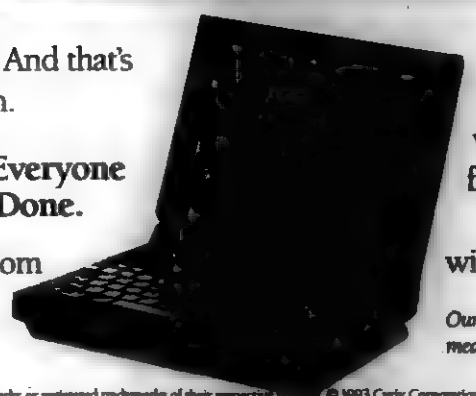

Our low-power 486SLC chips mean longer-running laptops.

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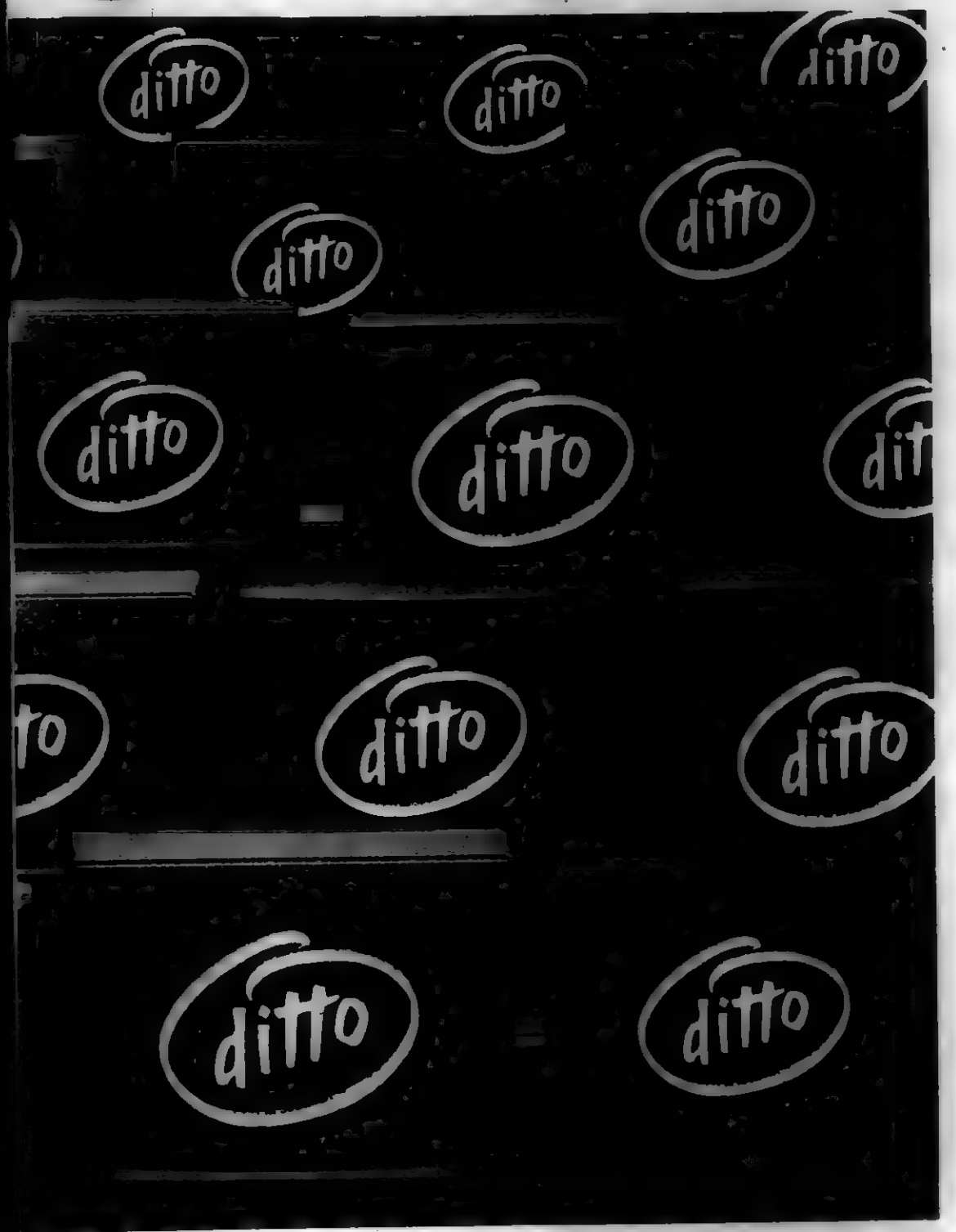
get any better if the part ng is always the same?



You see, rather than copying existing microprocessors, and producing more chips with the same architectural limitations, we took a more innovative approach. We started by looking at your software, and figuring out what it would take to make it run faster, and more efficiently.

And since software is the reason for having a computer in the first place, that approach seems to make sense.

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And some of our most popular products are being second-sourced by Texas Instruments.

So you can plan on seeing a lot more chips that are a lot smarter than what you're used to.

And that, ladies and gentlemen, is the benefit of having a choice.

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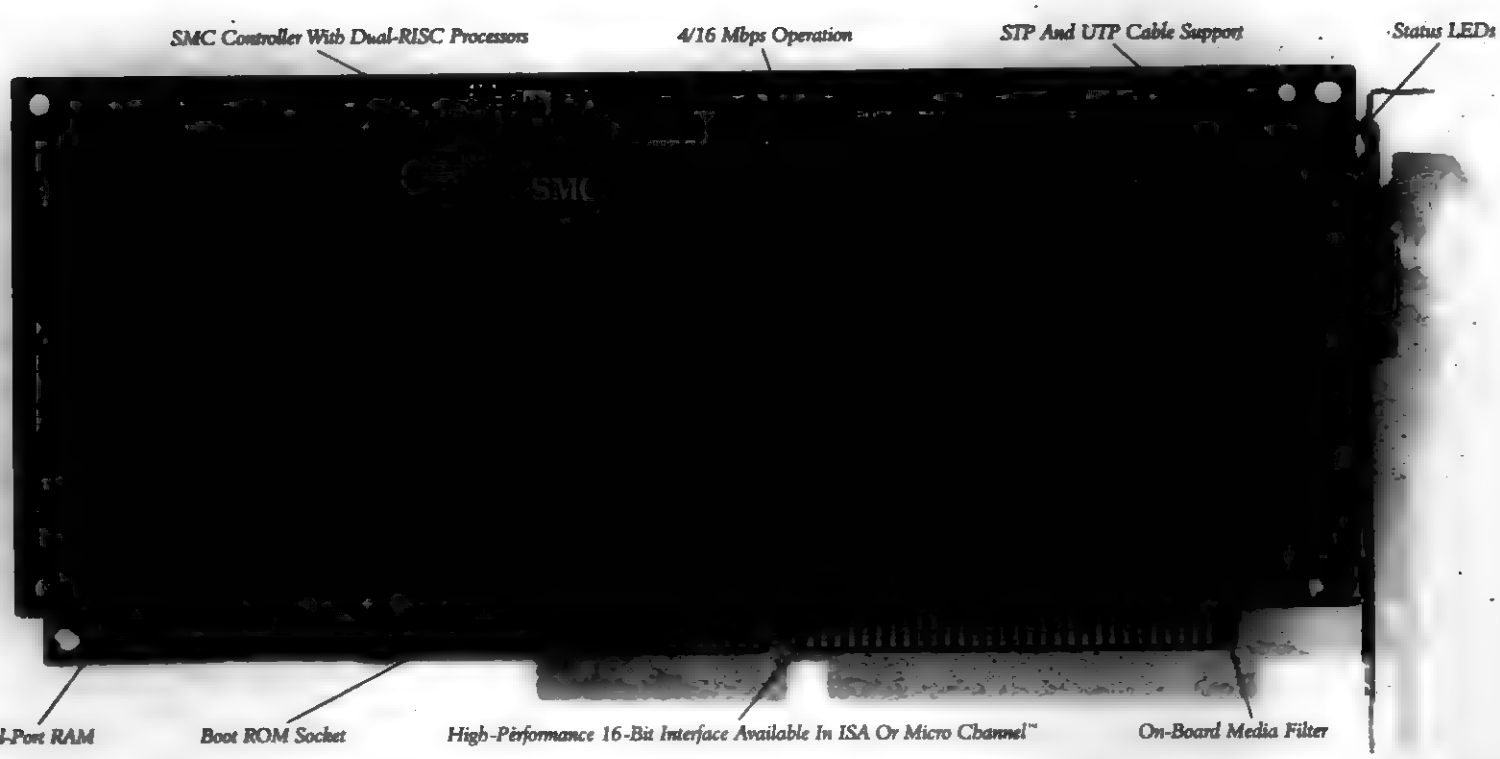
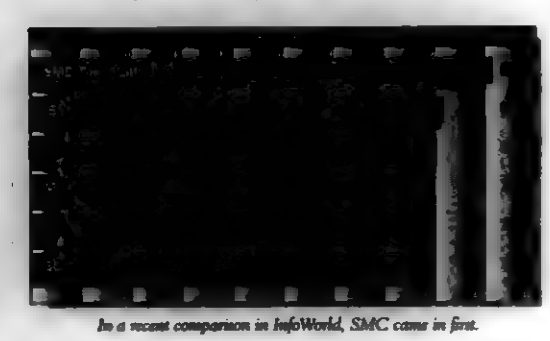


There's a new leader in Token-Ring Technology.

In June 1993, InfoWorld tested the top Token-Ring adapters for speed and flexibility. Guess who came out on top?

Not IBM, Madge or Olicom. But SMC. The review stated: "Not only did the



In a recent comparison in InfoWorld, SMC came in first.

SMC TokenCard Elite™ offer overall excellence (with excellent or very good scores in every category), it stood out for being among the easiest to install."

The SMC TokenCard Elite is 100% interoperable within IBM environments. It's also fully compatible with both IBM and IEEE 802.5 Token-Ring standards, fully software configurable, and backed by a lifetime warranty. You get lots of extras, too. Like free SNMP management.

But the story doesn't end there. SMC is not only the technology leader but also the low price leader.

In fact, with an incredible new price of $249 in a 50-pack, and only $299 for a single card, the SMC TokenCard Elite is priced far lower than any other Token-Ring adapter.

With SMC Token-Ring products priced 50% lower than typical solutions, that can translate into a savings of over $35,000 per 100-node installation. Without your having to sacrifice quality, reliability or peace of mind.

EZStart: The ultimate installation and diagnostic tool.

EZStart™, SMC's new Windows-like auto-configuration and test utility, makes installation and troubleshooting a snap.

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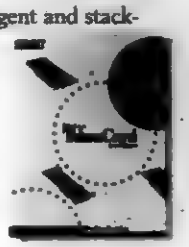
So before you make another Token-Ring purchase, talk to SMC. In addition to the world's best adapters, we offer a full line of intelligent and stackable MAUs and hub cards that deliver the lowest cost per managed port in the industry.

SMC also has the industry's first switching hub that supports Token-Ring and the first HMI-compliant Token-Ring hub card.



For information on a free 30-day evaluation kit, call 1-800-SMC-4-YOU.

Contact us today and find out why, if you're not using SMC in your Token-Ring network, you're settling for second best. And paying for it.

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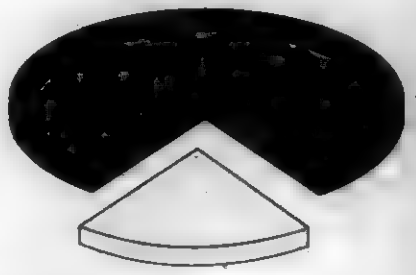

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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
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13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
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❑ Netware (b) ❑ Windows NT (f)
❑ OS/2 (c) ❑ DOS Windows (g)
❑ Unix (d)
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❑ CASE (h)
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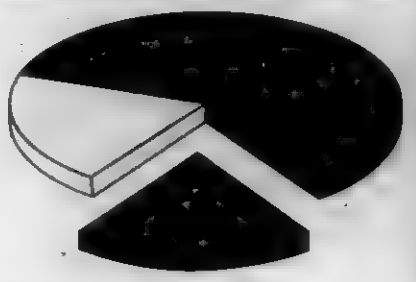

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70. Mining/Construction/Petroleum/Refining/Agric.
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23. Dir./Mgr. Sys. Development, Sys. Architecture
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Digital's Alpha battles steep incline

Windows NT, OSF/1 emphasis has not paid quick dividends

By Craig Stedman

■ One year into their rollout, Digital Equipment Corp.'s Alpha AXP systems are firmly implanted in VAX/VMS users' consciousness. Questions, however, remain about Digital's ability to market what analysts have called make-or-break technology outside the company's traditional customer base.

Alpha's success hinges on its DEC OSF/1 operating system now and Microsoft Corp.'s Windows NT on a longer-term basis. Both Alpha thrusts face significant roadblocks, such as a lack of multiprocessing support for the former and an ever-changing positioning of the latter. And while some longtime VAX customers are becoming more open to switching platforms, they tend to buy from other vendors with better Unix track records, such as Hewlett-Packard Co., IBM and Sun Microsystems, Inc.

Digital's Robert Palmer *is 'encouraged' by sales growth so far*

"Unless DEC really comes up with convincing evidence that Alpha will outperform HP or a high-end Sun server, there won't be any reason to go with Alpha," said Mike Thompson, information systems manager at Integrated Device Technology, Inc., a semiconductor vendor in Santa Clara, Calif.

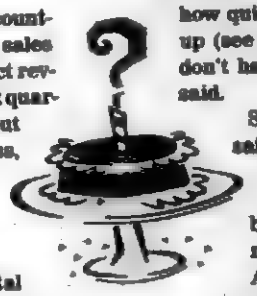
Preparing for mix

J. R. Simplot Co., a food processor in Boise, Idaho, is "overwhelmingly" a VAX shop now and just bought a pair of low-end Alpha servers, said Raymond Sasso, its chief information officer. But he added that he is "certainly preparing for more of a mixed environment than we've had in the past."

Purchasing decisions will depend largely on application availability, Sasso and Thompson noted. "Whatever we can do on Alpha, we'll do," Sasso said. "But some of our software vendors will go in their own directions, and we'll have to accommodate them."

Roughly 3,000 applications are available for Alpha, including 1,500 for DEC OSF/1. The balance runs on Open VMS, a Posix-compliant derivative of VMS that also runs on Alpha.

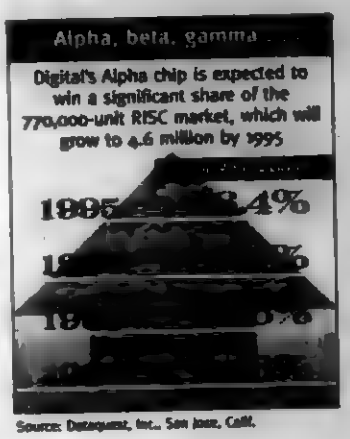
Alpha machines accounted for 20% of system sales and 10% of total product revenue in the most recent quarter, amounting to about $150 million in business, according to Digital. These figures are in line with expectations, analysts said.



Technically, Digital has been getting good marks since it introduced the first Alpha systems last November. Alpha's price/performance remains strong compared with other RISC-based architectures, VAX code reportedly was ported to the new machines with relative ease, and the company for the most part is meeting or exceeding its plans for making layered software available, such as its clustering technologies and Rdb database, analysts said.

"Slow, steady progress is never very exciting, but they're consistently hitting doubles and triples," said Chris Christiansen, worldwide commercial systems research director at International Data Corp. (IDC) in Framingham, Mass., of Alpha's progress. "They never said they were going to hit home runs early on."

Most analysts said they do not expect heavy Alpha demand to materialize until the second half of 1994. Digital Chief Executive Officer Robert Palmer said he is "encouraged" by the sales growth so far, but he agreed that it will likely be mid-1994 before he can judge how quickly Alpha will ramp up (see chart). "Today I just don't have enough data," he said.



Source: Dataquest, Inc., San Jose, Calif.

Some users, however, said the technology has evolved enough to make Alpha a viable choice for their next purchases. Most Alpha-based systems are finding homes as replacements for VAXs, analysts said.

Ralph Dunlap, senior manager of information resources for sales and manufacturing systems at Georgia-Pacific Corp. in Atlanta, said his company's strategy is oriented toward Alpha "at least as an interim solution for implementing NT" at the server level.

The Lutheran Church-Missouri Synod, in Kirkwood, Mo., plans to start migrating from VAX to Alpha running Open VMS next June when it needs more machines, said Steve DeLorey, director of applications and technical support.

Meanwhile, Digital is still tinkering with its derivative of Unix, OSF/1, to make it more attractive to users outside its base. OSF/1, however, still lacks key functionality such as multiprocessing, which is not scheduled for general availability until next July. "It's going to be another six months or so before Digital can legitimately pitch OSF/1 as a commercial product," said Terry Shannon, an independent consultant in Ashland, Mass.

Long way to go with Unix

Moreover, Digital is starting from almost ground zero in the commercial Unix market.

"When it's time for people to go buy a Unix server, they just don't think about Digital," said Lynn Berg, a program director at Gartner Group, Inc., a consulting firm in Stamford, Conn. "Having a bad image isn't as hard to overcome as not being on the radar screen."

Nor is NT necessarily the answer to Digital's Alpha prayers. It, too, brings more uncertainties. Digital is counting on NT support to lure PC vendors to support the Alpha chip set. However, it has been unable thus far to sign on any major PC manufacturers other than ing. C. Olivetti & Co., in which Digital holds a minority investment.

One thing that could be making PC makers reticent is that Windows 4.0 will dominate the desktop for the next few years. Windows 4.0 — code-named Chicago — is 32 bit and due out for the Intel Corp. architecture in late 1994. NT is seen primarily as a lower-volume server operating system, analysts have said.

"Chicago is the next step on the desktop, and the big numbers are going in that direction," said Richard Zwetchkenbaum, a PC analyst at IDC. "NT is going to be pretty small potatoes with mainstream corporate customers."

Backing away from NT

Bud Enright, vice president of product marketing at Digital, acknowledged that there are "disconcerting aspects" to Microsoft's intentions regarding NT and Chicago. Digital has even backed off its ambitious NT plans while the operating system is put through the early paces (CW, Nov. 1). "There are many unanswered questions, but I believe Windows NT will be a true juggernaut within two to three years," Enright said.

At a press briefing following Digital's annual meeting this month, Palmer said NT "is really for a very high-performance desktop at this point, so we don't expect any giant volumes in the near term."

There is hope that NT will become more of a factor "as memory prices come down" and make Microsoft's 16M-byte minimum recommended memory for the system less onerous, Palmer added. "I would prefer that it's quite successful . . . but I'm feeling under no real anxiety about it," he said.

Uncertain future

At Digital's recent annual meeting, CEO Robert Palmer said it is "hard to forecast" when the company will start growing its revenue again. "How fast VAX business might decline vs. how Alpha business might come up is unpredictable," he said. Palmer added that Digital is being hurt by its lack of a strong presence in indirect channels. "We need much more coverage out there to move off our existing base," he said.

Boosting volume

Signing up PC manufacturers is a move projected to help boost Digital's annual semiconductor volume from about 2 million devices to the 5 million that company executives say will be needed to fund operations at a new chip plant scheduled to start operation in Hudson, Mass., in 1996.

Setting priorities

Even though CEO Robert Palmer has made addressing Digital's well-publicized marketing and sales deficiencies a priority, the company is still losing orders "that should have been open-and-shut wins," according to Gartner Group analyst Wee Meiling.

The company has been tinkering with its marketing operations in an attempt to set its house in order. Most recently, product marketing was broken away from Digital's engineering units and aligned more closely with its worldwide sales and marketing organization.

Bud Enright, who joined Digital in August as vice president of its Alpha AXP program office, is now in charge of all product marketing. Also getting an expanded role is Jeane Lipcon, formerly head of Digital's Windows NT program office. He is now vice president of systems marketing under Enright.

Enright acknowledged that Digital needs to build up its "marketing delivery mechanisms and processes." Despite a major sales force training program, though, he offered no promises of fast improvement. "It's not an on-off situation," he said. "It's going to be incremental improvement."

—*Craig Stedman*

Even now, Chicago's scofflaws recall the sport warmly. ◆ You took a parking ticket. Folded it. Crumpled it. Then, simply booted it away. ◆ Thirteen thousand parking tickets written each day. Maybe, on a charitable day,

How A New Type Of Computer Put A Stop To One Of Chicago's Favorite SPORTS.

10 percent paid. ◆ But if you're thinking of playing that game these days, officials have one word of advice: Don't. ◆ Sun™ computers have been installed. And they are very, very effective. ◆ Claim the meter was broken, and a Hearing Officer will check a "meter database" on a Sun computer. Protest the ticket isn't yours, and a scanned image of the original is pulled from a database. Yell that you're in a hurry, and all these

jobs can be done at once, because Sun computers can do more than one job at once. ◆ "With document imaging based on Sun hardware, we save citizens time, and the city money," Judith Rice, Chicago's revenue director, proudly says. ◆ There's more to this story, of course — revenue increases of 400 percent, limiting property taxes — but it looks like our time is up. ◆ And you know what that means. ◆ Sun computers. Just the ticket, it seems, for the City of Chicago. ○ More than 135,000 organizations are using Sun systems, powered by the SPARC® chip and the Solaris® operating environment, to gain a competitive edge. The City of Chicago is just one. To learn how you can benefit, call 1-800-426-5321, ext. 605.

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It tolls for thee

Why do CIOs continue to get fired as often as they do?

What many believed was a temporary aberration a few years ago, with 25% or more turnover in the CIO ranks, has continued unabated. Many of the mighty have fallen, and there is little reason to believe things will change soon.

Last month, an Andersen Consulting survey of 800 senior, non-IS executives discovered a group largely disenchanted with the returns on technology investments. In fact, eight out of 10 respondents ranked the returns minimal to average.

The cover story in the most recent issue of Forbes' *ASAP* magazine depicted lemming-like CIOs walking the plank into the abyss of unemployment, questioning whether it is "Ciao for CIOs?" Four years ago, a *BusinessWeek* article posited whether CIO stood for "career is over." So the beat, or the beating as the case may be, has gone on for several years and does in fact continue.

Why? Certainly the contribution of IS is no less important to the corporation than it used to be. Our own independent, biennial survey of non-IS executives indicates that if anything, IS is growing in importance and is generally deemed extremely critical to the success of the organization.

I'll offer one reason for this state of affairs. Not enough CIOs are in Las Vegas this week attending Comdex. Too many of them have instead dispatched their chief technologists or PC managers to the desert. Why bother taking valuable time to shuffle through crowded exhibit aisles and even more crowded conference sessions when the displays and the discussions are mostly about PCs and LANs and multimedia?

Correct. That sort of stuff is much better left to others, like chief technologists, PC managers, outsourcing companies, your successor ...

There are still far too many people at top IS posts who believe their time is too valuable to spend on technology. It's something to be left to others while the CIO continues with the transition to full-time business strategist. All the while the error of their ways becomes apparent each week as one CIO after another is bounced.

Today's CIOs spent the first 20-plus years of their careers in the IBM 370 era. It was the only technology they knew, all they had to know.

Now the entire underlying technology structure is changing. Frankly, I feel some CIOs just don't want to bother with the learning process anew. And while the name of the game today is the same as it was 25 years ago — distributed computing — that same goal is reached in a far different manner in the client/server world of microprocessor-based computing than it was back in the mainframe-centric era.

So ask not for whom the bell tolls. It's clanging so darned loud these days for so many people that no one's getting much sleep.

Bill Laberis

Bill Laberis, *Editor in chief*

Got the faith

In reference to "Damage control" [CW, Nov. 1], I don't believe it!

Finally someone inside the trade press has the courage to say what's been the rumble on the streets for some time now: The Emperor is au naturel. Microsoft has nothing to fight with except fear, uncertainty and doubt. Windows 3.1 is a lame duck product, Windows NT is outsized and questionable, and who the heck knows if Chicago is another elegant shell on top of myopic old DOS or really a 32-bit operating system?

Thank you for writing and publishing your editorial. You have restored my badly damaged faith in PC journalism. More than that, you have made me really happy I've subscribed.

Joe Barr
Austin, Texas

Plenty of work for programmers

As the president of a company that specializes in recruiting computer professionals internationally, I must speak out and defend the reasons and legitimate uses for employing international computer programmers ["Remedy or ruin?" CW, Nov. 1].

First, let's look at some facts. The Bureau of Labor Statistics says positions for computer programmers will double by the year 2000 to about 1.2 million.

Unfortunately, according to the Department of Education, fewer students are majoring in computer science. In 1982, 8.8% of students were receiving technical degrees.

Last year, a University of California study found that less than 1% of students had any interest in computer programming. Where are American companies going to get the talent they need?

In addition, the number of foreign students enrolled in our universities is on the rise. The two most popular degrees for foreign students, according to the Education Department, are business and engineering.

What are American companies going to do to satisfy their need for computer science and computer engineering graduates? While there are some companies abusing the system, you should not condemn the practice altogether. There are many of us out there who play by the rules.

As far as putting thousands of programmers out of work, take a look at any major metropolitan newspaper on any Sunday. You will find hundreds of jobs advertised for computer programmers.

David Benson
President
Global Resources
Danville, Calif.

Customer size not an issue at IBM

I strongly disagree with Johanna Ambrosio's commentary, "Blue blues" [CW, Oct. 11], that suggests that IBM is ignoring its small to medium-size mainframe customers. Every customer is important to us — small, medium-size and large — and the experience of the overwhelming majority is dramatically different than what you described in your article.

That's not to say we're flawless, so we're making changes daily to be more responsive. Our marketing activity for small to medium-size customers is aggressive and focused. It includes the following:

- A direct sales force comprised of outbound marketing representatives who are committed to delivering same-day response.
- Product specialists who are expert in a wide range of technology.
- A direct-order capability.
- Alliances with nearly 20,000 business partners and software providers.

I would invite any of your readers who have a problem to contact our Information Support Center. It will ensure that the caller is contacted immediately and that any shortcomings are rectified.

R.J. LaBant
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White Plains, N.Y.

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Client/server may be ragged, but it's not on the ropes

Marc Dodge

Even a casual reading of the computer press and industry research shows that client/server computing is on the ropes. Say it isn't true! What about all the money we have spent? Yet, we must be in trouble. Consider the facts:

Everybody has jumped on the oh-my-god-isn't-the-cost-of-distributed-computing-awful bandwagon. Gartner Group says the total five-year cost of owning a PC is $40,000. (Don't worry, that includes the mouse pad.) Forrester Research says it costs up to $3,900 per year to support each LAN user. The Business Research Group says it costs $330 per year per LAN user in support staff salary alone.

Don't be misled by all the alarming statistics and revisionist cant. Client/server is still the way we'll all have to go.

My favorite alarming statistic comes from a company that computed the annual cost of LAN downtime for U.S. companies. The money lost was slightly less than the gross national product of Central America.

This research report has been quoted shamelessly over the last four years. (I refuse to name the company because I'm petrified it will publish an update, and we will have to live with it for the millennium.)

Another perceived problem with client/server is white collar productivity. Wags say LANs and PCs have not delivered. On the other hand, some people believe the reason job growth has not recovered with the economy is that LANs and PCs improved corporate communications. With improved communications, many middle managers hit the road.

The really hot story today is the mainframe. It turns out it isn't really dead after all. Starry-eyed print jockeys are climbing over each other to bow at the feet of the former pariah.

Why the resurrection? Because database technology has not evolved to support advanced forms of client/server computing. Applications requiring large data sets and geographically distributed data still need a data center.

There is more bad news. How can we implement and support New Age computing without a way to manage it? Imagine a database split among Los Angeles, Chicago and New York. How do we update data when Chicago goes down? How will we know when it goes down? Once we know, how do we fix it from Dallas?

These are all good reasons to move cautiously, but client/server will succeed because it is an exact fit with the core business.

Getting close to the customer

Client/server will succeed because we are scrambling to get closer to our customers. We are tailoring services to individual customers. Services we used to provide in a week are expected overnight. Soon, customers will expect them the same day.

Products and services have to be faster, better and more personal. My company has introduced more services in the last 10 years than in the previous 75 years.

The only way to meet customer expectations is to put decision-making authority closer to the customer. We can't do it with the old hierarchical management organization, and we can't do it with the old hierarchical computing architecture.

That is why client/server, LANs, PCs and downsizing have staying power. They match the needs of mainstream business.

Client/server ain't no oil painting, but it is here to stay. We may be stumbling, but we are all stumbling in the same direction.

Dodge is telecommunications department manager for a Fortune 100 company.

Say it, point to it or type it

Esther Dyson

How do you turn a potential success into an embarrassing flop? By promising more than you can deliver, as in the promotion of the Newton on the basis of its handwriting recognition skills.

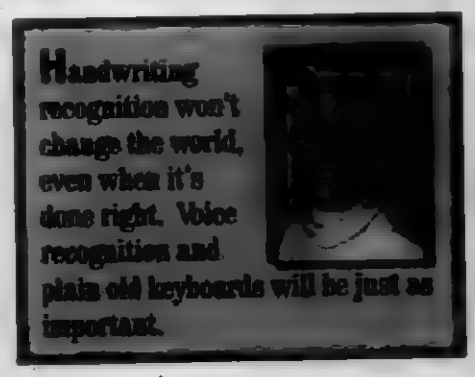
The machine actually works fine for many tasks, but it was marketed most heavily on the basis of handwriting recognition, one of its weakest features. That's a little like selling DOS on the basis on its user interface. Basically, handwriting recognition is a poor way to enter free text, and it's not a great way to enter commands, either.

In fact, the natural successor to the keyboard for word entry is not the mouse or the pen but voice. Note that I said word entry, which means mostly single words or commands, not text entry, which will remain the province of keyboards for a long time.

It's not that voice recognition is that much more accurate or faster than handwriting recognition, but its "cost" in user effort is so much less. I don't really mind saying "load budget" three times, but I would mind writing it carefully one . . . two . . . three times to get it right.

Of course there are other factors involved, such as the presence of noise, that would work against the use of voice. On the other hand, if you are driving or knitting or clipping your nails, you might want to use voice. In general, the best approach is a combination. For example, I can use the pen to point at an object or word and voice to enter a command such as "erase," "send to Alice," "change to Friday" or "schedule Comdex meeting with Jim."

I can even use voice for light data entry, such as speaking a phone number or entering the product number for a customer's order of 29 red rubber ducks. His shipping address and other information is already in the system, of course. It was entered the old-fashioned way, by keyboard, and can be downloaded to my Personal Digital Assistant or kept in my desktop computer, which I may someday control with voice too.



Handwriting recognition won't change the world, even when it's done right. Voice recognition and plain old keyboards will be just as important.

These technologies do not replace one another but rather add useful ways to interact with the system. Keyboard entry is to create the data; the pen (or mouse) is to select it or create graphical information; and voice is to enter brief commands.

A voice recognition system, like a handwriting recognition system, has a good chance of recognizing spoken instructions if it knows the context. Just as a human expects a name after "with" and a place after "at," a voice recognition system needs a set of possible commands for a certain application and information about whether you're likely to be specifying a name or a lunch location. Both a person and the system know the difference between Alice Haynes and Alice's Restaurant, given the context.

Thus, it's in the areas of understanding and context sensitivity, not phoneme or character recognition, that the biggest developments will come. They will make all kinds of recognition more effective.

What these developments won't do is make the keyboard outmoded (in fact, keyboard entry will be enhanced) or even significantly alter the roles that each technology plays in data capture.

Dyson is editor of "Release 1.0" and "Rel-East," newsletters on new technology and new computer markets in Eastern Europe.

THE ME GENERA
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1-2-3 RELEASE 4 BRINGS IT ALL TOGETHER.

Once again, the world of spreadsheet users is coming together around Lotus® 1-2-3.® The new 1-2-3 Release 4 for Windows™ has made using a spreadsheet easier, faster and dramatically more productive for everyone, based on hundreds of advancements in functionality and usability.

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> PC/WEEK, 5/3/93

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*In Canada, call 1-800-GO-LOTUS. †Usability study by User Interface Engineering, 8/93. ©1993 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, 1-2-3, Working

TION DISCOVERS EADSHEET.

working. Every 1-2-3 package can be installed on the network right out of the box. No special version is required. And because 1-2-3 and all other Lotus Windows applications are mail-enabled, you can quickly and easily share your data with others on the network. And vice versa.

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The real power of Working Together comes from 1-2-3's advanced Versioning technology and group editing powers. These are features no competitor can match.

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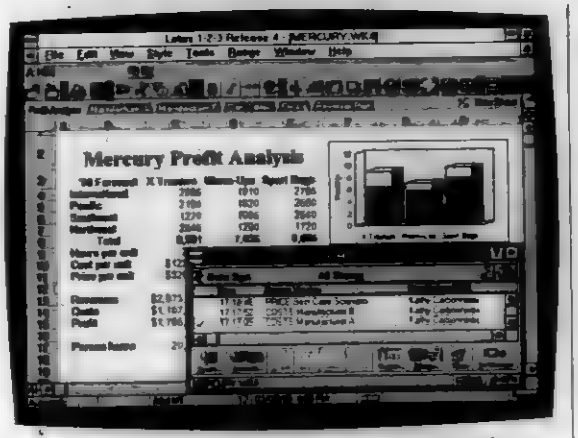
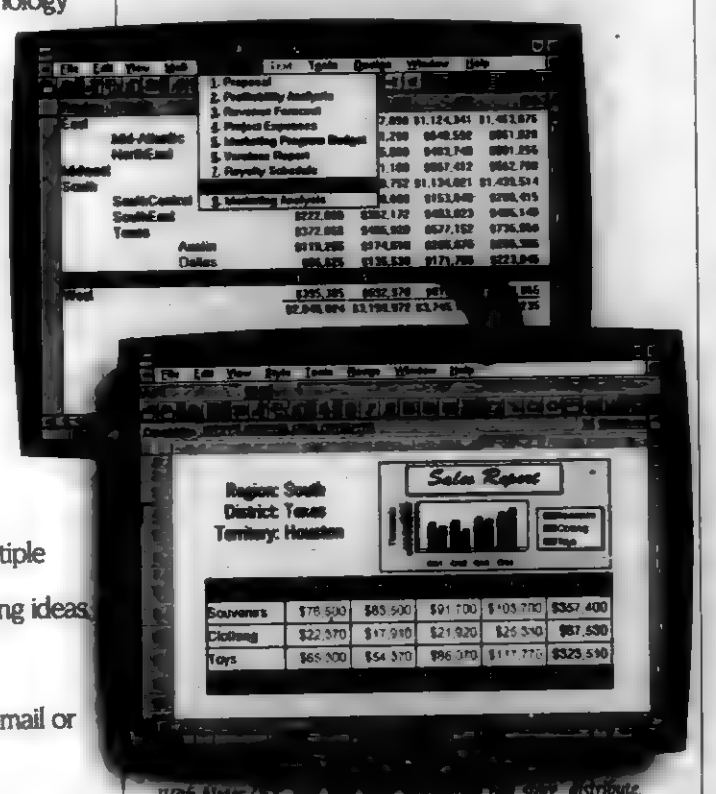


Version Manager lets each member of your workgroup know who made what changes to a file, when and why.



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WHAT OTHERS PROMISE TOMORROW,

Intel, Unisys Said to Plan to Develop Commercial Uses of Parallel Processing

Intel Corp. and Unisys Corp. are teaming up in the race to develop a form of high-performance computing power known as parallel processing for the commercial market, industry officials said.

Intel and Unisys declined to comment.

Their development agreement, which is scheduled to be announced today in Santa Clara, Calif., is an attempt [illegible] the building blocks currently [illegible]

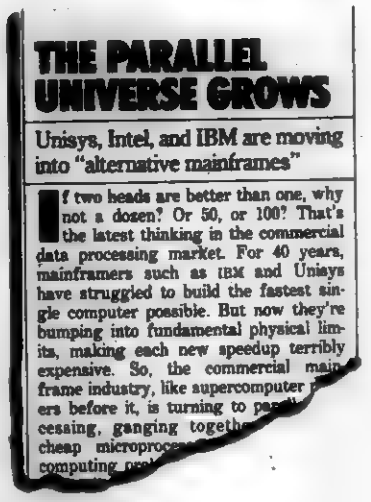
to bear fruit until 1995. And it will face stiff competition from others who have already entered the market or are planning to soon. Among larger companies, that includes International Business Machines Corp., which is planning to [illegible] parallel entry by year end.

One parallel-computer [illegible] always focused on the [illegible] is Teradata, [illegible] Telephone & [illegible] last June.

Parallel box draws near

IBM is essentially on schedule with its Enterprise System/9000 parallel processor announcement set for later this year, a company executive said last week. But the unveiling will likely take place in October — or even later.

The machine, intended to handle complex database queries and off-load that [illegible] from the regular mainframe, will be [illegible] as many as 50 processors in [illegible]. It will com[illegible]



THE PARALLEL UNIVERSE GROWS

Unisys, Intel, and IBM are moving into "alternative mainframes"

If two heads are better than one, why not a dozen? Or 50, or 100? That's the latest thinking in the commercial data processing market. For 40 years, mainframers such as IBM and Unisys have struggled to build the fastest single computer possible. But now they're bumping into fundamental physical limits, making each new speedup terribly expensive. So, the commercial mainframe industry, like supercomputer [illegible] ers before it, is turning to parallel processing, ganging togeth[illegible] cheap microproces[illegible] computing [illegible]

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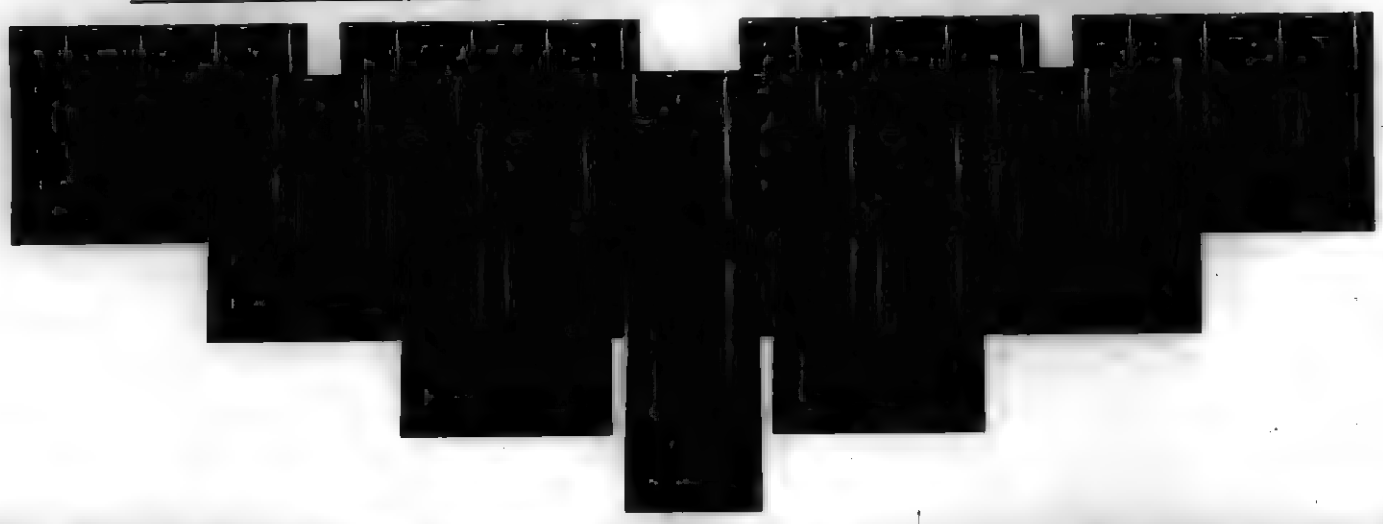

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An Xplor International White Paper

The New Enterprise IS Strategy

Transforming Data Systems into Document Systems

WRITTEN INDEPENDENTLY OF COMPUTERWORLD

Xplor International

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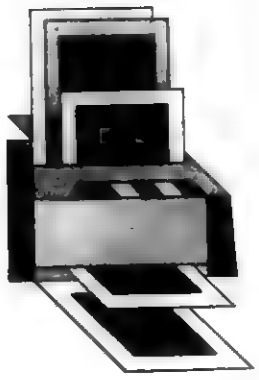

INTRODUCTION

In his recent book, *Life after Television*, George Gilder reports that data will double 20 times by the year 2000. This means that in only six short years our organizations will be forced to manage a data avalanche. If you can imagine multiplying your current data load by half a million, you will have the idea.

Information, on the other hand, is doubling only once every three or four years, say the experts. What is information? Information is a collection of data organized to meet specific needs. When the millennium rolls around, the amount of data will be 125,000 times greater than that of information. This means we will have an almost overwhelming amount of data to organize into information.

That is an unbelievable projection until we consider that virtually everyone who has a personal computer or workstation also soon will have the equivalent of a small town library in data storage capacity. Furthermore, high-speed telecommunications and supersearchable databases let us import even more data — gigabytes at a time — faster than we can fetch the morning newspaper.

How will we manage this deluge? The cost-effective data storage and access technologies currently on the horizon will be fundamental. The key, however, is not a single technology, but a concept. We must shift from data management to document management.

As new data comes through the floodgates, we can distill and channel that which is important to us by strategically managing logical units — documents — rather than physical units. To bring this about, we must change the way we think about the shape and organization of information.

Those who organize and channel data as documents — documents that include digitized text, graphics, photographs, color, audio and video — will be able to absorb the information required for survival. Those who do not may drown in fathoms of unorganized — and therefore useless — data.

An enterprise-wide electronic document strategy is essential in order for companies to remain competitive, and printing is an extremely important element. Given the flood of data, does anyone really believe that paper will disappear from our society and offices?

This white paper addresses the need for such a corporate document policy. The concept has many aspects and many names. The Gartner Group calls it an electronic output strategy; IBM/Pennant Systems calls it an enterprise presentation strategy; Xerox calls it a document services architecture. While the names may vary, they all refer to the same concept. We must move on from the management of physical units of data to the strategic management of logical units of information called documents. Corporate survival rests on this shift from data to document management.

This White Paper was written by Keith T. Davidson, Ph.D., executive director of Xplor International.

Xplor International is the electronic document systems association dedicated to providing educational opportunities for industry professionals. It can be reached at (800) ON XPLOR.

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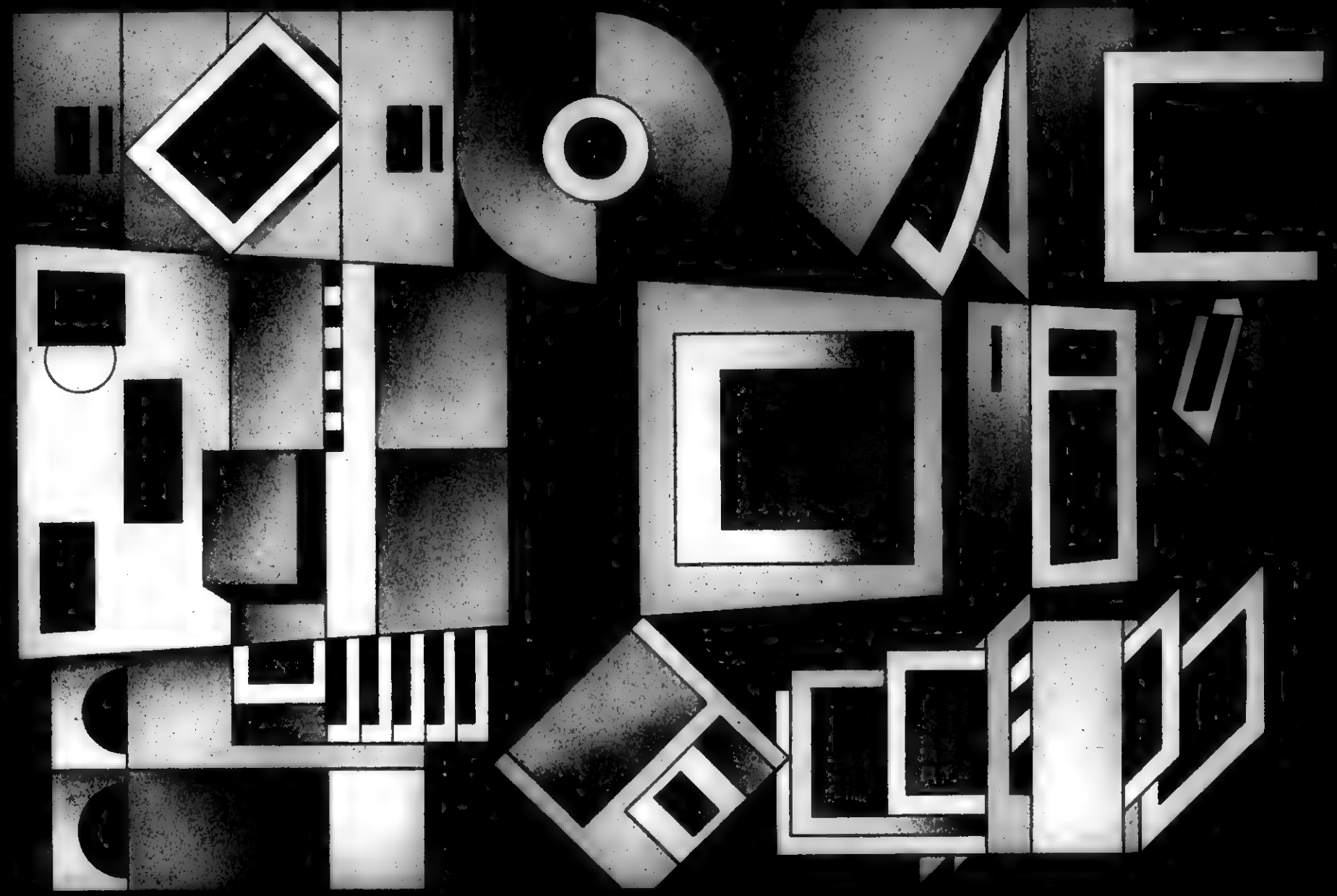

An Xplor International White Paper

Transforming Data Systems into Document Systems

You are now holding what most of us think of as a document. A magazine, report, catalog, manual — a collection of paper pages bound or stapled together. That is the traditional definition of document.

In the world of information processing, however, the concept and definition of the document is changing. To cope with an influx of data, the industry has harnessed a new unit of information which is also called a document. Unlike data, which traditionally has been described physically, documents are units that are planned and managed based on informational use.

This new document unit is defined as any package of data structured for informational purposes.

Acceptance of this unit will lead to a number of changes in an organization's information management system. These include increased implementation of digitized information, standardized information representation, redesigned corporate databases for universal accessibility, and increased computer literacy. For electronic printing professionals, these changes present new opportunities for developing cost-saving and revenue-improving strategies in document preparation and distribution.

DOCUMENT-BASED INFORMATION FLOW

In the beginning there was the bit, and it was good. Then came the byte, and it was also good. Now comes a new unit of information — the document — and it is good, too, especially at conveying information that enables productivity and competition.

For the information systems manager, this new unit provides a fresh challenge — the enterprise-wide establishment of an electronic network capable of creating, viewing, transferring and outputting documents. Without this continual electronic flow containing digitized text, graphics, photographs, color, audio and video, organizations will be incapable of absorbing and manipulating the information required to compete in the global marketplace.

The need for an electronic document highway is made apparent by the growth of distributed architectures, wherein documents flow through multiple channels via local and wide area networks. In this environment, documents can be created in one location and printed in another. If this were a perfect universe, such information systems would already be in place. For most organizations, however, this is a goal rather than a reality.

Those currently on this journey must contend with a variety of systems that have sprung up over the years. First came the mainframe-based system, where data flowed to a central mainframe and was processed and stored for distribution and printing. Most printing was done at the mainframe site — until rapid distribution demands resulted in remote printing.

Then came enclaves of local printers and PCs, many of which functioned as standalone application centers. Some of these have now been networked in LANs. Over time, low-cost laser printers began to provide some of the capabilities, such as high-quality output, of centralized printing systems. Now, many organizations have begun to set up links between local LANs and central mainframes. In many cases, these links provide the underpinnings for the eventual development of digital document highways.

The need for an electronic document highway is made apparent by the growth of distributed architectures, wherein documents flow through several channels.

TEXACO

At Texaco, a recent decision to implement a broad information presentation strategy illustrates the challenges and opportunities shared by many large corporations. Like most big companies, Texaco must deal with a proliferation of hardware and software. Tying the output together into a cohesive document strategy will be a complex project, but one that should pay off in cost and time savings, greater efficiency, improved customer service and a host of other benefits.

Near the turn of the century in the small Texas town of Beaumont, Texaco began its growth into an international refiner and marketer. Today, with annual revenues near $37 billion, the primary focus of the company is to increase its oil and gas reserves and refine and market its products.

It was in support of those goals that the company developed its presentation strategy. That strategy will allow users to print or view documents anywhere in the system. Upon receiving a call from a customer, for example, a service representative will be able to pull up the customer's account statement on the screen and begin answering questions and resolving disputes immediately. Special indexing features organized by name, account number and address will speed the process.

Without the ability to view documents on screen immediately, customer service reps currently spend extra time on each call. In many cases, a representative takes down the initial information from a customer, checks the account statement on microfiche, and calls the customer back. Documents on view eliminate many wasted steps and improve customer service.

At the heart of Texaco's new print-anywhere-view-anywhere strategy is the installation of hardware and software that will give the company a way to manage its three most common data streams.

Data stream output from the mainframe is generally in the form of Advanced Function Printing (AFP). PC output is usually based on Printer Command Language (PCL) or PostScript.

Texaco evolved from centralized mainframe printing with line printers to laser printing on IBM 6670s in the late 1970s. From there, the company moved to IBM 3820s and began using the AFP data stream. Meanwhile, various departments installed PCs and thousands of Hewlett-Packard LaserJet printers to support their printing requirements.

Defining Documents

People who familiarize themselves with the strategic importance of different kinds of documents stand to realize a competitive advantage. Here are a few document terms and definitions:

Customized documents: Documents structured and/or distributed by an author based on the needs of individual audience members.

Audience-defined documents: Documents structured and distributed to an audience based on its own self-described needs.

Intelligent or "active" documents: Documents that contain embedded information such as directions for information sources and instructions for updates.

Collaborative documents: A special subset of intelligent documents designed and developed using systems allowing joint and interactive electronic preparation, editing and review.

Compound or multimedia documents: Documents that manipulate information digitally, regardless of their format, text, data, graphics, audio and video.

HETEROGENEOUS COMPUTERS

Refineries were using Data General computers and printers. Accounting groups were tied to Datapoint for their computing and printing needs. Each made its own contribution to the data flow.

Texaco is developing a presentation strategy that will allow users to print or view documents anywhere in the system.

A 1988 decision to standardize on AFP printers was re-examined four years later when the people supporting Texaco's electronic printing needs realized that the large and growing number of PC users was familiar with PCL and PostScript, but not AFP. During the interim, the impact printers at the mainframe site had been replaced by Xerox 9700 laser printers.

Despite the desire for standardization, it was clear that different kinds of printers were destined to keep appearing. And so a new presentation strategy was born, one that would allow both viewing and printing anywhere, regardless of hardware.

The champions of this single data stream, members of the Electronic Presentation Services Team, are gearing up for implementation. "This support group will allow people to concentrate on the job for which they were hired instead of trying to master the intricacies of printing or viewing documents," explains Jim Wills, the primary person supporting AFP and printing issues at Texaco since 1986.

"This team will address a wide range of support issues, from LANs to PCs, and we look forward to being able to add support for the many hardware and software issues related specifically to printing and presentations."

Standardizing on a single data stream and enabling it to flow through the company will bring about a number of positive changes. For example, employees will be able to tackle a number of different jobs because they will all be familiar with the same data representations.

In the past, it was difficult for people to change positions because their specific systems knowledge insulated them from other departments and opportunities.

Last but not least, adopting an electronic document strategy at Texaco will help unify all the disparate areas — mainframe-based electronic printing, on-line viewing, archival storage, print shop and PC-based printing — that have traditionally been treated as separate entities. By reorganizing around the document, Texaco makes its information as lucrative as its oil.

ESTABLISHING AN ELECTRONIC OUTPUT STRATEGY (EOS)

Though few organizations think of themselves as publishers, publishing is really everyone's second business. According to the Gartner Group, internal corporate printing is expected to reach 1.5 trillion pages a year by 1995, a 50% increase from 1990.

Despite the explosion of paper and the hefty proportion of revenue going toward publishing, few companies have consciously attempted to fold the many aspects of enterprise output into a comprehensive electronic output strategy.

Creating and instituting an enterprise-wide output strategy takes the randomness out of printing and replaces it with deliberation and strategic thinking. An effective output strategy starts with a plan that comprehends key business goals, changing user requirements and shifting computing paradigms.

Joel Wecksell, vice president and service director for the EOS Strategies service of the Gartner Group, has described guidelines that help businesses implement such a plan. According to him, in establishing an EOS, information systems (IS) managers have three goals: create revenue opportunities, make users more productive and improve the competitive position of the company.

An EOS provides an excellent framework for achieving these goals, but the plan must be documented and measurable. If the goals, timetables, re-

PAPER REDUCTION EFFORTS
(Xplor Survey Respondents)

Duplex Printing	81%	9%	4%	6%
Two-up Printing	76%	8%	7%	9%
Computer Output on Microfilm	66%	3%	13%	18%
Screen-view as an Alternative to Printing	59%	26%	5%	10%
Electronic Imaging to Replace/Augment Output	40%	38%	10%	13%
CD-ROM for Publishing/Information Dissemination	31%	33%	14%	22%
Optical Disk Jukebox	29%	35%	13%	22%
WORM for Archiving	24%	38%	16%	22%

Source: Xplor International

AIIM International
The Electronic Document Systems Association

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Six Steps for Implementing an EOS

The following six-step process is useful in identifying all the criteria that must be included in an EOS. Since this is a guideline rather than a map, a company may need to change the order of the steps to meet its particular needs.

1. *Pick an EOS champion to spearhead the project and create a preliminary set of goals:* Set broad goals based on an area you already know such as reducing print volume.

2. *Audit the current environment:* Audit central and distributed print environments, end users and outside customers to establish a base for setting manageable goals. The audit should cover five categories: the documents themselves, equipment (hardware and software), organizational considerations, requirements for disaster recovery, and electronic publishing mechanisms outside the data center. Concentrate on application areas that are manageable, visible and valuable so success in these areas will attract the support of senior management.

3. *Begin to refine goals based on the audit:* At this stage, you can fine-tune the goals and add quantifiable measures, numbers and time frames. The simple goal of print volume reduction, for example, might be redefined as reducing print volume by 50% over 36 months. A general goal to revise a cumbersome proposal process by developing a three-day proposal turnaround might be redefined as a 12-month plan.

4. *Identify installed and available technologies:* Six technology areas — creation and capture devices, processors, communication systems, distribution mechanisms, tools for developing applications and solutions, and output devices — play critical roles in enterprise output strategies. Usually, each technology takes multiple forms. For example, output includes not only hard-copy printing on central system printers but also soft viewing, monitors, tape, optical media, microfiche and printing plates. Now is the time to evaluate the vendors and packages associated with these technology areas.

5. *Understand the organization's business requirements:* Identify the non-technology issues, the external and internal business pressures and the strategic business goals that can affect EOS objectives and costs. Then make sure the EOS strategy matches the non-technology issues. Consider these three examples: If the U.S. Postal Service implements incentive programs to soothe the sting of a rate hike, an output strategy that ignores these incentives would be inappropriate. If an organization is shrinking, a strategy based on office expansion would not make sense. If an organization defines itself as a key provider of electronic data interchange, an output strategy that relies exclusively on hard-copy printing would be inappropriate.

> *"Write a set of clear, manageable and measurable goals. Without these, EOS champions and senior management will not know when these goals have been reached."*

6. *Redefine Goals:* Write a set of clear, manageable and measurable goals. Without these, EOS champions and senior management will not know when goals have been reached. Ideally, the final set of goals should target high-value application areas that improve employee productivity, address customer and vendor contact, sharpen the competitive edge, or affect the bottom line.

To recap the important steps in establishing an effective EOS:

- Designate a champion to spearhead the EOS
- Choose realistic and manageable applications for prototype projects
- Document a set of achievable, measurable goals based on the current environment, technology choices and external and internal influences
- Report results regularly to management and gain support.

As a famous coach once said, "A football does not a touchdown make."

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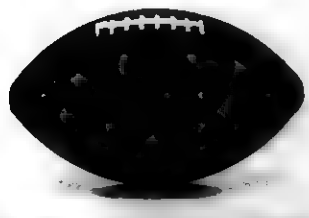

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sources and costs are not laid out, senior management should not permit the plan to progress. Measurable plans allow IS managers to demonstrate progress as they move toward their goals.

XPLOR SURVEY RESULTS

Since 1989, Xplor International has annually surveyed member companies that traditionally push forward the leading edge of document technology. The results spotlight concerns and opportunities in the industry. These Xplor members include a high concentration of large, information-dependent companies, such as banks (8%) and insurance companies (17%).

Xplor survey results make it clear that technology is advancing rapidly, due in large part to the virtually universal availability of easy-to-use desktop computers, and more recently, the ability of "least-common-denominator" desktop systems to connect to corporate information processing systems. Those companies that are able to harness these widespread systems will realize increased efficiency, faster response time, and possibly lower costs. Ninety-two percent of all companies participating in the 1993 Xplor Technology Directions Survey regard information as a strategic tool and recognize the importance of putting information processing tools in the hands of users.

Shifting Investment Emphasis

Documents go hand in hand with most work. In addition to meeting a wide range of external docu-

Industry Scope

The electronic document systems industry traces its beginnings to 1977 and the introduction of the first high-speed electronic printer. Today, less than 20 years later, the industry has grown to $31 billion in the United States and $65 billion worldwide, according to Xplor International.

Electronic printing accounts for $26.5 billion of the total, with imaging and micrographics accounting for $5.2 billion of the 1993 total market.

To capture a true picture of the marketplace, Xplor's analysis includes those portions of the office copying, in-plant printing and commercial printing industries technologically accessible for electronic processing. This amounts to an estimated additional marketplace of $109 billion in 1993 for the electronic document systems industry.

Combining the identified and potential markets, Xplor International estimates the 1993 U.S. market for electronic document systems to be $140.8 billion, with the worldwide identified and accessible market amounting to $287.3 billion. This marks the first definitive analysis of the electronic document systems industry's size, components and market potential.

Until now, the market has been difficult to describe and size accurately. Clearly, it is emerging as one of the most important segments of information technology. But even the totals from this emerging new market are dwarfed by the total cost of document management. Industry watchers have estimated the cost of documents to American business and industry at 6% to 8% of total corporate revenues.

The latest statistics reveal that total U.S. business receipts in a recent year amounted to approximately $10.8 trillion. Applying the 6%-to-8% formula, this would mean that American business spends between $650 and $850 billion annually on document management.

Another industry leader estimates that American business spends one quarter as much on document management as it does on people costs — one of the biggest corporate expenditures. Recent figures show that U.S. business spends about $3 trillion annually on wages and salaries. Applying the 25% formula, this would mean that business spent about $750 billion on document management.

These analyses are meant to provide a rough indication of the opportunity that effective document management offers. Xplor International is providing the first definitive description of this dynamic industry with the help of several important contributors, including the Association for Information and Image Management, BIS Strategic Decisions, Eastman Kodak, INPUT, Pennant Systems and Xerox Corporation.

ment production requirements, most information systems are also charged with two main internal document missions: describe or summarize business activities and collect information by logging business processes such as sales transactions.

Rather than shipping such documents around the company — a wasteful practice in terms of paper and technological resources — many companies are investigating viewing systems as an alternative to printed output. More than half of the respondents have shifted their emphasis to include viewing as one of their top three future priorities. In current investment priorities, more than half (51%) list mainframe printers among their top three investment choices. That choice may be less popular in the coming years, as only 30% expect mainframe printing to be a top investment priority by 1996.

Few companies have consciously attempted to fold the many aspects of enterprise output into a comprehensive electronic output strategy.

Laser Printer Use Rising

While investments in printers may be overshadowed by those in imaging, LANs and digital networks, IS professionals recognize that the ability to print documents will be a major part of spreading processing capabilities around the organization.

In fact, nearly 30% of respondents say that PC laser printers and distributed printers account for as much volume as data processing center printers, a trend that does not seem to be abating. Nearly four-fifths (79%) of Xplor members expect desktop laser print volume to increase over the next two years. On the other hand, only 57% expect increases in data center laser print volume, and 18% expect that volume to decline.

Document Policies Need More Research

Nearly all respondents (93%) recognize that access to any printer from any point in an organization is a worthwhile objective. As companies broaden the pool of print job creators and offer a wider selection of output alternatives, they begin to recognize the need to include these additional groups in their printing strategies. Eighty-seven percent will include in-plant printing, desktop printing and copy centers in their next document policy review. One of the potential hazards of decentralizing printing is that a company's image is more difficult to control, according to two-thirds of the respondents.

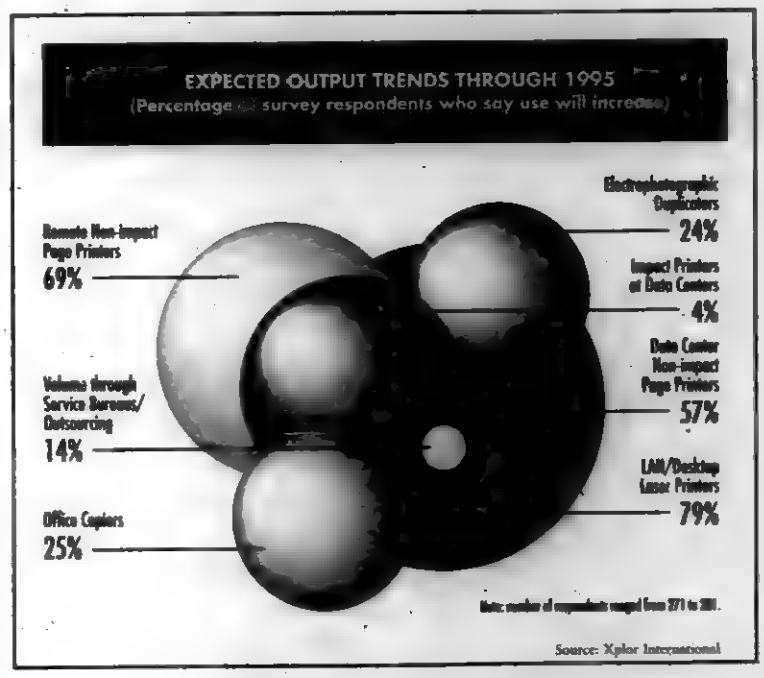
Reducing Print Volumes

Do we have to print at all? As mentioned above, at 18% of the companies surveyed, data center print volume is expected to decline. Accepted tactics for print volume reduction include duplex printing, two-up printing, and printing on microfilm. Some 60% of respondents are testing screen-view as a printing alternative. Newer technologies such as imaging are less common — 40% have an imaging program or pilot program, and another 37% are investigating imaging.

In the future, Xplor members will continue to take the lead in harnessing technology for better and more efficient document production. Their observations will be reflected in the 1993 Xplor Technology Directions Survey distributed this month.

VOLVO

Swedish automaker Volvo has long had a repu-



tation for efficient, cost-effective vehicles. As the result of an enterprise-wide document strategy, it now has an information services operation to match. A combination of centralized printing, standardization and new technologies has given Volvo's IS department — Volvo Data — greater control and expanded opportunities.

Like many other companies, Volvo is also a publisher. Focusing on the document lets Volvo produce both cars and documents with greater success. In 1987, Volvo Data had centralized mainframe-based printers as well as five remote printing sites. Because there was no system of printing and publishing, production was inefficient.

In an effort to reduce costs and increase productivity, IS introduced a plan to cut both staff and expenses by 50% over a seven-year period. By the end of 1992, Volvo Data had reduced its IS staff from 32 to 16. Standardization has brought greater control and decreased duplication of effort, so fewer people are required.

By automating centralized production at the mainframe and focusing on AFP, Volvo Data streamlined production of text manuals printed by IBM DCF printers and spare parts catalogs and price lists printed by Xerox XICS printers.

To help realize its goal of printing on demand, Volvo Data standardized on PostScript for printing in LAN environments. "We decided that PostScript was the way to go because it is text-based and therefore portable," explains Jimmy Lundbeck, output strategist. "Our goal is to support only a few PDLs." Due to the large number of HP PCL-based printers, IS will also support PCL.

Re-engineering Checklist

The following 10 steps toward re-engineering success were developed by Kenneth Morris, president of the international identity and communications firm Siegel & Gale.

Before tackling a document re-engineering project, ask these questions:

1. *What information should be captured?* Include information that helps you and your customers.

2. *How should information be displayed?* Consider how your customers want information presented. Would they prefer brokerage statements broken out by product category rather than listed chronologically by transaction? Now is the time to examine the changes in application programs this may require.

3. *How important is the timeliness of the information?* Consider upgrades, such as an electronic capture system, if customers want more up-to-the-minute information to monitor monthly costs.

4. *What are the different information sources, and how compatible are they?* Examine existing documents to identify and eliminate incorrect, untimely, duplicate and inconsistently formatted information.

5. *How accurate is the information?* Clarify document information to reduce customer confusion and boost understanding.

6. *What are the steps required to process and produce documents?* Break down the document work flow into steps that identify opportunities for eliminating unnecessary or duplicate procedures, reducing paperwork, and allowing faster processing by fewer people.

7. *What is the degree of customization required?* Keep the degree of customization in mind when designing a document — it will also determine the degree of programming flexibility required.

8. *How can quick and easy access to information be provided?* Work with output documents, rather than systems screens. It is an easier way to build compatible screen logic and design when you need quick access to electronic documents that track the hard copy your customers receive.

9. *Will centralization or decentralization be more effective?* Determine the answer after documents are developed. That way you can factor in volume, the need for local input or monitoring, turnaround time and design so your decision will increase savings and productivity.

10. *How can my company offer new products and services?* Start by looking at output documents and their uses. Those that contain certain kinds of information, such as a management breakdown of all telecommunications costs by type of service and region, may present revenue opportunities.

To support PostScript and HP-PCL, Volvo Data launched a print-server strategy based on both PSF/2 and OS/2. Both print managers are necessary for Volvo Data to handle print from all its different platforms. A particularly innovative and cost-effective publishing strategy involves the Xerox DocuTech Production Publisher. PostScript-formatted data from both Unix- and Macintosh-based systems that includes gray-scale is fed into the DocuTech, which produces technical documents for trucks.

Volvo has reduced warehousing expenses for its spare parts catalog for trucks and buses by over $400,000 annually.

Printing On Demand

Prior to this system, Volvo Data had to print out one text-only copy, cut out and paste in the graphic, and send the document to an external print shop.

"Now we can truly print on demand," says Lundbeck. "This saves us quite a bit of money." Today, the DocuTech churns out between 700,000 and 800,000 pages per week from Unix- and Mac-based systems that once had virtually no output. By publishing on demand, Volvo Data has reduced warehousing expenses for its spare parts catalog for trucks and buses by over $400,000 annually.

Another progressive information processing strategy involves a goal of "outputting anything anywhere." Lundbeck likens this concept, which is designed to streamline internal communications, to an "electronic post office."

Currently, an employee prints out a document on a LAN printer, makes a number of copies, then puts them in an internal mail envelope for delivery. With the electronic post office, the employee prepares the document on-screen, then selects the recipients and output options electronically. A paper-based delivery option then triggers automatic delivery by a printer close to the recipient or an electronic-based delivery option sends the file directly to the recipient's screen.

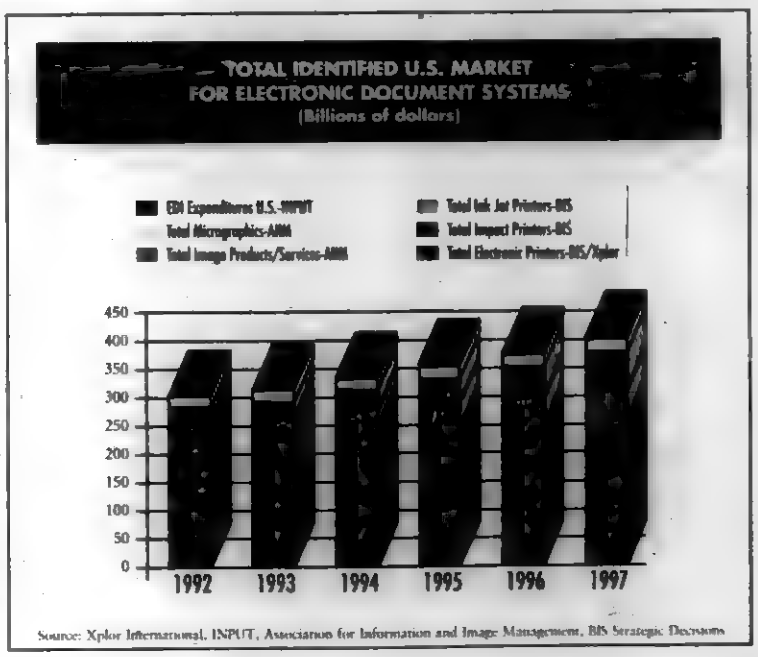
These delivery options reduce reliance on couriers, trim paper costs and improve delivery times. By taking control of its documents, Volvo has strengthened its ability to steer the company safely and effectively.

RE-ENGINEERING THE DOCUMENT

Documents are highly visible indicators of the way we conduct business. They are vehicles for the information we provide and the medium for the corporate messages we send. Documents symbolize the quality of our service and give us a distinctive voice in the marketplace. They also mirror our thinking. If documents are clear and logical, they convey our professionalism. If they are fuzzy and ambiguous, they reflect badly on us.

Because documents are so closely intertwined with an organization's business processes, they provide a unique inroad for re-engineering those processes, according to Kenneth Morris, president of Siegel & Gale, an international identity and communications firm. Organizations that have examined themselves through the lens of the document often find many ways to improve — by doing away with obscure or unnecessary practices, streamlining forms and distribution; and improving enterprise-wide communication.

To help clients understand their current document situation and then take steps to improve it, Siegel & Gale developed an innovative methodology based on the concept of re-engineering. There are several advantages to using documents rather than application programs or overall systems structure as



Source: Xplor International, INPUT, Association for Information and Image Management, BIS Strategic Decisions

a re-engineering starting point:

• The primary focus is on output, which keeps customer needs in focus at all times.

• The document determines information needs — what is required, the level of detail to be displayed, structure and sequence, and desired degree of customization.

At GE, the time required to print and assemble a manual dropped from six weeks to six days.

• All affected groups — systems, marketing, legal, customer service, public affairs, operations — have a clear picture of the end product.

• Knowing how the document will look can guide purchase and development decisions. These are compelling advantages. They indicate why it is preferable to re-engineer processes based on the document rather than vice versa.

GENERAL ELECTRIC

Ever wonder how General Electric brings all those good things to life? One way is by continually improving the quality and timeliness of its documents. Unlike the 10,000 electrical plant managers who use GE documentation in nearly 100 countries, most of us will never see the manuals required to operate gas and steam turbines and generators.

All of us who use power, however, have reason to appreciate the clarity of these documents because it ultimately means better customer service.

Technical service manual printing poses a special challenge for document management at GE Power Generation. With gross new unit sales of $3 billion annually, this group markets gas and steam turbines and generators for GE Power Systems.

Thanks to a re-engineering effort and the installation of an electronic document system, a cumbersome and time-consuming manual production process was brought under control. Benefits include better print quality, faster turnaround and lower cost.

By moving to electronic production, GE Power Generation has been able to absorb a 19% volume increase in 1992 and 1993 while keeping total costs to the business at the 1991 level.

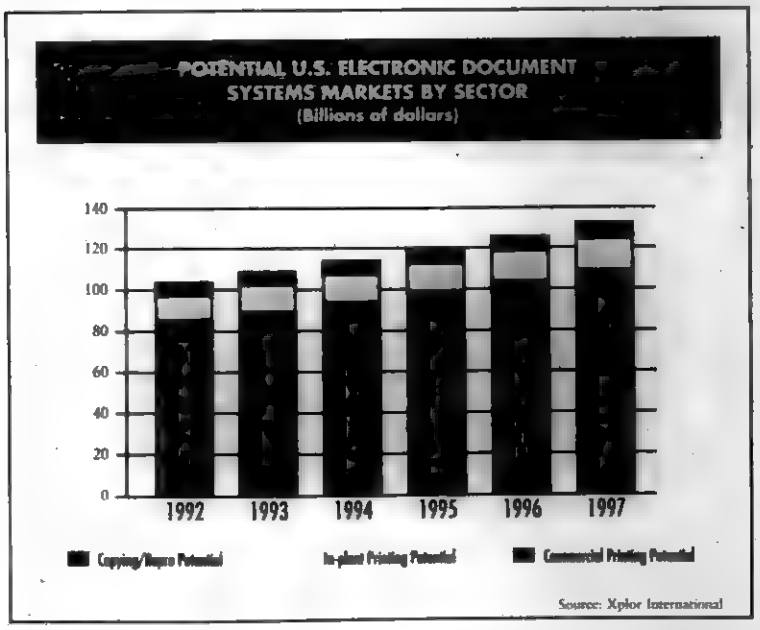
When gas and steam turbines and generators are shipped, they require operation, maintenance and parts manuals. Typically, each set of manuals consists of four volumes. Each volume contains 400 to 500 pages gathered together in a four-inch binder. About 20 to 30 sets, or a total of 50,000 to 60,000 pages, accompany each order.

About 100 different sets of manuals are produced at GE each year. This means that the organization starts or completes a customized and unique set of manuals every working day.

The Previous System

A number of factors previously hampered production. Because vendor-supplied material came in a variety of formats and sizes, it was difficult to integrate systematically. Another problem was integrating engineering drawings and text. To accommodate these size, shape and format discrepancies, final pages for a master book were assembled by hand, and the master pages were duplicated.

This awkward process was made worse by the fact that much of the source material was not available until late in the production cycle. This meant that all 120 books — the number in a typical set — had to be laid out on tables, and sections of the manuals were inserted as they became available. It took six weeks to assemble a four-book set. With the help of Siegel & Gale, GE Power Generation re-engineered its document process. A simplified format made the manual easier to navigate. And an electronic document system



that can store and compile a volume or set in one batch was brought on line.

As a result of these changes, the time required to print and assemble a manual dropped from six weeks to six days. "Our goal is to bring the production time for a typical set down to six hours," says George Fox, manager of proposals and technical manuals.

In addition to speed, the new electronic system has also provided greater flexibility and connectivity. "We now have greater production capacity because we can use networks and other electronic sources for text and graphics," says Fox. "Currently, we are only using about half of the full capacity of this electronic document system."

Re-engineering helped improve customer satisfaction as well. Shortening the production cycle allows GE Power Generation to get manuals into the hands of its customers more quickly. The fact that each page printed is now a master rather than a duplicate means the visual quality is superior. This is particularly important for those pages containing graphics. "If you take a page of text and copy it, the quality degrades a little," comments Fox. "But if you have drawings, schematics and tables, reproduction may destroy the fidelity."

Thousands of pages of instructive text, drawings and vendor material are now stored in an electronic library. Though digitizing this material has made it much easier to integrate, files from various CAD systems remain difficult to import and convert due to a lack of industry standards for manipulation.

Re-engineering helped improve customer satisfaction as well.

By using the document as the currency of its ongoing re-engineering effort, IDS has increased profitability while enhancing its reputation as a financial planning company that knows how to save and spend wisely.

Now, the organization outputs A-size pages on Kodak 1392 printers and outputs B-size pages with engineering drawings on QMS printers. Eventually, GE Power Generation hopes to electronically streamline the 8.5-by-11-inch pages and the 11-by-17-inch pages into a single speed production run.

At the moment, the company is using electronics for cycle and quality improvement, but one day electronics may be used for delivery as well. A utility in Panama recently delivered a bid specification via floppy disk, and asked that the proposal be supplied in the same format.

"I don't think we'll ever get out of hard copy completely," says Fox. "But once we produce manuals in electronic form, those warehouses full of books will disappear and information will be much easier to find searching for words electronically."

IDS FINANCIAL SERVICES

As IDS Financial Services nears 100 years of existence in 1994, it continues to provide the innovative financial planning products and services that have made it a favorite of middle-to-upper income individuals and their families. Not surprisingly, documents play an important role in the company's ongoing success.

IDS Financial Services strives to improve the effectiveness of its products, many of which take the form of documents, while containing costs. By continually evaluating and implementing new technologies over the past decade, the company has grown at a record pace in a highly competitive field and now has 7,400 financial planners serving 1.5 million clients from 180 offices.

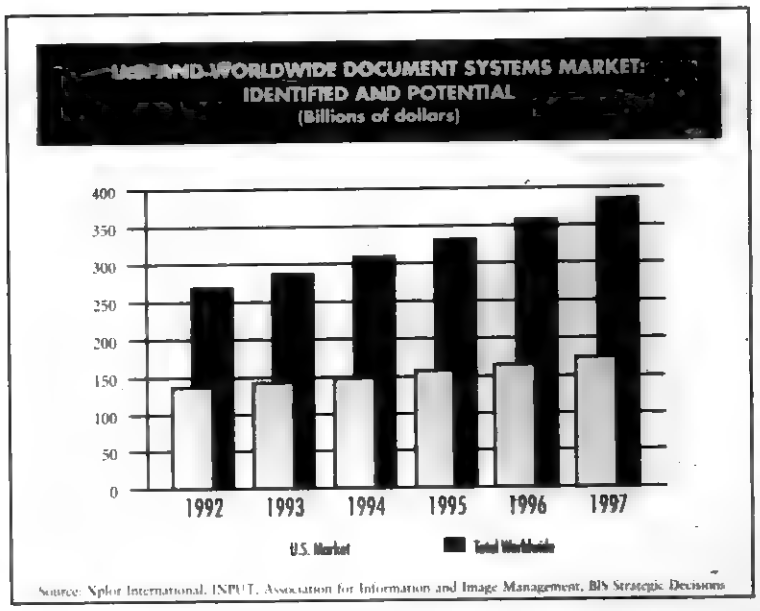
A corporate re-engineering effort called "IDS 1994" is now underway. Its objective is to increase the success of the financial planners so they stay with the company, thereby reducing turnover costs and improving customer retention.

"We also hope to increase client satisfaction, which we believe will lead to superior financial results and increased profitability," says Ron Humm, manager of mainframe printing and mailing operations. "Technology will play an important role in making that happen."

One project is aimed at getting information into the hands of new clients more quickly. When new clients are enrolled, it takes a week to deliver a financial plan with investment options. In the future, financial planners will be able to prepare and print a new client's plan while the client is still in the office. This is a competitive advantage because it sets IDS apart from other financial service providers while allowing clients to put their money to work sooner, potentially increasing profitability.

Following a 1992 reorganization that put all document-related groups into one division, a new document management strategy group was formed to maximize information technology.

By developing a more effective document manufacturing process, IDS hopes to improve the way it creates, produces and distributes documents



across the company. Currently under investigation are PC-to-mainframe links for distributed output and mainframe-to-offset printing.

In 1985, the same year the company was acquired by American Express, IDS adopted a printer strategy. Playing a proactive role within the company, the printer strategy group evaluated new technologies, brought in new equipment and software for testing, and implemented new systems. Its recommendation to use duplex printers has resulted in more than $1 million in paper and postage savings.

By using the document as the currency of its ongoing re-engineering effort, IDS has increased profitability while enhancing its reputation as a financial planning company that knows how to save and spend wisely.

By switching from multi- to single-part forms, and by switching from pre-printed forms to plain white paper, New York Life has saved money.

NEW YORK LIFE

At 150 years of age, New York Life Insurance Company is at the top of its form. One of only four life/health insurers granted the highest possible ratings from the major ratings agencies, New York Life helps insure its own healthy longevity by continually re-evaluating its information processing support structure.

Four years ago, New York Life implemented a document printing strategy that revamped the way forms were produced, processed and finished. The resulting diagnosis prompted several changes: migrating to AFP, re-engineering to take advantage of postal discounts, and standardizing on a few basic forms.

Though these are just several steps in the ongoing re-evaluation of information processing, they have already paid dividends. By re-engineering to take advantage of postal discounts, the company has saved up to five cents per envelope over a four-year period, according to Anthony Curcuruto, systems director.

By switching from multi- to single-part forms, and by switching from pre-printed forms to plain white paper, the company has saved more money. By printing low-volume reports locally, New York Life has also trimmed costs by reducing reliance on messengers and others responsible for document handling.

Local printing also helps internal customers get their reports three to four hours quicker. This is particularly important when reports contain such items as stock quotes, because it improves the accuracy and timeliness of the information the company prepares for customers.

Such innovations have helped the company expand its range of services. In addition to life insurance, New York Life also offers annuities, group benefits and pensions. Not content to rest on its laurels, the company is currently evaluating new document processing steps to save money and improve operations. One strategy under consideration is the elimination of microfilm processing, a costly and burdensome operation due to obsolete hardware and software. New York Life is considering archival and retrieval products to electronically handle both microfilm and other types of output, an alternative that would cut costs by reducing report printing while increasing the availability of information.

THE FUTURE: UBIQUITOUS COLOR

The future will bring advances in color that will make it a key part of organizational competitiveness, and therefore a key part of document information strategies. Virtually every document that goes to a customer and every document that calls for action or decision will use color, regardless of preparation method. No other printing technology

holds more promise for increased document efficiency than electronic color printing.

In this color-intensive environment, electronic color imaging will increase dramatically. Electronic publishing and presentation programs will make it easy to experiment with color highlights in electronic image form. Spreadsheet programs will deliver colorful graphs and charts at the touch of a few keys.

Dramatic reductions in storage costs thanks to CD-ROM technology mean that every desk soon will have electronic files full of electronic color originals. What is not stored on the desktop will be available in huge libraries accessible via low-cost, wideband telecommunications networks. For those billions of times when a printed paper document is needed, electronic color printers and copiers will provide them.

The widespread availability of low-cost, value-enhanced color electronic images will increase the cost-effectiveness of color printing technologies. The goal of the electronic document systems industry is to provide the marketplace with affordable, broad-range color. Industry leaders are competing to be the first provider of a system in which the price of color is only minimally above that of black and white. Eventually, color on paper will be as common as color on television.

THE FUTURE: ELECTRONIC DOCUMENTS AND PRINTING COEXISTENCE

Most of an organization's transactions, especially those involving documents that have a financial effect, will be transmitted via electronic data interchange. These kinds of documents will only be printed for specific and occasional archival, legal and review purposes. Very few documents or forms will be printed for inventory. Most will be printed on demand, and most will be customized to reflect the informational needs of the recipient. Almost all direct mail will be customized and structured for action or response. Finally, while the notion of a paperless society makes eye-catching headlines and interesting cocktail party chitchat, it just is not realistic.

Printing will take on an even more important role in enterprise-wide information processing thanks to the new era of the document. As the electronic document systems association, Xplor International will continue its stated mission of providing forums, programs and services that enhance the use of these systems to achieve organizational goals.

SUMMARY

In the not-too-distant future, the total amount of data stored in all systems is projected to increase half a million times. In the same time period, information is projected to increase only six to eight times. The need to structure this overwhelming mass of data into mission-critical information is changing data processing into document processing. We are at the threshold of a new era, the era of the electronic document. Electronic documents — no longer just pieces of paper, but data structured for informational purposes — are emerging as the critical, new units for information management. Here are some document forecasts for the coming years:

- Contrary to popular opinion, mainframe-based printing will not wither away — it will grow.
- Technology partnerships will continue to produce integrated, automated mailing systems that spur the growth of high-efficiency, electronic printing.
- Almost all printing systems that operate under corporate control will require view-before-print. That means documents must be reviewed and overtly selected by their recipient before being printed.
- Almost all internal documents on corporate systems will be available electronically. Broad-based information will be distributed electronically, then printed locally, rather than vice versa.

Xplor International

Xplor International is the electronic document systems association serving eight regions on five continents and is dedicated to providing educational opportunities for the industry professional. Xplor's mission is to provide forums, programs and services which enhance the use of electronic document systems in achieving organizational goals. Xplor also serves as a liaison between the user and vendor communities. Users and vendors in the electronic document systems industry join Xplor International to take advantage of the many educational opportunities provided in order to help their organizations benefit from them.

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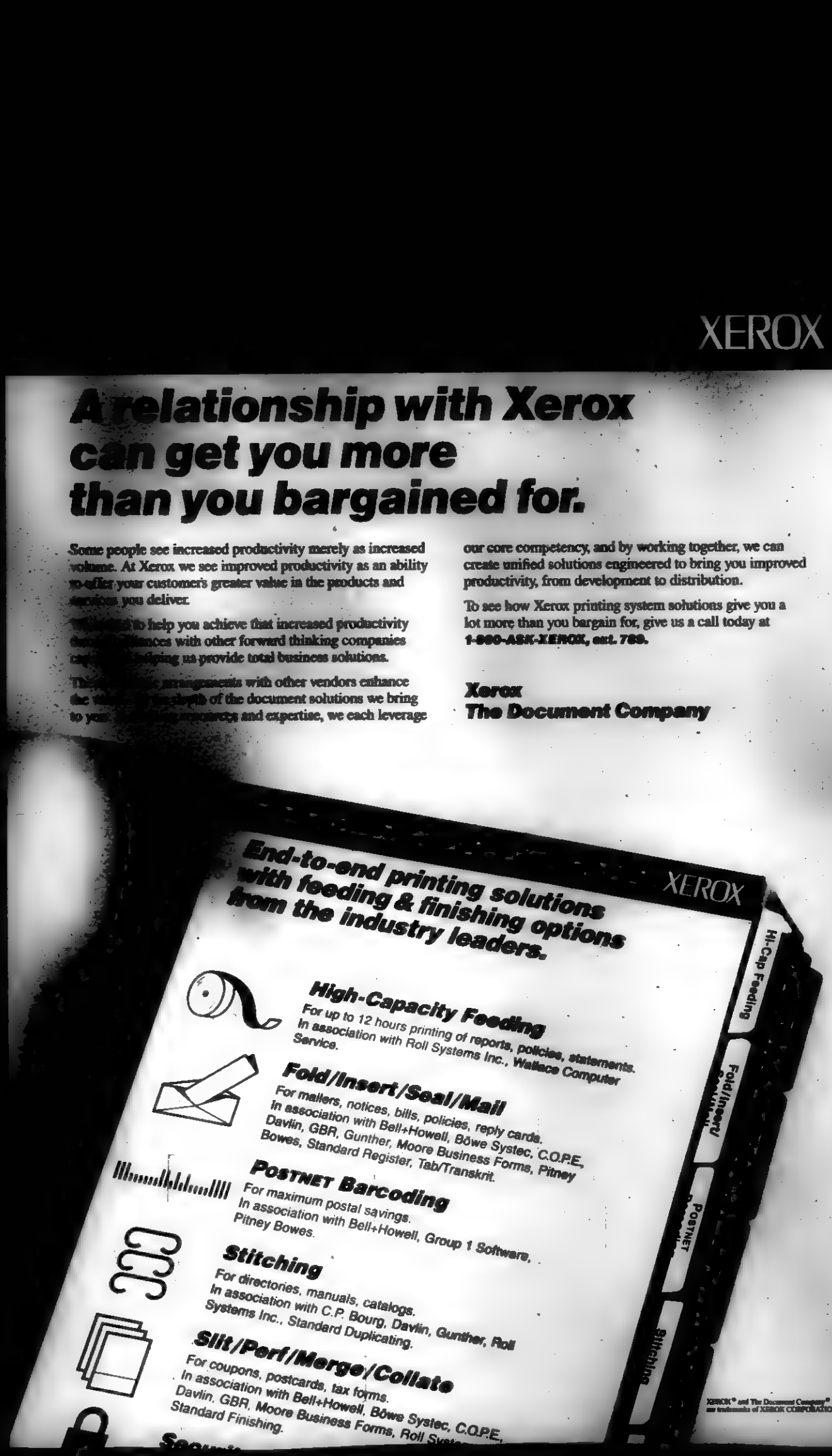


Can PowerBook regain its cutting edge?

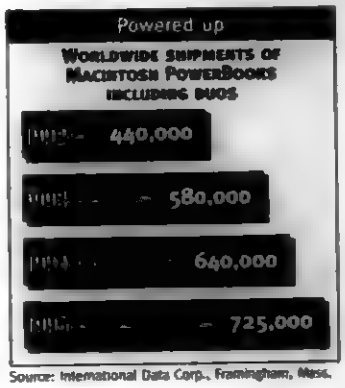
Apple must up battery life, fix other design flaws

By James Daly

The PowerBook has fallen to earth.

Two years after Apple Computer, Inc. dazzled the portable PC market with the slim elegance of the PowerBooks, the once ground-breaking machine now seems, well, ordinary.

When it was introduced at Comdex/Fall '91, the PowerBook boasted several technical and ergonomic innovations that made it an easy "Rookie of the Year." A trim design, a built-in wrist support and a trackball design drew critical raves, and sales went through the roof.



Source: International Data Corp., Framingham, Mass.

More than 400,000 of the portable computers were snapped up in their first year, and the PowerBooks became a billion-dollar business. Suddenly, a 5-pound portable was rejuvenating a $7 billion company.

Then something happened. Technologically, the PowerBook stood still. Meanwhile, other portable makers continued to innovate.

"The PowerBook is still a good machine, but there are certainly more advanced products on the market," said James Yip, manager of technical service at Ernst & Young in Toronto.

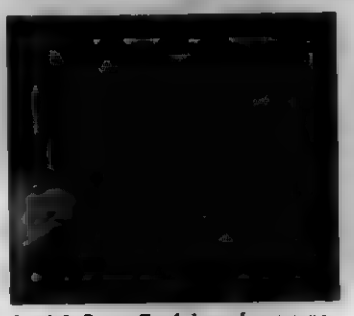
IBM's ThinkPad, for instance, sports the Trackpoint II, a handy little pointing device tucked into a nook among the G, H and B letters on the keyboard. IBM clone makers such as NEC Corp. and AST Research, Inc. are also integrating PCMCIA cards — tiny devices that contain hard drives, modems or memory. The PowerBook's slim design also now looks chunky alongside Hewlett-Packard Co.'s OmniBook 300, a 3-pounder that has a keyboard and display as large as those on a notebook computer.

"The PowerBook just doesn't stand out as much as it did in the beginning," said Eric Lewis, an analyst at International Data Corp. (IDC). "It's ordinary."

That does not mean PowerBook sales are off. In fact, IDC said sales will be up 32% this year, to 580,000. Apple last week claimed to have shipped its millionth PowerBook machine.

But the PowerBook is no longer unique. Apple users are jealously eyeing some of the features that appear on IBM PC portable clones, particularly PCMCIA cards.

"From a cross-platform perspective, I'd love to see [the PCMCIA card] with the PowerBook," said Rodney Schmidt, systems analyst at Eli Lilly and Co. in Indianapolis. "If Apple doesn't come out with them, I may need to think of going to other portables."


Apple's PowerBook *is no longer as unique as it was when introduced*

PowerBook rebates

Apple recently announced $200 to $500 rebates on selected PowerBook systems. Purchase a PowerBook 165 or a 165C and receive $100 cash back; buy the PowerBook Duo 230 and receive $500 cash back. The rebate offer continues through January 1994.

Sources at Apple said their engineers are busy trying to add the PCMCIA feature to a PowerBook by next year. They are also upgrading the portables from the passive-matrix screen technology, which tends to suffer from ghosting. Apple recently added several models with crisp active-matrix displays and is expected to add a PowerBook that sports the speedy PowerPC 603 RISC chip next fall.

"These advances are key if Apple is going to remain in the pack of front-runners," said Pieter Hartsook, an Apple analyst in Alameda, Calif. The portable market is expected to begin another growth spurt soon, as mobile PCs are brought into areas such as sales and field service that have remained uncomputerized. Close to 5 million mobile PCs are projected to ship in 1995, according to Norwalk, Conn., research firm Inteco Corp.

If Apple wants to continue to gain from this windfall, PowerBook design flaws must be fixed, observers say. Battery life, for instance, remains a problem. While brochures say you can get five or six hours from each charge, expect more like three. Users also say accessory doors break easily. Apple promises a fix.

Unless these and other deficiencies are repaired, the PowerBook may wind up just another technology that was fast out of the gate but quickly became winded.

"The PowerBook is just not on the cutting edge anymore," Hartsook said. "Whether Apple can get [the edge] back is anyone's guess."

Apple excess inventory spawns Macintosh auctions

By James Daly

Spring cleaning is coming months early at Apple Computer, Inc., which, facing criticism in the analyst community, has scheduled three large auctions in an effort to clear tens of millions of dollars worth of excess older inventory from its warehouses.

Apple plans to offer more than 18,000 discontinued Macintoshes and peripherals at the auctions, which are scheduled for Nov. 20 in Des Plaines, Ill.; Dec. 4 in Framingham, Mass.; and Dec. 11 in Washington.

Apple plans to auction more than 18,000 discontinued Macintoshes and peripherals, all of which will be covered by Apple's one-year warranty.

"Apple is getting beaten up by the financial community because they are holding on to too much," said Eric Lewis, an analyst at International Data Corp. "Old PCs don't gain in value."

Among the items scheduled to go on the block are PowerBook Models 145, 160 and 170; Duo 210; Macintosh IISI; Apple IIG; assorted monitors; Macintosh Classic II; Quadra 700; CD-ROM drives; speakers; scanners; and printers. More than 6,000 machines and peripherals will be offered at each of the auction sites, which are located near Apple distribution centers.

Apple's software subsidiary, Claris Corp., will sell current application packages at previews the night before the Saturday auctions at their regular retail price.

No current desktop models will be offered, and all of the products will be covered by Apple's one-year warranty, said Apple spokeswoman Jayme Curtis. "Everything offered has been returned new from the dealer channel," she said. "These are all buy-backs."

Buyers will be charged a 5% commission for each item sold.

Lewis said the auctions are not expected to impact Macintosh dealer sales. "Apple is going to sell an estimated 3.5 million PCs this year," he said. "This represents about two-tenths of 1% — it's a drop in the bucket."

SAS ports management system to Mac

By Gary H. Anthes

CARY, N.C.

SAS Institute, Inc. has successfully ported the kernel of its system for information management, analysis and presentation to the Macintosh, and the company is now working on bringing up the graphical user interface.

SAS hopes to ship beta copies of SAS Mac by April, when it will hold its international user group meeting in Dallas. General availability is planned for a year from now.

Tom Cole, who heads the 12-person development effort, said the port is a challenge because of the size of SAS — more than 6 million lines of C code. However, he said all features in all 20 SAS products will be available on the Macintosh. "This will not be SAS lite," he said.

However, Cole cautioned that SAS will be viable only on Macintoshes with Motorola, Inc. 68030 or faster processors and will require a hardware floating-point unit.

Cole, manager of VMS/Macintosh research and development, said SAS Mac will run on Macintosh servers or desktop machines in ways that allow splitting of SAS processing across Apple Computer, Inc. networks or mixed networks containing MVS, Unix, OS/2 or Windows servers.

Predominant system

SAS is on Intel Corp.-based PCs at 98 Fortune 100 companies, Cole said. "But in upper management, they tend to have lots of Macs, and we'd like to deploy things like our [executive information system] technology on those desktops."

He declined to predict the demand for SAS Mac but said 10% of all PCs are Macintoshes. He said the company hopes to achieve penetration of the Macintosh market comparable to its reach into the IBM PC market. SAS now runs on Intel-based PCs at 12,000 sites, a SAS spokesman said.

SAS, *page 65*

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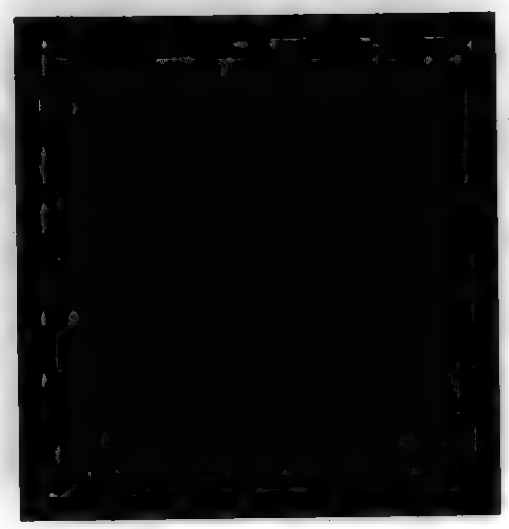

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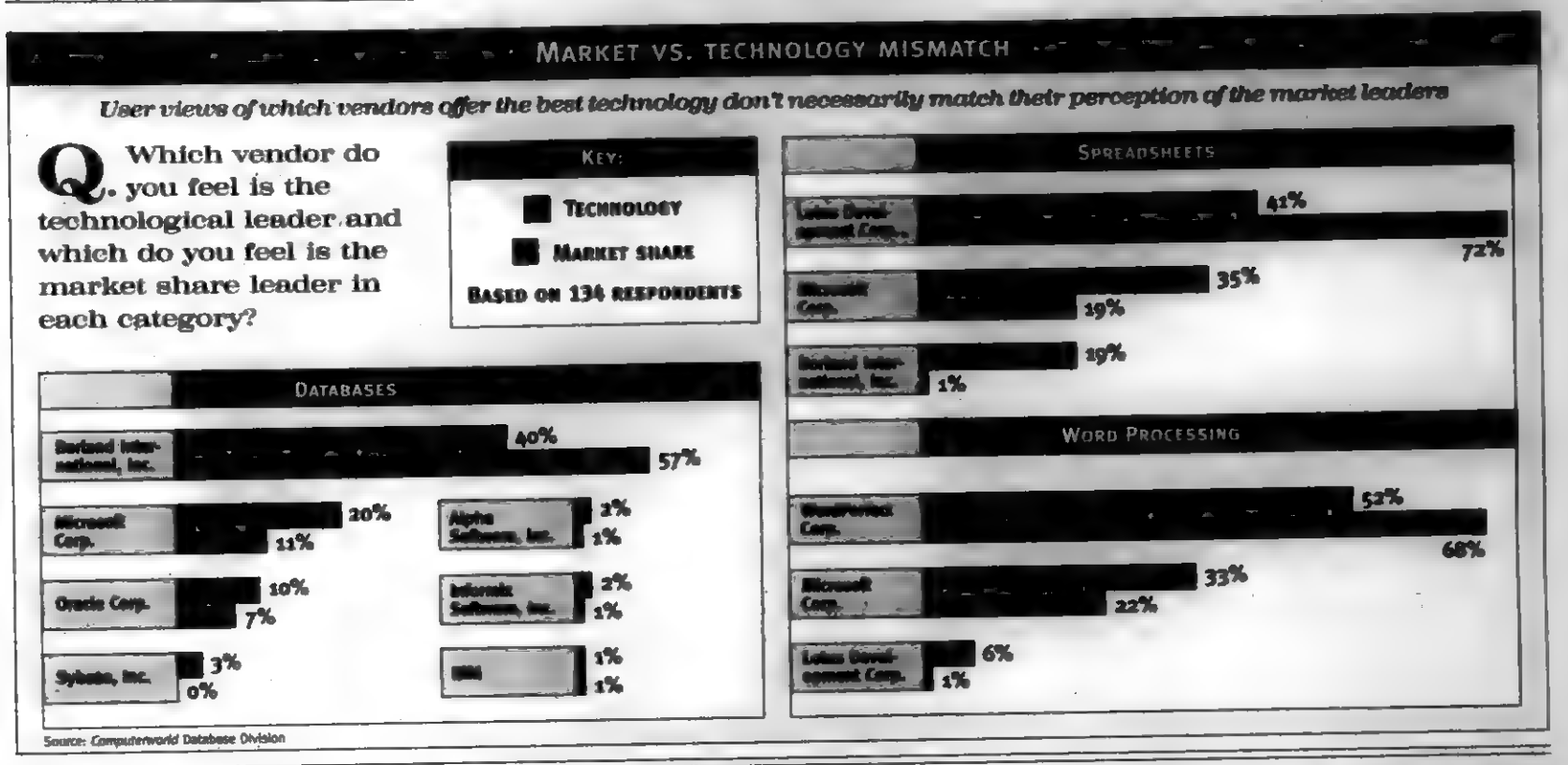

Source: Computerworld Database Division

SAS Mac

CONTINUED FROM PAGE 61

Celtrix Pharmaceutical, Inc. in Santa Clara, Calif., has SAS running on an OS/2-based PC but is mainly a Macintosh user company, said Mark Holdbrook, manager of clinical data processing.

Holdbrook said he might set up the Sun box as a SAS server and let his users access the database using their Macintoshes as X Window System terminals, or he might put SAS on the Macintoshes when the software is available. He said the latter approach would allow him to free up Sun compute cycles by distributing the SAS work load across the network.

Pricing for SAS Mac has not yet been determined but will be comparable in structure to pricing in existence for Windows-based SAS products, Cole said.

Although all of the details have not yet been worked out with Apple, Cole said SAS plans to support the new RISC PowerPC-based Macintosh when it makes the Motorola-based version of SAS available.

He said SAS will run in native mode on the PowerPC, not in emulation mode, as will be necessary for some Macintosh applications.

AutoDesk scales down AutoCAD

Lite version offers 3-D tools

By Ellis Booker

AutoDesk, Inc. recently introduced a scaled-down version of AutoCAD, its popular computer-aided design (CAD) software.

AutoCAD LT carries a recommended price of $495. The software uses the same .DWG file format as the industrial-strength AutoCAD system, for which there are more than 900,000 users worldwide, according to AutoDesk. That high-end package, which runs on many hardware and operating system platforms, sells for $3,750.

AutoCAD LT is aimed at architects, designers and engineers who need a design tool — or need to monitor the progress of AutoCAD drawings — but do not require AutoCAD's advanced features or application development tools.

The Windows software offers two-dimensional CAD features and 3-D CAD tools.

AutoCAD LT requires at least an Intel Corp. 80386 chip, MS-DOS 3.31, Windows 3.1, 4M bytes of RAM and 10M bytes of available hard disk space. The program also supports Windows' Object Linking and Embedding feature.

Separately last month, AutoDesk introduced Release 2.0 of AutoSketch, its Windows-based tool for precision 2-D drawing. The latest release, which will also be available in the fourth quarter, will be priced at $299.

Remote access

Stampede, Ocean Isle ready notebook software

By Michael Fitzgerald

Seeking to ride the surging notebook market, two remote access software makers recently made moves.

Stampede Technologies, Inc. in Dayton, Ohio, recently began shipping its Remote Office package, while Ocean Isle Software in Vero Beach, Fla., went into beta testing on a full Windows version of its Reach Out Remote Control and Total Remote software, said Doug Fowler, vice president of new product development.

Pricing on its Remote Office ranges from $395 for a two-user version to $9,499 for a 32-node version with an Ethernet adapter and DigiBoard communications hardware. Ocean Isle's software will be priced on release, but the stand-alone-oriented package will probably cost less than $200 at introduction. Fowler said it will support TCP/IP, run 25% faster than the current version and let users remotely access multiple applications.

Notebooks represent the fastest-growing part of the PC market, and users welcome the chance to have more remote access products.

"I'm certainly interested in something a little more user-friendly," said Randall Huber, director of information services at Audience Research & Development in Dallas. Huber said he is happy with the features and functionality of his remote access software, Symantec Corp.'s PC Anywhere, but thinks it is difficult to use.

Options galore

Analysts said the notebook market should create more choices in remote access software.

"These sorts of products will only become more important as things like the [Casio/Tandy Corp.] Zoomer proliferate," added Gerry Purdy, analyst at Pacific Group in Cupertino, Calif.

In the future, utilities that provide remote access capability may go away. Jeffrey Henning, an analyst at BIS Strategic Decisions in Norwell, Mass., said that while "remote access software is a key utility right now, eventually it'll get built right into the operating system."

Software AG tool eases load balancing

By Gary H. Anthes

Software AG of North America, Inc. announced Entire Reporting Workstation, a tool for Windows-based PCs that enables users to access, display and manipulate data for reporting and presentation in graphical or text formats.

Entire Reporting Workstation allows users to access enterprise data and bring it to their PCs for further processing and analysis. It works with Software AG's mainframe-based Super Natural reporting tool and its Entire Connection for Windows, a file transfer and electronic-mail product.

Without Entire Reporting Workstation, a PC user would simply get an IBM 3270-like finished report downloaded from the mainframe, generated by a character-based query tool that is harder to use, said Tony Cook, director of workstation marketing at Software AG.

By moving some processing from the mainframe server to the desktop, the product reduces network traffic and makes load balancing easier, Software AG said. It offers the consistency and security of a server-based system with the ease of use of a Windows application, the company said.

Reports can be exported to other Windows applications such as Microsoft Corp.'s Excel or Word, and files can be imported into the product from other applications. The product is intended for end users such as financial or market analysts, Cook said.

The product is sold in the U.S. by Professional Sales Solutions, Inc. in Warrendale, Pa. Single copies are available for $300.

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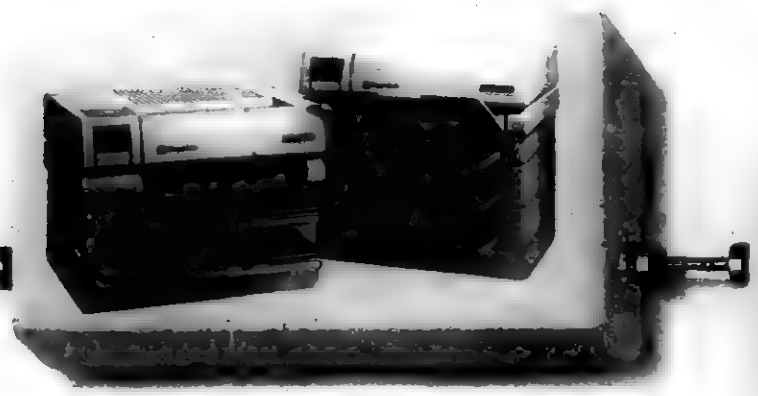

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HELP LINE

Part of an occasional series of columns aimed at providing users with answers to technical questions about their software. This week's questions and answers are provided by software services provider Corporate Software, Inc. in Canton, Mass.

Microsoft Corp.'s Excel for Windows Version 4.0:

Q. Is it possible to have a macro automatically execute when I open a file in Excel?
A. Yes, macros can be executed automatically when a file is opened. To do this, select Formula/Define Name and then enter Auto Open in the Name field. In the Refers To field, enter the address of the first cell in the macro with the file name included (for example, C:/EXCEL/MACRO 1.XLM! $AA1). Then save the file. When you open the file, Excel executes the macro referred to in the Auto Open range name.

Q. How can I extract records from a database located on another worksheet?
A. You can extract records from a database located on another worksheet or macro sheet if you specify an external reference formula for the name Database in the Define Name dialog box. This is useful when you're working with a very large database. The criteria range and the extract range must reside on the same worksheet. An example of an external reference formula for the range name Database might be (=DATA.XLS!$A$1:$G$100). The only range name that has an external reference is Database; Criteria and Extract are on the active or current worksheet.

Q. After I type a number into a cell, I want to be able to press Enter and have the cursor remain in the same cell. Is this possible?
A. Yes. Select Options/Workspace and deselect Move After Enter. When you press Enter, the cursor will now remain in the same cell.

Microsoft's Excel for the Macintosh Version 4.0:

Q. Can I have the macros from my macro sheet available without having to actually open the macro file?
A. Yes. Move the file containing the macros into the Excel Startup Folder, which is located in the System Folder. When Excel is started, choose Macro/Run, and the macros in the macro sheet will be available.

Lotus Development Corp.'s 1-2-3 for Windows Version 1.X:

Q. How can I print the actual formulas that I have entered in a spreadsheet?
A. To print out the formulas of a spreadsheet, select the range you want to print. Then select Range/Format and choose the Text option. The formulas will be displayed on the spreadsheet, and you can now print them. To set the spreadsheet back to normal, reselect the range, then choose Format and General from the Range menu.

Microsoft's Windows Version 3.1:

Q. Is there anything I should consider when installing Microsoft's Windows on a machine running QEMM-386?
A. To install Windows on a machine where QEMM-386 is installed, leave the QEMM-386 drivers installed and active on your machine. The Windows Setup program detects QEMM-386 and installs Windows in a way that maintains complete compatibility.

After Windows is installed, run the QWINFIX program in the QEMM directory, which adds the entry SYSTEMROMBREAKPOINT=FALSE to the [386enh] section of the SYSTEM.INI file so that Windows can support the QEMM-386 stealth feature. Run the Optimize program in the QEMM directory to ensure that the system is still configured properly after Windows adds or updates drivers in CONFIG.SYS or AUTOEXEC.BAT.

Q. What is the meaning of the "general protection fault" error message?
A. A general protection fault occurs only in the standard and enhanced modes of Windows. This error message indicates that something unexpected has happened within the Windows environment — usually an improper memory access. In other words, a program running in the Windows environment has made a call to a location in memory that it cannot access, thus overwriting and corrupting the program code that already resides in that area of memory.

Since all memory management in Windows is supposed to be handled by the Windows environment itself, when applications or Windows components directly access memory, the result is often a general protection fault.

Q. What is the meaning of the "system integrity violation" error message?
A. A system integrity violation is a message that indicates a general protection violation by an MS-DOS-based application. Similar to the general protection fault, the system integrity violation indicates that the DOS application is accessing memory that does not belong to it.

Since Windows is managing memory in this situation, the DOS application's memory access will corrupt Windows program code or vital data. Windows generates an application execution error and terminates the application. This message can also occur when an MS-DOS application tries to access a system's hardware component directly.

Lotus' Freelance Graphics for Windows Version 2.0:

Q. How can I change the default fonts for a presentation in Freelance Graphics?
A. Select a font from the Default Attribute option under the Style menu. This selection will change the default font for the current presentation. To change the default font for new presentations, edit the slide master's default font by opening the slide master and selecting a new default font.

Novell, Inc.'s NetWare Version 4.0:

Q. How can I change the server license on a Novell NetWare 4.0 server?
A. To change the server license on a Novell NetWare 4.0 server, enter LOAD INSTALL-M at the server prompt.

Intel/AMD clash generates user benefits

By Michael Fitzgerald
SANTA CLARA, CALIF.

Sometimes a computer industry spitting match can bring good things to users, as evidenced by Intel Corp. and Advanced Micro Devices, Inc.

Intel's battle with AMD on the processor side has led to lower system prices for users. PCMCIA is the current target for Intel and AMD's challenge match. The two recently bumped the PCMCIA market forward, Intel with new PC cards and flash memory chips that hold more information and AMD with a lower-voltage flash chip that will suck less power from portable computer batteries.

Intel added 16M- and 32M-bit flash parts to its line, incorporating a new technique called dual-die packaging to build the 32M-bit flash memory chip in the same size package as its lower-capacity brethren. It also introduced flash cards that hold up to 40M bytes of data and enhanced its cards to support up to 1 million read/write cycles. Pairing up with Conner Peripherals, Inc., Intel introduced AT-bus Attachment cards with 5M and 10M bytes of capacity.

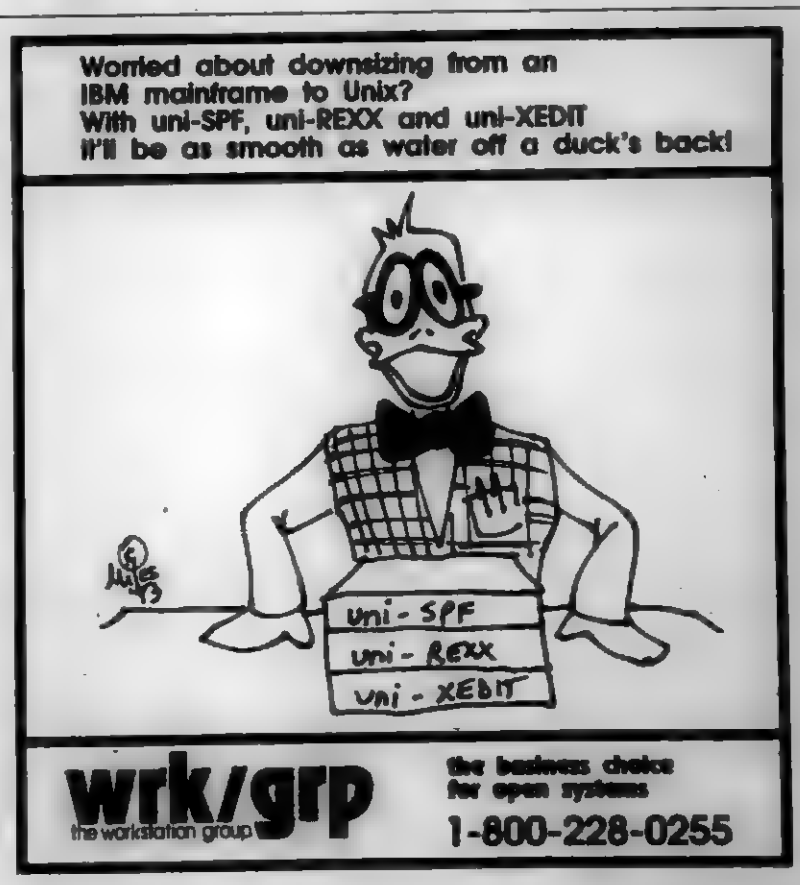
The 16M-bit parts are available now, while the 32M-bit parts, the new cards and the new drives are scheduled to become available late in the fourth quarter or in the first quarter of 1994. Steep pricing for user-oriented products continues, however, with a 4M-byte card costing $220 in units of a thousand, a 20M-byte card costing $925 and a 40M-byte card $1,895. The 5M- and 10M-byte drives cost $310 and $475, respectively.

Meanwhile, AMD took the low end, bringing out a 4M-bit flash part that runs at 5V. The 4M-bit flash components market is expected to be a high-volume arena this year, and the low-volt aspect could mean good things for users shocked by the power drain caused by PC cards. While Intel's new parts are capable of running in 5V or 3.3V systems, they are 12V parts.

In a related announcement, Microsoft Corp. said SystemSoft Corp. in Natick, Mass., will distribute the Microsoft Flash File system and take over development of Flash File. Flash File, which controls the way the operating system reads PCMCIA cards, will become part of SystemSoft's CardSoft PCMCIA support software.

Intel is interested in flash partly because it presents the company with an opportunity to get back into the memory market, a market it created but later ceded to the Japanese. Gordon Moore, Intel's chairman, said flash "has an excellent chance of being bigger than DRAM."

While the most visible market for flash is in PCMCIA memory cards, peripherals and drives, the largest volume comes from components in conventional hard disk drives, modems, digital cellular telephones and PCs.



Virtual reality, real money

Japan's Matsushita hopes virtual reality support system will double sales

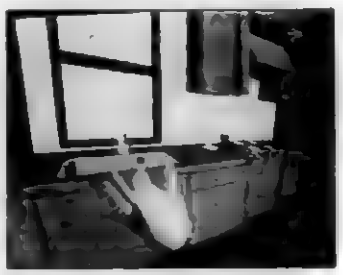
By David Kellar

Virtual reality is ready to take a step into the commercial home electronics market. Next spring, Matsushita Electric Works Ltd. in Osaka, Japan, will deploy virtual reality decision-support systems at its product showrooms throughout Japan to help homeowners visualize their new kitchens before ordering.

Newly developed home fitness and relaxation products that promise to provide consumers with a mind-soothing place to escape from the hustle and bustle of the workaday world are also set for release early next year.

Advanced technology

With the kitchen system, Matsushita — a sister firm of electrical giant Matsushita Electric Industrial Co. and one recognized by analysts in Japan as a pioneer in virtual reality — hopes to assure a buyer that the planned arrangement of cabinets, counters and appliances really works as the buyer imagines. The needed confidence is provided by a virtual space decision-support system called Viva (Virtual Reality for Vivid A&I space system), which takes customers into a virtual kitchen generated from their plans. Matsushita offers more than 30,000 kitchen products, presenting an infinite number of layout possibilities.



Viva leads customers into a virtual kitchen from their own plans

"The ability to 'feel' the room gives the customer confidence that the design is right and helps catch potential problems before the kitchen is built," explained Junji Nomura, senior staff researcher directing virtual reality systems development at Matsushita's virtual reality research and development group.

Increased customer confidence translates into increased sales: On average, 80% of those who use the virtual reality simulation system place kitchen orders, Nomura claims. For those who do not use virtual reality, the figure is 35%.

Touted as "the first commercial application of virtual reality in the world," Viva lets potential system kitchen buyers walk around, open cabinets, check the counter height, turn on faucets and view the room from different angles in three-dimensional space. A Silicon Graphics, Inc. (SGI) workstation generates 3-D graphics in real time according to movement commands sent from a data glove and an "eyephone" goggle/headset that immerses the user in images and sound.

Though currently shackled by expensive computer hardware, mediocre image quality and a heavy, unwieldy headset, the Viva system — which has been in trial use at Matsushita's Tokyo showroom since 1991 — will soon undergo a major technological evolvement that Nomura claims will solve these problems and pave the way for deployment of the system in showrooms throughout Japan.

A Silicon Graphics, Inc. *workstation generates graphics that immerse the user in images*

"We've spent the last three years developing and improving the system, identifying problems and making sure that we can actually reproduce virtual models of the kitchens that our customers design," Nomura said.

Bringing down costs

To achieve the price/performance necessary for full-fledged deployment, Matsushita engineers are harnessing Intel Corp. Pentium power to develop a low-cost version of the Viva system. When it is complete, Nomura said he expects to achieve a per-system cost of about $90,000 — approximately one-tenth the cost of the SGI-based prototype.

On the software side, the company is switching from VPL Research, Inc.'s Reality Built for ▮ platform to Sense Eight's PC-based World Tool Kit. Programmers are working overtime to write World Tool Kit-based versions of the Viva programs — nearly 80% are applications originally developed by Matsushita.

Since even a graphics-tuned Pentium is slower — 30% slower, according to Nomura — than the SGI/VPL system, techniques such as texture mapping will be incorporated in the new system to reduce the polygon processing load. Texture mapping will also provide the extra benefit of adding patterns for more realistic images.

The heavy (2 kilogram) and expensive ($35,000) VPL Eyephone used will be replaced by the lightweight (350 grams) and inexpensive ($2,000) goggles Matsushita developed for its consumer-use virtual reality products (see box below). Although the image resolution of the new goggles will initially be the same as the current system — about 100,000 pixels — Nomura said he expects near-term advances in LCD technology to enable improvement to television-quality, 250,000-pixel resolution by the end of 1994 and to high-definition, 1 million-pixel resolution in the next few years.

Nomura said Matsushita's most difficult technical challenge in developing Viva into a commercially viable virtual reality system was streamlining the data input and management process.

Entering the vast amount of graphics data necessary for the virtual reality image database is by far the most time-consuming factor in creating a virtual reality application. When the University of North Carolina, which is active in virtual reality research, prepares its virtual reality demonstrations, for example, data input can sometimes take several months, Nomura said.

"That's OK for a demonstration, but when using a virtual reality system for business purposes, it's just not practical," he said.

For Matsushita's Viva system, the data input process involves converting 2-D computer-aided design drawings of kitchen components into the 3-D image data required by the virtual reality system, then linking the objects together into a contiguous whole.

Kellar is Tokyo correspondent at the IDG News Service.

Cycle into cyberspace

While virtual reality has proved to be a boost to Matsushita Electric Works' bottom line as a sales support tool, its real potential profitability lies in applications that can be mass-produced and sold to the consuming public, according to Matsushita officials.

Matsushita will make its first foray into this promising area next spring with the release of two products that apply virtual reality to the aid of fitness and health.

The "Relax-Refresh Lounger" is a massaging chair that uses virtual reality images and sound to help relax the user. It monitors the user's pulse rate and automatically controls the images and sound to match the user's body condition and state of consciousness for maximum effect. The 3-D image software sold on videocassette tape is played on a conventional VCR connected to the system.

The "Cycling Machine" is an exercise bike that lets the user cycle through a 3-D virtual world while exercising. Inside the computer-generated world, the rider must avoid obstacles such as buildings and cars. Bike speed changes according to the pedaling speed, and pedal resistance varies according to the surface of the road.

— David Kellar

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[redacted]

Keyfile Corp. has introduced Keyfile Version 2.2, integrated document management software.

According to the Nashua, N.H., company, the product enables organizations to distribute Keyfile document servers to users anywhere across their enterprise networks.

Version 2.2 supports TCP/IP and Banyan Systems, Inc.'s Vines network protocols, and the product features true WYSIWYG TypeMatic comments, improved Tag Image File Format, Internet electronic mail and an enhanced briefcase capability.

The Keyfile workgroup edition costs $2,995. The keyfile enterprise edition, consisting of the client and server, is priced at $995 and $4,995, respectively.

▶ *Keyfile*
(603) 883-3800

Systems Compatibility Corp. has introduced Soft Bridge 6.0, a file-conversion program for PCs that supports more than 100 DOS, Windows and Macintosh file formats.

According to the Chicago company, Version 6.0 can convert 13 new files, including WordPerfect Corp.'s WordPerfect 6.0 for DOS and Windows, Word 6.0 for DOS and all versions of Lotus Development Corp.'s Ami Pro.

The product converts files into a user-selected word processing format from more than 100 word processing, database and spreadsheet programs.

Soft Bridge 6.0 costs $99.

▶ *Systems Compatibility*
(312) 329-0700

Central Point Software, Inc. has announced PC Tools Pro 9.0 for DOS, which includes CPR, a work-recovery utility capable of restoring unsaved work-in-progress after a system crash or power failure occurs.

According to the Beaverton, Ore., company, PC Tools Pro 9.0 for DOS features support for DoubleSpace and Stacker drives and large disks up to 2G bytes, critical-error messaging for LAN administrators, integrated hardware diagnostics and expanded protection against unknown viruses.

The product costs $179.95.

▶ *Central Point Software*
(503) 690-8088

Stylus Innovation, Inc. has announced Visual Voice, a Visual Basic custom control and graphical workbench.

According to the Cambridge, Mass., company, the product allows developers to build sophisticated, PC-based voice-processing applications.

Users can create applications such as Touch-Tone order entry, voice mail and fax-on-demand. The product offers functions such as waiting for inbound calls and detecting ringing connection; line dropping; playing and recording voice files; making outbound calls; and detecting busy signals.

Visual Voice offers an introductory price of $495.

▶ *Stylus Innovation*
(617) 621-9545

The Molloy Group, Inc. has introduced Top of Mind Help Desk for Windows, a software system based on cognitive processing.

According to the Parsippany, N.J., company, the software provides users with accurate, up-to-date answers to problems, while gathering and storing precise data about user needs.

Instead of working with existing "expert" systems, Top of Mind employs a self-learning cognitive processing system that gives users automatic access to problem resolutions.

A single-user workstation is priced at $4,500. A 15-user LAN version costs $22,500.

▶ *The Molloy Group*
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Using the 32-bit file system from our Chicago project, Windows for Workgroups performs 50% faster on disk-intensive tasks and over 100% faster than the previous version of Windows for Workgroups when accessing the network. Who knows, it may just make your office that much more productive.

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running Windows for Workgroups 3.11.

For more information or the name of your local reseller, call (800) 426-9400. And let new Windows for Workgroups 3.11 get your PC up to speed.

Microsoft Windows for Workgroups

Microsoft

The disk I/O performance gains represented were measured with Disk WinMark™ performance tests using WinBench™ version 3.11 from Ziff-Davis Labs. Two test configurations were used and the performance results averaged to produce a single percentage: Northgate® Slimline 320 with Intel® 80386/20 CPU, 8MB RAM, 2048KB RAM Cache, 200MB hard disk, IDE controller, and no hardware disk cache; Zenith® Znote 425L with Intel 80486/25 CPU, 4MB RAM, 512KB RAM Cache (SmartDrive 5.0 with Windows 3.1, 32-bit file access with Windows for Workgroups 3.11), 200MB hard disk, IDE controller and no hardware disk cache. Tests were run using shipping versions of Windows 3.1, Windows for Workgroups 3.11 and MS-DOS® 6.2. Tests not independently verified by Ziff Communications Company. Zenith is a registered trademark of Zenith Electronics Corporation. Intel is a registered trademark of Intel Corporation. WinMark and WinBench are trademarks of Ziff-Davis. Northgate is a registered trademark of Northgate Computer Systems, Inc.

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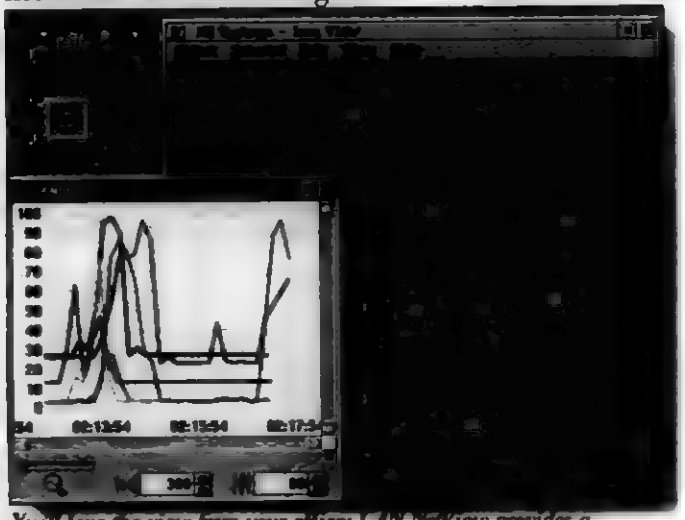

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IBM

Windows for Workgroups faces off with Novell

By Ed Scannell

■ Trying to make the market forget about the first version of Windows for Workgroups, Microsoft Corp. last week formally rolled out a more robust successor that will face direct competition from Novell, Inc.

Unlike the first version, Windows for Workgroups Version 3.11 appears to have an enthusiastic backing from some Top 10 hardware manufacturers, which plan to bundle it with both server and desktop systems.

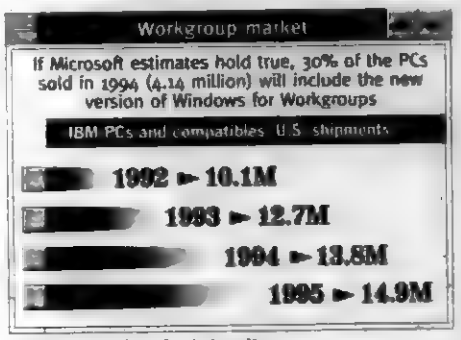
With that kind of support, Microsoft believes it can far exceed the 1 million copies it sold of the first version. In fact, Microsoft officials have said in internal communications that they expect Version 3.11 will ship with 30% of all PCs during the next year.

Besides grabbing a healthy piece of the peer-to-peer networking market, Microsoft wants Version 3.11 to give users a taste of what the 32-bit Windows 4.0, code-named Chicago, will be like.

One of the technical highlights of Version 3.11 is its 32-bit file system, which is being drawn from Chicago. That file system, along with other improvements, makes Version 3.11 up to 100% faster in many applications than the current Windows 3.1.

All of the program's networking components, including its redirector and NetBEUI transport for supporting Novell, Inc.'s NetWare, are also 32 bit.

"I am recommending it for a lot of our users because our company is transitioning up to networks over the course of 1994, and this [Windows for Workgroups] makes it a lot easier," said Tom Gibson, PC coordinator at Weyerhaeuser, Inc. in Portland, Ore.



International Data Corp., Framingham, Mass.

What may also make Windows for Workgroups appealing as a bundled product to many information systems shops is that it gives users access to a 32-bit file system without requiring them to be on a network. This will give IS managers the option of installing Windows for Workgroups as a stand-alone program.

"MIS is scared to death of Windows for Workgroups. They don't want all these networks scattered about," said Kimball Brown, an analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif.

While Microsoft has an advantage with the hundreds of OEM bundling agreements in place for DOS and Windows 3.1, some observers said they believe Novell could make things interesting in some corners of the corporate market.

Expected to ship in the next month, Novell's DOS 7.0 combines an improved version of DR DOS 6.0 with Personal NetWare.

DOS 7.0 features

Unlike DOS 6.2, the Novell product can multitask many applications in character mode in the background. Its other advantage, according to analysts, is that IS managers also have the option of turning one of the peer systems into a server on the network.

"You can take a peer and load it up with files that anyone [on the network] can access just like a server," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington. "And priced at $69, it is not a bad deal. Of course, they are not going to be able to compete against Microsoft with OEM deals."

However, one DOS 7.0 feature that Novell is touting as a major advantage could turn out to be a stumbling block.

Version 7.0 contains a new DOS Protected Mode Services (DPMS) programming interface that helps alleviate the perpetual memory-crunch problem that DOS presents. However, the new 16-bit model may not be fully compatible with Microsoft's 32-bit virtual device drivers in Windows for Workgroups.

"Their DPMS model is interesting, but the question is, are they inventing a whole new standard for device drivers where people have to go back and rewrite their device drivers?" asked Rogers Weed, product marketing manager for Windows for Workgroups.

Aside from not being 32 bit, Novell DOS 7.0's DPMS programming interface should not cause users any compatibility problems with Windows for Workgroups, Novell officials said.

"The NetWare clients can take advantage of their virtual device drivers, and our server doesn't need to use them, so there should be no incompatibilities," said John Linney, line product manager for DOS 7.0.

Despite the odds, Novell may be able to effectively leverage DOS 7.0's network orientation against Microsoft in larger accounts where NetWare plays a strategic role in the enterprise.

"With just print and file [server capabilities]— never mind the sexier stuff— I think they can make this a winner," Dzubeck said.

Start-up readies Windows BBS

By Michael Vizard

A small start-up last week launched Channels, an interactive bulletin board system for Windows said to provide — at a substantially lower cost — many of the popular features found in Lotus Development Corp.'s Notes groupware package.

Team Software, Inc. in Houston built Channels around a database engine from Raima Corp. that allows multiple users to log in to a discussion in real time. Users can then post a comment, add a document via electronic mail or chat on-line with other users.

Through December, Channels costs $395 for a 10-user starter pack. In January, the price will increase by $200. Notes is priced at $495 per user.

Channels "kind of" combines the functions of a chat utility with the discussion database associated with Notes, said Bob Flanagan, an industry analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

He predicted that Channels will probably make a solid low-cost alternative for customers who only need an interactive discussion database. In contrast, the discussion database in Notes is augmented with a set of application development tools that will allow sites to build a richer set of office automation applications.

Windows BBS, *page 77*

Bank treasures Unix system

Plans to promote the use of open systems servers

By Jean S. Bozman

Until recently, Sanwa Bank California was a traditional mainframe operation that did not want to be on the leading edge of technology. But a Unix-based packaged system in its treasury department and the start-up of a custom Unix system in June have shown information systems managers the promise of a new tier of midrange servers between PCs and data center mainframes.

In one stroke, the Unix-based treasury system, first installed 18 months ago, has reduced the IS department's application backlog and made data more accessible to financial traders. But it also has had unintended benefits, such as a greater sense of independence and control for its end users.

The packaged InTrader system from Digital Solutions, Inc. in Bloomington, Minn., (recently acquired by Sungard Financial Systems, Inc.) runs on four Hewlett-Packard Co. Series 700 Unix workstations, about 35 X Window System terminals and a Progress Corp. relational database. The same Unix workstation network hosts a 5-month-old custom-built wholesale currency system, which is based on the Oracle Corp. database.

In control

About 15 of the bank's traders use the InTrader application, while five traders use the homegrown currency system.

"We're a self-supporting unit now," said John Precopio, an assistant vice president at the bank's treasury division and the treasury system's coordinator. "We're learning about the network, how to support Unix, writing programs and supporting programs," he said. "The old system was run by a service bureau, and we had to go by their rules. We're in control now, and we have more access to our own data."

Traders are more involved with data, keying in transactions on bonds, treasury bills and Eurodollars rather than writing them down on slips of paper for others to input. "The traders are on the front end, entering transactions," Preco-

Bank, *page 80*

ON SITE

Sanwa Bank California
Los Angeles

Challenge: To begin operation of a Unix-based treasury system that invests millions of dollars for top corporate customers, yet maintain links to the data center.

Strategy: To buy packaged software, relational databases and the Unix system and to leverage investments by updating mainframe databases.

Results: Users are able to manipulate data and create custom reports.

Work flow

Document management system firms prep upgrades

By Michael Vizard

■ Leading PC document management systems vendors are set to escalate their battle for market share with major upgrades of their products over the next two months.

The enhancements will focus primarily on adding the ability for multiple authors to work on the same document simultaneously by including support for synchronized replication and integration with Notes.

"As we move into workgroup computing, these kinds of abilities will be critical. A large percentage of documents are now created by multiple people," said Carl Frappaolo, a vice president at the Delphi Consulting Group in Boston.

Leader of the pack

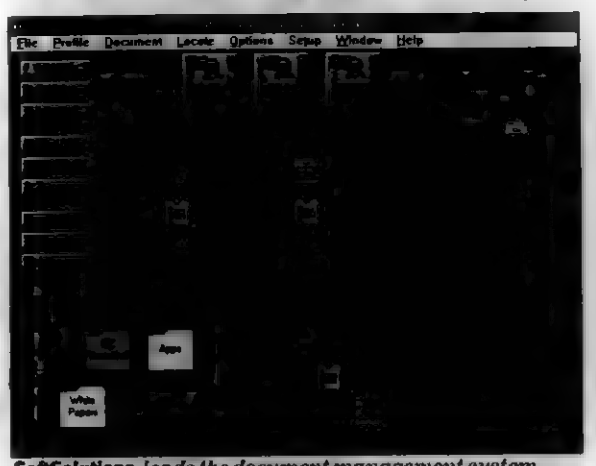
Leading the way is SoftSolutions Technology Corp. in Orem, Utah, which last week was acquired by WordPerfect Corp. Last week, SoftSolutions announced that next month it will ship Version 4.0 of its namesake document management software. Version 4.0 will include support for Notes, work-flow software from Reach Software, Inc. and partial support for Version 2.0 of the Object Linking and Embedding (OLE) interface. Also included will be support for a customizable interface, replication of document libraries to remote sites and support for SQL.

PC Docs, Inc. in Tallahassee, Fla., meanwhile, will announce at Comdex/Fall '93 that its next release will support Notes and replication. And next month, Saros Corp. in Bellevue, Wash., will ship its first commercial document management system on top of its Mezzanine object database, which allows its document management system to support multiple data types and OLE 2.0.

"Document management systems are really good at managing the active work flow of creating documents across teams and boundaries. Once completed, we want to use Notes as a knowledge base for those documents," said Sally Gonzalez, manager of firmwide proactive systems at Jones, Day, Reavis and Pogue, a law firm in Cleveland.

SoftSolutions is identified as the market leader, with a 59% share of the document management system market, followed by PC Docs with a 21% share and Saros with a 7% share, according to International Data Corp.

But some SoftSolutions users said the company's rapid growth is exceeding its ability to support its software. "They are going through a lot of growing pains and are having a difficult time managing their programming life cycle," said Gary Faulk, a PC application specialist at Nixon, Hargrave, Devans and Doyle, a law firm in Rochester, N.Y.



SoftSolutions *leads the document management system market, but some say growth has affected its support*

Against upgrades

According to Faulk, who manages more than 600 PCs running word processing software from WordPerfect, PC databases and the SoftSolutions document management system, the company has been telling him to upgrade to a new version rather than fix existing software.

"For us, an upgrade means new training and support costs to install it. And when the new release comes out, it will have problems, so it becomes an endless loop. I think they should focus on fixing the existing software," Faulk said.

During the past year, SoftSolutions has delivered two bug fixes, a point upgrade and now a major release, he noted. But Faulk said his firm is not likely to switch vendors because of the massive investment in the SoftSolutions system.

Windows BBS

CONTINUED FROM PAGE 75

For example, Elf Acquitane, the French national oil company, is running 10 Channels databases on a PC server in its Geneva offices. Using TCP/IP, up to 80 traders in Houston, Paris, Madrid, Singapore, London and Santiago, Chile, use the system to exchange documents and have on-line conversations.

"We needed to be able to share information on a real-time basis, and we didn't need all the capability of a Lotus Notes. We simply wanted to keep people informed. With Channels, all you have to do is write a macro and your document is sent to the database via electronic mail," said Xavier Sanz y Prast, information systems manager for international supply, trading and shipping.

Team Software President Sean Doherty said his company plans to focus on providing workgroup applications for the Windows market only and that it has no plans to build an application development environment around its products.

At the same time, Doherty said he did not know what effect Microsoft Corp.'s forthcoming Electronic Mail Server for Windows NT, which is expected to include support for a built-in bulletin board system, will have on his sales.

COSE not expected to ship until mid-1994

By Jean S. Bozman

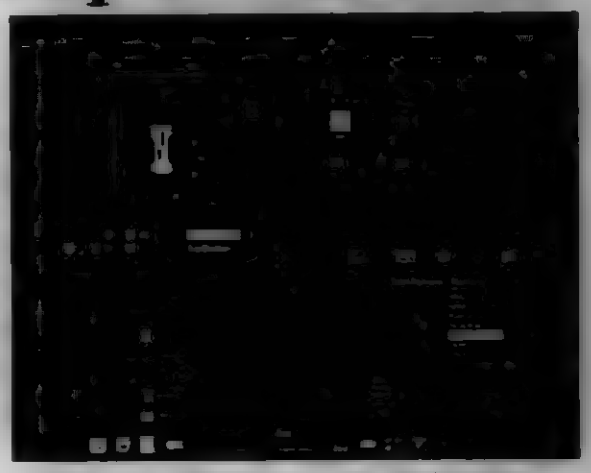
The look-alike graphical user interface for Unix systems, the Common Desktop Environment (CDE), will not be finalized until year's end, Unix vendors said last week. So corporate software developers who want to build CDE-compatible applications will have to work with sample CDE "implementations" released on a CD-ROM disk at a recent developers conference in San Jose, Calif.

Vendors' versions of the CDE code, due by mid-1994, will allow developers to write an application and deploy it on many Unix platforms. "Software developers could simply recompile when going from one platform to another," said David Smith, a senior Unix analyst at International Data Corp. in Framingham, Mass. "It would mean less costly software that would look and feel the same, regardless of what system it runs on." The compilers will be shipped with Unix vendors' operating systems.

For now, developers can prototype CDE-compatible applications, said Becky Austen, manager of AIX desktop products at IBM's Advanced Workstations and Systems Division in Austin, Texas. "The code is in an early form, and we would not suggest that people start developing production applications," Austen said.

The CDE disk contains sample code for systems made by Common Open Software Environment (COSE) founders Hewlett-Packard Co., IBM, SunSoft, Inc., Novell, Inc. and The Santa Cruz Operation.

UniForum in Santa Clara, Calif., distributed more than 1,100 CD-ROM disks at the CDE conference, but users can obtain more disks from the COSE vendors and UniForm.



CDE sample code *will let developers begin pilot projects*

By January, the Unix vendors who launched COSE expect to finish the final CDE specification, the CDE application programming interfaces and the underlying CDE code. If all goes as planned, CDE will be submitted to the X/Open Co. for review and testing and will be ready for vendor shipment by mid-1994.

Some users at large Unix sites said they are concerned that it will be hard to make many changes in CDE specifications. "I have the sense that they're moving in the right direction," said David Grubb, manager for standards and technology at Lawrence Livermore National Laboratory in Calif. "At this point, it's kind of like standing in front of a semi-truck and saying, 'Stop.' "

But vendors insist that the X/Open process includes user feedback. "X/Open has many people in the working groups who do not work for our companies," said Josina Arfman, an IBM program manager.

Unisys takes client/server a step at a time

By Stephen P. Klett Jr.

In an effort to breathe new life into its proprietary CTOS operating system, Unisys Corp. has rolled out a client/server strategy replete with a new business unit, PCs, servers and software.

Unisys' strategy divides the client/server market into four target markets: downsizing, upsizing, networked PCs and replicated client/server. The company will focus its CTOS efforts on the latter, which is mainly composed of sites that have end-user services at branch offices and require systems that are easy to use and install — which Unisys sees as CTOS' strength.

"Our plan of attack is not to attack the total $100 billion client/server market but to take one target market at a time," starting with replicated client/server, said Donald E. Coleman, president of the new Unisys Client/Server Systems Integrated Business Unit in San Jose, Calif.

Coleman acknowledged that a key to CTOS' survival — holding on to existing users while attracting new ones — is its ability to interoperate with Unix and Windows. During the first half of next year, the company plans to announce tighter Windows integration that will allow users to drag and drop between CTOS and Windows applications.

On the Unix side, Unisys announced availability of the Enhanced SNA software suite, which was designed to improve connectivity between Unix-based U6000 series systems and IBM SNA networks.

Unisys also rolled out additions to its CTOS SuperGen product line and PW2 Advantage PCs.

"Unisys has put some real teeth behind its client/server push," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass.

Ready to commit

Christiansen said that Unisys needed to put the lines together under one business unit in order to convince users of its commitment to client/server.

"This turns their client/server push from a marketing club into a corporate business," he said. " It's one thing for a marketing message to fail — it's quite another for a business unit to fail."

The CTOS SuperGen line includes six new family members, ranging from Intel Corp. I486- and Pentium-based multiprocessing servers, priced between $4,400 and $11,400, to an I486SL-based notebook, which starts at $2,800.

Unisys also unveiled 10 additions to the PW2 Advantage series of PCs. The new machines include Pentium-based servers and workstations with integrated networking capabilities, new and enhanced midrange servers and desktops and a new line of entry-level, Energy Star-compliant systems starting at $799.

Aiming high

Unisys has set ambitious goals for its client/server unit. Unisys plans to derive 20% of its revenue from the unit within three years. Analysts place the figure at less than 10% today.

The systems run Microsoft Corp.'s MS-DOS, Windows and Windows NT Advanced Server; Novell, Inc.'s NetWare and UnixWare; The Santa Cruz Operation's SCO Unix; and IBM's OS/2.

Christiansen said that despite CTOS' installed base of one million, the platform is still unknown.

"CTOS doesn't have a lot of the buzzwords but it works incredibly well in a distributed environment," he said. "A big negative has been its proprietary nature, and Unisys is chipping away at this by putting it on Intel and integrating it with Windows."

While analysts said it appears that Unisys has put the right client/server lineup together, they said it still has to solve the problem of communicating its strategy to users. Toward this end, Coleman said the client/server unit will have a dedicated sales force with focused programs designed to push its products for each target market through both direct and "alternate channels."

While CTOS may not enjoy much time in the limelight, it is a hit at Lib/Go Travel, Inc. in Ramsey, N.J. The company has been using CTOS to run its mission-critical marketing and accounting applications for eight years and recently converted an I486-based SG6000 server to a Pentium-based SG7000, according to Robert H. Dever, vice president of information services.

Dever said that about a year ago Lib/Go began writing applications with Mapper, Unisys' fourth-generation language, which dramatically improved performance but has also spawned a deluge of new requests and raised applications' complexity levels.

Lib/Go chose to stick with CTOS in order to meet its distributed computing needs because it felt it was the most stable option available, Dever said. "What CTOS brings to the party is an OS that's been around for 10 to 12 years and has the maturity that length of time can bring," he said.

David Coursey

Keeping up with success

To say WordPerfect has been surprised by the success of its Office 4.0 electronic-mail/calendaring/scheduling system would be an understatement of some magnitude. Understanding this requires a trip to the third floor of Building M at the company's cookie-cutter campus in Orem, Utah, a 45-minute drive south of the Salt Lake City airport.

There, on a Friday morning last month, I found a development and support building that, judging by the way folks were running around, might have been on fire. Of course, had this been an actual emergency, no one would have noticed until one of the mail servers — how many were there, three dozen? — had begun to smoke.

Crammed into a former conference room, these systems provide messaging and calendaring for the company's 5,700 worldwide employees and serve as the most important testbed for Office 4.0 and its successors. (And no, it doesn't take that many machines for you to support a like number of users. They really do run some of everything they sell.)

It was in this room, called the "war room" by the development team, that I realized how sudden the success has been for Office, which now claims some 2 million users (400,000 of them added since June). WordPerfect seems committed to being a leader in desktop services such as messaging, calendaring and forms automation. The company also has a long and commendable history of desktop and server multiculturalism.

The downside of supporting multiple platforms is that today's most optimized Office installation would combine a NetWare Loadable Module (NLM) post office with OS/2-based gateway services and a collection of DOS, Macintosh and Windows clients. Even less optimized mail systems probably use two operating systems, with OS/2 likely to turn up some place regardless of what you're using. And since the NLM runs like a scalded primate, even sites that aren't wild about NetWare might set up a server or two just for WordPerfect Office.

Having created the kind of environment that spawns complexity, WordPerfect must make it a major priority to come up with a configuration that won't require a mail administrator to understand the guts of multiple operating systems. And there are other must-dos as well, such as improving the Macintosh client, adding still more Unix support and implementing a shopping list of features (some pretty cool) that are still on the Top Secret list. Software is being updated quarterly for some pieces, and you need a scorecard to keep track of all the beta releases, current and expected.

The developers are also working to build third-party relationships for add-on hardware and applications, while the top brass is eyeing what it will take to get the value-added reseller (VAR) and systems integrator support that could really propel the product into orbit.

Reinforcements on the way

If all this sounds confusing and hectic, it is. People here just can't seem to sit still. They know and, what's even rarer, they admit that they have lots of catching up to do. They don't balk at a recently published review that gave them low marks for installation support but simply concede that they didn't expect to be such a success and are coping as best they can. Reinforcements are reportedly on the way, and the company says it believes VAR and systems integrator support would provide the kind of installation hand-holding many customers desire and are quite willing to pay for.

A new name would also help. The first WordPerfect Office was developed before "office" became synonymous with "suite," but that doesn't change the fact that most people, when they hear the name, assume the product is a suite and that they have to have WordPerfect, the word processor, to use it.

In fact, the integrated E-mail, calendaring and scheduling package runs just fine with Microsoft Word, Ami Pro or whatever Unix geeks run these days.

WordPerfect Office is a good product that I'm betting will someday become a great one. If not, it certainly won't be for lack of ideas or initiative among the residents of Building M. But it also remains a work in progress. Customers used to expect that from software companies (how else did CC:Mail become such a big deal?) but are leery today of entrusting their critical systems to a company still in the throes of giving birth.

WordPerfect needs to get its Office in order — and that includes a new name and dramatically improved support — or risk alienating potential customers before they've had a chance to see what a nice product Office 4.0 really is.

Coursey is editor of "P.C. Letter," a San Mateo, Calif., industry newsletter. His MCI Mail address is 558-4480.

Bank

CONTINUED FROM PAGE 75

pio said. "They're monitoring their positions on-line, and they're passing information back to the people in operations for clearance, settlement and accounting."

The treasury department also does database extracts that are fed to several PC-based data analysis systems, he said. Bank managers said they believe that the timely market analysis may spur more profits.

Sanwa Bank's Lynn Ryan: *Unix servers may provide future model*

But all Unix transactions are posted to the bank's mainframes nightly, and database backups are made on the Unix network and in the data center. The update process is "kicked off" when IS staffers log on to the Unix workstation network through an X terminal in the data center. The updates and backups take the treasury systems off-line for about 90 minutes.

Until 1992, Sanwa Bank California — the state's sixth-largest bank, with $7.2 billion in assets — rarely ventured into the open systems arena. Most applications still run on large IBM mainframes in its Monterey Park, Calif., data center near Los Angeles. Departmental PC-based solutions run on Novell, Inc. LANs, and use of IBM RS/6000 Unix workstations is limited to parent Sanwa Bank Ltd.'s worldwide data network [CW, May 4, 1992].

Changes on the way

That architecture is about to change, said Lynn Ryan, senior vice president of Sanwa Bank California and director of information services.

The success of the treasury system proved the concept of local manipulation of enterprise data and made it a model for future systems. "The packaged software was the primary solution," she said. "However, we designed the database analysis, the reports and some of the interfaces to other systems."

The qualitative benefits to Sanwa's business are substantial, Ryan said. "The value of the technology is that it allows them to use the information on call, rather than submitting a service request for [IS] programming," she said. "Our strategy, going forward, is for the departmental systems to be open. That will facilitate more end-user computing ability and [require] less centralized core processing services."

Ryan is trying to eliminate the storage of redundant data on PC databases since a shared server database is preferable for data integrity and accuracy. She also wants to see the Novell LANs become better integrated with Unix servers over time, weaving together horizontal office systems with networked database servers.

"We will look for opportunities to use the network for file transfer rather than for re-creating data," Ryan said.

The successful experience with Unix servers will also allow the bank to try similar solutions in other departments, Ryan said.

Other areas to be automated with open systems include a financial data repository built with a Sequent Computer Systems, Inc. machine running the Oracle database, she said.

Briefs

Colorado county outsources

Weld County in Colorado has signed a 10-year, $14 million outsourcing contract with Systems & Computer Technology Corp. in Malvern, Pa. Under the contract, Systems & Computer Technology will manage the county's information services department and direct its migration from a mainframe system to a distributed computing environment.

Profiting from government

Demonstrating that there can be commercial application for government-sponsored technology developments, SunSolutions, a Sun Microsystems, Inc. business, said it will make available by year-end desktop videoconferencing software developed by Sandia National Laboratories, a U.S. Department of Energy laboratory in Albuquerque, N.M.

Ethernet expansion in Japan

National Semiconductor Corp. and NEC Corp. have announced a partnership designed to expand the Ethernet market in Japan. The companies will codevelop a 32-bit 10Base-T Ethernet controller, and NEC will manufacture and market National Semiconductor's Ethernet LAN products.

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Citrix Systems, Inc. has announced an upgrade to WinView for Networks Version 2.2, its application server.

According to the Coral Springs, Fla., company, multiple users can simultaneously access DOS, Windows and OS/2 applications, regardless of the type of PC workstation or whether it is local or remote from the network.

Features in Version 2.2 include client drive support, automated client scripting, expanded remote node and client support, simplified Windows setup and support for applications running in Windows enhanced mode.

A 10-user system of WinView costs $2,645.

▶ *Citrix Systems*
(305) 755-0559

Starlight Networks, Inc. has introduced Starter Suite, a networked multimedia product.

According to the Mountain View, Calif., company, Starter Suite combines industry standard products from leading vendors in a low-cost system.

The product includes everything necessary to create a five-user networked multimedia application on an existing network of Macintosh computers or PCs.

The Entry Prototyping Kit version is a software-only video playback solution that offers an entry-level way of getting started with network multimedia.

The Extra Prototyping Kit provides software and hardware for video capture and playback. It was designed for users who want full-screen, full-motion video productions.

The Entry Prototyping Kit version for both the Macintosh and PC costs $4,995. The Extra Prototyping Kit for the Macintosh is priced at $17,500, and the Extra Prototyping Kit for Windows costs $11,995.

▶ *Starlight Networks*
(415) 967-2774

Data Exchange, Inc. has introduced WinDX, a client/server portfolio management system for Windows.

According to the New York company, the system incorporates all the functionality of its industry standard DX/V Portfolio Management System, with enhancements to usability and a reduction of hardware resources needed to support the system.

The product is a LAN-based system that provides trading automation, management analysis and complete back-office support.

Prices start at $100,000.

▶ *Data Exchange*
(212) 809-6868

Legent Corp. has announced Paradigm 2.0, an updated version of its problem management software.

According to the Vienna, Va., company, Paradigm 2.0 accurately tracks the actions and time taken to resolve systems problems against vendor, integrator or internal service level agreements (SLA).

This version also addresses critical customization and integration requirements for distributed systems management.

Users can monitor and measure vendor, integrator and internal problem response times and specific actions taken against contractual commitments with Paradigm 2.0's SLAs.

A Flexible Forms package is provided that lets users modify the look and feel of forms and add and delete files to meet with specific management requirements.

Paradigm installation prices start at $25,000.

▶ *Legent*
(703) 734-9494

InVision Systems Corp. has introduced VisionGraphics for InVision Video Conferencing for Windows.

According to the Vienna, Va., company, InVision transforms a Windows PC into a full-motion, real-time audio and video-conferencing workstation.

The document conferencing option, known as VisionGraphics, allows users to interactively collaborate and exchange ideas, designs, documents, spreadsheets and pictures. VisionGraphic's features include interactive annotation and a tool bar with colored markers, highlighters and erasers.

VisionGraphics also works with Windows or DOS software and costs $195.

▶ *InVision Systems*
(703) 506-0094

BLOC Development Corp.'s F3 Forms Automation Division has introduced [redacted] Pro Designer, F3 Design & Mapping and F3 Fill, re-engineering tools.

According to the Coral Gables, Fla., company, F3 Pro Designer automates the composition of preprinted business forms, replacing pens, graph paper and the T square.

Without using paper, F3 Design & Mapping creates an application that resembles and acts like a form. The product generates stand-alone forms applications for users who work with F3 Fill, the company's forms completion program.

F3 Fill is a tool that fills out, edits, saves, prints out and electronically mails or faxes forms.

F3 Pro Designer costs $1,500, F3 Design & Mapping is $3,000, and any style of F3 Fill costs $300.

▶ *F3 Forms Automation Division*
(305) 529-6939

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Government

No sure benefit in electronic services

By Gary H. Anthes
WASHINGTON

■ Local, state and federal agencies are accelerating the movement toward electronic delivery of government services, but there is no assurance this will improve services or reduce costs, according to the U.S. Congress' Office of Technology Assessment (OTA).

In a report that praises and criticizes government efforts to build and use information superhighways, the OTA said the effort risks "overlooking the human element and the need for affordable, user-friendly applications."

In "Making Government Work — Electronic Delivery of Federal Services," the OTA also warned that government efforts could widen the gap between the information "haves" and "have-nots" and the advantages that citizens who are educated and technically proficient have over those who are not.

Redesign necessary

The OTA said the federal government must redesign its outdated management structure for information technology applications and modernize laws dealing with privacy, security, pro-

Government, *page 88*

Group drafts graphics protocol

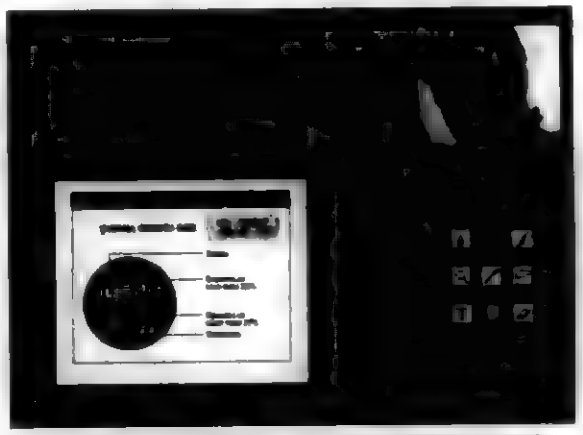
By Joanie M. Wexler

While videoconferencing vendors have been promoting their equipment as interoperable by virtue of the "px64" international video compression standard and long-standing voice conventions, a key component to an electronic conference has been left out of the loop.

There is no standard way for equipment to exchange graphics in a teleconference. This means that companies wishing to include whiteboard and other collaborative computing functions in their electronic meetings today are restricted to using one vendor's equipment.

To speed up resolution of this situation — which limits companies' product choice and pool of eligible conferees — a group of 16 companies last week banded together to form the Consortium for Audiographics Teleconferencing Standards, Inc. (CATS).

The group's goal, announced at the TeleCon XIII show in San Jose, Calif., is to hurry along efforts by the International Telecommunications Union (formerly the CCITT) with what is called the T.120 standard for graphics, said David Belove, a CATS member from audio teleconferencing vendor Polycom, Inc.



Being able to *collectively manipulate and discuss graphics-oriented information is a key benefit of electronic conferencing, users said. Today it is restricted by the lack of a standard graphics exchange protocol.*

The lack of a standard today "makes having a multimedia call impossible in a standardized environment," he said.

CATS would like the whole standard to be written by its members by year's end; the group will then submit it to the standards committee, Belove said. He said he expects implementations to get under way by mid to late 1994.

Some users were heartened by the efforts and said the graphics component of an electronic conference is more important to them than the video aspect.

"You really do need the equivalent of a whiteboard or something you can present material on and [collectively] mark up," said Martin Yeas, a senior information systems analyst at electric utility Ontario Hydro's Grid Division in Toronto.

Currently, he said his group of engineers is more interested in comparing design notes, diagrams and drawings than seeing talking heads. He added that at some point, he would like to let field engineers join in the graphics and audio components of an electronic conference, but the video portion would be too unwieldy from "out in the boondocks."

Graphics, *page 84*

HP opens its mailbag

By Lynda Radosevich
SANTA CLARA, CALIF.

Hewlett-Packard Co. added some punch to its OpenMail messaging line with product and partnership announcements and a strong strategy statement at the E-Mail World conference here earlier this month.

The strategy revolves around two main points: that legacy messaging systems, while reliable and centrally manageable, lack flexibility; and that LAN messaging systems are friendly and flexible but don't scale or work well together and lack management features.

As outlined at the conference, HP's OpenMail messaging strategy addresses these issues by splitting back-end mail transport and directory services from front-end clients. OpenMail is based on X.400 addressing and X.500 directory services running on Unix-based servers. The servers natively support Lotus Development Corp.'s CC:Mail, Microsoft Corp.'s Mail and HP's own clients for DOS, Windows, Macintosh and Unix. The idea is that by integrating the back end, HP will reduce the need for gateways, directory synchronization and dedicated PC server post offices.

Specific announcements included OpenMail graphical management tools for tracking message traffic flow. HP also added migration services for moving Digital Equipment Corp.'s All-in-1 and CC:Mail users' information and stored data to OpenMail. HP started the migration service for IBM's Professional Office System (Profs) users in June.

Gateway choices

HP joined marketing ranks with message gateway vendor SoftSwitch, Inc. to increase OpenMail gateway options. On the client side, HP announced support for CC:Mail for Windows 2.0 and CC:Mail for OS/2 and announced new versions of its own clients.

Also, HP and Dexotek Canada Corp. announced a joint sales and support agreement and said that Dexotek's calendaring and scheduling product will run natively on the OpenMail backbone.

The company also plans to integrate OpenMail management into its OpenView network management system.

HP is not alone in this messaging backbone market. Lotus and Microsoft, the leading LAN-based electronic-mail vendors, have outlined strategies for robust back-end messaging servers. However, product delivery dates are still about a year away for Microsoft and even longer for Lotus, whereas HP OpenMail has been on the market for two years, according to analysts.

For BellSouth Telecommunications, Inc. in Birmingham, Ala., that availability is what tipped the scale for OpenMail.

"Timing is a big issue. HP has a one- to two-year jump start on the PC vendors," said Julie Farris, a strategic planner at BellSouth.

BellSouth began an OpenMail pilot in June after spending a year developing a messaging strategy to support 40,000 end users. Starting this month, the company is going into production with OpenMail, and Farris said she expects to have roughly 5,000 users up by the end of 1994 and more than 10,000 by the end of 1995.

Coming your way
HP OpenMail additions:

Fourth quarter '93
- OpenMail graphical management.
- Legacy migration services and tools.
- OpenView integration.
- Systems Network Architecture Distribution Services (SNADS) and Profs connectivity from LinkAge, Inc.
- SoftSwitch EMX modules.
- CC:Mail for Windows 2.0 support.
- Enhanced support for Microsoft Mail.
- HP client for IBM AIX.
- Enhanced HP clients for Macintosh, HP/UX and SunSoft, Inc.'s Solaris.
- Support for Microsoft Schedule+.
- Scheduling software from Dexotek.

First quarter '94
- Native support for CC:Mail for OS/2.
- Vendor Independent Messaging 2.0.

Chief among the reasons for choosing OpenMail is its multiclient support, Farris said. That is because BellSouth already has a large population of CC:Mail and Notes users, as well as users of "all flavors of Unix" and Macintosh computers. The CC:Mail users will be migrated to the OpenMail back end, and Unix and Macintosh users will have the OpenMail clients for their platforms.

Also, the LAN messaging platforms — with their DOS-based file-sharing post offices — were not scalable enough. BellSouth considered an X.400-based messaging backbone from Digital but its "ability to deliver was not there," Farris said.

One concern Farris has is that OpenMail clients have a consistent feature set so that they are easier to support. HP announced that it is addressing dissimilarities in their look and feel.

Client/server

Network speeds access to Duke hospital records

By Gary H. Anthes
DURHAM, N.C.

Health care reform may be all the rage this year, but the Duke University Medical Center has been using an information system to improve services and control costs since 1968.

Now, The Medical Record (TMR) system, which has evolved continuously over a quarter-century into a comprehensive tool for doctors, nurses, administrators and 400,000 patients, is about to give way to a client/server implementation that will spread large and complex databases of medical records across multiple servers working in parallel.

Paper records *cannot keep pace with the changes at Duke University Medical Center*

TMR, in its current incarnation, runs on Digital Equipment Corp. VAX minicomputers attached to PCs acting as dumb terminals. The VAXs are accessible to doctors throughout the vast medical complex via a fiber-optic backbone and by connections anywhere in the world over the Internet.

TMR, in its more recent networked configuration, has enabled significant cost-savings in ways that were not at first envisioned, said Professor William E. Hammond, head of the Division of Medical Informatics.

For example, bone marrow transplants used to require very costly 30-day hospital stays. Now, patients stay three days for the transplant and then go to motels near any of a number of outpatient clinics around the state. The results of daily follow-up tests at the clinics are sent electronically each day to TMR, where they are reviewed by patients' physicians.

"The patient could be in any of four or five places; the paper records would never catch up," Hammond said. "The only way to update the record [in a timely way] is to do it electronically."

TMR is used in Duke's Surgical Intensive Care Unit, where some 75 nurses use bedside terminals to enter "head-to-toe assessments" of patients, said Johnetta Bowen, nurse manager. She said it has improved the quality of care over the old paper-intensive procedures. For example, the results of laboratory tests can be relayed instantly to operating rooms from remote test facilities, she said.

In another application of the networked TMR, Duke set up an integrated database of pregnant women to track prenatal care, no matter where it was given. Hammond gives the system partial credit for reducing the number of fetal deaths in the county from 12.7 per 1,000 pregnancies to 9.1 per 1,000.

Now, Hammond said, the time has come to take advantage of the enhanced performance and graphical user interfaces available with more modern technology. His staff will rewrite TMR in a combination of C and C++ and put it on 10 LANs around the medical complex. Each LAN will have multiple Intel Corp. I486-based servers running Microsoft Corp.'s Windows NT.

In the Family Health Center, for example, there will be 200 to 300 PCs attached to four servers. Hammond said he does not know yet just how the work load will be distributed across the servers. One possibility is to split the database into four parts by patient Social Security numbers. Another is to put the entire database on each server and have a front-end route requests to the least busy CPU.

The multiple server approach is needed to guarantee the top performance and near-100% uptime required by the mission-critical application, Hammond said. In addition, it will make the systems easy to scale up as volume grows, something not easily accommodated with the VAXs.

Sitting on top of the 10 LANs will be a central patient index pointing to subsets of patient records in cardiology, the bone-marrow transplant unit, the family health unit and so forth. In ways not entirely worked out, the index will be used to route users to the appropriate medical department and database.

Hammond estimated it will take 12 people 18 months to develop an alpha test implementation of TMR. Total development cost over two years will be about $2.7 million, he said.

Hammond said he hopes Duke will be able to market the new TMR to other medical centers across the country.

Storage that keeps on saving

When the Duke University Medical Center brings up a client/server version of TMR, the application code and hardware will be brand new, but the data storage structures will be carried over unchanged — the legacy of years of refinement.

To support medical research, all data for patients — even the deceased — is kept on-line at all times. That, plus the requirement for rapid access in medical emergencies, has led to a Duke-developed hybrid storage approach that uses 10 data architectures, including hierarchical, relational and object-oriented structures, inverted files, hash files, B-tree files and sequential transaction files.

The approach maximizes performance and storage efficiency for each type of use, said William E. Hammond, head of the Division of Medical Informatics. For example, a patient-billing application would access a transaction file, physician inquiries would typically use a patient-keyed structure and medical researchers might use an inverted file to look for specific treatments and results across entire populations of patients.

—Gary H. Anthes

Briefs

Las Vegas: Fast town

Wireless network service provider Ardis announced earlier this month that it has brought the Las Vegas portion of its network up to 19.2K bit/sec. speeds and will demonstrate those speeds at this week's Comdex/Fall '93 show there. The enhancement marks the second Ardis-served city to get the faster speeds; Washington was upgraded earlier this year. The 19.2K bit/sec. speeds are the fastest to date in wireless wide-area networks.

Hub costs drop

Allied Telesis, Inc. in Mountain View, Calif., recently announced a 25% across-the-board reduction in list prices for its stackable Ethernet wiring hubs. The price range for the six-, eight- and 12-port hubs has dropped from between $1,595 and $3,195 to $1,200 and $2,400.

Infonet gets Nifty

Global value-added network service provider Infonet Services Corp. is providing access throught its x.25 public data network to Nifty Corp.'s on-line subscriber service, called Nifty-Serve. Nifty-Serve has more than half a million subscribers in Japan.

Alfa teams with Xyplex

Alfa, Inc. in Hyannis, Mass., has teamed with terminal server company Xyplex, Inc. in Boxboro, Mass., to integrate Alfa's Fiber Distributed Data Interface (FDDI) concentrator technology into Xyplex's Network 9000 Routing Hubs. The effort includes Alfa's copper-based FDDI products.

3Com adds reseller

3Com Corp. recently signed up Anixter, Inc. as a 3Com Network Systems Integrator, which means Anixter in Skokie, Ill., will resell 3Com's networking products.

Graphics

CONTINUED FROM PAGE 83

Yeas said he is pushing for standards because "we don't want to be limited to a specific vendor" for product selection. Currently, the company uses proprietary graphics software from just one supplier, WorldLinx Telecommunications, Inc.

Also, some companies are concerned about standards as their electronic conferences move beyond their own corporate borders. Business partners that are potential conference mates could have installed gear and software from any number of vendors with proprietary graphics-exchange algorithms.

"We have a big desire to mix and match" equipment, said Nick Di Iorio, director of networking and telecommunications at worldwide advertising agency Young & Rubicam, Inc. in New York. Di Iorio said the main purpose of the agency's conferences are to show storyboards and layouts to clients.

The agency's corporate standard for video equipment is PictureTel Corp. gear. About half its clients with videoconferencing systems use PictureTel, and the other half use Compression Labs, Inc. (CLI), Di Iorio explained.

"With the CLI people, we can't exchange graphics," he said. "This is obviously something that should have been resolved by the vendors; they standardized on audio and video, then they deadlocked" over graphics.

Another area the graphics standard could affect is customer service, said Basil Halhed, president of Halhed Enterprise, Inc., a consulting firm in Ottawa.

According to Halhed, there is a trend among companies to start talking electronically to suppliers. "If you're a high-tech company, for example, you can [collaborate on] a printed circuit board and show what is going wrong."

Tim McElgunn, an associate analyst at Datapro Information Services Group in Delran, N.J., said the users he talks to find "a lot of value" in the graphics component. On the flip side, he said, "show me a very rich still video or whiteboard manufacturer," indicating that the market is still in its infancy.

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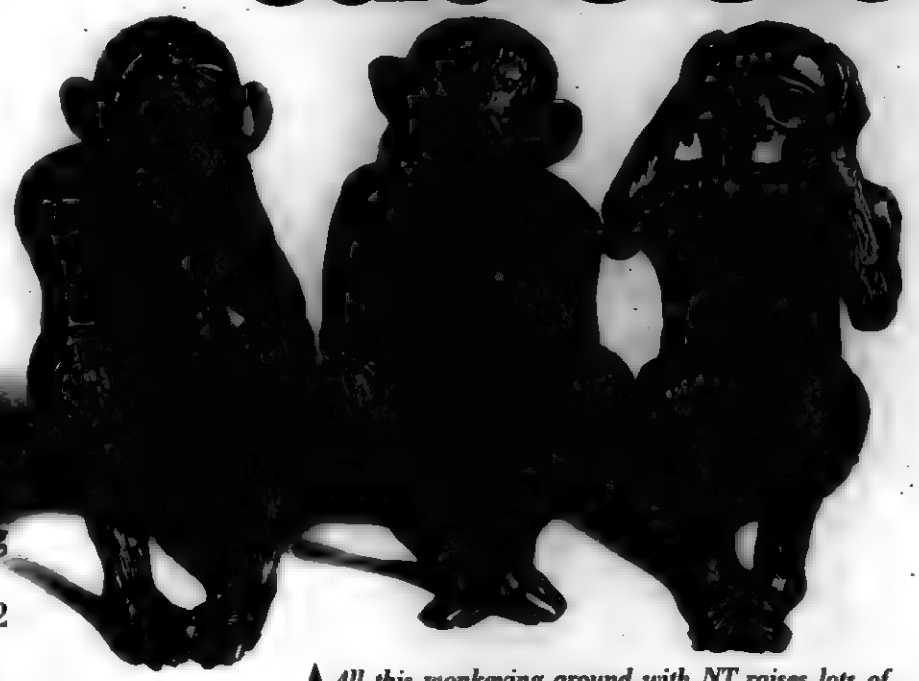
The truth about

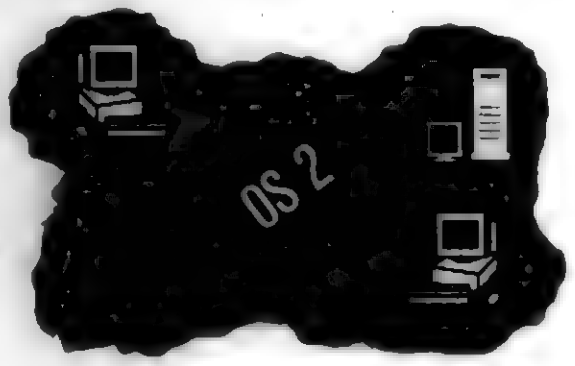
Before you decide what client/server platform is right for you, make sure you know what's true, and what's Not True.

Fact: the OS/2® client/server solution preserves your current hardware and software investment, accessing your mainframes, minis and PCs when necessary and bringing their power and capacity to the desktop level. **Fact: the Windows NT™ solution is based on PC servers and desktops and *doesn't* embrace all your existing resources. That could mean porting applications and data. The only plus that offers is the cost of porting *plus* the cost of additional PC servers.**

Fact: OS/2 2.1 runs DOS, Windows™ and more than 1,200 native OS/2 applications. With LAN S[illegible] or Novell® NetWare,® OS/2 supp[illegible] Windows, OS/2 and Mac clients. I[illegible] not likely NT will support all your existing applications. It won't run existing 32-bit applications like WordPerfect® 5.2 for OS/2 and Lotus® 1-2-3® for OS/2. It *will* require additional software to support DOS, OS/2 and even Windows clients. Worse yet, *Infoworld* sources report that Windows 3.x applications run *20% slower* under NT than they do under OS/2 2.1!



▲ *All this monkeying around with NT raises lots of questions. OS/2 has the answers.*



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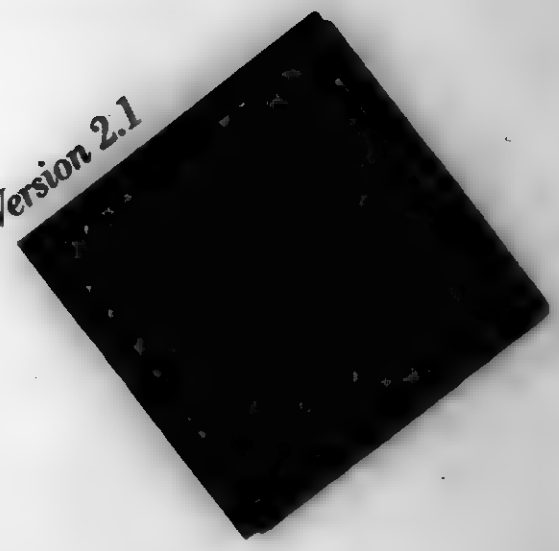

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Domain/DACS,™ AlertView,™ Foundation Manager™), and more. Fact: The NT strategy is still Not There, and neither are native client/server applications.

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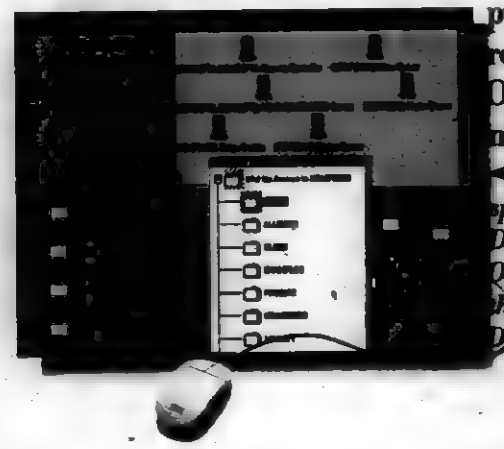

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Kiosks handle employment queries

By Ellis Booker

■ A prototype unemployment office featuring self-serve kiosks opened last month in Arlington Heights, Ill.

Called Touch Illinois, the system is a joint project of the Illinois Department of Employment Security (IDES), IBM's Advanced Interactive Systems Group in Chicago and the Interactive Transaction Systems Group at IBM's T. J. Watson Research Center in Hawthorne, N.Y.

IDES expects to increase its productivity through the kiosks because they are self-serve and will eliminate some paper-based chores.

For instance, the agency estimates the kiosks will reduce the time it takes to process a claim from two hours to about half an hour. Complex cases are routed to agents via a work-flow subsystem.

"We anticipate freeing up our employees to help people find new jobs," said an IDES spokeswoman, who added that the department is not planning to layoff any workers as a result of the automation.

"We took a great deal of care to make the system 'user-seductive,' " said Jeff Mortner about the system's "video game-like" interface. Mortner is team leader at the Advanced Interactive Systems Group and project manager for the Touch Illinois project.

One important design consideration, he said, was to avoid alienating or intimidating users. For this reason, Mortner's group vetoed the use of retina scans to identify individuals. Rather, users show some form of identification to a receptionist and then are given a Touch Illinois card to enter the kiosk system.

Getting connected

The kiosks are based on IBM PS/2s running the OS/2 Version 2.1 operating system and are linked over a Token Ring LAN. A larger PS/2 with 1G byte of storage and 24M bytes of RAM acts as a server. The system communicates with the IDES mainframe system based in Springfield, Ill., by using IBM's Advanced Program-to-Program Communications over a dedicated phone line.

The pilot system, now working with 12 kiosks, will soon be expanded to 25.

Future enhancements to Touch Illinois include placing the kiosks in IDES offices throughout the state, as well as in public buildings such as community colleges, libraries and shopping malls.

Ultimately, in-state employers looking for workers may be able to link directly into the IDES job applicant database.

Government

CONTINUED FROM PAGE 83

curement and freedom of information. "It may be necessary to revise the concept of universal telephone service to include advanced telecommunications and computer networking," the report said.

The concept of electronic government is a cornerstone of the Clinton administration's "reinventing government" effort, but currently, the government lacks the overall strategy and vision needed to achieve the goals set out recently in Vice President Al Gore's National Performance Review, the OTA said.

For example, the OTA said the government has demonstrated the technical feasibility and utility of electronic benefits transfer, especially for food stamps. But it "is not likely to be cost-effective for delivery of federal benefit programs if each agency or state goes its separate way," the OTA said.

The OTA called for a coordinated and integrated electronic benefits transfer effort by federal agencies, state and local governments, banking and electronic funds transfer systems and others.

"The [National Performance Review] documents set a general direction and some degree of vision for use of information technology," said Fred Wood, senior associate and project director for the OTA study. "But they are very vague and fall well short of what's needed to make things happen."

Wood acknowledged that the performance review team is preparing a detailed report on its information technology program, but he said it is likely to be specific in only a few areas. He said he hopes Congress can use the OTA report as a checklist or benchmark for evaluating administration proposals.

Community left out

The OTA said the federal government generally fails to involve the local community infrastructure — including schools, libraries, senior centers and town halls — in its electronic delivery projects. "That has not been done much in the past. It's not in the culture. It's something easily overlooked or manipulated," Wood said. "We're saying, 'Do something that has bite, mandate it, put some resources into grass-roots involvement as part of every electronic delivery project.' "

"This OTA study rightly points out that in the past decade, state governments have taken the lead in electronic delivery services," Rep. George Brown (D-Calif.) said in a written statement. "A similar transformation in service delivery is inevitable at the federal level."

Franco Vitaliano

Beware the butterfly effect

Warning: Don't place too much faith in the latest and greatest SNMP2/NetView/DME/OSI-compliant/network framework.

The arrival of large-scale distributed client/server applications is likely to unleash forces beyond the diagnostic and preventive powers of network management systems.

The reality is that your network and its associated systems can be up and stable and problems can still develop when you try to implement a large-scale distributed client/server application.

Something gone wrong

Imagine yourself in this situation: The network management system says everything is A-OK and both the server and client system diagnostics check out, but you still have a problem of sluggish network performance — or worse yet, data corruption. What then?

This is the point at which the dreaded finger-pointing really starts in earnest. Is it the user? The WAN provider? Weird interactions between this application and some other code? Is it the operating system? Who do you call in first?

Most likely, what you'd do is start tearing things apart piece by piece, working off a short list of likely candidates. Then, when that proved futile, you'd move on to the long list.

Maybe you'd get lucky and finally discover a tiny systems interaction bug buried deep in several million lines of code. This would be the kind of bug that wouldn't show up during testing and deployment of the new application; it would activate only when a unique set of conditions interacted in exactly the right star-crossed way. When all the conditions collided and the bug was unleashed, the system would have done exactly what it was supposed to do: promptly shut itself down.

Finding such a bug would be a best-case scenario. It is also possible that you could tear everything apart and find absolutely nothing wrong.

Sound impossible? It's not. And, as your distributed applications become more complex, and the processing intelligence becomes ever more diffused, this no bug/big crash secenario is going to happen to you one day. Please note that I said *will* happen, not *may* happen.

Bernardo Huberman, a research fellow at Xerox PARC, has written extensively about this new type of network systems failure. He likens large complex computer networks to biological ecosystems.

Natural chaos

In nature, when something gets just big enough, and complex enough, localized chaos occasionally sets in. The irony is that such chaos is not unnatural. Quite the contrary, it seems to be integral to the natural scheme of things. Consequently, small sections of an ecosystem can suddenly become chaotic. These localized effects may also alter the state of systems far removed from the event.

This is sometimes called the "butterfly effect," referring to the theory that a small insect fluttering its wings somewhere over China somehow plays a role in triggering a hurricane that storms up the Florida coast.

Huberman believes complex computer "econets" are susceptible to crippling the chaotic events. So next time you contemplate deploying a multiyear, multimillion-dollar network application, think about that little butterfly over the Asian landmass.

Vitaliano is a principal at VXM Technologies, a Boston-based networking software developer.

Briefs

Modem maker cuts tags

U.S. Robotics, Inc. has reduced the prices on its Sportster line of fax and data modems. The company's $219 to $329 line of products has dropped to between $179 and $279.

NEC, National Semi team

National Semiconductor Corp. and NEC Corp. have signed a semiconductor technology partnership agreement aimed at expanding the Japanese market for Ethernet-based PC and systems networking. The companies will jointly develop a low-power Ethernet controller, and NEC will manufacture and market National Semiconductor's family of Ethernet products under the NEC logo.

Manageability grows

Newport Systems, Inc. in Newport Beach, Calif., recently announced that its router products will gain a snap-in module that allows them to be managed centrally by Novell, Inc.'s NetWare Management System.

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*Manufacturer's Suggested Retail Price

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mode, a Wyse PCTerm mode and a UNIX Console mode. Whew.

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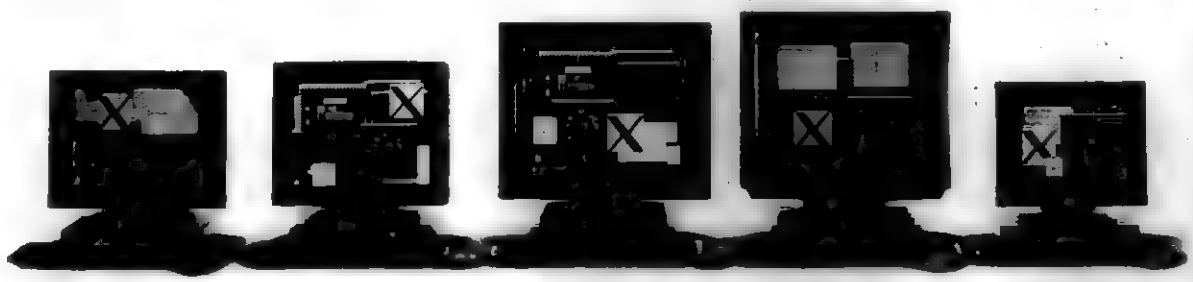

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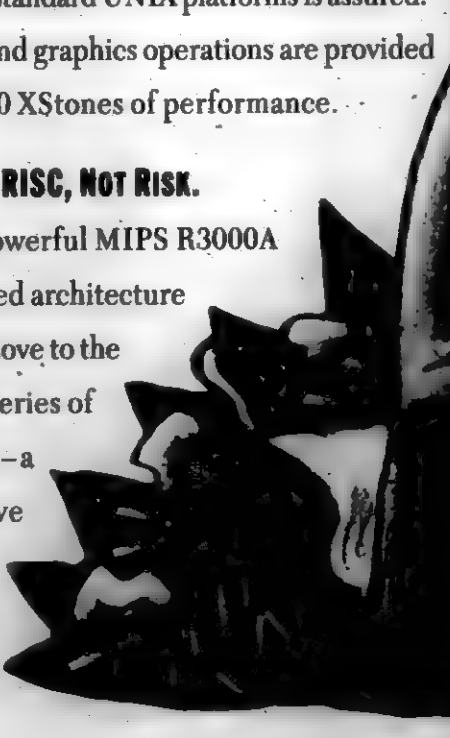

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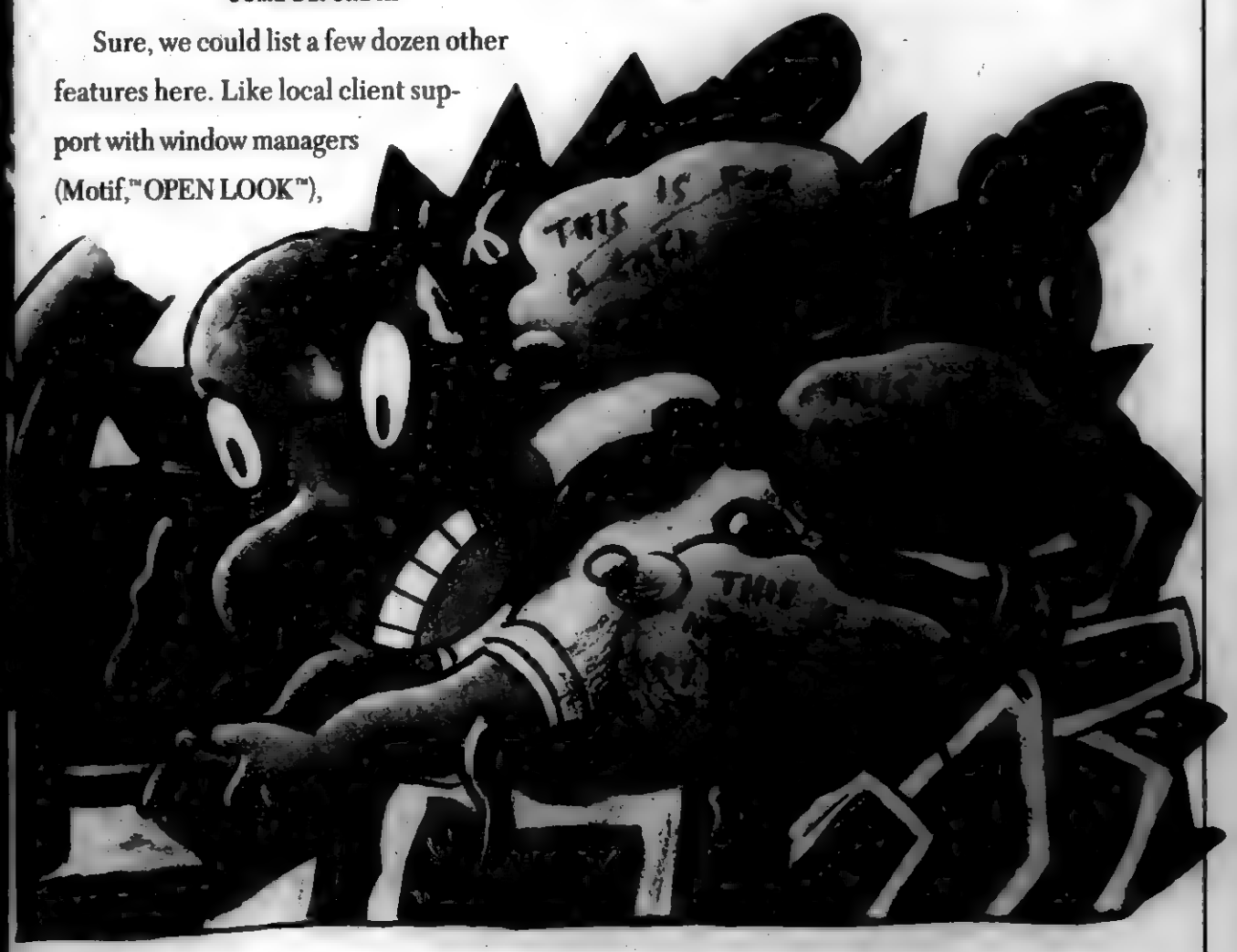

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[redacted]

Watch Hill Research has announced the IPX Accelerator, a data compression product.

According to Coventry, R.I.-based Watch Hill, the IPX Accelerator and the Mini-IPX Accelerator compress data for transmission from 56K to 2M bit/sec., enabling Novell, Inc. network users to increase overall network throughput by 200% to 600%.

The IPX Accelerator supports all Novell protocols and was designed for higher speed links up to and including T1/E1.

The Mini-IPX Accelerator operates on networks at speeds of 56K to 256K bit/sec.

The IPX Accelerator and the Mini-IPX Accelerator cost $9,000 and $4,000, respectively.

▶ *Watch Hill Research*
(401) 826-0005

Software Artistry, Inc. and **ServiceWare, Inc.** have announced Knowledge-Paks, a product line offering help desk troubleshooting expertise in a ready-to-use form.

Knowledge-Paks was designed for Software Artistry's Expert Advisor help desk automation product.

According to Indianapolis-based Software Artistry, each Knowledge-Pak contains complete troubleshooting instructions for a particular office automation product such as Windows 3.1, Microsoft Corp.'s Excel 2.0 and Word 4.0 and Novell, Inc.'s NetWare 3.1.1.

Detailed step-by-step problem-solving strategies, descriptions of error codes, instructions for recovering from system failure and hundreds of problems and solutions are provided.

Knowlege-Paks costs $5,000 for the first 10 seats per domain.

▶ *Software Artistry*
(317) 876-3042

Wall Data, Inc. has introduced Rumba Office connectivity software.

According to the Redmond, Wash., company, the product provides users with universal access to multiple applications on multiple-hosts mainframes — IBM's AS/400s and Digital Equipment Corp.'s VAX/Unix machines — from a Rumba software "Window," a single Windows interface.

Rumba Office features include multiple host connectivity; batch, drag-and-drop file transfer; enhanced nonprogrammable terminal user interface; floating tool bar; selective install; Rumba Office Manager; Rumba Office Workspace; Configurable Rumba; and client/server support.

Rumba Office costs $500 per single-user license.

▶ *Wall Data*
(206) 883-4777

Microcom, Inc. has announced two 28.8K bit/sec. V.fast modems.

According to the Norwood, Mass., company, the Microcom DeskPorte Fast desktop fax modem and the TravelPorte Fast portable fax modem take advantage of a PC's high-speed parallel port to deliver V.fast throughput speeds of 115.2K bit/sec.

Both products provide hardware and special PC drivers that reroute data via the PC's high-speed parallel port.

Other features include the following: flash memory, CCITT standards support, security features, Windows fax software as well as LCD display/LEDs.

Microcom's V. fast modems support Microcom Networking Protocol Class 10, the de facto standard designed for high-performance data communications that enable users to get connected and stay connected.

The Microcom DeskPorte Fast desktop fax modem and the TravelPorte Fast portable fax modem cost $499 each.

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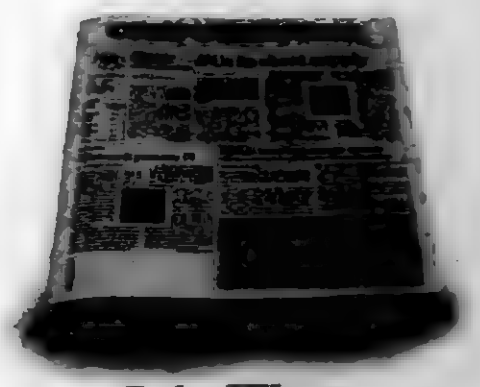

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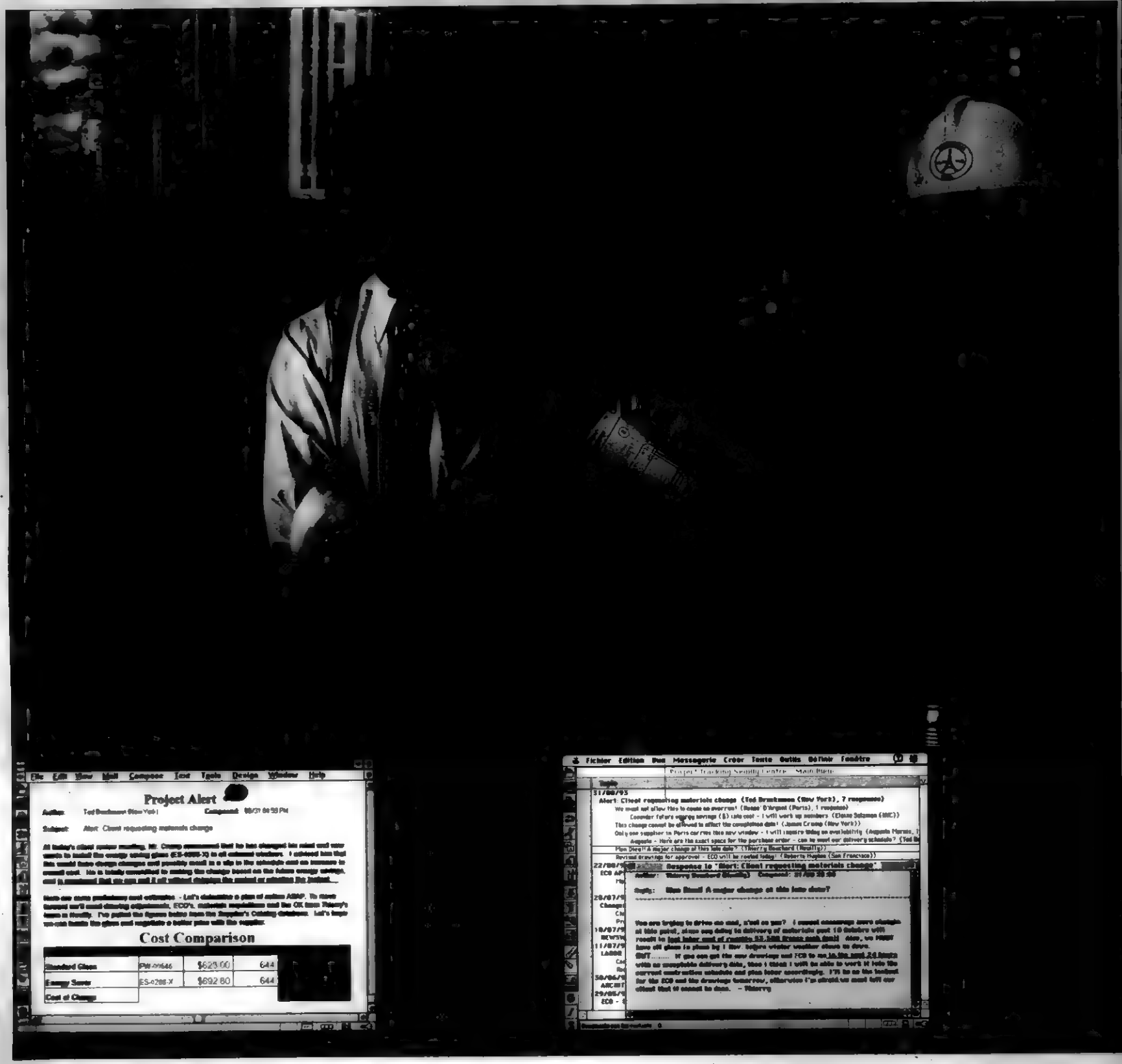

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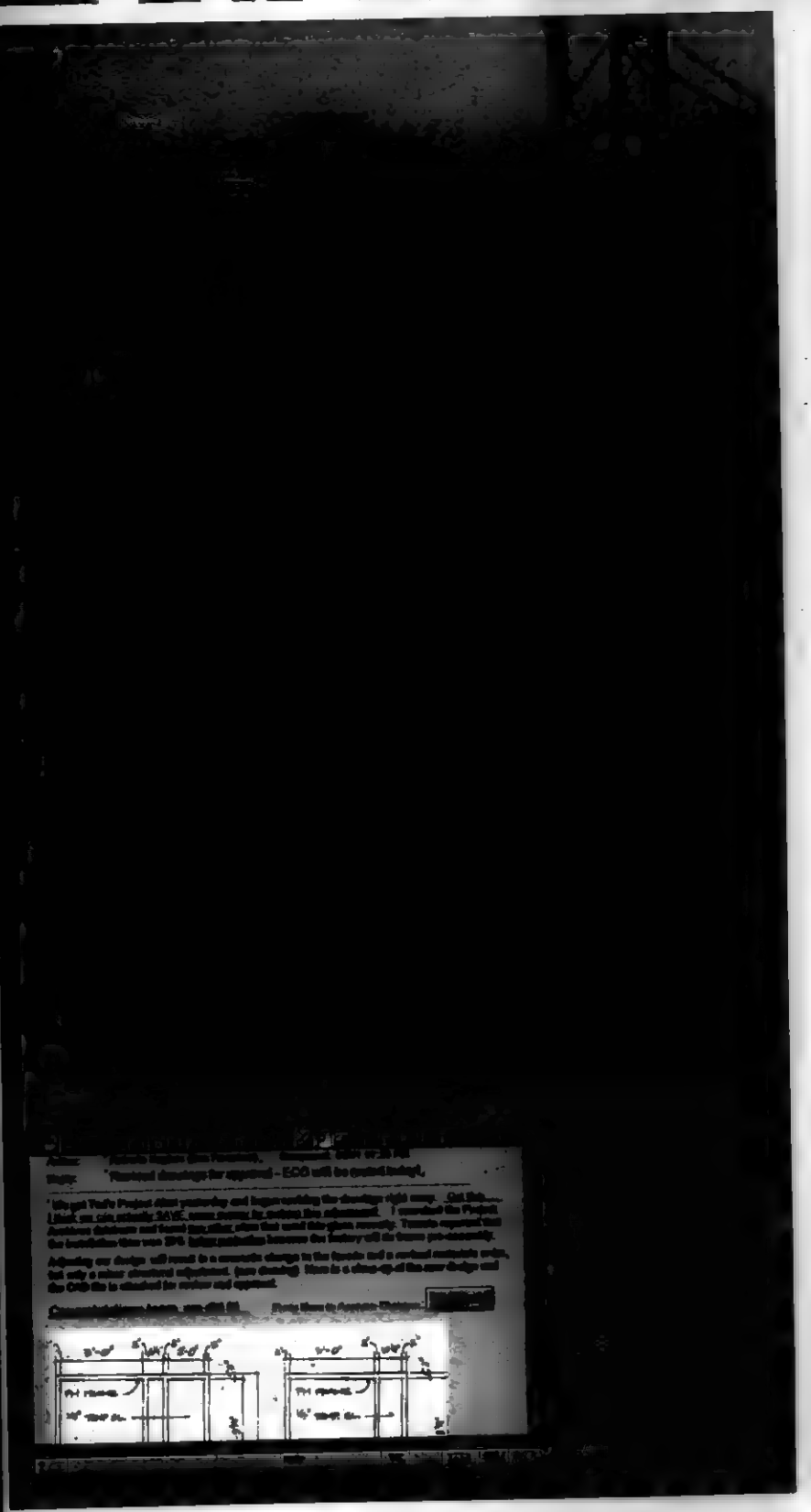

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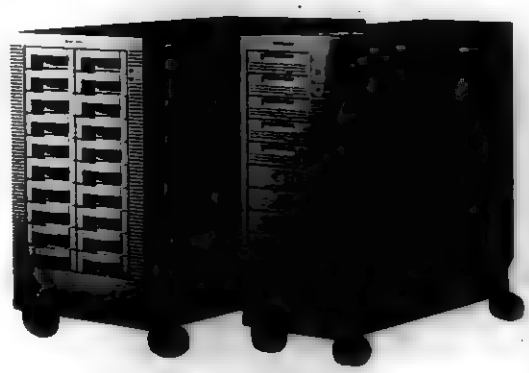

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Unix systems

Pyramid plans MPP machine

By Mark Halper

Pyramid Technology Corp. recently quadrupled its systems performance with the introduction of its Nile boxes, but users and analysts said they expect a quantum leap late next summer, when the company plans to unveil a massively parallel system.

Code-named Meshine for the "mesh" technology that will interconnect processors and memory, the system will scale up to 256 processors, according to John Jones, a San Francisco-based analyst at Salomon Brothers, Inc.

Nile accommodates up to 16 processors in a symmetrical rather than parallel layout [CW, Oct. 4].

San Jose, Calif.-based Pyramid will time Meshine's introduction to coincide with Oracle Corp.'s anticipated unveiling of a database designed to exploit massively parallel designs, and with Unix System Laboratories, Inc.'s introduction of a massively parallel Unix operating system, Jones said.

Users would benefit from the system's ability to spread a single task among several processors rather than dish out those tasks in whole to various processors, a more time-con-

Pyramid, *page 103*

Benchmark benefits

Data center managers share, compare results

By Thomas Hoffman

Ever wonder how your data center operations stack up against the competition's?

The question was intriguing enough for 10 companies, including Texaco, Inc., The Travelers Corp. and Texas Instruments, Inc., to form a "best practices" group 18 months ago to exchange dialogue on how each participant approaches key data center functions.

See story on **benchmarking resources**, page 136

The group was co-sponsored by the United Services Automobile Association (USAA) and Real Decisions Corp., a Darien, Conn., consultancy that conducts an annual benchmark of more than 200 U.S. corporate data centers.

While the benchmark compares each company's data center activities with those of other firms with comparable MIPS and infrastructure parameters, the statistics are kept anonymous and confidential.

In 1991, the companies formed the best practices group to better determine why they were ranked favorably or otherwise in areas such as problem management, systems support and

Benchmark, *page 101*

Data repositories

On the slow road

Repositories may be winning users' hearts, but technical challenges remain

By Johanna Ambrosio

Successful repositories are built one subject or business division at a time, implementors say. Still, creating these directories is a slow and painful process rife with frustration and technical challenges.

Repositories are essentially the "Yellow Pages" of corporate information. They provide the location where the user can turn to find the information he requires. The repository does not contain the data itself; it merely serves as a roadmap to find the data.

In some cases, the repository contains information about application development projects going on around the company — which developer has which piece of the project, for example. In other cases, the repository is used to keep track of subject- or division-specific data that users request.

Need for speed

People charged with implementing these directories talk of increasing acceptance of the need for this corporate resource, particularly as client/server systems make data harder to find and track. "Some of our users are begging us to go faster," said Kristy Bruce, a repository administrator at Eli Lilly and Co. in Indianapolis.

But that is a double-edged sword because users who are promised information not available to them before may expect overnight miracles.

Managing end-user expectations is a big part of the repository job, according to implementors who gathered at a Repository/Architecture/Development user group held recently in Chicago.

What's it worth?

Another challenge is finding the money to do the work. Although the benefits of a repository may seem apparent, they are not always easy to quantify in hard dollars.

"How are the benefits measured?" asked David Swan, assistant director of data architecture at the Group Health Cooperative of Seattle. "As soon as I make it easier for people, my backlog triples. No matter how productive you get, nobody outside of IS will ever believe you."

Swan suggested letting the end users or the programmers — whichever group uses the repository — figure out what the effort has been worth to them in time saved or increased productivity.

Repositories, *page 108*

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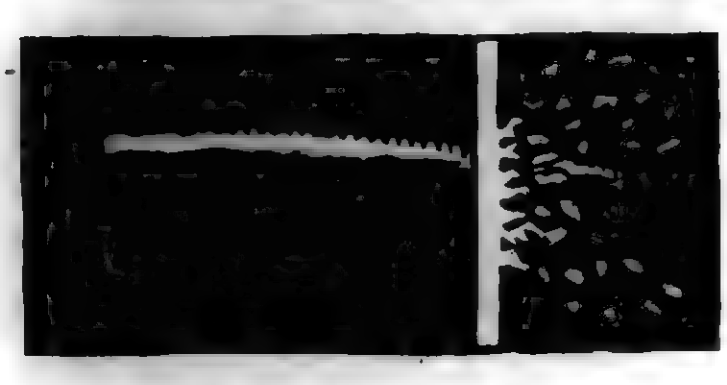

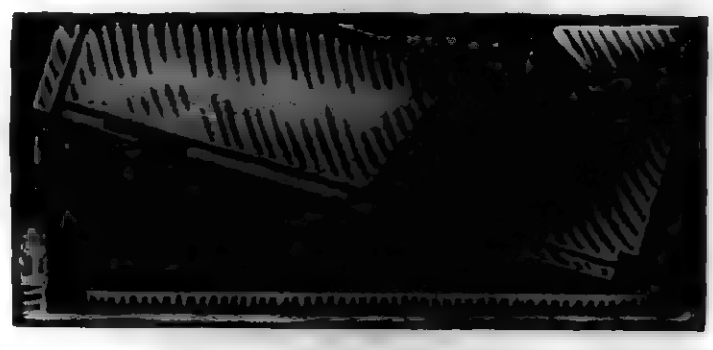

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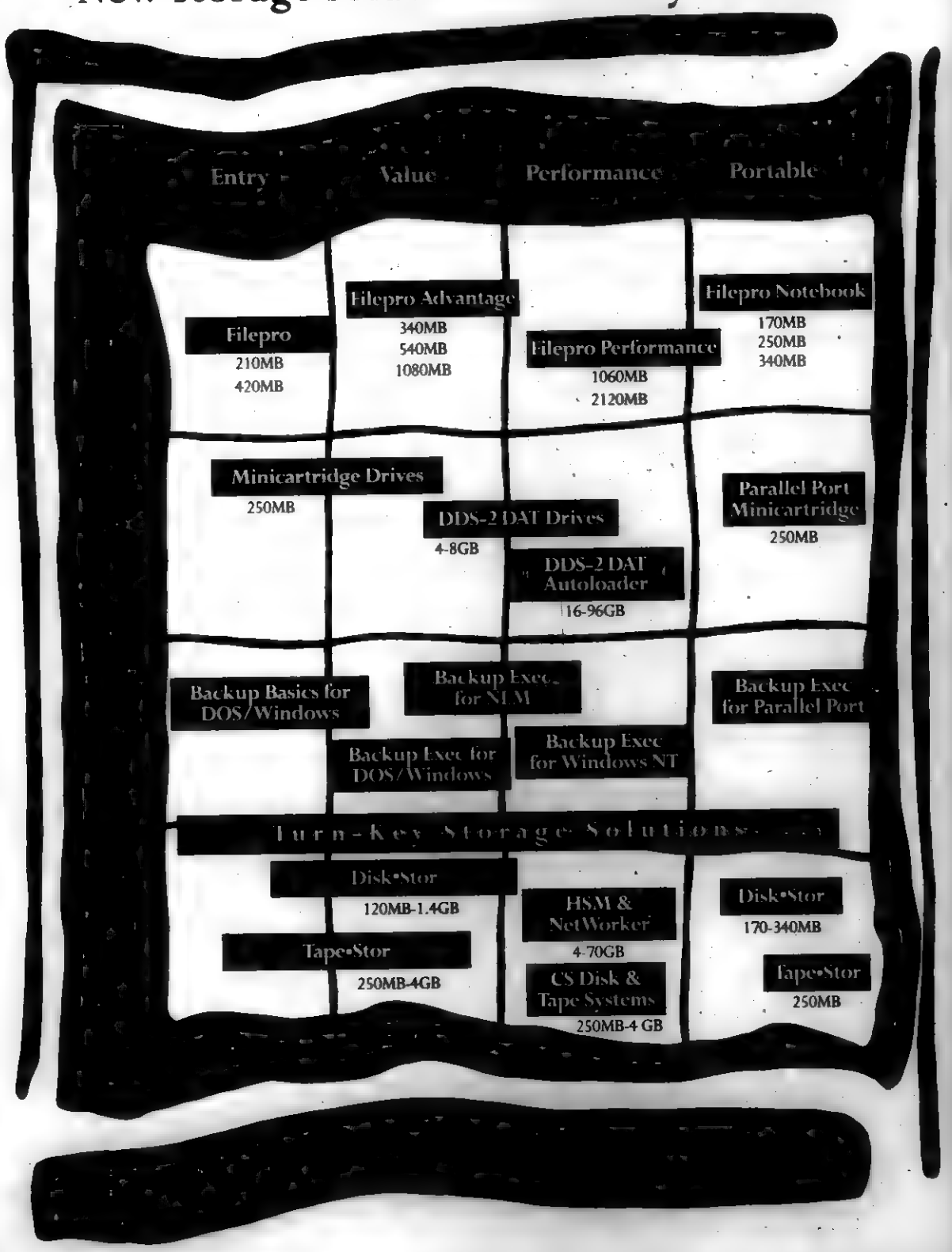

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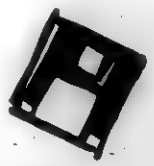

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- data compression for greater capacity on the tape
- backup for Windows and DOS

TOTAL SOLUTIONS FOR THE CHANGING FACE OF VALUE-ORIENTED STORAGE.

Value systems—including mainstream desktop PC's used for advanced applications, databases and multimedia— need low cost storage, with capacities from 300 to 1000 MB and higher performance. Tape backup for these capacities is essential.

Value market priorities:

- Cost at Capacity
- Performance

Disk

Filepro Advantage 340 MB, 540 MB and 1080 MB

The Filepro Advantage Series of low-profile 3.5-inch disk drives is ideal for the full-function PC market. With 340 MB, 540 MB and 1080 MB, this powerful family meets the storage needs of business users for advanced applications, networking and multimedia.

Filepro Advantage	340MB	540MB/1080MB
Average Seek Time	13ms	12ms/10.5ms
Rotation Speed	4011	4500
Buffer	64K	256K
PC/AT Interface	Yes	Yes
SCSI-2 Interface	Yes	Yes

250 MB Minicartridge Drive

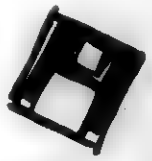
Conner's 250MB Minicartridge drive offers a cost effective backup solution for the value market. With a one-inch-high design, it provides 250 MB of capacity. Plus, it's easy to install without adapters or conversion kits.

DDS-2 DAT 4–8 GB Drive

Conner's DDS-2 DAT tape drive combines high capacity, absolute reliability and performance for high speed, stand alone and networked PCs.

- 3.5- and 5.25-inch internal and 3.5-inch external form factors
- DDS, DDS-2 and DDS-DC formats
- 400 KByte/second native transfer rate
- SCSI-2 interface

Tape



Software

Backup Exec Software for DOS/Windows

Conner's value-oriented storage management software provides award winning backup solutions for SCSI tape drives whether they are in use on DOS, Windows or Windows NT™ operating environments. Integrating perfectly into these operating systems, with seamless Graphical User Interfaces and full NetWare® compatibility, Backup Exec simplifies backup and restore operations for individual users or network work groups.

TOTAL SOLUTIONS FOR THE CHANGING FACE OF PERFORMANCE STORAGE.

Performance systems for high-end business, engineering and multi-user environments need fast access to data and high capacity of 1 GB or more. Plus very large backup capability for mission critical requirements.

Performance market priorities:

- Performance
- Capacity
- Cost

Disk

Filepro Performance 1060 MB and 2120 MB

The new Filepro Performance 1060 MB and 2120 MB 3.5-inch disk drives deliver the highest performance and capacity for mission critical applications. Like workstations, RISC systems and high-end PCs. Plus, multi-user environments including servers, storage subsystems and mini or main-frame storage.

- fast 9 msec average seek time
- high speed data transfer rate
- fast and flexible SCSI implementation.
- 5400 RPM rotation speed

DDS-2 DAT 4–8 GB

Conner's DDS-2 DAT tape drive combines high capacity, absolute reliability and performance.

- 3.5- and 5.25-inch internal and 3.5-inch external
- 400 KByte/second native transfer rate
- SCSI-2 interface
- DDS-DC data compression

DDS-2 Autoloader

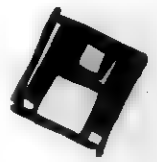
Our DDS-2 Autoloader is ideal for networks that require unattended, high capacity backup devices. It allows easy integration and provides the lowest cost-per-megabyte solution in the industry.

- stores up to 96 GB with compression
- 4 cassette magazine standard format, 12 cassette optional
- 5.25-inch full-height form factor.

Tape

Backup Exec Software for NT

Backup Exec for NT is the first full-featured, 32-bit backup application created for Microsoft Windows NT. Conner developed the backup utility included with the Windows NT operating system. Backup Exec offers an easy-to-use, comprehensive data storage solution for Windows NT-based workstations and servers.



Software

- automatic backup
- disk grooming
- E-mail notification
- remote registry support
- concurrent backup to multiple tape drives

Backup Exec Software for NetWare

For performance applications, Conner has created Backup Exec for NetWare. It's a fully-integrated, client server data management solution that's just right for high powered, data intensive systems. Created specifically for Novell systems, Backup Exec for NetWare allows network administrators to control all backup management operations from the file server or a workstation.

TOTAL SOLUTIONS FOR THE CHANGING FACE OF PORTABLE STORAGE.

Portable PCs and notebooks for mobile executives need disk capacity of more than 200 MB, with low power, light weight and outstanding shock resistance. And cost effective tape backup systems with fully capable software.

Portable market priorities:

- Capacity at Cost
- Performance

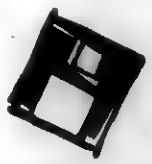
Disk

Filepro Notebook 170 MB , 250 MB and 340 MB

The Filepro Notebook Series of 2.5-inch disk drives meet the demanding needs of today's mobile executive. Featuring capacities from 170 MB to 600 MB (with data compression), their patented low power, low-profile, light weight design is perfect for advanced notebooks and other mobile applications.

Tape

- 600 MB capacity with compression
- 0.2 watts power (sleep mode)
- 200Gs of shock resistance
- 12 msec average seek time
- 4500 RPM rotation speed
- less than 7 ounces
- PC/AT or SCSI interfaces



Software

Parallel Minicartridge 250 MB Drive

The new Conner Parallel Minicartridge 250 drive is perfectly featured for a wide variety of portable storage applications. Like mobile notebook computing. And for customers looking for a cost effective method to protect valuable data. Our Parallel Minicartridge 250 combines small size, low weight and maximum ease-of-use. Making laptop and desktop system backup easier than ever.

- plugs into the parallel port
- requires no special controllers or adapters
- includes Backup Exec Software

Backup Exec for Parallel Port

When you're on the move, Conner's new Backup Exec for Parallel Port backup software makes protecting valuable notebook PC data as easy as clicking a mouse. It's a full-featured program providing all of the options you want and need from a comprehensive backup program. Its unique combination of robust features and easy graphical interface make it the ideal backup solution for a wide variety of users on the go.

- schedule automatic backups to run attended or unattended
- run Windows backups completely in the background
- select optional levels of data compression

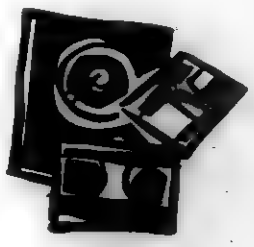
TOTAL SOLUTIONS FOR THE CHANGING FACE OF TURN-KEY STORAGE SYSTEMS.

From basic single-user needs to complex network storage requirements, Conner Storage Systems Group delivers turn-key solutions, coupled with customized service and support. For every user from entry level PCs to enterprise-wide network administrators.

Disk•Stor

Beginning with the Conner Disk•Stor Series. Available through retailers and mass merchandisers, today's Disk•Stor Series offers disk drives with higher performance and capacity for system upgrades, at competitive prices.

- capacities range from 120 MB to 1.4 GB
- bundled with mounting hardware for easy installation



Storage Systems

Tape•Stor

The Tape•Stor Series offers a full range of easy-to-use tape systems for backing up valuable stored data.

- Minicartridge drives—internal or external parallel, 250 MB
- Data Cartridge drives—internal, 250 MB, 525 MB, 1.35 GB
- DAT drives—internal, 2 GB or 4 GB
- Includes DOS and Windows software

NetWorker

Conner NetWorker offers Novell NetWare users a centralized, enterprise-wide backup and recovery product for complex networks.

- increase performance with concurrent backup of multiple clients in parallel
- true "lights out" operation through scheduling, autoloader support, and automated media management
- support for high performance, high capacity devices including DAT, 8mm and DLT drives and autoloaders

HSM

Conner introduces HSM—the first hierarchical storage management system for Novell NetWare.

- automatically migrates inactive network data to less expensive storage
- supports a hierarchy of hard disks, optical jukeboxes and tape libraries
- transparent user and application recall of migrated data

Autoloaders and Jukeboxes

Conner also offers autoloaders and jukeboxes in capacities up to 50 GB—for DAT, DLT and optical network storage.

CS Disk and Tape Systems

Conner offers the industry's widest selection of SCSI tape and hard drive solutions for UNIX workstations and PC UNIX systems.

- capacities from 250 MB to 4 GB
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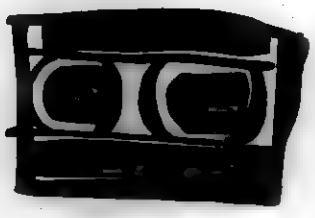
Disk



Tape

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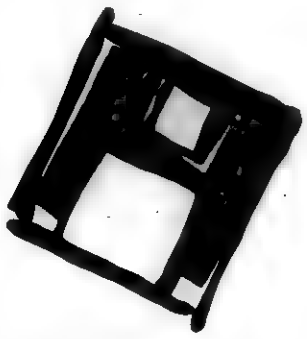
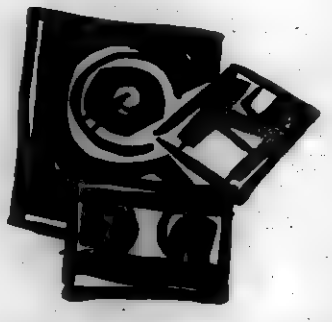


Software



Storage Systems

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Briefs

Argonne gets Power Parallel

Argonne National Laboratory has acquired a 128-processor version of the IBM Power Parallel supercomputer. Groups of researchers from universities, corporations — including Amoco and Allied Signal — and other national labs will all use the supercomputer and will help test it.

Digital combines units

Digital Equipment Corp. has combined the five customer business units it formed earlier this year with its worldwide sales and marketing organization. The business units are now overseen by Edward Lucente, vice president of sales and marketing who had previously reported to Robert Palmer, Digital's president and chief executive officer. Digital said it hopes the combined organization will be more efficient and added that Palmer also wanted to reduce the number of his direct reports, which totaled 19 executives before the reorganization.

Graphics accelerators

IBM plans to remarket high-end graphics accelerators that are made by Evans & Sutherland for its RS/6000 family of computers.

Bull introduces mainframe line

Its high-end strategy will be built around new DPS 9000/900 machines

By Craig Stedman

Groupe Bull recently expanded its DPS 9000 mainframe line with six models based on NEC Corp.'s hardware and its own GCOS 8 operating system. The beleaguered French company also said it has started early development work on a CMOS-based parallel processor akin to IBM's Power Parallel system.

However, Ted Raffel, U.S. business development director for enterprise systems, said Bull's high-end strategy will be built around the new DPS 9000/900 machines at least through 1996. Bull is still "trying to determine the rate that we would implement" the parallel technology, he added.

Whether Bull has the staying power to wait several years for a new approach is unclear, said Carl Greiner, a large systems analyst at the Meta Group, Inc. consultancy in Westport, Conn.

The DPS 9000/900 "does not warrant them to be considered as a long-term architectural player," Greiner added.

Code-named Zeus and rated for twice the performance of Bull's existing mainframes, the DPS 9000/900 models are scheduled for general availability in late March, according to Raffel. He said the company hopes to ship 100 to 150 of the machines during the next five years.

Bull's mainframe business still totals about $1 billion per year, Raffel indicated. Sales are expected to be down by 5% or so this year, partly due to concerns with the company's precarious financial position, which recently forced the French government to propose another cash infusion.

Along with the DPS 9000/900, Bull also introduced a gateway to the Open Software Foundation's Distributed Computing Environment (DCE). The product allows the mainframes to access data and services such as distributed printing that reside on DCE-equipped Unix systems, Bull said.

Bull also unveiled software that enables its mainframes to do some transaction processing work in conjunction with Unix machines running NCR Corp.'s Tuxedo transaction monitor. However, Raffel noted that transactions can only be updated in one direction at a time for now.

Two-way commit capabilities are in the works, and Bull is thinking of adding support for IBM's CICS transaction processing software, Raffel said. A more complete offering may be added next fall, although the time frame "will depend on customer demand."

Zeus ex machina

Base pricing and specifications for the entry-level and high-end models in Bull's DPS 9000/900 mainframe line, code-named Zeus

	DPS 9000/971	DPS 9000/945
[illegible]	1	4
[illegible]	1	2
[illegible]	1	2
[illegible]	128M bytes	256M bytes
[illegible]	364 trans./sec.	2,020 trans./sec.
[illegible]	$5.9 million	$31.6 million

Source: Groupe Bull

Benchmarks

CONTINUED FROM PAGE 97

technical support head count.

"It was time to pull back the next layer and look at what other companies were doing better on the Real Decisions metric and whether those practices can be brought to bear in our shop," said Bob Horansky, director of information systems at The Travelers, a Hartford, Conn., insurance and financial services firm.

Steve Groce, manager of operations in information services at TI's Plano, Texas, worldwide command center, was more blunt about his interest in the group.

"If you don't come out as the best, you want to find out why," he explained. Groce said the Real Decisions 1991 data center benchmark indicated that TI had underperformed relative to comparable data centers in areas such as MIPS use and billable MIPS to customers.

The benchmarking partners meet quarterly, following up those discussions with monthly teleconferences.

Technical services

One of the first areas the group explored was technical services head count, according to Don Perez, manager of change and problem management at USAA, an insurance firm in San Antonio.

"In some technical services areas, such as operating systems, we looked real good," Perez said of the benchmark results. In other technical support areas, such as internal systems support, USAA fared less favorably, he said.

The best practices group, Perez said, also helped him identify why USAA fared so well in areas such as capacity planning. One of the main reasons Perez wanted to schmooze with his peers was to justify for his bosses why certain subsets of USAA's data center operations are the best of breed.

"If you want to go out there and do internal subsystems support [benchmarking] against a Texas Instruments or Texaco, you want to know some of their priorities and confirm that you're heading in the right direction," Perez said.

Despite its unfavorable MIPS-use ratings, TI has not made any demonstrable changes to its operations from the feedback Groce has gathered from other best practices confidantes, he said.

Benefits

"We feel comfortable where we are, even though we would like to be more cost-effective," Groce said. He added, however, that other input he has received from the group's participants in areas such as problem management, change management and help desk have helped influence his company's data center decisions.

Two of the participants, Perez and Mike Jones, manager of Texaco's Bellaire, Texas, data center operations, said their companies have received tangible benefits from the brainstorming sessions. "Other companies had better service-level agreements than we had," Jones said. "That has helped us to rethink the value of our service-level agreements and how they may or may not be used as a tool to improve relationships with our customers."

Perez said he used feedback from Jones on how the petroleum giant addresses problem management with its vendors. Perez said USAA adopted Texaco's "scorecard" approach to ranking its hardware vendors on a monthly basis in areas such as a failure to meet a timely preventive maintenance schedule. Since implementing the ratings for its five primary hardware vendors several months ago, USAA has received considerably better service, Perez said, though he was unable to quantify those changes.

TI Manager of Operations Steve Groce *said peer input influenced his decisions*

Code of conduct

Because the best practices group included insurance industry competitors such as USAA and The Travelers, it decided to avoid conflicts by incorporating the American Quality Institute's Code of Conduct at its first meeting, according to USAA manager Don Perez. The measure was adopted to ensure that proprietary corporate information discussed at meetings be kept secret.

And by networking with his data center peers, Horansky at The Travelers said he has likely avoided having to bring a consultant into his shop to gauge future projects because some of his cronies have already embarked on these endeavors and helped guide his early steps.

Indeed, the best benchmarking practices are those that bring tangible benefits to participating companies, according to Brian Lowenthal, managing director at The Benchmark Partners, Inc., an Oak Brook, Ill., consultancy that specializes in benchmark processes.

"I'm a proponent that if you can't have quantifiable benefits from the benchmarking initiative, you probably didn't approach it properly," Lowenthal said.

Client/server arena

The UEAA-cosponsored best practices group plans to broaden its discussions to include the challenges facing historically mainframe-centric shops as they move into the client/server arena. But before those issues are raised, there is still a bevy of data center-related topics to explore, including recovery management, Jones said.

Besides, client/server is the basis for a second Real Decisions best practices group, cosponsored by McDonald's Corp., that met for the first time last week, noted Tom Janus, home office director at the Oak Brook, Ill., fast-food franchise.

Conde Nast melding HP 3000, PCs

By Mark Halper
LONDON

For Conde Nast Publications Ltd.'s business and commercial operations, relying on a proprietary Hewlett-Packard Co. minicomputer has meant conforming to old hierarchical computing procedures, even for end users who access the mini through PCs.

But MIS manager James Bedster hopes to soon install technology that will move the publishing company's HP 3000 minicomputer into a distributed computing scheme that would spread processing among some 100 PCs. Sales and production staffers use the PCs to track advertising bills, payments and copy.

Bedster's aim is not only to speed up PC access of 3000-resident data but to distribute processing to about 10 486-based servers.

"You can't keep throwing stuff at the 3000 and hope it's going to do it," Bedster said. Conde Nast has continually added functions to the HP 3000, such as an editorial system that tracks writers' and photographers' costs, he explained.

One other factor driving the move: Conde Nast wants to simplify life for end users who have to operate in two different environments — Windows, for tasks such as word processing and spreadsheets, and the menu-driven HP 3000.

"They have to have a completely new set of commands, and they want to know why they can't use the same ones they are accustomed to," he said. "So we want to give a Windows feel to our system."

The company is now evaluating development tools that it will use to build a PC-to-HP 3000 interface.

In the present mode, the company ties PCs into the HP 3000 through Walker Richer & Quinn, Inc.'s Reflection emulation software. Another 30 or so end users still use terminals to access the 3000 and its proprietary database, HP's TurboImage.

Distributing the tasks

Bedster referred to the installation of Reflection in 1992 as "a first step" toward a distributed environment. The move enabled the company to put its PCs to work for tasks other than isolated chores such as word processing and spreadsheets.

"But effectively, we're still using the PCs as dumb terminals," said Bedster, who pointed out that while Reflection enables the PCs to draw data from the HP 3000's database, it does not permit free swapping from one PC to the next. "The challenge is to distribute the processing of the data out to the [PCs]," he said.

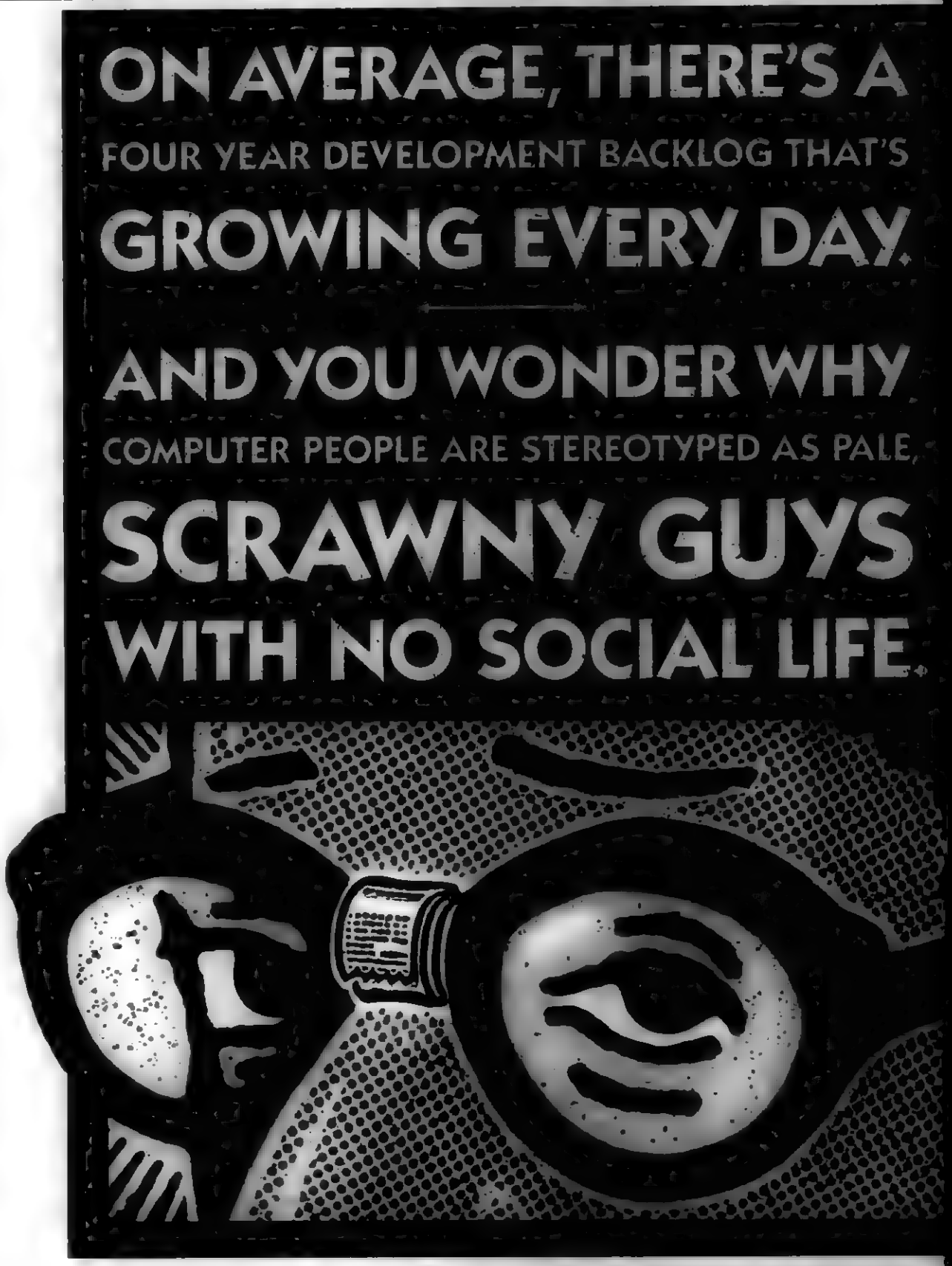
The 70 PCs already sit on a Novell, Inc. NetWare LAN and Microsoft Corp. LAN Manager LANs that support a total of 250 PCs at Conde Nast for other operations, including classified advertising. But they bypass those networks to communicate with the HP 3000 through a slower asynchronous link, which Bedster said he hopes to eliminate.

Denys Beauchemin, a Houston programmer at database tool vendor Hicomp America, Inc., cautioned that moving to a client/server mode with the HP 3000 is advisable as long as the user does not put a heavy transaction load on the network. Bedster added that Conde Nast has limited on-line transaction processing needs.

To make the shift, Bedster is evaluating development options from three vendors: Speedware Corp., Microsoft and Dynamic Information Systems Corp. He said he expects to make a decision within six months.

The least-expensive option could be Speedware because Conde Nast is already a Speedware licensee and should receive the company's forthcoming client/server project as a free upgrade.

Microsoft's Visual Basic would cost about $300, and Dynamic Information Systems' product would cost a "few thousand" dollars, Bedster estimated. But the product would include process-to-process linking (PPL), which Conde Nast would have to purchase if it were to decide on the Speedware or the Microsoft product, he said. And the PPL element could make the cost of a Speedware or a Microsoft solution close to the Dynamic Information Systems price, Bedster said.



Pyramid plans MPP machine

CONTINUED FROM PAGE 97

suming technique employed in symmetrical schemes.

Craig Sultan, an analyst at Montgomery Securities in San Francisco, said large retailers and travel industry companies could benefit from faster searches and interpretations of massive databases that could contain terabytes of information.

A central office of a large retail chain, for instance, might want to analyze how tie-dyed T-shirts are selling in hundreds of stores around the country.

Pyramid director of product marketing Judson Groshong declined to provide product details.

He noted, however, that Pyramid is developing what he called a "massively scalable" architecture intended to extend the clustering capabilities well beyond the maximum four-box clusters that Pyramid now supports.

A reservation clerk at a hotel chain could use the system to simultaneously obtain property, map and room inventory information rather than run separate queries for all three, said Bill Rieke, director of strategic systems at The Promus Cos., the Memphis-based owner of Embassy Suites, Hampton Inns and Homewood Suites.

"You could cut down on the amount of time it takes to handle a call at the reservation center," said Rieke, a Pyramid customer who said his chief concern before implementing massively parallel technology would be reliability.

Sultan pointed out that unlike some of the massively parallel vendors that sell to scientific markets, Pyramid is focusing on the needs of the commercial world.

"The kind of sale you make to Wal-Mart is different than what you make to NASA," Sultan said. "The commercial people are looking for reliability, support and software. It's not the same as selling to an engineer who likes to sit around and tweak things."

Symmetrical designs

On a sobering note, Gordon Kerr, senior vice president of MIS at Hyatt Hotels Corp., said massively parallel systems from Pyramid and other vendors could benefit users with intensive data and image search demands, such as insurance companies, retailers or credit reporting agencies.

But he disagreed with Rieke, noting that for transaction-intensive operations such as a hotel reservation system, symmetrical designs from the likes of Pyramid, Hewlett-Packard Co. and Sequent Computer Systems, Inc. are sufficient.

"Whenever the dust settles on the latest round [of symmetrical multiprocessor introductions], they're all going to be at around 2,000 transactions per second," Kerr said.

"And I don't know of anyone, with the possible exception of Sabre, who's running 2,000 transactions per second," he added, in reference to AMR Corp.'s Sabre reservation operation.

Sultan said Pyramid should have a six- to nine-month lead on massively parallel introductions by HP and IBM.

Jones said Pyramid plans to introduce a beefier massively parallel system 12 to 18 months after it introduces Meshine.

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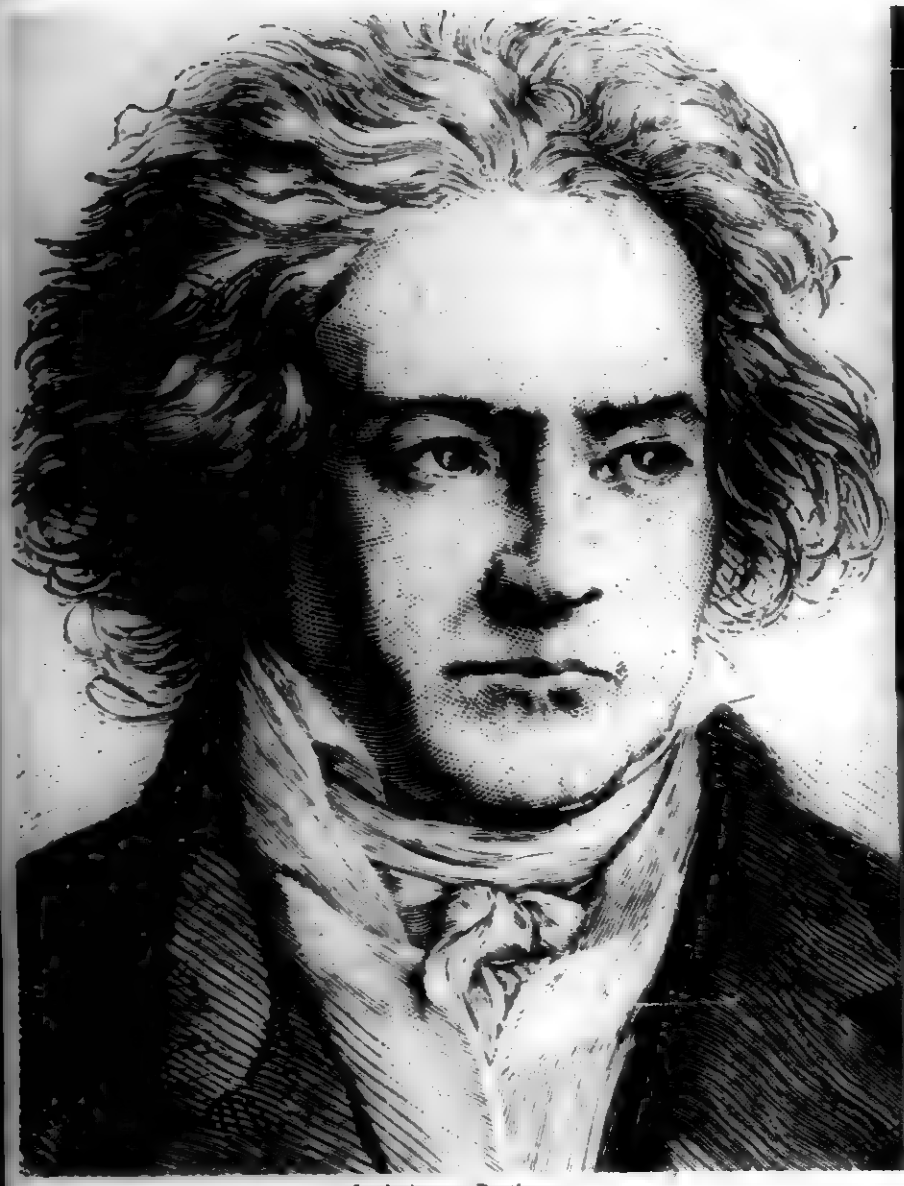

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Buddy Holly

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Data repositories

CONTINUED FROM PAGE 97

That can be used as justification for expanding the effort.

Joe Illingworth, a systems planner at Eli Lilly, suggested that implementors start with a project that is at the heart of the "value-added business cycle." In the pharmaceutical industry, he said, the key is to reduce the product development cycle to get more new products out the door quickly. In other industries, he said, perhaps it is the manufacturing or order-processing cycle that is critical. "You have to find out what is important and focus on that. Work with the visionaries in your company."

All are reasons why it is important to start small. Donald Feinberg, an analyst at Gartner Group, Inc. in Stamford, Conn., said that perhaps only 20% of existing mainframe data will be accounted for in a repository. Once this data is modeled and cleaned up, all information created afterward should be available through a repository. "There is no way to retrofit all legacy data," he said.

At Kraft General Foods in Northbrook, Ill., the goal has been to provide the repository as a service to application developers, according to Ann Marie Durso, director of applications architecture. "The developers are so focused on delivering function to their business customers, they needed something that wouldn't impact their schedules," she said.

Gerald Moss, who served as the project leader of the Federal Aviation Administration's repository pilot during the past year, said technical challenges can be daunting. "A lot of things behind the scenes can sneak up on you and cause you problems," he said. "You need a good, solid technical team that knows existing technology, data modeling, the repository, and that includes functional area experts in each of the business areas."

Moss, a consultant with the Fairfax, Va., consulting firm Advanced Testing Technologies, Inc., also suggested paying particular attention to the communications infrastructure. In the FAA's case, the agency had to implement TCP/IP before it could deploy the repository it had selected.

Repository implementation requires the team to find out what kinds of data exist in various database dictionaries and computer-aided software engineering tools and what kinds of information business users or developers need. The biggest effort, and the one hardest to cost-justify, implementors said, is the data-modeling required to standardize names and other data components across the enterprise.

One application may ask for a customer name of 12 letters, while another requires a customer of just eight. These issues need to be rectified for all applications and data that will be included in the repository.

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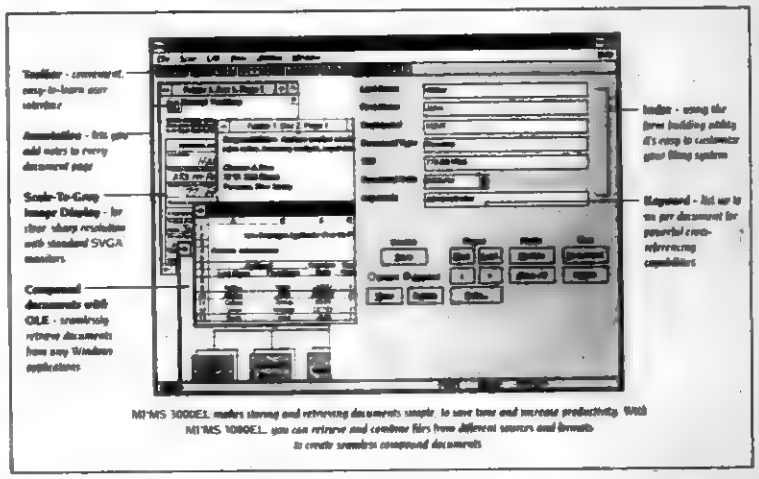

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Briefs

Utility buys System 3600

Kansas City Power & Light has purchased two NCR Corp. System 3600 massively parallel systems. The machines, which will replace two Unisys Corp. 2200 Series mainframes, will be used to maintain customer data, perform financial functions and serve as a disaster support system.

3M to sell IBM tapes

Users can now buy half-inch cartridges and related tape accessories for the IBM 3480 tape drive family through the 3M Co. IBM has said it will no longer sell the tapes.

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Software

Compuware Corp. has introduced Abend-Aid Release 7.0, a batch fault diagnosis tool that analyzes the cause of abends.

According to the Farmington Hills, Mich., company, enhancements added to this release include extended support for IBM environments and DB2 enhancements that provide plan package support.

Other features include extended Cobol support, improved Snap-Aid functionality, enhanced table functionality, batch file utility commands, an updated output selection menu and improved user exits.

Pricing begins at $39,500.

▶ *Compuware*
(313) 737-7300

FlexiWare Corp. has announced the availability of IBM DB2 support for its FlexiFinancials client/server accounting software.

According to the Shelton, Conn., company, FlexiFinancials is an object-oriented, Windows-based client/server financial accounting system that was designed to address high-volume transaction-processing requirements of corporations with multinational or multidivisional sites.

PC users can access data stored on IBM mainframes, AS/400 systems and other platforms in a client/server environment.

A five-user connection costs $100,000.

▶ *FlexiWare*
(203) 925-3040

Omron Electronics, Inc. has announced several software drivers designed for IBM's Distributed Application Environment network software that allow for high-speed, transparent communications with Omron's factory automation and control networks.

According to the Schaumburg, Ill., company, the drivers allow IBM computers and factory management software, including Plantworks, Paperless Manufacturing WorkPlace and the Process Operations Management System to transparently access manufacturing information from Omron programmable controllers for easier setup and faster screen updates.

Pricing begins at $1,000.

▶ *Omron Electronics*
(708) 843-7900

Management Information Technology, Inc. has introduced WatchWorks, an intelligent database monitoring and response tool for Oracle Corp.'s relational database management systems.

According to the Long Beach, Calif., company, the product monitors one or more Oracle databases. Through user-defined actions, it alerts users to specific conditions and events such as system overload and security violations.

WatchWorks monitors user activities, thresholds or changes in data and performance.

WatchWorks pricing begins at $2,000.

▶ *Management Information Technology*
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Hardware

Deltec Electronics Corp. has announced its line of PowerRite Pro Uninterruptible Power Systems and PowerCheck Pro software for monitoring uninterruptible power supply (UPS) power across the network.

According to the San Diego company, PowerRite Pro incorporates Deltec's Advanced Battery Management, which extends the life of UPS batteries up to 10 years and alerts users up to 60 days in advance that the battery life of the UPS is fading.

The PowerRite Pro indicates site wiring faults, battery and load status, communications status, and under and over voltages. It was designed to protect LAN file servers, network nodes and workstations from power anomalies.

PowerCheck Pro is power-monitoring software that informs the network administrator about all of the information required to monitor the network's power.

Available in six models, PowerRite Pro prices start at $449. The optional PowerCheck software starts at $99.

▶ *Deltec Electronics*
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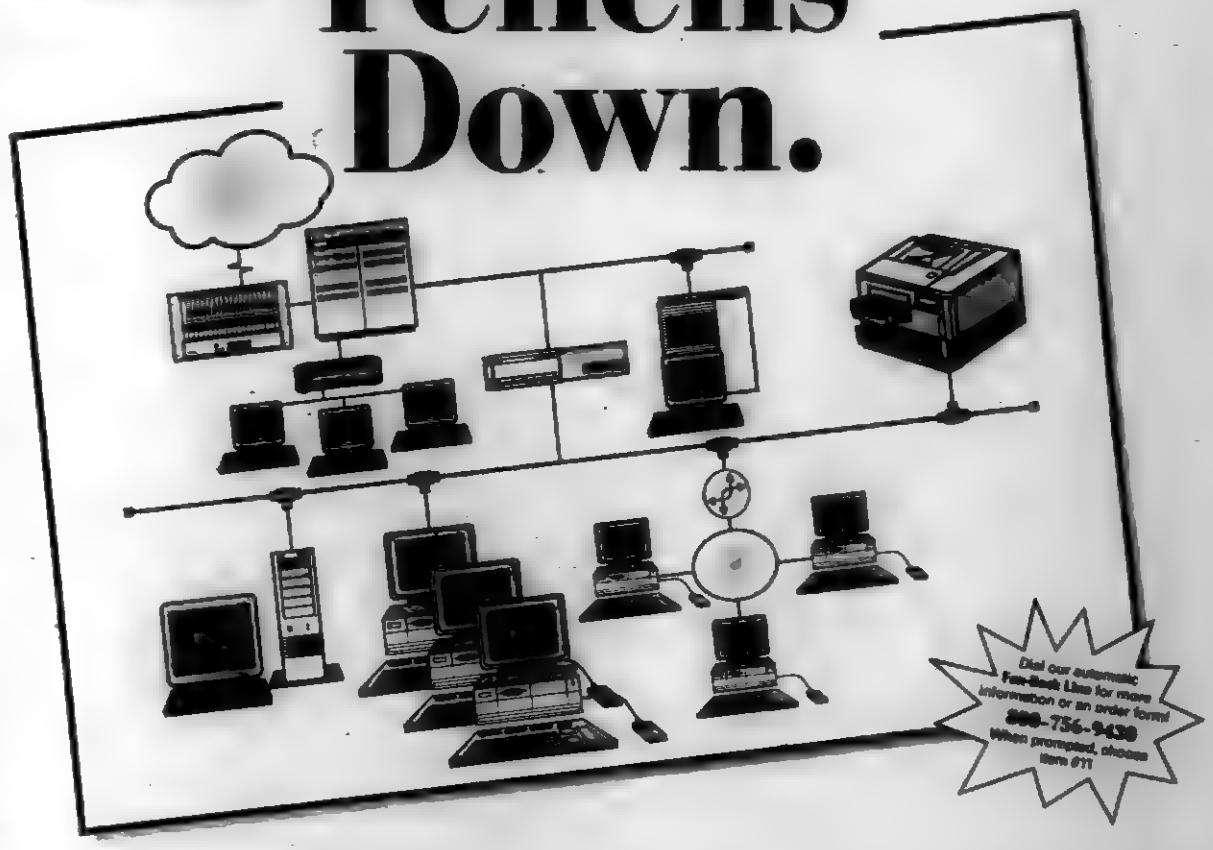
Pencils Down.



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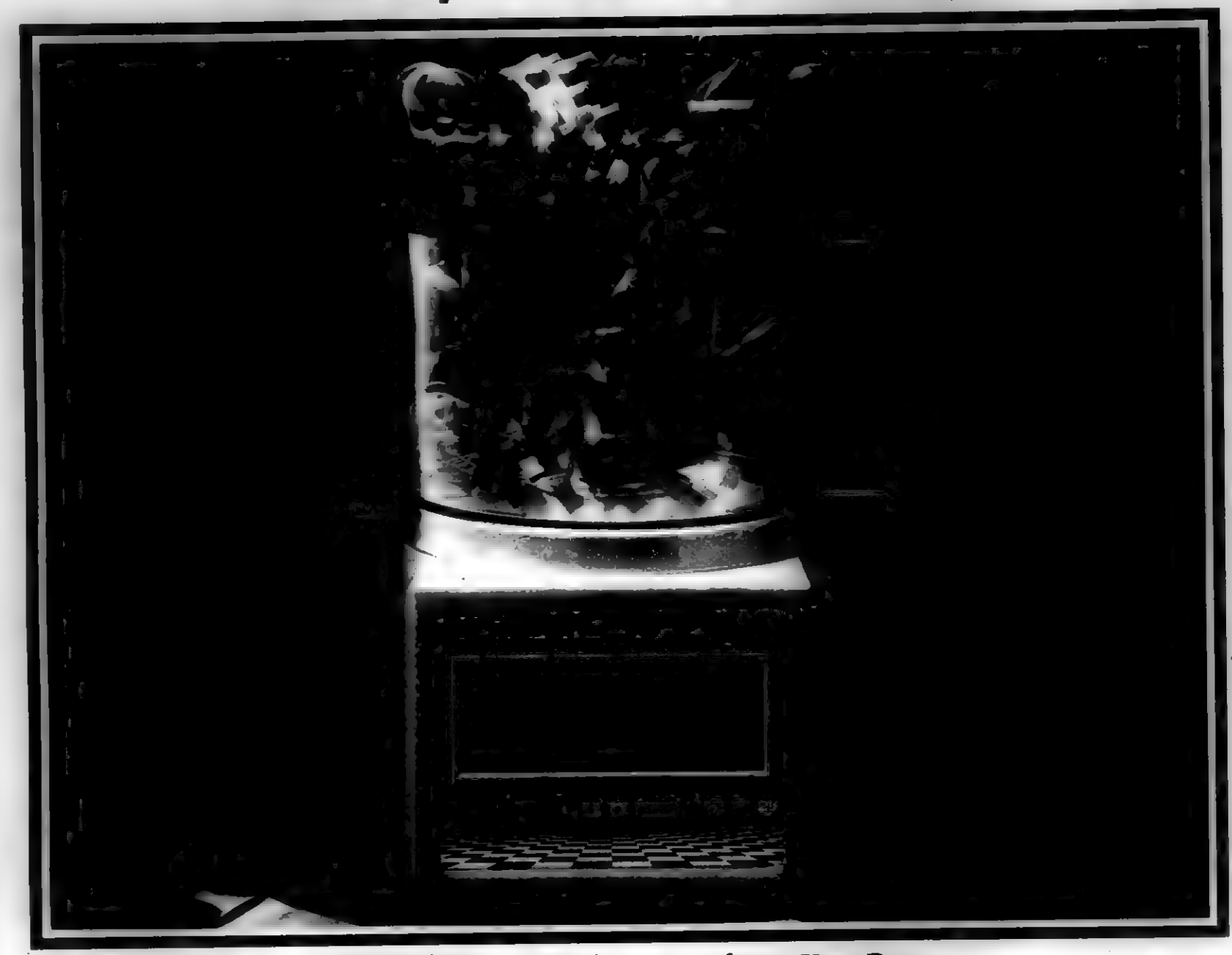

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Intersolv scales for the desktop

By Melinda-Carol Ballou

Intersolv, Inc. recently announced Intersolv APS for client/server, a version of the company's fourth-generation language tools that offers Windows support, a graphical interface and a tool to allow for the rapid development of client/server applications.

Intersolv seeks to leverage its traditional strengths in accessing mainframe environments along with the current tools' ability to scale down to the desktop. APS 3.0 for Client/Server offers a feature called Automatic Client/Server Access, which allows developers to have, for example, high-performance, native access to IBM IMS or VSAM data from Windows or OS/2 clients.

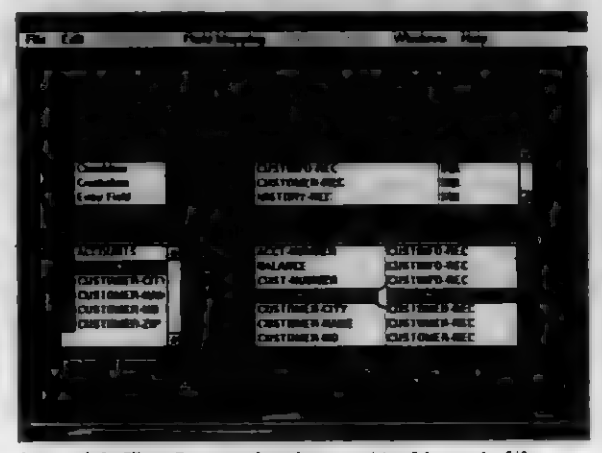
CICS everywhere

Home Savings of America, one of the largest savings and loan organizations in the U.S., is using APS to make the transition to client/server from 150 old Cobol programs and CICS on the mainframe to CICS running on OS/2.

"We're very excited about the APS tools. The learning curve is something we're very comfortable with because the mainframe terminology is the same," said Greg McDonald, computer-aided software engineering tool consultant at the bank. "We can make the transition from character-based screens to GUI-based using these tools and access our legacy data. It's like PowerBuilder and SQL Windows now [but] with mainframe support."

He added that the new version lets developers split functions of an application to target either the client or the server and to change it "at any given moment."

"You do prototyping on the screens, and the last thing you do is generate code," McDonald said. "You can go to APS, change the parameters and regenerate for either CICS on the mainframe or CICS on OS/2, for instance."



Intersolv's Client Express *development tool is part of the firm's move from mainframe to client/server*

The new graphical user interface (GUI) offers a point-and-click environment for accessing multiple document interfaces, user-configurable tool bars and floating tool palettes, as well as Client Express, a tool that lets developers create client/server applications with GUIs in a nonprocedural, visual manner, company officials said.

Positive track record

"Intersolv has demonstrated the ability to interact with mainframes and get online performance for transaction systems using mainframe data and multiple databases," said Paul Bloom, general partner at Volpe, Welty & Co., a San Francisco investment company. "Some of the other client/server tools targeting the high end have not been proven in the marketplace."

"With this release they have delivered a much richer client capability. Their challenge was to scale down rather than scale up," said Steve McClure, an analyst at International Data Corp., a Framingham, Mass., consulting firm. "They now have a tool that is a lot more graphical and exploits the Windows environment to create applications more easily but retains the access to mainframe data."

APS 3.0 for Client/Server will ship next month and is priced at $4,000 per seat for both Windows and OS/2 platforms.

Digitalk ties old apps into SQL databases

By Ed Scannell

Digitalk, Inc. has released an updated version of its OS/2-based client/server tool designed to better integrate several best-selling relational databases.

One of the biggest advantages of Version 2.0 of the Parts Relational Data Interface for OS/2 is that information systems organizations can assemble or reuse existing software from multiple technologies instead of writing components from scratch.

Using Digitalk's Parts Workbench as a framework, corporate users can create new components in several languages including Smalltalk/V, Cobol and C.

"Using our CICS and Cobol wrappers, we believe customers can integrate legacy systems with SQL database functions," said Michael Arrigo, vice president of marketing at Digitalk in Santa Ana, Calif.

Besides the support it already offers for OS/2 Database Manager, Version 2.0 of Parts has added support for more than a half dozen other client/server databases including Microsoft Corp.'s SQL Server, Oracle Corp.'s Oracle 6 and 7, IBM's DB2/2, Novell, Inc.'s NetWare SQL Database and Borland International, Inc.'s dBase III and IV.

Some of the tool's new features include a SQL library that can hold multiple SQL statements, the ability to read rows of data forward and backward and a new workbench database menu that allows developers to customize data types.

Version 2.0 also lets users put together graphical applications that work independently of a database. Those same client/server applications, however, can also work across different databases.

Shipping now, Version 2.0 carries a list price of $695. Users can distribute applications using Parts without paying a runtime royalty.

Cobol in KnowledgeWare's sights

By Melinda-Carol Ballou

KnowledgeWare, Inc. will fill out its product line next month when it begins shipping tools that allow users to redeploy legacy programs as client/server applications.

Atlanta-based KnowledgeWare's NorthStar tools will allow developers to pull out Cobol code from applications, analyze it to determine its design and then move it over to KnowledgeWare's Application Development Workbench (ADW) for redevelopment as a client/server application, sources close to the company said.

The unveiling will follow similar announcements by Texas Instruments, Inc. and IBM [CW, Oct. 18].

Developed in conjunction with Integrated Microcomputer Systems, Inc. in Rockville, Md., NorthStar acts as a stepping-stone to ADW. The product offers an interim repository where developers can perform graphical analysis of Cobol code to create flow diagrams of an application.

Using program analyzers, developers can obtain finer levels of detail about an application's design, the sources said. The program can then be moved into ADW for redeployment as a client/server application, the sources said.

KnowledgeWare declined to comment on the product.

Developers can also take advantage of other computer-aided software engineering tools, such as Intersolv, Inc.'s Excelerator and TI's Information Engineering Facility and tools from Bachman Information Systems, Inc., Cadre Technologies, Inc., LBMS, Inc. and Popkin Software, via ADW's Rochade repository, they added.

NorthStar supplements KnowledgeWare's Legacy Workbench tools, which provide for the maintenance, redesign and migration of mainframe-based systems. Legacy Workbench offers application assessment, program documentation, program restructuring and graphical maintenance, KnowledgeWare officials said.

Some users of the Legacy Workbench spoke about the advantages of the tools. "We've used Legacy Workbench for some time and have integrated the tools into the operations for our Cobol change control systems," said Fred Saner, a systems planning specialist at a major automotive company. "[They] provide measurement of the quality of the programs each time they're updated."

Asked about the ability of NorthStar to bring legacy Cobol programs into ADW for analysis and redeployment, Saner said, "It sounds very tempting, but I'd like to see it working first."

However, while these tools and others like them can help with the process, they are not cheap and offer no "silver bullet" for eliminating manual coding, industry analysts said. "It's far from an automated procedure," said Ed Acly, an analyst at International Data Corp., a consulting firm in Framingham, Mass. He noted that "considerable work may be required to get the application in shape."

NorthStar's pricing starts at $24,000, sources said, and the product will run under OS/2 or Windows 3.1. The Legacy Workbench is priced at $100,000 for five workstations.

Gateway

KnowledgeWare offers a one-way gateway between ADW and its Flashpoint and Objectview GUI-based client/server tools. A bidirectional gateway can be expected during the first quarter of 1994. More than 4,200 companies use ADW, and KnowledgeWare has shipped more than 208,000 products, the company said.

Client/server enters mission-critical game

By Melinda-Carol Ballou

While some corporate information systems departments complain of hitting the wall with client/server tools, others are targeting client/server for mission-critical, transaction-intensive applications.

One such example is Fortis, Inc. in New York, the U.S. arm of Fortis International, a $46 billion international insurance and financial services company. Fortis is setting up an infrastructure for corporatewide client/server processing along with a pilot claims processing application.

Using Andersen Consulting's Foundation tools and consulting services, Fortis will develop client/server applications to link three subsidiaries in Woodbury, Minn., Kansas City, Mo., and Milwaukee (see chart).

Fortis officials said they initially opted for Andersen's consulting services and then chose its tools after evaluating other options.

Before the acquisition

The three subsidiaries were originally separate companies: Time Insurance Co., a health care organization in Milwaukee; Mutual Benefits Life Insurance, a Kansas City firm specializing in long-term disability and similar programs (now called Fortis Benefits Insurance Co.); and Western Life Insurance in Woodbury, a mutual fund and variable annuities firm (now called Fortis Financial Group).

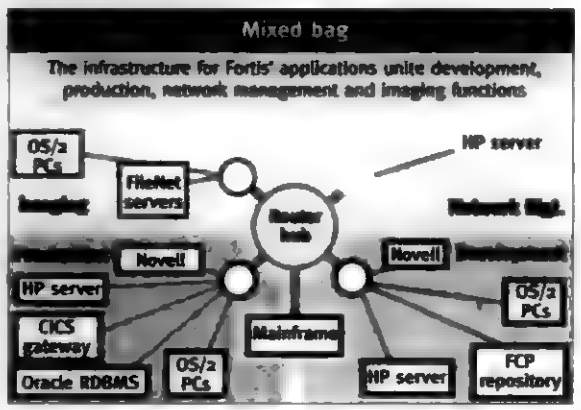
When Fortis acquired them, each had disparate hardware and software systems that had to be re-engineered to create a united, coordinated entity, said Cheri Rodolfo, senior vice president at Fortis.

The first application, which will go live in Milwaukee next month, is an imaging tool for claims processing that also incorporates data capture and analysis and work management. It will be built using Foundation for Cooperative Processing (FCP) tools and methodology, imaging software and hardware from FileNet Corp. in Costa Mesa, Calif., and Oracle Corp.'s relational database management system. The application is scheduled to go live at the other two locations in early 1994.

"The application as we've currently defined it is a medical claims application. This first phase involves setting up the infrastructure, the networks, security, software distribution methodology and development tools standards," Rodolfo said. "We've developed two utilities which will be used across our different companies. The first one is imaging and image-assisted data capture, and the second one is work management."

Fortis will be able to apply the two applications across the subsidiaries, allowing the companies to focus on their markets while working in a cohesive manner. "We want to cross-sell among the three units. We want the companies to be recognized as one in the marketplace so that if you call any one of them, they will [have easy access to the data] to recognize your relationship with all three," she said.

Fortis is using Foundation to generate client applications for Windows and graphical user interface (GUI) environments and a methodology tool to define all the tasks involved and to schedule them, said Gordy Jager, second vice president of architecture at Fortis. Foundation also includes transmission services to generate communications from IBM OS/2 clients and Hewlett-Packard Co. HP/UX servers to legacy mainframe data, he said.



Replacing the legacy

Initially, the Fortis application will act as a GUI front end to gather data for legacy host-based CICS, DB2 and IMS applications, according to Jager. The current application runs close to one million transactions per day for claims processing on CICS. Eventually, the entire application will move to client/server as the legacy code is replaced.

Fortis spent $1 million for the Foundation FCP tools, methodology and services and the 1,000-workstation, imaging-based claims system.

While tools such as Foundation are becoming more appropriate for developing mission-critical client/server systems, consulting provided by the vendor can be critical and expensive, said Curt Monash, president of Monash Information Services. "There is an up-front learning curve which cannot be evaded," Monash said.

Briefs

Ada specialists unite

Verdix Corp. in Herndon, Va., and Rational in Santa Clara, Calif., makers of Ada compilers and development tools, have announced plans to merge.

The combined public company, with annual sales of about $70 million, reportedly will have the largest share of the Ada market. Both companies want to expand their markets into broad commercial areas.

Technology alliance

Earlier this month, Object Design, Inc. and ParcPlace Systems, Inc. set up a technology and marketing alliance to unite Object Design's ObjectStore object-oriented database with ParcPlace's Smalltalk.

When available, the combined products will allow developers to create applications with complex data requirements to manage interactive multimedia and financial time-series information, for instance, according to officials from both companies.

An early-access beta program is scheduled for the second quarter of next year.

Scott H. Koehler

Object illusions

Say "object-oriented" and some people see dancing cubes and spheres. Others have a variety of misconceptions.

These flawed notions result from a combination of media misinformation, vendor hype and attempts to fit object orientation within existing frames of reference, such as modern structured analysis or data normalization techniques. Some misconceptions are the following:

▶ **All visual development tools are object-oriented.** There is a hot debate around the issue of what constitutes object orientation — support for inheritance, polymorphism, encapsulation, etc. I subscribe to purist "think." I do not believe that tools such as PowerBuilder and Visual Basic are true object-oriented environments. I'm in the camp that calls them "object-based."

Based, oriented — what does it matter? Just semantics, right? As long as the tool delivers the necessary functionality, who cares if it handles polymorphism or if the business logic is coded in a procedural-based language?

It matters in that users of these tools will not receive or understand the benefits of full object orientation. The experiences of those users will cloud information reported by early adopters of pure object-oriented technology, and many people will remain confused.

▶ **The hard part is mastering the programming language.** Many firms are focusing on training developers in C++ and expecting object implementations to follow. The reality is that in object-oriented development, analysis and design are critical. If you get the design wrong — that is, pick the wrong objects — your implementation will be impaired and most likely will not be object-oriented.

▶ **Objects are packaged procedures/subroutines.** People often commingle object concepts and procedural-based thinking. It's not uncommon to hear objects described as verbs, for example, a print object or calculation object. However, objects are generally nouns, and the verbs represent methods or processes that are part of the object. For instance, a Form will know how to print itself, or an Insurance Policy will know how to calculate its premium.

▶ **Object orientation emphasizes process over data.** Some see the object approach as a return to the days when process was king. Actually, it is "thing" centric. An object represents an abstract data type that models some real-world thing and presents a unified model that encourages a tighter coupling of process and data than we've seen before.

▶ **Object-oriented technology is synonymous with GUIs.** Many people feel that object-oriented technology is used only to build GUIs, and all GUIs must be built using object-oriented technology. Neither, of course, is true. Object-oriented technology excels at implementing GUIs but is not mandatory. Object technology is well-suited for a host of non-GUI business applications, particularly those that model complex, dynamic domains.

▶ **Stored procedures are an example of object orientation.** Stored procedures provide a method of embedding process, along with the data, in a relational database. There is no object orientation to this approach since the stored procedure can update whatever it wants.

▶ **Class hierarchies are a method of providing functional decomposition; they describe whole/part relationships.** Neither is true. A class hierarchy establishes a network where specialized classes inherit behavior from more generalized classes. This is a powerful way of sharing attributes and behaviors, and therefore, code. There is no corollary from structured design to use as a frame of reference.

▶ **Object-oriented means Object Linking and Embedding (OLE).** Microsoft's OLE 2.0 specification facilitates linking various PC-based applications such as spreadsheets and word processors. Applications are called "objects." Object-oriented programming is not required.

▶ **Object-oriented programming requires the use of an object-oriented database.** Not so. Many techniques for object storage are possible, including relational databases.

Koehler is a principal at Koehler Consulting in Holliston, Mass.

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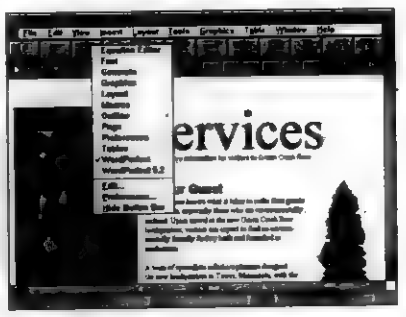

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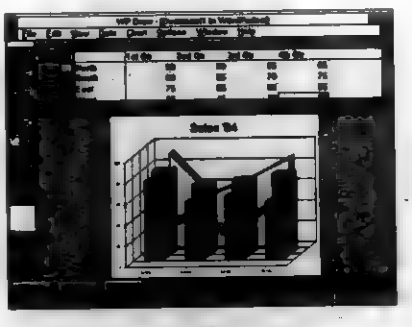

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DataServer Analyzer tackles complex queries

By Kim S. Nash

CEO: So tell me, Mr. Analyst, how many circular saws did our hardware division sell in Louisville after running a 20% off coupon in local papers in April, and how does that compare with sales after the giveaway radio spot in Buffalo all summer?

Analyst: Uh, I'm not sure, Ma'am. We have to wait for the quarterly reports at the end of December because my query tool can't get the relational database to give me that kind of data.

CEO: But IS just told me we spent several million dollars converting flat-file systems to relational to give us those answers.

Fade to black.

Relational database management systems, with their strict rows and columns of data, cannot facilitate the intricate, multifaceted requests that financial and marketing analysts — never mind chief executive officers — like to make.

At least according to IRI Software, formerly known as Information Resources, Inc. IRI provides a data warehouse and tool set that sits between inquisitive PC end users and RDBMSs, such as Oracle Corp.'s Oracle, Sybase, Inc.'s SQL Server, IBM's DB2 or Digital Equipment Corp.'s Rdb.

The Waltham, Mass., company recently unveiled a sales and marketing analysis product set designed to reshape corporate data into a form akin to the complex queries decision-support workers pose. DataServer Analyzer comprises Windows-based tools such as a report writer and query makers. A proprietary database built on IRI's Express scripting language stores information culled from corporate databases. But it does not use SQL, the preferred access method of relational products.

DataServer Analyzer's Express language lets users look at raw data in ways that are impossible with SQL, claimed Jeff Stamen, president of IRI. SQL was created to get at data stored neatly on a two-dimensional X/Y axis. IRI's database stores information multidimensionally, Stamen said.

US West sees IRI's products as a way to maintain — and in some cases enhance — decision-support tasks as the company moves some applications from a central host to a Unix client/server environment. Express tools "open new insight into data" on mainframe and desktop platforms, said Tom Keeney, director of financial information systems.

Because marketing professionals can subdivide, rearrange and juxtapose raw data in new ways, they can ask different questions. The process can turn up markets "they couldn't see before," said Gary Langstaff, president of TPM Resources, a marketing service firm specializing in retail and franchises.

IRI tools are better suited for decision support than products from Oracle or Sybase because IRI built the products for that sole purpose, Stamen said. RDBMSs, he said, are better at what they were created for: transaction processing.

Red Brick Systems in Los Gatos, Calif., makes a similar argument for keeping specialized decision-support DBMSs separate from transaction processing systems. In theory, dedicated decision-support databases give users quicker access and the ability to perform more useful queries. Traditional RDBMSs can bog down or misinterpret questions such as, "What if we offered a discount to friends of customers who have bought products in the past year using personal checks or cash?"

DataServer Analyzer is the first in a series of vertical market-oriented tools expected from IRI. A financial analyzer is due out by Christmas, Stamen said. The products support Microsoft Corp.'s Open Database Connectivity, the Open Software Foundation's Distributed Computing Environment and other links to third-party products.

The client portion of DataServer Analyzer, which requires 8M bytes of memory, is priced at $3,750. The database piece, which can sit on a mainframe, minicomputer or Unix server, starts at $25,000.

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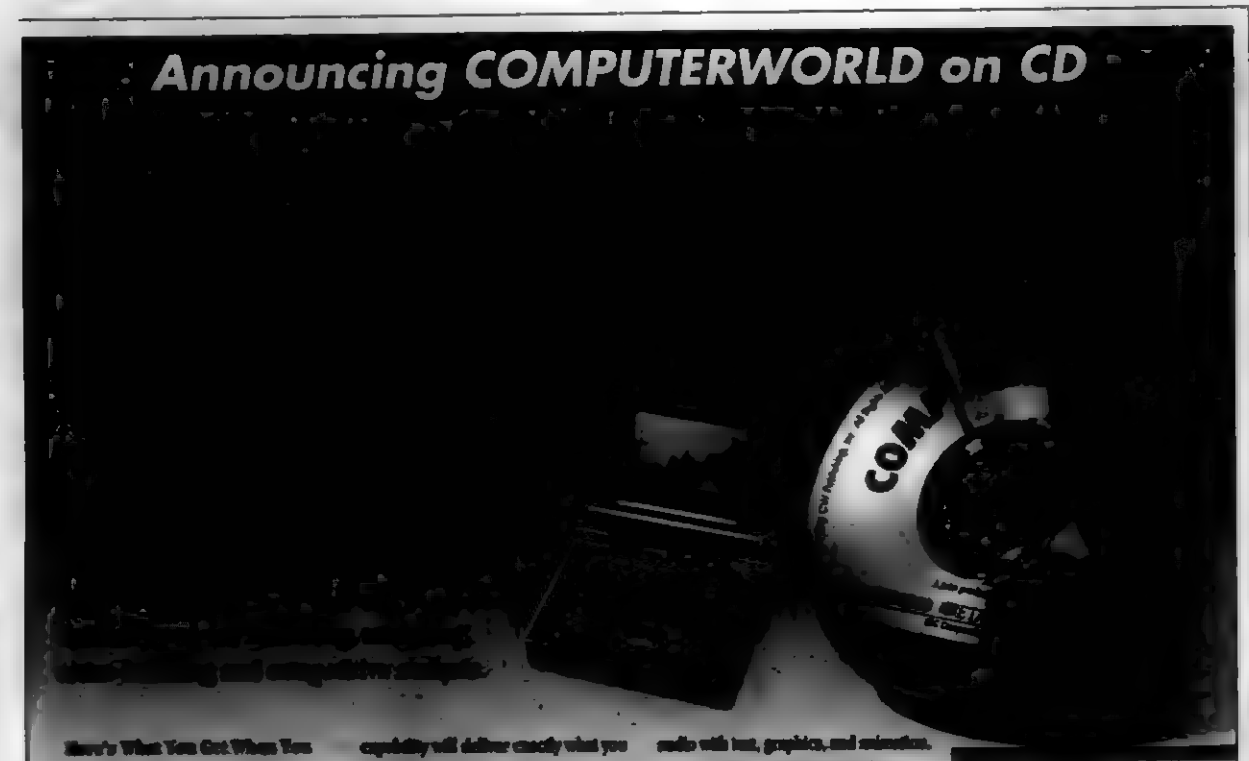

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Small integrators play to current advantage

By Ellis Booker

Small systems integrators are winning their fair share of business, particularly on the client/server integration and development front, where new technology smarts, not price, is the calling card.

These so-called boutiques — with revenue in the $50 million range — operate in the shadow of top integrators Andersen Consulting, IBM and Computer Sciences Corp. Those three owned 44% of the industry's $21.8 billion in revenue last year, according to ParaTechnology, Inc., a market research and consulting firm in Bellevue, Wash.

System integrators

ParaTechnology figures also indicated that an increasing number of new systems integration contracts last year were awarded in the $50,000 to $250,000 range, rather than the $500,000 to $5 million range, effectively lowering the entry barrier for small firms.

Indeed, if smaller systems integrators have an edge, it is due to their ability to focus on projects with relatively smaller staffs and finish projects faster, analysts said. "The big guys take 30 days to put together a team and put 50 people on the project, and [they] take 12 to 18 months to finish it," said Peter Raulerson, ParaTechnology's president. "The little guys can complete the project in 30 days."

Many of these smaller firms are ahead of the larger companies when it comes to expertise in new technologies, particularly client/server computing. "They have been able to offer what the big guys had to play catch-up in," said Bonnie Digrius, an analyst at Gartner Group, Inc. in Stamford, Conn.

On the other hand, Digrius said she believes the client/server emphasis is not a long-term strategy. Companies such as Electronic Data Systems Corp. and Andersen Consulting have made no secret of their plan to ramp up a client/server capability. "Within a year, these boutiques have to be on the next phase of technology or go out of business or be acquired," she said.

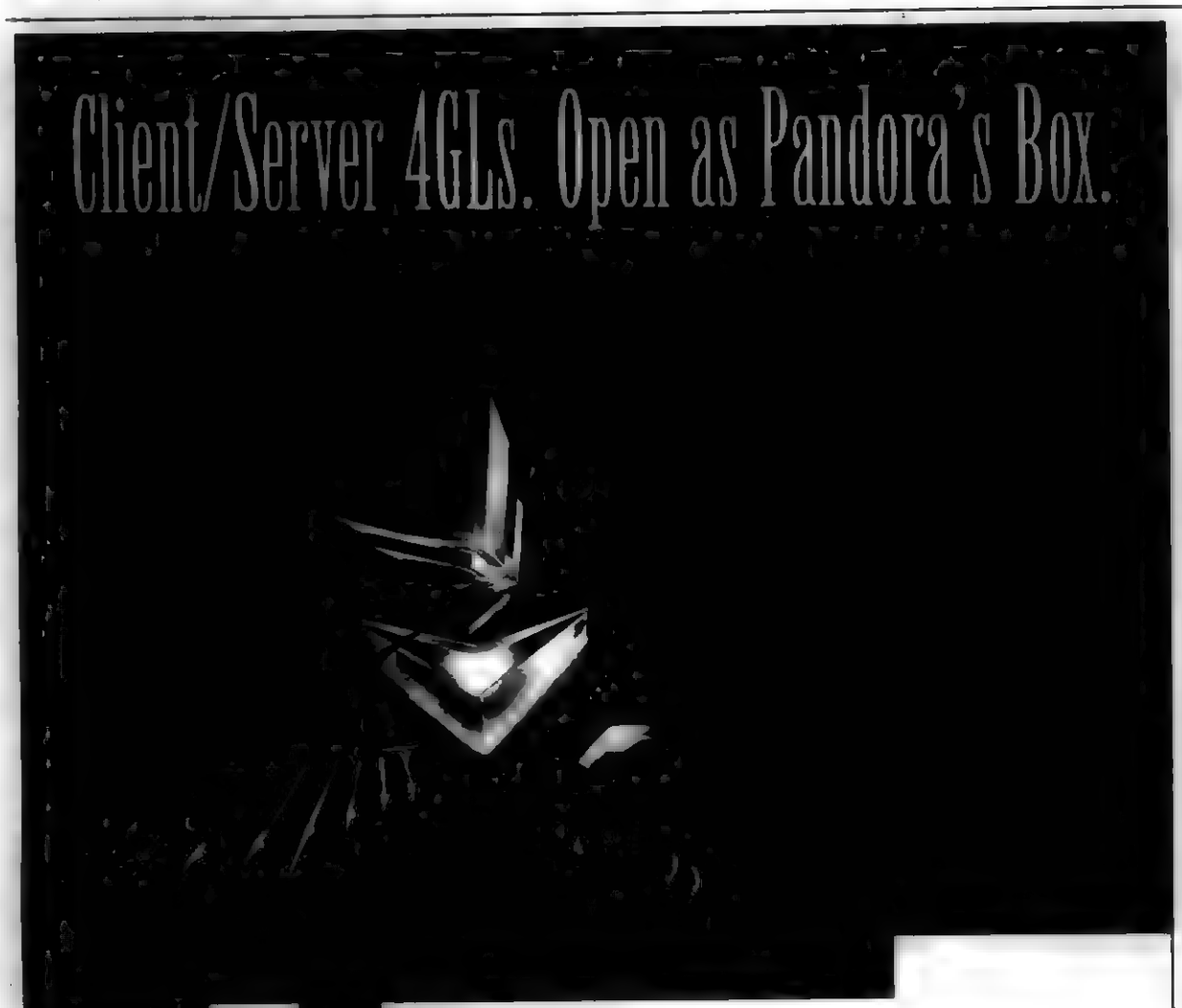
"We have a two-year window to grab market share [with client/server]," agreed Mark Shirman, who left Andersen Consulting in 1985 to form Innovative Information Systems, Inc., an integrator in Norwood, Mass. Today the privately held company does between $50 million and $75 million annually, Shirman said, most of it on client/server jobs.

Still, Shirman and other small-company executives pointed out that their head start will serve them well in the future; besides, they say, there will be "abundant" work and clients for the foreseeable future.

"If it's a fair game ... we can win [against larger integrators]. We've won against them already," said Mark Tebbe, president of Lante Corp., a Chicago firm founded in 1984.

Like Shirman, Tebbe is an Andersen Consulting alumnus who left the firm in the mid-1980s to, as he put it, "leverage the corporate investment in microcomputers beyond making the PC a terminal emulation device."

Tebbe also disputed the assumption that small firms win accounts because of low prices. The Bank Administration Institute, a trade association in Chicago and a recent Lante customer, backed up Tebbe. "They were 50% more expensive than Digital," said Clint Swift, director of MIS. Swift used Lante to develop a strategy for deploying a graphical development environment for his IBM AS/400.



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Aerospace giant TRW approached NetBase, a Microsoft Solution Provider, to help it manage its projects more efficiently. The problem: Getting project data from the mainframes was expensive and slow.

NetBase used Microsoft Visual Basic to build a multiuser system with a graphical front end, and the Microsoft FoxPro® database for real-time reporting. The result: Mainframe expenses were cut by 40%, and TRW's profitability is up 20%.

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"Agents can grab data, work with it, and use it to give customers better service."

In 1992, Air France's ticketing data was in a holding pattern, stuck inside a proprietary database that ran on mid-range equipment.

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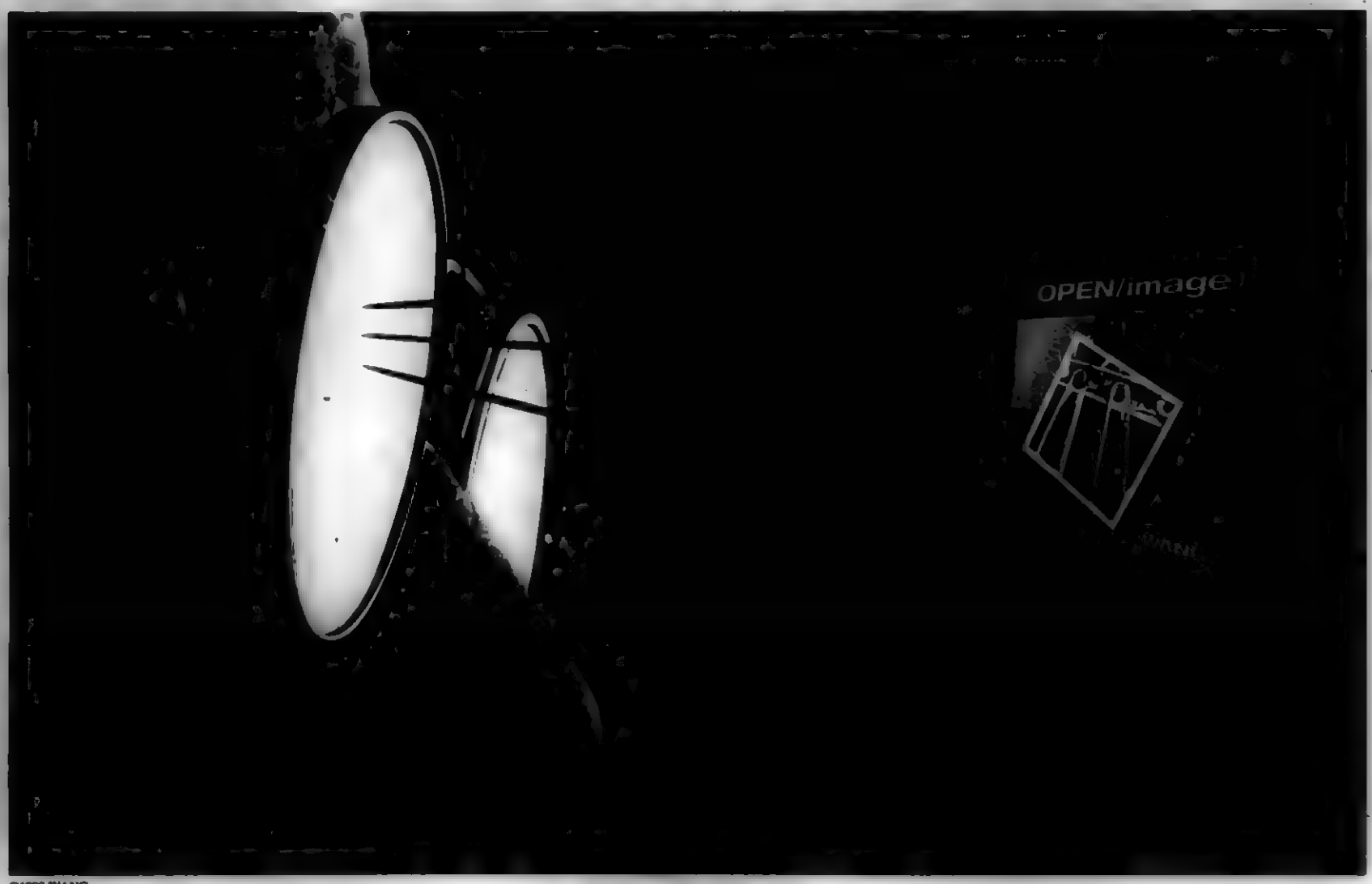

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THE POWER OF IMAGINATION.

Togai InfraLogic, Inc. has announced TILShell 3.0, a fuzzy logic software development tool.

According to the Irvine, Calif., company, TILShell 3.0 is a robust, full-feature graphical computer-aided software engineering tool that supports all design steps for engineering environments.

TILShell 3.0 features real-time on-line debugging and tuning of fuzzy rules, membership functions and rule weights; advanced fuzzy inference methods; fully integrated graphical simulation of fuzzy systems; three-dimensional color rule base and operator visualization and tuning tools; a variable editor for defining system data; and a membership function editor for defining membership function variables.

Prices start at $795.

▶ *Togai InfraLogic*
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AimTech Corp. has introduced IconAuthor 5.0 for Motif, an upgrade to its Unix-based multimedia authoring tool.

According to the Nashua, N.H., company, this version features its SmartObject Editor as well as technology that is equivalent to functionality in IconAuthor 5.0 for Windows.

IconAuthor 5.0 for Motif offers an object-oriented editor for creating content pages, including standard Motif objects such as list boxes, buttons, navigational screens, lesson pages and tests that allow the user to create all of their screens and copy and paste or drag and drop between pages.

IconAuthor 5.0 for Motif costs $10,000 for a single user, $30,000 for a four-user license and $60,000 for a 10-user license.

▶ *AimTech*
(603) 883-0220

XVT Software, Inc. has announced XVT Development Solution for C (XVT-DS) and XVT Development Solution for C++ (XVT-DS++).

According to the Boulder, Colo., company, XVT-DS repackages releases of the company's software that emphasize visual layout and prototyping of portable graphical user interfaces for fast, easy development of "industrial strength" cross-platform applications in C.

XVT-DS++ unites XVT-Power++ with the XVT Portability Tool kit, creating an advanced framework for the development of portable applications that use C++ object-oriented programming.

The XVT-DS and XVT-DS++ cost $1,950 on PCs and Macintoshes and $6,300 on workstations.

▶ *XVT Software*
(303) 443-4223

Blue Sky Software Corp. has announced that the WindowsMaker Professional 5, Prototyper and C/C++ Code Generator for Windows and Microsoft Corp.'s Windows NT now also generates code for Borland International, Inc.'s ObjectWindows Library (OWL) 2.0.

According to the La Jolla, Calif., company, WindowsMaker features include the ability to create Windows applications, edit during Preview Mode, switch to any language or major C++ library during the development of an application, add functionality directly behind objects and provide fast code generation.

Other features such as full tool bar support, application templates and an extendable open architecture are also provided.

The OWL 2.0 application programming interface shows how to take advantage of object-oriented programming.

WindowsMaker Professional 5 costs $995.

▶ *Blue Sky Software*
(619) 459-6365

Cincom Systems, Inc. has announced XpertRule Version 2.1, a Windows-based knowledge specification and application-generation system.

According to the Cincinnati company, Version 2.1 provides enhanced graphical knowledge capabilities, refined source-code generators and forms-based end-user facilities.

Users can develop, prototype and refine applications needed for complex decision processes.

The product automates knowledge capture by employing learning-by-example techniques and graphically displays the information as truth tables, pattern rules and decision and exception trees.

XpertRule Version 2.1 costs $990.

▶ *Cincom Systems*
(513) 662-2300

Avid Technology, Inc. has introduced the Open Media Framework (OMF) Interchange Toolkit, a software package that adds support for OMF Interchange to any digital audio, graphics, video or animation application.

According to the Tewksbury, Mass., company, OMF Interchange is a standard file format that encapsulates the information needed to transport an assortment of digital media between applications and across heterogeneous platforms.

The Open Media Framework Interchange ToolKit costs $499.

▶ *Avid Technology*
(508) 640-6789

Geoworks has introduced the Geos 2.0 software development kit, an all-inclusive set of application tools and documentation on CD-ROM.

According to the Berkeley, Calif., company, the product runs in a cross-development environment, making it possible for developers to create a single application for multiple computing devices.

Users can create custom debugging commands with Swat, the Geos debugger. Other features include a Linker and a Resource Editor.

The product costs $99.

▶ *Geoworks*
(510) 644-0883

Applied Business Technology Corp. (ABT) has announced Methods Architect Version 1.0.

According to the New York company, the product is a Windows-based program that allows information systems organizations to customize and automate their chosen development methodologies regardless of whether they are proprietary.

When the product is used with the company's Project Bridge Modeler, customers can plan and estimate a project before sending it to be scheduled, tracked and analyzed in ABT's interactive project planning, control and decision support system, Project Workbench.

Prices range from $1,875 to $25,000.

▶ *Applied Business Technology*
(212) 219-694

Product shorts

Evergreen Technologies, Inc. has announced VisionTools, a set of scientific imaging and visualization tools for the Visual Basic programming environment. Designed for high-end scientific imaging applications, VisionTools facilitates rapid prototyping and development of complex solutions in a productive programming environment. Cost: $495. Evergreen Technologies, Castine, Maine (207) 326-6300.... **Application Development Consultants, Inc.** has introduced CASEwise Modeler, an intuitive modeling tool for business analysts and software engineers. Version 3.0 provides more than 200 enhancements with two additional fully integrated Matrix Modeling and DataFlow Diagrams modules. Cost: $3,750. Application Development Consultants, Tampa, Fla. (813) 265-3706.... **Visible Systems Corp.** has announced Version 5.2 of the Visible Analyst Workbench computer-aided software engineering tool. Features include SQL Dynamic Data Link generation enhancements, Gupta Corp.'s SQL Windows interface, Powersoft Corp.'s PowerBuilder interface, entity/attributes displayed on data models, an extensible repository and the generation of structure charts from the repository. Cost: $1,895 to $4,995. Visible Systems, Waltham, Mass. (617) 890-2273.... **Information Engineering Systems Corp.** has announced IDE: Advisor Version 2.0, which fully documents the business-driven Information Engineering methodology and runs under Windows 3.1. The product consists of a hypermedia software-based reference product and a comprehensive set of methodology/application/assimilation manuals. Cost: $75,000 for a site license. Information Engineering Systems, Alexandria, Va. (703) 739-2242.... **Ipsys Software** has introduced Object Information Engineering Version 2.1. The product is an implementation of the Information Engineering method and was designed to speed up the development and maintenance of large client/server projects. Cost: $100,000 for five users. Ipsys Software, Newbury, Mass. (508) 463-0008.

TAFE NSW

TENDERS INVITED

Campus Management System Software

RFT 93/01

The NSW TAFE Commission seeks Tenders for Campus Management software to support its 11 institutes, 120 Colleges and 450,000 enrolments in the State of New South Wales, Australia.

The aim is to select either a single package or a number of packages for integration with existing TAFE NSW applications to provide functionality for its:

- ★ Class Members System
- ★ Resource Management System
- ★ Planning System

The software must be proven and operate in either Digital VAX/VMS or VAX/UNIX "Open Systems" environment.

Tender documents are available from John Negus 61-2-950 1619 or 61-2-950 1600 (FAX) on payment of a $200 non-refundable fee.

Responses should be lodged in the Tender Box, Level 3, Information Systems Division, NSW TAFE Commission, 39A Herbert St, St. Leonards, NSW 2065, Australia by 2.00 pm local time on 11 January, 1994.

Trapped In The Body Of This Tiny Ser

This is a story about a small computer engineered to be so dependable, you won't think twice about trusting it with your mission-critical applications. And to be this without filling a closet, much less a room. If you haven't thought of Compaq as an enterprise-critical platform before, we invite you to grab your bifocals and begin. (We'll be cramming a lot of information into this ad, which, given how much we managed to fit into our new servers, only makes sense.)

If there's one thing we've learned working with our customers, it's that you're running more and more mission-critical applications on your network. And if your network goes down, your business goes down. All of which makes the introduction of the new Compaq ProLiant Server even more timely.

The ProLiant is a new family of affordable, high-performance, easy-to-manage servers engineered specifically to provide the high availability you need for mission-critical networks. We've designed ProLiant in three different models, ranging from a single-processor configuration to a four-Pentium processor model.

Now, how can you be sure our server is truly a miracle and not a mirage? To begin with, there's Full Spectrum Fault Management, provided by Compaq Insight Manager technology and software that continually monitors over 800 aspects of the server's operating status. (For example, Drive Parameter Tracking checks 15 hard-drive parameters.) All of this information is constantly gathered, analyzed and then used to prevent, tolerate or recover from system problems.

If the performance of a monitored component drops below a specified level, our unique Pre-Failure Warranty kicks in. We'll actually replace a Compaq warranted drive or memory system free. Before it stops working. No downtime. Ringing cash registers. Happy boss.*

Still, no network's perfect. In the unlikely event problems occur, our server exhibits remarkable tolerance. Every ProLiant includes Compaq-designed hot-pluggable drives. ProLiant Models 2000 and 4000 come standard with advanced error-correcting memory and off-line backup processor features (whereby the server reboots automatically to a second processor). And, most notably, the Compaq Smart SCSI Array Controller together with the ProLiant Storage System ensures mission-critical data integrity. Should a network problem bring the server down, the Rapid Recovery Systems of the ProLiant are designed to bring it back up.

VER IS A MAINFRAME WITH AN ATTITUDE.

For example, Automatic Server Recovery 2 uses a historical record of server status and performance to perform an astonishing array of tasks. Like intelligently restarting the server, automatically correcting a variety of problems, and accessing a telephone pager to contact network administrators.

By now you'd expect us to have rethought server setup, configuration and OS installation, but you might be surprised by the results. Introducing SmartStart, a CD-ROM system that takes the headache out of getting your server up and running. ProLiant includes a CD-ROM drive and bundled CDs of optimized Netware and other major operating systems. To get hooked up to your network operating system, simply call your dealer for an access code, enter it, answer a few questions, and leave. Minutes later—say, after you've enjoyed a cup of coffee and a jelly donut—you'll return to find an integrated OS fully installed and optimized for increased performance and improved management. And we'll keep you updated via CD when new operating system versions appear.

*And finally, to accompany our new line of mission-critical servers, we're introducing mission-critical support. With ProLiant, we now offer extensive analysis, installation and service through our CompaqCare System Partners, a select group of highly trained systems experts backed by Compaq engineers. You can now choose 4-hour on-site warranty response upgrade** direct from Compaq. Again, there's our unique Pre-Failure Warranty. And, of course, all Compaq servers come with a 3-year on-site† warranty, and 7-day-a-week, 24-hour-a-day technical support.*

All in a surprisingly small box for not a whole lot of money. In fact, a DX2/66 Compaq ProLiant 1000 starts at about $6000‡.

Which may help to explain the look your boss gives you when he hears how much money you've saved: stunned admiration. But you'll get used to that. It goes with the territory. For more information on the new Compaq ProLiant servers, or for the location of an authorized Compaq reseller near you, just call us at 1-800-345-1518. If you'd like to receive model, feature and specification information immediately via fax, select the PaqFax option. Or, if you'd like that information even sooner, just turn the page.

COMPAQ

THE NEW COMPAQ PROLIANT MISSION-CRITICAL SERVERS

	ProLiant 1000	ProLiant 2000	ProLiant 4000
HIGH PERFORMANCE NETWORK SERVERS			
Processor	DX2/66 or Pentium 60MHz	DX2/66 or Pentium 66MHz	DX2/66 or Pentium 66MHz
Architecture	TriFlex/PC One Processor	TriFlex with up to two symmetric processors	TriFlex with up to four symmetric processors
Network Interface	Up to 12 High-Speed Channels; NetFlex 2 with Packet Blaster Technology Standard		
Standard Disk Controller	Integrated Fast SCSI-2 and Smart SCSI Array Controller (selected models)		
Storage Capacity	550MB–112GB Internal/external	1050MB–140GB Internal/external	1050MB–140GB Internal/external
Typical Usage	Departmental network services—primarily NetWare	Departmental network application services—NetWare, NT and Unix	Application services for preemptive downsizing—NT and Unix
Transaction Rating	50–150 TPS	200–300 TPS	300–400 TPS
Estimated Starting Street Price‡	$6,000	$8,900	$13,900
SERVER DEPENDABILITY AND AVAILABILITY			
Management	Second-generation Compaq Insight Manager (standard) combines with innovative hardware design to constantly monitor, assess and report server health and performance		
Fault Prevention	Insight Manager alerts you to server status changes in over 800 component parameters, allowing proactive server management backed by 3-Year Pre-Failure Warranty		
Fault Tolerance	Standard support for RAID levels 1,4,5; hot-pluggable drives; on-line spare drive; off-line backup processor§; advanced ECC RAM§		
Fault Recovery	Standard rapid recovery services automatically return server to full operational status even in the event of a critical subsystem failure		
SIMPLICITY, EASE OF OWNERSHIP AND SUPPORT			
SmartStart	Standard CD-based intelligent hardware configuration and system software installation, providing simplified server configuration for NetWare, NT or Unix. (CD-ROM drive standard)		
System Warranty	Free Three-Year, On-Site Limited Warranty		
Pre-Failure Warranty	Three-Year, On-Site Warranty replacement of designated components that fall below preestablished thresholds		
4-Hour Warranty Response Upgrade	Optional Three-Year On-Site Warranty upgrade to 4-hour response		
Technical Support	Toll-free, 7 x 24 technical phone support from Compaq engineers		
CompaqCare System Partners	Highly trained, dedicated, third-party professionals who provide systems maintenance and comprehensive technical support		
QuickFind/PaqFax	Proactive notification and delivery of new technical information/7 x 24 fax response for updated specification, configuration and settings data		

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The IS business manager/account executive position has taken off among the Fortune 100. But the question still lingers . . .

Whose side are you on?

BY WILLIE SCHATZ

The Benedict Arnold of information systems — that was how Howard Piggee was made to feel after he became IS business manager at Corning, Inc.'s Scientific Products Division in Corning, N.Y. But to him, it was simply a matter of putting the business first.

In his previous life, Piggee worked in the corporate IS center at the glass products company. Part of his job description was to provide the company's 15 business divisions with the best technology at the most competitive prices. But, he says, he felt he didn't have enough control over his job, so when the opportunity to become an IS business manager arose, he immediately seized it.

As IS business manager, Piggee would have the chance to work on the cutting edge of IS organizational practice by serving as the intermediary between IS and other functions.

Taking the post required a new attitude: "Readjusting your mental set is the most difficult thing for a person coming into this position," Piggee says. "You can't be totally focused anymore on being an IS techie. You can't have the same mental set as you had in centralized IS."

While Piggee grasped that concept from day one, his former IS peers apparently still don't get it. Piggee's most trying times occur when centralized IS believes it has gotten the shaft from one of its own.

With the new IS business manager model, central IS no longer deals directly with the business unit customers, as it had become accustomed to doing. The central information technology unit saw Piggee as a traitor — a former member of the organization who had become an obstacle. The word went out that Piggee was not a cooperator; it took intervention from senior management to crush the opposition.

Since then, the territorialism has significantly decreased, Piggee says. Still, he finds it very difficult to stay in sync with two sometimes hostile groups that want all of his time.

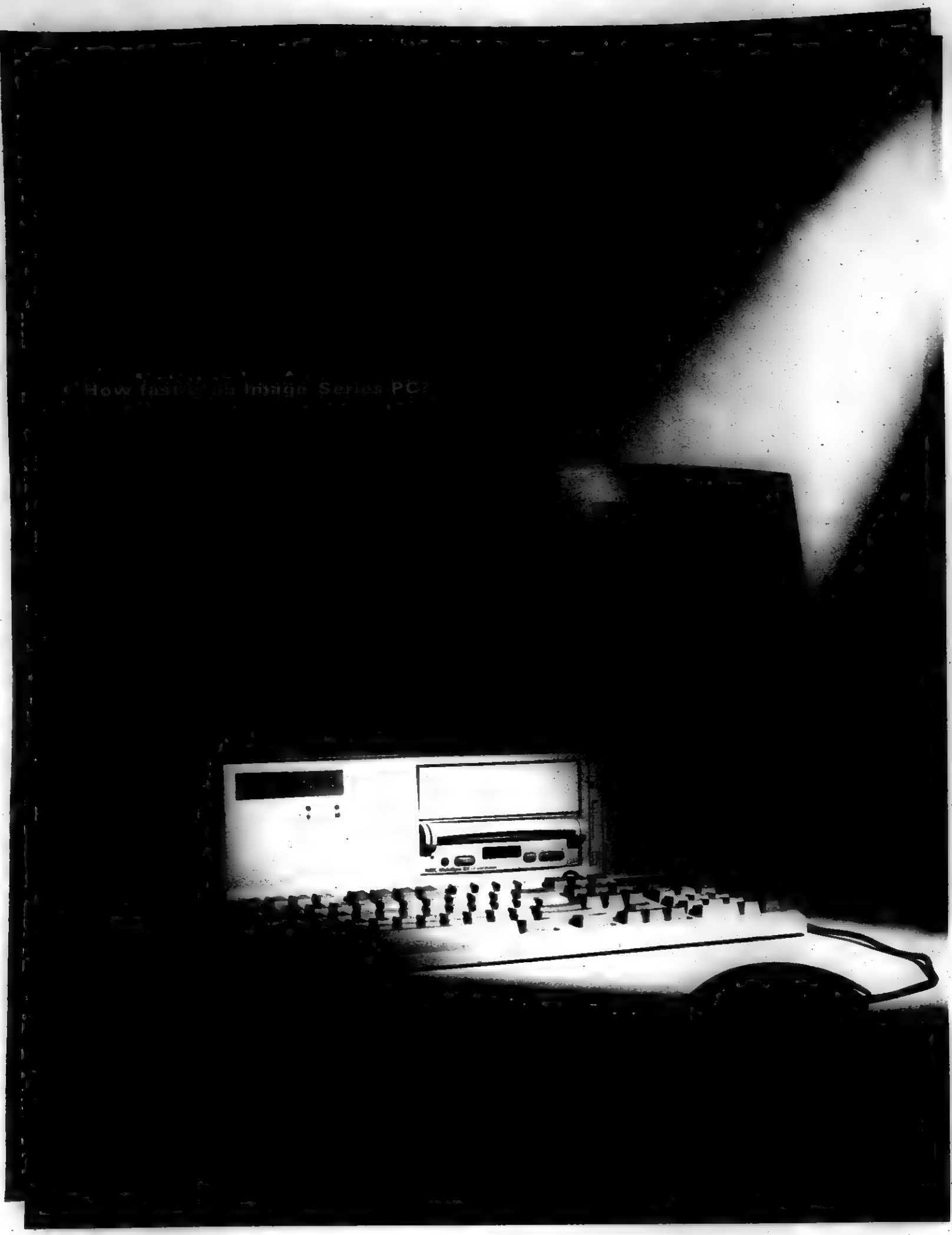
Also known as IS account executives, IS business managers are midlevel managers appointed to serve as intermediaries between IS and other functions or between IS and various business units. They can act as facilitators and enhance communication. Sometimes, they are the end users' advocate to the IS organization.

Gaining appeal

The business manager concept is becoming more popular because of the pressure on IS organizations to better serve their internal clientele. Three years ago, not more than six of the 84 members of the Research Board, Inc., a New York-based consultancy of chief information officers from companies with $10 billion in annual revenue, were interested in the concept. Now the trend is sweeping across all Research Board companies, although some have implemented the concept more fully than others, says Executive Director Ernest von Simson. Syracuse University's School of Information

Whose side?, *page 133*

Howard Piggee's *former IS peers at Corning saw him as a traitor*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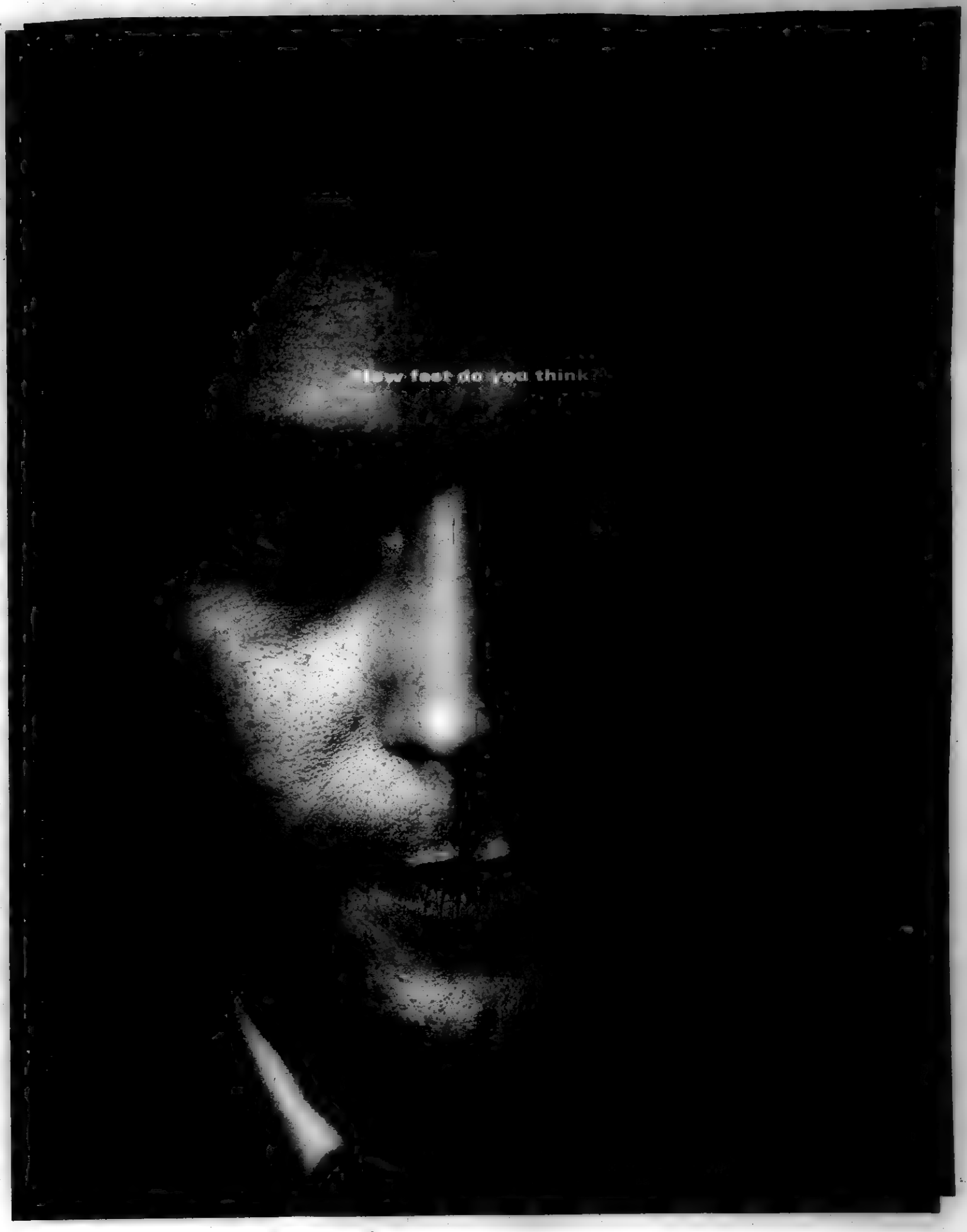
"How fast do you think?"

Some more information to bring you up to speed.

NEC

Whose side?

CONTINUED FROM PAGE 129

Studies is now training its graduates to serve in this position (see box below).

Much of the pressure to create the IS business manager position came from users. "Senior managers in our biggest financial service and manufacturing companies are telling IS they want them to take the lead in creating a partnership between centralized IS and the company's business units," von Simson says.

The skills and personality required to become a successful IS business manager are the antithesis of those associated with the stereotypical techie, according to von Simson. IS business manager hybrids are extroverted, curious about the business and more willing to take risks than your average IS professional. They must be practiced in the art of interpersonal relationships and willing to work literally side by side with their non-IS clients.

"Our members are really combining the IS units and the business units into teams so they are subject to a common set of metrics, objectives and physical space to get a common job done," von Simson says. "This is a totally different environment than either IS people or business unit people are used to."

Managers without a country

When they first appeared, IS business managers were treated as pariahs.

"These folks used to be like people without a country," says Cheryl Currid, who for eight years functioned as an IS account executive while serving as director of applied information at Houston-based Coke Foods.

"They weren't part of IS any more, and they weren't part of the business units they were supposed to serve. They were half-breeds who had to speak two different languages and be intergalactic translators," says Currid, who is now president of Currid & Co., an IS consulting firm in Houston.

Even today, they still find they can't serve two masters. They must serve one side or the other, Currid says.

At Corning, it's clear that the business side is the side Piggee serves.

"I'm a buyer of our centralized IS services," Piggee says. He still feels the old connection with Corning's IS organization: If his division needs information services, and the competition between an internal or external IS service provider is close, "I'll stay with our services."

"But the decision is always made on overall value to the business needs of my division. I can't be so short-sighted as to focus something solely on IS that's not beneficial to the entire organization. I understand the bottom line of where we're going because that's what pays us," Piggee says.

A house divided

At Tenneco Gas in Houston, the issue of serving two masters was addressed through a team approach.

Tenneco started using IS end-user intermediaries when federal regulations forced it to re-engineer its billing process. A cross-disciplinary 15-person "brain trust" of vice presidents and directors, including Roger Berry, Tenneco Gas' vice president of IS, oversaw the implementation of the project. A 50-person force of IS and non-IS personnel carried out the down-and-dirty trench warfare.

"Communication between my IS staff and the end users before the re-engineering was OK, but it wasn't focused enough," Berry admits.

Team approach

The team approach allowed the company to focus on key user issues and coordinate testing procedures. The end result allowed it to migrate from an IBM-based system to a Sequent Computer Systems, Inc.-based system within its target timetable of a year.

Whether organizations decide to assign an individual business manager to individual departments as Corning has done or follow the team approach used by Tenneco Gas, IS business managers will be crucial to running the IS department of the 1990s.

"The whole IS business manager concept is about how the hell you run an IS department in the '90s," Currid contends. "Everyone knows that IS organizations have to transform themselves, but no one's figured out the right way." IS business managers are likely to be crucial to finding the answer. ■

Schatz is a free-lance writer in Washington.

THE EVOLUTION OF THE IS BUSINESS MANAGER

Ernest von Simson, executive director of the Research Board, says the growing trend of combining IS units and business units into teams is the third phase of managing the often fractious relationship between the two groups.

1 ● In the first phase, business unit members led the peacemaking efforts with the IS sector. But the companies discovered, often too late, that much of what these facilitators did further complicated the relationship between the two. Von Simson says they proposed application enhancements that were redundant and unnecessary, hopelessly backlogging both departments.

2 ● In the second phase, the IS department appointed members of their own staff to serve as account executives. They helped the business units navigate the often troubled waters of IS solutions in order to get the biggest bang for their limited bucks.

3 ● The third phase sees the two groups working by a common set of metrics and objectives and in a common physical space to get the job done. The job of the IS business manager, once ridiculed and scorned throughout the company, is now among the most prized in the corporate hierarchy.

"Most people see being an IS business manager as a successful step up on the career ladder," says Harvey Shrednick, senior vice president of information services at Corning, Inc., the Corning, N.Y., glass products company. "Their image and credibility have both increased significantly."

Where is the IS account executive/business manager position likely to head? According to von Simson, "The next generation will knit together [information technology] and the business units into solutions which cross the entire organization. That concept will be driven by two things: the need for the corporation to present a single face to the customer and the notion of reusability, such as object-oriented technology."

SYRACUSE UNIVERSITY TRAINS IS BUSINESS MANAGERS

You know the subject of IS business managers has to be deadly serious when the academic community rewards it with shoopskin.

"Business analysts are the prototypical bridge between a company's information systems operation and its business units," says Don Marchand, dean of the School of Information Studies (IST) at Syracuse University in Syracuse, N.Y.

"We specifically train our students to be business analysts so they leave here with an already integrated awareness of the business world and the information technology world."

FOR COURSE AND CURRICULUM INFO THAT GOES IN FOUR MORE ARTICLES:

- **Management of IS and technology in a business environment context.**
- **The organization of information and its use and added value.**
- **The application of information technology in terms of the overall operations of computers, communications and telecommunications.**
- **Customer/user focus to understand how people use information technology.**

The program mixes these intense academic pursuits with a variety of corporate cooperative programs that, Marchand says, give students a chance to focus on their career path before they escape the academic ivory tower.

IST grads have been hired by such industry giants as J. P. Morgan, Merck & Co., Digital Equipment Corp., General Electric Co. and Andersen Consulting and government agencies such as the Federal Aviation Administration.

– Willie Schatz

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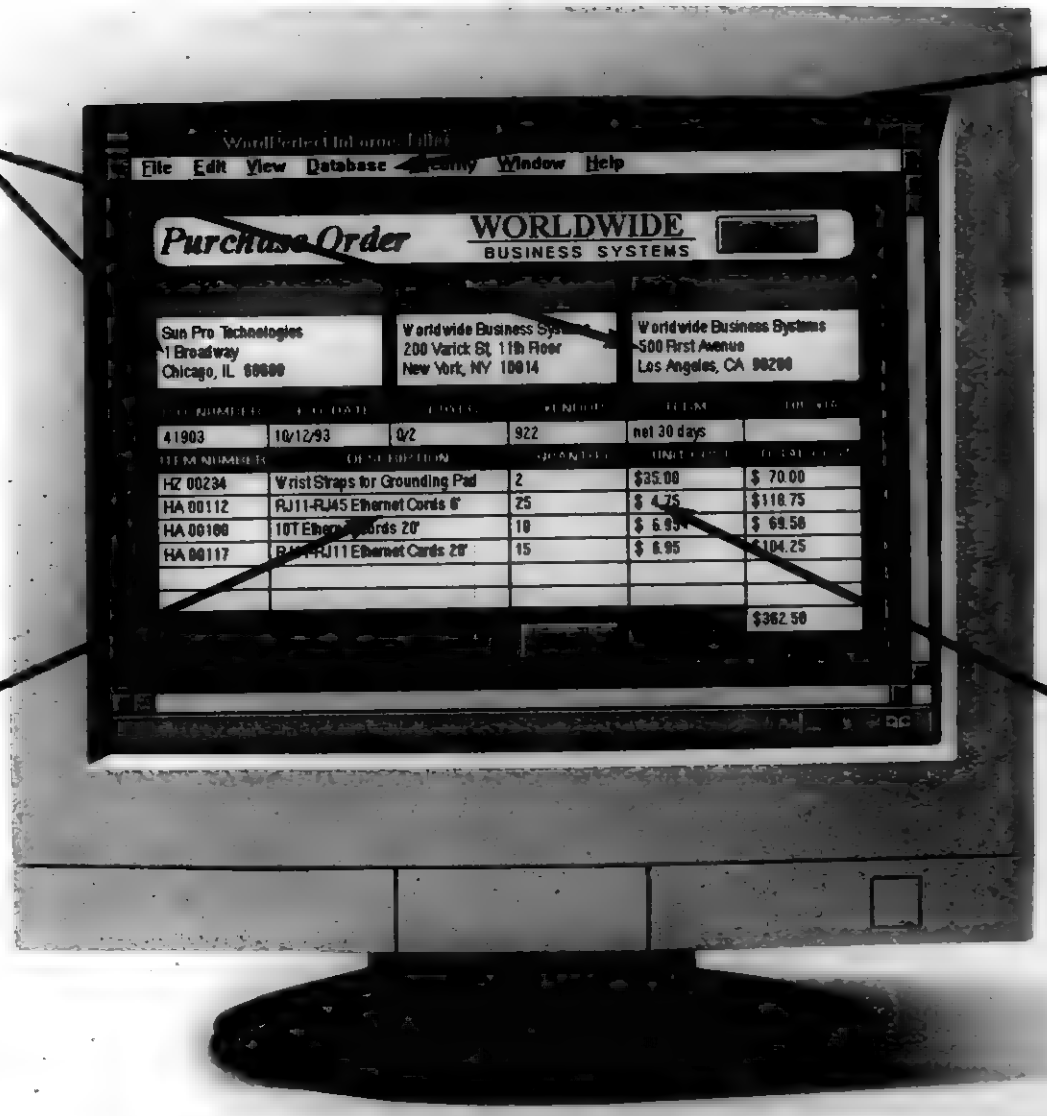

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WordPerfect INFORMS

Benchmarking resources grow for IS managers

IS managers wanting to develop a formal benchmarking program can take advantage of a wide array of resources

BY LESLIE GOFF

Gary Pollard has found partners in his benchmarking program from what at first glance might seem like unusual sources. After all, what do airline reservation systems have to do with manufacturing printed circuit boards?

More than one might think, according to Pollard, who found that one of the beauties of information systems benchmarking is that you can learn from a company in a different line of business. Because the technologies from one company to the next are basically the same, the challenges are similar, says Pollard, who is the total quality director of IS and services at Texas Instruments, Inc. in Dallas.

TO BE SUCCESSFUL WITH PROCESS BENCHMARKING, IS MANAGERS SHOULD BE SURE TO:

- **Determine the specific areas of IS to be investigated, such as data center management, how to construct an information technology strategy that is connected to the business strategy or whether an IS head count is appropriate.**
- **Define consensus models of the problems to be addressed by the group members.**
- **Find and approach potential partner companies with which to share information.**
- **Develop appropriate and ethical questionnaires. (Never ask a colleague a question you wouldn't answer yourself.)**
- **Analyze the data gathered to apply to changing existing processes.**
- **Conduct surveys and field visits to compare processes.**

Making comparisons

Arising largely from the total quality management (TQM) movement, process benchmarking involves comparing the internal IS processes of one company with those of other companies. The goal is to identify and borrow from the best practices of exemplary IS organizations.

Numerical benchmarking has been the traditional process used to evaluate an IS system's performance efficiency, such as how quickly in MIPS the system is operating or how quickly disk drives are accessing information.

Process benchmarking, on the other hand, measures how efficient the IS process is in general.

IS managers who want to develop a formal benchmarking program can take advantage of a wide array of resources from IS consortia, professional associations, consulting firms and benchmark vendors. Costs range from $7,500 to $100,000, depending on the services required (see chart below).

In less structured (and less costly) efforts, companies can also turn to user group roundtables, professional association meetings, networking with colleagues and trade literature, according to Doug Brockway, a principal at Nolan, Norton & Co. in Boston.

Running the gamut

The array of available benchmarking services covers everything from training and education to consensus modeling of goals and expectations, facilitation of partnerships and multiclient study groups. The latter has become an increasingly visible benchmarking tool employed by many organizations.

These study groups choose a limited number of topics to explore one by one and meet regularly over the course of a

Benchmarking, *page 141*

WHERE TO FIND PROCESS BENCHMARKING SERVICES

COMPANY	CONTACT	SERVICES OFFERED	CLIENT REQUIREMENTS	FEES
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Consulting firms				
EDI Group Ltd. and Price Waterhouse, 221 Lake St., Oak Park, Ill. 60302	Ruth Ochaig-Lindroth, director of sales and customer service, (708) 848-0155	Sponsors multiclient benchmarking projects that collect and analyze such data as the business uses of EDI, quantitative measures of EDI activity, staffing and costs of EDI activity, and flow-charting of processes and discussion of the application of EDI to business processes.	Must be involved in a high level of EDI implementation.	$7,500/year/participant payable upon signing the benchmarking project agreement.
Ernst & Young Center for Information Technology and Strategy, 1 Walnut St., Boston, Mass. 02108	Richard Swanborg, principal, (617) 723-1317	Sponsors the IS Leadership Program consisting of 18 companies focusing on information technology management issues and the identification of leading practices. Areas of interest: retraining IS professionals, managing information technology value and accelerating the systems delivery process.	Member companies must be involved in applying TQM techniques.	$25,000/year/company.
IBM Consulting Group 44 S. Broadway White Plains, N.Y. 10601	Sharon Seidell, program manager, bus. dev. (914) 286-5575	Benchmark training and education; facilitation of multiclient groups focused on specific topics of mutual interest.	None.	Depends on service chosen; $10,000 to $100,000 for participation in multiclient groups.
Nolan, Norton & Co. 1 Boston Place Boston, Mass. 02108	John P. Halloran, managing partner, U.S. operations, (617) 723-6600	Sponsors multiclient study groups on topics of mutual interest, including end-user computing, information technology architecture, telecommunications and data center management.	Not available	$10,000-$50,000 for participation in multiclient studies; fees for benchmarking consulting depend on scope of the project.
Towers Perrins, 200 W. Madison St., Suite 3400, Chicago, Ill. 60606	Jeffrey A. Thompson managing consultant, (312) 609-9419	Conducts Data Processing Quality Benchmarking Survey (in the process of soliciting institutions to participate in the 1994 study).	Not available	Cost is $15,000-$20,000 per company.
Xerox Quality Solutions P.O. Box 20423 Rochester, N.Y. 14602-0686	Customer information line, (800) 609-9701	Benchmark consulting, training and facilitation, including assistance in determining appropriate partners and working with benchmarking partners, as part of its total quality management services for external clients.	Should be committed to implementing TQM techniques.	$333 to $433/student/day for training courses.
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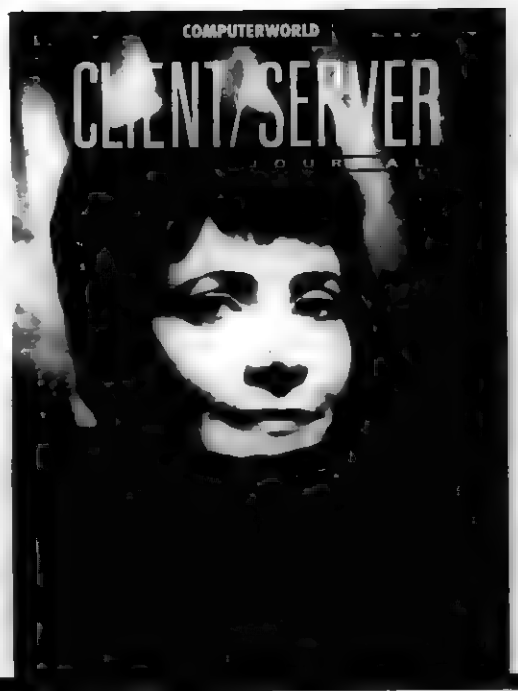

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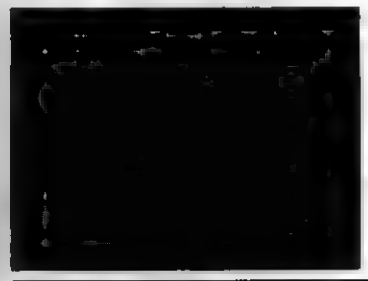

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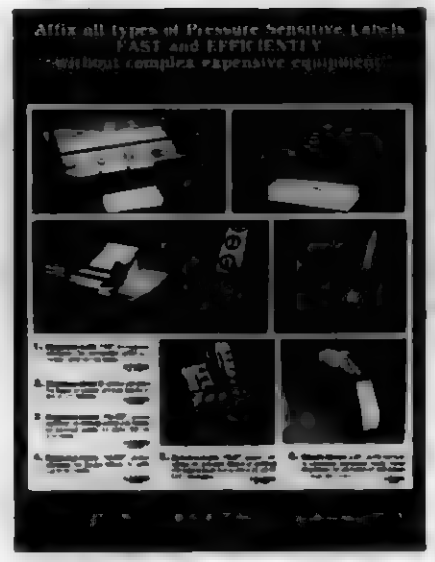

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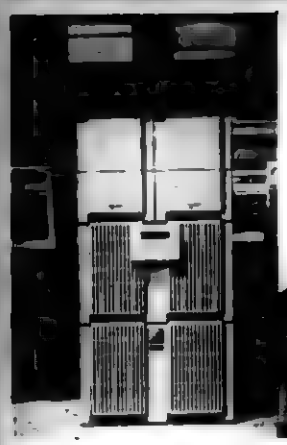

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By Paul Longoria—San Antonio, Texas

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Benchmarking

CONTINUED FROM PAGE 136

year or more, either in person or via teleconferencing. Member firms also arrange field visits among themselves.

"The whole phenomenon of multiclient groups is noteworthy," says Janet Caldow, a senior consultant at the IBM Consulting Group in White Plains, N.Y., who is heading up such a group to examine business culture and its relationship to IS. "Information technology is so state of the art that you can't take a university course, since those are behind, and you don't get enough depth from a single two- or three-day conference."

The Society for Information Management (SIM) International, for example, sponsors working groups of members with mutual interests that study information technology issues as they relate to TQM.

"We look at everything from the quality viewpoint — how do quality procedures affect the output of the IS organization, and how does [information technology] improve the overall quality of the entire enterprise? We wanted to come up with a knowledge base to help people understand TQM in IS and also put out a deliverable," notes Frances Craig, chairman of the Working Group Committee of Volunteers for SIM and president of Computing Strategies, Inc., a Vienna, Va.-based systems integration firm.

Most multiclient groups include senior or executive management only, but benchmarkers agree that the participation of lower management and staff is integral to the success of any good process benchmarking effort.

Pursuit of excellence

"It's an overused term, but your [firm] has to have a top-down commitment to pursue excellence," says Don Perez, manager of change and problem management for voice and data services at USAA, a financial services firm in San Antonio.

USAA and Real Decisions Corp. in Darien, Conn., are co-sponsoring a best practices group investigating data center management. "If it does [have the commitment], then best practices benchmarking is a steppingstone in that direction," Perez says.

So whether employing large-scale or less formal benchmarking techniques, IS organizations "can learn whether their preconceived notions are valid," Brockway says. "They can study the decisions of different companies and evaluate whether other processes would work better in their own organizations."

Companies are using process benchmarking to explore such IS issues as developing an information technology strategy connected to the business, reducing systems development cycle times, building the information technology infrastucture, distributing software in a client/server environment and end-user computing.

"We wanted to evaluate IS performance at a strategic level, not just measure our data center," says Maryann Holloway, planning specialist at Du Pont Information Systems in Wilmington, Del. The Du Pont Co. division is conducting two simultaneous benchmarking efforts.

Holloway is a member of Ernst & Young's IS Leadership Program. Sponsored by Ernst & Young's Center for Information Technology and Strategy in Boston, the group consists of 18 firms implementing TQM.

Holloway also heads a strategic benchmarking program for Du Pont's 21 business units and a number of external partners. Together, they are tackling nine specific IS issues, such as the experience and skills of the IS organization, IS financial management and budgeting and how to evaluate re-engineering projects.

But Rick Swanborg, a principal at the Center for Information Technology and Strategy, warns IS managers not to expect miraculous improvements in every function of their IS department.

"For benchmarking to be successful, there has to be a certain amount of expectation management. Some organizations set their standards so high that they're looking for 10 improvements in one process. That rarely exists," Swanborg says.

Goff is a free-lance writer in New York.

Executive Track

Jeffrey Tarte has joined **Ernst & Young** as a partner in the New York firm's health care information technology practice. Tarte will assume a national role in the firm's advanced clinical systems and systems integration practice.

Prior to joining Ernst & Young, Tarte was principal and co-founder of The Core Group where he specialized in information technology and operations management consulting for the health care industry.

Enterprise Technology Corp. in New York has named **Joseph Rosen** to the position of managing director. Rosen's responsibilities will involve all aspects of the development, organization and management of the company's consulting and software development business in the investment management and securities trading sectors. He will report to Kevin J. Merz, managing director and chief executive officer.

Prior to joining ETC, Rosen was chief information officer at Dubin & Swieca Capital Management and was a founding partner of the financial technology consultancy Rosen Kupperman Associates.

The Chicago Board of Trade has announced the appointment of **Mike Boyle** to the position of vice president of planning and implementation for the information systems department. He will report to Donald Karmazin, vice president of information systems.

Boyle has been an employee of the Chicago Board of Trade since 1974. Prior to his appointment, he was director of floor support systems. He also serves as chairman of the Inter-Exchange Technical Committee.

Cognos, Inc., which maintains dual headquarters in Burlington, Mass., and Ottawa, has named Neal Hill vice president of corporate marketing. Prior to joining Cognos, Hill was a senior analyst in the Computing Strategy Service at Forrester Research, Inc.

Forrester Research, Inc. in Cambridge, Mass., has announced that **Mary Modahl** has joined its Computer Strategy Service as an analyst. Modahl was formerly director of Forrester's Network Strategy Service.

Bob Shaw, vice president of management information systems at **Atlantic Records** in New York, has been promoted to senior vice president of MIS.

Gail D. Fosler, vice president and chief economist at **The Conference Board** in New York, has been elected to Unisys Corp.'s board of directors.

Warren Ferriter has been named senior vice president, systems and technology, at the publishing unit of **Paramount Communications, Inc.** in New York. He succeeds John Diesem, who left the company. Ferriter was previously senior vice president and chief information officer at Paramount Pictures.

Laurent Levy has been promoted to group manager, network services, at **Omicron Consulting** in Philadelphia. He reports to Valerie DeRusso, director of network services. Levy joined Omicron as a senior systems anaylst. Prior to that he was a senior systems engineer at the Robbinsville, N.J., office of Inacom.

Intelligence Files

CIO pay scales soar . . .

Chief information officers had good reason to smile this year: Their annual compensation continued to grow at nearly twice the rate for white-collar professionals in general.

The average total annual compensation (salary plus yearly bonus) for CIOs reached $172,000 this year, a 10% increase from the year before, according to the 1993 Information Systems Compensation Survey released by William M. Mercer, Inc. in New York.

Average annual compensation for CIOs in 1992 was $155,800, which also had grown by 10% from the preceding year. In contrast, compensation growth for white-collar professionals in general showed a 4.6% increase this year.

. . . but IS staffs shrink

The same survey also showed some bad news for CIOs this year: Most of them will have to get by with smaller staffs. That won't be quite so hard to take for some CIOs, however. The same survey found that of the 1,000 corporations contacted, 16% are downsizing information systems functions. Also, 14% of the total companies surveyed are now considering outsourcing some or all of their computer support services. This number has doubled from the year before.

Other findings in the survey include the fact that 46% of the companies now offer flex time to their IS employees, and 65% now require their IS employees to be on call during nonwork hours, either by phone or beeper. Most firms requiring this did not provide extra call-in pay or compensatory time off in lieu of such pay.

Source: 1993 Information Systems Compensation Survey, William M. Mercer, Inc., New York.

Getting global vision

Companies wanting to develop global vision and take advantage of significant profit and growth potential from overseas markets should focus on six strategic steps. These six steps are discussed in detail in a new study, "Global vision: Building new models for the corporation of the future," by John L. Daniels and N. Caroline Daniels.

The book is intended to be a blueprint for companies that wish to enter the global marketplace. It looks at the experiences of companies that have already gone global, discusses the pitfalls they encountered and advises managers on how to avoid false starts and wasted time. The book is based on a five-year study by IBM and KPMG Peat Marwick.

Source: "Global vision: Building new models for the corporation of the future," John L. Daniels and N. Caroline Daniels (McGraw-Hill, $27.95).

Work-flow explosion

The average chief information officer is now involved in 4.4 business re-engineering projects at any one time, up from 1.8 a year ago. That is the finding of a recent survey of more than 500 CIOs by Deloitte & Touche's Information Technology Consulting Services in Wilton, Conn. The survey also notes that CIOs are reporting mixed results on their re-engineering efforts, but the demand for re-engineering software is still expected to skyrocket.

Source: Deloitte & Touche, Wilton, Conn.

Research service launched

CSC Index, Inc., a Cambridge, Mass., unit of Computer Sciences Corp. (CSC), will introduce a new research service called CSC Genesis that will examine breaking developments in business strategy, process management, organizational change and corporate culture in the information technology community.

Source: CSC Index, Inc., Cambridge, Mass.

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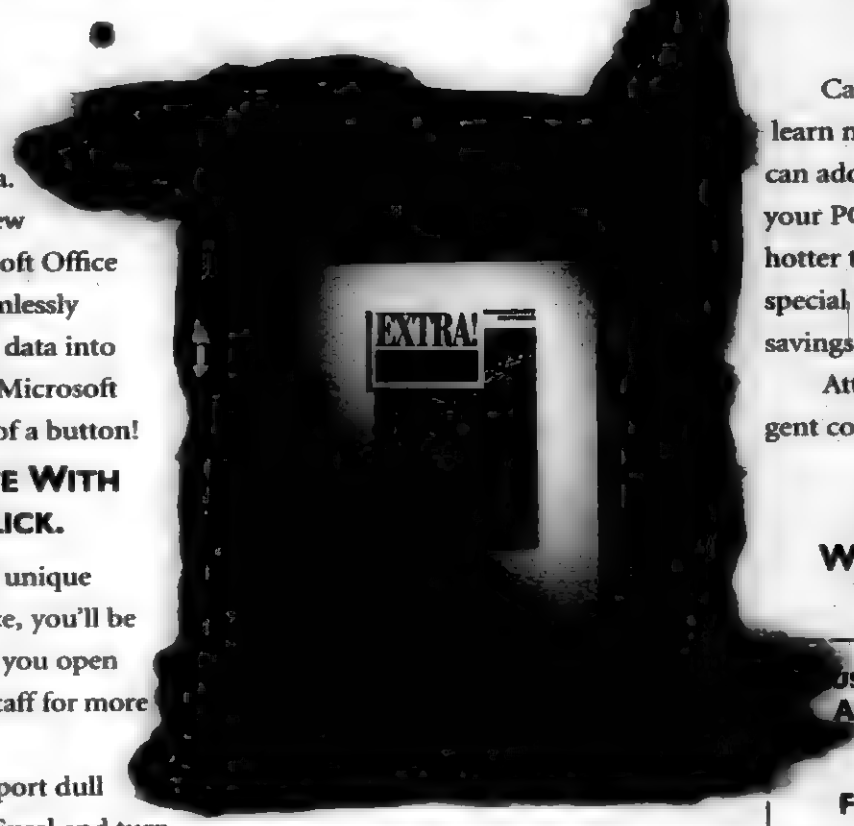

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The CW Guide to Next-Generation PCs

CHIP SHOTS

A STRUGGLE FOR LEADERSHIP IS CHANGING THE FACE OF PCs. HERE'S HOW THESE CHANGES AFFECT YOU.

BY GEORGE THOMPSON

Don't look now, but the next generation of PCs is here. More than 100 Pentium-based PCs will be unleashed at Comdex/Fall '93, and the first systems using the new RISC CPUs are now available. So for anyone assessing the cost/benefit of PC LAN or client/server environments, it's time to reconsider the implications of these new PCs in the next three to five years.

It may be three years or so before Intel Corp. feels the real heat from RISC competitors, most notably the Motorola, Inc./IBM/Apple Computer, Inc. PowerPC effort. According to senior analyst Chris Goodhue at Gartner Group, Inc. in Stamford, Conn., it will be more like five years before enough software will run on each of the leading CPUs. At that point, he says, "you'll be able to go to Egghead and get Excel 4.0 for an x86-based PC or for a [Mips Technologies, Inc.] R4400."

Despite all the attention that will undoubtedly be lavished on the price/performance equation, software really is the key issue here. On that count, it's hard to argue with Intel's Pentium, which can now run more than 60,000 software applications.

However, there is more to software than DOS/Windows compatibility. Desktop systems using recently developed RISC CPUs such as Digital Equipment Corp.'s Alpha AXP, the PowerPC 601 and Mips' R4x00 take advantage of newer 32-bit operating systems. The PowerPC chip is expected to support a native Windows NT for PowerPC, as will the Alpha AXP and R4x00.

From a desktop perspective, Macintosh applications may be the key for the PowerPC. The fact is, the new chips are really just groundwork for a future that can take any number of routes.

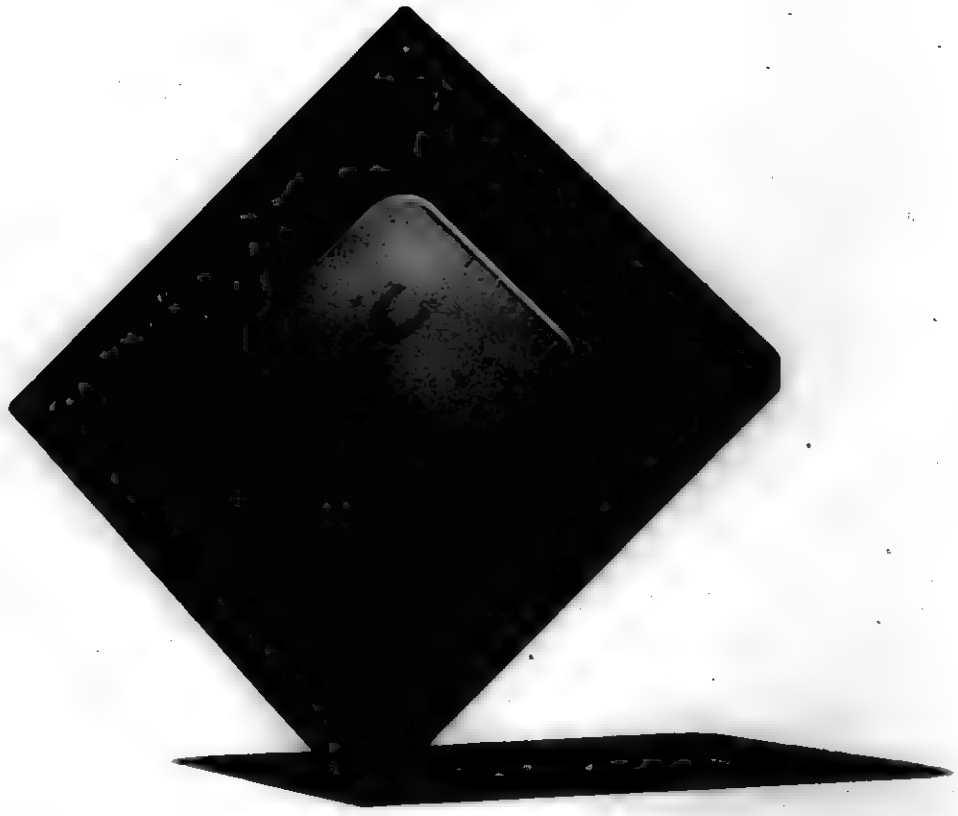
IN THIS SECTION

COMPUTERWORLD BUYERS' SATISFACTION SCORECARD

Dell's OptiPlex scores highest of 486-based PCs in 12 of 17 categories rated by users. Page 174.

FIRING LINE

Evaluators say NCR's System 3000 workstations and servers, with dual Pentium processors, are screamers. Page 177.



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If you're responsible for evaluating new PCs running Windows NT, look for the new V_R4400-based systems. They run faster, save you money and even let you use your existing DOS and Windows 3.1 applications.

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NUTS, BOLTS AND CHIPS

The grand plan is still under construction in the PC arena, but some facts have been hammered out. George Thompson, technical editor at Cardinal Business Media, spoke with three analysts to address some of the more tangible issues and get responses to users' most common questions.

How will existing software applications fare, running on Pentium?

Pentium systems can run all 16-bit DOS and Windows applications natively. But to take full advantage of the chip's architecture, the applications have to be recompiled.

Software code compiled with the best 486 compiler will run about 15% slower than code compiled for the Pentium, according to Frank Spindler, Pentium's product marketing manager. Existing x86 code will run about 30% slower. Once recompiled, however, those same applications will run incrementally faster on a 486 as well.

The typical PC user who does not buy new recompiled software and uses very little floating-point calculations will see a 40% to 80% performance increase over a 66-MHz 486DX2-based system.

With RISC- or Pentium-based systems running Microsoft Corp.'s Windows NT, existing 16-bit software will run in emulation, courtesy of an NT application programming interface (API). New applications written for each CPU instruction set will run natively via other NT APIs. These latter APIs make it easier for developers to write programs that will run under Windows NT, the current Windows 3.1 and the forthcoming Chicago (which will probably be known as Windows 4.0).

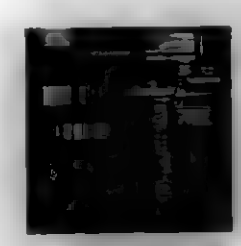
What software is expected to run directly on the PowerPC?

Currently, no PC software has been compiled for the PowerPC. But it is expected in the future to run 80% to 90% of today's Macintosh software. Additionally, IBM's recently introduced PowerStations, using the PowerPC 601 chip, run the same IBM AIX applications as its current line of RS/6000 workstations.

As for DOS- and Windows-based applications, there will be two options. The first option is to run them unmodified using a technology called the Windows Application Binary Open Interface (WABI) developed by Sun Microsystems, Inc.

The second option is to run them under native Windows NT, but in order to do this, the applications would have to be recompiled.

The PowerPC will also run applications written for the PowerOpen Application Binary Interface. A Unix-variant derived from AIX, the PowerOpen Environment will conform to industry standards such as Posix, X/Open's XPG and the Open Software Foundation's Motif.



Pentium

- Offers integer performance advantages over current 486-based systems by at least a factor of two (at the same clock speed).
- Can execute more than one instruction simultaneously.
- Completely redesigned floating-point unit.
- Performance at 66-MHz clock speed:
  - 64.5 SPECint92 (integer)
  - 56.9 SPECfp92 (floating point)
- Power requirement: 16 watts.
- 32-bit address bus and 64-bit data bus.
- On-chip caches: two 8K-byte caches, one for instructions and one for data.
- Operating systems:
  - Windows/DOS – available now.
  - Windows NT – available now.
  - OS/2 – available now.
  - SCO Unix, Solaris – available now.
- For portables: A second Pentium version with lower power requirements is on the way.
- Cost: $965 each for a quantity of 1,000.

How will PowerPC performance be affected when it runs Windows applications under emulation software?

Actual results remain to be seen, but WABI-aided applications are expected to take performance hits of as much as 50%. Still, many expect the performance to be acceptable. At any rate, it should be faster than a 486 DX2.

IBM is also working on a hardware-aided emulation strategy for the more straightforward instructions. The hardware actually "suggests" the correct corresponding PowerPC instruction to emulate the CISC instruction. However, there is no telling when that technology will be available.

Will a PowerPC system hook into installed PC LANs running NetWare, LAN Manager or common network operating systems?

That depends on the kinds of drivers and protocols available for the operating environment you're working in. Networking capabilities are not an advantage for either the Pentium or PowerOpen CPUs.

What software will be most important for PowerPC's success?

The key will be for Apple to drastically open the availability of the Macintosh operating system. More so than PowerOpen or AIX, System 7 has the mass appeal to vault the chip into a major position. But they will have to get to 20% or 30% market share to do that. That means opening the system to third parties.

On the Windows side, some people said they think PowerPC and other RISC chips will be limited to niche applications. For example, spreadsheet power users might benefit from a RISC/Windows combination, which could be much, much faster than a traditional x86-based PC. In application areas where execution speed is not critical, RISC/Windows may not be the best solution.

PowerPC 601

- RISC architecture.
- Can execute more than one instruction simultaneously.
- Performance at 66-MHz clock speed:
  - 80 SPECint92 (integer)
  - 81 SPECfp92 (floating point)
- Power requirement: 9 watts.
- 32-bit address bus and 64-bit data bus.
- On-chip cache: A single 32K-byte cache for instructions and data.
- Operating systems:
  - Windows/DOS – emulation through WABI or Windows NT.
  - Windows NT – native expected for first half of 1994.
  - System 7 – native planned for first half of 1994.
  - AIX available now; Solaris is planned.
- For portables: A PowerPC chip specifically for portable computing, the 603, is scheduled for availability in early 1994.
- Cost: $480 each purchased in a quantity of 1,000.

When Pentium systems first appeared, there were some reports of overheating. Is that still a problem?

Although early versions of Pentium-based systems were criticized for their heat problems, most of the heat issues have been resolved. Intel expects to solve all of its thermal problems with the next version of the chip. But when it speeds up the internal clock of that chip, the problem may get out of hand again.

What is the relative cost of RISC and Pentium systems?

IBM's current PowerPC workstation is drastically more expensive than Pentium PCs, by two to three times, depending on the configuration. But because of the large number of system vendors using Pentium CPUs, the cost varies widely.

For example, while a Gateway 2000, Inc. 60-MHz Pentium with a display costs $2,995, a similarly configured Pentium-based system from IBM costs $4,699. By comparison, IBM's PowerPC 601-based PowerStations range from $5,445 to $9,395. Digital's new DECpc Alpha AXP 150, which uses a 150-MHz Alpha CPU and includes Windows NT, is $6,795. A similar Digital 60-MHz Pentium-based PC, the DECpc 560ST with Windows NT, costs $7,613.

Pricing for the next generation of Macintosh systems, built around the PowerPC, remains to be seen. If Apple is smart, it will undercut Pentium system prices by 20% or more.

Intel continues to push the performance of the 486, with 486

Next generation, *page 146*

THE NEXT-GENERATION PC

VIDEO

Because the XT/AT buses cannot keep up with the video output of today's CPUs, video performance can be a bottleneck under graphical environments such as Windows. Local bus video has already become a fairly common solution. Local bus bumps video output up to 32 bits bandwidth and 33-MHz bus speed. The standard XT/AT bus could only handle 16 bits at 8 MHz.

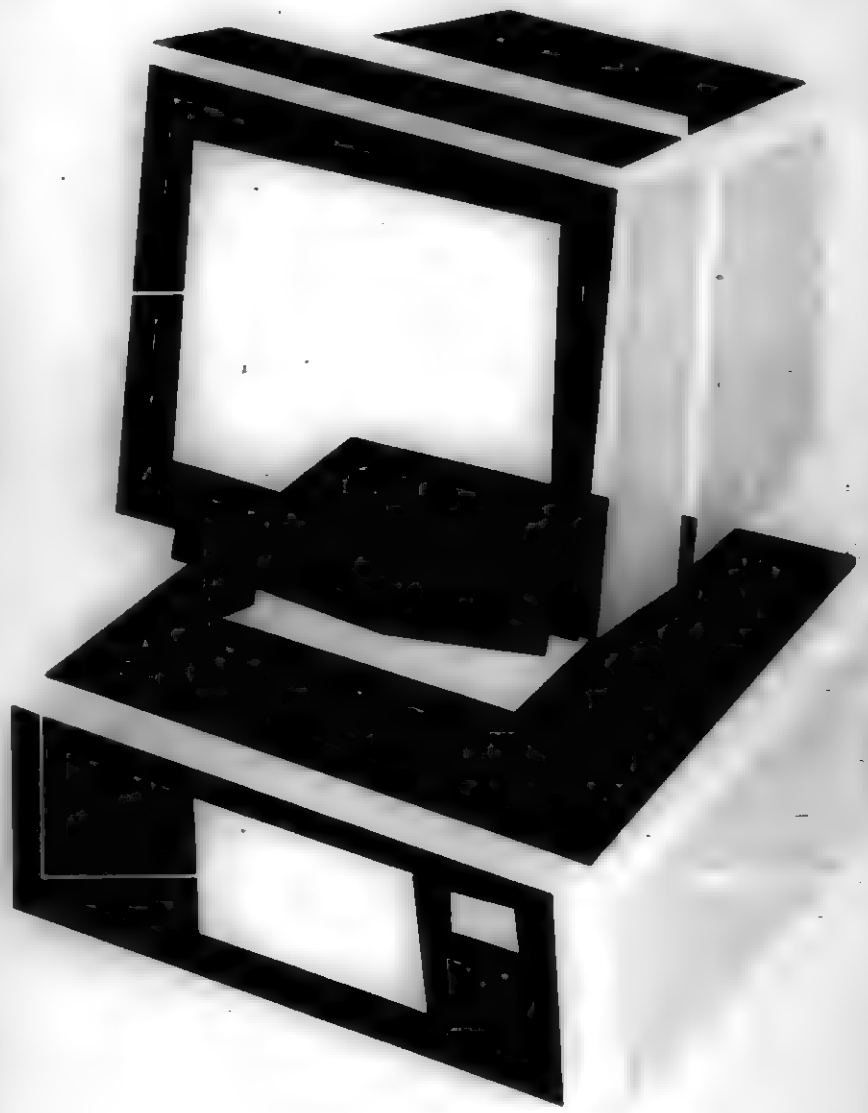
The de facto local bus standard to date has been the Video Electronics Standards Association (VESA) local bus, also called the VL bus. That may be replaced by the Intel-backed Peripheral Component Interconnect (PCI) standard, which is just rolling off the drawing boards. Last month IBM and AST Research announced systems with the PCI local bus integrated onto the motherboard.

The VESA and PCI standards groups are both working on 64-bit implementations. Whichever standard prevails, users can expect fast video performance in next-generation PCs.

STORAGE

Watch for hard disk capacities to continue to rise. A standard-size hard disk, such as Quantum's newest Empire drives, can already accommodate well over 2G bytes of data with fast seek times and data transfer rates of more than 5M byte/sec. That will enable applications such as playing video clips from the hard disk.

Advances are also being made in optical storage, which historically has been limited by slow data access times. As optical drive makers such as Pinnacle Micro cut down access times, optical storage solutions are becoming more practical.



ADD-IN CARDS

Watch for Plug-and-Play, a new set of specifications that could eliminate, or at least curtail, the requisite software configuration and meddling with dip switches every time a new card is plugged in. When the add-ins, operating system and BIOS all support Plug-and-Play specifications, the user can simply drop in the card and start using it; the PC will detect the card or device and update the BIOS itself. For existing systems, the cards will not be quite that simple, but they should still help ease the PC add-in process.

Plug-and-Play is being supported by many key vendors – including Intel, Microsoft, Compaq, Gateway 2000 and Phoenix Technologies. Operating system support is expected in the next version of Windows. Not all of the specifications have been delivered, but with so much clout behind it, Plug-and-Play should be here to stay.

INTEGRATED MOTHERBOARD FEATURES

Many functions previously handled by peripherals and add-in cards are being integrated onto the motherboard, including disk drive controllers, graphics accelerators and networking support.

Building these functions into the PC makes them easier for the end user; it also frees up more ports and expansion slots.

Fax/data modem capabilities in many next-generation systems will be handled by integrated digital signal processor (DSP) chips. DSPs will also make PC voice synthesis more common and could replace add-in sound cards.

CONTINUED FROM PAGE 145

DX3 chips in the works. How fast will the DX3 be, and will it cut into Pentium demand?

A. First of all, it probably won't affect Pentium demand because the Pentium market is still developing. It takes several years for CPU markets to mature. Pentium volume probably won't surpass 486 volume until 1996.

The DX3 chip should be slightly slower than the current Pentium processor, but not by much. Of course, future Pentium chips will have higher clock speeds as well. Intel will continue to push 486 performance forward while the Pentium market picks up momentum. Otherwise, Intel would be leaving the door open for its x86 clone competitors.

The PowerPC (being smaller and cooler) seems like a better chip for portables. Is this true, and will there be Pentium portables at all?

A. Although the PowerPC 601 was designed primarily for use in desktop PCs, Tadpole Technologies, Inc. has demonstrated a PowerPC 601-based notebook due to be released next year. Another PowerPC CPU, the PowerPC 603, will be specifically designed for low-cost desktops and notebook computers.

Pentium portables are possible, too, although not in the chip's current implementation. Pentium portables may use a 32-bit version of Pentium, called the P24T, that has lower power requirements. That version may not be available before the middle of next year, however. Portable batteries would not last long running the current Pentium chip.

Looking further down the road, is the x86 line a dead end? After the P6, some people believe that Intel will stop upgrading its x86-compatible processor line.

A. Intel is on record as being committed to the x86-based architecture through the year 2000, which means that at least the next two generations of Intel CPUs — the P6 and P7 — will likely offer backward compatibility. Keep in mind that compatibility with the x86 architecture has been one of Intel's strongest marketing gambits.

If the PowerPC is successful, Intel may go a different route. But if it fails, Intel will own the market for a long time. ■

The following analysts contributed to this discussion: Christopher Goodhue, senior analyst at the personal computing service division of Gartner Group, Inc. in Stamford, Conn.; Dean McCarron, an analyst at Micro Design Resources in Scottsdale, Ariz., and Kimball Brown, vice president of microcomputer systems at Computer Intelligence/InfoCorp in Santa Clara, Calif.

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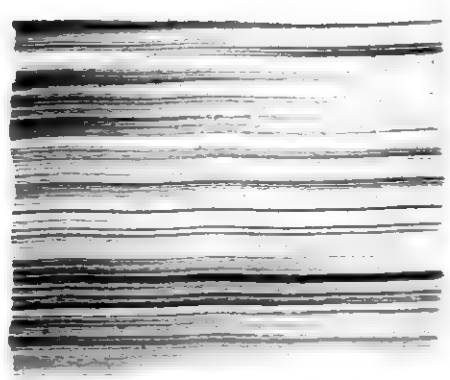

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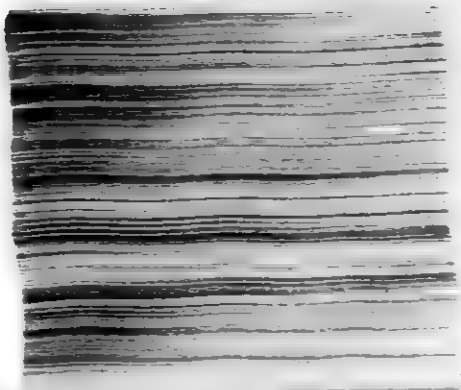

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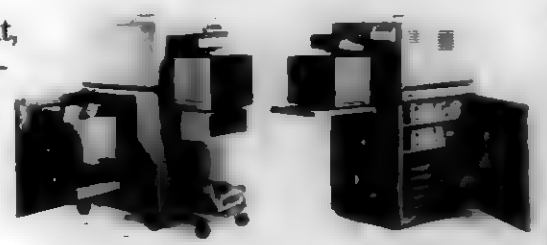

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Derek Slater

Patience pays

Your 16-year-old daughter walks into the house and announces that she's engaged to her 17-year-old boyfriend.

He seems like a nice enough fellow, you say, somehow maintaining your cool. But you dare to suggest that she might spare herself some rocky times if the nuptials come after they are a little more mature. After they've both seen a few more of the options.

Well, the same principle applies if you are about to commit to a high-end PC system. Buying now is throwing money away. Stop drooling over those Pentium marketing brochures for a minute and consider the benefits of waiting, say, a year. You will have more choices and a lot lower cost in 12 months. That's always true to some degree with PCs, but now it's more true than ever because of the IBM/Motorola/Apple PowerPC and Windows NT.

First off, PCs based on the PowerPC should be a viable option for many companies. Even if it has to run a trillion installed Windows applications under Apple's System 7 and emulation software (the PowerOpen plan) or under bulky NT, PowerPC is a performance threat to Pentium.

Right now, the viable chip choices are expanding by the day as operating system vendors announce ports to new platforms. For example, IBM recently caved in and announced native NT for the PowerPC, due in the first half of next year. Compaq also inked an interesting agreement with Microsoft to develop PC hardware that is tied closely to the operating system, a la Apple.

You may want to let some of these things shake out before plunking down your cash.

Whether or not you want NT can have a big effect on whether you have any incentive to leave Intel, because NT is the most likely way to get RISC performance and still run Windows applications. NT is pretty bloated right now. However, it is a major undertaking still in its first release. NT, like your daughter's boyfriend, could turn into a better prospect as it grows older. That's a wait-and-see issue.

It's also conceivable that NT and PowerPC may help ease some of the integration issues users are now facing. NT is going to be ported to the SPARC platform. Eventually that may facilitate integration of your Sun workstations with PC LANs. PowerPC may also provide a long-awaited bridge for consolidating Macintoshes and IBM-compatibles.

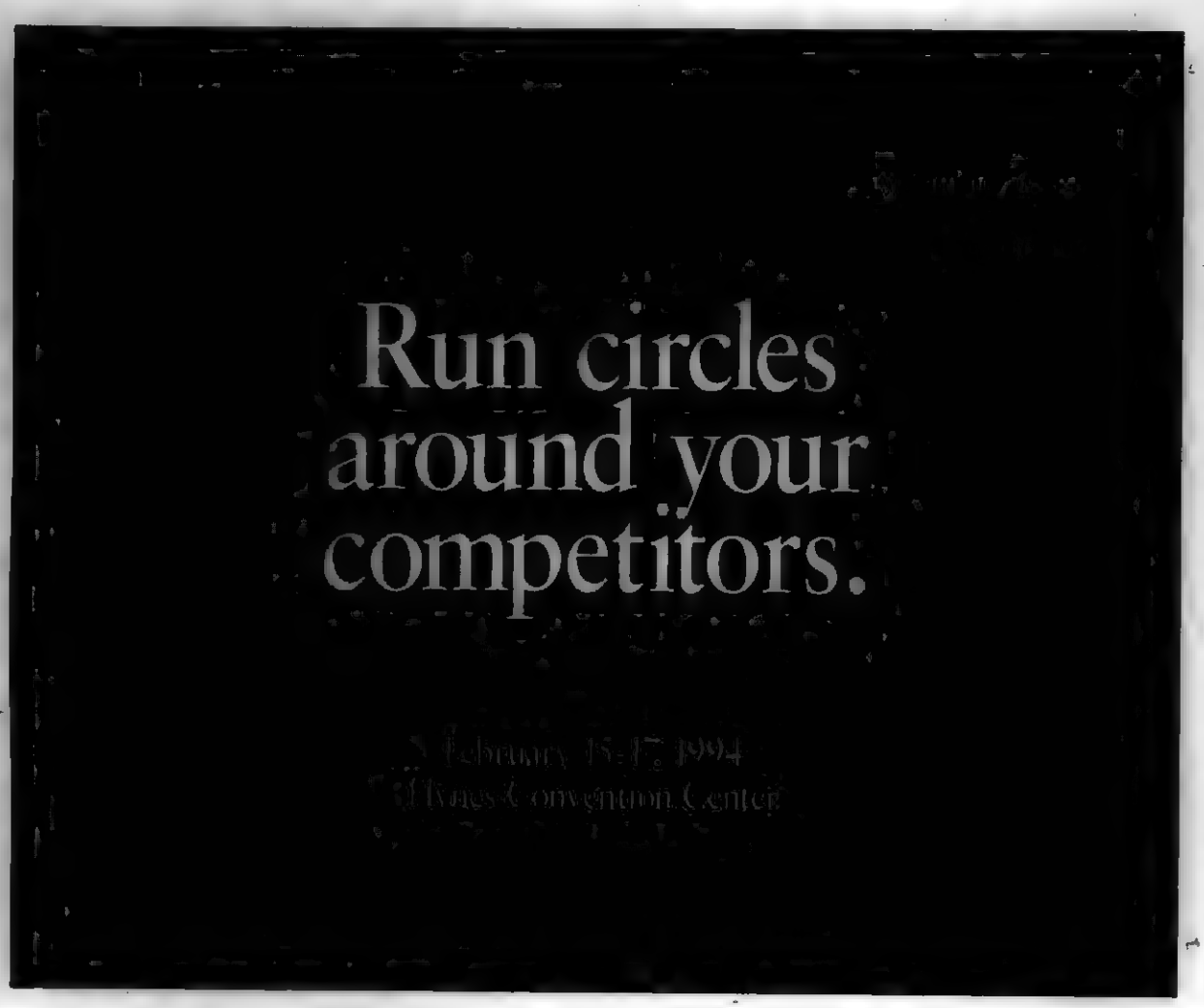
Use your cents

As for the money, it's true that you could wait forever for some optimal price/performance ratio. No matter when you buy PCs, you'll kick yourself when you see the price six months later. But the emergence of the PowerPC means Pentium prices are going to fall off a cliff. Not everyone believes that, but if Intel is unclear on the fate of market-leading computer systems that refuse to take notice of cheaper, faster alternatives, they are invited to consider the mainframe as a case study.

IBM plus Apple plus Motorola equals a lot of marketing clout, and you can bet that Intel is going to take action to squash PowerPC. Cyrix is also planning what it touts as a cheaper, faster x86-compatible processor called the M1. A war of words isn't going to be enough for Intel. Significant price cuts are inevitable. This is a bad thing for Intel but a good thing if you are a user planning to shell out for 1,000 desktop PCs and 50 servers.

So if you have to put new PCs on users' desks right now, hedge your bets and buy 486s. They're cheap — you can get 66-MHz DX2 models for less than $2,000 — and that should buy you some time while Pentium prices fall, PowerPC matures, and operating system issues shake out. ■

Slater is *Computerworld*'s assistant editor, features.



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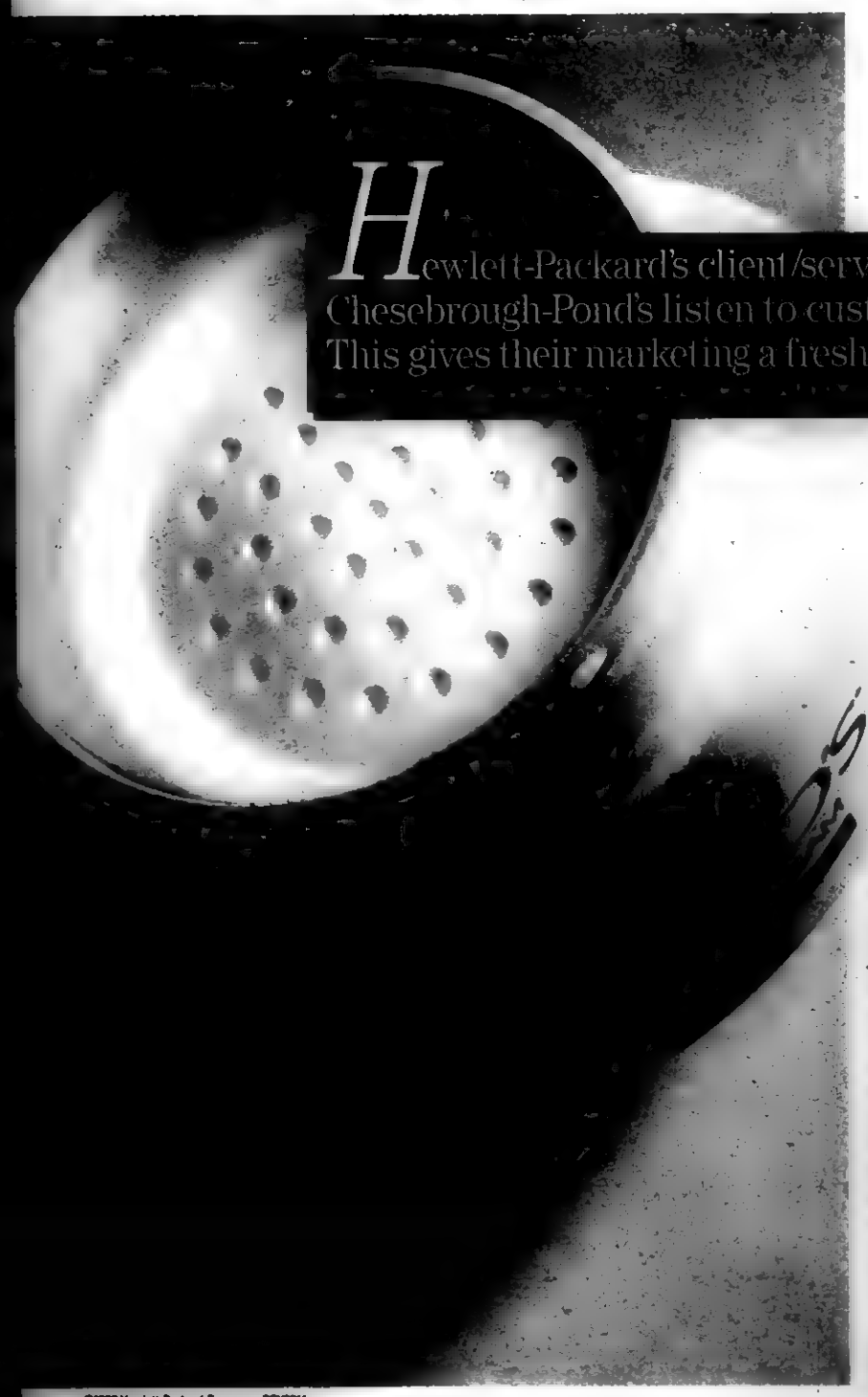

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Mega Trends in Enterprise Application Development

By Eliot D. Weinman

Information technology (IT) is a major catalyst for achieving competitive advantage and the application development industry is one of the fastest growing IT sectors in the U.S. In this report, senior industry analyst Eliot Weinman describes the major technology trends which are shaping that industry.

Major changes are now taking place in the business and technology sectors of our economy. After the rapid growth and economic expansion of the 1980s, the 1990s have brought a global economic recession, forcing businesses to refocus on new imperatives. Today's main business drivers include:

- finding ways to increase knowledge worker productivity, and generally doing more with less
- improving the quality of goods and services delivered to customers
- building flexible and more efficient business architecture
- finding ways of working with even your closest competitors, in a spirit of what has been labeled "coopetition"
- remaining sensitive to global social concerns, including increasingly important global environmental issues

Not surprisingly, businesses are turning to IT to help solve their business problems. In 1992, the U.S. information technology and communications marketplace had grown to 10% of domestic gross national product, with the computer equipment and services sectors together totaling more than the combined total of the auto, mining, petrochemical and natural gas industries!

For IT executives, this means coming to terms with a vast spectrum of rapidly changing technologies. Indeed, a discussion of the major challenges to IT professionals would easily exceed the space of this article, but perhaps management consultant Dr. James Senn summarized the problem best when he said at a recent computer software conference, "There is no information technology problem that is not a business problem first."

Transition to a New Era of Computing

To respond to these new demands for increasing flexibility and responsiveness, organizations are shifting away from large, centralized computer systems with proprietary architectures to standards-based distributed networks of low-cost computers. The resulting computing and information systems architecture better reflects the open networked business environment required of today's competitive business. Today, the most widely accepted label describing this new generation of computing is "enterprise-wide client/server computing." The major client/server enabling technologies include (See Figure 1):

- distributed and cooperative database processing
- enterprise networking
- mobile computing
- application development
- systems integration and management

Enterprise Client/Server Computing

The client/server movement is actually a result of several different trends, including:

Redistribution of processing

Within the client/server architecture processing is distributed between host systems and intelligent desktop machines. Many organizations are moving critical, end-user-oriented applications off host computers to low-cost networks of workstations and database servers, within an open systems environment.

Distribution of process and data

Within the client/server computing model, both process and data can be distributed throughout the system. A key objective of client/server computing is to provide transparent access to data from any node in the network, independent of the source of the data. Repository-based location services permit organizations to locate data anywhere in a network of computer systems.

Replacement of mainframes

Many small- to medium-size mainframes can be replaced by dedicated servers capable of supporting 50 TPC-B transactions per second or more. Mainframes can be replaced by high-performance, high-availability datacenter-servers capable of supporting high-transaction processing volume at a fraction of the cost of a mainframe. These systems, such as Hewlett-Packard's 9000 Corporate Business Servers, when integrated with workstations or PCs offers significant savings in operational costs while maintaining mainframe-like functionality.

Migration (downsizing) of existing applications

Existing host-based software systems are being migrated to microprocessor-based servers and desktop machines, with the goal of preserving as much of the investment in software development as possible. One example of a redevelopment tool effort is the recent agreement of Texas Instruments to work with Price Waterhouse, in an

Figure 1: Transition to a New Era of Computing

attempt to translate information from existing Cobol applications into objects that TI's IEF encyclopedia can understand.

Standardization of computer hardware and software architectures
Progress in the definition and acceptance of formal standards for computer hardware and software has generally proceeded at a glacier-like pace. However, an unprecedented level of defacto standardization has been achieved through widespread use of a common personal computer-based hardware platform (based on the Intel microprocessor), common desktop systems software based on the Microsoft Windows environment, and common local area network support based on the Novell NetWare environment. In the UNIX world, industry standards have tended to be more pervasive, including the C/C++ languages for portability, POSIX API specifications, SVID 3 compliance, X11 windows, Motif, TPI/IP communications protocols, and vendor-neutral middleware based on the Open Software Foundation Distributed Computing Environment (DCE) and Distributed Management Environment (DME) software layers with SQL as a database access (defacto and formal) standard.

Client/Server and Application Development Market
Corporate executives no longer accept solutions from information systems (IS) departments that take too long to deliver, cost too much, and fail to support strategic business requirements. Traditional development processes, based on manual coding techniques and the waterfall method of systems development, are too slow and inflexible to meet requirements for rapid development of applications that provide a competitive advantage. The inability of IS to build applications rapidly in response to competitive challenges often acts as a roadblock preventing the organization from achieving its strategic objectives.

The requirement for business to deliver next-generation applications, and the tremendous demand for client/server solutions are the primary forces driving the application development marketplace. Indeed, the size and growth of the application development (A/D) market seems surprising, especially when compared to the growth of other computer markets during the same timeframe. For example, in 1992 the Gartner Group (Stamford, CT) reported that the worldwide A/D market was almost $4 billion. They also reported that the client/server application development tools market segment would be growing at the rate of 60-70% over the next two years. In contrast, the entire database market was estimated to be just over $4 billion in 1991. By the end of 1993 the A/D marketplace is anticipated to be as large, and growing faster than the entire DBMS marketplace!

To characterize and better understand the major trends in the A/D technology marketplace, we need to look back at

the various types of tools that existed yesterday, understand what companies are doing with their older technology to meet today's requirements, and then look at the new breed of tools. Since we do not have enough room in this article to articulate all of this, we can streamline things a bit by considering a simplified categorization of A/D technologies available today. Major categories include:

- *Software re-engineering tools:* used to extract data models and process structures from existing applications
- *Automated client/server development tools:* used to meet corporate requirements to generate complete client/server applications rapidly and at low cost
- *Integrated CASE tools:* used to generate applications that require high data and design integrity. These tools can also be used to maintain data models and generate physical databases for client/server applications.
- *Cross lifecycle development tools*: a wide range of desktop development, testing, and production support of distributed applications.
- *Prototyping methodologies:* support close end-user involvement to build projects rapidly and efficiently (eg. Joint Application Design (JAD) workshops.)
- *Enterprise-wide methodologies*: including information engineering and enterprise engineering, that provide an overall framework for application development

Enterprise Client/server Architectures:

As organizations continue to build distributed computing environments, the requirements for delivering new mission-critical business applications have become increasingly more complex.

To generate mission-critical enterprise applications, the toolset ultimately must deal with a number of different network-level software layers. From DBMS access, to multiple NOSs, network gateways, stored procedures (for multiple DBMS sources), support for configuration management/version control, and OLTP transaction manager support. Finally, since most large organizations have three or more tiers in their enterprise architecture, including one or more mainframe hosts, additional support would be required for host connectivity, mainframe TP monitors, and host database access methods.

To better understand each of these layers, we include a brief description of each.

Client Software Layers

The client component is typically a workstation or PC. The layers of software on the client computer include a GUI, a client operating system, business-specific applications, and packaged applications. Client applications typically incorporate an intuitive GUI, business-specific procedural logic, interfaces to packaged applications, and transparent access to distributed data on local or remote database servers and host computers.

Layers of Software on the Server

Distributed networks of servers are used to store the data and procedures required to support end-user interaction. A complex, layered server software structure is evolving to support a mainframe-like range of services on the server. The lower server software layers support requirements for the transparent distribution of both process and data. These functions include access to multiple RDBMSs, stored procedures and triggers, server operating systems, network operating systems, and intelligent gateways to remote computers. The upper layers of software support requirements for transaction processing, distributed computing, and distributed network management. These upper software layers, often called middleware, provide the range of services required to support a mainframe-like environment on a desktop computer.

Distributed Database Management

To avoid dependence on a single database vendor, servers typically should provide access to multiple databases on varying platforms. A wide range of server platforms are supported by various client/server tools, including host mainframes or RISC-based servers. Databases supported by client/server tools include Oracle, Sybase, Informix, Ingres, Cincom, OpenODB, Rdb, DB2/2, DB2/6000, DB2, IMS, VSAM, CA-IDMS, and CA-Datacom. The runtime support software for the server, usually supplied by the vendor of the client/server tool, utilizes the extended features of the installed database management system, such as stored procedures and triggers, two-phase commit, and restart/rollback. The goal of these mechanisms is to provide vendor-neutral access to the extended SQL functionality of the installed database management system, freeing the user from becoming dependent on the vendor of the database management system. The server typically incorporates a database gateway, which is used by client applications to provide transparent access to data from a host computer.

Server Operating System

The operating system for the server must provide a robust operating environment, including support for 32-bit memory addressing, pre-emptive multitasking, multithreading, memory protection, and virtual memory. Additional operating system requirements for heavily loaded servers include 32-bit I/O, support for SMP, support for the POSIX APIs, integral peer-to-peer networking support, integral SQL-compatible DBMS support, distributed global naming, layered device drivers, inter-application

communications, and portability of the operating system to multiple platforms. In operating systems, such as UNIX and Windows NT, the NOS functions are supported as an integral component of the operating system environment, not as a separate software layer as in a DOS/Novell Netware solution.

Middleware

As we said, the upper layers of software on the server provide the system support functions that are commonly available in a mainframe environment. These layers of software, commonly referred to as middleware, provide support for transaction processing, security, version control, network management, etc. To avoid dependence on proprietary solutions, it is important that the middleware is compliant with open systems standards. Currently, the most widely accepted standard for middleware is the Open Software Foundation Distributed Computing Environment (DCE) and Distributed Management Environment (DME).

Distributed Computing Environment (DCE)

The DCE is a vendor-neutral layer of software from the Open Software Foundation (OSF) that provides distributed file services. It allows users on one system to access and modify data on another system within a distributed environment. Functions supported by DCE include access security and protection, standardized Remote Procedure Calls (RPCs), management of threads used to implement parallel processing, conformance to POSIX standards for portable operating systems and interoperability with NFS (Network File System from Sun Microsystems). OSF has completed many of these open systems services and plans to release all of the components of DCE during 1993.

An important function of middleware is support for distributed on-line transaction processing (OLTP) applications. Rather than using a proprietary software solution, the preferred method of supporting distributed OLTP is via a vendor-neutral software layer, such as the Transaction Manager extension of the DCE from OSF.

Many vendors with client/server solutions, like Hewlett-Packard, have announced that they will be compliant with OSF/DCE, providing transparent interfaces to middleware that are compliant with standards defined by the OSF. A few client/server tools already incorporate an integrated interface to Transarc's Encina, an open, OLTP product for updating and synchronizing multivendor databases spanning workstation, midrange, and enterprise-level platforms. The OSF has adopted parts of Transarc's Encina as part of its Distributed Computing Environment.

Distributed Management Environment (DME)

The Distributed Management Environment (DME) is another vendor-neutral, generic layer of software from OSF that aims to provide a uniform framework for the management of distributed systems within an open systems environment. The primary function of DME is to provide central management of distributed applications across heterogeneous networks. Functions supported by DME include application services, management services (e.g., software distribution, license management, and printing services), network management, configuration management and object services. DME is a critical support layer for the management of distributed applications. The OSF plans to release components of DME in 1994. Although it is still not clear whether DME will become the missing link to helping organizations resolve client/server systems management issues, at the moment it represents the best vendor-neutral approach in the market.

Conclusion: Asking The Right Questions

IT is one of the fastest growth sectors in our economy, and the enterprise client/server market is spearheading that growth. Businesses are turning to IT and various forms of client/server solutions to solve business problems to keep their organizations more competitive. The final layer of software that a business places on their computing architecture is the business application itself. Unfortunately for business and IS managers, the complexities of distributed computing are placing tremendous demands on the application development tools that are used to build these critical business applications.

Buyers of enterprise application development solutions need to understand these important dynamics, and need to ask the right questions from their potential product and service providers. Complexity is the operative word: Open systems and integration are the operative solutions.

Eliot D. Weinman is President of Software Productivity Group, Inc. (SPG) and publisher of Application Development Trends magazine. Mr. Weinman is a senior industry analyst and has developed and chairs several influential information technology conferences.

This is a partial excerpt from a report he is currently co-authoring, entitled "Enterprise Application Development: Strategies for Competitive Advantage," to be published in December 1993 by SPG.

By Dan Kara

Many organizations are struggling with the legacy of computer innovation in the form of multiple hardware, software, operating systems (OS), and networking architectures. While management is rightly concerned that the explosion of platform types will undermine productivity, the current industry dynamic is one of increasing platform diversity, as organizations try to exploit the advantages of different systems as they use IT in an attempt to gain a competitive edge. However, recent advances in computer technology make it possible for organizations to standardize on a system architecture which promotes diversity, scalable growth without disruption, and innovation, yet is consistent throughout the enterprise. This paradigm is the enterprise desktop.

The focal point of the enterprise desktop paradigm are desktop systems that combine the strengths of workstations, including reliability, availability of next-generation development toolsets, processing power, and superior management software, with easy-to-use desktop systems which boast of numerous personal productivity applications. Moreover, enterprise desktop systems can be seamlessly scaled down to end-user workstations and mobile systems, or scaled up to development platforms, servers, or host systems.

Enterprise Strength Development Platform

The enterprise desktop will assume many roles within an organization including that of end-user workstation and client workstation in a client/server or distributed processing architecture. One of its primary roles will be that of development platform.

The functional requirements for enterprise desktop systems that are to act as development platforms are greater than those typically associated with low-end personal computers. Key operating requirements for enterprise desktop development platforms include a robust operating system, prevalence of support software, and the availability of a variety of networking hardware and software products (Enterprise connectivity for workgroup development is a must). Numerous development tools covering the complete range of application types should also be available.

The development tools arena is very broad and generalizations are difficult to come by. However, upon close examination it can be seen that four key trends are currently driving the development tool market. These are:

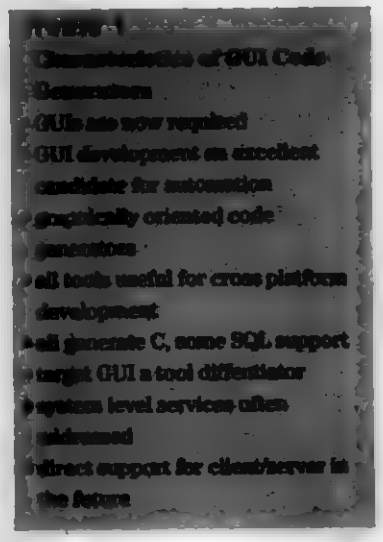
- the reality of multivendor computing (cross platform development)
- the "downsizing" of development
- The ascendance of the client/server computing paradigm
- the GUI as the primary means of human/computer interaction 3GLs

One of the surest ways of developing cross platform applications is to code them in one of the popular 3GLs, port them over to appropriate platform, massage the code, and recompile. To achieve portability, applications must be developed using languages that are supported by formal standards. Common 3GLs that have achieved standardization at the international level include Ada, BASIC, C, COBOL 85, FORTRAN 77, PASCAL, and PL/1. Popular 3GLs with no international standardization at this time include C++, Common LISP and Prolog.

Several products exist that allow developers to develop 3GL-based host applications on personal workstations, and then upload the completed and tested applications to the host environment. For typical business programming this involves the use of COBOL based development environments. Currently several programmer toolsets exist for PC based development of host COBOL applications. RM COBOL, CA-REALIA COBOL and Micro Focus COBOL/2 are all dialects and can emulate IMS, CICS, DL/1, DB2 and VSAM. In addition to developing mainframe applications, these COBOL programming environments can be used to migrate COBOL applications to other environments including DOS/Windows, OS/2 and UNIX, or even to create cross platform transaction processing systems.

GUI Generators/Cross Platform Development Tools

Although in a strict sense GUI generators and GUI cross platform development tools are not the same class of products, they do share many areas of commonalty (see Table 1). These tools



allow you to create and manipulate graphical representations of GUI constructs, and then generate the required source code. The code includes the main "Event Loop," and the code to create the GUI, and operate within it. Hooks for custom code are also provided. The cross platform tools go one step further allowing the developer to generate for multiple GUIs from a single specification.

Most of the tools in this class support object-oriented languages and environments, and virtually all offer some support for C. At this time the majority of the GUI generators support client/server by way of low level calls (usually in C), but a few of the tools have incorporated the capability to make SQL calls. It should be noted that the GUI regeneration problem that dogged early releases of these products and severely limited their use has been solved by every major GUI generator vendor.

The majority of GUI code generators are found in the Windows, OS/2 and Macintosh environments, and as a result they are useful as cross platform development tools when developers plan to port to these environments. Representative GUI generators include:

- AppMaker (Mac), Bowers Development Corp.
- CASE/W, CASE/PM (Windows, OS/2), KaseWorks
- GUI Programming Facility, GPF Systems
- Instant Windows (Windows), WinSoft
- Marksman (Mac), IT Makers
- XFaceMaker (OSF/Motif), Non Standard Logics
- WindowsMaker (Windows), Blue Sky Software

Since they share many features, cross platform GUI generators are often categorized in the same group as the aforementioned GUI generators/rapid prototyping tools. However, the functionality of the cross platform GUI generators is a superset of the rapid prototypers. Not only do these tools let one draw and dynamically model their GUI, they also allow the developer to generate multiple GUIs from a single specification. The cross platform development products also differ from the "GUI only" generators in that they address many system level services such as memory management, file services, and so on. Currently, all of these tools generate for some combination of OS/2, Windows, Macintosh, OSF/Motif, and OPEN LOOK GUIs. They differ in other GUIs they generate for, hardware platforms they target, and the languages they produce. Representative cross platform GUI generators include:

- Aspect /Open Inc.,
- XVT /XVT Software,
- Galaxy /Visix Software
- Open Interface/Neuron Data

Frontware

One major class of client/server development tools goes by various names including frontware, screen scrapers and 3270 beautification tools. Frontware tools enable developers to create GUI front-ends, complete with dialog boxes, pull-down and pop-up menus, scrolling bars and so on, for existing mainframe programs, with the added bonus that no changes to the mainframe code are required. Using these tools, data streams sent by the host are captured and mapped to the client GUI (The control characters in the host data are scrapped away, hence the term "screen scrapers"). GUI commands are similarly mapped to the data stream supported by the host. To the host the client appears to be just another a dumb terminal sending keystrokes. The frontware solution and development tools exhibit a number of characteristics that differentiate them from other tool types (see Table 2).

Many of the benefits attributed to client/server computing can be realized under GUI front-ending. Such benefits include increased end-user productivity and reduced outlays for training. Perhaps more importantly, the existing mainframe systems are still perfectly viable solutions. Frontware tools are well suited for companies that simply require the embellishment of existing host applications. Since all data and processing remains on the host, there is a lesser chance of data loss under this particular client/server architecture. These tools also offer a client/server solution for non-SQL data sources at a time when the mainstream focus of client/server is targeting data held in relational database management systems (RDBMS). Representative Frontware products include:

- Easel, Easel Corp.
- Flashpoint, Knowledgeware
- InFront, MultiSoft
- MitemView, Mitem
- Mozart, Mozart Software
- 4GLs and the Next Generation of Client/Server Systems

The ascendance of client/server computing has had a major impact on 4GL and RDBMS vendors and their development tools. All 4GL and RDBMS vendors have reworked their development tools to run on workstations and develop for distributed environments. The use of long extant development tools for client/server development has many advantages. For example,

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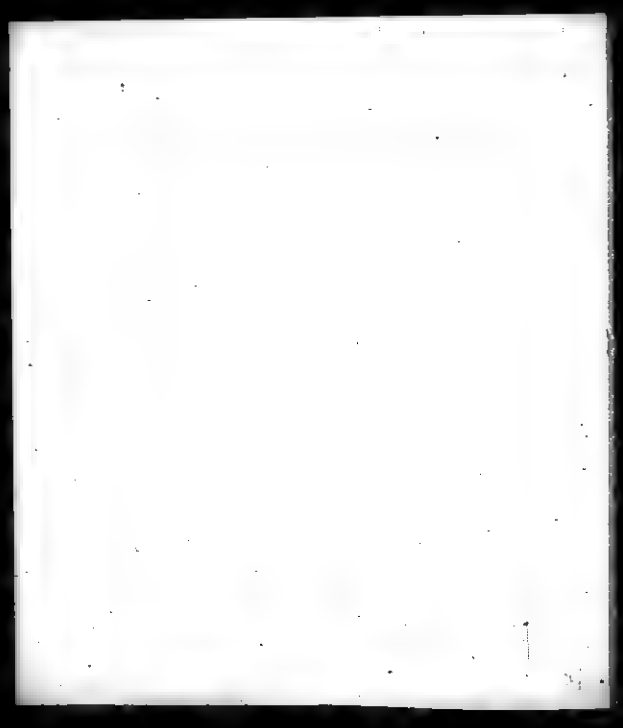

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4GL and RDBMS vendors have a long-standing presence in the corporate data center and as a result have accrued much experience delivering robust business applications. By using familiar 4GLs for development, companies do not forfeit existing staff expertise, with the accompanying loss of productivity, when migrating to client/server computing architectures. The 4GLs and RDBMS toolsets also offer strong support for workgroup development, configuration and project management, and CASE.

Representative 4GL products include:

- FOCUS, Information Builders Inc.
- JAM, JYACC
- Natural, Software AG
- Nomad, Must Software
- Powerhouse, Cognos, Inc.
- UNIFACE 4GL, Uniface, Corp.

While the development tools from the 4GL vendors and RDBMS vendors share much in common (Table 3), there are important differences between the two vendor classes, and these differences translate into differences in their development tool offerings. Lacking a DBMS of their own, 4GLs must support multiple RDBMSs and offer many other features, otherwise developers will simply use the well integrated tools available from the RDBMS vendors themselves. As you would expect, 4GL tools are very strong in their support for multiple database types across heterogeneous computing environments relative to the RDBMS offerings. While both the 4GL and RDBMS vendors will continually add to their list of supported databases, over time the 4GLs stand a better chance of reaching database independence. Individual 4GLs, however, differ in the depth and means of support for database independence.

Some industry analysts have pointed out that often the 4GL tools cannot fully exploit the individual features of specific databases. In an effort to offer maximum RDBMS coverage, the 4GL tools may limit support for features that exploit the full potential of a given database. For example, Oracle's triggers and stored procedures and Sybase's remote procedure calls cannot be fully exploited by all 4GL products. New 4GL vendors and new releases of existing tools are beginning to offer ways to target these latest DBMS features, although the degree of support varies from tool to tool.

Table 3
Characteristics of 4GL, RDBMS Tools

- tools from RDBMS vendors work best with their own RDBMS, but connect to other SQL databases
- GUI support is often incomplete
- CASE is often supported
- strong support for workgroup development
- strong support for development of business applications

Other capabilities that currently differentiate 4GL products is their ability to implement joins across multiple files or databases (remote joins), or to access and update different databases simultaneously. One product that does support remote joins and concurrent access is UNIFACE. The product makes use of what UNIFACE terms its PolyServer architecture, which gives applications simultaneous read/write access to heterogeneous databases on different servers and across different networks transparently.

RDBMS Tools

Database management systems are only as good as the development tools that target them. As a result, RDBMS vendors have released numerous tools that ease the process of database development. The majority of the development tools from the RDBMS vendors are 4GLs, so the discussion above also applies to this class of tool. However, because these vendors sell and support their own database, their tool offerings differ in many respects from "4GL only" vendors. Products in this category include:

- ACCELL/SQL, Unify
- Informix-4GL, Informix
- SQL Forms, Oracle
- PROGRESS, Progress Software
- APT Workbench
- Windows /4GL, Ingres

RDBMS vendors have taken a page from a book of their 4GL counterparts to have their development tools target multiple databases, including those of their competitors. Of course, while the RDBMS vendors as a whole fall short of offering the blanket database coverage the 4GL vendors offer, they are certainly moving in the right direction. For example, the "Big Four" RDBMS's from non-hardware vendors, Sybase, Oracle, Ingres and Informix, target some combination of DB2, IMS, Rdb, RMS, SQL/DS, SQL Server (both Microsoft and Sybase) and VSAM backends, in addition to supporting their own and each others databases as well.

As you would expect, the 4GLs from the RDBMS vendors offers support for native database features such as triggers and stored procedures for their own RDBMS. Some of the tools also support the native features of other database management systems, and a few provide direct CASE functionality. Vendors lacking their own CASE products often provide bridges to CASE tools. Unify, PROGRESS, JYACC and UNIFACE for example, offer bridges to some combination of Index Technology's Excelerator, IDE's Software Through Pictures, KnowledgeWare's ADW, Cadre's TeamWork and others.

Client/Server Tools

A relatively new class of easy-to-use application development tools, similar to the 4GLs in features and function,

have evolved that target multiple database types. Like the 4GLs, these tools typically support multiple DBMS types, often supporting more back ends than either the DBMS or 4GL tools. Unlike the 4GLs, which are found on PCs, workstations and numerous host systems, client/server tools run primarily on PCs and UNIX workstations. Moreover, the tools often employ an object-oriented approach and as a result are much easier to use than the products from 4GL vendors. While workstation-based client/server tools are limited with respect to workgroup and joint application development, they excel in support for rapid application development and rapid prototyping. Tools is the class include:

- Actor, Symantec Corp.
- Application Manager, Intelligent Environments
- Easel, Enfin/2, Easel Corp.
- Ellipse Cooperative Solutions
- Object/1, MDBS
- ObjectView, Knowledgeware
- PowerBuilder, PowerSoft
- SQL Windows, Gupta Technologies

CASE Tools Tackle Client/Server Development

While CASE tool vendors have addressed all four of the current drivers for the development tool marketplace, the focus is most heavily on the development of client/server systems, with heavy overlap on the other three areas. Compared to their point tool counterparts, many CASE vendors have been slower to deliver client/server solutions. This is partly due to the original focus on mainframe based COBOL application development. Moreover, many of these CASE toolsets are based of some type of methodology, and at this time the distributed design methodologies required for determining the partitioning of application logic are in their infancy.

Basically CASE vendors have approached the development of support for client/server from two different avenues, and the two methods each have their pros and cons. First, some CASE vendors have developed client/server support internally and integrated this functionality into their existing product sets. One benefit to this strategy is that these vendors typically have a large installed base of users who are familiar with the CASE products. This eases the learning curve associated with migrating to client/server development. Tight integration with an established CASE product also implies that the product can be used to develop large scale, strategic, client/server applications. The developer of client/server applications would have all of the benefits traditionally associated with CASE.

The incorporation of client/server support into existing CASE products could also have a number of negative connotations. For example, if piggybacking of client/server functionality onto the CASE technology is not handled properly, you have merely extended an older technology, one that is unsuitable to the task of creating true distributed processing applications. Also, developers today are unwilling to pay the large "CASE overhead" for small to medium sized applications. Recall that one of the touted advantages of client/server computing is the rapid development of strategic systems. If developers feel burdened by the stringency's of CASE, they will simply employ workstation-based client/server tools for creating all but large scale systems.

It should be noted that some CASE vendors have targeted the cooperative processing and client/server market. Such companies include Andersen Consulting, Texas Instruments, CGI, Intersolv, Synon, Computer Systems Advisors, KnowledgeWare, Popkin, SEER Technology (High Productivity System), Netron and others have released, or will soon release client/server CASE products.

The second method for adding client/server functionality to an existing CASE tool suite is via strategic alliance or merger. Under this scenario, the benefits of both the CASE environment and the client/server "point" solution are combined. Furthermore, the CASE tool vendor can boast of support for the latest client/server development technologies. Of course, there is always the chance, especially with the initial releases of the combined products, that the integration of the CASE and point solutions will be less than adequate.

The Enterprise Desktop

Most future application development will be performed on desktop systems. Vendors recognize this fact and have released a variety of development tools to aid in the engineering of GUI-fronted, client/server and cooperative processing applications targeting multiple deployment platforms. With their multitasking capabilities, network collaboration, breakneck speed and graphical displays, enterprise desktop systems are the best platforms for developing tomorrow's applications.

Dan Kara is the technical editor for CASE Trends magazine.

There are many issues to address when enterprise applications are either moved or developed for more distributed computing environments. Platforms, operating systems (OS), Application Program Interfaces (API), network operating systems (NOS), network protocols, middleware, application tools, development environments, and I-CASE all must be evaluated and selected. What's more, all of these elements must work together.

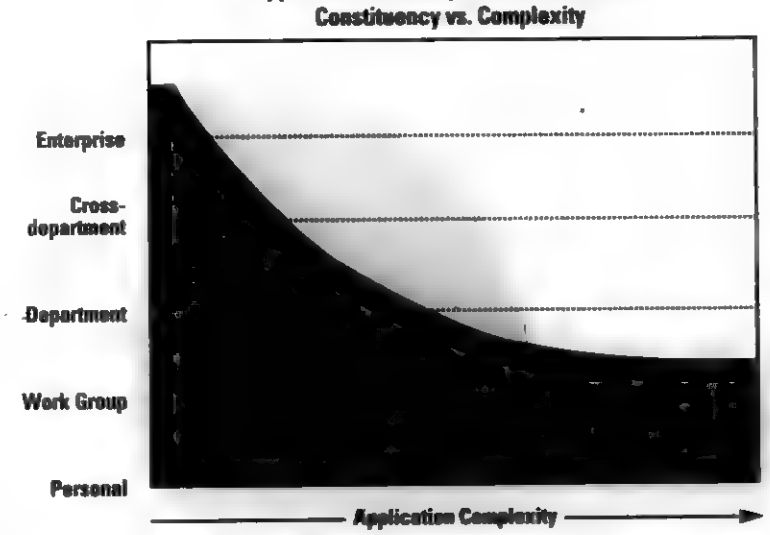
Hewlett-Packard faced the same decisions a decade ago when it began moving to client/server architectures, and with its work as a supplier of client/server hardware and software to Fortune 500 and 1000 companies. Through these efforts, HP has recognized that no single company has a complete enterprise solution. Therefore, HP has established partnerships with leading vendors of hardware, software, and services, bringing together complete client/server solutions for enterprise application development.

What is Enterprise Application Development?

It is the development of mission- or business-critical IT solutions from which a significant amount of a company's preceived value is derived. These solutions are typically user-specific, engineered to give the business a significant competitive edge in the delivery of their products and services. Examples of these include:

- customer services – the point at which many business "touch" their customers
- brand management – using IT to add value in product management
- distribution – managing the inventory/tracking activities in high-volume distribution channels.

Applications Development Technologies: Constituency vs. Complexity



Source: Gartner Group

The following summarizes HP and its Channel Partner offerings that are part of a total client/server solution for enterprise application developers.

Hardware: PA-RISC

Network expandability and performance scalability are key benefits associated with client/server architectures — and HP has the most scalable line of systems in the industry. From the desktop to the data center, applications written for one system will run on any system. This makes it easier to realize the flexibility of distributed environments, while greatly reducing planning, design, deployment, and maintenance costs. The quality of HP's systems is also evident in their mean time between failure (MTBF) of greater than three years.

HP-UX

When developing business-critical applications, the need for a stable, robust, open, and standards-based operating system assures the ease of development and eventual deployment of the solution. HP-UX meets the needs of developers, both in terms of product quality and support. A recent U.S. Datapro survey that focused on UNIX implementations from IBM, Sun, DEC, and HP reflects the user satisfaction with HP's products and services. Out of 704 respondents HP's maintenance/support was rated #1.

The respondents also rated HP-UX #1 in 11 out of 15 separate categories, including reliability and ease of use. HP-UX scored higher than any other UNIX implementation in overall user satisfaction and won a spot on the Datapro Honor Roll (the most prestigious award given by Datapro). The reliability and flexibility of HP-UX provides developers with a robust and adaptable platform.

All HP systems are standards-based. In fact, several HP employees have key positions on the major standards bodies and a number of its technologies have been chosen as distributed computing standards. The adherence to

This is a sample of application development tools available on HP

4GL C/S Tools
- FOCUS – IBI
- JAM – JYACC
- NETRON/CAPP – Netron
- PROGRESS ADE – Progress
- UNIFACE – UNIFACE Corp
- Visual/Works – ParcPlace
- Natural – Software AG

4GL C/S Client Tools
- ENFIN – Easel
- ObjectView – KnowledgeWare
- PowerBuilder – PowerSoft
- SQL Windows – Gupta

3GL Tools & Environments
- COBOL – Micro Focus
- C, C++ – HP
- C , C++ SoftBench – HP
- ObjectCenter – CenterLine
- Smalltalk – ParcPlace
- Distributed Smalltalk – HP
- NEXTSTEP – NeXT

DBMS & Tools
- Allbase – HP
- Open ODB – HP
- ObjectStore - ODI
- Versant OODB – Versant
- Oracle CASE – Oracle
- ToolBus – Informix
- Momentum – Sybase
- ASK INGRES – The ASK Group

Model Driven & Integrated-CASE
- FCP – Andersen Consulting
- PacLAN/X – CGI
- ADW – KnowledgeWare
- IEF – Texas Instruments
- Teamwork – CADRE
- Software Through Pictures – IDE
- Westmont I-CASE – Westmont
- Corvision – Cortex
- Synon/Open – SYNON
- PowerHouse – Cognos

standards means HP systems network easily with other vendors' products. For those companies still running legacy systems, HP networking can leverage these investments, making them a integrated component of a distributed, open environment.

Distributed Computing Environment (DCE)

HP's DCE/9000 is based on the latest release of the Open Software Foundation's (OSF) DCE environment. It provides a standards-based environment for heterogeneous distributed applications. A high-quality, fully functional, standards-based framework, it can be used to develop, administer and use distributed applications. It offers:

- Transparent communication. The DCE directory services provide for dynamic server location which results in transparent communication between clients and servers.
- Inherent security. Security is integrated throughout, providing for protection of critical data, applications and communication links.
- Resource replication. DCE provides for high availability by allowing for replication of key servers. Routing is automatically handled by the directory services so clients never need to know when alternate servers are used.
- Central software installation. DCE provides for more efficient installation and configuration, including installation of software to all DCE systems from one central software server.

DCE Application Development Tools

HP provides a suite of development tools to increase DCE application developer efficiency. These include:

- RPC tracing, logging and error reporting facilities to help debug DCE applications. No other vendor offers tools to track RPC communication between the client and server portions of a distributed application.
- Integration of the DCE compiler with the SoftBench development environment, thereby integrating it with any other development tool.
- Tools for tracing application threads and associated RPCs, along with timing information for use in debugging and tuning.

DCE-based applications

Distributed databases and enterprise application development databases are integral to enterprise application development/deployment, and several major vendors have emerged as leaders in this field. HP has extensive working relationships with all of them.

Distributed databases mean different things to different people. Data and logic can be distributed thoughout the network. Developers can use client workstations as a front end to accumulate, format, and display information from different legacy database systems. Here the underlying data and applications are not changed, efficiency being enhanced through the integration of a graphical user interface with multiple on-screen windows. As logic is distributed throughout the network, workstation processing power can be used to extend the functions and performance of distributed information/databases.

Although the major database management systems have unique features, several key elements are required for effective distributed databases development. Some of these are: rule integrity, locking, stored procedures, and two-phase commits. HP can work with its customers to choose the right DBMS or, for those companies that have already chosen a DBMS, HP can help transition to a more distributed environment.

HP database partners include:

- HP ALLBASE
- IBI
- Informix
- Ingres
- Oracle
- Software AG
- Speedware
- Sybase

HP also offers Open ODB, a commercial-grade, object-oriented database for large multi-user environments. OpenODB is an object-oriented database integration standard designed to support hundreds of users and very large quantities of data. It allows users to progress naturally to object-oriented technology while still accessing and using existing applications. Open ODB lowers information technology costs by simplifying the process of developing interoperable software. This can add up to a powerful strategic advantage for enterprise application development teams.

A range of tools are also available for Open ODB. For example, STEP Tools' STEP/EXPRESS, which is used to build an information model, is now available for OpenODB developers. STEP/EXPRESS models can be automatically implemented in OpenODB through HP's object-oriented structured-query language (OSQL).

Integrated CASE

HP supports fully integrated CASE environments for commercial development. I-CASE products from Andersen Consulting, CGI Systems, KnowledgeWare, Softlab, and Texas Instruments all run exceptionally well on HP systems. These repository-based solutions provide support for the full lifecycle of application development in a single environment. Code is generated from high level-application definitions supported by standard design methodologies.

For example, IEF from Texas Instruments is one of the leading integrated-CASE software solutions today. IEF, running on the HP Series 700 can be used for planning, analysis, and design. The Series 800 can be used for the repository, providing a complete HP development environment. IEF supports the generation of C or COBOL code and Oracle and Ingres RDBMS. Generated code supports client/server applications, with the Series 700 and Series 800 acting as client/server.

HP/NeXT

HP and NeXT are jointly marketing and developing Object/Enterprise, a client/server enterprise-wide computing solution. The partnership combines NeXT's object-oriented foundation with the HP desktop-to-data-center PA-RISC architecture and the Intel486.

NEXTSTEP is object-oriented system software for workstations, designed to increase programmers' productivity. NEXTSTEP provides a rich set of prebuilt objects for common functionality that allow programmers to write less code. It also provides a complete set of development tools designed to work together.

SoftBench

The I-CASE environments mentioned above include both development tools and an integrated development methodology. For those application development teams that want to customize their development environment, HP offers SoftBench. It is an open development environment that provides a common user interface. Development teams can choose the best tools available from a range of vendors and integrate them using SoftBench.

Commercial SoftBench is a program developed by HP's Software Engineering Systems Division. It consists of a combination of products, services and third-party relationships to extend the SoftBench product family to the needs of commercial UNIX developers. A key goal of the program is to ease the transition from mainframe development platforms to open, client/server environments by reducing the learning curve facing commercial developers.

Collaborative/Multimedia Development Tools

HP's MPower and SharedX capabilities allow developers to work together on projects, no matter the distance between them. Users can discuss and annotate an image that is being simultaneously viewed, resulting in significant productivity advantages. Users can also integrate desktop productivity capabilities such as fax, imaging, and electronic mail with multimedia technologies such as audio and video. This allows users to communicate and collaborate in ways most natural to them.

Another collaborative tool, Gain Momentum from Sybase, offers the first object-oriented multimedia information delivery environment for the extended office. Gain Momentum is targeted at large, content rich commercial applications.

Process Engine

SynerVision is HP's process engine used to model, implement, track, and report on user- defined processes. It is fully integrated into the SoftBench development environment and provides application developers the means to control, monitor and improve virtually all aspects of the development cycle.

ChangeVision is a completely developed application that runs on the SynerVision engine. It automates the handling of software change requests, including tracking requests, assigning tasks, handling version control,

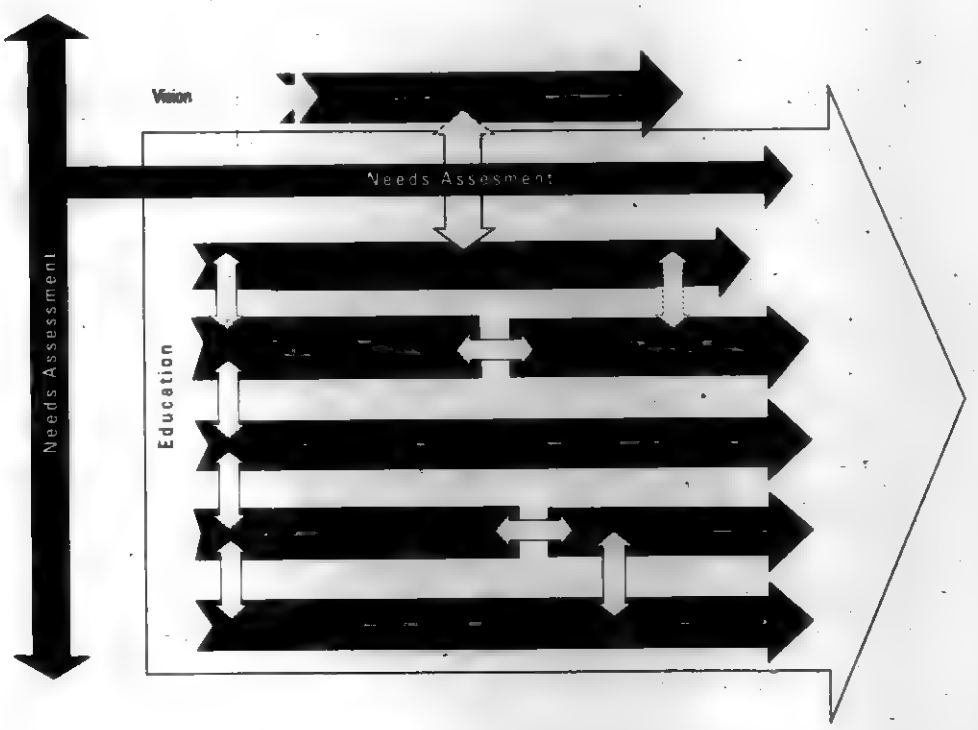
running test suites, and reporting on completion. It empowers the enterprise application development manager with the ability to control and continually refine the process of handling change requests.

Service

HP's commitment to quality and customer service is embodied in its Professional Service Organization (PSO). The PSO provides four types of service to address any consulting and training needs:

1. *Consulting.* Consulting consists of planning and implementation services. Planning consultation may include business process reengineering, consultation on what kinds of information systems are needed, and consultation on database structure, communication protocols and networking standards. HP's consultation services make years of experience available to its customers.
2. *Systems integration.* HP can serve as the primary contractor for systems integration. It can manage the entire contract, sharing the risk with the customer. In this case, HP delivers a fully functional system, including hardware, software, applications, and training in the system
3. *Education.* HP offers over 200 courses in its course rooms, located worldwide, or at customer sites. Courses cover simple and advanced topics including introduction to UNIX, programming with UNIX systems calls, object oriented analysis and design techniques, C++, and others. HP also builds custom education curricula, using standard courses or third-party materials. In short, HP can act as the system integrator for enterprise technology education needs.
4. *Support Services.* HP provides a full range of customer services from setting up, staffing, and training help desks, to managing a customer's entire system. This includes multivendor maintenance on hardware and software.

HP's PSO has "been there." Its personnel have extensive experience with all aspects of moving development to a more distributed environment — from network architecture design to coding applications. The PSO makes that experience available so its customers can quickly achieve the cost savings and competitive advantages available from the new computing paradigms.



Barclay's Bank: An International Distributed Environment

The corporate lending business of Barclay's of London deals with medium to large companies and financial institutions.

Until recently, the process of handling such loan applications had only islands of automation. One section of the bank would gather information, generate spreadsheets, or produce documents relating to the loan. These would then be bundled and "passed over the wall" to the next section, which would add to the pile and pass it along. The paper system made it nearly impossible for managers to know how many applications were in process and where they stood. It also resulted in a great deal of duplicate data entry. A little more than two years ago, a project was initiated to automate the entire corporate loan process.

According to Malcolm Dunn, senior IT manager, the bank settled on an architecture and several key components for the system before beginning any design or coding. "We wanted to increase the ability to distribute applications, reusability of units between systems, and lower the cost of our mainframes," said Mr. Dunn. "In summary, the bank went very strongly toward open systems. Legacy systems were allowed to survive, but target dates were set to phase them out."

Mr. Dunn commented, "In this project we have developed a range of programs to support corporate lending from research both internal and external — to structuring the deal, including establish interest rate returns, margins, etc. The goal is to put together an infrastructure which helps research, sell, and put together an actual deal for the client; but if you look beyond that selling process, you also have to be able to understand the client's current position with the bank. Maybe [at first] this position will only include dealings with the lending environment and not dealings with the money market or other area. However you have to be able to pass this deal to a unit that handle tthe servicing of the loan, eg. collection of payments. The next phase takes us toward that objective."

Barclay's used HP's SoftBench running on a Series 800 server and an HP 700 X station for both the development environment and for version control. They wrote their own Remote Procedure Call (RPC) interfaces and did some C coding, but most of the application was written in Ingres' 4GL. IDL's BasisPlus database was also used to store some documents and spreadsheets, although the user never knows where the data is coming from; it is all seamlessly presented through one application.

A major advantage of the distributed architecture has proven to be the ease of network management.

"The tools are good — network management, communications, monitoring of the network, managing servers," said Mr. Dunn. "We had no idea how much performance we were really going to need on our servers or networks. And I wanted to be able to tune the system easily, quickly and with smaller incremental costs quickly. That is why we have five defined server types. It is very easy for us to respond to some performance shortfall. It is also very easy for us to provide technical support to users if there is a failure."

Mr. Dunn attributes some of the ease of network management to the use of a UNIX approach on the desktop, rather than PCs.

"We would support the view that the UNIX approach to the desktop is better than PCs because of the ease with which we can support several hundred users from a single location," said Mr. Dunn. "These users are in five buildings. We distribute software automatically overnight. It is easy. If we had

240 PCs out there, it would be a complete nightmare. From that point of view, the technology is right."

Although Barclay's possessed a great deal of technical skill internally, they relied on assistance to make the move to a more distributed environment work.

Mr. Dunn stated, "We used a range of consultants and contractors to help us including people with development skills, UNIX skills, network skills, and training. Hewlett-Packard provided consultants to the project in the technical and training areas."

Barclay's move to a distributed environment has been gradual. But with the proper planning and intelligent network design they have constructed a flexible system that will take them into the next century.

Telecommunications user

A major telecommunications equipment and services supplier with locations in Canada, the United States, Japan, Europe and Australia is using enterprise application development (EAD) to support their customer services departments. In the North America service center a 200-person EAD team is working to enhance competitiveness while reducing their dependence on mainframe based technology.

Until about two years ago, this company's application development was done in COBOL and their computing was highly centralized. At that time, the company began moving to a more distributed development/support environment.

The move came about because of cost issues. Currently they have around 60 workstations with six servers. This large distributed environment is supported by only one systems administrator, keeping maintanence costs at a minimum. Growth is also projected to be much more cost effective. Adding incremental performance in the form of servers and workstation clients represented a low cost way to expand, verses that of a mainframe.

However, the move to distributed computing has not happened immediately. Instead it is an ongoing process. They still support a large number of COBOL applications, although all new applications are written in C and C++ in an HP Softbench environment. They plan to eventually move to HP's Distributed SmallTalk and Forte. The technical win is the ability to easily and efficiently design, deploy, and support applications in a large distributed network.

The move to a fully distributed environment is not finished. With the flexibility offered by a UNIX development environment they have realized the need to formalize the process used for software development, design and deployment. The tools are available, they just need to be learned, implemented and used.

Owens-Corning

For Owens-Corning Fiberglass Corporation, the Toledo, Ohio-based world leader in fiberglass manufacturing, restructuring operations has helped offset declining product sales volume and prices. Through aggressive cost-cutting and organizational streamlining, the company, which generated $2.8 billion in sales in 1991, continues to improve its productivity and gain market share. Facilitating these changes is the company's recent shift to open, distributed computing. Offering dramatic cost savings, open systems will more importantly transform the company's information systems into a competitive weapon for strategic planning, opening vast new business opportunities. The HP Open Software Environment (OSE) Software Architecture workshop helped Owens-Corning take the important first steps toward open systems. Just one year later, Owens-Corning, in partnership with HP, delivered it first object-oriented client/server applications operating on a UNIX platform, a goal the company had struggled with for five years.

Says Bill Whitten, senior specialist for technology assessment and planning, "We had tremendous support from HP's consultants in actually implementing this system. But above that, the HP OSE Software Architecture workshop identified all the work that had to be done, so we have had very few surprise along the way."

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ASK Group

The ASK Group is a developer and integrator of strategic business software. ASK Windows4GL, ASK INGRES Intelligent Database, and ASK VisionPro are designed to improve the productivity of developers and the quality of applications delivered to end-users.

Frame

Frame Technology is a worldwide provider of award-winning writing and publishing software for the creation and distribution of critical business and technical documents. FrameMaker 4.0 is designed specifically to make it easier to create demanding documents in advanced desktop computing environments.

HEWLETT PACKARD

HP's C and C++ SoftBench based on the SoftBench framework including compilers, editors, debuggers, static analyzers and electronic mail. HP's Distributed Smalltalk 2.0 is the first full implementation of CORBA 1.1 standard for distributed object systems.

Information Builders

FOCUS, the company's flagship product, is the most widely installed 4GL for information systems with more than 8,000 installations and 1,000,000 users worldwide. Additionally, IBI offers LEVEL5, an application development tool with expert system capabilities, the EDA/SQL family of data access products and a full range of educational and consulting services.

INFORMIX

Informix provides database application technology for open systems including; database servers, application development tools, end-user tools, and connectivity solutions.

NeXT

NeXT develops and markets the award-winning NEXTSTEP object-oriented software for industry-standard computer architectures. NEXTSTEP is used to develop and deploy custom client/server applications, using both custom and shrink wrapped software for companies requiring enterprise-wide, object-oriented productivity environments.

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SYBASE

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What the new chips mean to you

The marketing machines are in overdrive for Intel and the PowerPC trolls. The IS community's appetite for increased PC power is indeed high. However, IS managers express caution when asked about their immediate plans for the new chips, due in part to the premium price tags.

The only way we would consider these machines is if Lotus 1-2-3 ever gets to the point where it requires Pentium. Otherwise we have to ask ourselves: Is a three-tenths-of-a-second response instead of a two-second response really worth it?

However, if we decide to go on to Novell, Inc. NetWare 4.0, everything might change. We might need the extra horsepower.
Harold Sample, data processing manager, Amerada Hess Corp., Jackson, Miss.

If the Pentium truly offered twice as much computing power and I could buy it, it would have significant impact. With the way it stands now, we'd see a marginal power increase, 20% or 30%. It's not enough to make dramatic changes.
Sheldon Laube, national director, information technology, Price Waterhouse, Menlo Park, Calif.

Sheldon Laube

We're certainly going to look for the horsepower of Pentium, as we're now getting into imaging and compound documents. Multimedia is hot for us, as is CD-ROM. But we're not interested in third-party Pentium machines; we'll wait for the big guys to start shipping.
John Houlihan, PC consultant, Super Shops, Inc., San Bernadino, Calif.

PowerPC has a lot of hurdles. It certainly competes with other engineering workstations, but on the desktop, against Intel, that's a tough hurdle.
David Evans, vice president and director, JC Penney Co., Dallas

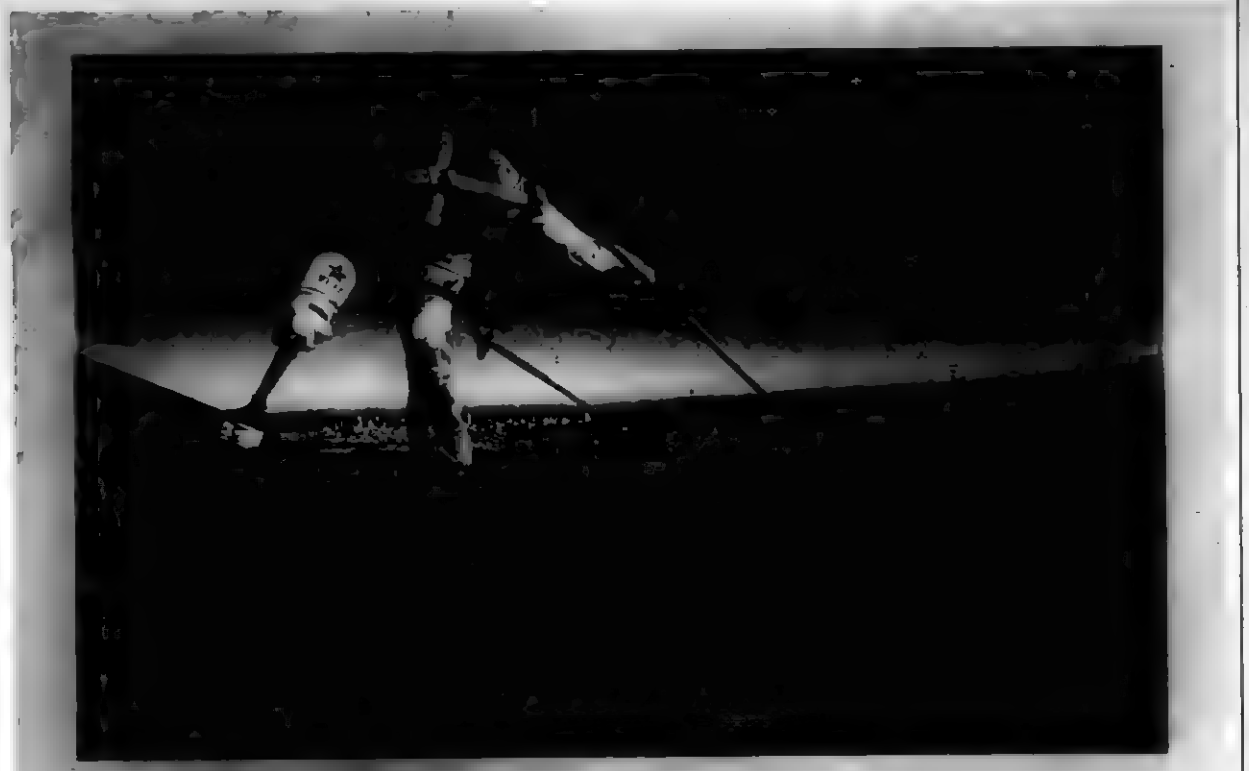
We're interested, and we need [more power] now. But it's not like we've "gotta have it," and we're not going to make a stupid move.
Scott Salter, LAN manager, JBL Professional, Northridge, Calif.

I'm sure we'll be purchasing Pentium machines specifically for the graphics in our marketing department. But we will have to evaluate the price/power ratio to make sure they're worthwhile.
Eric Baughman, PC consultant, Coronetrics Medical Systems, Inc., Wallingford, Conn.

George Brenner

We're not going to change just because the Pentium and PowerPC are available. We'll change as the application software evolves to make use of these facilities. Portability is the buzzword in 1994 in our organization, so that's where we're spending more of our time.
George Brenner, director, corporate information services, MCA, Inc., Universal City, Calif.

We're getting some RS/6000s with the PowerPC chip, but the chip itself had no bearing on the decision to purchase them. It didn't matter whether they were PowerPC or Pentium. The RS/6000s will serve as an entry device for imaging. We actually store the images on our AS/400 for faster access time.
John Robinson, director of data processing, county of Walla Walla, Wash. ■



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COMPUTERWORLD BUYERS SATISFACTION SCORECARD

Dell's OptiPlex scores high in value for the dollar, overall user satisfaction

By Kevin Burden

PC vendors take note: Your customers expect high price volatility in the PC market and seldom jump at attractive sale prices. Even users of today's high-end multiuser systems can be considered price-sensitive. But more than a great deal, these users expect value.

At press time, Dell Computer Corp.'s OptiPlex line, led by the 66-MHz DX/2, was priced at $3,749. At that price, the OptiPlex is not considered to be a clone-killer or low-priced by today's PC standards. But the feature-laden, high-powered multiuser system scored the highest value-for-the-dollar rating, proving users do not mind paying a premium when they believe it is worth it.

The survey measured user satisfaction with the Top 4 market share leaders in PC hardware. These include three systems running Intel Corp.'s 1486 processor at 66 MHz and the Apple Computer, Inc. Quadra 800 running Motorola, Inc.'s 68040 processor at 33 MHz.

The OptiPlex achieved the highest scores in 12 of the 17 categories, including eight areas rated "most important" to all of the191 users surveyed.

Apple's Quadra garnered the highest ratings in three categories and Compaq Computer Corp. topped two. IBM posted competitive scores but did not rank at the top of any category.

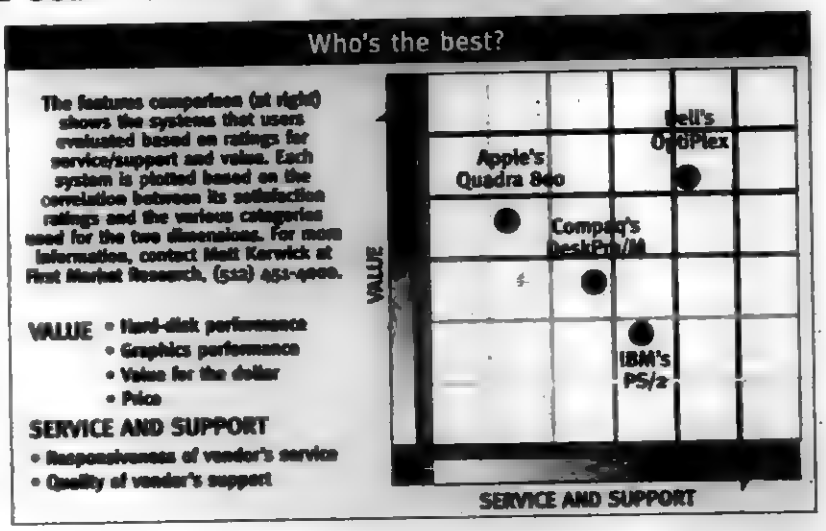
Dell's strengths are in its expansion options and processing performance. But users were dissatisfied with DeskPro/M's warranty length.

Apple scored its highest marks for graphics performance and multimedia capabilities. Its warranty period was also cited as too short.

Compaq users like the DeskPro/M's processing performance and awarded it the top score for keyboard layout.

IBM's PS/2 scored high for its hard-disk performance and bundled software.

The Compaq and IBM systems received their lowest scores for price.



Service and support policies

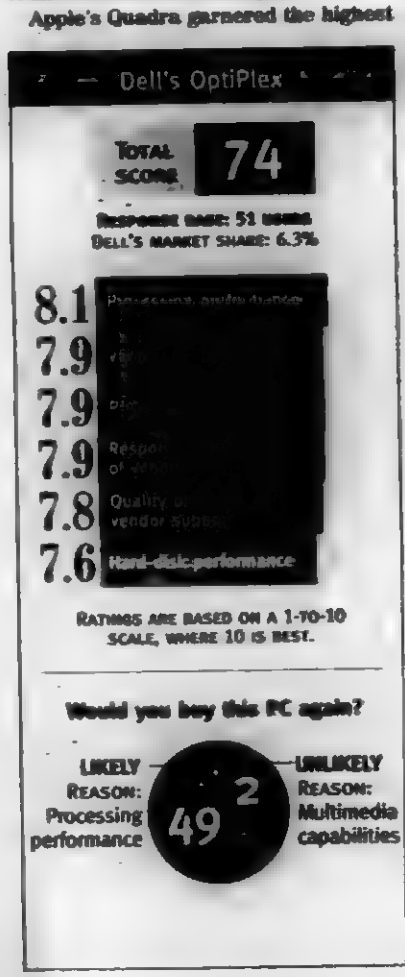
With products that offer similar features, vendors use service and support to differentiate their systems. Dell's newly enhanced support offering helped it achieve the highest rating in the service-related categories — vendor responsiveness and technical support quality.

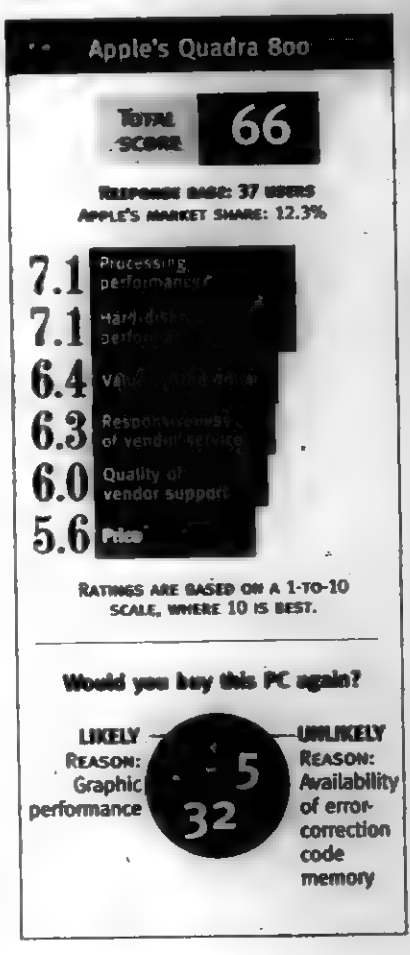
In addition to standard around-the-clock phone support and a one-year, next-day parts and labor service offering, Dell provides users with the option of a customized program, allowing them to choose the level of service they need.

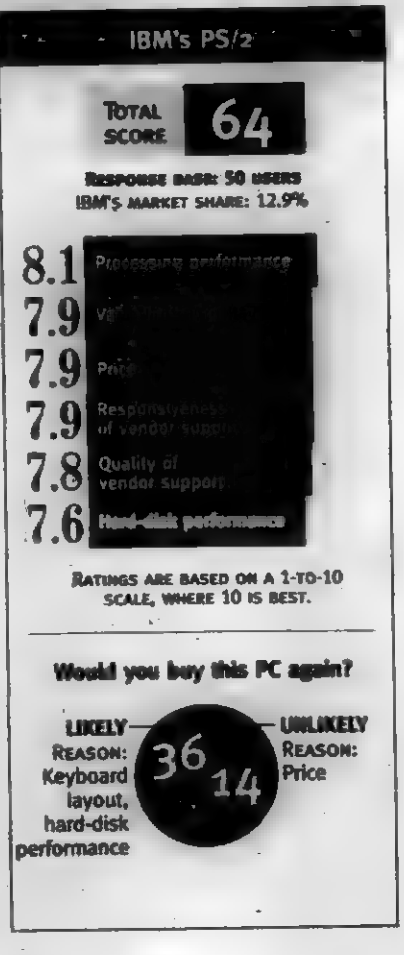
Compaq also received high service marks for its CompaqCare program, which includes lifetime phone support and a RemotePaq. This offering lets technical support engineers remotely troubleshoot your system. Compaq also provides a three-year limited warranty, the longest of the competing systems.

OptiPlex's upgradability achieved the highest score of the four PCs. Like its Intel-based brethren, the OptiPlex can be expanded to the Pentium through a P24T socket. Its chassis allows access to the system's processor board by turning a single screw. It also includes five XT/AT bus slots and five drive bays compared with only four slots and four bays for Compaq's DeskPro/M and IBM's PS/2.

Although Quadra's upgradability was rated below that of the other systems, users gave it high ratings for its expansion options. Quadra's hard disk can be expanded up to 1G byte, but the system's performance can only be enhanced by interleaving the memory. ■







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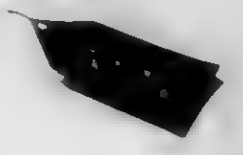

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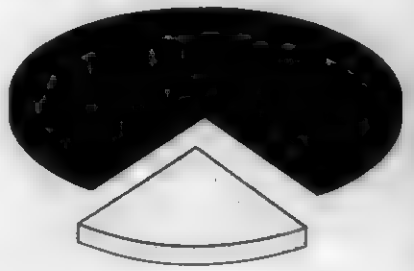

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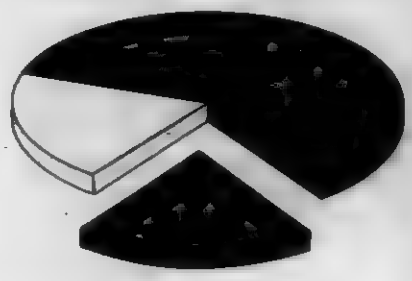

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NCR 3000 Pentium systems: Strong performance and support

System 3000

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ Evaluators rated NCR Corp.'s System 3000 Pentium machines as average or better in all categories and raved about NCR's technical support staff. They agreed that the systems provide extraordinary performance as both workstations and file servers.

Participating in this evaluation were three users of the NCR 3360 workstation, a $20,000 (approximately) desktop system that shipped this summer with a standard configuration of dual Intel Corp. Pentium processors, 32M bytes of RAM, a 535M-byte SCSI hard drive and a 600M-byte CD-ROM drive.

One participant was using the NCR 3430, which has dual Pentium processors but far greater disk storage for use as a network file server.

All were equipped with Microsoft Corp.'s Windows NT operating system and had similar architectures.

The evaluators included technical managers from a computer-aided design (CAD) software company, a graphics software company, a chemicals manufacturer and an engineering firm. They had been using and evaluating the NCR Pentium systems for one to six months.

Surprisingly, the three NCR 3360 users anticipated purchasing only a handful of units during the next year, explaining that they had no immediate need for its high-level performance. The engineering firm evaluator, who has just completed a month-long analysis of the 3360, said his company might buy as many as 15 units during the next two years.

The chemicals company user had already installed three 3430 network servers running Windows NT Advanced Server and SQL Server. He anticipated a large conversion to the 3430 configuration from other LAN servers currently running Novell, Inc.'s NetWare or IBM's OS/2. "I can collapse three Novell servers into one 3430 running Windows NT," he said.

The format for this evaluation was created with the help of Howard Rubin Associates and Technology Investment Strategies Corp.

Reliability

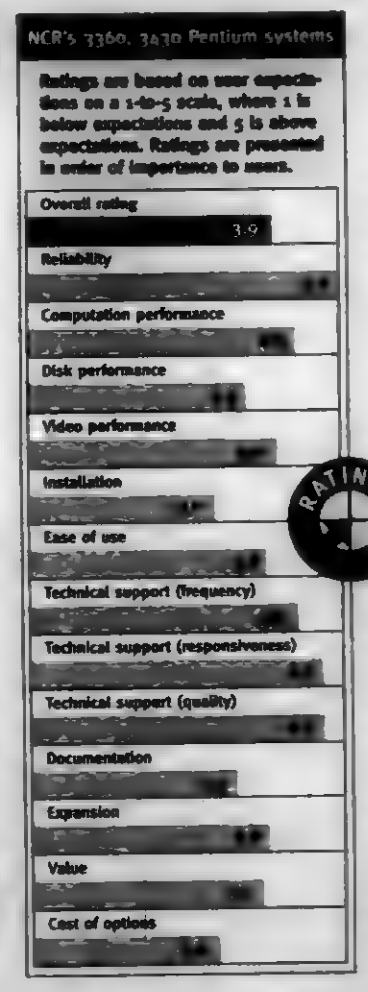
All of the evaluators had been pushing the system to its limits with program compilation, intensive graphics applications and working network programs. However, none reported any memorable crash or failure. Although they expected such behavior, they were impressed that the systems software (both NCR's and Microsoft's) did not exhibit any bugs or faults.

Performance

The evaluators were asked to rate separately computation and disk and video performance. They said the dual Pentium architecture of the systems provided outstanding computation performance but were marginally less complimentary of hard disk and video subsystems. All categories were still rated above average.

CAD software firm: "The 3360 is more than twice as fast as the fastest workstation we benchmarked, including [Sun Microsystems, Inc.'s] Sparc 10."

Chemicals manufacturer: "The processors and I/O channels are both very fast and provide a balanced architecture."



Installation/Ease of use

The evaluators did not report any problems or exceptional improvements.

Technical support

The evaluators provided ratings for three separate technical support categories: frequency of support, responsiveness of support personnel and quality of support rendered.

In all categories, they gave NCR much higher than average ratings and lavished compliments on NCR personnel for responsiveness and competence.

Graphics software firm: "Responsiveness has been tremendous.

CAD software firm: "If we have any questions, or anything goes wrong, they are there."

Chemicals manufacturer: "We had a communications error and couldn't figure it out. They came in and debugged our network on a Saturday."

Expansion

Although users generally rated expansion capabilities slightly above average, the CAD software evaluator gave the NCR 3360 the highest rating based on his experience with other workstation vendors. He said the 3360 was significantly more expandable, at lower cost, than competitive systems.

CAD software firm: "The advantage is that you buy peripherals and memory with workstation performance, at PC prices."

Value

The evaluators had markedly different perceptions of value. The graphics software and chemicals company evaluators were comparing their NCR systems to competitive systems based on Intel I486 processors. They found the NCR Pentium systems to be radically more expensive than 486 machines.

The CAD software evaluator compared the 3360 to a variety of workstations and development systems including the Sun Sparc 10 and the IBM RS/6000. He said the NCR 3360 was a much better value. The overall rating was still above average.

Graphics software firm: "It's best to compare [the 3360] against [Digital Equipment Corp.'s] Alpha or Mips [Technologies, Inc.'s] systems. But they're all a major leap in cost."

CAD software firm: "It provides more than twice the performance at one-sixth the price of IBM [RS/6000] systems."

NCR responds

▶ **Performance:** NCR has more than seven years of experience developing general-purpose symmetric multiprocessing systems and is recognized as the leader in this area. The 3360 and 3430 multiprocessing architecture utilizing dual-bus, simultaneous access to memory and system scalability will keep us ahead of the competition.

▶ **Who should buy:** NCR recommends that customers of the 3360 and 3430 be involved in areas such as Windows NT or Unix software development. They should use these systems as workstations and small workgroup branch servers.

Written by Computerworld *senior editor Garry Ray.*

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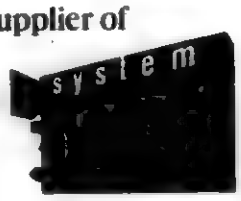

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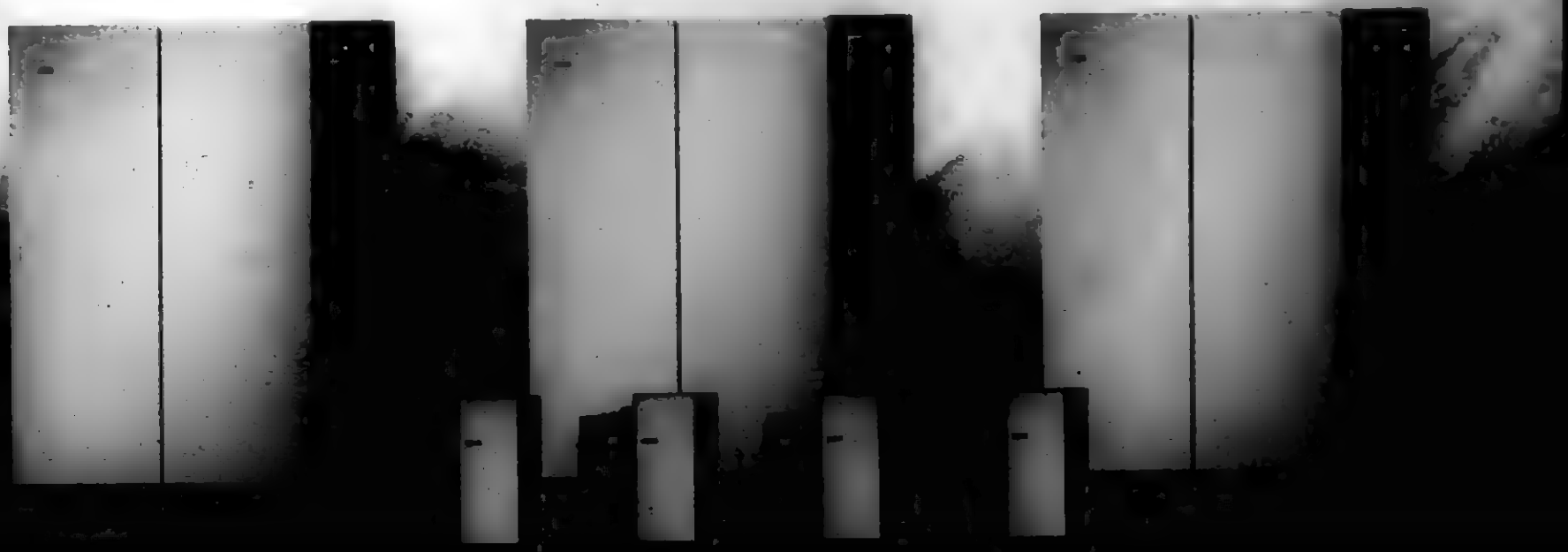

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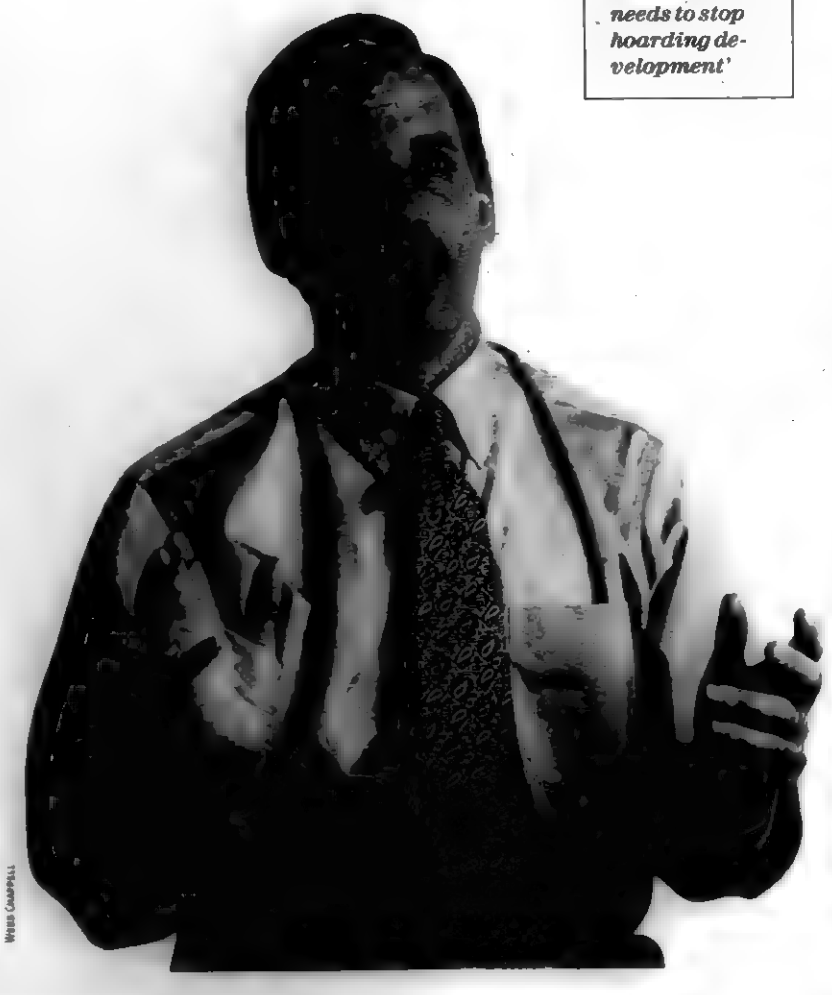
THE END-USER DEVELOPER:

FRIEND

AT ISSUE: Products such as Lotus' Notes are ushering in a new era in which users can develop powerful systems on their own. What results, says Lotus' Jeff Papows, are better applications and help for IS. For developer Joe King, user involvement means chaos.

SOUND OFF!



◀ JEFF PAPOWS: *'IS needs to stop hoarding development'*

User developers build better business systems

It's too late to debate whether end users should be invited into the application development process. They have already arrived.

Groupware, with the power it gives to end users, is the phenomenon that is forcing the development rules to change. Groupware products are both technologically and dynamically in tune with the user developer: The level of complexity varies with users' needs and knowledge. Entry-level users can whip built-in templates and examples into simple applications, while power users can take advantage of macros to help develop more sophisticated tracking and work-flow applications.

In this way, end users can become the most effective weapon against an applications backlog that can mount up to several years at the typical Fortune 1,000 company. And people who work in glass houses shouldn't be throwing stones at this idea: Information systems needs to stop hoarding development and realize the best thing that could happen to an organization is for users to develop what they need.

The benefits of harnessing user power into the development process are clear. For starters, no one has a keener insight into what makes an efficient and effective business application. It stands to reason that end-user developers will create — or quickly add — a necessary function once they know they need it.

There is no opportunity for the messy and costly miscommunication that sometimes occurs in the typical development life cycle when users hand in their requirements and pass system specs to programmers, who hand applications back to users and so on.

Even more importantly, as users develop these systems, they can discover flaws in work flows the applications address.

At one New York-based advertising company, for instance, a cross-functional team of businesspeople, with little help from IS, planned to develop an automated traffic control system for projects. The groupware-based system was to replace the company's manual,

Friend, *page 182*

or FOE?

If you want trouble, then let users develop

Don't be swayed by the popular myth that users are your programming resources of the future.

With the PC applications backlog what it is — at least three years, by my reckoning — it would be great to think that end users are the answer to the information technology group's prayers. What information systems manager would turn down a bunch of extra helping hands if it meant faster development?

But getting end users involved will do more harm than good.

I'm not talking about end-user development with personal productivity tools, such as spreadsheets, word processors and personal databases. That's baby stuff, stand-alone and isolated development that rarely has any ripple effect on applications and communications companywide.

Rather, the danger is letting end users go wild with new enterprisewide multiuser application systems of which Notes, Objectvision and Visual Basic are all a part. Combine user-controlled development and the workgroup computing nature of such tools and you have the makings of a technology Molotov cocktail.

Such products are a siren song to end users. They promise simplicity and ease. (Perhaps a new Dale Carnegie course is in order — "Yes, You, Too, Can Be an Application Developer.") Users don't have to wait around with their hair turning gray to get an application built. But are you prepared to have your users "simply" and "easily" handle complex communications software, administer a client/server environment, ensure security over multiplatform systems, distribute databases over a wide-area network and master multiple programming languages?

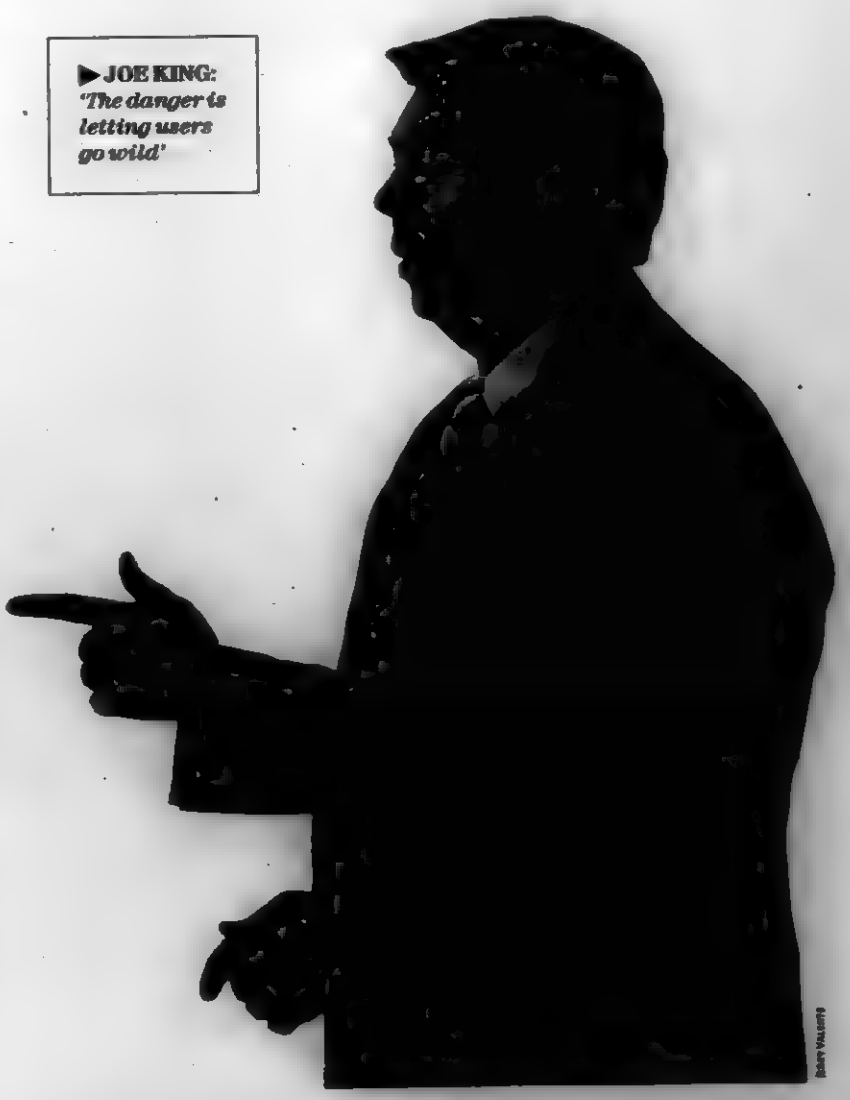
Yet these are all part and parcel of what it means to develop applications with Notes or Visual Basic or whatever. It's been my observation that the learning curve for Notes — and I'm talking about the learning curve for technical professionals — is long: about six months. Users take twice that time to come up to speed — if they ever do. Can your organization afford to have your users spend up to a year learning to be competent developers?

I'm not kidding when I say development can get complicated. Notes, for instance, doesn't sit there by itself; building a complete application often requires, say, Visual Basic or Objectvision. I know of one project that needed as many as seven separate products to build a single system!

You can't really expect users to master all of these tools. Even if they did, issues of design, data integrity and quality come into play.

I know one company whose business users built a slick shared database application on a LAN. But it took so much effort to maintain

Foe, *page 182*



▶ **JOE KING:** *'The danger is letting users go wild'*

Friend

CONTINUED FROM PAGE 180

nine-step time- and paper-intensive work-flow process. As the team mapped the work flow, it realized the process was a mess. It would be a mistake merely to automate it. For instance, there was no formal way to specify who would be a member of which project, to assign team duties or to set up teamwide briefings.

Because the developers were professionals integrally involved in the business, they picked up on the poor processes. IS would never have been able to.

This is heady — and empowering — stuff for users. "Suddenly, they see their own information needs being met and quickly envision myriad specific applications to be implemented," says the IS director at an accounting and consulting firm. He says the appeal of this kind of development is "almost visceral."

As users, excited and enabled by groupware, flock to the application development party, business organizations are starting to see quantifiable results in terms of reduced time to action and improved quality in business processes, including product development, account management and customer service.

One leading scientific equipment manufacturer I know of got a 20% increase in response after putting in a prospects and sales tracking system that an applications engineer and the company's director of training created.

On the basis of this improved response, the company estimates that if each rep makes one additional sales call per week, it can bring in $4.3 million more in revenue annually.

As users are brought into the development mix, the loudest applause should come from savvy IS professionals. Only those with their eyes on the past will bemoan the rise of groupware as the fall of the IS profession. There's a chance for users and IS to work together.

That's because, as Mark LaRow, a consultant at the Ernst & Young Center for Technology Strategy, points out, there is a shift occurring. Command, control and communications are no longer the driving forces in companies. Coordination, cooperation and collaboration are what's in store for the future.

Users in the development process can't be ignored anymore. ■

Papows is vice president in the Notes Products Division of Lotus Development Corp. in Cambridge, Mass.

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CONTINUED FROM PAGE 181

that the support staff doubled. And then it doubled again. The system duplicated the existing corporate systems' data entry functions, and the company was left with data that did not balance. Data integrity has become a major issue.

While the rigors of design, analysis, testing and methods are second nature to professional developers, users haven't been versed in these areas. And you can kiss documentation good-bye.

Also, when companies let their users take on development, users quickly discover that for their applications to have value (surprise!) they either have to get data from or talk to older systems. So IS ends up spending a good chunk of its time figuring out how to integrate new and legacy systems. What starts out as a way to shorten an applications backlog ends up adding to it instead.

I don't want to give the impression that I'm not a big fan of these new development tools. Quite the contrary. These tools can have a profound impact on the development life cycle. But *only if* development is in the right hands.

It's not like users won't be involved in development at all; in fact, one of the things these tools have going for them is iterative and rapid development, which brings users and developers together in a real-time "conversation." Users participate actively, but control stays with IS.

I can't see why companies want to create more development headaches than they already have. ■

King is founder and president of Crossroad Partners, a Shrewsbury, N.J., consultancy specializing in Notes. Formerly assistant vice president of systems architecture at Continental Insurance Co., he can be reached at (908) 842-3527.

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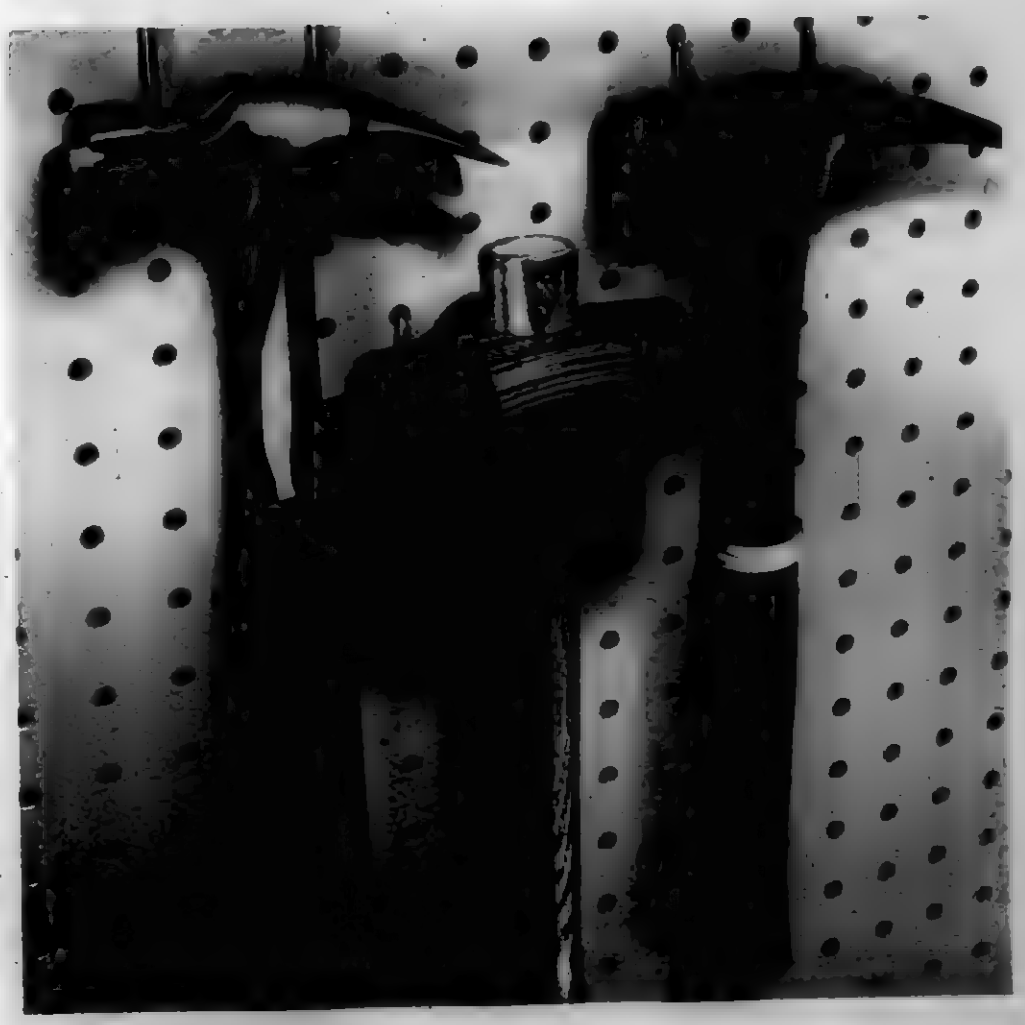

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Computer Careers

COPING WITHOUT BOUNDARIES

KEEPING up

By Alice Bredin

NARROW AND CLEARLY defined job descriptions have become a thing of the past in many information systems shops. In a recent survey, systems administrators and analysts said job cross-functionality has been the biggest change they have experienced in the past year.

Increased dem? ds on their time have left many strugg .g to keep up with old responsibilities while finding the time and means to learn new ones. Their biggest concern is balancing the two.

Until last year, Jan Zumwalt, a programmer/analyst at Bristol Bay Area Health Corp. in Dillingham, Alaska, spent his days programming and handling Unix systems administration. Things changed when the company brought in the X Window System.

Now Zumwalt spends most of his time ironing out the kinks and learning this new environment. His old responsibilities still exist, but he tends to them on a crisis-management basis only.

Like many others, his solution to the time crunch is to work more hours. Six-teen-hour days are the norm, and almost everyone works weekends and holidays. Zumwalt handles work on an emergency basis but no longer has the luxury of doing lower-priority tasks such as system auditing.

"The productivity increase is substantial because of the X Window [System], but as soon as we brought it in, we were busy," he says. "Now my job is a cross between attempting to keep promises and juggling the political pressures and priorities of the department."

Expanded job descriptions

Scrambling seems to be the only way to get things done, and for some, getting the right education is the solution. "Our job descriptions have expanded, and we're responsible for four to five times the amount of equipment than before," says Michael Sharpe, a computer specialist at Midlands Technical College in Columbia, S.C. For three years, he maintained systems at one of the school's three campuses. After several departments were consolidated, Sharpe's duties were significantly broadened. Now, he and his coworkers care for every technology.

"We are expected to work on new brands of equipment but haven't gotten training or documentation," Sharpe said. He has taken matters into his own hands and is seeking classes for the more complicated technologies that he handles.

Eventually IS staffers realize you just can't do it all and shouldn't try. Jeff Mullin, data processing coordinator at CPAC, Inc. in Leicester, N.Y., has a unique way of handling the overload. Once responsible for Macintosh support, he now handles a LAN and is learning a new manufacturing system software package and setting up an electronic-mail system.

As he migrates upward from one responsibility to the next, Mullin delegates some of his duties in order to manage his time. "Once I know something and it's running smoothly, I find someone to do the upkeep," Mullin explains. "If there's no logical choice, I let things fall behind, and someone gets frustrated and takes it over because I'm not giving them the response time they want."

Bredin is a free-lance writer in New York.

The ever-GROWING job

In a recent survey, IS professionals were asked how their jobs have changed in the past year

My [illegible] has become more . . .	
Cross-functional	52%
Technical	25%
Other	13%
Business-oriented	10%

Most important new skills learned are . . .	
Software	76%
LAN	64%
PC	56%
Interpersonal	53%

[illegible]: 167 systems administrators and analysts

Source: Computerworld Database Division, Framingham, Mass.

HELP is on the way

IS MANAGERS acknowledge that IS professionals are being overwhelmed by a growing list of responsibilities, and they want to help.

Bob Connelly, IS manager at Pfizer Food Service Group in New York, has seen his employees become buried in work during the last few years.

To help organize their time, he sends them to a training seminar called "Managing IS Priorities." The course teaches how to make priority lists and review them to reflect changes.

Similarly, Irving Ladue, IS manager at Data East, Inc. in Weare, N.H., also places a strong emphasis on organizing priorities and avoids assigning employees four or five projects at one time.

Managers also advise their staffs to speak up when feeling buried. "When they do, I look at what they're working on and generally find they have too much to do. I help prioritize it or get rid of some," Connelly says. "But if they don't tell me, I keep piling it on."

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AS/400 sites seek PC expertise

With the introduction of the AS/400 Server Series, analysts predict that pure AS/400 expertise will be ousted in favor of a PC and local-area networking mix

By Sally Cusack

You may be overlooking a significant employment opportunity in an area confined to those specializing in RPG — the IBM AS/400.

According to information systems directors in AS/400 shops, opportunities exist for those with the right blend of PC savvy and LAN expertise. These skills are becoming increasingly essential as IBM takes its flagship midrange system into the client/server world.

With the introduction of the AS/400 Server Series earlier this fall, IBM has left no doubt that it is readying its 5-year-old line of proprietary minicomputer systems for 21st century open computing. IBM's communications software — Connection Program/400 — allows the system to support most major Unix workstation platforms and opens the field to those with Unix, PC and LAN connectivity qualifications.

"As companies get serious about integrating their AS/400s into client/server, they are going to need people certified in NetWare," says Theresa Elms, president of Elms Information Services Group, a research and consulting firm in San Diego. Elms adds that while the AS/400 will not run Novell, Inc.'s NetWare, it is now capable of more participation in a network.

> Good news for the PC literati. According to Theresa Elms, president of Elms Information Services Group, in San Diego...

Subsequently, AS/400 IS shops must become network-literate to compete in today's computing environment.

AS/400 shops that have not yet decided to forge ahead are keeping their eyes on the new technology. Mark Harrington, systems analyst at Kendall Healthcare

> ...approximately one-third of the devices attached to AS/400s today are PCs.

Products Co. in Mansfield, Mass., says the company is "looking into" client/server. "We haven't made any definite decisions yet," Harrington says. But PCs and LANs will play a larger part in Kendall's future, he says.

With three AS/400 F Series models currently installed, Harrington relies on a staff of 50 to keep things running smoothly. He estimates that a "couple hundred users" are tied to each system, operating from Intel Corp. 80386-based PCs. "There are still some dumb terminals around," Harrington says, "but these will be phased out over the next few years."

> ...Seventy percent of AS/400 sites have also installed LANs.

Kendall is typical of many AS/400 shops because previously it had relied on former IBM System/36 and System/38 facilities for its IS staff. However, things are starting to change. In addition to looking for staff with PC knowledge, the company is actively preparing its existing work force by offering in-house training for PC-to-AS/400 support.

Another wide avenue of employment within the AS/400 world can be found with third-party application developers. With more than 20,000 applications currently available, this sizable market is moving toward graphical user interface-based client/server platforms.

Kathleen Campbell, director of research and development at Software 2000, Inc., a $50 million privately held firm in Hyannis, Mass., says she is strictly focusing on client/server for research and development.

"I'm looking for people with a client/server background — not necessarily on the AS/400," Campbell says. Candidates should have some familiarity with communications and ideally have a demonstrated competence in object-oriented programming and programs such as Digitalk, Inc.'s Smalltalk, she says.

More and more companies are also willing to train recruits on the newer technology, and Software 2000 is no exception. The company provides an intensive three-week course, running the gamut from object-oriented analysis to GUI design.

Susan M. O'Connor, corporate recruiter for Software 2000, emphasizes that the company still actively searches for AS/400 professionals, but the ideal candidate mix has changed. A year ago, AS/400 experience in itself was the primary factor in choosing R&D, programming and support employees. Today, PC skills are a must.

> ...With more than 225,000 AS/400s installed worldwide, that translates into a lot of opportunity.

Cusack is a free-lance writer in Marstons Mills, Mass.

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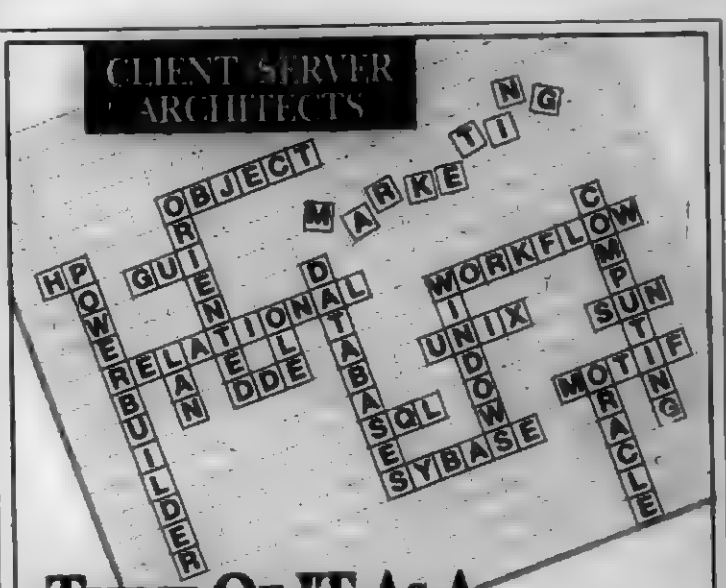

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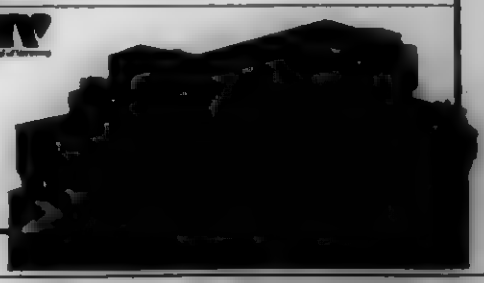

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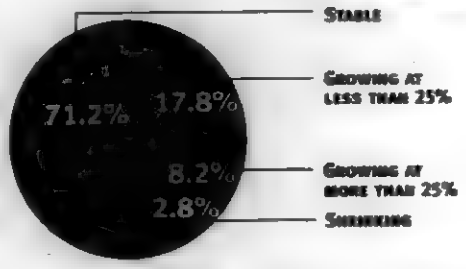

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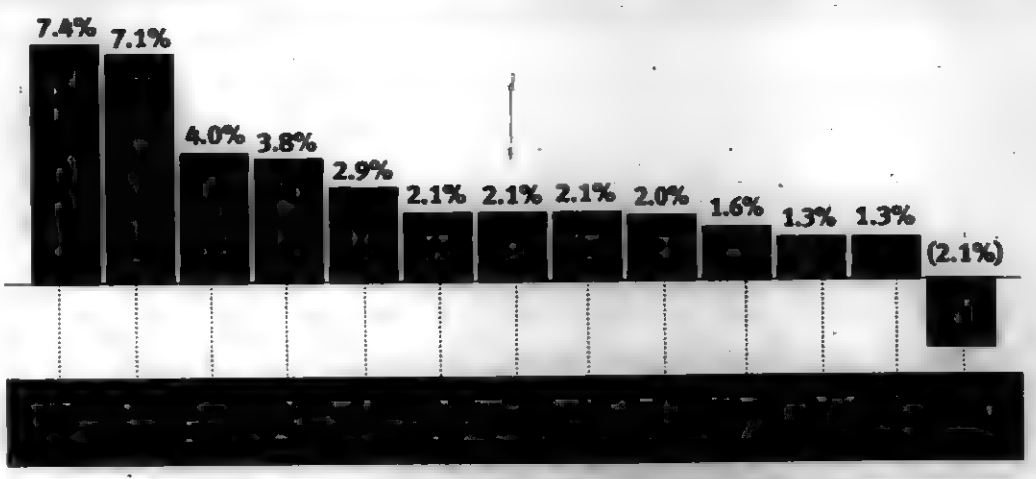

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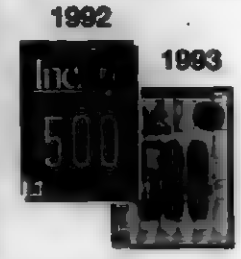

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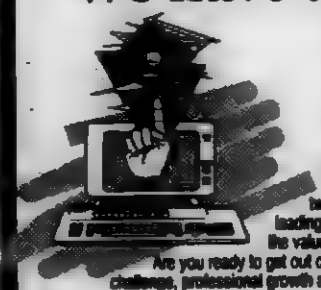

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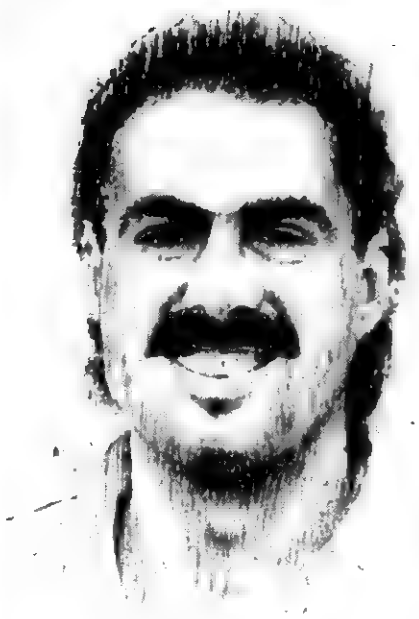

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BEST READ

NPFs nickel-and-dime bottom line

NPF n (no problems found): A term used in the storage industry when a SCSI device is returned to the manufacturer for repairs and, after much testing, no problems are found. If not controlled, NPFs can potentially cost thousands of dollars.

By Christina Avallone

The phenomenon of "no problems found" is to the corporate bottom line what eating out every night is to your budget — a slow but sure erosion of funds that are better spent elsewhere.

"No problems found," otherwise known as NPF, is a term that SCSI drive manufacturers use when, after much testing, the disk errors experienced by a customer cannot be duplicated by the manufacturer. When the drive is returned to its owners, a NPF tag is attached along with a service bill for each drive.

A manufacturer spends an average of five hours finding and fixing an error in a disk that actually has a problem. Sometimes in-house technicians cannot pinpoint the faulty drive and must return all of the questionable ones. For drives without problems, however, approximately 10 hours are spent trying to duplicate the error described by the customer.

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These services aren't cheap. Maintenance on SCSI devices usually costs between $200 and $600 per drive, and experts estimate that many companies average five to six NPFs per month — a potential $40,000 a year just to learn that there is nothing physically wrong with your SCSI drives.

Experts estimate the NPF return rate to be as high as 30% to 35% of all annual drive returns to manufacturers. The causes of these returns vary. The usual source, however, is the drive's incompatibility with the system.

The American National Standards Institute has outlined a set of mandatory commands for SCSI compliance in an attempt to make all SCSI devices generic. Vendors, however, add their own specifications and commands, allowing drives to perform tasks not envisioned by these specifications. Given these variations, it is likely that a technician will at some point install into a system several different SCSI devices that do not comply with the disk vendor's specifications.

For example, when a bug is detected in a drive, the manufacturer often sends the customer a floppy disk containing microcode that updates the existing firmware, fixes bugs and enhances the drive's performance. The ability to download the microcode is written into the set of mandatory SCSI commands, but the ability to read it is determined by the manufacturer. A vendor-unique command might allow a user to read the microcode, but because it is not universal for all SCSI devices it may contribute to compatibility problems if the system does not support this feature.

While every company using SCSI devices is bound to have an occasional NPF, companies averaging three to five NPFs a month should be concerned. Depending on the volume of SCSI devices that your company employs, an investment in a generic SCSI hard drive tester may be justified to screen out suspect drives.

Choosing a tester

SCSI tester options include generic and user-developed. A generic tester examines drives independently of the manufacturer and configuration. It has built-in diagnostics and failure analysis features that locate errors, determine the cause and suggest a fix.

User-developed programs require the user to write a test program. This allows you to set the parameters for drives but requires extensive SCSI and programming knowledge.

If generic testers are used by both a customer and a manufacturer, the results are repeatable when a problem occurs. When home-grown programs are used, enough variation may exist in how the tests are programmed and executed to contribute to another NPF cycle. —*Christina Avallone*

Avallone is an independent storage consultant in Santa Monica, Calif.

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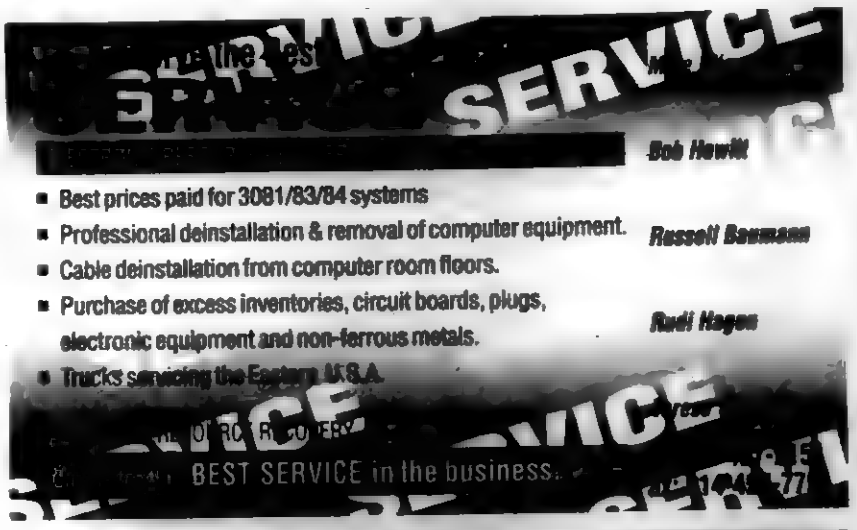

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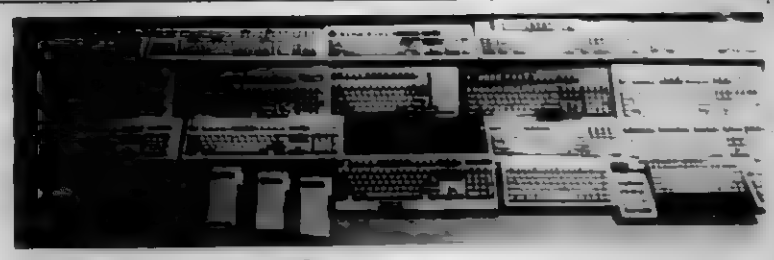

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COMPUTERWORLD
The Newspaper of IS
P.O. Box 2043, Marion, Ohio 43305

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Gainers Losers

Percent

[illegible]	60.9	Group I Software	-23.8
Proteon Inc.	40.5	Kendall Square Research	-21.1
Western Digital Corp.	32.8	SML Systemhouse	-21.1
Brooktrout Technology	31.8	Computervision Corp.	-14.6
Chips and Technologies	26.2	Informix Corp.	-12.4
Intergraph Inc.	26.0	Easel Corp.(L)	-12.2
Microdyne Inc.	25.7	Parsons Int'l Inc.	-12.0
Spectrum Software	25.0	US Robotics	-7.4

Dollar

Cabletron Systems	11.88	Programs Software Group	-4.00
Networking Dynamics Corp.	8.88	Bell South Corp.	-3.38
Texas Instruments	7.25	Kendall Square Research	-2.88
DSC Communications	7.13	Bell Atlantic Corp.	-2.38
Informix Inc.	6.75	Group I Software	-2.25
Wellfleet Communications	6.50	US Robotics	-2.25
Micron Technology	5.13	American Info Technologies	-2.25
Motorola Electronics	5.00	Informix Corp.	-2.13

Networking stocks sizzled last week. Cabletron, Newbridge Networks and DSC Communications all boasted gains of more than 20 percent over the previous month. Data Race, a relatively small modem and multiplexer manufacturer, announced a spate of new products and strategic partnerships.

A safe stock is hard to find

With a solid share price and a big dividend, IBM used to be the safest stock around. In light of IBM's troubles, what are the most conservative computer industry investments?

Stephen McClellan
First vice president, Merrill Lynch Securities

"Automatic Data Processing. They have 33 consecutive years of double-digit growth, every quarter. And they do pay a dividend. If you want stability, that's it. It's in the services business, not software, not hardware."

Neeraj Vohra
Analyst, Standard & Poor's Corp.

"As for dividends, Hewlett-Packard yields about 1%. [The yield is a firm's dividend as a percent of its share price.] 3M yields about 3%, and that's a conservative, solid company, although it's only marginally in the computer industry. Xerox has a yield of about 4%, but I don't know whether I would characterize it as a 'safe, conservative' stock.

"I'm still kind of bullish on Digital in the long term. Obviously it is taking a lot longer to turn around than people wanted, but I think we've hit the low in terms of stock price.

"The older companies that you might think of as safe are all going through that same transition that IBM is — from host to client/server technologies. I hesitate to call anything I follow safe. For years health care stocks and food companies were safe, and IBM was the safest stock around. Now they're all having problems."

— Compiled by Derek Slater

The big guys

IBM clings to a narrow lead in market capitalization; Cisco has climbed the list over the past eight months, while Novell has fallen

	Price (11/10/93)	Shares outstanding (millions)	Market cap ($ millions)
IBM	49⅞	573	$28,582
Intel Corp.	69½	409	$28,241
Microsoft Corp.	84¼	284	$23,922
Hewlett-Packard	39⅝	253	$10,027
Automatic Data Processing, Inc.	53⅞	143	$7,697
Cisco Systems, Inc.	54½	132	$7,218
Novell, Inc.	22¼	314	$6,965

Exch	52-Week High	52-Week Low		Nov. 12 3 PM	1 Wk Net Change	1 Wk Pct Change
Communications and Network Services						UP 4.95%
OTC	60.00	19.63	J COM CORP.	35.75	4.13	13.0
NYS	91.13	63.88	AMERICAN INFO TECHS CORP.	80.75	-2.25	-2.7
NYS	65.00	45.75	AT&T	57.38	1.38	2.5
OTC	4.44	0.75	ARTEL COMMUNICATION CORP.	3.19	0.44	15.9
OTC	24.50	12.50	BANYAN SYSTEMS INC.	23.00	2.25	10.8
NYS	69.13	45.00	BELL ATLANTIC CORP.	61.38	-2.38	-3.7
NYS	63.88	47.50	BELLSOUTH CORP.	56.63	-3.38	-5.6
NYS	14.75	4.25	BOLT, BERANEK & NEWMAN	12.88	0.25	2.0
OTC	18.50	9.50	BROOKTROUT TECHNOLOGY	13.75	3.25	31.0
NYS	119.00	66.75	CABLETRON SYSTEMS	99.38	11.00	12.4
OTC	36.50	10.25	CENTIGRAM COMMUNICATIONS	33.00	-1.50	-4.3
OTC	55.50	27.88	CHIPCOM CORP.	50.50	4.50	9.8
OTC	59.25	33.88	CISCO SYSTEMS INC.	55.88	2.88	5.4
OTC	18.38	8.00	COMPRESSION LABS INC. (H)	16.00	-0.50	-3.0
OTC	36.00	20.75	CROSSCOMM	30.50	1.25	4.3
OTC	4.63	1.75	DATA SWITCH CORP. (L)	2.13	0.25	13.3
NYS	19.88	12.38	DIGITAL COMM. ASSOC.	18.75	0.13	0.7
OTC	12.75	3.50	DIGITAL SYSTEMS INT'L INC. (L)	3.81	-0.06	-1.6
OTC	73.13	17.75	DSC COMMUNICATIONS	66.88	7.13	11.9
OTC	9.50	4.75	FIBRONIX INT'L INC.	5.50	-0.75	-12.0
OTC	24.00	8.75	FILENET CORP.	17.75	-0.50	-2.7
OTC	4.38	1.63	GANDALF TECHNOLOGIES INC.	3.13	-0.25	-7.4
OTC	2.06	0.69	GATEWAY COMMUNICATIONS	1.00	0.19	23.0
NYS	15.75	4.50	GENERAL DATACOMM INDS.	10.88	0.38	3.6
ASE	3.75	2.00	GO VIDEO	2.44	0.13	5.4
NYS	39.88	33.13	GTE CORP.	37.25	-0.38	-1.0
NYS	94.75	68.25	ITT CORP.	91.75	0.88	1.0
OTC	29.88	17.19	MCI COMMUNICATIONS CORP.	26.25	-0.75	-2.8
OTC	6.50	1.50	MICROCOM INC.	2.88	0.06	2.2
OTC	24.25	3.50	NETRIX CORP.	5.75	0.63	12.2
OTC	19.00	6.50	NETWORK COMPUTING DEVICES	7.75	-0.25	-3.1
NYS	11.50	5.38	NETWORK EQUIPMENT TECH.	10.63	0.75	7.6
OTC	20.13	8.00	NETWORK GENERAL	14.13	0.13	0.9
OTC	15.63	6.88	NETWORK SYSTEMS CORP.	8.00	-0.38	-4.5
OTC	73.88	13.00	NEWBRIDGE NETWORKS CORP.	65.00	8.00	14.0
NYS	46.00	21.38	NORTHERN TELECOM LTD.	26.88	-0.25	-0.9
OTC	35.25	17.00	NOVELL INC.	23.25	1.25	5.7
NYS	48.88	40.00	NYNEX CORP.	42.88	1.00	2.4
OTC	30.00	19.00	OCTEL COMMUNICATIONS CORP.	24.13	0.63	2.7
OTC	6.13	3.75	PENRIL DATA COMM NETWORKS	5.38	0.06	1.2
OTC	30.50	14.50	PICTURETEL CORP.	20.25	2.00	11.0
OTC	11.50	3.63	PROTEON INC.	7.38	2.13	40.5
NYS	38.88	17.75	SCIENTIFIC ATLANTA INC.	33.88	1.38	4.2
NYS	47.00	32.25	SOUTHWESTERN BELL CORP.	40.88	-1.25	-3.0
NYS	40.25	24.38	SPRINT CORP.	34.13	0.13	0.4
OTC	27.00	12.50	STANDARD MICROSYSTEMS CORP.	24.88	3.38	15.7
OTC	19.25	10.00	STRATACOM INC.	18.75	3.00	19.0
OTC	42.75	20.00	SYNOPTICS COMMUNICATIONS	30.00	3.25	12.1
OTC	9.88	2.88	TELEBIT CORP.	7.13	-0.50	-6.6
OTC	17.88	5.13	TELEMATICS INT'L INC.	15.13	0.38	2.5
OTC	35.25	17.00	US ROBOTICS	28.00	-2.25	-7.4
NYS	50.75	35.50	US WEST INC.	47.00	-1.25	-2.6
OTC	57.75	28.25	WELLFLEET COMMUNICATIONS	57.75	6.50	12.7
OTC	19.50	7.25	XIRCOM	17.25	1.50	9.5
PC Local Area Networks						UP 8.21
OTC	5.56	2.50	ADVANCED LOGIC RESEARCH	3.50	0.25	7.7
OTC	65.25	22.00	APPLE COMPUTER INC.	31.75	0.00	0.0
OTC	24.25	12.75	AST RESEARCH INC.	23.75	3.00	14.5
NYS	9.25	2.50	COMMODORE INT'L	4.00	-0.13	-3.0
NYS	69.38	39.25	COMPAQ COMPUTER CORP.	68.75	3.13	4.8
OTC	49.88	13.50	DELL COMPUTER CORP.	26.13	4.13	18.8
NYS	89.25	54.50	HEWLETT PACKARD CO.	78.13	4.13	5.6
NYS	46.75	23.50	SILICON GRAPHICS	45.38	4.63	11.3
OTC	41.00	21.13	SUN MICROSYSTEMS INC.	26.25	1.38	5.5
NYS	47.50	24.63	TANDY CORP. (H)	46.63	0.38	0.8
OTC	7.00	2.50	ZEOS INTERNATIONAL LTD.	4.63	0.88	23.3
Large Systems						UP 8.2%
ASE	8.50	4.38	AMDAHL CORP.	5.00	0.25	5.3
NYS	8.75	3.63	CONVEX COMPUTER	5.25	0.13	2.4
OTC	5.38	2.25	CRAY COMPUTER	2.75	-0.13	-4.3
NYS	30.88	20.38	CRAY RESEARCH INC.	26.75	-0.25	-0.9
NYS	13.88	7.75	DATA GENERAL CORP.	9.88	0.50	5.3
NYS	49.25	30.38	DIGITAL EQUIPMENT CORP.	38.13	2.13	5.9
NYS	47.38	32.50	HARRIS CORP. (H)	46.50	1.13	2.5
NYS	68.88	40.63	IBM	51.88	1.88	3.8
OTC	25.75	9.50	KENDALL SQUARE RESEARCH	10.75	-2.88	-21.1
NYS	141.50	83.00	MATSUSHITA ELECTRONICS	138.50	5.00	3.8
OTC	33.75	12.75	NETFRAME	17.25	1.50	9.5
OTC	26.00	9.25	PARALLAN COMPUTER	18.00	-0.25	-1.4
OTC	23.25	8.50	PYRAMID TECHNOLOGY	15.25	1.25	8.9
OTC	24.00	11.25	SEQUENT COMPUTER SYS.	18.75	1.50	8.7
OTC	6.00	1.38	SEQUOIA SYSTEMS INC. (H)	5.25	0.38	7.7
NYS	41.25	20.25	STRATUS COMPUTER INC.	27.75	0.63	2.3
NYS	16.88	8.50	TANDEM COMPUTERS INC.	11.63	0.63	5.7
OTC	26.75	10.63	TRICORD SYSTEMS	26.75	2.63	10.9
NYS	13.88	8.38	UNISYS CORP.	11.63	0.75	6.9
Software						UP 4.9%
OTC	37.00	14.50	ADOBE SYSTEMS INC.	19.88	0.88	4.6
OTC	25.25	11.75	ALDUS CORP.	23.00	2.00	9.5
OTC	13.00	5.50	AMERICAN SOFTWARE INC.	7.75	-0.38	-4.6
OTC	28.13	9.50	ASK COMPUTER SYSTEMS	15.25	1.75	13.0
OTC	56.75	37.00	AUTODESK INC. (L)	41.25	2.88	7.5
OTC	7.25	2.38	BACHMAN INFO. SYSTEMS (L)	2.88	-0.13	-4.2
OTC	43.00	24.00	BGS SYSTEMS INC.	26.00	0.50	2.0
OTC	84.13	38.75	BMC SOFTWARE INC.	49.00	2.88	6.2
OTC	28.25	20.38	BOOLE & BABBAGE	27.00	0.75	2.9
OTC	31.00	12.75	BORLAND INT'L INC.	17.50	0.63	3.7
OTC	5.00	2.75	CE SOFTWARE	3.63	-0.19	-4.9
ASE	40.25	16.41	CHEYENNE SOFTWARE INC.	32.75	0.75	2.3
OTC	19.50	8.25	CHIPSOFT	18.38	2.88	18.5
OTC	10.50	5.63	COGNOS INC.	8.88	-0.13	-1.4
NYS	42.38	16.50	COMPUTER ASSOCIATES	42.38	4.88	13.0
NYS	6.50	2.13	COMPUTERVISION CORP.	3.13	0.38	13.6
OTC	34.25	19.25	COMPUWARE CORP.	25.75	1.75	7.3
OTC	14.75	5.75	COMSHARE INC.	10.25	-0.50	-4.7
OTC	37.00	10.75	COREL CORP.	34.88	2.13	6.5
OTC	15.25	4.50	EASEL CORP. (L)	4.50	-0.63	-12.2
OTC	25.25	15.75	4TH DIMENSION	24.00	2.00	9.1
OTC	19.25	5.25	FRAME TECHNOLOGY	10.25	0.50	5.1
OTC	17.50	8.00	GROUP I SOFTWARE	8.00	-2.25	-22.0
OTC	35.25	14.00	GUPTA	15.25	0.25	1.7
OTC	12.00	4.88	HOGAN SYSTEMS INC.	11.00	0.13	1.1
OTC	27.75	11.25	IMRS	24.25	-0.50	-2.0
OTC	44.75	27.00	INFORMATION RESOURCES	38.63	3.13	8.8
OTC	27.25	13.38	INFORMIX CORP.	19.00	2.25	13.4
OTC	14.00	8.50	INTERGRAPH CORP.	10.50	-0.25	-2.3
OTC	13.63	4.88	INTERLEAF INC.	7.88	1.63	26.0
OTC	35.25	4.75	INTERSOLV INC.	8.63	0.63	7.8
OTC	18.25	7.75	KNOWLEDGEWARE INC.	15.50	0.50	3.3
OTC	54.75	15.50	LEGENT CORP.	23.00	-0.75	-3.2
OTC	50.75	18.75	LOTUS DEVELOPMENT	48.00	4.50	10.3
OTC	23.00	4.25	MATHSOFT	6.88	1.25	22.2
OTC	21.25	4.50	MCAFEE ASSOCIATES	6.25	0.13	2.0
OTC	11.63	3.38	MECA SOFTWARE	6.50	0.00	0.0
OTC	13.00	7.63	MENTOR GRAPHICS	13.00	1.13	9.5
OTC	46.00	19.75	MICRO FOCUS	22.50	-0.13	-0.6
OTC	13.25	4.38	MICROGRAFX INC.	8.25	0.50	6.5
OTC	98.00	70.38	MICROSOFT CORP.	82.00	3.50	4.5
OTC	32.31	9.44	ORACLE CORP.	31.75	2.63	9.0
OTC	44.75	22.50	PARAMETRIC TECHNOLOGY	39.13	1.13	3.0
OTC	40.50	22.50	PEOPLESOFT	35.88	1.75	5.1
OTC	7.13	3.50	PHOENIX TECHNOLOGIES (L)	4.75	0.75	18.8
OTC	40.00	22.00	POWERSOFT	35.00	1.00	2.9
OTC	39.75	13.50	PLATINUM SOFTWARE	23.75	-0.75	-3.1
OTC	25.00	7.25	PLATINUM TECHNOLOGY	10.13	0.88	9.5
OTC	61.50	32.25	PROGRESS SOFTWARE CORP.	50.00	-4.00	-7.4
OTC	6.63	1.94	QUARTERDECK OFFICE SYS.	2.44	0.25	11.4
OTC	32.00	16.00	RAINBOW TECHNOLOGIES INC.	25.00	4.00	19.0
OTC	11.38	4.25	RASTEROPS	8.00	0.88	12.3
OTC	15.25	6.50	ROSS SYSTEMS	8.25	0.25	3.1
OTC	78.75	16.63	SAPIENS INTL. CORP. N.V.	24.38	-1.25	-5.0
OTC	14.50	5.50	SOFTWARE PUBLISHING CORP.	6.50	0.38	6.1
OTC	17.25	4.88	SOFTWARE TOOLWORKS INC.	14.50	0.63	4.5
OTC	2.81	0.75	SPINNAKER SOFTWARE	2.81	0.56	25.0
OTC	13.75	6.50	STATE OF THE ART	9.50	0.25	2.7
NYS	33.63	17.63	STERLING SOFTWARE INC.	32.63	1.88	6.1
OTC	21.63	9.63	STRUCT. DYNAMICS RESEARCH	18.50	2.63	16.5
OTC	77.50	38.25	SYBASE INC.	71.50	3.75	5.5
OTC	20.50	9.25	SYMANTEC CORP.	19.00	0.88	4.8
OTC	25.50	10.00	SYSTEM SOFTWARE ASSOC.	16.75	2.00	13.6
OTC	6.50	2.75	TRIDENT CORP.	5.38	0.13	2.4
NYS	36.50	13.50	VIEWLOGIC SYSTEMS	23.50	1.00	4.4
OTC	23.50	5.50	WALKER INTERACTIVE SYSTEMS	9.50	0.63	7.0
OTC	3.19	0.84	WORDSTAR	1.50	0.19	14.2
Semiconductors						UP 2.0%
NYS	32.88	14.25	ADVANCED MICRO DEVICES	19.88	0.63	3.2
NYS	28.00	11.88	ANALOG DEVICES INC.	24.38	3.88	18.9
OTC	38.63	14.00	ATMEL CORP.	27.75	1.63	6.2
OTC	6.63	2.75	CHIPS AND TECHNOLOGIES	6.63	1.38	26.2
OTC	39.75	13.00	CIRRUS LOGIC	36.00	2.38	7.1
NYS	16.75	8.63	CYPRESS SEMICONDUCTOR CORP.	13.00	1.25	10.6
NYS	19.00	11.13	DALLAS SEMICONDUCTOR	15.50	0.38	2.5
OTC	74.50	33.50	INTEL CORP.	62.75	2.75	4.6
NYS	19.25	8.38	LSI LOGIC CORP.	14.75	1.13	8.3
OTC	26.75	13.66	LATTICE SEMICONDUCTOR	15.50	0.25	1.6
NYS	63.63	16.25	MICRON TECHNOLOGY	45.00	5.13	12.9
NYS	107.50	47.69	MOTOROLA INC.	103.00	4.75	4.8
NYS	21.75	10.13	NATIONAL SEMICONDUCTOR	17.63	1.75	11.0
OTC	15.75	6.50	SIERRA SEMICONDUCTOR	8.75	1.25	16.7
OTC	52.75	25.75	SYNOPSYS	48.50	-0.25	-0.5
NYS	84.25	46.13	TEXAS INSTRUMENTS	65.50	7.25	12.4
OTC	18.88	6.50	VLSI TECHNOLOGY	14.13	2.25	18.9
OTC	14.38	4.38	WAFERTECH	11.50	1.63	16.5
ASE	10.13	3.63	WESTERN DIGITAL CORP.	10.13	2.50	32.8
OTC	56.50	18.25	XILINX	40.25	1.88	4.9
OTC	40.75	18.00	ZILOG INC.	38.25	1.50	4.1
Peripherals and Subsystems						UP 1.4%
OTC	24.75	10.50	AMERICAN POWER CONVERSION	20.88	0.13	0.6
OTC	22.75	15.50	BANCTEC INC.	20.25	0.25	1.3
OTC	18.00	3.50	CAMBEX CORP.	4.38	-0.25	-5.4
ASE	18.38	3.88	COGNITRONICS CORP.	5.13	-0.88	-14.6
NYS	25.50	9.00	COMPEX PERIPHERALS	12.75	1.25	10.9
OTC	38.50	17.25	CREATIVE TECHNOLOGIES INC.	27.75	2.00	7.8
OTC	30.75	6.50	DATA RACE INC.	12.50	4.75	61.3
ASE	12.50	7.50	DATARAM CORP.	9.75	0.13	1.3
NYS	39.00	8.34	EMC CORP.	34.38	1.50	4.6
OTC	10.50	5.25	EMULEX CORP.	6.38	0.13	2.0
OTC	19.00	14.00	EVANS & SUTHERLAND	18.50	0.38	2.1
OTC	20.63	7.50	EXABYTE	15.88	0.13	0.8
OTC	34.00	10.41	INTELLIGENT INFO. SYSTEMS	27.38	0.00	0.0
OTC	8.63	2.50	IOMEGA CORP.	3.50	0.25	7.7
OTC	14.25	5.75	IPL SYSTEMS INC.	7.00	-0.50	-6.7
OTC	24.00	13.75	KOMAG INC.	16.50	1.00	6.5
OTC	19.63	4.38	MAXTOR CORP.	6.50	0.50	8.3
OTC	10.00	5.75	MICROPOLIS CORP.	7.25	0.50	7.4
NYS	117.00	97.25	3M CORP	105.63	1.75	1.7
OTC	8.00	4.00	PRINTRONIX INC.	7.00	-0.25	-3.4
NYS	17.25	7.50	QMS INC.	10.50	-0.13	-1.2
OTC	17.88	9.38	QUANTUM CORP.	14.13	1.75	14.1
OTC	7.50	3.13	RADIUS INC.	7.50	1.00	15.4
NYS	17.75	11.75	RECOGNITION EQUIPMENT	16.50	1.25	8.2
OTC	13.88	3.63	REXON INC.	4.25	0.13	3.0
OTC	25.13	13.13	SEAGATE TECHNOLOGY (H)	24.63	1.63	7.1
NYS	45.00	18.00	STORAGE TECHNOLOGY	30.00	3.63	13.7
NYS	27.88	17.63	TEKTRONIX INC.	22.75	-0.38	-1.6
NYS	88.88	69.88	XEROX CORP.	81.63	2.13	2.7
Services						UP 2.78%
NYS	4.38	1.50	ALLEGRON INC.	3.50	0.63	21.7
OTC	29.75	14.88	AMERICAN MGMT. SYSTEMS	21.25	-0.38	-1.7
NYS	4.75	2.38	ANACOMP INC.	3.38	-0.25	-6.9
OTC	23.88	14.36	ANALYSTS INT'L	17.75	0.75	4.4
NYS	56.13	46.88	AUTO DATA PROCESSING	54.25	3.13	6.1
NYS	19.88	13.00	CEDIDATA CORP.	18.50	0.63	3.5
NYS	21.00	13.13	COMDISCO INC.	19.13	0.38	2.0
OTC	13.38	5.36	COMPUTER HORIZONS	12.00	0.13	1.1
NYS	98.13	70.00	COMPUTER SCIENCES	98.13	4.50	4.8
NYS	9.00	6.00	COMPUTER TASK GROUP	6.75	-0.13	-1.8
NYS	37.00	19.00	COMPUSA INC.	26.38	0.63	2.4
OTC	14.13	8.00	CONTROL DATA SYSTEMS INC.	9.75	0.38	4.0
OTC	15.88	7.00	CORPORATE SOFTWARE (H)	15.50	0.38	2.5
OTC	12.13	6.63	EGGHEAD DISCOUNT SOFTWARE	8.13	0.63	8.1
NYS	35.88	26.00	GENERAL MOTORS E (EDS)	30.75	0.25	0.8
OTC	25.50	13.25	INACOM CORP.	15.00	-2.13	-12.4
OTC	24.38	8.13	INTELLIGENT ELECTRONICS	23.25	1.88	8.8
OTC	17.00	9.63	MERISEL	15.63	1.13	7.8
OTC	33.00	6.50	MICRO AGE INC.	33.00	6.75	25.7
OTC	37.00	21.50	PAYCHEX (H)	37.00	1.75	5.0
NYS	87.25	21.63	POLICY MANAGEMENT SYS.	26.00	-1.13	-4.1
NYS	63.63	24.13	REYNOLDS AND REYNOLDS	42.75	2.50	6.2
OTC	24.00	13.38	SEI CORP.	22.75	-0.50	-2.2
OTC	26.00	17.50	SHARED MEDICAL SYSTEMS	22.13	-0.50	-2.2
OTC	12.63	5.75	SHL SYSTEMHOUSE	7.50	-2.00	-21.1
OTC	30.75	20.00	SOFTWARE SPECTRUM INC.	23.50	2.00	9.3
OTC	42.75	26.75	SUNGARD DATA SYSTEMS	37.63	1.13	3.1

KEY: (H) = NEW ANNUAL HIGH REACHED IN PERIOD (L) = NEW ANNUAL LOW REACHED IN PERIOD

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In Brief

AST restructures

AST Research, Inc. will cut its work force during the next six months by 16% — or 1,050 positions — following its June acquisition of Tandy Corp.'s PC operations. The Irvine, Calif., PC maker has already taken a onetime pretax charge of $125 million in the fiscal fourth quarter ended July 3 to cover restructuring costs. The cuts will be offset, however, by the addition of 850 jobs at AST's Fort Worth, Texas, and Limerick, Ireland, plants.

Wyse buys Qume

Wyse Technology, Inc. in San Jose, Calif., is purchasing Qume Corp.'s terminal and printer businesses — including the Qume brand name — in a deal valued at $13.8 million. Qume will continue in the storage controller market under the Data Technology Corp. name. That business generates $12 million in annual revenue, the Milpitas, Calif., firm said.

Cisco posts gains

Cisco Systems, Inc. posted fiscal first-quarter net profits of $33.2 million, an increase of 91% from the same period last year. Sales in the period grew 97% to $248.4 million, the Menlo Park, Calif., internetworking products maker said.

SHORT TAKES MasPar Computer Corp., a massively parallel systems maker in Sunnyvale, Calif., is cutting its work force by 25%, or 38 employees. . . . Kendall Square Research Corp., which recently said third-quarter revenue would be well below expectations, causing a loss, has postponed revealing its quarterly financial results until month's end. The Securities and Exchange Commission, meanwhile, is reportedly probing whether the company prematurely books its revenue.

Geoworks ties comeback to PDA

By James Daly
BERKELEY, CALIF.

Outside of Richard Nixon and Ebenezer Scrooge, few people are given a second chance to redeem themselves. Except perhaps Brian Dougherty, chief executive officer at Geoworks, Inc.

Three years ago, Dougherty and a team of stellar engineers dazzled analysts with the Geos user interface, a zippy alternative to Windows. Geos could run on any IBM compatible, from the original IBM PC to the fastest Intel Corp. 1486-based machine — eating up only 512K bytes of RAM.

Geoworks' Brian Dougherty: *'Life . . . really takes off at $100'*

Analysts raved, predicting corporate buyers would soon realize that Windows gobbled memory, required the fastest processors and would not run on the installed base of PCs. At the time, Jeffrey Tarter, editor of the industry newsletter "Softletter," noted, "If I were Bill Gates, this is the one product that would cause me to lose sleep."

Tarter proved to be a poor judge of Gates' sleeping habits. True, Gates salivated over the technology and even met with Dougherty to try to bang out a price for Geos.

But Dougherty nixed any deal and, within a year, Windows had rolled over corporate America as well as Geos, and its accompanying Ensemble application suite was on its way to becoming a winner in the next Computer Bowl. Ensemble eventually sold more than 750,000 copies but failed to win developer support.

"We got run over by Microsoft and all its marketing," Dougherty said. By the fall of 1991, the handwriting was on the wall: Either figure something out or fold the tent.

Then a funny thing happened. Handheld wireless devices straight out of the adventures of Dick Tracy began to emerge. Called personal digital assistants (PDA), these units promised true anytime, anywhere communications, allowing users to link into a variety of services while on the run.

More than a million PDAs are expected to be in the hands of corporate gypsies by 1996, with more than 4 million in use by the end of the decade, said researchers at BIS Strategic Decisions in Norwell, Mass.

Seeking to snatch victory out of the jaws of defeat, Dougherty pitched Geos to PDA makers. "We never lost our faith in small, tight software," he said.

Analysts said they like the changes at Geoworks. "They are masters of writing small, tight code," said Tim Bajarin, president of Creative Strategies Research International, Inc. in Santa Clara, Calif. "They can get more mileage out of an 8086- and 8088-based device than anyone."

Earlier this year, both Casio, Inc. and Tandy Corp. said they would standardize their Zoomer PDA on the updated Geos 2.0. Sharp Electronics Corp., AST Research, Inc. and Canon, Inc. will also use Geos.

With a second chance in the air, Dougherty said he is not going to make the same mistakes twice. That means software support, so he spent a chunk of the company's recent developer's conference evangelizing.

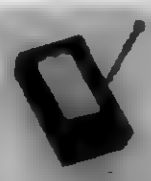
Center of attention

Analysts say grabbing and holding developer interest is critical. "You won't see old versions of new software but entirely new types of applications . . . customized to share information with others," predicted Jeffrey Henning, a senior analyst at BIS.

Still, the PDA market is anything but a certainty. The Zoomer, for instance, has a $700 street price, but that is expected to fall in the next 12 months. "For us, life begins at $500, gets interesting at $300 and really takes off at $100," said Geoworks President Gordon Mayer.

Meanwhile, Dougherty's old nemesis, Microsoft, is lurking nearby. Early next year, Microsoft is expected to introduce Microsoft At Work, a Windows-compatible operating environment that will appear on handheld devices from Compaq Computer Corp., Motorola, Inc. and others.

It is questionable whether Geoworks can rise Phoenix-like from the ashes, but Geoworks officials know the stakes. "If [PDAs] don't exist, we don't exist," Mayer said.



Making connections

Geoworks is targeting smaller developers who feel shut out of the mature mainstream software market, "where distribution and marketing outweigh technology," said President Gordon Mayer. It is also furiously inking networking deals.

Novell, Inc. recently agreed to license Geoworks to distribute Novell's NetWare Client with the Geos operating system. This lets Geos-based systems connect directly to the server and all network services.

Geoworks also recently added CompuServe support. America On-Line and Microsoft's Fastnet wireless electronic-mail network have also signed on.

Powersoft to buy Watcom

By Melinda-Carol Ballou

■ Powersoft Corp. last week said it will acquire Watcom Corp. in Waterloo, Ontario, a purveyor of high-end databases and C/C++ tools and compiler products.

Powersoft, like other players in the client/server tools market, has attempted to fill in gaps and strengthen its product capabilities by providing bridges to other vendors' offerings, such as Intersolv, Inc.'s version control software. With this purchase, Powersoft hopes to beef up its products by integrating them with Watcom's higher-end, comprehensive offerings.

For approximately 1.4 million shares of Powersoft common stock, Powersoft will acquire Watcom's outstanding stock when the deal is finalized early next year. This is the equivalent of $40 million to $44 million, or 11% of the combined shares of the new company, according to Mitchell Kertzman, chairman and chief executive officer of Powersoft.

While some Powersoft users have looked to other vendors for complex, transaction-intensive application development, Powersoft officials said they hope the Watcom acquisition will stem defections in that end of the market.

Some users spoke favorably of the high-end capabilities of Watcom's C++ environment.

Crowd pleaser

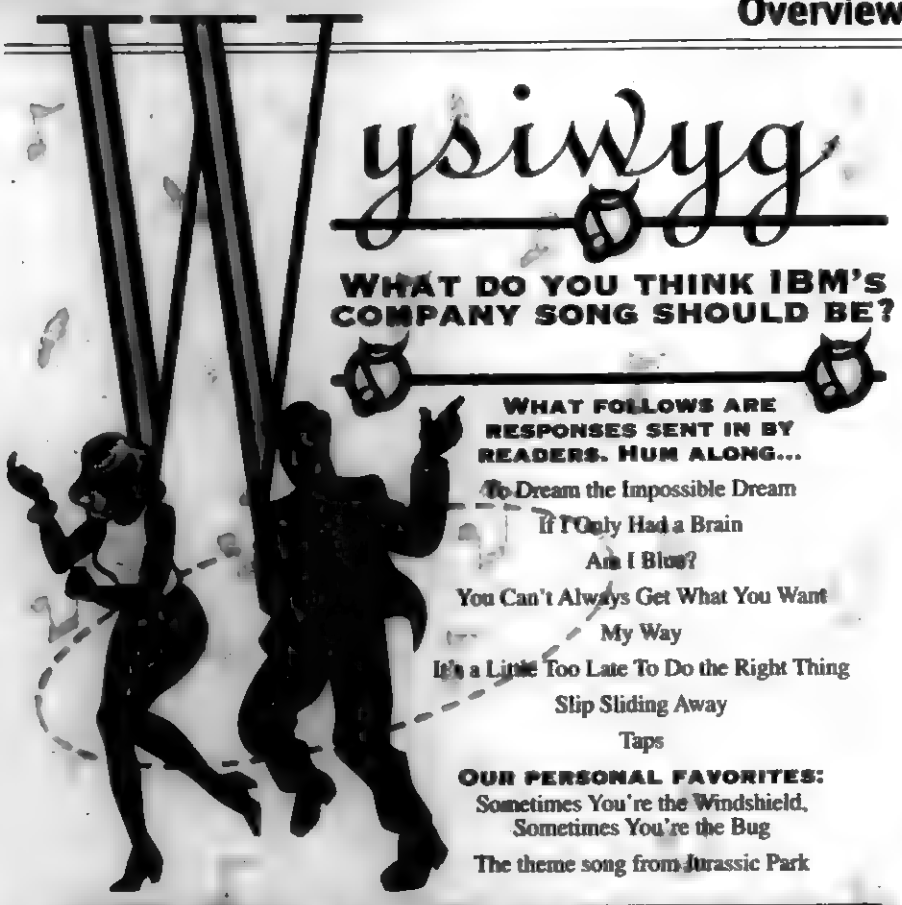
"Watcom targets true developers, not just people who are hacking around," said Don MacDonald, information systems officer at Chemical Banking Corp. in New York. "If you're writing some convoluted [Dynamic Link Libraries] with a million transactions going all over the place, and it has to be 100% guaranteed to always be fast, I'd pick Watcom."

Industry analysts said Powersoft is paying a lot for Watcom, but the high price tag may ultimately be worth it.

"This gives them the ability to do both the client and server portions of the applications — it's like having a car with four wheels instead of two," said Tony Picardi, an analyst at International Data Corp., a Framingham, Mass., consultancy.

However, other analysts said the move is a defensive one. For example, Competitor Gupta Corp. offers a database along with its development tools.

Powersoft began shipping PowerBuilder with the Watcom database this fall and needed to retain control of the product, said Tim Harmon, analyst at Meta Group, Inc., a Stamford, Conn.-based consulting firm.



FROM OUR READER FILES

"One of our users was having computer trouble, so we asked her if her cable had fallen out or become unplugged. But the user insisted there were no cables attached to her computer at all. One of our secretaries put a name to this kind of setup – immaculate connection."

Steve Wheeler
Information systems specialist, Union National Bank, Wichita, Kan.

Illustration & Design by Dave Marshall

Looks like Unix, Microsoft's mysterious Chicago and the server version of Windows NT are the operating systems of the future, at least according to a five-vendor panel at a Technologic Partners conference in San Francisco. The vendors — Clarify, D&B Software, Gupta, IBM and Peoplesoft – gave Unix and Chicago a perfect five. OS/2 got 2.5 votes.

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The 5th Wave *by* Rich Tennant

Inside Lines

Wagers, please

Jim Cannavino's promotion to the inner sanctum at IBM caught him by surprise, according to sources, who say the company will probably soon choose a successor from inside. Speculation has focused on Bill Filipe as the leading candidate, with Bob Corrigan and Lee Reiswig getting mentions.

Talk about reading over your shoulder

Microsoft is preparing to add a nifty little feature to Word 6 for the Macintosh, due early next year. It's called IntelliSense and corrects misspellings and grammar goofs while you type. A Windows version will also be available. Microsoft will also make a run at the Macintosh database market in January when it introduces the $500 Fusebase for the Macintosh.

Newton stumbles Down Under

Austel, the Australian telephone company, may seek prosecution of Apple because it released the Newton without getting the proper permit for its telephone dialing function. According to Jim Helm, Austel's inspectorate manager, the Newton tone dialing function does not conform to Australian exchange standards and is likely to dial incorrect numbers. Apple has sold an estimated 300 Newtons in Australia so far. Amstrand, which has released a similar personal digital assistant in Australia, also faces the problems.

In their backyard

Geographic proximity is no guarantee that an outsourcing vendor will win a deal. Texas Utilities Co., the $4.9 billion Dallas-based utility, confirmed it has selected IBM's ISSC subsidiary for a PC and LAN management and acquisition project. ISSC is believed to have bested EDS from nearby Plano. Chrysler Systems, Inc. also bid on the deal.

Even the midrange goes multimedia

IBM plans during 1994 to combine the three multimedia software packages it sells for the AS/400 into a single integrated product and said it will add tools that will start enabling the midrange system for multimedia development. Currently, AS/400 multimedia applications have to be developed in dumb-terminal mode and then moved to a PS/2 front end. Tools due out next year are supposed to let programs be developed for the PS/2 "to some extent," with more complete capabilities to follow, the company said.

Don't worry, be happy

Microsoft is still taking a "what, me worry?" stance on the COSE alliance of Unix vendors. At a customer briefing that the press joined via videocast, Microsoft vice president Jim Allchin said condescendingly, "We're not sure what the COSE group is up to. They keep changing their goals." Asked if Microsoft would support a unified Unix API from COSE, Allchin humorously replied: "That's like asking if you believe in the Easter bunny."

If you find yourself at ComdexFall '93 unable to look at another demo or in the mood for something a little less logical, you might want to hobble over to ATS ComputerCentre Pte Ltd. (#3637). It has a virtual reality demo that invites attendees to "enter" a PC-generated virtual world that includes an interactive walk through the world's tallest building. Or, you can stop by Software Sorcery's booth (#A1729) and check out the missles, medieval knights and a space junkyard. If you need a tennis fix, check out Corel's Comdex Tennis event on Tuesday at Caesar's Palace. You'll find Rod Laver, Johan Kriek, John Lloyd and Pat Dupree on the courts. Or if you like your drama live, visit the North Las Vegas Air Terminal, where close to 50 software execs will engage in simulated laser dogfights while flying real Marchetti SF 260 aircraft (#A1729). If you've stumbled across any battle plans, phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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COMPUTERWORLD

New quarterly section: Re-engineering the workplace. Page 5.

Gates offers 32-bit theatrics

Users eager for Chicago but wary of modified user interface

By Ed Scannell
LAS VEGAS

Joking that it might be a dangerous thing to do given its embryonic state, Microsoft Corp. Chairman Bill Gates gave users their first peek at the much-anticipated 32-bit version of Windows at Comdex/Fall '93 last week.

In a demonstration that proved rather safe, Gates and Brad Silverberg, leader of the Chicago development effort, gave users a quick tour of the product's multitasking and memory management capabilities.

MARK OSTERMANN

Microsoft's Bill Gates *demonstrated Chicago's Plug-and-Play features*

They also spent a fair amount of time showing off the unreleased product's support for the Plug-and-Play standard and gave a glimpse of its integrated Program and File Manager shell.

While the demonstration heartened corporate accounts looking to escape the constraints imposed by the 16-bit world of DOS and Windows, most information systems managers were left to hope Microsoft can deliver on its promises.

"I am really interested to see what sort of relief we get from Chicago. We, and I suspect many others, literally can't afford to go to NT given our current hardware

Theatrics, *page 16*

Network systems management

Hermes adding NetWare

By Elisabeth Horwitt

Microsoft Corp. is quietly preparing to add Novell, Inc.'s NetWare clients and servers to the roster of systems that its Hermes product will manage when it ships in the first half of next year, a product manager confirmed last week.

Hermes is the code name for a Microsoft Windows NT-based product that provides centralized software distribution and configuration management across heterogeneous systems, particularly the hundreds or thousands of desktop systems scattered across the enterprise, said Dan Shelly, group product manager for enterprise systems at the Redmond, Wash., company.

Microsoft spokespeople at Hermes briefings this fall said the product will manage the full gamut of Microsoft's Windows family but made no mention of NetWare.

NetWare management is not in the current beta version of Hermes, Shelly said.

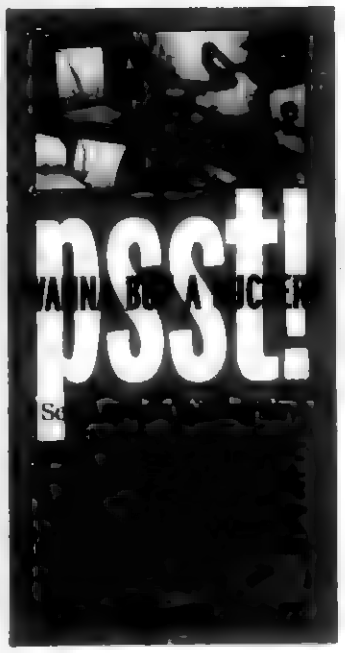
Capabilities to come

A subsequent beta version and the initial commercial release will provide the same management capabilities for Microsoft and Novell clients and servers, Shelly said.

"We just must not have communicated [Hermes' ability to manage NetWare] effectively," he noted.

That was a big oversight, given that a majority of Fortune 1,000 information systems managers re-

Hermes, *page 6*



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▶ **CDPD services arrive.** Page 25
▶ **Premium price days dead at Apple.** Page 29
▶ **CD-ROM patent stirs controversy.** Page 28
▶ **IBM advances networked multimedia PCs.** Page 57

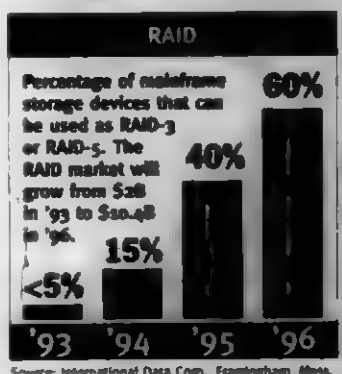
IBM to unveil first host RAID device

By Johanna Ambrosio

■ IBM is expected to fill out its high-end storage family in the first quarter of next year with both a high-speed disk system and its first mainframe RAID device, sources said.

Although user reaction was mixed, analysts said IBM needs to add these to its line-up to remain even in the dog-eat-dog high-end storage market.

"IBM's entire [storage] architecture is just not as competitive as it should be," said David Vellante, an analyst at International Data Corp. in Framingham, Mass. "These are crucial to IBM."



Source: International Data Corp., Framingham, Mass.

The announcements, expected by March with general availability shortly thereafter, will allow IBM to compete on the performance front with EMC Corp.'s Symmetrix mirrored drives. EMC has shipped almost 3,000 Symmetrix units since September 1990, virtually cornering the market.

IBM may even beat Storage Technology Corp. — and that vendor's much-delayed Iceberg — to be the first vendor with a redundant arrays of inexpensive disks Level 5 device for mainframes. EMC's mainframe Symmetrix is a RAID Level 1 unit, affording some duplicate protection but not quite the

IBM, *page 12*

Workin' on the railroad

Rivals align to lay outsourcing tracks

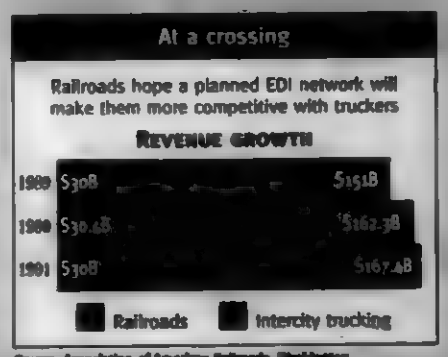
By Mark Halper

Tired of losing miles of market share to the trucking industry, railroad companies are banding together to develop computer technology that would facilitate interrail commerce and improve delivery time and customer service.

The Association of American Railroads is seeking an outsourcer to develop computer and electronic data interchange systems that would improve communications among railroads and enhance their cargo handling and billing processes.

The railroad group has issued the first of several requests for proposals for industry-centralized computer, network and repository systems, said Randy Randazzo, vice president of technology services at the AAR.

Railroads are trying to solve a logistical problem. Half of all rail cargo changes lines at least once before reaching its destination, while truck cargo generally arrives with no such switch-off, according to the AAR.



Source: Association of American Railroads, Washington

Consequently, only 70% of all railroad de-

Railroad, *page 14*

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November 22, 1993

Gale Zimmerman at Medtronic, Inc., maker of heart valves, pacemakers and other medical devices, is implementing process change and installing an information management system to cut time out of the design-approval process.

Re-engineering the workplace

Streamlined Product Design: This week *Computerworld* introduces a new quarterly section on workplace re-engineering. The section provides a practical and detailed view of how information technology is being used to redefine and reshape business operations. This week, we take an up-close look at how product design is being transformed into a fast, flexible and information-driven activity.

See pages 87 to 95

NEWS

■ **Novell** extends **NetWare services** into factories, homes and even fast-food outlets. *Page 2*

■ **Microsoft** reconsiders and joins **Digital** to offer technology that will **make OLE Corba-compliant.** *Page 2*

■ **CA** is threatened with **breach-of-contract lawsuit** by small developer. *Page 4*

■ Major network management vendors embrace **Windows NT** and **Hermes.** *Page 6*

■ **British Aerospace** selects **CSC** over EDS after a yearlong outsourcing evaluation. *Page 12*

■ **Duke Power** embarks on companywide reengineering and downsizing projects. *Page 14*

■ **Texas Utilities taps ISSC** for PC and LAN services. *Page 15*

■ **IBM apologizes** to customers and dealers for delivery problems. *Page 16*

DESKTOP COMPUTING

■ **Word 6.0** excels at "ease of use." *Page 37*

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■ **Uniplex** adds support for Windows clients, E-mail and remote access to its **office automation package.** *Page 47*

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■ **Enterprisewide conferencing** should benefit from **multimedia products** introduced at Comdex. *Page 57*

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■ **Sun** markets internal systems management tools. *Page 63*

APPLICATION DEVELOPMENT

■ **Borland** and **Microsoft** are vying to assist developers working on Windows and OLE applications. *Page 69*

MANAGEMENT

■ **Unscrupulous marketers** are sifting through commercial databases to target vulnerable segments of the population. *Page 77*

IN DEPTH

■ **If you like roller coasters, you'd love massively parallel processing.** Some sites have as many as 15 crashes a day. *Page 97*

COMPUTER CAREERS

■ The quest for widespread direct access to business data is creating new **career opportunities for IS professionals.** *Page 103*

MARKETPLACE

■ **Upgrade inflation.** When you factor in upgrades, the price of a PC package can triple in five years. *Page 111*

COMPUTER INDUSTRY

■ **Relational database vendors** threaten already **struggling object-oriented database suppliers.** *Page 119*

COMMENTARY

■ We're getting a lot closer to the day when we'll be able to perform **complex searches on massive databases,** says **Charles Babcock.** *Page 6*

■ **While leading vendors engage in semantics about openness,** writes **Bill Laberis,** users are finding they have little choice except to pick one brand and stick with it. *Page 32*

■ **Top corporate executives often know shockingly little about their information systems investments,** writes **Rebecca Ballin.** *Page 33*

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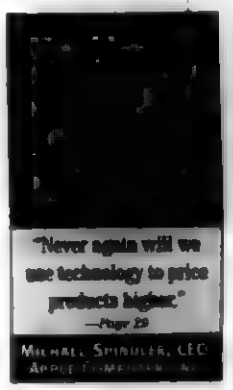
Friday Stock Ticker ..... *Page 118*

Executive Briefing

Technology-enabled teamwork is the goal for many businesses trying to beat back competition and ensure profitability in lean times. **Railroads** are looking for **computer** and **EDI systems** that will help them collaborate more effectively against truck transport. *Page 1* Many companies are also turning to information technology to pull **product design** into closer collaboration with **marketing and manufacturing.** *Page 87*

Increased interest in privacy and security of computerized data is a safe bet. Public and governmental concern is already rising about **protection of sensitive medical data** under a health care reform plan involving computerized transfer of massive volumes of patient data. Although President Clinton's proposal calls for enactment of strong privacy legislation, privacy advocates say laws should come much sooner. *Page 63* Another emerging concern: An increase in **direct marketing scams** aimed at vulnerable individuals, whose names are "filtered" from commercial databases using high-tech search tools. *Page 77*



Wireless reaches adolescence. The consensus of customers at Comdex seemed to be that the technology is coming of age and you don't have to be a daredevil to begin experimenting with it. **American Airlines** is slated to begin piloting **wireless Sabre terminals** and Cellular Digital Packet Data links by the end of this month. And a member-owned network services supplier to the insurance industry is readying a pilot **wireless network for claims adjusters.** *Page 25*

Wider on-ramp, cheaper toll for Internet. Basic-rate ISDN access to the Internet is now offered in 30 cities for $400 per month. This may be a cheaper alternative for some companies than paying for dedicated lines for sporadic use. *Page 67*

Multimedia: Lots of products in search of a market. The show-floors of Comdex were full of multimedia offerings. IBM software debuted that lets users of OS/2 2.1 capture images off regular video equipment and then edit it into other software. **Peregrine Systems** announced software it says will give Windows users desktop videoconferencing and the ability to share live information through on-screen display. *Page 57*

A possible fly in the soup is software publisher **Compton's NewMedia**'s recently announced attempt to patent a core technology used in thousands of multimedia applications.

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Pact to heal division over objects

By Melinda-Carol Ballou

Microsoft Corp. next week is expected to announce technology developed by Digital Equipment Corp. and others that will enable Object Linking and Embedding (OLE) 2.0 to comply with the Common Object Request Broker Architecture (Corba) standard from the Object Management Group (OMG), according to sources close to both companies.

The announcement of the technology, said to bridge the chasm between these two key, emerging object-oriented standards, is timed to coincide with the OMG's request for proposals for the Corba 2 interoperability standard. It will be submitted by the companies to the OMG early next month, the sources said. The technology and tools supporting it are expected to ship by late 1994.

Separately, Microsoft has been participating in discussions with IBM, Candle Corp., Sun Microsystems, Inc. and others to offer interoperability between IBM's Distributed System Object Management (DSOM), SOM and OLE, sources said. This will also be offered to the OMG for Corba 2.

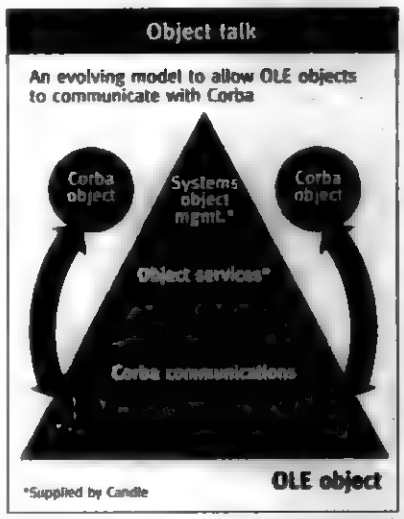
Lack of compatibility between OLE and Corba would ultimately have meant a struggle for developers and end users as the industry moves toward object-oriented operating environments, according to industry analysts.

"People will care ultimately, even if they don't know that they care today," said Adrian Bowles, managing director at Atelier Research in Westport, Conn.

The Digital technology could eventually offer total interoperability between OLE and Corba, according to one source familiar with its inner workings. "I could be working in Word writing a proposal and need to get information about bills and materials down from the server. I would be able to open an OLE object, link the data down and the server won't have to understand OLE. It will handle it as a Corba request," the source said.

Corba has been adopted by major systems vendors other than Microsoft as the standard traffic cop technology for enabling objects to communicate with one another. OLE, meanwhile, has increasing ubiquity in the behemoth Windows marketplace and will pave the road to Cairo, Microsoft's object-oriented environment due out in 1995.

As part of an alliance with Microsoft, Digital will supply technology that will allow OLE to retain its own object model but will manage and reconcile differences between OLE and Corba, the sources said.



Source: Industry sources CW Chart: Dave Marshall

The technology will include an object adapter from Digital, which will transform the OLE object into a Corba object or vice versa, sources said. Digital's Object Broker gateway will send and deliver messages between OLE and Corba, they added.

Also included will be object systems management and object services from Candle in Santa Monica, Calif., sources said (see chart).

Microsoft's Chief Executive Officer Bill Gates indicated at the Seybold Office Computing Conference last month that his company would reverse an earlier stance opposed to such an accommodation between OLE and Corba. Microsoft, Digital, Candle and OMG officials refused to comment on the upcoming announcement.

Some analysts were skeptical about the expected technology, however.

"These are two different architectures, and we're going to have to see how robust the interoperability can be between them," said John Rymer, an analyst at Patricia Seybold Office Computing Group, a consulting firm in Boston.

NetWare everywhere — if Novell can pull it off

By Elisabeth Horwitt

Novell, Inc. is looking to extend NetWare's franchise into applications far removed from its traditional network operating system turf — such as the factory floor, fast-food outlets, consumer electronics, office equipment and environmental systems.

Novell's Extended Networks Group plans to announce by January an architecture for delivering NetWare services over a "broadband information highway" to disparate environments (see chart), said Darl McBride, vice president and general manager of the Monterey, Calif., group.

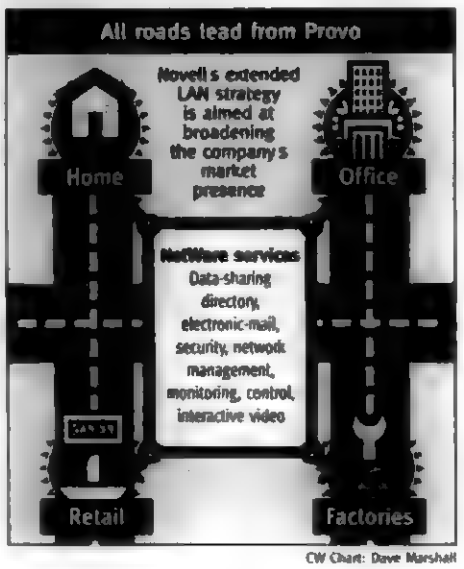
The devices to be linked into NetWare will include factory machinery, refrigeration and cooking equipment in fast-food chains, point-of-sale (POS) systems, environmental and security systems and office equipment such as faxes and copiers, Novell said. Such devices, which tend to be proprietary and only semi-intelligent, will be prepared to receive NetWare services through embedded client software, scaled-down operating systems and network boards, McBride said.

The group's overall goal is for NetWare to assist efforts by retailers and manufacturers to gain control of and views into the processes occurring at factories and retail outlets, he explained.

Novell's Extended Networks Group's strategy is partly a response to Microsoft Corp.'s Microsoft at Work initiative but is critical if Novell is to maintain healthy revenue growth, analysts said.

Retailing and manufacturing are potentially fruitful industry segments for Novell, which has "penetrated [them] somewhat" in the back office "but not to the floor," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington.

Several users and analysts in the retailing and manufacturing sectors expressed a strong interest in what Novell is promising. However, even McBride agreed that the vendor has a tough row to hoe to achieve consensus in industry areas that are even more fragmented and proprietary than today's business computing market.



CW Chart: Dave Marshall

McDonald's Corp. is one company that Novell has approached to be a beta site for the Extended Networks architecture. "We think [Extended Networks] is more than interesting; we're just not sure how to apply it yet," said Chuck Rush, systems project manager at the Oak Brook, Ill., company.

McDonald's is in the initial stages of a project to network its in-store systems so that "based on historic sales data and forecasting and time of day, you could [remotely] start the fry machine," Rush said.

In the retailing environment, at least, Novell is the No. 1 LAN supplier on the office side and is in a good position to shoehorn its way into store automation, said Tom Friedman, editor of "Retail Systems Alert," a newsletter in Newton, Mass. Several vendors now offer systems to poll retail POS devices, but Novell can add value by providing a way to collect and integrate data from disparate devices in a secured and reliable manner, Friedman said.

Indeed, NetWare network management and security services are a major reason why Friendly Ice Cream Corp. is now looking to use NetWare to send information between its shops and the headquarters data center, said Bob Laprade, senior systems programmer at the Wilbraham, Mass.-based restaurant chain.

In the manufacturing sector, Novell is looking to provide a standard architecture by which companies can monitor factory floor equipment and collect data to be fed into business systems, such as manufacturing resource planning, McBride said.

Hoechst Celanese Corp., a chemical manufacturer, would be interested in NetWare as a low-cost way to to tie different areas together, as long as Novell could provide the real-time operating system to ensure real-time communications, said project leader Lorie Mouklas. A symmetrical multiprocessing version of UnixWare would be a strong candidate, he added.

NetWare certification tips, page 104

Stretch the net

Novell is employing the following tactics to extend NetWare into new business:

- **Allying with dominant equipment and network vendors in target industries to make their products NetWare-compliant.**
- **Embedding scaled-down NetWare, UnixWare and Novell's Flexos real-time operating system in devices.**
- **Using standards such as the Desktop Management Task Force's Desktop Management Interface and Simple Network Management Protocol, which enable a central system to collect a variety of statistics from networked devices.**
- **Bringing NetWare intelligence to semi-intelligent devices via third parties. Two of the third parties are likely to be Geoworks, which recently partnered with Novell to embed NetWare in personal digital assistants and other mobile devices. Its Geos "small footprint" operating system can be cheaply added to office devices; and Echelon Corp., which offers a network processor and peer-to-peer networking software embedded in factory floor, environmental, building and retail systems.**

—Elisabeth Horwitt

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Supercomputing '93

Vendors see the MPP light

By Ellis Booker
PORTLAND, ORE.

The commercial market appears primed to embrace high-performance computing architectures — especially massively parallel processor (MPP) systems — as tools that can solve real-world business problems ranging from SQL queries against gargantuan customer databases to video-on-demand services over the information highway.

At least that was the take of observers attending Supercomputing '93 last week, which was replete with the fruit of efforts by supercomputing vendors that have been polishing their products and business strategies for the past year in an attempt to appeal to a broad commercial market.

"Look, I like knowing the mass of a proton and watching galaxies collide. . . . But I'd much rather see Boeing be able to beat Airbus," said James R. Kasdorf, director of supercomputing at Westinghouse Electric Corp. in Pittsburgh.

Kasdorf said dependable MPP machines suitable for the production applications found in the industry have only recently appeared. "The vendors just didn't know what was required for production-quality system software," he said.

Jeff Canin, a research analyst at Salomon Brothers, Inc. in San Francisco, agreed, although he warned that the MPP market, which is now at about $300 million, "is only half what conventional wisdom was predicting it would be five years ago."

Thus, Canin estimated that serious use of MPP architectures for decision-support systems and online transaction processing is still three years away. In the interim, he said, it will be critical for MPP vendors to find "unique applications and niches."

Source: International Data Corp., Framingham, Mass.

Find a niche

This approach was endorsed by none other than the supercomputing industry's most senior executive and pioneer, Seymour Cray, founder of Cray Research, Inc. and current president and chief executive officer of Cray Computer Corp. in Colorado Springs.

During a rare, informal conversation at Supercomputing '93, Cray somewhat chided MPP vendors for "trying to be all things to all people." A better approach is to find niches and fill them, he said. (Cray also revealed that his own next-generation supercomputer would mix MPP and vector computing, although he declined to say when the platform would be available.)

Meanwhile, price/performance of supercomputers has improved spectacularly during the past several years. Larry Smarr, director of the National Center for Supercomputing Applications at the University of Illinois, said the price per million floating-point operations per hour has fallen by a factor of 100 during the period, from approximately $5 in 1985 to 5 cents today on the center's CM-5 from Thinking Machines, Inc.

Others noted that technologists' debates about raw processing power are less important to commercial customers. "Price/performance is only 30% [of the sale]," said new President and CEO John M. Harte of MasPar Computer Corp. in Sunnyvale, Calif.

Equally or more important to these customers is the support of interfaces, integration, standards and peripherals, he said.

Even so, vendors, when pressed, rein in their excitement about the commercial market and its opportunities. IBM executives, for instance, acknowledge that the first sales of their IBM Scalable Power Parallel Systems 9076 SP1, which became generally available in September, will go into the technical/scientific realm first.

"But we'll be making sales to our first commercial customers on Wall Street and a UK retailer in December," said Ben C. Barnes, assistant general manager of IBM's Power Parallel Systems in Somers, N.Y. Both of these customers will be running Oracle Corp.'s parallel database engine, Barnes said.

Big attraction

Supercomputing '93, sponsored by the Association for Computing Machinery and the IEEE, saw attendance edge up to more than 5,000 from 4,650 a year ago. In 1988, the show attracted just 1,400 attendees.

High-performance wares

Announcements of note at Supercomputing '93 included the following:

• Showcasing the promise of the "information highway," the National Information Infrastructure Testbed unveiled its first application for a wide-area, interactive multimedia network.

Called Earth Data System, the interactive multimedia application was linked across nine U.S. sites with Asynchronous Transfer Mode, Fiber Distributed Data Interface and frame-relay networks. Researchers in any of the locations could access data and images about Earth's weather and environment.

• High Performance Parallel Interface (Hippi) was hot at the show. MasPar Computer, Hewlett-Packard Co., Broadband Communications Products, Inc. and Essential Communications announced products adhering to the 800M bit/sec. ANSI interface standard.

• Network Systems Corp. demonstrated its Hippi-over-Sonet (Synchronous Optical Network) gateway product. Intel Corp. said it would market Hippi-attached storage servers from Maximum Strategy, Inc.

• Thinking Machines Corp. announced a new generation of parallel processing nodes for its CM-5 MPP platform.

Suit questions CA code use

By Thomas Hoffman

■ Opening arguments in a breach-of-contract lawsuit filed by a small Vermont software developer against Computer Associates International, Inc. are set for January, and the action could have major ramifications for the Islandia, N.Y., software giant.

At stake are millions of dollars in international revenue and profits accrued during the past six years from the sale of nearly 90 CA programs, including CA-Unicenter, CA-Top Secret and CA-SuperProject. Reliability Research, Inc. in Salisbury, Vt., claims CA must pay for the right to use and market technology gained when the latter acquired University Computing Co. in August 1987.

Thomas Wilinsky, an associate at Leventhal Slade & Kranitz, a New York law firm representing Reliability Research, said his client had been attempting to settle its claim with the vendor for a number of years before finally filing suit.

A CA spokesman said Reliability Research's claims "are totally without foundation" and that the company is vigorously defending itself. He added that "CA's policy is not to comment on the specifics of pending litigation."

Legal pundits familiar with the suit said Reliability Research has a valid case, though they were unsure whether it has a legitimate claim against all 90 CA software programs.

"Obviously, nobody's laughing them out of court," said Ron Abramson, intellectual property counsel at Hughes, Hubbard & Reed, a prominent New York law firm.

Suit's origin

The lawsuit, filed in U.S. District Court in New York in 1991, stems from a 1979 licensing and marketing agreement between University Computing and Reliability Research under which the latter granted the former an exclusive 99-year license to market and distribute Reliability Plus — a program that was designed to monitor, analyze and report on computer hardware failures — in the U.S. and Canada.

In 1984, the agreement was modified, stipulating that University Computing and Reliability Research were honor-bound to notify each other of any "product improvement or other offerings in the area of computer reliability." University Computing was required to request a waiver for any computer reliability-designated products it sold. This agreement, Reliability Research contends, extended beyond University Computing products that used its technology to any systems management products University Computing developed and marketed.

In the absence of a waiver, the software in question would become the sole and exclusive property of Reliability Research, which would then be entitled to all non-North American revenue and profits University Computing earned from those products.

When CA acquired University Computing, it assumed all of the company's rights and obligations, including the 1984 licensing and marketing agreement, Reliability Research claims. Reliability Research also contends that CA has marketed nearly 90 products offering computer reliability since its acquisition of University Computing.

Payback time

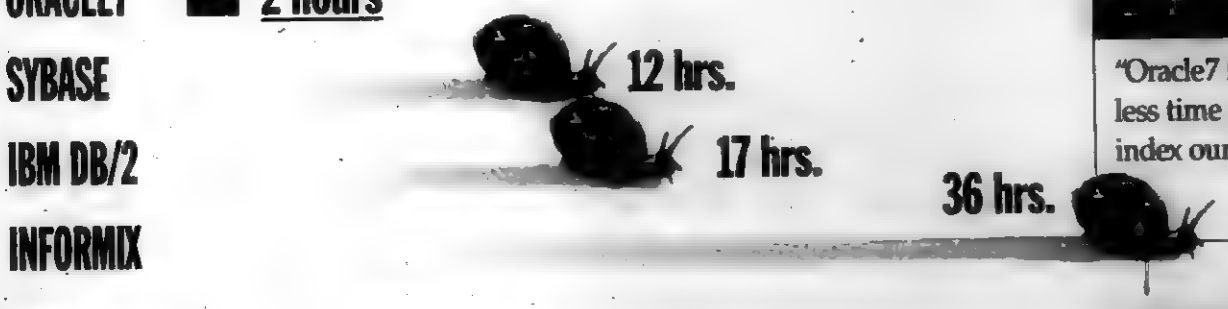
The developer further claims that since CA has not honored the University Computing agreement, the $1.8 billion software giant owes Reliability Research at least $5 million in non-North American profits and revenue.

Wilinsky said $5 million is the minimum amount of damages the company is seeking. He added that the law firm's accountants were trying to determine what the maximum damages could be.

Wilinsky said his firm has had occasional settlement talks with CA but declined to elaborate further. Wilinsky did not rule out a settlement before — or even during — the jury trial.

Gentlemen, start your snails.

PC Magazine independently defined and ran a battery of real world performance tests to compare database server software. PC Magazine states, "Oracle7 was the hands down winner on our performance tests, outperforming the others by a wide margin."



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PC Magazine

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"Oracle7 completed the queries in a blistering 47 minutes, three times as fast as...the other products."

PC Magazine

CONCURRENT RANDOM WRITE

"Even with the many new features that were added, we found Oracle7 to be exceptionally stable"

PC Magazine

CONCURRENT RANDOM READ

"Oracle7's read-consistent model and record level locking helped it breeze through the test."

PC Magazine

Just to be fair, here's what PC Magazine had to say about the other guys:

Informix OnLine *"Only after days and days of repeated crashes were we able to obtain a full set of results."*

Ingres Server *"...we would not recommend it because of the showstopping multi-user bug we encountered."*

Gupta SQLBase *"...took an unthinkable 60 hours to load the tables and then crashed on the index builds..."*

For your copy of the complete PC Magazine article, including test results call 1-800-633-1071 Ext.8129.

ORACLE

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A world of records is a moment away

We are rapidly moving closer to creating systems that treat objects like other forms of data. When such systems do exist, it will become routine to launch spur-of-the-moment queries against complex data types.

That might not sound like much, but when this advance comes about, many of the hidden constraints on the power of computing will begin to drop away. Whether we acknowledge it or not, we still deal with data in superficial ways, accepting our manacles because "the system" can't get around them.

There's little doubt a database of X-rays would help an oncologist if he could search for tumors similar to the one he was treating. The most relevant X-rays, however, would be those of tumors that not only had been prearranged by medical classification but also were a match in size and shape. Furthermore, if the doctor found the related patterns, he would then want to know what therapies had been used and which were the most successful.

This combination is beyond the capability of present-day systems. If one compiles a database of images, it is difficult to search for physical patterns without a specialized neural network. If one can search for patterns, then it is difficult to relate the pattern to other forms of complex data or do an ad hoc query to discover developing trends.

We are about to gain the ability to search large, complex databases, unleashing one of the hidden powers of computing.

Charles Babcock

Small databases might yield records that could be sorted by hand, but a national database would have hundreds of thousands of records. If we could use computers to search large, complex databases, they would yield hard-won knowledge that lies hidden in their underlying patterns.

Today's object-oriented systems can store and retrieve complex data, but the way they access the data is determined at the time the database is organized. We can't do impromptu queries against them.

Current relational systems can do ad hoc queries, but they only deal with a few simple data types. Getting relational databases to deal with date/time stamps was considered a big advance in the last revision of SQL.

I say we are rapidly moving toward unlocking these shackles because fresh work is going into developing the key. Some of the research has been done by Michael Stonebreaker in his Postgres project at the University of California at Berkeley. Stonebreaker was one of the founders of Ingres. Other work has been done by Won Kim, who generated a relational-like system for objects at Microelectronics Computer Corp.

Stonebreaker and Kim have received venture capital backing to start companies that capitalize on their insights. Stonebreaker's Montage Software, Inc. in Emeryville, Calif., and Kim's UniSQL, Inc. in Austin, Texas, have launched object-based systems that respond to ad hoc SQL queries.

At Science Applications International Corp. in San Diego, Jean Anderson, database manager at the open systems division, has implemented Montage and says, "We feel we've got the best of both worlds."

In Houston, Petrotechnical Open Software Corp., a technology sharing consortium comprising Chevron, Texaco, Mobil and others, is about to release a set of interfaces it developed that allow UniSQL (and a hybrid object system, OpenODB from Hewlett-Packard) to work alongside DB2 and other relational systems. Once in place, this amalgamated system will allow the oil companies to do things that Leon Karcher, director of operations, says are "not imaginable with relational engines" — things such as searching their seismic data on an ad hoc basis, looking for patterns that indicate subterranean oil reservoirs.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Vendors plan support for Hermes, NT

By Lynda Radosevich

LAS VEGAS

Microsoft Corp.'s Windows NT and its desktop management application (code-named Hermes) received broad support from the network management world last week as major vendors released details on how their platforms will embrace them.

Key announcements regarding support plans came from IBM, Digital Equipment Corp. and Hewlett-Packard Co. [CW, Nov. 15]. Additionally, Cabletron Systems, Inc. said it is porting its Spectrum for Open Systems network management software to NT, and Siemens Nixdorf Information Systems, Inc. demonstrated at Comdex/Fall '93 its Transview-SNMP network management system, which accesses desktop computers via an NT server using the Desktop Management Interface standard.

"The Hermes capability is very attractive because it gives us the ability to manage down to the desktop, and that is vital for the future," said HP OpenView user Rick Sturm, a member of the technical staff at US West Advanced Technologies, Inc. in Boulder, Colo.

"Right now, one group manager looks after the network, another monitors PC hardware and software and another takes care of the file servers," said a senior systems programmer at a major consumer products company in Oakland, Calif., who asked not to be identified. After viewing a Hermes and an IBM NetView/6000 demonstration, he said the combination held promise for centralizing the operations.

IBM, Digital and Microsoft said Hermes will be able to send desktop topology and status information to all NetView/6000 releases. In August, Digital licensed NetView/6000 to port to its Alpha-based systems running OSF/1 as part of its Polycenter network management platform.

Last week, Digital said it will port NetView/6000 and Hermes links to DEC OpenVMS and NT. Hermes will also support OS/2 and DOS desktops and Novell servers at an as-yet unspecified date (see story cover 1).

Meanwhile, HP said it will port OpenView to NT for Intel Corp. machines in the first half of 1994. HP also said its now-incompatible PC- and Unix-based OpenView management consoles and the upcoming NT-based OpenView will be fully interoperable by the end of 1994. Integration with the Hermes application is scheduled for the second half of 1994.

Hermes

CONTINUED FROM COVER 1

cently interviewed by Forrester Research, Inc. said their biggest problems in managing heterogeneous client/server systems lay in getting a grip on what is actually out there and then being able to distribute software across the enterprise.

"I said [to Microsoft], 'OK, I've got Windows clients, NetWare servers and database server operating systems. What do I buy to manage them all?' " said Janet Hyland, a senior consultant at the Cambridge, Mass., research firm. If Microsoft does not address such heterogeneous systems with Hermes, users are likely to go to Novell's NetWare Distributed Management System (NDMS), Hyland said.

NDMS can already manage NT via the Simple Network Management Protocol (SNMP) and will be able to collect information from NT systems via the Desktop Management Task Force's Desktop Management Interface protocol, according to Novell product line manager Steve Dauber. However, he did not say NDMS would work directly with NT management utilities, as Hermes does.

The ability to manage NetWare as well as Windows systems will make Hermes a very powerful management product, particularly in concert with Hewlett-Packard Co.'s OpenView, which provides the Unix management component, said Frank Belland, senior communications consultant at Martin Marietta Corp.

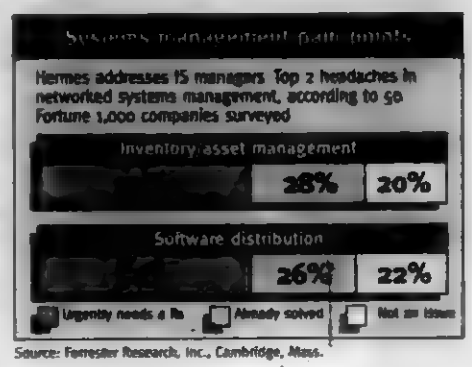
HP and Microsoft announced plans last week to integrate Hermes with OpenView (see story above). HP has positioned OpenView as an enterprise manager that tracks networks and networked systems across the corporation.

Integration between Hermes and OpenView would allow network administrators to do software distribution and metering without "needing to use a Unix tool, then a DOS/Windows tool and then a Novell tool," Belland said.

Hermes will distribute software updates and batch files to both NT and NetWare clients by programming the server to download the files as a preset time, Shelly said.

However, Hermes does not provide real-time diagnostics and monitoring of either Microsoft or Novell systems, Shelly said. Microsoft provides real-time management of NT systems via a Windows console through utilities embedded in NT. And the company will provide integration of NT management with management of other systems through third-party enterprise management systems such as OpenView, which manages NetWare through software provided by its partner, Peregrine Systems, Inc.

Hermes management of Microsoft and Novell clients and servers will include the ability to collect configuration information, such as disk utilization and which peripherals, hardware and software components and applications are installed, Shelly said.



Source: Forrester Research, Inc., Cambridge, Mass.

Hermes' primary function will be able to communicate with Novell systems via either Novell's IPX protocol or TCP/IP, Shelly said.

Microsoft would not give technical details on how Hermes will interact with NetWare to accomplish this. One likely scenario, however, is for Hermes to collect information from NetWare using standards supported by both firms, including SNMP, Desktop Management Interface and the Internet Engineering Task Force's Host Management Information Base, Belland said.

Digital license manager stays in limbo

By Craig Stedman

Digital Equipment Corp. is close to completing development of a software license manager that supports Microsoft Corp.'s Windows NT operating system, but plans for marketing the product still hinge on the signing of a long-delayed agreement under which Microsoft would offer it with NT.

Digital expects to get Microsoft on board in June and then immediately introduce the Polycenter Licensing System (PLS) technology [CW, June 28]. However, both the deal and the introduction have been held up following management changes within the Windows NT organization at Microsoft during the past few months, according to sources familiar with the PLS strategy.

PLS, code-named Omni, would ensure that client PCs are licensed to run specific applications. Software vendors could thus be assured that their programs are being used properly, while users would have the potential to electronically track licenses and monitor software use.

Limited appeal

Digital is taking a programmable, object-oriented approach with Omni that differs from the existing menu-driven license managers made by Gradient Technologies, Inc. and others, analysts said. But Digital executives describe deals of this sort with Microsoft as prerequisites to bringing Omni to market.

"A proprietary licensing system is of no use to anybody," said Dennis Biedrzycki, marketing manager for Digital's Polycenter line of network and system management products.

Bob Koskovich, information services manager at EDM Supplies, Inc., a distributor of electrical equipment in Downey, Calif., agreed that Omni would not have much appeal unless other companies embrace it.

"If we have some vendor buy in more than Digital, the technology looks very promising," said Koskovich, who attended an Omni customer briefing last spring. "It looks like it would make life a lot easier, but if just Digital is using it, then that's not enough."

Robert Fowkes, business development manager for corporate business practices at Digital, said scrapping Omni has been "an option if we couldn't come to an agreement" with a key company, which sources close to Digital identified as Microsoft. He said he hopes to have a deal in hand "in a couple of weeks," but noted that Digital has viewed the deal as "days away" ever since June.

A Microsoft spokesman would not comment on the discussions with Digital over Omni. He said Microsoft will provide license management capabilities with Windows NT, probably as a set of system services, but added that the company is not ruling out an internal project.

Microsoft's Hermes systems management product, now under development for use with NT, will keep track of inventories of software licenses, but Microsoft officials have said it will not handle license management. They added that Hermes will eventually be able to query license managers (see story cover 1).

Andrew Dailey, an analyst at Gartner Group, Inc., a consulting firm in Stamford, Conn., said Digital's ability to market Omni against rival license managers from Gradient and other vendors is becoming "exponentially more difficult with each day that passes."

Dailey added that continued uncertainty over Omni could also hinder a series of software asset management services and products that Digital is now marketing. License and asset management can stand apart from each other, but combining them makes for a "much more potent" offering, Dailey said.

Biedrzycki noted that Digital may end up supporting multiple license managers with the asset management portfolio. "Quite frankly, if [PLS] is not widely accepted, you have to go with whatever [licensing] systems are being used by all the application vendors," he said.

Operating systems

Solaris' Intel support lags behind SPARC

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Even as SunSoft, Inc. continued last week to push its vision of the Solaris operating system as a Unix alternative for Intel Corp. PCs, the company confirmed that the X86 version will continue to run two releases behind the one for Sun Microsystems, Inc.'s SPARC-based workstations for at least several months.

The two Solaris releases will "sync up" in the spring, possibly as soon as April, said Jim Billmaier, SunSoft's vice president of product marketing.

"Solaris 2.3 started shipping last week," he said, adding that a common version of 2.x code would run on both SPARC- and Intel-based machines "in the first half of next year." From then on, he said, "everything we do will be released on SPARC and Intel simultaneously."

Until then, industry analysts said PC users will have to use Solaris 2.1 on their PCs. The Solaris X86 has limited multiprocessor support for certain machines, they said. It also lacks direct connections to Novell, Inc. NetWare LANs. Instead, users need to use Sun's PC-NFS software to connect to NetWare servers.

At the same time, Sun may be cautious about competing with its own line of SPARC workstations, said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

"The Intel Pentium is running deep into their space in terms of performance — where their SuperSPARC is running today," Iams said. "They could potentially be competing with their own workstations."

Faster 64-bit UltraSPARC machines are due from Sun next year, he noted.

When the synced version arrives — called either Solaris 2.3.x or Solaris 2.4 — it will offer support for Solaris Live videoconferencing software and multimedia tools, Billmaier said.

SPARC vs. X86

The biggest difference between the X86 and SPARC versions is byte-ordering, with SPARC's "big" endian and Intel's "little" endian, analysts said. Applications and data must be translated for binary compatibility, but the process can be masked. SPARC has multiprocessor support, more Posix support and higher performance. The PC version has to support a wider array of peripherals and devices, said John Morrell, a Unix analyst at International Data Corp.

Making it fit

SunSoft held a user roundtable here last week to explain how the PC version of Solaris would fit with large corporations' moves to Sun servers. During the discussion, users said a corporation's move to Solaris begs the question of PC compatibility. Analysts said Sun had to offer Solaris X86, plus the Wabi interface for Microsoft Corp. Windows compatibility, to address the concern that Sun was not playing in the PC space.

To expand its X86 market for Solaris, SunSoft made an agreement with Unisys Corp. to resell Solaris X86 on the Unisys U 6000 series of Intel-based machines.

"We're offering it on the uniprocessor systems to begin with," a Unisys spokesman said. Solaris X86 will run on three models: a desktop 486, a deskside server and a Pentium-based uniprocessor server. Unisys said it will continue to offer UnixWare and Unix System V, Release 4 from Novell for the U 6000 line.

SunSoft said it had made an agreement with Locus Computing Corp. to support Locus' Merge PC on the X86 and systems from Interactive Unix, a firm Sun acquired. At Comdex/Fall '93, SunSoft demonstrated Solaris software running on IBM's Power Personal computers, which are based on IBM's PowerPC chip.

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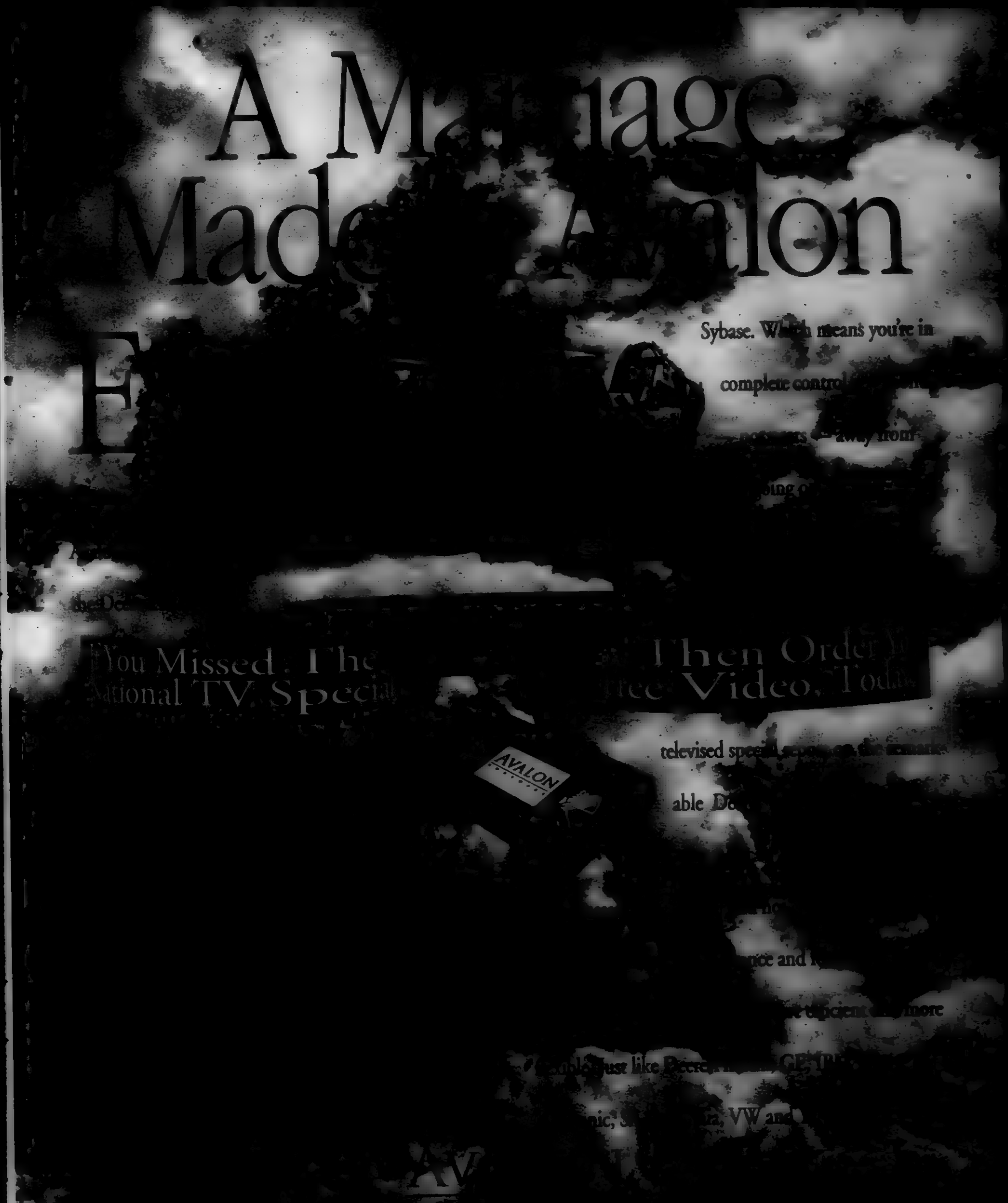
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News Shorts

Gates offers NT direction

In addition to talking up Chicago at Comdex, Microsoft Corp. Chairman Bill Gates elaborated on a promised major update for Windows NT next year. The update will feature improved file server performance in a bid to match Novell, Inc.'s NetWare and a slightly smaller memory size requirement to give NT an edge over Unix in the technical workstation market. Gates also said Microsoft will modify the Windows interface on NT to match the new interface under development in Chicago (see story on cover 1).

Hacker breaks into Internet branch

A computer intruder last week breached security in the Bay Area Regional Research network (BARRnet), a major branch of the Internet in Northern California. The person was trying to steal passwords that would permit him to access other linked networks, according to BARRnet officials. BARRnet subscribers have been advised to change their passwords while the hunt for the hacker goes on.

IBM object standard gets support

IBM's Systems Object Model (SOM) and Distributed Systems Object Model (DSOM) got a significant boost last week when five suppliers of object-oriented tools said they have licensed and will integrate the technologies into a range of different products. The companies include MetaWare, Inc., which said it has already shipped to beta sites its High C/C++ compilers for IBM's AIX/6000 and OS/2 2.1 operating systems that include DirectToSOM support for IBM's SOM and workstation DSOM. The other four companies include ParcPlace Systems, Inc., Digitalk, Inc., Watcom International Corp. and Objective, Inc.

Met Life IS chief moves on

Bruce J. Goodman, formerly senior vice president of corporate information systems and chief information officer at Metropolitan Life Insurance Co. in New York, has joined The Prudential Insurance Co. of America in Newark, N.J., as president of its newly formed Prudential Business Systems Unit. In his new post, Goodman will be responsible for re-engineering the individual insurance units' core systems.

Phoenix will Plug-and-Play

Phoenix Technologies Ltd. has signed a deal to develop and license to Microsoft Corp. a key piece of technology that supports the Plug-and-Play BIOS in an operating system. Phoenix will develop the BIOS Enumerator, which provides access to system board devices during a configuration process.

DOD official hit with harassment suit

The U.S. Department of Defense asked its inspector general to probe allegations that Gary Denman, head of the Pentagon's Advanced Research Projects Agency, sought sexual favors from IBM representative Veronica Gunther. Gunther filed suit last week against IBM for allegedly forcing her to have sex with Denman in order to win business. Denman denied the allegations but recused himself from dealings with IBM.

SHORT TAKES IBM said its DB2 3.0 database system, which allows for some distribution of data, will be generally available Dec. 17.... Microsoft Corp. has reported some problems in an unspecified number of its recently released Microsoft Office 4.0 suite. Some versions contain the lead name of the Microsoft product tester in the employee name information box in the Microsoft Office Manager shell. The company said the gaffe does not result in any technical problems but will replace any copies upon request.

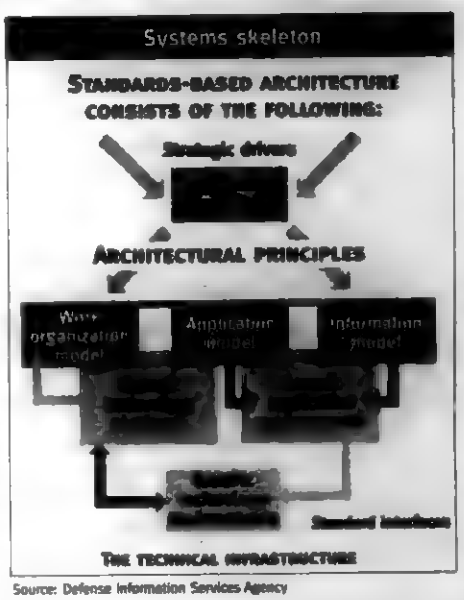
DOD plots common IS scheme

By Jean S. Bozman

The U.S. Department of Defense's game plan for a standards-based architecture (SBA), released for public review this month, is one of the first fruits of the 4-year-old Corporate Information Management (CIM) initiative.

The SBA guide describes a new world of systems built on common building blocks that are supposed to reduce software development and maintenance costs. Key elements include reusable code, standard platforms and shared data repositories. Software accounts for more than half of the DOD's $9.5 billion annual information systems budget, excluding classified systems.

The SBA — based on Posix, Government Open Systems Interconnect Profile, TCP/IP and the International Standards Organization 9000, for example — promises a framework for remaking the DOD's IS infrastructure. "If the [SBA] concept is accepted within the [DOD] user community," said Bob Deller, a vice president at Input in Vienna, Va., "then someone will probably come in as a contractor and lay it all out."



Source: Defense Information Services Agency

The Defense Information Services Agency (DISA), provider of central IS services to DOD agencies and publisher of the SBA guide, is looking for user comment. "We want feedback," said John J. Keane Jr., a senior DISA planner. "Within two years," he said, "instead of seeing hundreds of ways of doing business with DOD, users will see one, and we'll take care of any translation and navigation that needs to be done."

That may be a tall order because the DOD has virtually every major type of computer, from PCs to minicomputers to mainframes. Each military agency will specify its own technology, weeding out redundant systems, consolidating data centers and building a centrally managed network.

The benefits of SBA will come from breaking down barriers among hundreds of independent systems. "Open means that you are vendor-independent and that the software is portable," said Paul Strassmann, CIM director until January and now a consultant at Ernst & Young. "It doesn't mean Unix or another operating system. It means that the code and the objects that get delivered from application A can be reused in application B."

The SBA's debut has come, however, as CIM's momentum has slowed following the change in administrations and a review of CIM's lack of progress.

However, Strassmann's successor, Ret. Gen. Emmett Paige, agrees with the premise of CIM, which is to consolidate data centers and adopt object-oriented development methods, a DOD spokeswoman noted. "But he wants to see the process move along a little faster than it has."

Marine model

Progress is evident at the U.S. Marine Corps, which finished its own SBA model in January. The Marines are now an example for other DOD agencies as CIM proceeds, Keane said. "Because the Marines have done all this work [in the last year], people are recognizing that a significant amount of [the work] can be reused for other organizations." He said he believes other military services could build their own SBA model in six months.

Despite SBA's stated goals, today's Marine Corps has few open systems on-line at its 27 sites in the U.S., Hawaii and Japan, users said. Its LANs connect more than 25,000 PC users to mainframes that are linked via an IBM SNA network.

The Marine Corps uses Unix sparingly, mostly for "tactical" real-time systems deployed in combat, according to Lt. Col. Bob Shearer at Marine Corps headquarters in Arlington, Va. To integrate systems, the Marines may elect to use the X Window System to allow PC users to view mainframe and Unix server data, he said.

Framing re-engineering plans

Architecture is fast becoming a way for large IS organizations to protect valuable re-engineering plans from being ruined by changes in open systems technology.

Declaring a "profile" based on functionality, these users have the flexibility to plug new products into the architectural framework as they go along.

In addition to the Department of Defense, other organizations that have an open systems architecture include Charles Schwab & Co., The Chase Manhattan Bank NA and Sun Microsystems Computer Corp.

Insulation from specific products is key, as is storing business rules in high-level application code, users said.

"Do your homework first, have an architecture, have a standard tool set, have training and have a methodology," advised Gene Friedman, Chase Manhattan's vice president of applied technology.

Shopping limits

The New York bank has many global systems, including Unix servers, IBM mainframes and Novell, Inc. PC LANs. But its shopping list is short. "The issue is interoperability," Friedman said. "There is a limited set of things you can choose."

DMR Group, Inc., which helped the U.S. Marine Corps design its model architecture, advocates business process re-engineering, followed by technology adoption.

"Once you have an architectural framework, then you can hand off to the technology guys to operate creatively within the structure," said DMR's Boston director Robert Howie.

"Instead of arguing over [IBM] DB2 vs. Oracle [databases], you standardize on SQL," he said. "You can let 1,000 flowers bloom, as long they can connect." — *Jean S. Bozman*

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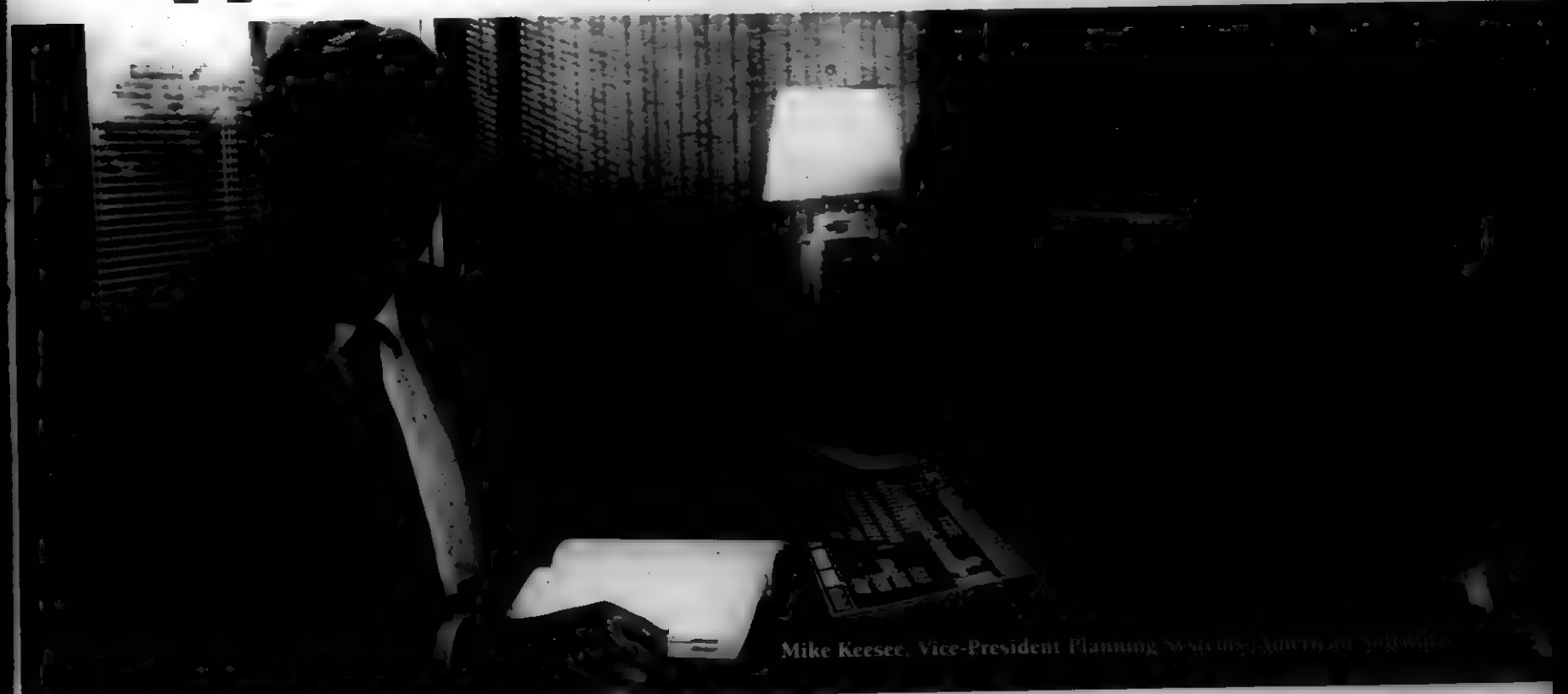

Mike Keesee, Vice-President Planning Systems, American Software

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The reaction at American Software to now working on the PC, Keesee points out, is very positive. "The developers will never go back to mainframe development again. No one here wants to return to mainframe development once they've had a taste of developing with Micro Focus Workbench™."

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Outsourcing

British Aerospace enlists CSC

$1.35B deal calls for outsourcer to buy most of client's IS assets

By Mark Halper

British Aerospace PLC finally chose its outsourcer last week, and in the process, demonstrated that large outsourcing deals are still as much financial arrangements as they are technological ones.

The 10-year, $1.35 billion deal with Computer Sciences Corp. calls for CSC to purchase most of British Aerospace's computer assets, from mainframes down to PCs, for $112.5 million.

Both sides expect to complete the transaction by this coming spring, after details and due diligence are worked out.

CSC, which edged out rival Electronic Data Systems Corp. in an evaluation that began a year ago, will save British Aerospace 15% in information technology costs. These costs are currently around $150 million annually, according to Len Milsom, information technology director at the $14.8 billion maker of weapons and commercial and military aircraft.

And the company could use the cash. Although its defense business has been healthy — UK defense cuts have been moderate and business with Saudi Arabia has been brisk — softness in the market for small commercial aircraft led to a loss of $300 million in the year ended Dec. 31, 1992.

CSC is taking over data center operation and consolidation, networks, distributed computing and application development. British Aerospace will use its savings to help move into new technology areas, Milsom said.

The Big $

The largest outsourcing contracts in the aerospace and defense business

Contract	Year	Amount
General Dynamics/ CSC	1992	$3B
McDonnell Douglas/ Integrated Systems Solutions Corp.	1992	$3B
British Aerospace/ CSC	1994	$1.35B

Money talks

The 10-year, $1.35 billion deal with CSC calls for CSC to purchase most of British Aerospace's computer assets for $112.5 million. An analyst who asked not to be identified said CSC beat out EDS because it offered more cash upfront.

The firm turned to outsourcing for several reasons, including an old-fashioned one, analysts said. "Cost was the bottom line," said Dean Witter Reynolds analyst Tim McCollum.

CSC will achieve the savings through systems consolidations and new technology implementation, Milsom said. For starters, CSC will consolidate eight IBM and Digital Equipment Corp. data centers, which serve 13 factories and the company's Farnborough headquarters, into two facilities, Milsom noted.

"There were inefficiencies in the way we were doing things," acknowledged Milsom, referring to the company's data centers.

The British Aerospace information technology chief maintained that the company entertained an internal proposal up to the end of the evaluation process, but he said CSC and EDS were both better able to generate cost savings and move the company into new technologies while it concentrates on its core businesses.

According to Milsom, the price tag of the CSC offer and the EDS proposal were virtually identical. British Aerospace chose CSC over EDS because it "felt more comfortable, and CSC had more experience in our line of work," he said, noting that CSC has a substantial list of defense contractor jobs, including a $3 billion outsourcing deal with General Dynamics Corp.

Architectures in flux

The exact shape and technological direction of the deal will be determined as CSC works out computing architectures with each of 13 different British Aerospace production sites, Milsom said. Some of those operations, starting with the smaller ones, will move to client/server architectures.

All clear

Questions regarding national security have surrounded the British Aerospace outsourcing evaluation ever since it began entertaining bids from American firms. British Aerospace said, "National security issues have been fully addressed."

Waiting game

CSC and British Aerospace expect to complete the deal by spring, but outsourcing contracts often take longer to close than anticipated.

About 1,250 of British Aerospace's 1,450 information technology employees will transfer to CSC, and about 900 of those individuals will continue to work on British Aerospace projects, Milsom said. The remaining 200 employees will stay with British Aerospace in managerial positions.

Employee walkout

Employee issues were a sticking point, just as they are in an ongoing outsourcing evaluation at the UK's Inland Revenue Service (see story below). Last August, about 200 information technology workers at British Aerospace's military aerospace site in Warton staged a one-day walkout in opposition to any outsourcing deal.

Milsom said British Aerospace has won assurances from CSC that the outsourcer will not cut workers' pay or benefits.

Labor pains

Employee objections have been a stumbling block in British Aerospace outsourcing negotiations. The labor backdrop for the UK's Inland Revenue Service's megadeal outsourcing evaluation is no less contentious.

Some 50,000 Inland Revenue workers joined a Nov. 5 nationwide strike of civil servants who object to the UK's "market testing" program of seeking private contractors to take over work performed by civil servants.

Inland Revenue information technology workers also walked out for a day last April, specifically protesting against any outsourcing arrangement, according to an Inland Revenue Staff Federation spokesman. And they have refused to work overtime, also in protest of an outsourcing deal, the spokesman said.

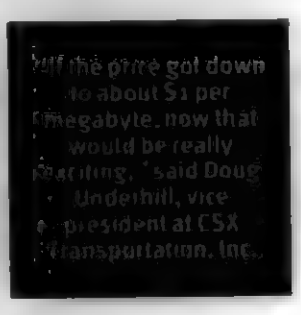
Inland Revenue is expected by next month to choose between CSC or EDS or keeping information technology in-house. — *Mark Halper*

IBM to unveil first mainframe RAID device

CONTINUED FROM COVER 1

level expected from the IBM unit. For its part, Storage Tek has said it will ship Iceberg in quantity "early next year" [CW, Nov. 1].

An IBM spokeswoman confirmed that the company will announce a high-speed and a RAID device in the first quarter, but she refused to provide any more details.



Both IBM's high-availability and RAID models will include 2G-byte, 3½-in. disk drives. The first device, tentatively named the 9390-HP, was characterized by Gartner Group, Inc. analyst Nick Allen as the "EMC stalker." It is said to feature an integrated controller and as such will not attach to the 3990 controller. It will include more than 2G bytes of cache storage to provide higher performance than today's top-of-the-line 3390 Model 3. List prices are expected to be about $5 per megabyte.

The RAID unit, called the 9590-HA, will have a maximum capacity of about 100G bytes per subsystem, which will allow for the space needed to store information required for RAID redundancy. It will attach to the 3990 Models 3 and 6, with performance roughly equal to that of the 3390 Model 3. List prices are expected to be about $7 per megabyte.

These high-end products are expected to appeal to customers who want some or all of their data in fault-tolerant or extra high-performance storage media. "We have some prospects" that might require those kinds of environments, said Thomas Woods, vice president at Halliburton Co., an energy concern in Arlington, Texas. "We do some work at the well sites with our customers, and we want to make sure that data is protected."

Other customers were less impressed. "I guess I'm just whelmed," said Doug Underhill, vice president at CSX Transportation, Inc. in Jacksonville, Fla. He said today's most current high-end disk drives, with street prices of about $6.50 per megabyte, have enough availability and performance for his needs. "If the price got down to about $1 per megabyte, now that would be really exciting," he said.

Nevertheless, Vellante said, IBM needs the new wares to help stem the storage unit's revenue declines, which have been averaging about 15% to 20% per year.

Corrections

Due to a production error, the second letter in the "Letters to the editor" section in the Nov. 8 issue omitted the name of the writer, Anthony P. Mayo at TeamWorks in Reston, Va.

Due to a reporting error, a story in the Nov. 1 issue incorrectly referred to Microsoft Corp.'s group product manager for Windows NT. His name is Greg Lobdell.

The full name of a Woburn, Mass., manufacturing software vendor mentioned in the Nov. 8 issue is Spectrum Associates, Inc., not Spectrum, Inc.

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Utility taps Oracle for customer service system

By Kim S. Nash

Loosened utility industry regulations have forced Duke Power Co. to revamp its technology infrastructure, starting with the construction of a customer information system built with the aid of Oracle Corp.

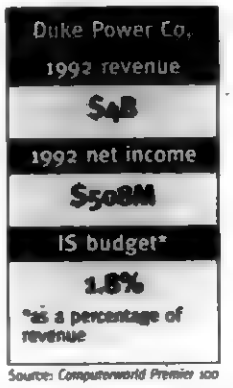
The $4 billion utility recently signed a $23 million software development and consulting pact with Oracle and is working with CSC Index, Inc. to re-engineer its customer service and other parts of the company. Duke provides electricity and other power to 1.7 million homes and businesses in a 20,000-square-mile area of the Carolinas.

The pact is part of a plan among utility firms to slim down to fighting form in anticipation of turf battles as power industry laws are increasingly relaxed. Northeast Utilities, for example, is counting on Asynchronous Transfer Mode networking projects to make it more competitive [CW, Nov. 15].

"Utilities are having to get more competitive all around, and technology is one key way to do that," said Joe Hunter, manager of information systems at Baltimore Gas & Electric Co. Hunter meets frequently, though informally, with IS chiefs at utility and manufacturing firms. Duke's planned customer information systems overhaul is not leading-edge, Hunter said, but "service is ever evolving, so there's no such thing as focusing on it too much."

For starters, Duke plans to toss out a 25-year-old, homegrown IBM mainframe-based customer information system in favor of a Unix version built on a template Oracle created with Pacificorp, a utility in Portland, Ore. The system will be based on Oracle databases and developed with Oracle tools.

Duke is the first user to engage Oracle Industries, a program announced in July to sell consulting services and prefabricated application templates designed for specific vertical industries [CW, July 19].



Source: Computerworld Premier 100

Customer choice

Like other utilities, Duke will be thrust into an open market next year, when the Energy Policy Act of 1992 kicks in to effectively free home electricity users to choose from several providers rather than be forced to buy from one regional player. Wholesale corporate utility customers have already received that freedom under the act. These free-market moves mean that for the first time, utilities will go up against rivals because consumers will no longer be locked into a single, like-it-or-not provider.

Thus, the push to re-engineer came from the business side of Duke, not IS, said Dan DuBose, manager of information technology at Duke's customer group. The utility's goals include the following:

- Shave response time to customer calls by 25% to 50%.
- Reduce Duke's software maintenance drain from 90% of IS staff's time and resources to 40% or less.
- Replace all character-based dumb terminal interfaces with graphical user interfaces.

DuBose said he is concerned about a lack of systems management tools designed specifically for client/server setups. However, he is sanguine.

"We're at the right moment in time" to ditch mainframe computing for client/server, he explained. "We're betting the tools will be there to let us pull this off when we want to deploy."

Oracle's utility template will help jump-start the application development process, saving developers anywhere from 20% to 40% of the time they would normally spend on creating systems in-house from the ground up, said George Wackerhagen, manager of customer group re-engineering.

Duke's two-year contract with Oracle calls for the customer information system to be delivered in two stages. In the first phase, to be completed by October 1994, Oracle is expected to convert Duke's mainframe data to Unix and create a streamlined billing system for industrial electricity customers. The rest of the system is due a year later and is scheduled to encompass home customers, possibly allowing them to pay electric bills and request information via automated teller machines.

Streamlining essential

Meanwhile, re-engineering work with CSC Index began early this year and is just now yielding blueprints for revamped customer service practices. Plans for streamlining customer inquiries, troubleshooting and power emergencies touch on the power and corporate groups as well as the customer unit, Wackerhagen said.

But because CSC Index continues to study and make recommendations for rethinking Duke's entire business — including customer service — Duke has reserved the right to make changes in the Oracle contract. "If we find, through re-engineering studies, that we don't need something from Oracle that we originally thought we did, we can take that right out of the contract," DuBose said.

Workin' on the railroad

CONTINUED FROM COVER 1

liveries arrive on time, compared with 90% for trucks. Although railroads have been making a comeback in recent years, truckers have trounced them with this competitive advantage in the last decade (see chart).

"We have to do a lot more to make our railroads look like one and the same to the customer, to get more seamless and make us more truck-competitive," said Chuck Schultz, vice president of management services for the Atchison, Topeka and Santa Fe Railway in Schaumburg, Ill.

General consensus

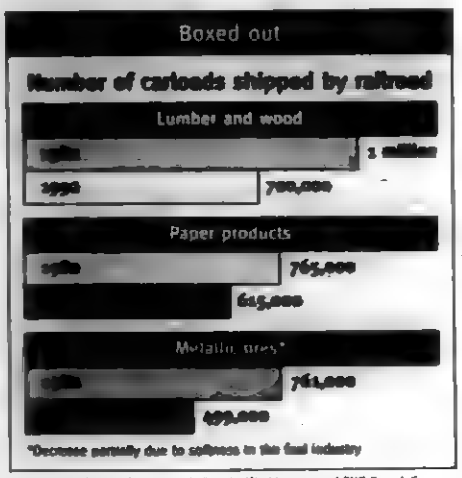
There was a chorus of agreement throughout the industry.

"Railroads have cooperated since the appearance of computers, but we recognize we have to cooperate more so that there will be much less differentiation between the two modes of transportation," agreed George Sekely, senior vice president at CSX Transportation, Inc. in Jacksonville, Fla.

Scott Flower, a railroad industry analyst at Kidder, Peabody & Co., noted that the technological cooperation is part of a trend among railroads to work together to offset trucking pressures.

For instance, railroads are working out deals to share track usage more than ever before, Flower noted.

"The railroads have realized that competing head-on with other railroads is not a profitable or intelligent strategy, and they have increasingly found ways to cooperate," Flower said.



Source: Association of American Railroads, Washington, and ENO Foundation

The first of at least two RFPs for the AAR's interline service management project seeks a provider for a central switch in an EDI scheme. The EDI network, which will conform to ANSI X.12 standards, will permit railroads to alert one another about schedules, schedule changes and cargo of individual cars and for entire trains. It will also allow them to swap rate information.

The manual process that railroads currently use to run those operations results in service delays to customers, said Charles Dettman, vice president of operations and maintenance for the AAR.

Dettman said the AAR is issuing RFPs to outsourcers such as Electronic Data Systems Corp. and Perot Systems Corp., as well as to the AAR's technology subsidiary, RailInc.

The AAR's plan is to have the first phase in place by January 1995. "It has to be because we are implying to our customers it will be there by then," said Ralph von dem Hagen, vice president of customer service at Consolidated Rail Corp. in Philadelphia.

Half of all rail cargo changes lines at least once, resulting in on-time deliveries only 70% of the time, compared with 90% for trucking. Railroads will use technology to try to even the score.

Central database

The second RFP will seek construction of a central database repository that railroads would use to exchange bills for one another's hauling services and possibly for repairs. Under the AAR's plan, all railroads would use standard customer file formats.

Other projects down the road would include EDI support of interline repair billing and computerized radio track-occupancy systems to replace antiquated technology such as colored lights.

The industrywide initiative must cope with the tension inherent when rivals try to cooperate on a project. As the industry fuses efforts, for instance, Union Pacific Railroad in Omaha and the Santa Fe line are marketing their own scheduling software packages to other railroads for internal use.

Individual initiatives

And individual railroads are undertaking their own internal information systems overhauls, such as Southern Pacific Line's recent outsourcing deal with IBM's Integrated Systems Solutions Corp. subsidiary, to try to get a leg up on the competition [CW, Nov. 15].

But the goal of the interline service management project, von dem Hagen noted, is to provide technology that would link the railroads, regardless of their internal systems.

Don Gagen, assistant vice president of customer service and systems at CN North America/Grand Trunk Western, Inc., the Detroit-based U.S. subsidiary of Canadian National Railways, agreed. "If you look at market share between the truck and rail industry these days, I think everyone will understand the rail industry better do something quickly," Gagen said.

PC surge at Texas utility goes to ISSC

By Mark Halper

A deluge of requests for PCs that raged out of control after Texas Utilities Co. lifted a purchasing freeze has led the $4.9 billion electric firm to outsource network PC services to IBM's Integrated Systems Solutions Corp. subsidiary.

"We had a two-year freeze on buying systems, and when we lifted it, the floodgates opened," said H. B. Keating, vice president of information technology at Texas Utilities.

The company's ability to handle PC operations and the rush of orders was also hindered by a hiring freeze and by head count reductions that had depleted the number of people available for staffing PC management, he added. The utility, which now has 10,600 employees, eliminated about a third of its work force between July and December 1992 through early retirement and voluntary departures, a spokesman said.

It also began a concentrated effort early this year to outsource other operations as it vies for business in an industry only recently opened to competition by the Clinton administration and the Energy Policy Act of 1992, which permits utilities to sell power in other utilities' traditional geographic areas [CW, Nov. 15].

"The whole industry is restructuring, and companies are doing some innovative-type things as competition comes in with passage of the Energy Act," noted Daria Roulett, an utilities analyst at Lehman Brothers, Inc. in New York.

ISSC bested offers from Dallas-based Electronic Data Systems Corp. and Chrysler Systems, Inc. in Oak Brook, Ill., to manage some 4,200 PCs linked via IBM LAN Manager and Novell, Inc. NetWare LANs for five years [CW, Nov. 15].

ISSC was chosen over EDS, Keating said, because the IBM subsidiary was thought to be more adept at handling the IBM OS/2 operating system that is widely installed at Texas Utilities.

The IBM unit will take over "the entire aspect" of PC and LAN services, including defining needs and specifications, purchasing, training, client/server installations and help desk operations, Keating said.

Keating said Texas Utilities will offer jobs to the 14 staffers and 10 contractors impacted by the contract. Those workers will also have a chance to interview with ISSC, he said.

Court upholds RBOC rights

The Supreme Court last week laid to rest lingering controversy over whether the nation's regulated local telephone companies should be allowed to provide information services.

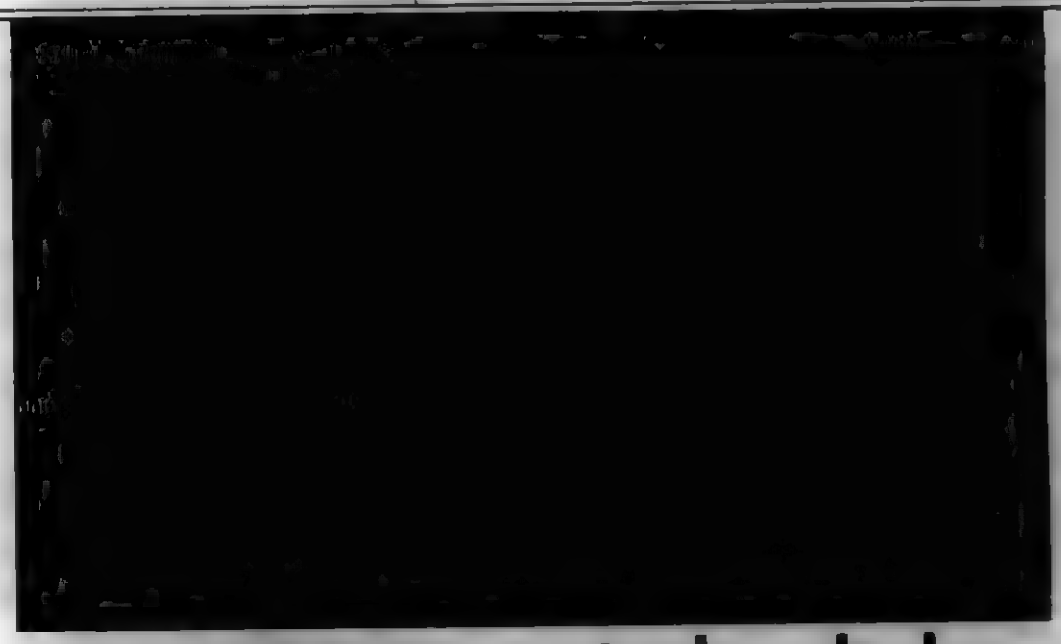
In a no-fanfare decision, the court gave AT&T's former Baby Bells the nod to continue providing information services, a right they have had since 1991 when U.S. District Judge Harold Greene lifted the ban on such services within the AT&T divestiture Consent Decree.

Last week's decision represented another regulatory deshackling aimed at allowing the invisible hand of competition to drive innovation and price competition in the local arena akin to what users have enjoyed in the long-distance market since 1984. Video programming is likely to be the RBOCs' next frontier.

"Regulators recognize that putting up artificial channels to keep [the telecommunications and computer industry] separate is not going to work," said Robert Rosenberg, president of Insight Research Corp. in Livingston, N.J. "It's clear they believe a free market is in the interest of the public good."

The ruling rejected arguments by would-be competitors that the regional telephone companies would have an unfair monopoly in information and other enhanced service markets because of its ownership of most of today's local telephone lines.

—Joanie M. Wexler



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IBM revamp

OS/2, AIX, PowerPC critical

By Ed Scannell
LAS VEGAS

Acknowledging that IBM has been complacent and sometimes out of touch with user needs, James Cannavino, senior vice president of strategy and development, promised to make the company's most aggressive push to date to build open systems that will empower users to better define their computing fates.

Speaking publicly for the first time as IBM's chief technical strategist at Comdex/Fall '93 last week, Cannavino said the troika of OS/2, AIX and the PowerPC chip will largely power IBM's client/server strategies for the rest of the decade.

Giving this message added weight was the solid backing Cannavino received from his boss, IBM Chairman Louis V. Gerstner. In a taped speech at the show, Gerstner said, "There is nothing more critical to us" than OS/2 and AIX, which he described as the twin pillars supporting IBM's future open platforms.

Eliminating any doubt that IBM is fully committed to the long-beleaguered OS/2, Gerstner noted the company is making major investments in OS/2-compatible relational databases, communications products and tools, as well as a budding consulting business.

Taligent support

Moreover, both Gerstner and Cannavino also made it clear that they are firmly committed to the object-oriented operating system under development by Taligent, Inc. IBM will eventually make available runtime versions of the Taligent operating system across most of its major host-based platforms, according to Cannavino.

James Cannavino

Big deal
Cannavino claimed IBM is negotiating with 50 OEMs to sign a deal for its PowerPC chip. He declined to name the companies or speculate on the prospects for closing some of those deals.

Louis V. Gerstner

"Any investment made by customers in OS/2 or AIX will only be reinforced in Taligent," Gerstner said.

Being open means supporting Microsoft Corp.'s Windows NT at some level, however, and Cannavino suggested that "if Microsoft ever sells enough of it," IBM might consider adding a Windows NT look and feel on top of WorkPlace OS.

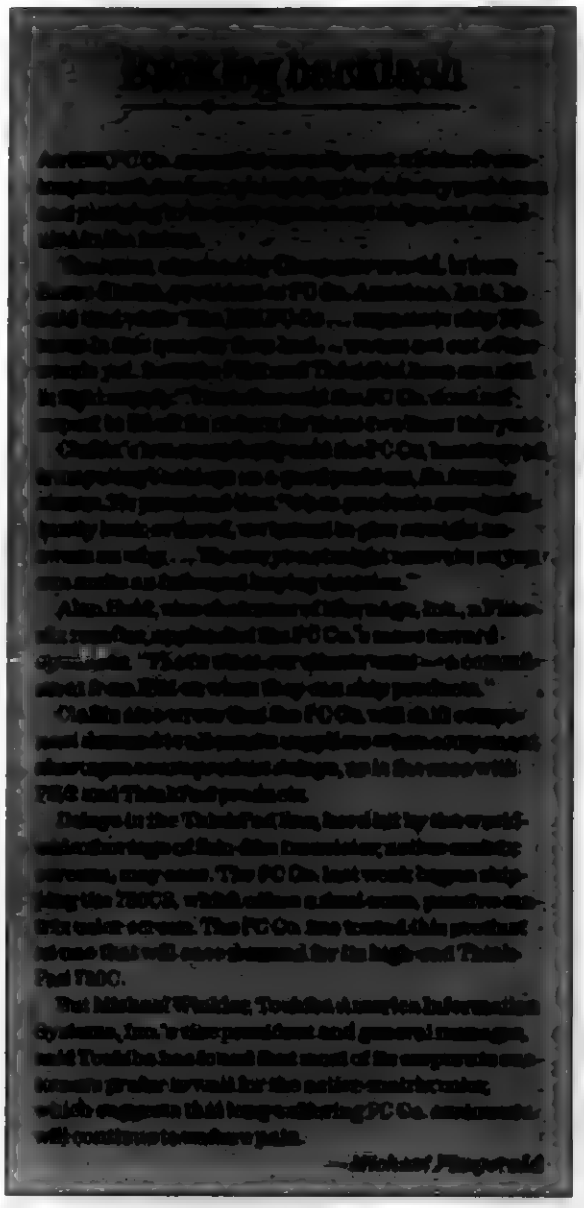
The right course

Most observers say they largely agree that IBM is now pursuing the right course in giving its customers the freedom they need to make the proper strategic decisions.

But with Microsoft hard-charging in corporate accounts with Windows NT and Advancer Server, some wonder if the company's decision to do so is too late.

"IBM is right in putting so much emphasis [on OS/2 and AIX] because clearly the growth area is software. But while IBM is holding on to its top 1,000 customers or so, Microsoft is eating everything else around it," said Rich Finkelstein, president of Performance Computing, Inc., a consultancy in Chicago.

Finkelstein and others agree that OS/2 has made a resurgence over the past three or months based on the stability of Version 2.1 and the validity of its long-term vision. But some say IBM still has a lot to learn about marketing outside its loyal corporate customer base.



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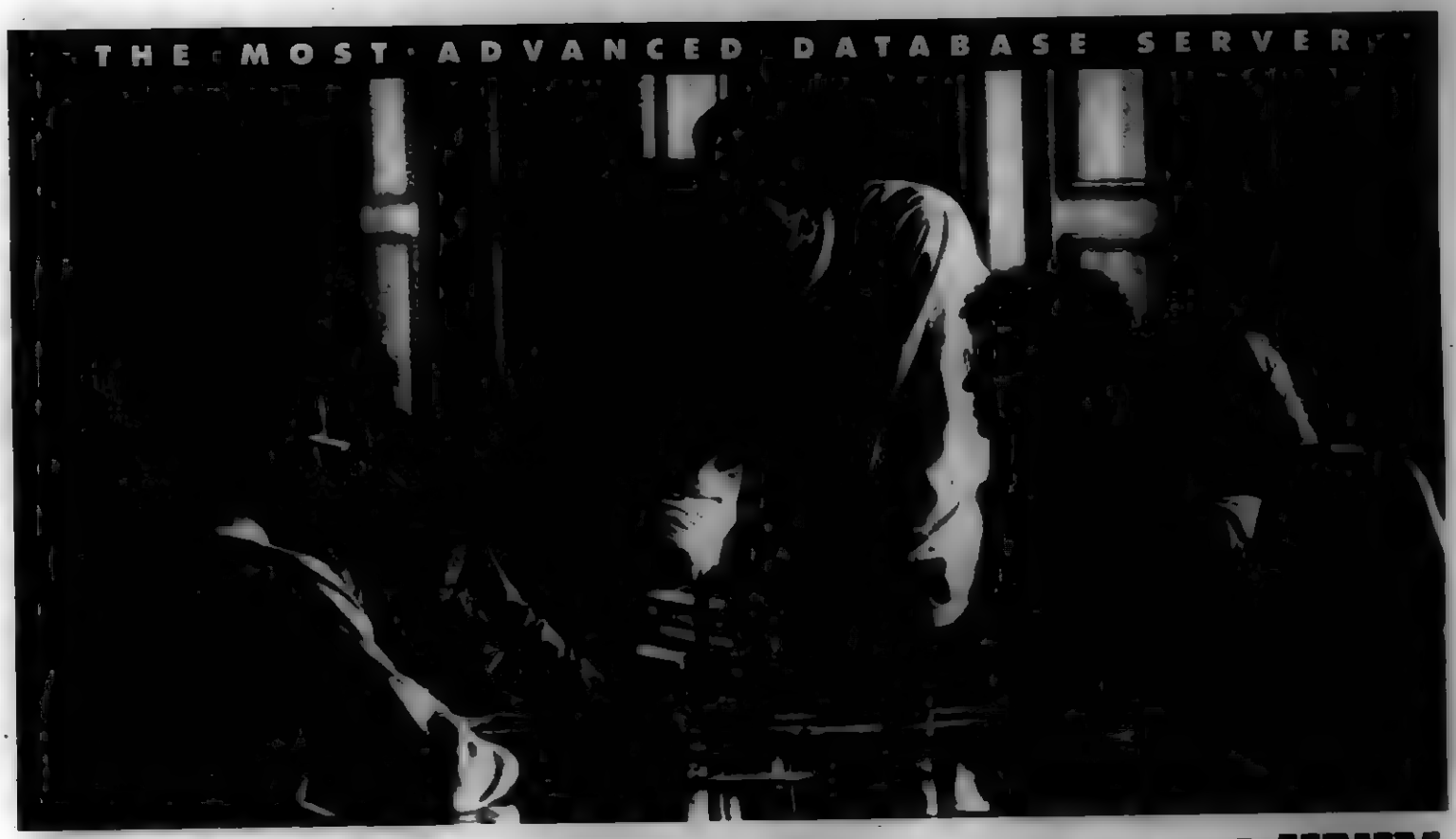

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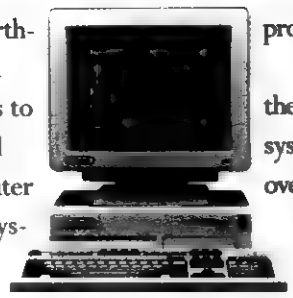

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Reporter's Notebook

▶ **Perhaps trying to be overly humble, Microsoft Chairman Bill Gates noted in his Comdex keynote speech that his company ranked "only" 20th in worldwide revenue. Gates said little old Microsoft chooses to specialize in just one area,** while the companies ahead of it on the revenue list make money in several market segments. He was quick to note, however, that Microsoft has business relationships with 18 of 19 firms ahead of it; **Sun Microsystems** is the exception.

▶ The omnipotent Microsoft was everywhere at Comdex, demonstrating Chicago for the first time (see story page 16), showcasing hundreds of OLE-compliant applications (see photo page 28) and even showing up in the humor column. During a session on network operating system standards, panelist Stan Schatt, director of LAN service at **Computer Intelligence/InfoCorp**, cracked the following joke: "How many Microsoft people does it take to screw in a lightbulb? None. They simply declare darkness a standard."

▶ If technology doesn't grab attendees, vendors reason that celebrities will. Stars abounded at various booths: **IBM PC Co.** had the comedian Gallagher and **Mannesman Tally** had ex-football star Gale Sayers, but **Motorola** had Brent Spiner, Lt. Data in *Star Trek: The Next Generation*.

▶ Of course, if all else fails, there's always flesh. A chunk of the show's multimedia contingent used cheesecake and pornographic clips in their technology demonstrations. Among the sexist offerings was a CD-ROM program used to "undress" *Penthouse* models.

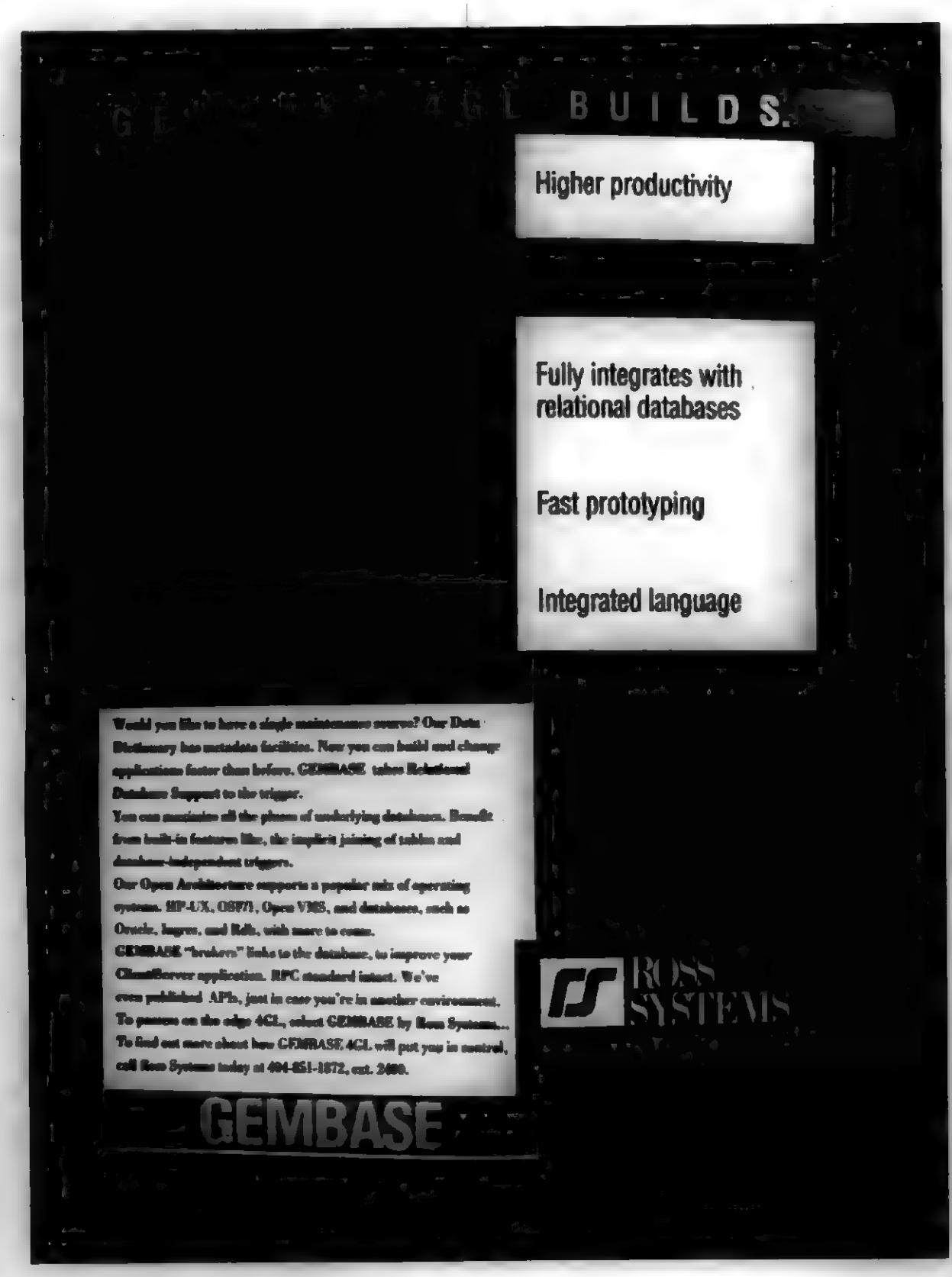
▶ **Apple**'s Newton may be dumb, but it can provide a new way to get you out of meetings. At least that's what it did for Apple CEO Michael Spindler when he demonstrated Newton during his Comdex keynote (see story page 29). He scheduled a meeting on his electronic schedule for a Wednesday lunch. The Newton misspelled Wednesday, then booked the meeting for a Monday. Spindler appeared not to notice and finished the demo by saying, "Newton will change the way you run a schedule."

▶ On the comeback trail is **Northgate Computer Systems**. The company says that not only is it back from the brink of financial death, but it is looking to be the first to market with a Pentium notebook. Though even **Intel** officials say informally that they do not expect to see Pentium notebooks shipping in volume until first-quarter 1995, Northgate officials said they thought they would offer a Pentium-based notebook as early as April 1994. The design will feature a fan built into the notebook casing and will weigh 6 pounds.

▶ PC-to-PC videophone systems from **Twincom** in Wilmington, Conn., drew oohs and ahs from onlookers. The PC video images and sound were smooth and synchronized, but the systems run only on a LAN, not across phone wires, a fact that bothered some potential users at the booth. The systems, to be available this spring, include a camera with speakers that sit on top of the PC, an adapter card and software for $1,995.

▶ Talk about negative reinforcement: **Interface Group** officials twice ordered **Micrografx** to shut down its booth show because its stunts were drawing too big a crowd. The company showed its graphics software being used to design in-line skates, capping the presentation with an eye-popping Rollerblading demonstration. Vendors in neighboring booths complained that the crowd was infringing on their space — and their business. By the way, Micrografx's chili cookoff raised an estimated $300,000 for the National Center for Missing and Exploited Children.

▶ Among the most sought after "gimmes" at Comdex was a CD called "Gates Unplugged." Featuring a picture of Gates with a laptop, the CD was a take-off on the recent spate of "unplugged" CDs that have appeared in the music industry. With the CD, users and developers can view state-of-the-art 32-bit Windows and OLE 2.0 applications.



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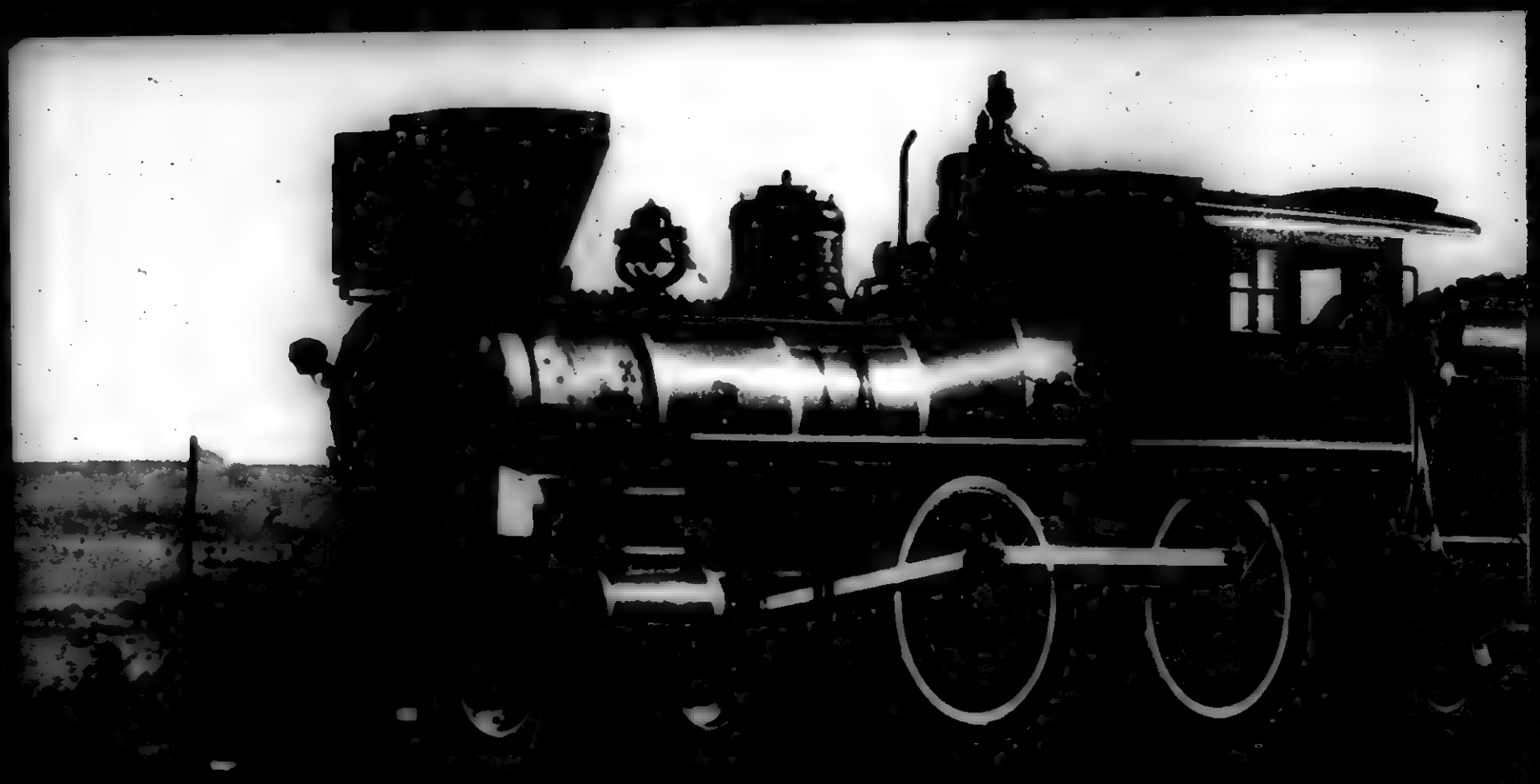

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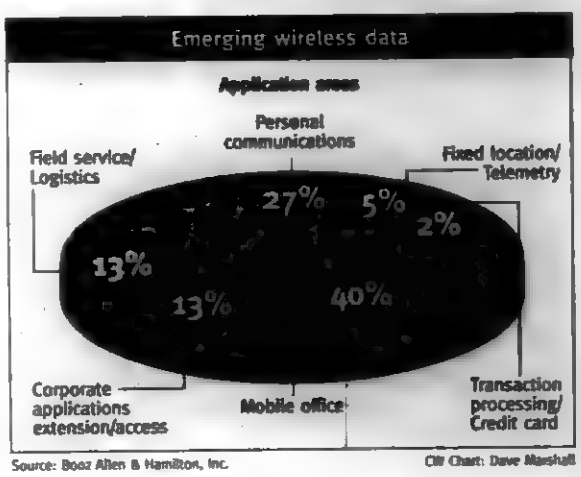
Cellular data services crystallize

By Lynda Radosevich
LAS VEGAS

Spurred largely by a massive rollout of new wireless data products and services, users at Comdex/Fall '93 said mission-critical wireless applications are less than a year away, and several said they will begin pilot projects by year's end.

Their plans indicate that wireless data applications, once relegated to pioneers such as United Parcel Service, Inc. and Federal Express Corp., are reaching wider acceptance.

"Wireless is in its teen years, not its infancy. We're starting to depend on it," said Eugene Hengel, director of strategic technologies at Insurance Value Added Network Services (Ivans), a membership-owned network services supplier to the insurance industry.



CDPD standard

Most of the wireless announcements here centered around the Cellular Digital Packet Data (CDPD) standard supported by IBM, McCaw Cellular Communications, Inc., the seven regional Bell operating companies and others for sending packet-switched data over existing cellular voice channels.

Dozens of vendors here, including McCaw, AT&T and GTE Corp., demonstrated CDPD networks and devices that are available now or are expected by the second quarter of 1994 (see story below). McCaw also disclosed an alliance with Lotus Development Corp. to CDPD-enable Lotus' workgroup products [CW, Nov. 15].

Users said they are attracted by CDPD's potential for broad coverage, security-enhancing encryption capabilities and network management capabilities using Simple Network Management Protocol and Common Management Information Protocol. Also, they said they like CDPD's ability to circumvent the high circuit-switched cellular connection charges incurred when sending data over analog cellular channels today.

McCaw and GTE were not ready to provide pricing specifics. However, a wireless applications developer close to the companies said he expected the average monthly bill to be $35 to $50 for a user who sends an average of two 1K-byte messages per hour. In comparison, the same use over switched cellular technology costs roughly twice as much. New pricing released last week from RAM Mobile Data gives users unlimited use on RAM Mobile Data's two-way wireless network for $135 per month.

Ivans, based in Tampa, Fla., typifies companies that are planning company- and industry-specific vertical applications. Ivans will begin piloting within 60 days for its members, including Metropolitan Life Insurance Co., The Travelers Corp. and Prudential Insurance Co., a wireless network that lets claims adjusters use circuit-switched cellular and CDPD networks to receive claims information and send completed claims to home offices.

"We've been thinking about this for a year, but now the technology is falling into place," Hengel said. Although wireless data services have been available from RAM Mobile Data and Ardis for roughly a year, CDPD is more attractive because of the sheer size of the cellular networks, he said.

Technology of choice

Travelers indicated that CDPD would be its wireless technology of choice in that "it will probably give better throughput" than other wireless technologies "because there is less overhead in the protocol itself," said Gus Bender, second vice president of telecommunications.

Bender said one of his hopes is that Lotus' relationship with McCaw will quickly result in Lotus' Notes groupware application running across CDPD to accommodate traveling executives needing wireless connections to Notes servers. To date, bandwidth limitations of existing networks have precluded Notes from running wirelessly.

Another major user, American Airlines, will begin piloting by the end of November wireless Sabre reservation terminals connected over CDPD links. American Airlines demonstrated a wireless Sabre terminal at McCaw's booth at Comdex. Officials at American Airlines, however, did not return calls for more details by press time.

Although they are counting on CDPD's benefits, users said some issues remain. For instance, because carriers are rolling out their CDPD services incrementally, nationwide service is not likely to be available before the end of 1994.

Until then, users can gain broad coverage by combining CDPD, circuit-switched cellular and packet radio services. To meet that need, Sierra Wireless, Inc. in Burnaby, British Columbia, showed a prototype modem that combines wire-line, CDPD and circuit-switched cellular options. The modem will be available in June 1994 for a price targeted below $800, according to a company spokesman.

Standard interfaces

Other efforts in this area include "standard" interfaces emerging from Motorola, Inc., RadioMail Corp. and the Asynchronous Protocol Standards alliance that link applications to wired and wireless networks [CW, Nov. 8].

Concerns over the regional providers' CDPD services not working together should be alleviated when the providers, including McCaw and GTE, begin interoperability testing by the end of 1993, said Charles Napier, a wireless data marketing director at GTE Telecommunications Products and Services in Atlanta.

Senior editor Joanie M. Wexler contributed to this report.

Data . . . phone home!

Wireless services are reaching a critical mass. Some examples discussed at Comdex include the following:

- McCaw announced commercial rollout of its CDPD network. McCaw said it will add New York, Dallas, Miami, Seattle and San Francisco by January and expects to complete its rollout in 105 markets by mid-1994.
- GTE said it will offer CDPD services in San Francisco and Houston in the third quarter of 1994 and will have service in 61 markets by the end of 1994.
- IBM demonstrated a CDPD module and cellular phone for its ThinkPad notebook computer running Lotus' Notes. The CDPD setup, including the phone (but not the ThinkPad or Notes), will be available in the first quarter of 1994 for $1,900, according to IBM officials.
- Several of the Comdex demonstrations used a CDPD modem from Cincinnati Microwave, Inc., which will be commercially available in the first quarter of 1994 for $495.
- AT&T and Advantis showed the Advantis Passport terminal emulation package running on the ThinkPad. Using AT&T CDPD system, the combination is meant to give users the ability to connect with host applications using a wireless network.

—*Lynda Radosevich*

ObjectView Tech Talk

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IBM 25T	$9,390	62.6	$150
HP® 715/33	$9,990	24.7	$404
DEC™ 300L	$7,920	45.9	$173
IBM 990	$147,800	126.0	$1,173
HP 160	$136,530	82.0	$1,665
DEC 4000/610	$131,728	94.6	$1,392

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Patent pyrotechnics

CD-ROM publisher claims rights to advanced multimedia retrieval technology

By James Daly

Software publisher Compton's NewMedia set off an uproar in the multimedia world last week when it announced it had patented a core technology used in thousands of competing multimedia applications.

The patent covers the retrieval of text, photo, audio, animation and video information from multimedia databases. The Carlsbad, Calif., firm rocked a Comdex/Fall '93 breakfast when it announced plans to seek royalties on the sales of competing CD-ROM applications, as well as similar search-and-storage techniques used with interactive television.

It will take industry attorneys and engineers months to decide if Compton's has a lock on the retrieval technology. An early examination by some legal experts revealed that Compton's claims may not be as broad as it thinks. "The patent acknowledges a lot of existing systems, so I'm not sure if they'll be able to lay claim to every search technique on the market," said Robert Barr, a patent attorney at the law firm Brobeck, Phleger and Harrison in Palo Alto, Calif.

Compton's President Stanley Frank said his company secured the patent in August but does not intend to use it to dominate the industry. He noted, however, that Compton's should "be compensated for the investments we have made."

"Nonsense," said Nick Arnett, president of Multimedia Computing Corp. in Campbell, Calif. "They're acting like they invented the multimedia industry, which is ludicrous."

Unique abilities?

Compton's developed its Smartrieve data retrieval technology in the 1980s to create its Multimedia Encyclopedia; it applied for a patent in October 1989. Compton's officials said their data retrieval methodology is unique because of its ability to explore databases of text or graphics that can be interrelated and yet searched independently of one another.

Patent opponents who fear the document could have a chilling effect on the budding multimedia industry said they plan to challenge the patent in court. Insiders said the Interactive Multimedia Association is mapping out its legal opposition and that other multimedia industry groups are considering similar moves.

Frank said Compton's will widely license its invention provided developers meet one of several conditions: They must use Compton's software development tools; jointly develop software with Compton's or give it the right to distribute their product; or pay an undisclosed royalty based on product sales.

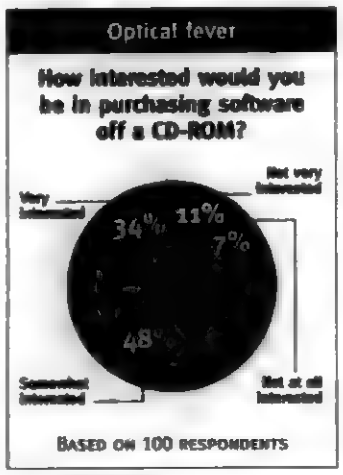
That is blackmail, Arnett said. "They're trying to intimidate people into signing distribution agreements so they can control the industry," he said. "It's not at all ethical."

The effect of the patent could be far-reaching. InfoTech, a market research firm in Woodstock, Vt., estimated that more than 7,000 CD-ROM titles will be available by year's end, many of them using graphical storage techniques similar to Compton's. Attorneys estimated the fee Compton's claims a right to will be about 1% of sales.

"And that cost will come right out of the pockets of the consumers," Barr said.

Compton's is one of the leading multimedia application producers, its most notable product being its Multimedia Encyclopedia. The company has 40 CD-ROM titles of its own and distributes 120 other programs from 22 software publishers. Last year, Compton's sales totaled about $30 million.

The patent also acknowledges that "this invention can be used with any information that can be stored in a database." Analysts said the patent could cover all new platforms that search multiple databases and are interactive, including interactive television and interactive digital entertainment.



Source: *Computerworld* survey

Reaction

Competitors cry 'shame'

A Comdex press breakfast held to publicize Compton's NewMedia's new multimedia patent disintegrated into a screaming session, as developers decried Compton's "arrogance."

Compton's announcement that it intends to charge a license fee for its patent raised a stink from competing vendors and analysts, who questioned how the company could claim a patent on a basic technology such as image retrieval.

"It's shameful you would even apply for such a patent — shameful, shameful," said Tomas Lansky from Munich Production Partners in Germany.

Peter Blakeney, manager of IBM's U.S. multimedia operations, agreed with Lansky: "The disappointing thing is it injects the industry with a level of uncertainty ... at a time when we're at a point of acceleration. This could dampen that."

Several analysts suggested Compton's may be trying to throw a wrench in the spokes of Microsoft Corp., its major competitor in the multimedia encyclopedia market.

View from the top

Microsoft Chairman Bill Gates, speaking informally, called Compton's patent claim "a joke. There'll be a thousand companies with single patent claims as more people" develop multimedia applications.

Gates said the issue was receiving more attention than it deserved and suggested that an entire publication could be devoted to single patent claims.

Gates also said Microsoft had an early multimedia encyclopedia at least six years ago.

— Michael Fitzgerald and IDG News Service correspondent Clair Whitmer

▶ **Microsoft** *last week showcased over 30 third-party applications that are in the process of adding support for OLE 2.0*

Borland Office gains ammunition

By Michael Vizard
LAS VEGAS

Echoing strategies already deployed by Microsoft Corp. and Lotus Development Corp., Borland International, Inc. last week outlined a 1994 suite strategy that calls for building visual scripting tools into Borland Office.

The tools will be layered on top of Borland Office 2.0, an upgrade to the Borland suite featuring tighter integration between Borland applications and WordPerfect Corp.'s namesake word processing software under an effort called Perfect Fit. The $595 Borland Office, which includes the Quattro Pro spreadsheet and Paradox database along with WordPerfect, is scheduled to ship next month.

Perfect Fit includes a customizable icon tool bar called the desktop application directory, a desktop finder that uses the same file manager across the suite, and the ability to use either Borland or WordPerfect icons on all the applications in the suite. Long-term plans include more use of intelligent agents, increased use of common graphical elements across applications and support for the Object Linking and Embedding (OLE) 2.0 and OpenDoc interfaces.

Once OLE 2.0 and OpenDoc are in place in 1994, it will be easier to use suites as components in custom applications.

Borland's strategy parallels Microsoft's recent move to include Visual Basic in its suite. With Visual Basic, users will be able to create applications on top of the Microsoft Office 4.0 suite, which will ship with all its components by year's end.

Meanwhile, Lotus has announced that it will include LotusScript, a graphical derivative of Basic, in SmartSuite in 1994.

But while these tools from Microsoft, Lotus and Borland promise to make application development somewhat easier for information systems shops, they also represent a double-edged sword. Maintaining quality control over applications that end users develop using the tools in the suite will be difficult.

Doq Baarns, president of Baarns Consulting in Sylmar, Calif., cautions that IS managers who pursue end-user-driven application strategies will run afoul of exceptions that have to be planned for when creating applications that many people will access.

Apple declares micro war

By James Daly
LAS VEGAS

Like the skinny guy who loses his girlfriend after getting sand kicked in his face by the beach bully, a newly muscle-bound Apple Computer, Inc. is ready to return with powerful new machines and take on all comers.

In last week's Comdex/Fall '93 keynote speech, Chief Executive Officer Michael Spindler said he intends to do microprocessor battle with market leader Intel Corp.

Spindler said his choice of weapon is the powerful RISC-based PowerPC, which is just one part of his multipart comeback strategy for Apple. His plan is to make RISC mainstream on desktops, making RISC boxes Apple's volume mainstay by the end of next year.

Apple's executive vice president, Ian Diery, forecasted that in the next 12 months, 25% to 35% of Apple's volume will be from PowerPC.

Other pieces of the strategy pie include the following:

- Putting multimedia everywhere.
- Offering superior price and performance. [Our PCs] "do more, cost less, fit in and stand out. It's just that simple," Spindler said.
- Applying technology leadership across the industry.

Apple's Michael Spindler *promises PCs that will 'do more, cost less, fit in and stand out'*

How are Apple's chances? Pretty good in the long run, say analysts who give high marks to the PowerPC and Apple's intent to support multiple operating systems. Apple will be the only PC company with a machine that can run DOS, OS/2, Windows, Windows NT, Unix and Macintosh software.

Apple's chief drawing card may be that it is the only PC company that has committed to an all-RISC platform at extremely aggressive pricing. "Never again will we use technology to price products higher, but we'll use technology to drive volume leadership," Spindler said. "Prices on Macintosh will be more aggressive than ever."

> With the Quadras, users get a desktop with an 80M-byte hard drive and built-in sound for $970 or less.

The initial PowerPC, the 601, sells for about the same price as an Intel 1486DX and delivers substantially better performance than the Pentium, especially on floating-point applications, according to Michael Slater, publisher of the "Microprocessor Report" in Sebastopol, Calif.

"Apple is at an incredibly delicate point in its evolution. If they bungle this transition, people are going to switch to Windows en masse. It could be catastrophic if they don't make that a smooth transition," Slater added.

Apple's recent introduction of inexpensive PCs, many of which can be upgraded to the PowerPC next year, also target Intel. With the new Quadras, for instance, users can get a desktop with an 80M-byte hard drive and built-in sound and networking for $970 or less. That's no more than an ordinary 1486-based machine.

Apple users said they were skeptical, however, about the new Quadra 610 that can run both DOS and Macintosh applications. It could appeal to Macintosh fanciers who need to use the occasional Windows application. But reservations remain about whether such a half-breed system will present operational difficulties. "Part of the magic of the Mac is that you have the hardware and software tightly linked," said Dave Lustig, manager of technical services at Bose Corp. in Framingham, Mass.

"You buy a Mac because it has the best operating system out there," said Bob Anderson, a senior analyst at A. O. Smith Automotive Products Co. in Milwaukee. "If I wanted a Windows machine, I'd buy a Windows machine." His company is an all-Macintosh shop, with about 400 machines in the main office and 200 to 250 spread throughout the rest of the country.

Others wondered about compatability problems. "A good part of the charm of the Mac is that the [operating system], the hardware and the applications are so tightly coupled," said Tim Yancy, a unit manager at Southern California Edison Co. in Rosemead, Calif. Yancy, who works with more than 2,500 Macintoshes, added, "Look at the compatibility problems when you run some software on different DOS machines."

Michael Fitzgerald contributed to this report.

PowerPC debut delayed; Apple seeks more support

Apple insiders say the company has backed off its original plan to unveil a PowerPC-based Macintosh in January.

Users should now look for a late February/early March introduction date, with shipments to begin the day of the rollout.

Apple had originally planned a January introduction to coincide with the 10th anniversary of the original Macintosh, with shipments of the PowerPC machines to begin in March, sources said. No longer.

Why the delay? Apple simply wants to build up a bigger head of steam in terms of native third-party application support. A few more names were added last week to the ranks of developers who have pledged native PowerPC applications at ship date, but the total number of those committed is only around two dozen.

Apple officials also announced that System 7 for PowerPC has gone into beta testing.

—James Daly

Millions served

Apple is expected to ship 225,000 RISC machines in 1994, about 15% of its expected overall Macintosh shipments, according to estimates made by analyst Pieter Hartsook, who publishes the Macintosh-specific newsletter called "The Hartsook Report." That number will jump to 2.7 million in 1995 and 3.5 million in 1996.

Application trends

Lotus cuts OS/2 pact; WordPerfect draws back

By Michael Vizard
LAS VEGAS

It looks like the major PC software vendors are ceding much of the OS/2 market to Lotus Development Corp.

Last week, Lotus extended its joint marketing and OS/2 development pact with IBM by allowing IBM salespeople to sell Lotus SmartSuite software directly.

At the same time, WordPerfect Corp., in a joint letter signed by IBM, announced it has canceled its plans to develop a 32-bit native implementation of its word processor for OS/2, a product that was once relegated to the back burner.

According to WordPerfect officials, the company intends to serve the OS/2 market through IBM's recently improved ability to run Windows applications on OS/2 desktop systems using its Ferengi technology.

"Those applications now run at very close to native speed," a spokesman said.

In fact, the only OS/2 sites that will require a native implementation of word processor and spreadsheet applications are the small percentage that use OS/2 for a high-end, performance-driven application, said Carter J. Luscher, an industry analyst at Gartner Group, Inc. in Stamford, Conn.

He said most sites will opt for the Windows implementation on OS/2 because it means they will be able to support a single set of applications across native Windows platforms and OS/2.

As a result, WordPerfect will focus its desktop OS/2 efforts on its current 16-bit Windows port for OS/2 and future 16-bit and 32-bit versions of Windows that will be compatible with Ferengi, a company spokesman said.

However, the company will support a native 32-bit implementation for OS/2 with WordPerfect Office, its electronic-mail server.

"We see native OS/2 as more of a server environment," said a WordPerfect spokesman. WordPerfect views the IBM deal with Lotus as being driven by the fact that Lotus is the only company that already has a suite available for OS/2, he added.

For its part, Lotus executives said the deal with IBM gives IBM more account control over OS/2 customers and allows Lotus to focus its sales staff on other desktop platforms.

"Lotus might get some advantage from this because a lot of suite sales may be driven by the minority platform. So shops that have Windows and OS/2 will probably favor Lotus, while shops that have Windows and Macintosh will favor Microsoft Office," Luscher said.

Far from perfect

- Citing the declining price per unit of software during the past two years, a WordPerfect spokesman said the company plans to layoff an undecided number of employees in 1993.
- WordPerfect's revenue per employee dropped from $184,000 in 1991 to $131,000 in 1992.
- WordPerfect Chairman Alan Ashton once again denied there are any merger plans between WordPerfect and Borland International, Inc.
- The company's move to outsource DOS support has resulted in longer response times. Some internal staff was shifted back to DOS to shore up third parties.

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Point of order

As luck would have it, there was a defining moment in the conference session I was chairing last week at the huge Comdex exhibition. It came as my panelists, representing the leading network operating system vendors, debated the issue of openness, as in what and who is open.

A gentleman responsible for nearly 2,000 LAN end users spread among three operating environments — Banyan, Microsoft and Novell — rose to speak. He didn't have a question to ask as much as a lament to share.

His boss, an Air Force general, wants to know why Novell users can't talk to Banyan users, who can't talk to Microsoft users, who can't talk . . . well, you get the gloomy picture.

It got gloomier. What this manager wants to do is what you want to do in building distributed client/server systems. He wants to mix and match network components to take advantage of the best features each vendor brings to market.

But the noninteroperability facts of life have him thinking that his best option might be just to choose one of the major providers and go with it, if only to prevent the general from asking him, "Hey, why can't our users talk to one another?"

In truth, the panelists had no satisfying answers for this beleaguered individual and they have no immediate answers for you.

Earlier in the week at Comdex I heard Jim Cannavino, IBM's newly minted chief strategist, declare that IBM is "totally open." When asked how this pronouncement would manifest itself at corporate sites, he was nonspecific, saying that the benefits would be manifest in terms of greater value to the customer.

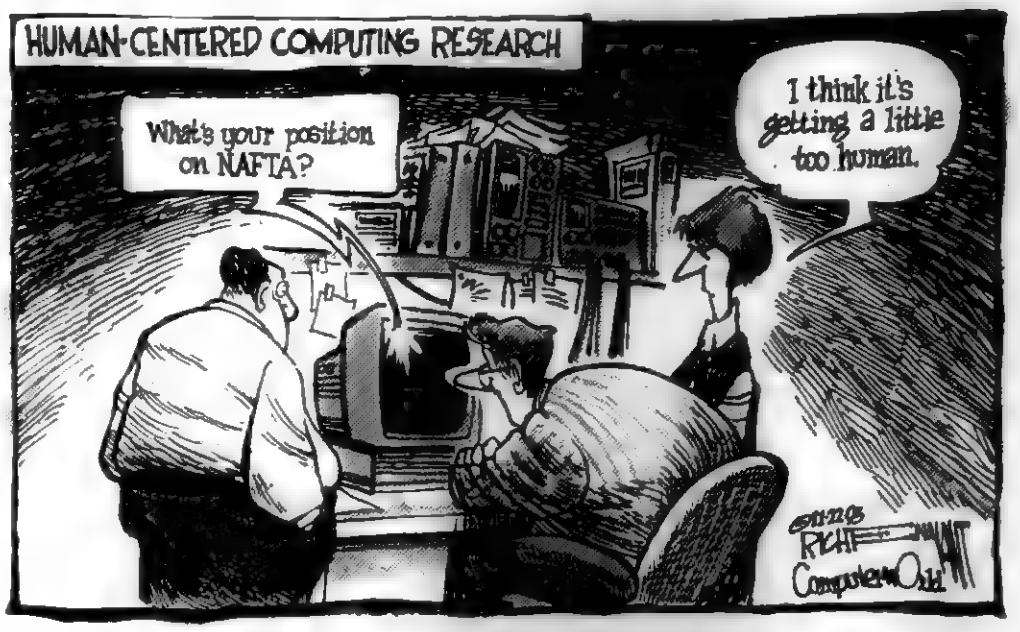
Meanwhile, Comdex itself was overflowing with an utterly mind-numbing array of information technologies, much of which really won't work well when hooked up to something else. It seems elementary to say, but I think more vendors ought to realize that hitching things up is what users do in a serious computing environment. Hitching things up and having them work together.

But while the leading vendors continue to lose themselves in semantical arguments about what is open, what is a standard and so forth, corporate customers seethe in utter exasperation as tensions mount and demands go unfilled in their companies.

Customers want a leader to emerge, dare I say, in the image and likeness of the IBM of old with respect to forcing order in the vendor community. They are not going to get one anytime soon. And this is causing some of them to mull some systems decisions based more upon expediency than on the open computing tenets they know they should be pursuing.

Bill Laberis

Bill Laberis, *Editor in chief*



Some say remedy, others say ruin

Regarding "Offshore programmers: Remedy or ruin" [CW, Nov. 1]: Corporate America needs to listen, watch and learn to be sensitive to cultural differences, both those represented by foreign mergers and those that emerge from changes in the domestic work force.

Pushing and taking has become our style. This style loses one very important asset — respect for the individuals who have strived, sweated and remained loyal to the end.

We need to correct, relearn and rethink our culture and consider people as well as the dollar. No one is afraid, Mr. Kruse, only concerned with tomorrow and the next lost job.

Gregory L. Sanders
Longwood, Fla.

While reading "Remedy or ruin" by Steven Kruse and Louis Buoncontri, I found both gentlemen to be correct. I've been managing computer professionals for more than 20 years and have operated an offshore programming company for seven years.

The best way to use foreign programmers is through software conversion.

Take advantage of your people's knowledge and let them do development. They know your business, the foreigner doesn't. Use the savings in cost and training to develop your shop's skills. There's minimal communication required in a conversion; the specifications are the old system.

Americans must learn to compete with foreigners by continuing to maintain our technological lead. I say to both men: Merge the talents and use the skills available. Quit complaining about losing jobs. Innovate and compete.

James Rotter
President
DBMS Software Services
League City, Texas

Louis Buoncincontri does not have any basis for making a comment that foreign programmers do not fully understand U.S. business terms.

I was part of a project team that worked on a welfare system in Napa, Calif. We were a staff of about 99.9% foreign programmers.

If we hadn't understood the business purpose of the programs we wrote, Napa's would not have been one of the top-ranked projects with Unisys and one of the best welfare systems to be implemented statewide in California. I strongly urge Mr. Buoncincontri to do some homework before blindly bashing so-called foreign programmers.

Srikant Ramabadran
Mastech Systems Corp.
Pittsburgh

In reference to "Remedy or ruin," I can't make up my mind whether Mr. Kruse is a pimp or slave trader. Both professions make their living selling bodies and making large profits.

Phil Conrad
Data processing manager
Mechanicsburg, Pa.

Different view of job statistics

In reference to "The white man's club" [CW, Oct. 18], the statistics presented in the article can be misleading.

Willie Fields states that "... the bar has been raised." If, indeed, the bar has been raised, the new level should be applicable to all, including minorities. On the other hand, the wall represented by that level of promotion beyond which minorities could not expect to progress, as referenced by Enrique Crespo Jr., should be torn down now.

I also have a hard time with organizations with names such as "Black Professional..." or "Professional Women's...." We only hurt ourselves when we fail to take full advantage of all our human resources, regardless of religion, gender or any other categorization.

Robert F. Weber
Bridgestone/Firestone, Inc.
New Philadelphia, Ohio

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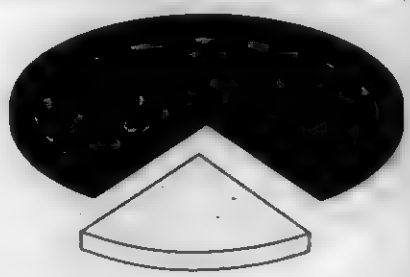

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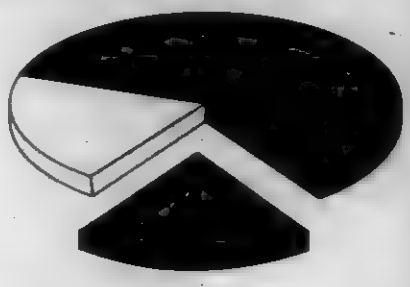

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What top executives don't know can hurt you

Rebecca A. Bailin

What top corporate executives don't know about their IS investments is sometimes shocking.

The CFO at a $127 million Pacific Northwest manufacturing firm tells me his company is moving its critical processing from an IBM mainframe environment to client/server. Changes will take place over a three-year period at a cost of approximately $4 million. "Gee," I say, "that kind of massive systems restructuring usually costs at least in the teens of millions."

He smiles a little. "That's what I've heard. I guess we're getting a good deal."

In the course of our discussion, several things become apparent: This executive has no idea that hardware costs are just a small part of downsizing; he doesn't understand how these changes will affect his business; and he believes his company can make this transition for one-fourth of what it normally costs, without incurring greater risk.

What's really appalling is that this situation is far from unique. At another company, a mid-Atlantic transportation firm, a project involving process restructuring and redeployment to client/server had been under way for a year-and-a-half. On the weekend before the original deadline, the president of the company asked how the impending installation of the new system was looking, unaware that the work wasn't even 10% done.

Corporate executives are abdicating their responsibilities when it comes to information systems, and IS managers must take part of the blame.

These officers aren't stupid. If either received a call from a stockbroker offering a no-risk 30% return on investment, they'd hang up the phone. How then could they get caught in such a naive position with so much at stake.

Simple. Corporate managers routinely suspend normal practice when it comes to information systems. Executives who would never approve other expenditures without a thorough understanding of costs, benefits and risks throw up their hands and either rubber-stamp projects that IS says will save money or insist on nonsensical hard-dollar benefit projections. In the latter case, IS managers often manufacture some good-looking numbers to get on with what they know is necessary.

General managers don't need in-depth knowledge of specific technologies. They no more need to know what the OSI layers are than they need to know how to build a manufacturing line with their bare hands. They do, however, need to understand what is being proposed, how it will affect their company and what it will take for the effort to succeed. They need to understand the risks and the trade-offs and take responsibility for making decisions with imperfect information.

Corporate executives aren't the only guilty parties here. IS executives are active participants in this little game. For far too long, they have implied that, without technical knowledge, general managers cannot make informed funding decisions and must simply rely on their recommendations. This may have increased their sense of power, but it has also meant that they've had to shoulder an inappropriate level of risk and responsibility.

Managing the risk and return of an organization is something CEOs, CFOs and line managers should do. It is not a job that CIOs should be shouldering alone. Corporate decision-makers have to educate themselves and start doing the job. And IS has to wake up and support, rather than sabotage, that education.

Bailin is a consultant with Lumin Corp., specializing in technology management and executive education.

Will we ever land in Cairo?

John Gantz

Cairo, schmairo. When I listen to discussions about Microsoft's object-oriented operating system, code-named Cairo, I have flashbacks that take me back almost 20 years.

Although the Justice Department never proved it, it was pretty clear back then that IBM had mastered the technique of announcing products that would never see the light of day simply to cause trouble for competitors. They were called "phantom computers."

I think Cairo is a phantom operating system just like Windows NT turned out to be, for all practical purposes, a phantom desktop operating system. Oh, bits and pieces of Cairo will show up in future Microsoft products, but portraying Cairo as *the* follow-on to Windows NT and *the* reason to port to the full Win32 API and *the* reason to embrace OLE 2.0 sooner, rather than later, is a little ingenious. There may be good reasons to do those things, but the promise of Cairo should *not* be one of them.

The Justice Department, Control Data and the others that sued IBM over the issue of phantom machines had difficulty proving IBM's intent. Pulling a product from market before it's shipped is not anticompetitive behavior. Never intending to ship it in the first place is.

Now I don't believe, in the hearts and minds of Microsoft's employees, there is an attempt to portray an operating system that will never exist. So in that respect, Cairo is not a phantom system. But Microsoft, by virtue of its market share and precision marketing, has learned how to use unannounced, undeveloped products as real forces in the market.

Think you might want to develop to OS/2's distributed object model? Better factor in Cairo. Think you might be ready to switch to Unix and DCE? Better factor in Cairo. Think you might not want to wait for Novell to catch up with your enterprise network operating system? Better factor in Cairo.

Cairo may turn up in bits and pieces, but the image of it as the follow-on to Windows NT is about as substantial as a desert mirage.

Microsoft is not alone in running future products up a flagpole — What is IBM's Workplace OS but a Cairo knockoff? — but Microsoft seems the most skilled at doing so and then changing plans later without repercussions. Windows NT sold the upgrade story for Windows 3.x until Windows 3.x was so successful it didn't need an upgrade story to gain converts. Now Windows has its very own upgrade path, and NT has been repositioned as a server operating system. Slick.

For users, there would be great entertainment value in watching Novell, IBM, Sun and others square off against a chimerical operating system if there weren't so much at stake in training programmers, writing to the Win32 APIs and waiting for the benefits of OLE 2.0 and Cairo to appear. (Sometimes I think Microsoft has three 32-bit Windows APIs simply to monopolize developer mind share.)

But maybe Murphy will intervene in our favor. If Cairo never appears as a full-fledged operating system follow-on to Windows NT, but Cairo technology finds its way into future versions of both Windows and Windows NT throughout the rest of the decade, maybe it's all for the better. We aren't ready for the object revolution yet anyway.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

Even dead, they're trouble. ◆ Dr. Jack Horner will tell you that. He's the man whose research brought the monstrous dinosaurs back to life in the hit movie *Jurassic Park*. And more than once, he recalls, he nearly lost the fight. ◆ "How did dinosaurs run?" the Montana paleontologist asks. "How fast did they grow? How long did they live? We would have been short of answers without some very sophisticated statistical

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Word 6.0 adds features, usability

By Garry Ray

Your training budget is skyrocketing. Users are frustrated. And here comes yet another word processor upgrade to begin the cycle all over again. Or so you fear.

However, Microsoft Corp.'s Word 6.0 for Windows should put your mind at ease. While this update includes an abundance of new features, it also offers enhancements that will make its original and newer functions vastly more accessible and effective.

Take its new Toolbar. Like Lotus Development Corp.'s SmartIcons, this array of icons can speed access to any number of functions that might normally be buried deep within menus and dialog boxes. In Word 6.0, the configurable Toolbar brings these to the forefront. What's more, you can customize the 13 context-sensitive Toolbars delivered with Word 6.0 to your heart's content by adding or deleting functions and tools.

Icon creation

Creating a custom Toolbar icon is as simple as clicking on a Word 6.0 command in the Customize dialog box and dragging the command to an existing Toolbar. A menu of icon patterns automatically appears on the screen, and you select the one you want to apply to your custom icon. You can also create a new icon with a drawing tool. Icons are easily removed from Toolbars by dragging them off the bar.

One of the best features for information systems shops and power users is that customized Toolbars, macros and other user-defined features can be stored in network-based template files. These can be manipulated through the new Word 6.0 Organizer.

For example, a template file might contain a group of corporate document formats with specialized macros and Toolbars for fine-tuning. You could store this template on a network drive as OURSTYLE.DOT. Then you could invoke the Organizer to copy one or more of the corporate Toolbars or macros into your own default settings template or load the entire corporate Toolbar in your normal start-up process.

Word 6.0 was designed to allow you to change any pull-down menu to your liking. If you don't like menu command Tools Options (which can easily be confused with the adjacent Tools Customize), it takes only a few mouse clicks to rename it Tools Configure Word. You can also add new pull-down menu commands based on macros or embedded Word functions.

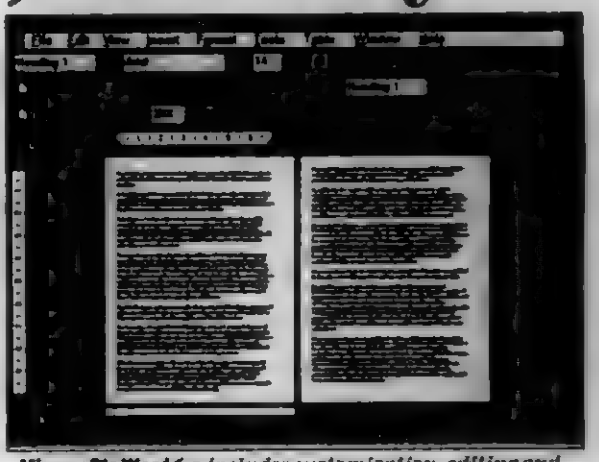
Even with this potential for customization, general users will be able to gain immediate productivity using default settings, menus and Toolbars. The new Word 6.0 background printing function eliminates the need for a coffee break during multipage print jobs.

File Finder

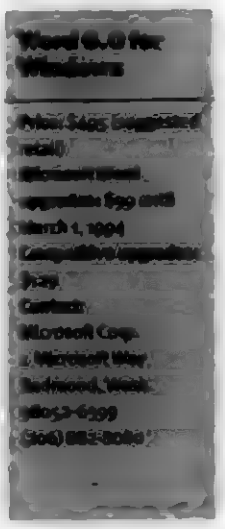
If users habitually open a group of documents to begin their workday, Word 6.0 makes it possible to select and automatically open any number of documents from the revamped File Open dialog box. The same objective can be accomplished in the new File Finder, a speedy file-location program that also supports a file previewer, printing and other functions. Files can be located across drives and directories.

Once users have loaded or created a document, Word 6.0 includes a wealth of features to ease editing and formatting. The powerful AutoFormat command will examine any document and automatically apply a series of document styles, fonts and formats from its active style libraries. At the end of this process, users can accept or reject each formatting suggestion.

In practice, AutoFormat is reasonably accurate and speedy. A 135-page ASCII document was reformatted in less than 10 minutes. While the document still required substantial tweaking and fine-tuning, without AutoFormat this process would have required far more adjustment.



Microsoft's Word 6.0 *includes customization, editing and viewing options*



Once users create a document, Word 6.0 offers a full-featured print preview mode. This provides everything from a thumbnail view of document pages to a Reveal Formats tool, which allows detailed examination of the underlying format information in any section of a document.

The View menu now includes a multipage view, which, in theory,

Word 6.0, *page 41*

Price Waterhouse to deliver object-based auditing system

Will use hypertext links, business rules

By Michael Vizard

In a move demonstrating how suites of PC applications are being used as elements of a custom application, Price Waterhouse has created an electronic auditing system composed of internally developed C++ code that runs in conjunction with databases, spreadsheets and word processing applications from Borland International, Inc. and WordPerfect Corp.

The Menlo Park, Calif., Price Waterhouse division plans to ship what it calls the TeamMate system commercially in February.

To build the system, the company used the object-oriented C++ to encapsulate PC applications as objects within the overall auditing application. By doing this, Price Waterhouse has been able to deliver an application that incorporates hypertext links and business rules, according to Chief Technology Officer Sheldon Laube.

Easy to share data

For auditors, the hypertext capability is particularly important because every document in an audit is invariably linked to another document or a footnote, Laube said.

Scheduled to ship in February, the TeamMate system is currently in beta testing at 10 corporations, including USX Corp., a diversified energy and steel company. What attracted USX to TeamMate was the hypertext links, which will allow its auditors to easily share data across applications for the first time.

"Auditors can now really share files, as opposed to working individually on their PCs," said Tom Smith, electronic data processing audit supervisor at USX.

This capability translates into less travel for supervisors, who no longer have to go to an audit site or wait for the end of the audit to do a review, and the ability for supervisors to handle larger caseloads, according to Fred Cohen, USX director of audits.

In addition, Cohen said it is easier to supervise audits because TeamMate has a built-in summarization facility that allows the supervisor to get a high-level view of the audit that flags anomalies.

"What we did was build in some business rules in the application," Laube said.

The cornerstone of the application is the Quattro Pro spreadsheet and Paradox database from Borland and WordPerfect's namesake word processing software.

Part of plans

To take advantage of the Price Waterhouse application, USX recently moved from the Symphony integrated suite for DOS from Lotus Development Corp. to Borland Office for Windows.

In the coming year, USX also plans to take advantage of Borland's Object Exchange facility to make it easier for users to exchange data without having to preconfigure a network or electronic-mail system.

"What we've been able to do is program in a lot of the hypertext links that Microsoft talks about with OLE 2.0 and replication services across the databases. But we needed [the capability] today, so we couldn't wait for Microsoft," Laube said.

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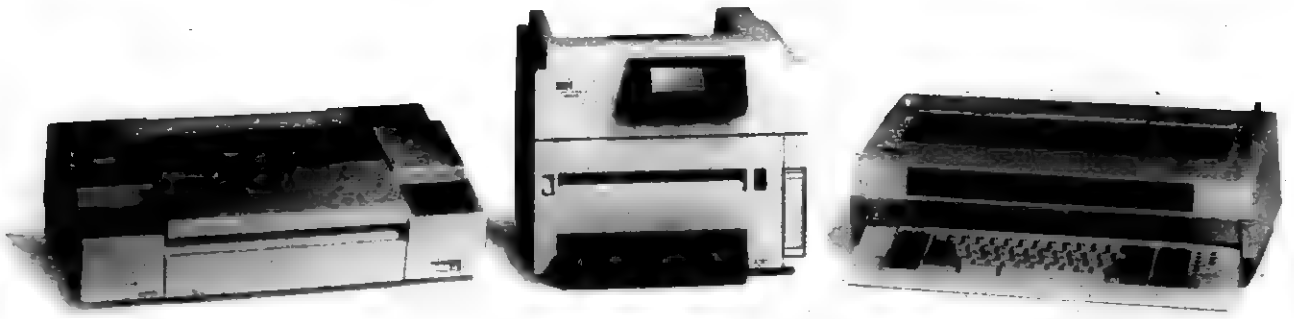

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Compaq, Duracell seek battery standards

By Michael Fitzgerald

■ If Compaq Computer Corp. and Duracell, Inc. have their way, notebook batteries will be getting much cheaper and easier to find.

The two companies, in conjunction with a number of other vendors, are pushing to create standard battery sizes for different types of portables, including notebooks, subnotebooks and handhelds. Currently centered on nickel-metal hydride technology, Compaq and Duracell will offer four different types of batteries, which Compaq will build into its future products.

Today, portable vendors contract with battery makers for a custom-sealed battery for each machine. Volumes are relatively low, which results in high costs. Unlike the camcorder market, which does have a standard battery size, batteries for portables can be purchased only from the vendor, not at retail stores.

Own interest at heart

Analysts reserved judgment on the initiative, saying it was possible that Compaq was trying to create standards out of its own technology.

"The one thing that makes sense is that it should lower battery prices because it gives the third-party manufacturers a way to build batteries in volume," said Janet Cole, an analyst at Dataquest, Inc. in San Jose, Calif.

Compaq and Duracell officials said their effort was made possible by industry trends.

"We talked to 60 OEMs, and it looks like the architecture of several types of devices is starting to settle down," said Norman Allen, vice president of new product sales and marketing at Duracell in Bethel, Conn.

Key to the initiative, observers and vendor officials agreed, is support from other vendor companies. While battery makers Toshiba Battery Co. and Varta Batterie AG support the plan, systems manufacturers other than Compaq are currently keeping a low profile.

Also, the world's largest portable maker, Toshiba America Information Systems, Inc., has no interest in joining the standard effort.

"For us, it's the wrong choice," said Steven Andler, director of marketing at Toshiba. Andler said that "to try fitting an industry standard battery into a machine means I can't innovate."

Toshiba, for instance, recently introduced a portable with the industry's first lithium ion battery.

AER Energy Resources, Inc. offers another battery technology called zinc air. At least four vendors plan machines around its developments.

Word 6.0

CONTINUED FROM PAGE 37

allows users to edit thumbnail pages. Because characters are virtually unreadable in a thumbnail view, the feature is unlikely to be useful for anything but large-scale formatting adjustments.

There is far more to Word 6.0 than can be described here, but suffice it to say that the word processor has been substantially overhauled. New features are both sensibly designed and well-integrated with the rest of the program.

New users will find it easy to get started with Word 6.0, and power users will find no shortage of enhancements to keep them occupied and productive.

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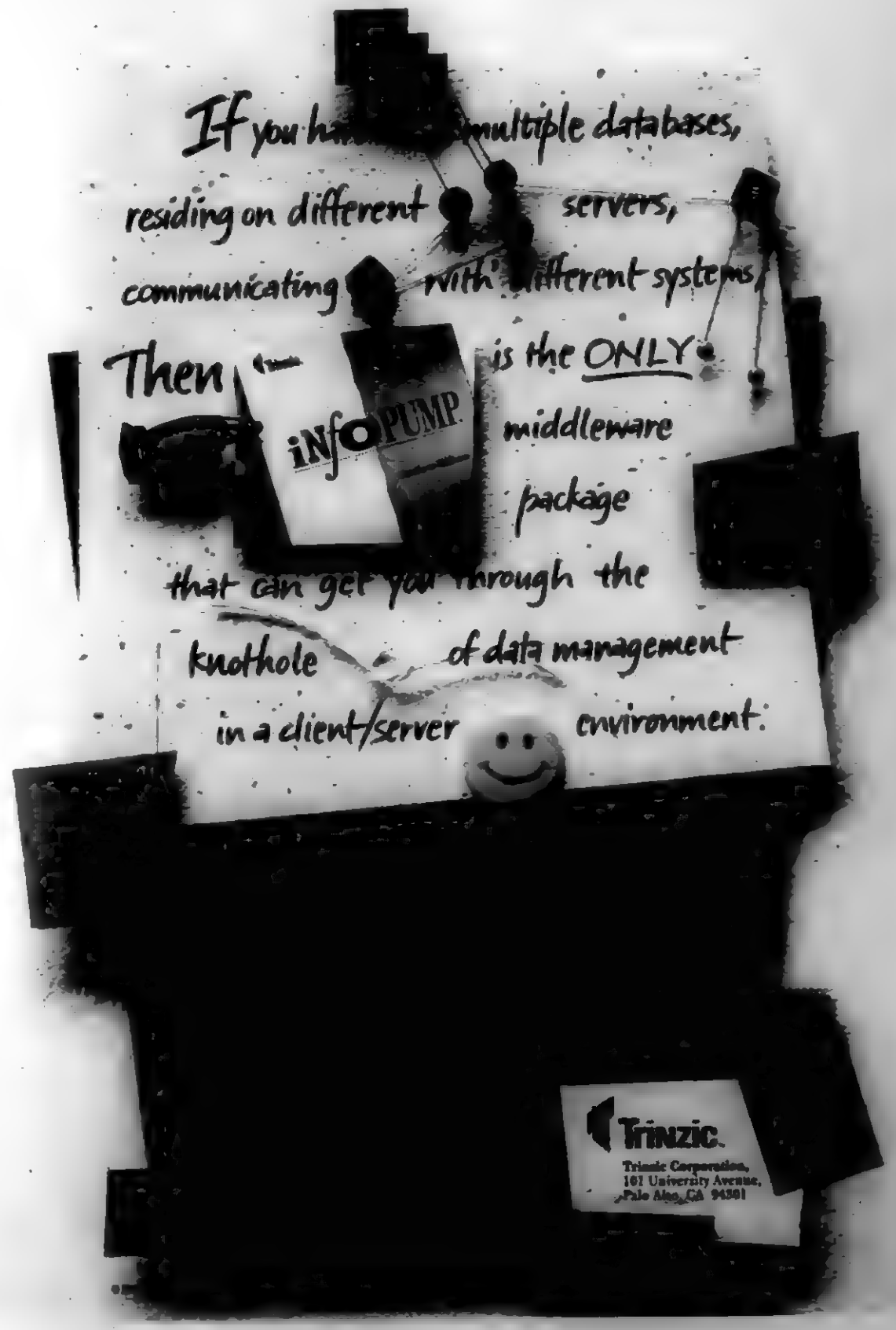

Midwest firms without data protection as rains begin anew

By Ellis Booker

As flooding began anew in the Midwest last week, chances were slim that businesses in the region were scurrying to alter their disaster recovery plans, if indeed they had any.

According to a recent survey commissioned by 3M Co., less than half of the 109 companies affected by the floods that swept the Midwest last spring had any kind of PC disaster recovery plan in place when the torrents hit [CW, April 20].

The telephone survey was conducted by Los Angeles-based Fleishman-Hillard Research, an independent division of Fleishman-Hillard, Inc.

Despite the apparent laxness indicated by the survey results, only 5% of all the firms interviewed lost any PC data because of the floods or subsequent power outages. Only 2% lost data because it was not backed up.

Daily backup not the norm

About 21% of the sites said they backed up their data in advance of the floods. But a whopping 38% of the respondents said that prior to the floods, they did not back up data on a daily basis.

Another third backed up only "some" or "none" of their data, and a slightly greater number stored most of their backup data on-site.

Interestingly, about half the businesses said individual users are responsible for backing up the data on their PCs. Floppy disks were the most prevalent backup medium (50%), followed by ¼-in. data cartridges (19%).

The study also found that only about one-fifth of the flood-affected businesses plan to modify their PC backup/recovery strategies. Those not planning to alter their plans gave the following reasons:

- The current plan is effective (56%).
- They had no significant problems with this year's floods (24%).
- They already back up data daily (13%).
- They already store data off-site (13%).

The top reason given by companies that conduct only partial PC backups is that the lost "data is easy to recreate" (20%).

Among those who had a disaster recovery plan in place, the most frequent solution was to move to another location to process data (26%). Just 20% of those with a plan said they had a document that instructed staff as to who to call and what to do in the event of a disaster.

BACKUP TIPS

SIMPLE BACKUP PRECAUTIONS FOR PC AND NETWORK USERS

- Back up modified files daily — except on Friday, when a full backup should be done.
- Create at least two sets of backup data each time a backup is conducted.
- Keep at least one set of backup data off-site.
- Back up original applications.

Source: 3M Co. Data Storage Tape Technology Division

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Slate Corp. has announced the Slate PenPower family of products.

According to the Scottsdale, Ariz., company, PenPower helps users take advantage of the flexibility and mobility provided by pen-equipped PCs without giving up the power of the applications they depend on every day.

Using Microsoft Corp.'s Office 4.0's open architecture, the products can integrate the functionality of pen and keyboard for enhanced input, control and navigation of applications running pen-equipped PCs. PenPower is available for Microsoft's Excel, PowerPoint and Word.

PenPower products cost $99 each.

▶ *Slate*
(602) 443-7322

Blue Sky Software has announced full support for Microsoft Corp.'s Word 6.0 for Windows with Version 2.6 of RoboHelp, its help authoring system designed for Windows and Windows NT.

According to the La Jolla, Calif., company, the product converts Word 6.0 for Windows into a help authoring system capable of producing Windows help files as easily as it does plain text.

Features include the ability for users to create hot spot graphics, to access all of the new features of the Windows Help Engine, to automatically convert existing text into a help system or a help system into user documentation and an Error Wizard that detects potential errors.

RoboHelp 2.6 costs $499.

▶ *Blue Sky Software*
(619) 459-6365

Storm Technology has introduced the PhotoDSP family of accelerators for Intel Corp.-based PCs.

According to the Mountain View, Calif., company, the PhotoDSP 800 and PhotoDSP 400 accelerate many commonly used Adobe Systems, Inc. Photoshop functions up to 10 times through the use of dual AT&T Digital-Signal Processors and accelerated software for performing Photoshop functions such as sizing images, sharpening edges and feathering.

The PhotoDSP 800 and the PhotoDSP 400 cost $899 and $399, respectively.

▶ *Storm Technology*
(415) 691-6600

COMDEX

Conner Peripherals, Inc. has announced the FilePro Advantage 810, a 3½-in. disk drive designed for advanced desktop computers, entry-level workstations and file servers.

According to the San Jose, Calif., company, FilePro Advantage 810 is a 1-in.-high drive that features an average seek time of 12 msec, an average latency of 6.7 msec and 810M bytes of formatted disk capacity.

Single-unit pricing is set at $690.

▶ *Conner Peripherals*
(408) 456-4500

Panasonic Communications and Systems Co. has announced two multifunction optical disc drive systems and one write once, read many optical disc drive.

According to the Secaucus, N.J., company, the three drives provide enhanced memory capacity and can be used for applications that require extensive data storage. The drives come equipped with a SCSI-2 interface for multiplatform compatibility and support operating systems that include MS-DOS, OS/2, Macintosh, Unix and Novell, Inc.

Prices start at $175.

▶ *Panasonic Communications and Systems*
(201) 348-7000

Logitech, Inc. has announced SoundMan Wave, an AT bus adapter card that supports synthesized music and digital audio recording/playback electronics.

The Fremont, Calif., company said features include FM and Wave table synthesizers, 100% SoundBlaster and Adlib compatibility, a five-channel stereo mixer, a CD-ROM interface and support for 8- and 16-bit stereo and mono files.

SoundMan Wave costs $349.

▶ *Logitech*
(510) 795-8500

IdeaFisher Systems, Inc. has announced a Windows-compatible version of IdeaFisher, a software program.

According to the Irvine, Calif., company, the program offers a tool bar that can be fully customized, offering a choice of more than 50 different buttons.

IdeaFisher's upgrade includes Randomizer and Synchronizer, two features that provide an expanded way to view and brainstorm ideas. Randomizer uses an algorithm that combines any list of ideas. Synchronizer allows for linked control of multiple windows.

In addition, the idea associations contained in the program's idea-thesaurus component, IdeaBank, have increased by 10% to more than 775,000.

IdeaFisher for Windows costs $199.

▶ *IdeaFisher Systems*
(714) 474-8111

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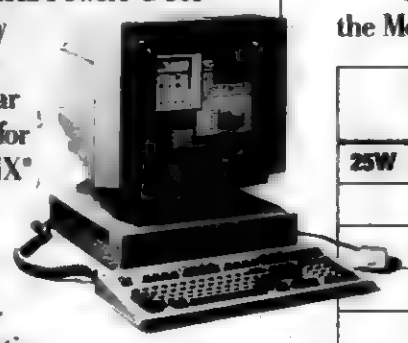

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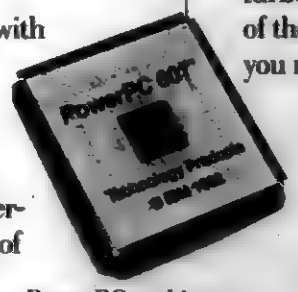

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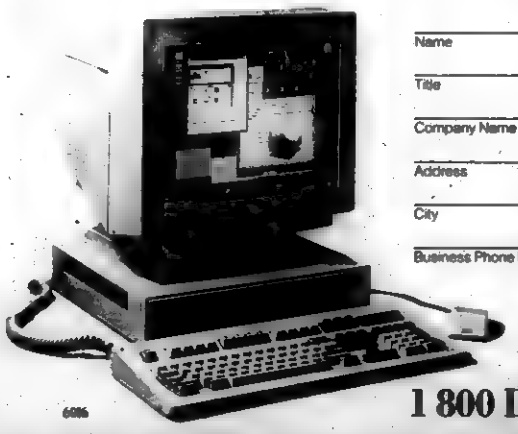

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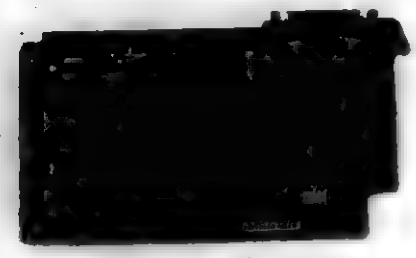

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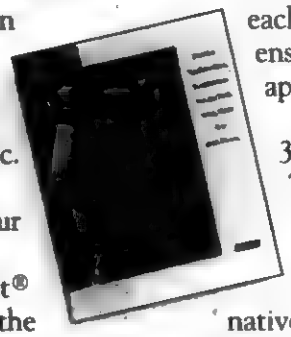

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RACAL

Microsoft ships Mail gateway

Builds bridge to AppleTalk networks

By Lynda Radosevich

Microsoft Corp. released a new version of its gateway between Microsoft Mail for PC Networks and Microsoft Mail for AppleTalk users, enhancing electronic-mail swapping and adding address list exchange capabilities.

Mail for PC Networks and Mail for AppleTalk are separate products, even though both include client software that works on DOS, Windows and Macintosh computers. Microsoft is phasing out Mail for AppleTalk, and most users are migrating to Lotus Development Corp.'s CC:Mail or Microsoft Mail for PC Networks, analysts said.

Customers at a Microsoft Mail users conference in April complained that the two Mail product lines do not work well together. The gateway is meant to help unify the products and aid the migration process. The new Version 3.02 of the Mail Connection Gateway supports functions such as shared address lists and file attachments.

The gateway requires a dedicated Macintosh running System 7.1 or higher, Microsoft Mail for AppleTalk Version 3.1C or higher and AppleShare workstation software or other software that allows shared access to MS-DOS.

Microsoft said it is providing the gateway software free to Mail for AppleTalk users.

A(O)CE in the hole

Microsoft also reiterated that its future Macintosh direction will be in the form of support for Apple Computer, Inc.'s Open Collaboration Environment (AOCE). That means that products working on the AOCE platform should be able to exchange information with Microsoft Mail servers.

Separately, NCR Corp. in Dayton, Ohio, said it will offer Microsoft Mail to buyers of its StarGroup LAN Manager product at 20% off the list price of $695 for 10 workstations. NCR and Microsoft have, since 1991, jointly developed and marketed the StarGroup software, which offers file and device sharing on TCP/IP networks.

Uniplex boosts office automation

Adds support for Windows clients

By Michael Vizard

Uniplex Integration Systems, Inc. in Houston has released Version 1.02 of its OnGo office automation system, which adds support for Windows clients, remote users, compound documents and electronic-mail packages from Microsoft Corp. and Lotus Development Corp.

In addition, Uniplex plans to make available by the middle of 1994 an add-on document management system that allows members of a workgroup to keep track of specific documents during their creation.

Maiden voyage

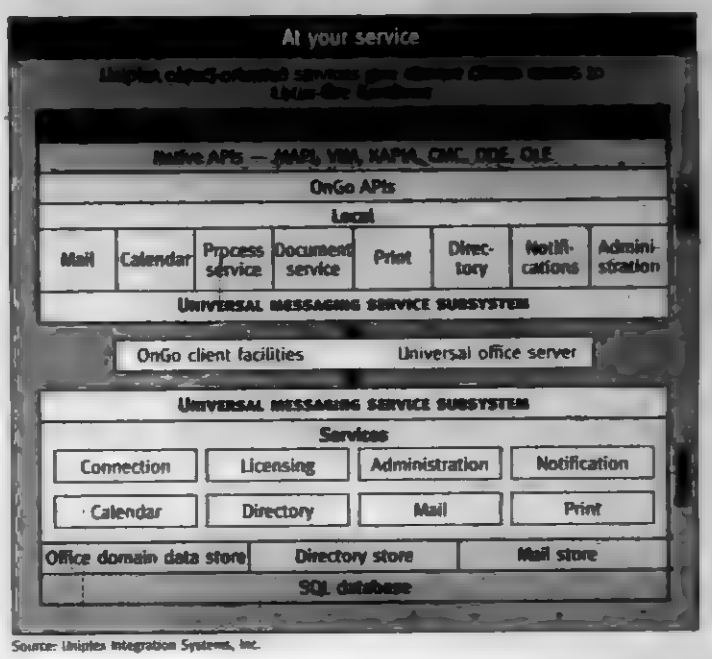
For Uniplex, the arrival of the new release marks the company's first move outside the Unix arena. As part of that effort, Uniplex will attempt to market OnGo as a client/server offering that makes use of robust Unix servers to support PC clients.

However, industry analysts noted that the downsizing of office automation applications off the mainframe has been dominated by PC LAN environments such as Novell, Inc.'s NetWare. As a result, Uniplex will have to work hard to establish Unix as an option for customers who might naturally look to PC LANs.

"Unix is pretty well-positioned because it has a more manageable infrastructure. The PC LAN approach is full of holes," said Mike Anderson, an industry analyst at Gartner Group, Inc. in Stamford, Conn. "People talk about a workgroup-centric strategy on PC LANs, but it doesn't have the management philosophy to back it up."

Seeking to provide a more robust systems management environment, Uniplex has layered various object-oriented modules in OnGo on top of a tradi-

Uniplex, *page 48*



Source: Uniplex Integration Systems, Inc.

Branch automation

Madge hub card to ease remote-site management

By Stephen P. Klett Jr.

Madge Networks, Inc. has announced a server-based Token Ring hub card aimed at easing the pains associated with managing branch-office LANs.

The $895 Smart 16/4 AT Hubcard was designed for remote, IBM SNA-based offices where managers want to install a Novell, Inc. NetWare-based LAN or integrate an isolated Novell network.

The hub card is part of Madge's branch office strategy, under which Madge will team with Novell to provide integrated products for what observers see as a market poised for fast growth.

By integrating hub functions into the branch-office server, Novell and Madge aim to provide a "LAN in a box" that will simplify LAN maintenance and manageability, reduce costs and streamline remote management.

John Depietro, an analyst at International Data Corp. in Framingham, Mass., said it was unclear if a LAN-based application could provide the same level of performance as the traditional SNA hierarchy. "Right now the separate pieces are stronger than the integrated pieces," Depietro said. "But [Madge] has a viable technology that has a lot of opportunity for growth."

The hub card is compatible with XT/AT bus or Extended Industry Standard Architecture servers and supports up to 10 Token Ring nodes connected by unshielded or shielded twisted-pair wiring. Three cards can be daisy-chained to support up to 30 users per server.

According to Madge, the Smart Hubcard automatically isolates network faults, such as a malfunctioning port, and redistributes the card's work load until the problem is corrected. The card also allows administrators to remotely manage the LAN via Novell's Simple Network Management Protocol over IPX and is compatible with Novell's NetWare Management System 2.0 and Hub Management Interface.

According to market research firm Forrester Research, Inc., 21% of Fortune 1,000 firms used LANs in their branch offices in 1993. The research firm expects that number to grow to 37% in 1994, a 76% annual growth rate.

"For the normal branch office with normal branch-office functions, this is a viable solution that shows a lot of promise," said Stan Schatt, an analyst at Computer Intelligence/InfoCorp in La Jolla, Calif.

For remote sites not hit with rapid growth and heavy transaction processing needs, Schatt said the Hubcard is a more cost-effective option than integrating the server into the hub, which vendors such as Cabletron Systems, Inc., Networth, Inc. and SynOptics Communications, Inc. offer.

Too early to judge

Users were intrigued by the hub card but said it was too soon to tell if it had a place in their environments.

"It sounds like something that may be useful to us, although it may be too small to meet our needs," said Randy Shaw, senior end-user services analyst at the Federal Reserve Bank of Baltimore. The bank has five locations, the smallest having 150 users.

"While we plan to keep our [IS] service centralized, this may be a viable solution if we choose to roll out servers to our branch offices," said John Scanlon, senior network analyst at Sun Life of Canada in Wellesley, Mass. "But then how do you do backup?" he asked. "We'd probably need someone out there."

Madge said it does not expect users to warm to the LAN-in-a-box concept overnight. "People are used to thinking about routers and hubs as separate entities and will need time to familiarize themselves with [this] concept," said Patty Rowland Burke, vice president of marketing at Madge in San Jose, Calif.

Edify offers voice response in work flow

By Michael Vizard

Edify Corp. in Santa Clara, Calif., has moved to enhance its work-flow software offering with support for voice-response applications and a variety of Btrieve and SQL databases.

Version 3.0 of Electronic Workforce, which is a set of canned objects that can be linked to automate a specific task, is intended to make it easier to automate any given task by linking objects that represent elements of that task using a point-and-click interface.

For example, TrustMark, Inc. in Charlotte, N.C., is building an automated voice-response application for banks using Electronic Workforce.

"The development environment is pretty elegant in terms of ease of use, and the applications we saw in it were pretty similar to what we wanted to build," TrustMark President Bob Van Art said.

Currently, TrustMark is using Electronic Workforce in conjunction with a Btrieve database, but the company expects to work with SQL databases in the long term. Among the databases supported in Version 3.0 are SQL products from Oracle Corp. and Sybase, Inc. and the DB2 database from IBM.

In addition to creating applications by linking canned objects provided by Edify, developers can also use Edify's Agent trainer software to create their own objects. Also available is software for managing work-flow applications that span multiple nodes.

Pricing for Electronic Workforce starts at $6,500 per agent and falls to $2,050 per agent in 100-agent lot quantities. General availability of Version 3.0 is scheduled for the first quarter of 1994.

Uniplex boosts office automation

CONTINUED FROM PAGE 47

tional SQL database. These modules handle specific tasks, and data can be passed among them as part of a process that can be layered on any standard SQL database (see chart page 47).

Passing Notes

Uniplex officials claim their approach to collaborative computing, otherwise known as groupware, is an advance over Notes from Lotus because it will support multiple data types on top of a standard SQL database, as opposed to requiring information systems to adopt another database engine.

In addition, Uniplex officials noted that the object-oriented services in Uniplex are capable of converting documents across front-end systems. As such, a document created in WordPerfect Corp.'s WordPerfect for Windows can be stored in OnGo on the Unix server. And when that document is called by a Unix client, it is automatically converted into the format of whatever word processor is being used on the Unix client.

When this capability is used in conjunction with an upcoming document management system module that will handle work flow and version control, Uniplex will be able to compete more effectively in the groupware space, said Larry Warnock, Uniplex vice president of marketing.

OnGo runs on Unix servers from IBM, Data General Corp., The Santa Cruz Operation, Hewlett-Packard Co. and Sun Microsystems, Inc. Pricing starts at $70 per user for 100 users.

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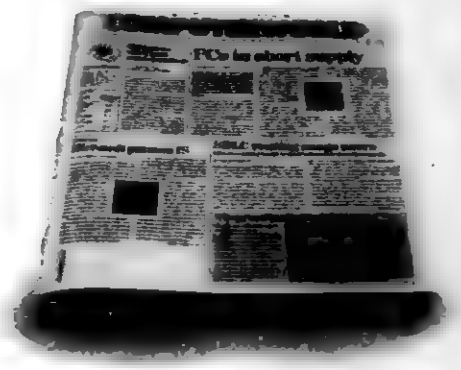

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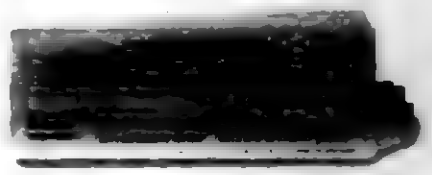

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There is a new source of computing power. It's capable of executing two instructions at once. It's produced processing speeds over 100 MIPS. It's the next generation of compatible power. It's called the Pentium™ processor. And this brief will tell you how its technology is making PCs run faster today.

THREE WAYS TO MAKE FASTER PCS.

Faster PCs start with faster microprocessors. And there are three ways to make faster processors:

1. Increase the number of transistors. Today, the use of sub-micron components lets designers fit more than 3 million transistors on a single chip. So we can integrate components such as math coprocessors and caches right onto the CPU—dramatically cutting access time.

2. Increase the clock speed. Twelve years ago the clock speed ticked along at a measly 4.7 MHz. Today we can run at an astonishing 66 MHz—and we're still pushing for more.

3. Increase the number of executions per clock cycle. Using new superscalar technology, our processors are now capable of executing two instructions per clock cycle.

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The Pentium processor can be described as a super-efficient factory. Its main assembly line is its superscalar technology—which enables information to be processed simultaneously through dual pipelines. To accomplish this, the pipelines divide up an instruction, then send it through five stages. As it passes from one stage to the next, the pipeline is free to begin another instruction. Speeding up operations substantially.

PUMPING DATA THROUGH.

The rest of the features on the processor are designed to keep that main assembly line working at peak capacity *(see diagrams)*. These features, along with the superscalar technology, help the Pentium processor to crunch more than 100 MIPS at a clock speed of 60 MHz.

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THINK OF IT AS A 64-LANE FREEWAY INSIDE YOUR CPU.

TO GET DATA REALLY MOVING, WE DOUBLED THE SIZE OF THE BUS ON THE FIRST PENTIUM PROCESSOR. THIS ALLOWS TWICE AS MUCH INFORMATION TO BE FETCHED AT ONCE. THERE IS EVEN A BURST MODE FOR HIGH-SPEED INFORMATION TRANSFER—SO MORE INFORMATION GETS TO WHERE IT'S GOING QUICKER. PLUS, AUTOMATIC DATA INTEGRITY CHECKING TO BE SURE THE RIGHT DATA IS BEING MOVED.

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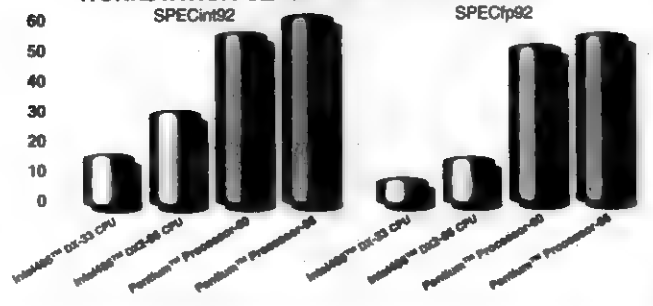

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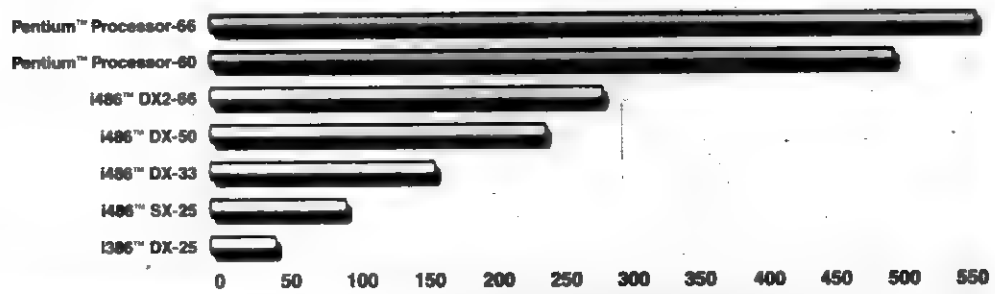

*The iCOMP index is an Intel microprocessor "horsepower" rating. It is a composite of selected performance measurements from SPEC 92, ZD Bench, and Power Meter. Source: iCOMP™: A Simplified Measure of Relative Intel Microprocessor Performance, Intel Corp., 1992.

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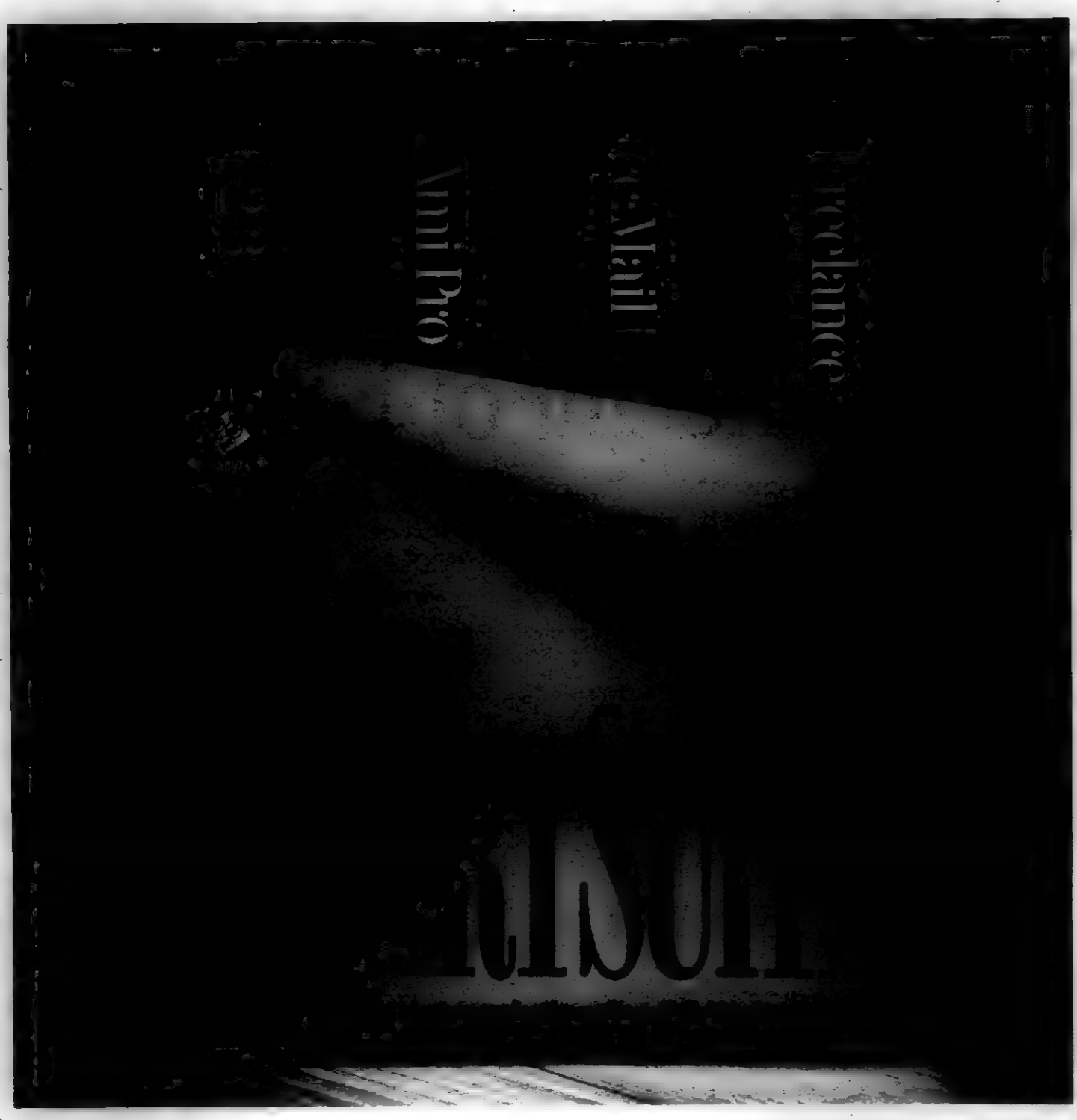

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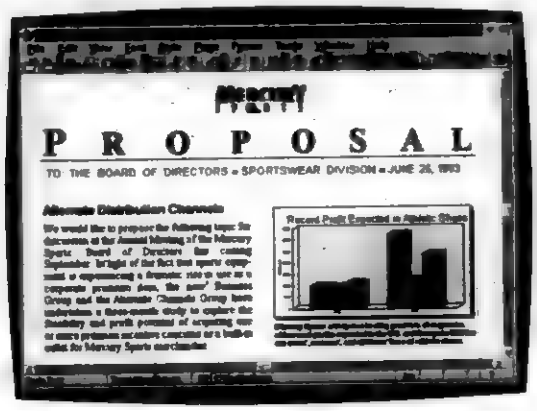

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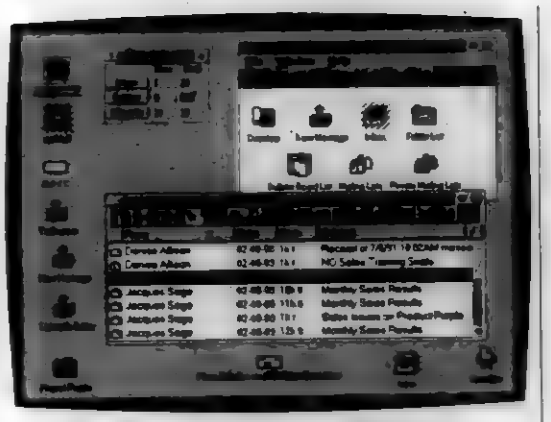

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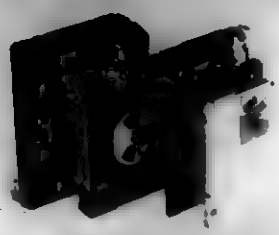

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Raxco, Inc. has announced Version 3.0 of Security Toolkit/Unix, a security assessment tool for Unix systems.

According to the Rockville, Md., company, this version facilitates the automation of regular and systematic security checks and ensures proper security implementation across Unix networks.

Version 3.0 provides a networkwide security summary of all the specified hosts and includes numeric ratings that can gauge improvements in system security.

The product also provides a remote installation mode, modeless dialog boxes and a File Access module.

Security Toolkit/Unix is priced between $250 and $9,790, depending on platform.

▶ *Raxco*
(301) 258-2620

Wyse Technology, Inc. has announced that it is shipping The Santa Cruz Operation's MPX Release 3.0 multiprocessor extension bundled with the Wyse Series 7000I multiprocessing platform.

According to the San Jose, Calif., company, the Series 7000I offers a linearly scalable multiprocessing operating system and server platform with automatic CPU load balancing and dynamic disk caching.

The Series 7000I employs a 64-bit wide, asynchronous zero-wait state bus and can use the maximum performance levels of Intel Corp.'s I486 processors.

The Wyse server can accommodate up to 250 users.

Prices start at $14,695.

▶ *Wyse Technology*
(408) 473-1200

Pillar Corp. has announced FyPlan Version 1.5, client/server budgeting and forecasting software.

The Foster City, Calif., company said it added a number of dimensions in which a budget can be viewed and analyzed and that FyPlan is fully interoperable in both Windows and Macintosh environments.

Pricing for FyPlan 1.5 starts at $19,500 for a five-user system.

▶ *Pillar*
(415) 349-6200

Sequent Computer Systems, Inc. has announced the WinServer 500, an entry-level member of the WinServer family of application and database servers running Microsoft Corp.'s Windows NT.

According to the Beaverton, Ore., company, WinServer 500 was designed for use as a departmental database server or LAN consolidation server, or for small workgroups.

The system includes 24M to 384M bytes of memory with parity checking, disk storage ranging from 1G to 18.9G bytes, two integrated fast SCSI channels and Windows NT Advanced Server preinstalled.

Prices range from $13,200 for the base configuration to $61,900.

▶ *Sequent Computer Systems*
(503) 626-5700

Mobius Computer Corp. has added three high-performance graphical workstations to its Mirage Series of SPARC/10.

According to the Pleasanton, Calif., company, the Mobius Mirage IPS/10 Model 51 is a 100%-compatible clone of Sun Microsystems, Inc.'s SPARCstation 10 Model 51; it can be field-upgraded to the multiprocessing models.

The IPS/10 Model 52 is a clone of Sun's dual-processor, SPARCstation 10/52 and offers a TurboGX+ graphics accelerator with 1,600- by 1,280-pixel resolution.

The IPS/10 Model 54 is a clone of the quadprocessor, SPARCstation 10/54, and also provides the TurboGX+ graphics accelerator.

Prices range from $11,995 to $26,995.

▶ *Mobius Computer*
(510) 460-5252

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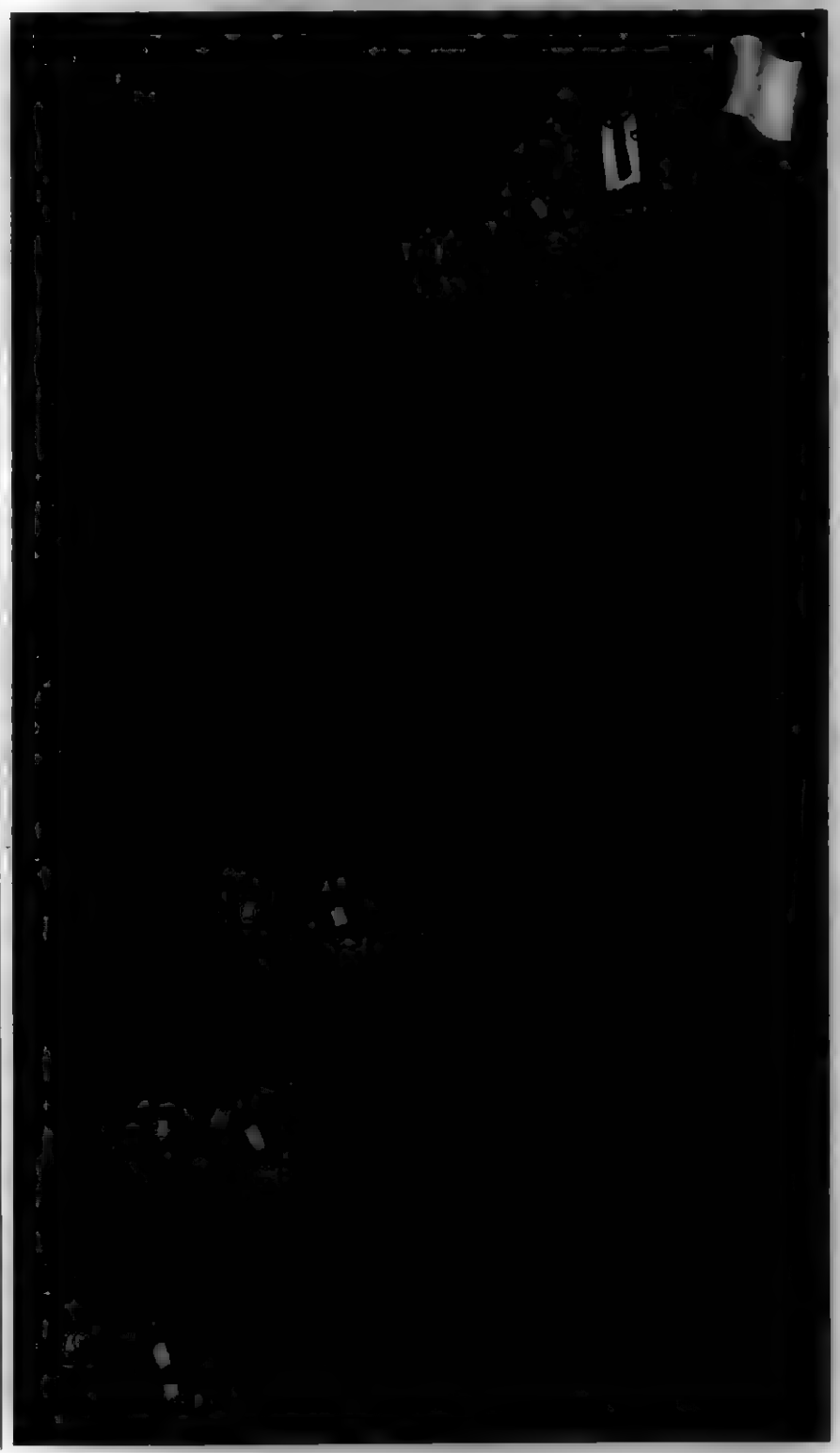

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If you're looking for availability in an open system, be prepared for another disappointment. The special programming a high availability solution requires almost always turns it into a proprietary system. No one can tell you what it's really going to cost to implement or how many vendors it will take.

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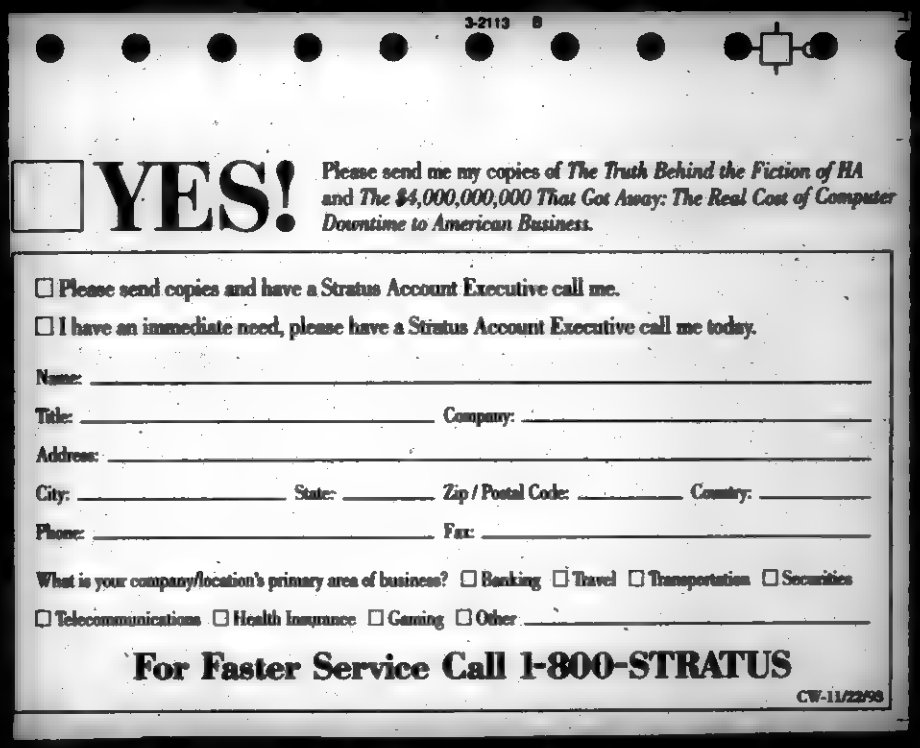
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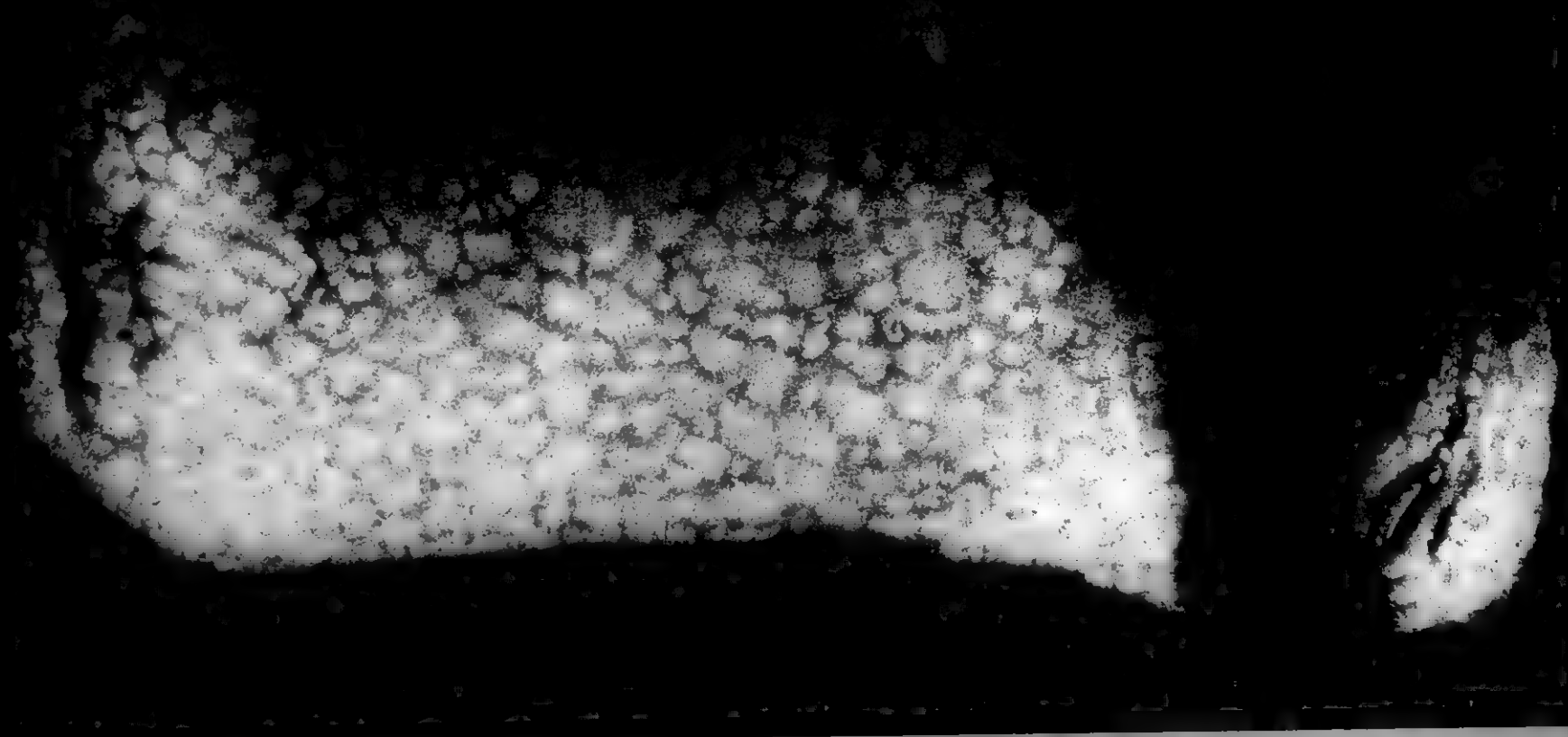

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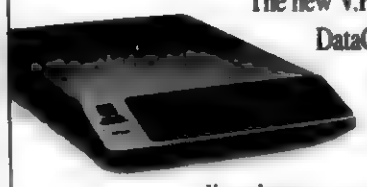

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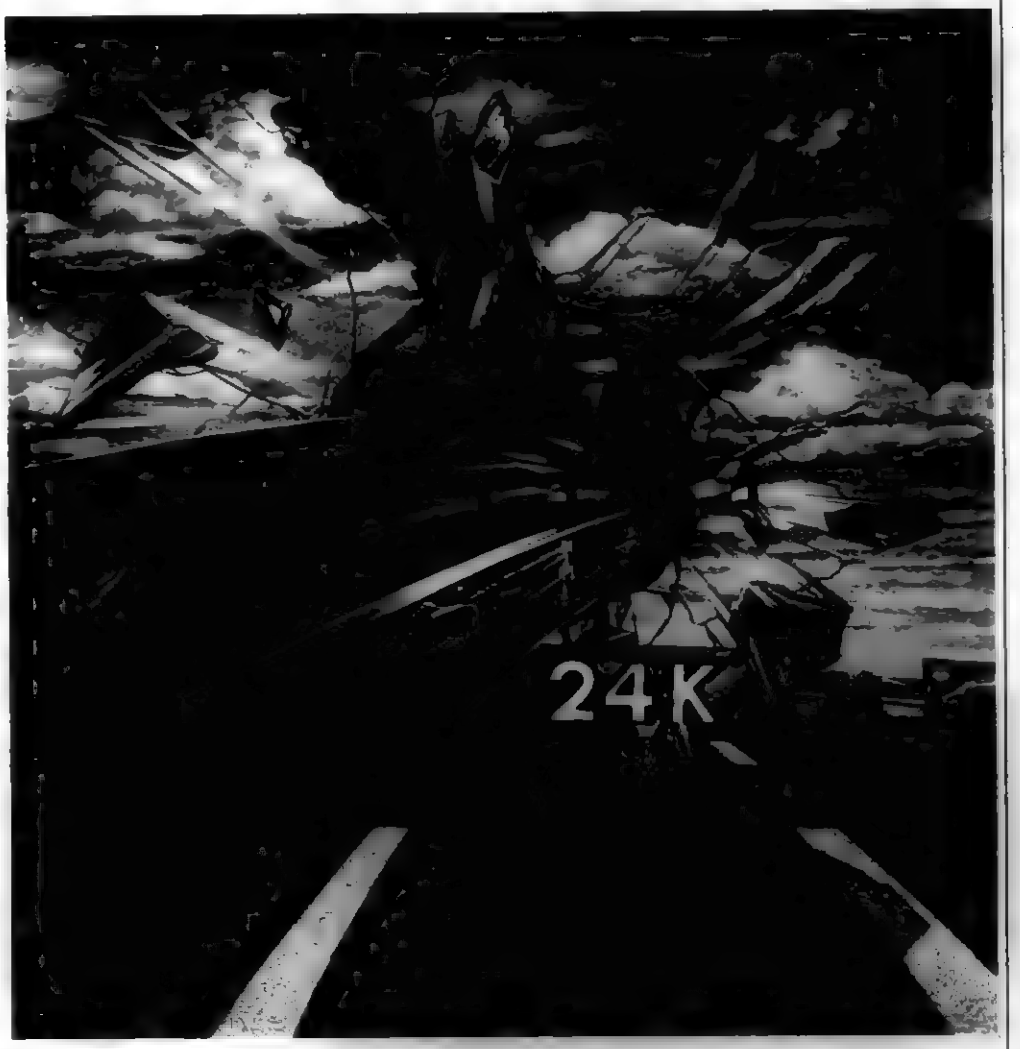

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ISDN access provides cheaper Internet links

By Joanie M. Wexler

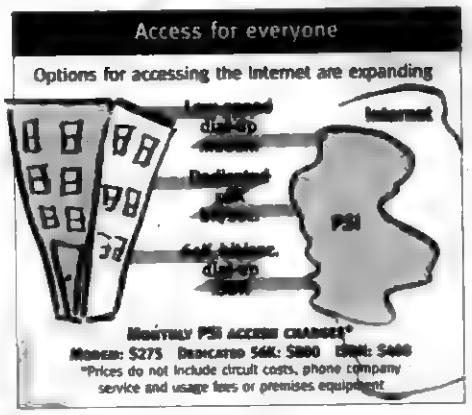
As the use of TCP/IP and the corporate quest for broader connectivity continue to accelerate, network service providers are coming up with new ways to deliver commercial access to the Internet.

The 62-country "network of networks," which supports an estimated 20 million users, is quickly becoming a cornerstone connectivity vehicle for global data communications.

To make the Internet more accessible to nontechnical users, Performance Systems International, Inc. (PSI) recently began providing basic-rate Integrated Services Digital Network (ISDN) Internet access in 30 cities. The 64K bit/sec. dial-up digital access should help companies save money by enabling them to dispense with dedicated, though often idle, Internet access links.

Called LAN-ISDN Service, PSI's $400-a-month offering plugs the current access gap between low-

ISDN, *page 58*



Asynchronous Transfer Mode

AT&T sets launch for '94

By Joanie M. Wexler

AT&T recently became the latest interexchange carrier to introduce Asynchronous Transfer Mode (ATM) services.

The company said it will begin a controlled introduction of its InterSpan ATM Service during the second quarter of 1994; general availability will follow in the second half of the year.

Although the announcement means that full-blown services might not be available for another year, the industry will not be left wanting, said Daniel Briere, president of TeleChoice, Inc., a Verona, N.J., consultancy.

Today, ATM is only about a 20-customer market, and the needs of that market can be satisfied by AT&T's controlled introduction, he said.

T1 speeds

Initial AT&T ATM services will run at T1 (1.5M bit/sec.) and 45M bit/sec. rates. Some controversy surrounds the usefulness of ATM at T1 speeds because of its associated 20% overhead. However, that figure drops to 10% at T1 rates because ATM packs cells onto those links more efficiently, said Bob Cole, a technical staff member at AT&T/Bell Laboratories.

AT&T issued only sample pricing. Flat-rate pricing for Class C service, which handles bursty data, serving a three-node network with sites in New York, Chicago and San Francisco, would be $94,500/month for a 7.5M bit/sec. guaranteed aggregate network speed. The same network would cost $115,200 at 34M bit/sec. Prices include access charges.

Voice, video supplements

Jayne Fitzgerald, AT&T's InterSpan product line director, said she expects users to incrementally add voice and video applications to their data. Voice and video, which require predictable, constant bit rates, will run over Class A links, which are priced based on connection distance.

On the ATM path, AT&T trails MFS Datanet, with its ATM-based LAN interconnect service, and WilTel, which offers a channel extension service over an ATM backbone. Sprint Corp. has announced service, and MCI Communications Corp. has yet to reveal its ATM plans.

Multimedia intros

Video for the desktop plays to full house at trade show

By Elisabeth Horwitt

Technology for delivering full-motion video to PCs throughout the enterprise achieved commercial reality at last week's Comdex/Fall '93 show in Las Vegas with a bevy of product debuts.

Uses for such products include videoconferencing, companywide distribution of training and other video materials and the ability to illustrate or otherwise complement with video clips charts and reports generated by popular PC packages.

Among the more notable announcements was IBM's Ultimedia Video IN/2, software that is said to enable users of IBM's OS/2 Version 2.1 to capture images off regular video equipment, such as camcorders, and then run, edit and merge it with other PC software.

A user could embed a video file in an electronic note and send it to a group of users via an OS/2 electronic-mail system, or the user could embed a video clip in a report generated by a standard PC application such as Lotus Development Corp.'s 1-2-3, an IBM spokesman said.

IN/2 is said to support a wide range of video-capture cards. It is scheduled to ship next month, priced at $199, IBM said.

IBM and the Indiana University School of Music demonstrated an application the school is building called the Variations Music Information System. The system will allow students and faculty to use a workstation to directly access the university's library of 121,000 recordings and 365,000 books and scores.

Users can then download video and sound objects for listening and editing using Ultimedia Server, according to IBM spokeswoman Deborah Stoll. The university hopes to have the application running when a new library complex opens in early 1995.

IBM also announced Windows and Macintosh clients for Ultimedia Server/6000, its RS/6000-based multimedia server, which also supports OS/2.

Tenfold increase

The U.S. market for networked multimedia desktop applications will shoot up from $201 million in 1993 to $2.46 billion in 1996, according to a recent report from Ovum Ltd., a British research firm. During the same period, sales of videoconferencing systems will stay pretty flat, going from $248 million in 1993 to $256 million in 1996, the report stated (see chart).

The explosion of networked desktop multimedia depends on the merging of affordable desktop video delivery systems with local- and wide-area network technologies such as compression; and a wide-area communications infrastructure that can handle such bandwidth-hungry applications, Ovum said.

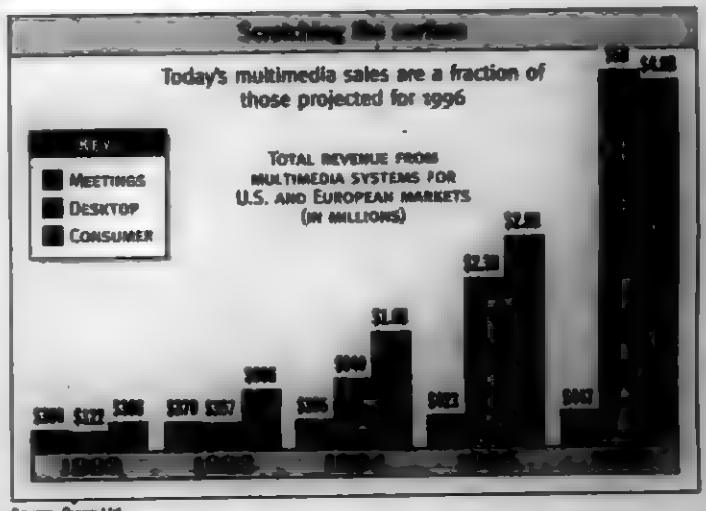
The more the merrier

Other announcements at Comdex included:

- Peregrine Systems, Inc. in Carlsbad, Calif., announced NTV, multimedia software that is said to provide Windows users with desktop videoconferencing and the ability to share live information displayed on-screen.

NTV is said to support virtually all commercial multimedia hardare. It is based on Microsoft Corp.'s Video for Windows. The product transmits 10 to 22 video frames per second. It works on Ethernet and Token Ring LANs and most major network operating systems.

NTV will be licensed to OEM hardware partners and is scheduled to ship in January. Peregrine estimated that the system, including video-capture board, audio board, speakers and camera, will sell for as little as $500.



Source: Ovum Ltd.

- Acer America Corp. in San Jose, Calif., demonstrated a $6,000 486-based PC that is said to convert a PC into a videoconferencing and document-sharing system.
- Zeos International Ltd. in Minneapolis announced the immediate availability of multimedia upgrades across its DOS and Windows workstations. A Zeos system based on an Intel Corp. I486DX2 66-MHz microprocessor with 8M bytes of high-speed RAM is priced at $2,800, Zeos said.
- Dell Computer Corp. in Austin, Texas, announced it would become the first systems manufacturer to bundle Sigma Designs, Inc.'s ReelMagic MPEG full-motion playback controller with its products. ReelMagic is said to allow PC-compatible computers to play back up to 72 minutes of full-screen, full-motion video and CD-quality digital stereo from a CD-ROM.

Briefs

ATM migration service

AT&T/NCR has introduced UniverCell Professional Services for ATM, a professional services program in the U.S. for customers seeking to create migration strategies to Asynchronous Transfer Mode (ATM) technologies.

Vendors fight over patent

InterDigital Technology Corp. in King of Prussia, Pa., and Motorola, Inc. have been trading patent suits over "time division multiple access," InterDigital's technology that sends multiple conversations over a single channel in a digital system. In the most recent action, InterDigital filed a suit against Motorola in U.S. District Court for the Eastern District of Pennsylvania claiming that the manufacture, use and sale of Motorola's digital wireless telephones and subscriber units violates its patents. Two weeks earlier, Motorola asked a district court in Delaware to declare that its cellular products do not infringe on InterDigital's patents. Motorola said it firmly believes "that the application of InterDigital's patents to digital cellular systems is without merit" and that those patents are invalid and unenforceable.

ISDN: Cheaper access to Internet

CONTINUED FROM PAGE 57

speed dial-up modems and dedicated links.

"If there were a cost-effective alternative with better bandwidth, we'd be interested," said Bill Conley, manager of corporate information systems at Loral Aerospace Corp. in Newport Beach, Calif. Today, he said, many nontechnical users have joined Loral's engineering network "just so they can get access to the Internet," which is provided by a regional Internet subnetwork called BARRnet.

Another option

Loral's engineering network links to BARRnet through a Cisco Systems, Inc. router. "But smaller divisions that can't afford a Cisco might like to get on" via a high-speed switched service, Conley said.

Tony Rutkowski, vice president of the Internet Society, the Internet's global administrative body, said the swelling interest in commercial Internet use has two primary drivers. People want into the Internet because "you basically aren't practicing your profession these days" without a connection. Companies need to reach customers, suppliers and peers and can participate in countless standards bodies and other activities, through the Internet, he explained.

From a technical perspective, "operating systems are becoming TCP/IP-ready on a massive scale," so users are automatically "at the plug-and-play stage" with the technology, Rutkowski said.

"If ISDN is available in your local area, [the PSI service] is a very reasonable alternative to a leased 56K bit/sec. line," PSI's other high-speed alternative, said Steven A. Taylor, president of Distributed Networking Associates, a Greensboro, N.C., consultancy. One reason is that most Internet traffic is sporadic, leaving high-speed leased lines idle some of the time, he said.

Rutkowski, however, who is also director of technology assessment at Sprint Corp., another provider of commercial Internet access, said Sprint is not offering ISDN access "because the cost/performance ratio is not there. I don't know of any RBOC [local telephone company] that has priced ISDN anywhere near a leased line."

He said that Sprint plans dial-up switched digital access of some sort.

Sprint now offers leased-line Internet access from 19.6K bit/sec. to T1 (1.5M bit/sec.) speeds. The carrier also offers a dial-up 800 Internet access service for nomadic users and is rolling out DS3 (45M bit/sec.) dedicated access, Rutkowski said.

Sprint announced last week that it would offer DS3 rates in its backbone in the first quarter of next year in anticipation of taking on some Internet transport.

What's it cost?

PSI's service has a onetime $500 fee, plus a $400-per-month price tag. That cost does not include monthly telephone company ISDN service charges (usually about $30) or any metered usage charges (see chart page 57).

PSI's service is founded on dial-up router equipment from Ascend Communications, Inc., a remote-access and inverse multiplexer vendor in San Francisco. Companies wishing to use LAN-ISDN Service need either an Ascend Pipeline 100 access router or Point-to-Point Protocol communications software from Sun Microsystems, Inc. or Morning Star Technologies running on a LAN-based Sun workstation.

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*CD-quality audio, local scanner support and internal floppy drive available as options. Speakers not included. †International Data Corporation, X Business Group, January 1993, by sales revenue.

Thursby Software Systems, Inc. has introduced TSSnet for Sun Microsystems, Inc.'s Solaris operating system.

According to the Arlington, Texas, company, systems can coexist with other networks while TSSnet is running Digital Equipment Corp.'s DECnet; the product also provides network terminal and printer support under Local Area Transport protocol.

TSSnet for Solaris costs $1,995.

▶ *Thursby Software*
(817) 478-5070

CNet Technology, Inc. has introduced the PCI Ethernet adapter card, a product that will support Intel Corp.'s Peripheral Component Interconnect (PCI) local-bus architecture.

According to the San Jose, Calif., company, the low-power card fully supports ANSI 8802-3, IEEE 802.3 and 10Base-T connection in Novell, Inc.'s NetWare, Microsoft Corp.'s Windows NT, Windows LAN Manager and The Santa Cruz Operation's Unix environments.

Features include an independent 10-MHz serial clock and a PCI system clock that operates at speeds up to 33 MHz.

The card also provides address filtering modes.

A Direct Memory Access (DMA) channel is not required because the card has its own DMA engine.

The adapters cost $399.

▶ *CNet Technology*
(408) 954-8000

Digicom Systems, Inc. has introduced a V.32terbo software upgrade package for the Connection Series V.32 internal data and fax modems.

According to the Milpitas, Calif., company, the package offers software based on digital signal processing technology and exclusive firmware algorithms to achieve full-duplex V.32terbo data transfer rates.

The upgrades are compatible with Digicom's modem Connection 96+ and other products in the Connection series.

The upgrade package costs $49.95.

▶ *Digicom Systems*
(408) 262-1277

Solectek Corp. has introduced AirLAN/PCMCIA, a member of its AirLAN wireless Ethernet product family.

According to the San Diego company, the product was designed for use with PCMCIA-equipped notebook computers, providing mobile LAN connections that allow users to move about their workplace free from power cords or network cables.

AirLAN operates at 2M bit/sec. and supports all major network operating systems, including Artisoft, Inc.'s LANtastic, Novell, Inc.'s NetWare and Microsoft Corp.'s Windows for Workgroups.

The product uses spread spectrum 915-MHz radio technology to pass data through walls, ceilings and floors. Line-of-sight operation is not required.

AirLAN costs $699.

▶ *Solectek*
(619) 450-1220

Fluke Corp. has introduced the 672 Ethernet LANMeter test tool and the 675 Combo LANMeter test tool for Token Ring and Ethernet LANs.

According to the Everett, Wash., company, the 672 and 675 allow for fast and portable network troubleshooting by diagnosing the most common problems and isolating faults on the physical media and adapter cards.

The instruments offer troubleshooting capabilities such as "LAN-at-a-Glance" LEDs, collision analysis and Novell, Inc. and TCP/IP traffic analysis.

The 672 Ethernet LANMeter costs $5,995; the 675 Combo LANMeter is priced at $8,995.

▶ *Fluke*
(206) 347-6100

Chipcom Corp. has introduced two Windows versions of Ondemand Network Control System (NCS) network management software.

According to the Southboro, Mass., company, Ondemand NCS for Windows extends the management capabilities of Chipcom's Unix-based Ondemand NCS package to the PC platform.

Ondemand NCS for Windows software offers key information for tracking network problems and locating performance bottlenecks. It can be configured "on-the-fly" to balance network loads.

Ondemand NCS for Windows is available in two versions: a portable version that operates as a stand-alone product and a desktop version that is bundled with Hewlett-Packard Co.'s HP OpenView network management platform.

The portable version of Ondemand NCS for Windows is priced at $895, and the desktop version is available for $2,995.

▶ *Chipcom*
(508) 460-8900

Product short

Eicon Technology Corp. has announced its WAN Services for Windows NT, a product designed to provide wide-area network support for all Microsoft Corp. Windows NT communications programs in a single package. Users can connect WANs through X.25 packet-switched networks and Synchronous Data Link Control lines worldwide. Cost: $595. Eicon Technology, Dallas (214) 239-3270.

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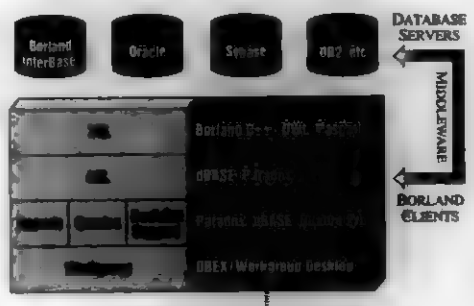

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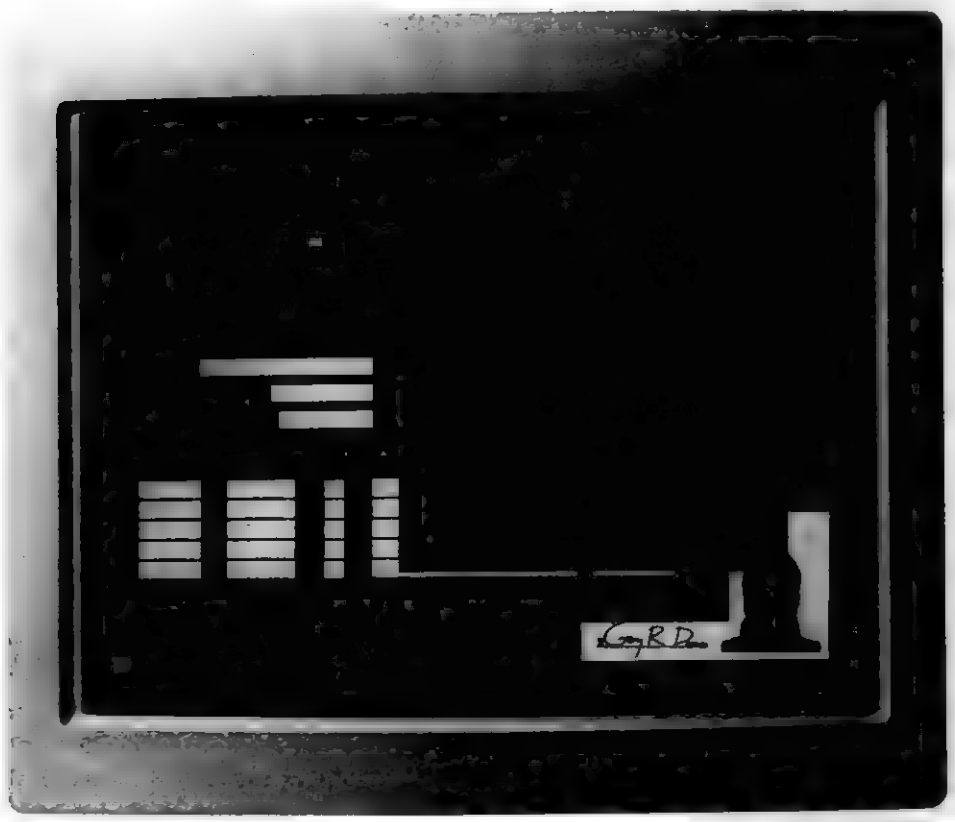

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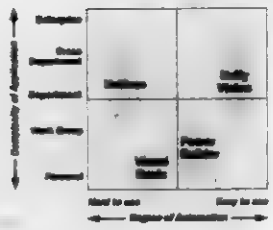

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Host-tracking package helps rein in software costs

By Johanna Ambrosio

Turning a critical eye toward software costs is the politically correct thing to do these days, and a package from Isogon Corp. can help.

Called SoftAudit, the mainframe-based package monitors and tracks all of the other software on the host. The product helps users determine which products are on the mainframe, which are being used often and which can be retired.

"Over the years, people add software to the system, and you don't necessarily know what you have after a while or even which files belong with what," said Robert Barritz, president of the New York vendor. SoftAudit tracks all load modules on the mainframe and matches them up with whatever products they belong with. SoftAudit also monitors actual use of the products. A reporting facility is included.

Introduced in August, SoftAudit has some 40 customers. Michael Bryant, a senior systems specialist at Blue Cross/Blue Shield in Eagen, Minn., said he figures SoftAudit will save the company at least $150,000 annually. Part of the savings will accrue from eliminating the maintenance on one little-used package, and the rest will result from taking a package completely off the system.

"And this is just scratching the surface," Bryant said. "I know there's double or triple that amount that we can save."

Other reported benefits include saving disk storage space by removing software that is used little or not at all and cleaning up software that has been stored in many libraries. This will result in easier maintenance. SoftAudit also has the ability to verify software-license compliance by checking to see where the software physically resides.

Jim Manning, a systems pro-

Host-tracking, *page 64*

Sun offers in-house tools

Suite developed to move its own IBM applications to Unix

By Jean S. Bozman

Sun Microsystems, Inc. will sell users a suite of software tools it developed in-house to provide interoperability between its own IBM-compatible mainframe and Unix systems. The systems management tools will be sold as part of the SunIntegration Services unit's re-engineering and consulting services.

The five components of the Sun Enterprise Toolset package are SunDANS (Distributed Administration of Network Software), which automatically distributes software, updates and bug fixes; SunRAI (Remote Application Interface), which allows Unix systems to synchronize database transactions with mainframes; Sun Paperless Reporter, which electronically distributes documents in mixed-vendor networks; Sun ConsoleServer, which lets one systems administrator control many remote servers; and Sun DataCenter Scripts, which help manage multiple database systems.

Fraction of the code

Prices for the server-based modules, which were announced this month, range from $4,500 to $20,000. The packages contain only 25% of the downsizing code Sun developed for its own four-year project, said Bill Coleman, SunIntegration's general manager.

Users at many large Sun sites said they intend to keep their legacy applications for years. "There's a huge investment in IBM systems for MIS [in general], and the migration to client/server Unix systems is going to be expensive and time-consuming," said David Wasley, director of data communications and network services at the University of California at Berkeley.

"The complexity of integration is such that you will require special tools," he said. The public university has IBM-compatible mainframes and some 14,000 network devices, including about 2,000 Sun workstations and servers, Wasley said.

Mainframe countdown

Sun's modules were developed internally as part of a 1989 effort to downsize many of its mainframe applications to run on Sun Unix servers and relational databases. Sun plans to turn off its outsourced mainframe in 1995.

"We took the glass house and extended it around the world," said Harris Kern, manager of Sun's data center in Milpitas, Calif. "By redeveloping the tools, we are able to manage and control the distributed environment the same way we would control the data center." But users on Sun's 23,000-node global network had to give up their traditional Unix "root" access for security reasons and are using the central-site security system instead, he said.

Privacy key to public trust in health care reform

By Mitch Betts
WASHINGTON

■ President Clinton's health care reform proposal calls for enactment of strong medical privacy legislation within three years, but critics say that is not soon enough.

Making privacy seem like an afterthought will breed public distrust at a time when the public already is skeptical about the ability of government and business to keep sensitive data confidential, according to interest groups ranging from hospital administrators to the American Civil Liberties Union (ACLU).

Because the reform plan envisions computerized patient data flowing straight from doctor's offices to regional health alliances and insurers, "getting one day into health care reform without privacy safeguards is very dangerous," said Janlori Goldman, director of the ACLU's Privacy & Technology Project in Washington.

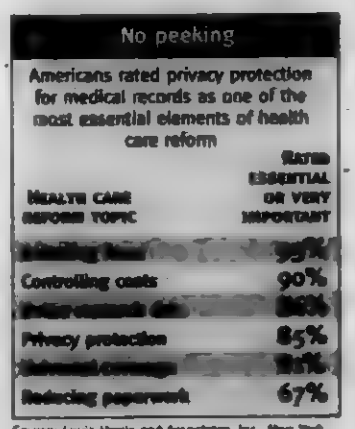
A part of the package

The U.S. Congress is not likely to wait three years anyway. Rep. Gary A. Condit (D-Calif.), who chairs a House subcommittee on information policy, said recently that he will forge ahead with his plan to write medical privacy legislation as part of the health care reform package.

Condit held a hearing on the topic Nov. 4, setting the stage for introducing a privacy bill in December and enacting it next year.

The Clinton plan calls for the new National Health Board to get public input and prepare a privacy bill within three years.

"Writing privacy legislation is complicated, and [the Clinton task force] didn't have time to do it, so they provided an outline of privacy legislation and figured to fill in the details later," a congressional source said.



Source: Louis Harris and Associates, Inc., New York, and Equifax, Inc., Atlanta

Even critics acknowledged, however, that the Clinton plan provides a good blueprint for strong privacy legislation that would preempt the "crazy quilt" of differing state laws [CW, Aug. 9].

The president's proposed Health Security Act includes the following provisions:

- Each person's health care card will have a unique identification number for accessing electronic records. The number cannot be used for purposes outside the health care system, and there are criminal penalties for misusing the number or card.
- Patients must consent, in writing, to any disclosures of medical records, and they have the right to see (and correct) their own records.
- The health board will create a 15-member advisory council on data processing and privacy policies. Within three years, the health board must submit a more comprehensive privacy bill.
- Using patient data for employment decisions or insurance risk assessments is prohibited.

"Insurers can't use the information [about medical conditions] for risk-adjusting you out of the plan. That's what happens today, and that's why people lose health insurance," said John S. Silva, co-chair of the information systems working group of Clinton's reform task force.

Public opinion

The importance of medical privacy was underscored by the release of a national opinion poll indicating high levels of public support for medical privacy legislation that has features similar to the ones in Clinton's proposal.

Furthermore, a sizable minority of Americans (27%) reported that their medical information had been disclosed improperly.

Alan P. Westin, a privacy expert at Columbia University in New York and director of the study, said the privacy of computer-based medical records will be the "litmus test" on whether the public can trust information technology. Because the public is not in a very trusting mood, according to Westin, the "policy-makers will have to go an extra mile-and-a-half to provide safeguards, enforcement and penalties."

Ross shows latest version of Promix

Ross Systems, Inc. recently introduced a new release of its Promix process manufacturing software that adds several features targeted at users in the chemical, pharmaceutical and food and beverage industries. Site licenses start at $400,000.

Promix Version 3.0 initially supports Digital Equipment Corp.'s VAX and Alpha AXP systems and Hewlett-Packard Co.'s HP 9000 and HP 3000 machines. Ross Systems in Redwood City, Calif., said it also plans to support IBM's RS/6000 line and Microsoft Corp.'s Windows NT operating system in the future.

Added functionality includes a sales-forecasting module and controls for managing the development of process specifications and automatically scaling recipes and formulas to account for the potency of the materials being used.

The software is written in Gembase, the company's fourth-generation language, and it can be integrated with its financial, human resources and distribution applications. Promix supports both character terminals and PCs with graphical user interfaces, but it remains a host-centric product for now, a Ross spokeswoman noted. — *Craig Stedman*

Host-tracking

CONTINUED FROM PAGE 63

grammer at the Federal Deposit Insurance Corp. in Arlington, Va., said he is using only the inventory-tracking part of SoftAudit and has not yet put the use-monitoring portion into effect. He said his organization is building a database of products that are on the system; the products' respective vendors and the information systems staffer have primary in-house responsibility for each product.

The one gripe that users have with Soft Audit so far is its reporting features. "The reports are too detailed. Either you get all or nothing," said Kevin Dooley, technical services manager at GTE Government Systems in Needham, Mass. Otherwise, he said, he has no complaints; his shop has saved about $24,000 so far in retired software.

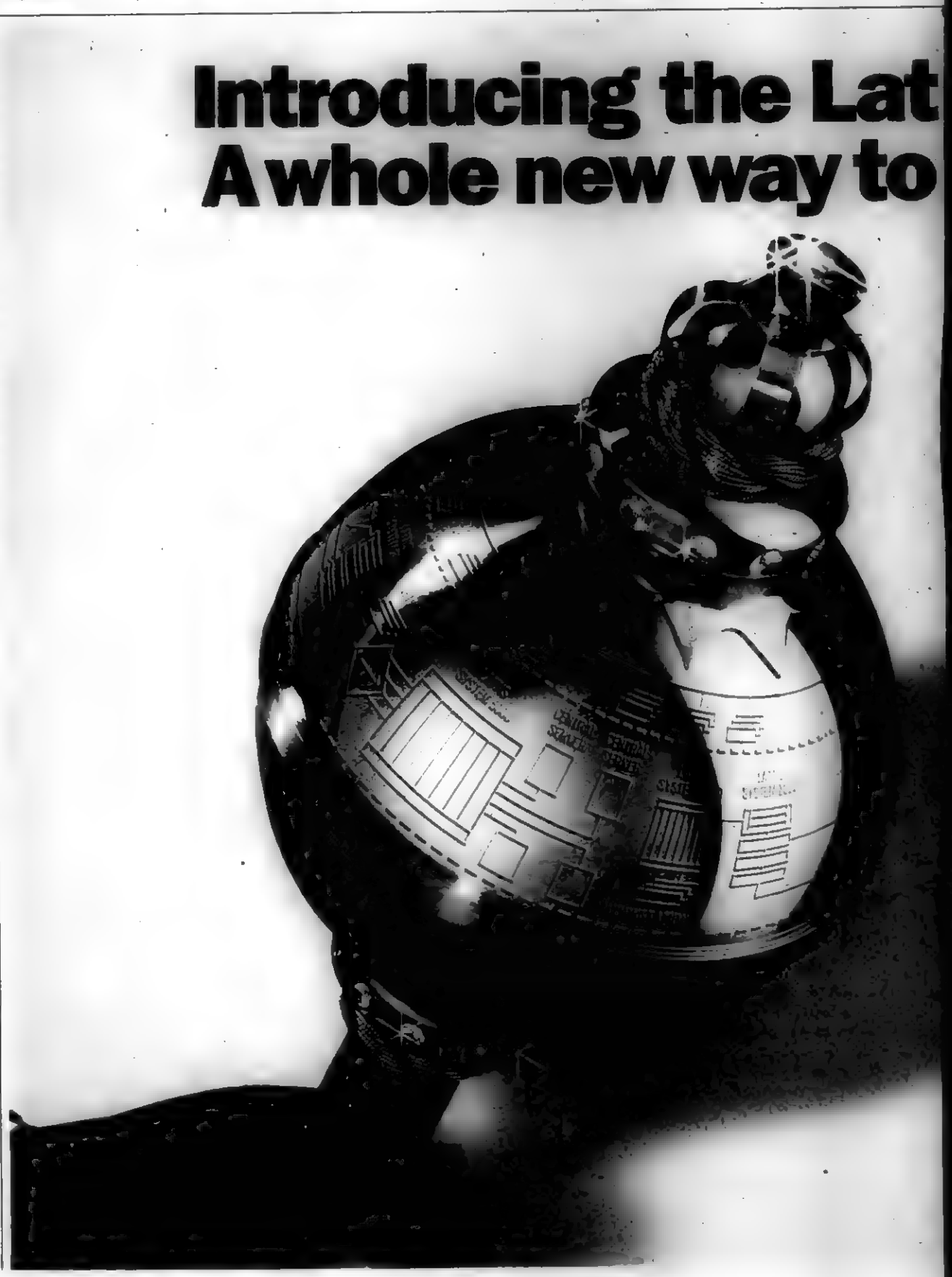
Isogon's Barritz said that additional data-filtering capabilities will be included with the next release of SoftAudit, which is due to ship by year's end. With that version, users will be able to specify products or vendors they wish to be included or excluded from reports, he said.

SoftAudit works with any release of MVS; license fees range from between $5,000 and $21,000, depending on the processor size. First-year maintenance is included.

Briefs

Oracle goes vertical
Oracle Corp. signed a $23 million consulting and software contract with Duke Power Co. The two-year deal is the first major win for Oracle Industries, a program that sells consulting services and prefabricated application templates for specific vertical industries. Duke Power in Charlotte, N.C., plans to create a client/server customer information system using Oracle databases, development tools and connectivity products.

Texas-size contract
The Texas Department of Human Services awarded Unisys Corp. three contracts totaling more than $25 million for hardware, software and services related to upgrading the state's automated welfare delivery system.



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Software

4th Dimension Software Ltd. has announced MultiPlatform Control-M to provide automated job scheduling and production-control capabilities for Unix, Digital Equipment Corp.'s VAX/VMS and IBM's AS/400 platforms.

According to the Irvine, Calif., company, MultiPlatform Control-M allows both intraplatform and cross-platform dependencies to be defined, enabling a job or process running on one platform to trigger a different job or process on the same platform or on any other platform supported by MultiPlatform Control-M or Control-M for MVS.

Pricing for MultiPlatform Control-M is based on the maximum number of tasks per day per processor, beginning at $750 for up to 10 tasks.

▶ *4th Dimension Software*
(714) 757-4300

Wallace Computer Services, Inc. has introduced electronic forms with Platforms, a group of software products and services that were designed to address larger corporations' needs for global electronic processing solutions.

According to the Hillside, Ill., company, the products offer an open architecture and include Platforms, electronic forms software modules for constructing corporate applications; the Wallace Electronic Forms Resource Center that consists of services to convert printed forms to electronic forms; enhancements to the Wallace Information Network for additional management and control of corporate electronic forms systems; and installation support.

Prices start at $80.

▶ *Wallace Computer Services*
(708) 449-8600

Advanced Solutions International Corp. has added Asist/System Monitor, a real-time system monitoring product, to its line of IBM AS/400-based management tools.

According to the Greenville, N.C., company, Asist/System Monitor provides constantly updated snapshots of 10 critical areas of AS/400 performance. Vital signs such as CPU use and average response times are monitored and continuously displayed on color bar graphs.

Pricing for Asist/System Monitor starts at $2,000 per CPU.

▶ *Advanced Solutions International*
(919) 355-8181

Hardware

Xerox Corp.'s Printing Systems Division has announced the Xerox 4220/MRP Console Midrange Systems Printer and the Xerox 4219/MRP and 4215/MRP Desktop Midrange Systems Printers.

According to the Stamford, Conn., company, the printers emulate most IBM printers commonly used in AS/400 settings and accept data streams associated with these IBM printers, including SNA Character Stream, Intelligent Print Data Stream and Document Content Architecture/Final Format Text.

The Xerox 4220/MRP prints up to 20 page/min. at 300 dot/in. resolution and was designed for monthly print volumes of up to 100,000 pages. The Xerox 4219/MRP prints up to 20 page/min., and the 4215/MRP prints up to 15 page/min. Both were designed for monthly print volumes of up to 50,000 single-sided pages.

The Xerox 4220/MRP costs $12,995; the Xerox 4219/MRP and the Xerox 4215/MRP cost $5,995 and $4,795, respectively.

▶ *Xerox*
(203) 968-3000

Digital Equipment Corp. has introduced Dorio, a single-session text terminal for open systems.

According to the Maynard, Mass., company, Dorio offers 16 modes of terminal emulation and compatibility with more than 30 operating systems.

Key features include industry-standard connectors and protocols, a cartridge slot for firmware enhancements, text windowing through rectangular-area operations, horizontal and vertical scrolling and a Windows-like setup in five languages: English, French, German, Italian and Spanish.

A Dorio terminal costs $399.

▶ *Digital Equipment*
(508) 493-5111

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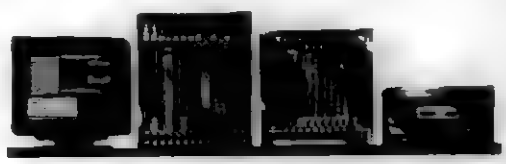

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A structured network lets you support the way your organization works—no matter how your buildings are wired. Take Optivity software, for example. Its intuitive user interface and simple drag-and-drop operation allow you to assign network devices to logical workgroups—regardless of their physical location. So you get the security of a central location to consolidate and manage key resources, with the flexibility of distributed LAN segments.

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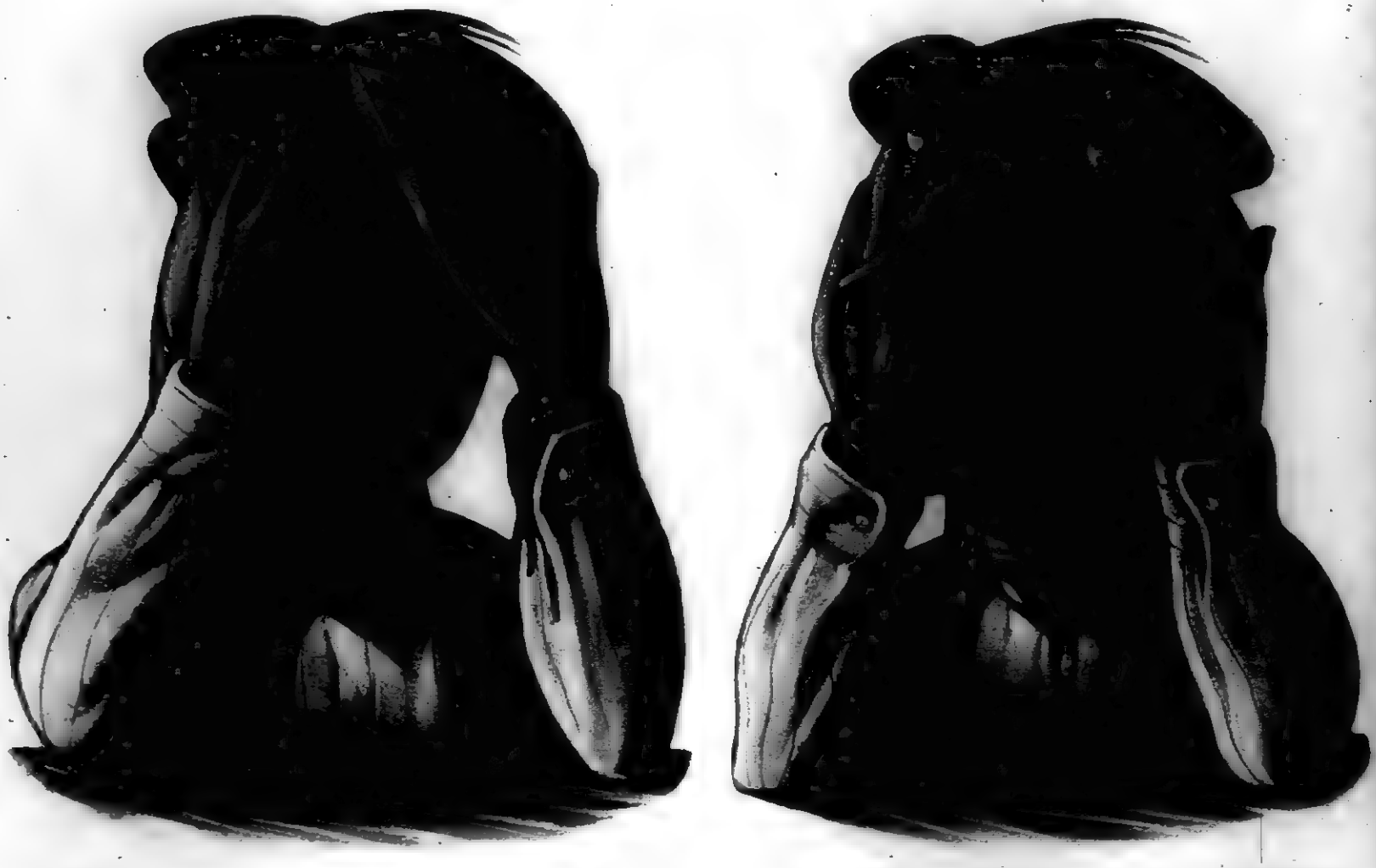

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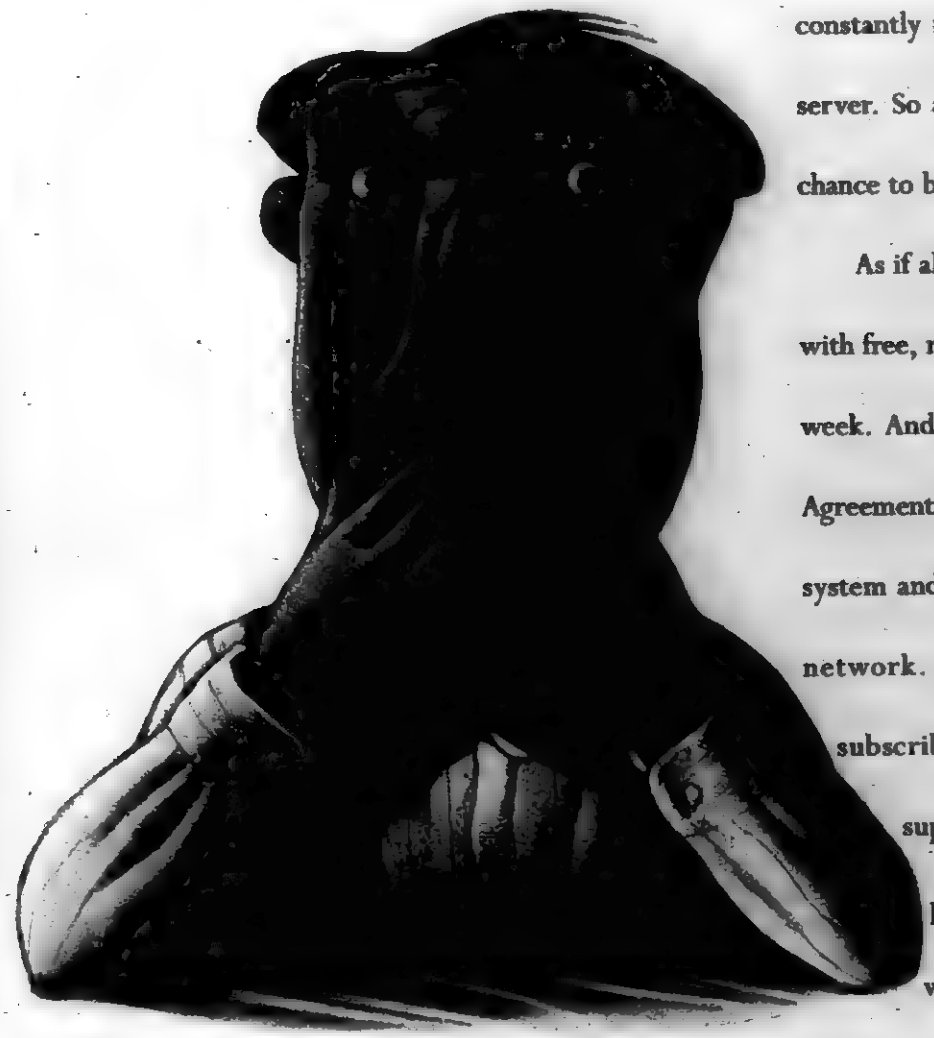

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Borland rolls out C++ 4.0, OWL upgrade

Class library battle with Microsoft wages on

By Melinda-Carol Ballou

For many beleaguered Windows programmers, the subject of choosing a class library to facilitate the development process — Borland International, Inc.'s Object Windows Library (OWL) or Microsoft Corp.'s Microsoft Foundation Classes (MFC), to name the leading contenders — evokes near-religious fervor.

Users of both products said they have saved time with the Windows class libraries, which provide a high-level set of classes for creating Windows applications and offer an application framework.

"Windows classes like OWL and MFC wrap the intricate details [of Windows programming] to let you get up to speed more quickly," said Roger Spitzig, senior systems engineer at The Mutual Life Assurance Company of Canada, an insurance company in Waterloo, Ontario.

The temperature of the Borland vs. Microsoft discussions was raised even higher by C++ compiler and tools vendors at Comdex/Fall '93 last week, as Borland touted a major upgrade to its C++ products and to OWL and as Microsoft and others previewed upgrades to their products.

Enhanced tools

Officially announced earlier this month, Borland C++ Version 4.0 will offer new visual programming tools for its integrated development environment (IDE), a Brief-based editor, a visual project manager, a new graphical user interface debugger for use within the IDE and an Object Browser with multiple window displays, filters and cross-referencing. It will also feature exception-handling and templates, which give developers a safety net if the application crashes and also make it easier to reuse code.

Major improvements to OWL 2.0 include a set of predefined visual objects, source-code compatibility between 16- and 32-bit Windows, high-level controls such as floating palettes and tool bars, and broader application programming interface (API) coverage to include the Windows graphics device interface. But these new features also require a transition for developers who created applications with OWL 1.0 because 1.0 is not compatible with the new class libraries. Borland will supply a utility with C++ 4.0 for making the conversion to OWL 2.0. Users who want to retain their OWL 1.0 applications can compile them with Borland C++ 4.0, according to Borland officials.

Borland's IDE *offers visual programming including point-and-click creation of Windows applications with App Expert as well as an editor and debugger and a design tool for customizing user interfaces*

Beta users spoke about the advantages of the new version and of class libraries in helping them navigate through the morass of Windows development.

"In the past, OWL gave you a real leg up in getting an application up and running, but you had to provide most of the functionality using the API," said Frank Imburgio, a project leader at Dean Witter, an investment firm based in New York. "We like the shortcuts with OWL 2.0.

"The [new] Borland tool set reduces the learning curve significantly," he added.

Imburgio said OWL 2.0 is no longer compiler-specific. Previously, Borland used specialized dispatch functions, but it now uses a new C++ template, which opens up the range

Borland, *page 72*

Vality unveils tool for re-engineering legacy systems data

By Gary H. Anthes

After two years of beta testing, Vality Technology, Inc. has announced general availability of a mainframe-based tool for analyzing, matching, reformatting and scrubbing data extracted from legacy systems.

Called Integrity Programming Environment, the "data re-engineering" product is especially geared for building relational databases for new enterprise systems from old files that contain overlapping, redundant or contradictory information, data errors, inconsistent formats and the like.

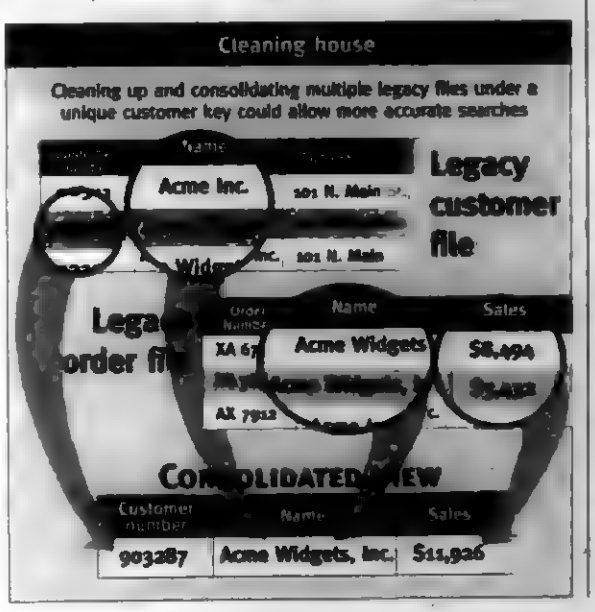
Using a neural network-like approach, Integrity employs user-specified scoring criteria for matching records or data fields. It is far more flexible and accurate than conventional data-scrubbing products — such as the merge/purge systems used by service bureaus to prepare mailing lists — that rely on hard-coded if-then rules, Vality said. It is especially adept at processing files containing names and addresses (see chart).

Through statistical analyses, Integrity can zero in on key data elements floating in free-form text, such as name and address fields. It can also uncover unknown patterns or errors, such as foreign addresses in records intended for domestic mailings, said Steven Feldman, marketing communications director at Boston-based Vality.

"Companies are starting to recognize that data re-engineering is on the critical path for business process re-engineering," Feldman said. "You can't re-engineer the future without cleaning up data problems of the past."

People often "drastically underestimate" the difficulty of migrating legacy data to relational

Vality, *page 72*



IBM offers entry-level C++ development kit

By Johanna Ambrosio

IBM announced enhancements to its C++ development kit and at the same time unveiled an entry-level version called FirstStep.

The full-fledged kit, called C Set ++, runs under OS/2 2.1 and allows developers to build object-oriented applications. As such, C Set includes object libraries and an optimized compiler.

With the additions in the new version, C Set also now includes support for drag/drop objects in enhanced class libraries, an interface builder called Kase:Set developed by Kaseworks, Inc. and an improved version of an integration mechanism called WorkFrame/2 that allows developers to use third-party tools with C Set.

Object drag feature

Wayne Kovsky, a consultant in Monument, Colo., who runs OS/2 developers' conferences, has been using Version 2.0 of the tool kit but has tried some of the new user class libraries in beta form. These allow developers to drag one object to another, thereby invoking an action to take place. For example, the spreadsheet icon could be dragged over to the printer icon to invoke the spreadsheet and format it properly for the printer.

"You could always do drag/drop," Kovsky said, "but this should make it a lot easier."

C Set 2.1 is available now in retail and other outlets or through IBM directly, priced starting at $395 for a CD-ROM version. Documentation is not included.

FirstStep, for its part, is a slightly pared-down version of C Set. For one thing, FirstStep's compiler, although the same as that in C Set, is not optimized.

Also, FirstStep contains a slightly older version of Workframe/2, a third-party integration mechanism.

Finally, FirstStep lacks the user interface library contained in C Set, although both products contain the collection class and standard libraries.

The CD-ROM version of FirstStep is available directly from IBM for $65. Packages including floppy disks and/or documentation are priced slightly higher.

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But what's truly amazing is the promotional pricing you can take advantage of now. The first WY-55 you buy per site will save you $150. (See the obligatory asterisk for details.)

What can you lose by trying the WY-55? Actually, nothing. There's a 30-day money-back guarantee.

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Besides price, there are many more reasons choosing the WY-55 is a decision you won't take any flak over.

First, the WY-55's incredible mix of 15 personalities (including the popular WY-50, WY-60 native mode and DEC VT220 emulations) can handle traditional minicomputer and mainframe environments as well as multi-user PCs. And the crisp, clear text is displayed via high-resolution character cells. Plus the new built-in rest timer can remind users to do what its name suggests. So many features, yet such a low price.

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WYSEnet Terminal Server. 9.9"W x 2.5"H x 6.7"D. 4 or 8 ports. TCP/IP (UNIX), LAT (DEC) environments.

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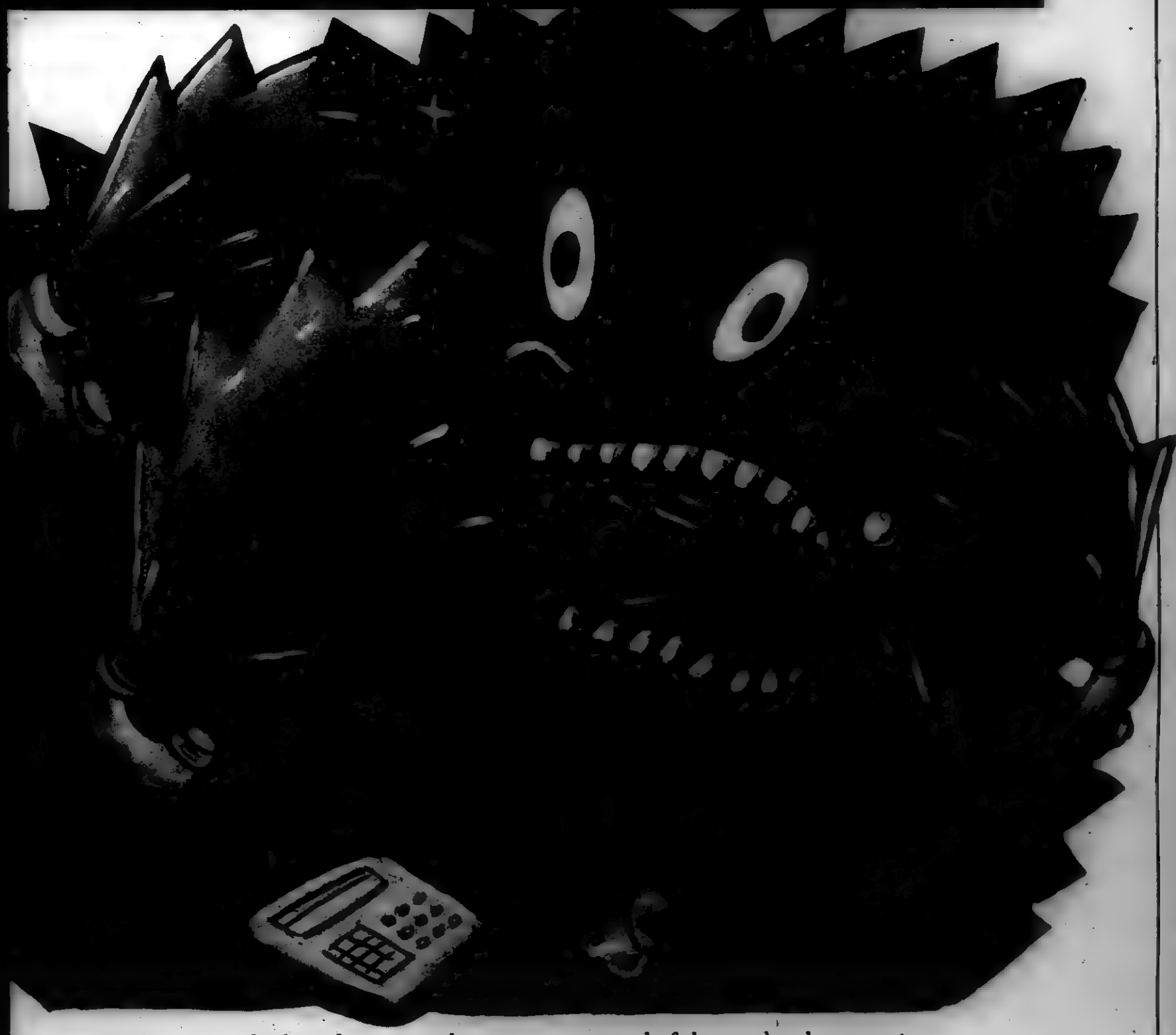

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Borland C++ 4.0

CONTINUED FROM PAGE 69

of compilers on which OWL applications will be able to run.

Microsoft, on the other hand, will release an upgrade to its Visual C++ compiler and environment next month, along with MFC 2.5, both of which incorporate Microsoft's Object Linking and Embedding (OLE) 2.0 and Open Database Connectivity support, among other features.

Borland will offer OWL classes for OLE 2.0 next year, and developers can now create OLE 2.0-compliant applications with the Borland tools, officials said.

Weigh the options

While Microsoft's MFC offers tight mapping to Windows APIs, Borland's OWL offers greater portability, according to Michael Schneider, an analyst at Gartner Group, Inc., a market research firm in Stamford, Conn.

"If you have people who want to live with Windows for the rest of their lives, then MFC will solve their problems. But I think we're looking at a lot of volatility in the operating system world over the next two or three years, which makes a strong case for going with Borland's OWL," Schneider said.

OWL eyes expansion

To expand the reach of OWL, Borland officials earlier this fall announced that they will combine OWL with Novell, Inc.'s AppWare Foundation technology to offer developers C++-based cross-platform development libraries. Borland and Novell have signed a joint development and cross-licensing agreement to merge AppWare Foundation and OWL and to offer a superset of features on supported platforms, according to Borland officials. Early access to the OWL and AppWare technology will be available in the first quarter of 1994. ObjectWindows for AppWare is scheduled to ship next summer.

While Borland and Microsoft fight it out, Symantec Corp. is moving back in the race. Over the summer it released its upgraded C++ compiler and tools, which use MFC for class libraries [CW, Aug. 23].

But Symantec has "a lot of work to do to get out there and take market share from Borland and Microsoft," said Brent Williams, an analyst at International Data Corp. in Mountain View, Calif.

Borland also announced Borland Visual Solutions Pack, a set of 25 VBX controls, and Borland Jumbo Assembler, which offers 16- and 32-bit assembler for C/C++, Pascal, Cobol, Basic or Fortran applications.

Borland C++ 4.0, including 16-bit DOS and 16- and 32-bit Windows support, as well as ObjectWindows 2.0, is priced at $495 and will ship by the end of this month. Borland's 16- and 32-bit Turbo Assembler 4.0 will ship separately and is priced at $99.

Vality unveils tool

CONTINUED FROM PAGE 69

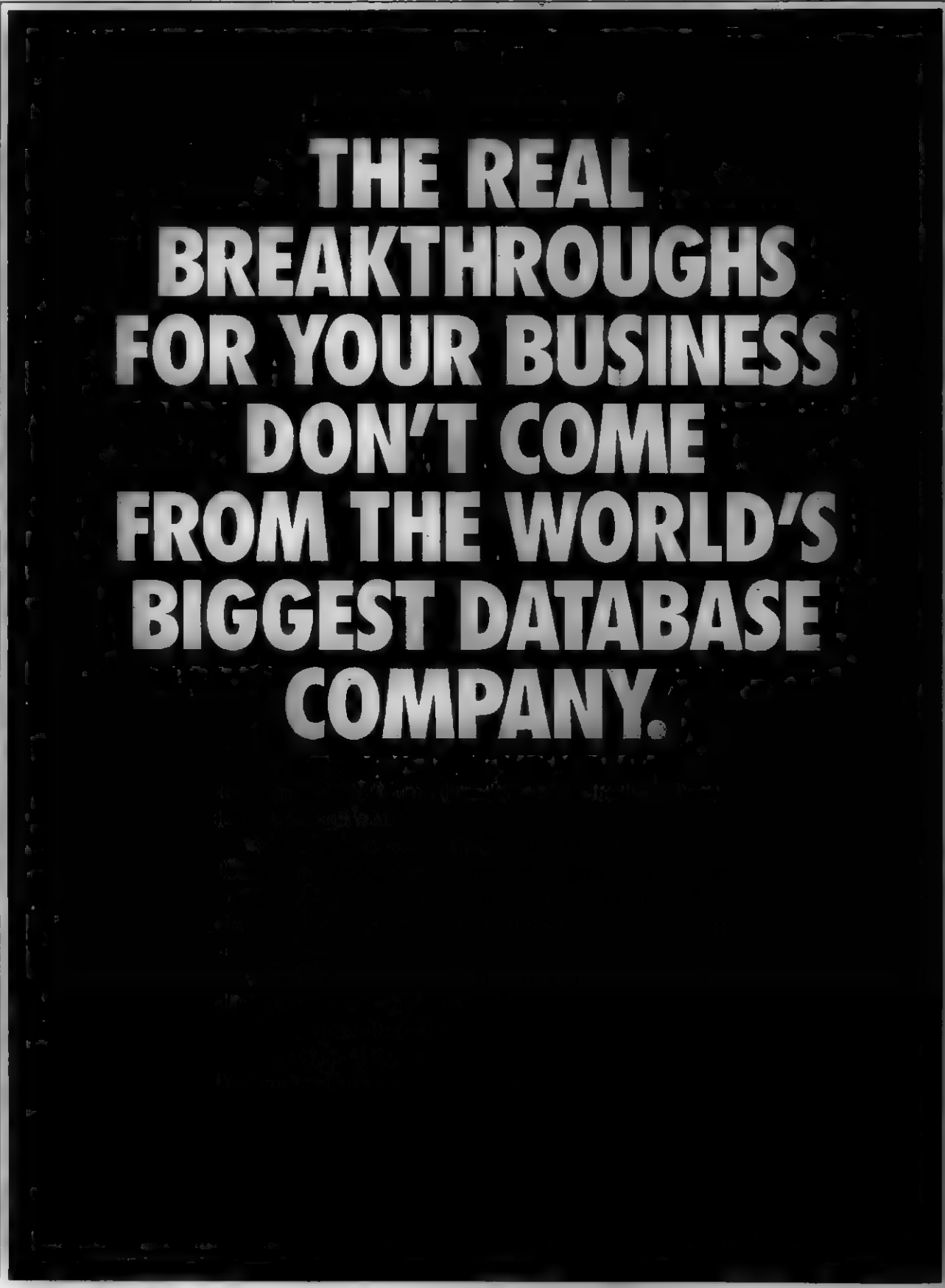
databases, he said.

First Data Corp. in Boston uses Integrity to re-engineer mutual-fund investor data from two old legacy systems for a new relational database supporting decision-support applications. "We have a lot of information buried in those legacy structures that we can't get at," said Augie MacCurrach, senior data analyst at the shareholders services group.

MacCurrach said most conventional approaches to cleaning up and reformatting old records deal only with problems anticipated in the logic of the conversion programs. "But Integrity finds and handles things that are not visible to you. It lets you identify those maybe 10 exceptions out of 1 million records. With Integrity, you assume nothing and you discover the true nature of your data."

"Vality's data cleaning offers corporations a way to intelligently streamline overgrown, inconsistent legacy data stores," consultancy Meta Group, Inc. said in a written report. "Vality offers companies the facility to clean legacy data first, extract its value and then apply information warehousing or business process re-engineering."

Integrity is used at some 20 sites, Vality said, and costs from $95,000 to $200,000.



[redacted]

NeuroDynamx, Inc. has introduced DynaMind Developer Pro, a suite of neural network software tools designed for PC, Macintosh and workstation platforms.

According to the Boulder, Colo., company, the product includes a scripting language for neural network training and testing, a comprehensive set of linkable C routines, DynaMind simulation software and neural chip emulation.

The PC version of DynaMind Developer Pro requires an IBM-compatible computer with 80286 or higher, Windows 3.1 or MS-DOS 3.1 or higher, 2M bytes of memory and one 1.44M-byte, 3½-in. diak drive and hard drive. It costs $1,795.

The Macintosh version of the product costs $1,795 and requires Macintosh II or higher with math coprocessor, Macintosh System Software Version 6.0 or higher and 2M bytes of memory.

The Workstation version is priced at $3,995 and operates with Unix workstations, including those from Sun Microsystems, Inc., Digital Equipment Corp. and Hewlett-Packard Co.

▶ *NeuroDynamx*
(303) 442-3539

NobleNet, Inc. has announced a WinSock-compliant version of its WinRPC compiler.

According to the Southboro, Mass., company, the compiler enables Windows programmers to automatically generate communication source code that is binary-compatible with WinSock-compliant protocols.

Through remote procedure call (RPC), the computer-generated code distributes applications across Windows, DOS, Unix and Novell, Inc.'s NetWare platforms. Because WinSock is an open interface for network programming under Windows, a common TCP/IP application programming interface is provided to which network software vendors and application developers can conform.

WinRPC 2.0 developer's kits cost $995.

▶ *NobleNet*
(508) 460-8222

Kenan Technologies has introduced Version 1.0 of the Acumate Enterprise Solution.

According to the Cambridge, Mass., company, the product is built around Multiway, a field-tested multidimensional database and fourth-generation language.

The Acumate Enterprise Solution offers client/server capabilities, object-oriented programming and instructional on-screen "co-pilote" to facilitate data configuration.

Other features include a focal point integrator, a programming object that pinpoints data sources and manages the data loading and integration process, and an open application programming interface that supports multiple users over multiple network protocols.

Acumate Enterprise Solution pricing begins at $25,000 for a minimum five-user client/server configuration.

▶ *Kenan Technologies*
(617) 225-2224

Product short

Gimpel Software has announced PC-lint for C/C++, a lint tool designed to support C++. The product can analyze a mixed suite of C and C++ programs and report on glitches, bugs and inconsistencies. Cost: $239. Gimpel, Collegeville, Pa. (215) 584-4261.

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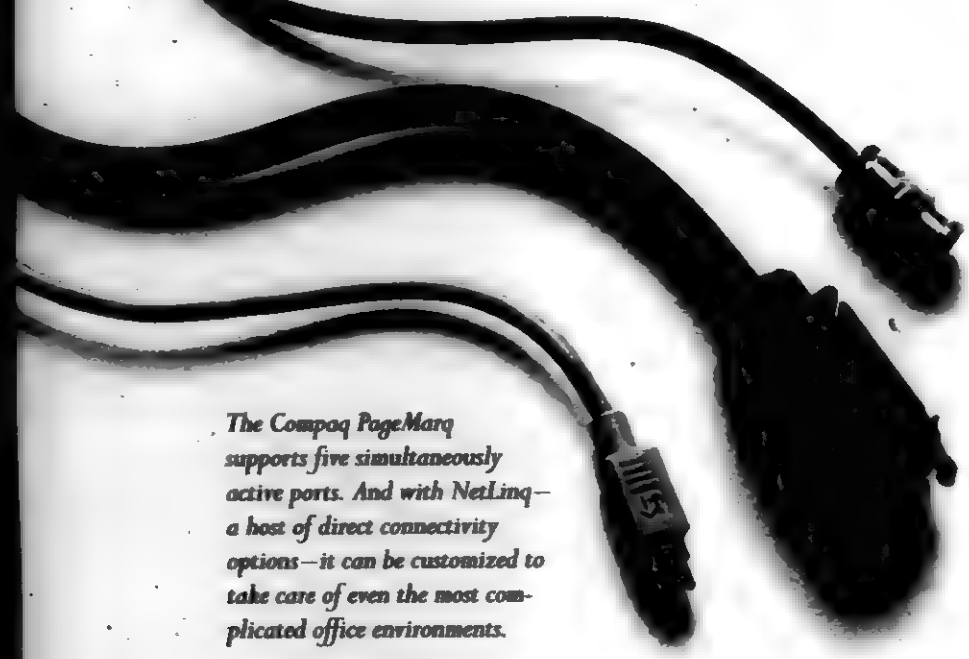
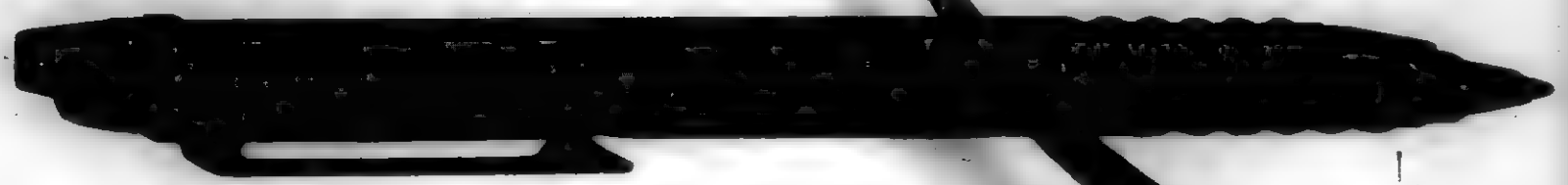


The Compaq PageMarq supports five simultaneously active ports. And with NetLinq—a host of direct connectivity options—it can be customized to take care of even the most complicated office environments.

It may be hard to imagine the world before fax machines, but it's not hard to imagine a world where they're no longer necessary. With PageMarq's internal fax modem, you can send and receive genuine Adobe PostScript documents in sizes up to 11x17.



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Unless you enjoy denying yourself, choosing a network laser printer that doesn't have everything you need just doesn't make sense. Which is why the more you shop and compare, the more one printer becomes the clear choice. The Compaq PageMarq.

In short, no other network laser printer offers the same high-performance features and rugged reliability at anywhere near the same price. And with PageMarq you also get everything you need by way of support. PageMarq includes a one-year, on-site warranty, free technical help 7 days a week, 24 hours a day for as long as you own the printer.

For more details, call us at 1-800-345-1518. (For complete model information, just select the PaqFax option.) After you've compared the Compaq PageMarq to other printers, you'll realize there's only one thing you have to give up. The notion of settling for anything less.

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The Integration Company

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Corporate databases may provide easy victims for high-tech scam artists looking to exploit vulnerable individuals

WANNA BUY A SUCKER?

WATCH OUT! **Scam artists are going high-tech. They're no longer content peddling counterfeit watches on street corners or making telephone pitches about gold mines in Bolivia to randomly chosen targets.**

They don't have to be. Technology is making it easier to find and exploit low-income, elderly, naive or other vulnerable people.

Lawmakers can't keep up. Consumer watchdog groups can't track all of these campaigns, many of which are perpetrated far from the target audience. The Direct Marketing Association (DMA) in New York keeps repeating that the industry should police itself.

This is an issue that information systems professionals will have to grapple with, both as guardians of corporate data that could be misused and as builders of systems that can be used for nefarious ends.

Arming these scam artists are so-called "sucker" databases that contain the mailing

Sucker, *page 79*

BY ALICE LaPLANTE

JANET HAMLIN

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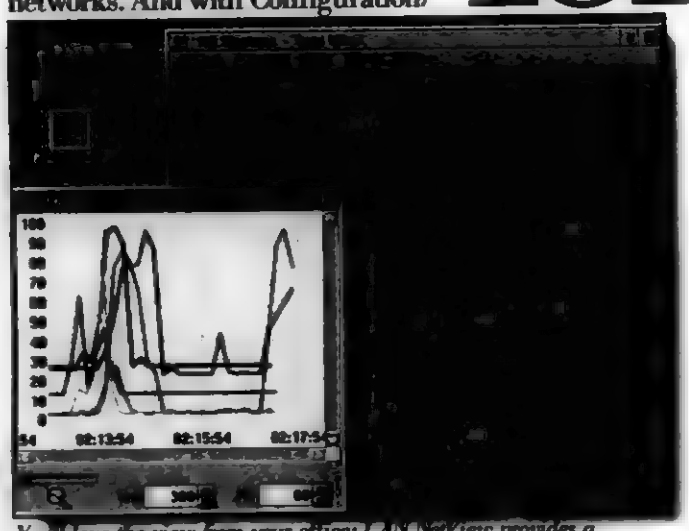

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IBM

Sucker

CONTINUED FROM PAGE 77

addresses and/or phone numbers of likely marks. The numbers of these databases are increasing, and they're becoming easier to access.

Of course, they're not called sucker databases. They're listed in *Direct Mail List Rates and Data*, the bible of direct marketing organizations, as "Opportunity Seekers," "Sweep-Nos" or "Game Buyers, Contest and Puzzle Participants."

These databases are not the standard marketing databases that profile income, lifestyle and consumer habits. They are the databases that peg you as easy prey.

Getting your name into this kind of database isn't difficult. Anyone who responds to a pre-approved credit card offer with an outrageous processing fee can pretty much count on landing in the circulating electronic files of the credit-poor and financially desperate. Even sending in a sweepstakes offer that comes in your mail can be a ticket for admission.

Good intentions

The fault does not always lie with the businesses collecting the information. Data that marks individuals for this kind of exploitation may be offered commercially with innocent intentions but may be misused by the renter. In extreme cases, it may even be stolen.

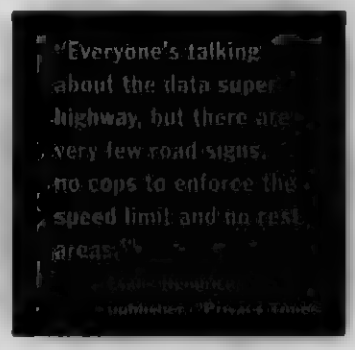
But both compilers of databases and renters have found themselves under investigation for their practices, as illustrated by the following cases:

•In June 1991, a direct mail campaign initiated by evangelist Oral Roberts apparently targeted consumers with heavy financial obligations, asking for charitable donations to aid in the "war against debt." In the personalized appeals, Roberts repeatedly alluded to the fact that the letter recipient was financially overwhelmed and asked for $100 in exchange for prayers to be said on behalf of the consumer and "the war against debt."

•In July 1992, a federal grand jury indicted the owner of ListWorld, Inc. in Huntsville, Ala., and nine other defendants on more than 140 counts of fraud. The defendants were alleged to have contacted by telephone and mail consumers from a database of individuals with poor credit histories, offering them low-interest credit cards. Respondents were charged up to $200 in "processing fees," then merely sent lists of banks that offered such cards — information readily available from public sources.

•In September 1993, an administrative law judge tried to prohibit Chicago-based Trans Union Corp. from compiling and selling targeted marketing lists based on the credit habits of consumers unless the list buyer intended to make a "firm offer of credit to each consumer on the list." Trans Union is appealing the injunction and continues to sell various subsets of the consumer databases in question.

•The Florida Insurance Commissioner's Office is currently investigating alleged misrepresentations by salespeople in Metropolitan Life Insurance Co.'s Tampa office, who are said to have used direct mail and telephone solicitations to push life insurance policies under the guise of high-interest-yielding retirement accounts. The particular MetLife promotion under investigation was targeted specifically at nursing professionals nationwide. An internal audit is also under way.



Opportunity knocks

The most common reason for a company to rent database lists is to identify potential customers and filter out unlikely ones. After all, the last thing a legitimate company wants is to make an offer to a person who is either unable or unwilling to pay.

But what about the unscrupulous marketer, the one searching for credulous or financially desperate targets? It is precisely the people who are filtered out from legitimate offers who are of interest to these marketers. These people are seen as more likely to enter into desperate gambles. And there's one born every minute — or at least the marketers are banking on that premise.

"An opportunity seeker is merely a euphemism for sucker," says Mary J. Culnan, an associate professor at the School of Business at Georgetown University in Washington. Culnan always asks herself upon seeing these lists advertised, "What are your customers selling that normal people won't go for?"

Culnan keeps a file of databases that worry her because of "the inferences you can make about the people on these lists."

In addition to the so-called opportunity seekers, another category of direct marketing databases — "Sweep Nos" — incorporates people who enter contests or sweepstakes without purchasing any products or services.

Highly lucrative databases, Sweep Nos are perceived as especially rich fodder for direct marketers because people who respond to offers such as sweepstakes are considered "mail responsive," says Ernest H. Schell, president of Marketing Systems Analysis, Inc. in South Hampton, Pa., a systems analysis and integration firm that puts together computer systems for direct marketing firms.

"These are not people who consider direct mail 'junk' and throw it away," Schell says. "They take the trouble to become involved even when they're not interested in the product being offered."

Potential for misuse

There are certainly legitimate reasons for organizations to buy databases, such as to target a marketing campaign only to those likely to need or want their service or product or to eliminate applicants who may be credit risks.

Examples include the "Credit Alert File" and the "Access America Credit," which, respectively, list people who are at least 60 days past due on their credit cards and seekers of credit cards whose applications were denied within the last 30 days.

Most list owners, however, are quite conscientious about how their databases are being used, according to Bill Dodd, director of Dodd Smith Dann, a San Francisco direct response firm. Dodd was formerly the circulation director at *Mother Jones* magazine and was responsible for renting out its subscriber list to interested marketers.

"Generally, you know the people renting the lists. They come through an established broker or firm that you trust," he says.

Moreover, Dodd says, "The direct mail industry is a small industry, and word spreads when someone is misusing a list. The industry cuts them off."

But for every 100 companies that use such marketing lists legitimately, there is perhaps one company that doesn't, says Jim Minno, an independent marketing consultant in Rochester, N.Y. List brokers — who sell but may not create these massive consumer databases — are not terribly diligent about checking up on their customers, he says.

Sucker, *page 81*

BEWARE buyer

Perhaps the best way for companies to safeguard against potential abuse of databases is to notify their customers that information about them is going into a database that could be shared.

Steve Rees, a magazine management consultant and president of San Francisco-based Publishing 20/20, gives publications that rent their subscriber lists this advice:

- **Tell subscribers up front – and often – that the personal data they provide will be used for other purposes.**
- **Offer them the opportunity to exclude their name from list rentals.**
- **Always ask the marketing firms renting your list for a sample of what they are mailing.**
- **Seed your list with random "dummy" names so you can check if they are being honest with you.**

LISTS YOU PROBABLY DON'T Want TO BE ON

The following lists from *Direct Mail List Rates and Data* probably offer value to certain legitimate direct marketers. But Denison Hatch, editor and publisher of "Who's Mailing What" and editor of "Target Marketing," and Mary J. Culnan, an associate professor at the School of Business at Georgetown University, warn that these lists are prime fodder for the exploitation of vulnerable "targets" concerned about their finances, health, mental well-being, aging or other issues.

America Seeking Opportunity: Individuals who took part in or inquired about multilevel marketing, money-making schemes, starting their own business, get-rich-quick and self-promotion programs.

Hot Line Bankcard Applicants: Individuals who have been turned down for credit by major banks.

Precision Optical Buyers: Over-40-year-old mail-order buyers of magnifying reading glasses, handheld magnifiers, glasses cases, sunglasses, etc.

Call & Claim 900 # Respondents: Respondents to a postcard promotion that says to call a 900 number for instant identification of a "preselected guaranteed" prize.

Penthouse Publications 900 # Callers: Male 900 number callers to various *Penthouse* publications and services.

Active Senior Citizens Working to Preserve Social Security and Medicare: Senior citizen donors to, and supporters of, preservation of the Social Security and Medicare systems.

Diabetes Self-management: Subscribers to a publication of health and lifestyle information for consumers who have diabetes or diabetic family members.

CreditMaster Applicants: Respondents to a national sales program for securing credit cards for people with poor or no previous credit history.

Source: *Direct Mail List Rates and Data*, November 1991, Standard Rate and Data Service, Wilmette, Ill.

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Sucker

CONTINUED FROM PAGE 79

Also worrying Culnan is the growing practice of companies downloading proprietary information from mainframe files into relational databases so outside users can get to it.

"If a company creates a data warehouse environment precisely so that users can go in and do ad hoc reporting against a relational database, how would you know what's been extracted or what it's being used for?" asks Ivan Brass, vice president of systems and technology at Paramount Publishing in Old Tappan, N.J., a division of Paramount Communications.

Denison Hatch, an active member of the DMA, is concerned that improper use of such databases will throw a shadow on legitimate marketing campaigns and the direct marketing industry in general. Hatch is also editor and publisher of the "Who's Mailing What" newsletter and editor of the "Target Marketing" newsletter in Philadelphia.

> **"If a company creates a data warehouse environment precisely so that users can . . . do ad hoc reporting against a relational database, how would you know what's been extracted or what it's being used for?"**
>
> Ivan Brass, vice president of systems and technology at Paramount Publishing

The problem is the lack of control over who gets access to these databases and for what purposes, Hatch says.

The ethics debate

So what are the ethics of seeking out vulnerable targets? What about purchasing a database of U.S. residents with diabetes or heart ailments or people who have sought remedies for managing stress, panic or anxiety attacks?

Beverly Goodwin, head of the ethics committee for the American Prospect Research Association, says the ethical issues new technologies raise is of growing concern to association members.

The association comprises people who spend their professional lives seeking individuals likely to give money to nonprofit and charitable organizations. Their prime worry: what constitutes exploitation of these "prospects" — who are, after all, sought precisely because they are seen as likely to have excess cash.

For example, say you are the fund-raiser for a medical facility, Goodwin says. Often, when a family member has died of a particular disease — bone cancer, for example — the family will ask friends, relatives and the community to send donations to the hospital or related medical research foundation in lieu of flowers or sympathy cards.

The potential for fund-raisers to use new database technologies to solicit such bereaved families for donations is perhaps the most extreme case that worries Goodwin. She says it would be in poor taste at best and unethical at worst.

As an example, Culnan points to a well-publicized mailing that was sent to senior citizens in the Washington area during the summer. Political action committees lobbying for Social Security and Medicare increases targeted the elderly, sending strong letters that in effect "scared" many of them into donating funds for these efforts, Culnan says.

"Often, the elderly are more vulnerable both emotionally and financially," she says. "Is it right to target them?"

Some laws already exist to protect populations perceived as especially vulnerable. Selling job listings was made illegal in most states decades ago, according to Jack Dale, vice president of sales and newspaper relations at North American ClassiFacts in Denver.

"There were a large number of frauds being perpetrated where people would pay exorbitant amounts for supposedly exclusive job listings that were often just photocopied out of the newspaper," Dale says.

Passed muster

ClassiFacts provides a computerized search service to job seekers. It will scan its database of 51 member newspapers for classified ad keywords in a given job category, salary range or geographic region. Up and running as of Oct. 3, ClassiFacts had a slower-than-expected start-up period because of the question of possible exploitation. Dale says the company has had to be careful to note it is merely an extension of the classified sections of those 51 newspapers, not a job placement clearinghouse.

"We needed to contact the attorney generals of all 50 states to make sure what we were doing was not only legal but proper," Dale says.

Questionable uses of demographic ZIP code databases can be subtle. For example, it's perilously easy to locate low-income areas through databases that list personal demographics by ZIP code and target mailings accordingly.

"The poor always pay more," says Lance Haver, executive director of the Consumers' Education and Protective Association in Philadelphia. "Now they're easier to find."

"Rent-to-own and second mortgage scams have traditionally targeted low-income people," agrees John Baker, senior vice president at Equifax, Inc., a consumer credit reporting agency in Atlanta. Baker also sits on the Federal Reserve Board's consumer advisory committee and says such scams as rent-to-own and second mortgage ultimately cause victims to pay from two to 10 times as much as they would under normal circumstances.

But "technology shouldn't be the fall guy," Baker argues. "The real problem is a lack of a standard as to how personal data can be used."

True, high-tech tools don't create criminals, Haver says. "But they certainly enable more efficient targeting and bilking of potential victims," he says. ■

LaPlante is a free-lance writer in Palo Alto, Calif.

Who's RESPONSIBLE?

IS professionals asked to take leadership role in the ethics debate

MANY BELIEVE that it's high time for information systems professionals to involve themselves in the process of monitoring what consumer databases are used for and by whom. Ernest Kallman is one of them.

A professor of computer information systems at Bentley College in Waltham, Mass., Kallman has been researching the issue of ethics for IS professionals in conjunction with the Center for Business Ethics, also located at Bentley. Chief information officers must take leadership roles in ethics considerations, according to Kallman.

"We always consider the economic, operational or technical feasibility of an IS project, but nobody ever sits back and asks, 'Is this ethically feasible?' " Kallman says.

The legality of a request from a user, manager or department for IS to aid in collecting, processing or querying a database is no justification in many cases, Kallman says. "We need to consider whether it is ethical."

Kallman's problem with IS and ethics: It's not enough to just follow orders from above if those orders are unethical. To illustrate the point, he uses an analogy from Nazi Germany.

"What if the Nazis had the potential to electronically pinpoint Jewish citizens by searching through a massive database? It's not that they couldn't do that successfully using manual methods — they obviously did — but computer technology would have made the effort easier. It's the ethical responsibility of a technologist to refuse to help in such cases and to recognize that the potential for harm can be greatly magnified by technology," Kallman says.

Robert M. Rubin, vice president of information services at Elf Atochem North America, Inc. in Philadelphia, agrees. "The ethics of the IS profession are no different than those of anyone else engaged in business," he says.

Rubin is also the president of the Society for Information Management, the 2,700-member professional organization for senior IS executives. "We are obligated to make sure our organizations are performing in an ethical manner," he says.

Indeed, Rubin has "a simple sniff test." He suggests, "If you would be embarrassed to go home and tell your spouse, significant other, children or parents what you are doing, don't do it."

Not quite that simple

Although agreeing with Rubin and Kallman in spirit, other IS managers point out the practical difficulties of taking this "high road" — especially in tough economic times when senior-level technology jobs are scarce.

"Absolutely, if something illegal is going on, it's your duty to take action," says Ivan Brass, vice president of systems and technology at Paramount Publishing, a division of Paramount Communications. "It's no different from copying software. It's against the law. Blow the whistle."

For those "gray areas," however — where perhaps there's possible exploitation but no broken laws — Brass says it's harder for IS managers to act decisively.

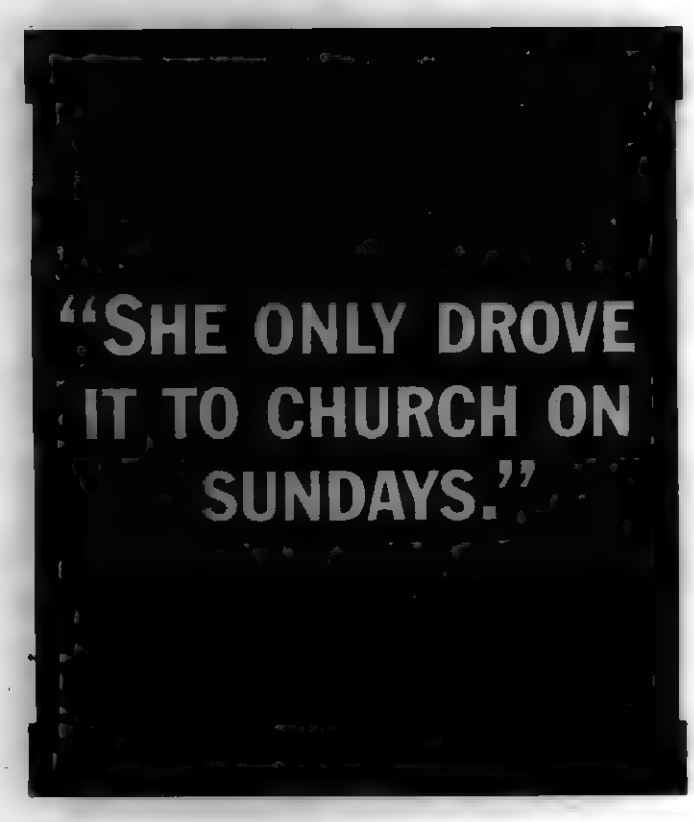
"We are the providers and processors of information. We can't be censors," he says. If something appears out of line, an IS professional should bring it to the attention of higher management and let them take appropriate action.

"But if senior management knows and approves, and it's not illegal but merely borders on something that is not nice, I don't know that you can do a hell of a lot," Brass says.

But CIOs must take responsibility for such issues, says Mary J. Culnan, an associate professor at the School of Business at Georgetown University.

"They need to be concerned about larger issues that affect the corporate entity. They need to ask, 'Would I like it if our company ended up on the front page of the *New York Times* for doing this?' " Culnan says. "If the answer is 'no,' they need to take appropriate action."

— Alice LaPlante



Calendar

DEC. 5-DEC. 11

Database Marketing Conference & Exposition. Orlando, Fla., Dec. 5-7 — Contact: The National Center for Database Marketing, New York, N.Y. (212) 972-2410.

Lotus Notes Users Conference. Lake Buena Vista, Fla., Dec. 5-9 — Contact: Lotusphere '93, Sudbury, Mass. (508) 443-1457.

Computer Measurement Group: Managing the Wave of Technology. San Diego, Dec. 5-10 — Contact: Computer Measurement Group '93, Chicago, Ill. (708) 655-1812.

Wireless Datacomm '93. Washington, Dec. 6-8 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

Internet World '93 & Document Delivery World '93. New York, Dec. 6-9 — Contact: Meckler Conference Management, Westport, Conn. (203) 226-6967.

First International Newton Industry Platform Development Conference. Santa Clara, Calif., Dec. 7-8 — Contact: Knowledge Industry Publication, White Plains, N.Y. (914) 328-9157.

Cause '93. San Diego, Dec. 7-10 — Contact: Cause, Boulder, Colo. (303) 449-4430.

Internetwork Management Technology Conference. New York, Dec. 8 — Contact: Beaupre & Co., Portsmouth, N.H. (603) 436-6690.

ITRC Innovation Through IT Research Opportunities. Etobicoke, Toronto, Dec. 8 — Contact: Anne Tyrie, Information Technology Research Center, University of Toronto (416) 978-7205.

The Outsourcing Conference: Opportunities, Strategies, Realities. Boston, Dec. 8-9 — Keynote speakers and programs will include Dale Kutnick, president and research director, Meta Group, Inc., "Making the Outsourcing Decision"; Capers Jones, founder and chairman, Software Productivity Research, Inc., "International Outsourcing: A Challenge to the U.S. Software Industry"; and Rota Terdiman, program director, Gartner Group, Inc., "Outsourcing: The Latest Update." Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

"Outsourcing the IS Function." San Francisco, Dec. 8-9 — Contact: International Quality & Productivity Center, Upper Montclair, N.J. (201) 783-4403.

Database World. Chicago, Dec. 8-10 — Contact: Digital Equipment Corp., Andover, Mass. (508) 470-3880.

Strengthening the IS/Client Relationship. Minneapolis, Dec. 9-10 — Contact: Ouellette & Associates Consulting, Inc., Bedford, N.H. (603) 623-7373.

The Kerzner Approach to Project Management: A Systems Approach to Planning, Scheduling and Controlling. Dallas, Dec. 11-12 — Keynote speaker will be Harold Kerzner. Contact: Lori Milhaven, International Institute for Learning, Inc., New York, N.Y. (800) 325-1533.

DEC. 12-DEC. 18

"Electronic Government: Policies for Redesigning Government and the Workplace and for Improving Communications with Citizens." Washington, Dec. 12-14 — Sponsored by the State Information Policy Consortium. Contact: National Association of State Information Resources Executives, Lexington, Ky. (606) 231-1905.

Lap and Palmtop Exposition and Conference. Toronto, Dec. 13-14 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7988.

Re-engineering: The Implementation Perspective. Boston, Dec. 14-16 — An educational seminar providing an introduction to the concepts and objectives of re-engineering with an analysis of the business factors driving it. Instructor will be Michael Hammer, The Center for Re-engineering Leadership in Cambridge, Mass. Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

JAN. 2-JAN. 9, 1994

Third Annual ShowBiz Expo. New York, Jan. 6-8 — Contact: ShowBiz Expo, Los Angeles, Calif. (213) 668-1811.

JAN. 9-JAN. 15, 1994

ObjectWorld. Boston, Jan. 10-13 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JAN. 16-JAN. 22, 1994

Usenix Winter 1994 Conference. San Francisco, Jan. 17-21 — Contact: Usenix Association Conference Office, Lake Forest, Calif. (714) 588-8649.

Client/Server Conference & Exposition. San Jose, Calif., Jan. 18-21 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-7460.

Nomda/Landa Emerging Technologies Expo '94. Orlando, Fla., Jan. 20-22 — Contact: Nomda/Landa, Kansas City, Mo. (816) 941-3100.

JAN. 23-JAN. 29, 1994

Demo '94. Palm Springs, Calif., Jan. 23-26 — Contact: InfoWorld Editorial Events, San Mateo, Calif. (415) 312-0545.

Comdex '94. Washington, Jan. 24-27 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

10th International Conference on Engineering Information Systems: Product Data Management & Alternatives. Dallas, Jan. 26-28 — Contact: Management Roundtable, Boston, Mass. (617) 232-8080.

The Fourth Annual Software Quality Conference. San Diego, Jan. 26-28 — Contact: Beck Ellman Agency, La Mesa, Calif. (619) 469-3500.

JAN. 30-FEB. 5, 1994

14th Annual Florida Educational Technology Conference. Tampa, Fla., Jan. 31-Feb. 4 — Contact:

Bureau of Educational Technology/Florida Education Center, Tallahassee, Fla. (904) 488-0980.

Executive Technology Summit '94. Sponsored by The Society for Information Management and *Computerworld*. Tarpon Springs, Fla., Feb. 2-4 — Contact: ATI Travel Management, Chicago, Ill. (312) 644-6642.

FEB. 6-FEB. 12, 1994

Building Enterprise Architectures. Washington, Feb. 8-10 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

FEB. 13-FEB. 19, 1994

The 1994 Annual Healthcare Information and Management Systems Society (HIMSS) Conference & Exposition. Phoenix, Feb. 13-17 — Contact: Andy Pasternack, HIMSS, Chicago, Ill. (312) 664-4467.

Sigda: Workshop on Field Programming Gate Arrays. Berkeley, Calif., Feb. 14-15 — Contact: Association for Computing Machinery, New York, N.Y. (212)-944-1318.

The Sixth Annual Software Support Conference. San Francisco, Feb. 14-16 — Contact: Jan Rosenthal, Institute for International Research, New York, N.Y. (212) 661-3500.

Mobile World. Dallas, Feb. 15-17 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Distribution/Computer Expo '94. West Irvine, Calif., Feb. 16-17 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

Conceppts '94. Orlando, Fla., Feb. 16-19 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

FEB. 20-FEB. 26, 1994

Share Winter 1994. Anaheim, Calif., Feb. 20-25 — Contact: Share, Inc., Chicago, Ill. (312) 822-0932.

Documation '94 Conference & Exposition. Los Angeles, Feb. 21-25 — Contact: Graphic Communications Association, Alexandria, Va. (703) 548-2867.

MacFair '94. New York, Feb. 26 — Contact: New York MacUsers' Group, Inc., New York, N.Y. (212) 473-1600.

FEB. 27-MARCH 5, 1994

Reseller & Integrator Symposium on Document Imaging. Santa Clara, Calif., Feb. 28-March 1 — Contact: The Rheinner Group, North Scituate, Mass. (617) 545-7027.

Engineering Document Mangement Systems (EDMS) '94. Orlando, Fla., Feb. 28-March 3 — Contact: The Kalthoff Group, Cincinnati, Ohio (513) 871-6808.

Workflow '94. Boston, March 3-4 — Contact: The Conference Group, Scottsdale, Ariz. (602) 661-1260.

MARCH 6-MARCH 12, 1994

PC '94 Show. Sydney, Australia, March 8-11 — Contact: Eileen M. Lavine, Information Services, Inc., Bethesda, Md. (301) 656-2942.

MARCH 13-MARCH 19, 1994

The BancA 5th Annual Executive Conference. Dallas, March 13-15 — Contact: BancA, Dallas, Texas (214) 788-0018.

The 14th Annual Conference on the Use of Clinical Information Systems. New Orleans, March 14-16 — Contact: Society for Clinical Data Management Systems, Los Angeles, Calif. (213) 224-6259.

MARCH 20-MARCH 26, 1994

UniForum '94. San Francisco, March 21-25 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

APRIL 3-APRIL 9, 1994

The Annual Computer Storage Exposition & Conference. San Francisco, April 5-7 — Contact: Sandi Eberhard, Eberhard & Co., New York, N.Y. (212) 486-6186.

APRIL 17-APRIL 23, 1994

ISCA '94: 21st International Symposium on Computer Architecture. Chicago, April 18-21 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Unix Reseller Conference. Dallas, April 18-21 — Contact: Expoconsul International, Inc., Princeton, N.J. (609) 987-9400.

Networks Expo. San Francisco, April 19-21 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

APRIL 24-APRIL 30, 1994

CHI '94: ACM Conference Human Factors in Computer Systems. Boston, April 24-28 — Contact: Association for Computing Machinery, New York, N.Y. (212) 869-7440.

Africa Telecom '94. Cairo, Egypt, April 25-29 — Contact: Africa Telecom '94, Secretariat International Telecommunication Union-Place des unions CH-1211 Geneva 20, Switzerland, 41-22-730-58-11.

MAY 1-MAY 7, 1994

EDI '94. Orlando, Fla., May 4-6 — Contact: Data Interchange Standards Association, Inc., Alexandria, Va. (703) 548-7005.

MAY 22-MAY 28, 1994

DB/Expo '94: Database, Client/Server, Technology Exposition & Conference. San Francisco, May 23-27 — Contact: Blenheim NDN, Inc., Mountain View, Calif. (415) 966-8934.

JUNE 19-JUNE 25, 1994

Ekran Asia '94. Almaty, Kazakhstan, June 21-24 — Contact: Fairtrade GmbH, Landhaustrasse 13, D 69115 Heidelberg 49-6221-181935.

JULY 24-JULY 30, 1994

Interop '94. Tokyo, July 25-29 — Contact: Thomas Associates, Inc., Menlo Park, Calif. (415) 325-6236.

Executive Track

Cargill, Inc. in Minneapolis recently hired **John B. Bjelland** as vice president of agriculture sector management information services and corporate information technology and application architecture.

Among other duties, Bjelland will oversee Cargill's transition from mainframe to client/server computing, a task he piloted at Grand Metropolitan in New York, where he was formerly vice president of worldwide application strategy.

Bjelland reports to Lloyd Taylor, Cargill's corporate vice president of information technology. Cargill is involved in the acquisition, processing, merchandising and storage of agricultural and other bulk commodities.

Joseph Rosen has been named managing director at **Enterprise Technology Corp.** in New York. He was formerly chief information officer at Dubin & Swieca Capital Management in New York.

Rebecca McPheters has been promoted to senior vice president, group executive, at **The New York Times Co. Women's Magazines**. She was formerly vice president of information services.

DuWayne Petersen, former Merrill Lynch & Co. chief information officer-turned-consultant, has announced the formation of a new benchmarking consortium for banks and financial institutions. The group will focus on helping information systems organizations evaluate their performance. Michael-Delia, Inc., a San Diego consultancy and developer of performance analysis software, will support **DuWayne Petersen Associates** in Pasadena, Calif.

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Source: Survey of Computerworld on CD subscribers, May 1993.

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Intelligence Files

True value of client/server

Large corporations are finding that client/server computing offers few, if any, long-term cost advantages over other kinds of information systems, according to recent studies conducted by The Research Board, a New York-based IS research consultancy that works only with Fortune 100 firms.

The cost of mainframe, minicomputer-based and client/server computing will be roughly equivalent in as little as three years. While client/server systems may appear to offer lower hardware costs, these advantages are neutralized by other factors. Fortune 100 companies have found that in a five-year period, 60% to 80% of the actual cost of client/server computing is taken up by end-user support costs, administrative costs and other factors.

The true advantages of client/server computing over traditional mainframe or minicomputer-based systems lie in its friendlier interface and its ability to enable users to access information from multiple sources on one screen. Another important factor favoring client/server computing is that third-party software vendors are now putting their development efforts into client/server systems.

Source: The Research Board, New York

On the information highway

Businesses are getting into high gear to ride the information highway. A recently completed study by the Society for Information Management (SIM) revealed that more than half of the responding corporations were already working on implementing aspects of the information highways in their business.

The SIM study presents data gathered from senior technology executives at 320 U.S. corporations. These executives expect the information highway will be widely available within seven years but that it probably will not come about for at least 12 years.

The executives said they also expect businesses to benefit from the information highway far more than education or the general public; that the highway is essential for global competitiveness; that it will benefit data exchange more than business strategy; and that standards for highway use should be set soon.

Source: Society for Information Management

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EDS

REDESIGNING DESIGN

PRODUCT DESIGNERS ARE TEAMED WITH MANUFACTURING AND MARKETING IN THE MOST FORWARD-LOOKING COMPANIES

BY JENNIFER DEJONG

Bill Canal has a funny story he likes to tell. Bose Corp., where he has worked for 18 years in various product engineering areas, once designed a tubular-shaped speaker called the Cannon. Intended for professional use, the speaker measured 12 feet long and one foot deep.

When it came time to roll out the cardboard packaging that had also been specially designed, there was a problem: The box was so large that the plant aisles weren't wide enough to accommodate it.

The speakers were finally packaged, and luckily for Bose, the event was more of an annoyance than a disaster. But it was also a strong early warning that something had to change: The manufacturing plants had to get better and quicker access to what the design group was doing.

Bose heeded the warning, and Canal is now heading up a system installation that will ensure the box mistake isn't repeated. From Mexico to Ireland to Quebec to Arizona, plant workers will always know beforehand what's going to emerge from the product designers in Massachusetts.

The data management system will alert them to things like packaging size while the cardboard box is still a computer-aided design (CAD) drawing on the designer's workstation.

Redesigning design, *page 89*

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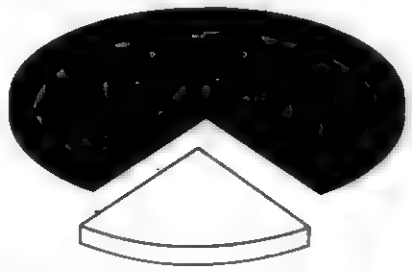

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80. Educator, Journalists, Librarians, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (check all that apply)

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❑ Netware	(b)	❑ Windows NT	(f)
❑ OS/2	(c)	❑ DOS Windows	(g)
❑ Unix	(d)		

App. Development Tools

❑ CASE	(h)		
❑ C++	(i)		

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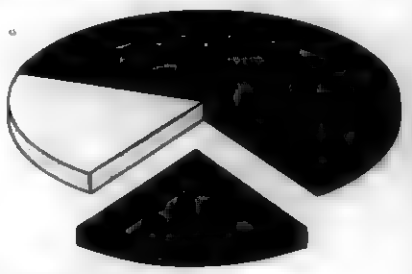

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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
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12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Educator, Journalists, Librarians, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (check all that apply)

Operating Systems

❑ Solaris	(a)	❑ Mac OS	(e)
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Redesigning design

CONTINUED FROM PAGE 87

Bose, the world's largest maker of music loudspeakers, tackled its design process problem before it reached a crisis point.

But many other U.S. manufacturers are under the gun to meet the demand of fast-moving markets, ferocious pricing pressure, fragmented customer tastes and intense competition.

The best route to survival, they're finding, is to tear apart and rebuild their approach to product design.

"Design is [a process of] problem solving. The visual aspect is just one part of it," says Sohrab Vossoughi, president of Ziba Design, a Portland, Ore., firm that designs consumer, medical and industrial products, ranging from small computers to athletic shoes for clients as diverse as Apple Computer, Inc. and Nike, Inc.

Designers wear many hats

These days, industrial designer Michael Laude spends a lot of time talking about target customers, changing channels and plunging price points. The Black & Decker Corp. engineer isn't changing careers; he just spends a lot of time, either on electronic mail or on Lotus Development Corp.'s Notes, with the folks in marketing and finance.

DESIGN INNOVATORS

Laude is one of six members of the "cleaning products" business team, which counts among its ranks a general manager, a director of engineering (Laude himself), a director of marketing and a representative each from finance, manufacturing and quality.

The team designs, manufactures, markets and sells the Dustbuster and other handheld vacuum cleaners. Like its three counterparts in the household products area, it's responsible for its own profit and loss.

The business teams, which were formed two to three years ago, allow the $5 billion maker of power tools and small appliances to act like a small business: nonbureaucratic, close-knit and driven by a common goal.

Say, for instance, the team wants to design a new vacuum cleaner. Marketing knows just how it wants it to look — what shape it should take and how large it should be. The engineers are concerned about the product's size and shape, too, but not for appearance's sake. The casing needs to house the inside circuitry that makes the product run.

"You don't want to end up trying to fit 10 pounds of stuff in a five-pound box," Laude says. "When that happens, you have to start over."

The teams have enabled Black & Decker to target the costliest stage of a product's life cycle — what Randy Muns, president of Horizon Technologies Group, a design consulting firm in Fort Worth, Texas, calls "white-collar rework." This is the transition stage between engineering and production, when a design gets bounced from department to department until all parties reach a consensus. It's expensive not only in terms of operations costs but also in the length of time it takes to get the product to the customer.

BLACK & DECKER uses a team approach to design toasters and other small appliances. The Household Products Group has already cut one year off its three-year cycle of getting irons, food processors and handheld vacuum cleaners out the door. It's working to further reduce time to market to one year.

So far, the team concept has cut one year off Black & Decker's three-year cycle time, which extends from the formulation of a preliminary marketing plan to the day the product ships.

That's impressive, but it's still too long for the fierce business climate in which the company competes. In the small appliance market, margins are as thin as 10% to 15%. One blender looks just like the others, and brand loyalty is a thing of the past.

Black & Decker needs to further trim cycle time to just one year and also reduce the number of products that are returned under warranty. Both are likely to

Redesigning design, *page 90*

CRUNCH TIME

AMONG MANUFACTURERS, TIME TO MARKET IS A CRITICAL FACTOR . . .

Very important

95%

. . . BUT ONLY A FEW COMPANIES HAVE MANAGED TO REDUCE THE INTERVAL.

Reduced time to market

12%

SOFTER MANUFACTURING, TOO

AMONG SOFTWARE VENDORS, THERE'S GREAT INTEREST IN USING DESIGN AUTOMATION . . .

Design automation	46
Total quality management	18
Electronic data interchange	18

. . . BUT ONLY A FEW HAVE FORMAL PLANS IN PLACE.

Pursuing but have no plans	43
Formal plans in place	3
No plans to implement	6

Response base: 52 software vendors

Source: Pittiglio, Rabin, Todd and McGrath

THE TECHNOLOGY TO DO IT

Product data management systems are often built in-house, but there are commercial systems available, as well.

Some of the available product data management systems include Structural Dynamics Research Co.'s DCMS; Sherpa's Product Information Management System; Hewlett-Packard Co.'s Project Management Control System; IBM's Product Data Manager; and FileNet Corp.'s Work Management.

Almost all suppliers of CAD software have some sort of data management component as well, including vendors such as Computervision and Intergraph Corp.

When it comes to enterprise data management systems, most companies turn to integrators or product data management vendors because of the high degree of customization involved.

In an enterprise data management system, the product data management component is wired together with companywide tools, such as design, operations, logistical support or desktop tools.

The enterprise system uses the engine of the product data management system to store information about product design. Common application programming interfaces link that engine to manufacturing systems. A common presentation manager brings in the desktop tools.

A common data repository, which would be a derivative of the engine but with a neutral database, acts as a SQL bridge to other relational databases throughout the company.

The following is a list of tools to implement for re-engineering product design:

- Electronic design tools that are complete for all facets of design.
- Electronic design analysis tools.
- A product data management tool.
- A manufacturing engineering assemble/process planning tool.
- A manufacturing/material control tool.
- An enterprisewide master scheduling and resource planning tool.
- An enterprise software integration tool that performs middleware functions to give the above tools a consistent view for all users in the entire enterprise.

Written by Randy Muns, president of Horizon Technologies Group, a design consulting group in Fort Worth, Texas.

Redesigning design

CONTINUED FROM PAGE 89

begin happening early in 1994, when each team in the Household Products Group starts to use a custom-developed "product information management" system.

Product information management systems — also known as electronic data management and product data management tools, depending on who's offering it — are systems that store, route, track and update every drawing and document that makes its way through the design process. Documents can include such items as CAD drawings, product specifications, customer requirements and parts lists.

Like a work-flow management system, these systems shepherd documents and changes to documents to the people who need to see them. If the specs in a particular CAD drawing change, associated documents will be updated.

In addition, people from various disciplines can see the current version of one another's work, ensuring that the pieces of the product fit together.

At Black & Decker, the system also electronically generates a bill of materials, which will eventually feed automatically into the company's new manufacturing resource planning system.

Moving out to the enterprise

Integrating design engineers and manufacturers on a single system is about as far as most companies have gotten today. The future, however, is in enterprise data management.

With this type of system, the flow of data would begin with customer requirements. Teams would work on a conceptual design and then go back and forth with the customer to formulate a detailed design. The enterprise product data management system would provide a common view and a way for all parties to review and comment on the product throughout its life cycle.

Today, only a few full-fledged enterprise data management systems are in use for product design. "There are people who've grappled for six years with product data management systems," Muns says. "When you move up to the enterprise types of systems, we're just in the inaugural stage."

DESIGN INNOVATORS

THE ROVER GROUP LTD. is now using an electronic data management system from Computervision to track the design documents used for its Discovery line of sport utility vehicles. It now produces models in 36 months, a drop from seven years.

One of the reasons for the lack of progress is the immaturity of the technology, Muns says. "That's not to say people aren't spending a lot of money on these systems," he adds. Indeed, a product information system from Sherpa Corp. starts at $20,000 to $30,000. Taylor Archer, a founder of Horizon Technologies, says software prices can range up to $100,000. Because of the huge amount of customizing and consulting needed, most systems range in the hundred of thousands.

And the technology is not even the expensive part in terms of effort and time. The most successful companies start by knocking down the barriers between business functions first and then installing the technology.

At Black & Decker, Laude isn't worried about the technology transition. He says the hard part — reinventing the business — is already done.

"Installing a box will not gain you the discipline you need to produce quality products," Laude says.

"Once you determine the process and define the steps, [the technology] is easy. It looks like a complicated dance, but it's not," Laude says. ■

DeJong is a free-lance writer in Boston who frequently writes about re-engineering.

MEDICAL SUPPLIER PRESCRIBES DESIGN RX

No one can predict the outcome of the Clinton administration's proposed health care changes. But Medtronic, Inc. isn't waiting for the picture to clear; it's preparing now for the probable price shakeout it will face in the not-so-distant future.

The Fridley, Minn.-based maker of pacemakers is sure of one thing: Hospitals are going to demand lower prices for the pacemakers, heart valves and other medical devices they buy from the $1.3 billion firm.

Automation efforts had been tried before at Medtronic, but nothing really took until upper management mandated a move on-line. The vice presidents saw plenty of room to cut costs by streamlining the product design and sign-off process.

UP FRONT

It wasn't hard to see. Under the then-current design process, it took Medtronic 17 to 20 days just to finalize a CAD drawing for a product change. And no wonder: Every drawing had to be approved by eight separate people in engineering, manufacturing and quality assurance, which meant a paper chase around the world to Medtronic sites in Puerto Rico, the Netherlands and Phoenix.

"That's two days to get there, two to get back and one for the review," says Gale Zimmerman, manager of configuration assurance at the firm. The company was spending $20,000 a year in shipping bills alone.

Medtronic has been using CAD tools since the 1970s. But each designer has been drafting alone at his workstation, drawing a single component that will eventually make its way into the final product. All interaction among the designers is manual.

The goal is to reduce the change cycle to 10 days by the end of 1995 and to five days by the end of 1996.

To do that, Medtronic is using an information management system from Sherpa in San Jose, Calif.

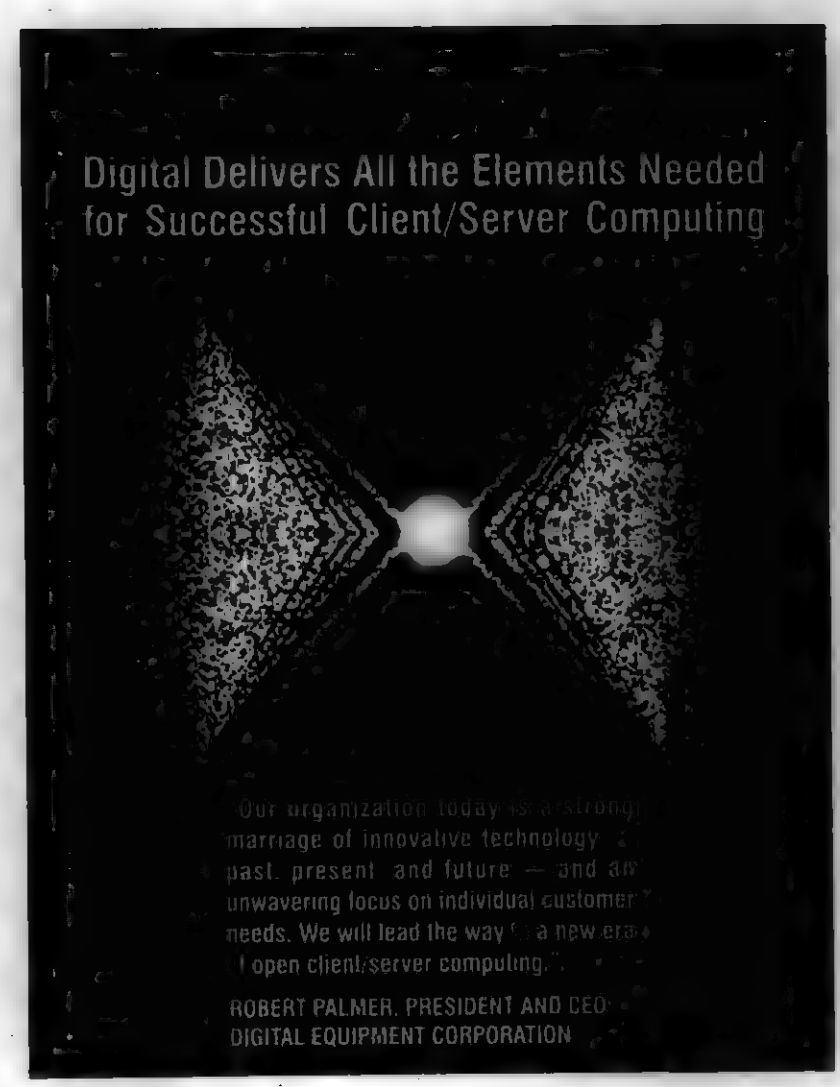
Medtronic's Gail Zimmerman says five days for approval of designs was much too long for today's market

To determine everyone's requirements, Zimmerman and his project manager Jim Drake formed a task team with the software engineers, quality managers, design engineers, network professionals and users of the system from all of the local divisions.

At this stage of the implementation, Zimmerman and Drake are loading in bills of materials, CAD drawings, images and word processing documents pertaining to the release of a product. It's a cumbersome, manual process, but Zimmerman's confidence is high.

"I have upper management's buy-in," he says. "Without it, you won't succeed."

—*Jennifer deJong*



Did you know?

- **Digital has made client/server computing its single business focus.**
- **Digital has grown its client/server-based systems integration capabilities into a $2.3 billion business.**
- **Digital has implemented successful client/server solutions for a broad range of businesses, including Tyson Foods and Pitney Bowes.**

The truth of the matter is that open client/server computing is at the very heart of what Digital is all about. It is the basis of our strategy to provide you with complete customer satisfaction, so that you can achieve your business goals today — and well into the future.

Client/server computing gives a company the means to make the most of all its resources: information, capital, technology — and most of all, people. It is helping people to work cross-functionally to improve customer service; to participate in international teams to enhance quality; to apply information in new ways in order to create innovative and unique products; to redesign and streamline processes, thus reducing time-to-market and improving profitability. Ultimately, client/server computing allows you to make business changes very fast — in response to changing business conditions. And that ability is what keeps you competitive.

How does Digital plan to deliver all these client/server computing promises? Our strategy is based on the following three principles:

We deliver the best and most comprehensive portfolio of open client/server technology solutions. We make it our business to know your business, by defining and implementing an organization that is focused on specific industries and accounts. We have expertise and support that is unmatched in the industry.

Delivering "No Compromise" Open Client/Server Technology

Digital continues to provide you with outstanding value in technology via:

- *An extensive portfolio of application software through collaboration with major developers*

Digital is partnering with key application vendors such as ASK Group, Cincom, Cyborg Systems, Inc., Parametric Technology, ROSS Systems, SAP, SAS Institute, Shared Medical Systems, Welty-Leger Corp., and WordPerfect, Inc., to provide a broad range of applications for industries, including aerospace, automotive, banking, education, engineering, healthcare, retail/wholesale, telecommunications, and many others. In addition, 3,000 applications to date have been ported to our revolutionary Alpha AXP platform — a platform that is scalable from desktop to mainframe.

- *Easy, open sharing and access to information in a multivendor environment — enabling you to link people in cross-functional processes*

Introducing LinkWorks. The fact is that there is no other software in the industry that can do what it does. We define LinkWorks as an "enabling tool" that can be integrated with a wide range of Digital and third-party software and adapted to virtually any industry application. LinkWorks will benefit your business by helping overcome communication barriers between workgroups, improving security and management of PC networks, simplifying access to information, and streamlining business procedures.

The PATHWORKS product family, Digital's PC networking and integration software, allows you to dramatically simplify network management across all your network operating systems (NOS). And, with PATHWORKS software, you can use whatever NOS commands you want to manage all of them.

Digital's framework for data access and integration, ACCESSWORKS, provides directory services so that a client system can find the data you need, and translation services so that the data you request arrives in the format you need. It is based on existing SQL standards and other developing standards such as ODBC.

Digital works with its database partners to provide the "plugs" that let you access best-in-class database management system servers and integrate them into your client/server environment.

We've even got mobile users covered — with mobile and wireless solutions that provide location-transparent application access for rapid access to network resources.

- *The comprehensive ability to integrate current and future technology into your existing environments with minimal effort and downtime*

Digital's client/server philosophy is based on a multivendor environment. In fact, a distributed computing environment is assumed with all Digital software products.

OBJECTbroker is the industry's first CORBA standard product — allowing existing applications to be encapsulated and accessed as objects. Source code is not necessary. Through this product, Digital gives you a very simple mechanism for integrating current as well as future applications into a full client/server implementation.

- *The best price/performance everywhere*

For today and for the future, Digital's Alpha AXP systems are and will be the performance platform for client/server computing. We offer a complete line of UNIX Alpha AXP workstations and a scalable line of dependable servers that offer the best performance at every price point. Plus, we'll continue to offer a full line of price-competitive Intel-based PCs and servers.

- *Exceptional system availability and data security*

In an OpenVMS VAX environment, Digital has long offered the premiere functionality for mainframe computing — particularly in a distributed environment. With Digital's October client/server announcements, this capability has been ported from the VAX platform to the Alpha AXP platform. In addition, we have delivered on our commitment to port this industry-leading capability to the UNIX operating system on the OSF/1 platform. But we won't stop there. Digital will also be porting this capability to the Windows NT operating system in the future.

We're Focused on Your Business Needs

Bob Palmer said it best. "The object of our renewed focus and direction is a single principle: customer satisfaction." Before Digital can offer you the best client/server solutions for your business, we need to understand your business and the issues that surround it. That's why we've restructured our organization into specific industry-focused business units. We also understand that no two companies within the same industry are alike. As a result, we have implemented industry-organized account management so that the specific needs of each of our customers are fully met.

Extensive Support, Unmatched Expertise

Let's talk about experience. Digital is ranked among the top two client/server-based systems integrators worldwide — and has a systems integration business totaling more than $2 billion. We've installed more than 100,000 networks, and networked more than 1 million systems. In short, we have the commitment, strategy, and experience to deliver the best and most comprehensive range of client/server solutions.

Digital also provides the most capable one-stop service for a multivendor environment. And we can prove it. We support:

- All major PCs, PC LANs, and PC applications
- The broadest range of UNIX systems and applications
- 14,000 products from 1,300 vendors
- Environments including IBM, Hewlett-Packard, Sun, UNISYS, CDC, Wang, and many more

In addition, along with Digital's 35,000 support professionals located worldwide, we are building a staff of 7,000 trained systems integration specialists dedicated to implementing your open client/server environment. ■

digital

DO YOU HAVE A CLIENT/SERVER ENVIRONMENT THAT'S HUNGRY FOR FAST I/O?

Serve Up Digital's High-Performance Solid State Disks

Today's client systems are faster than ever. And multiple clients, running more and more distributed applications, are placing an ever increasing strain on the server's ability to deliver data to them. In order to optimize the power and performance of your client system, you need to make sure I/O doesn't become bottlenecked. Solid state disks from Digital can help you distribute critical information when and where you need it.

Whether your server is CI- or SCSI-based, Digital has a solid state disk to meet your business requirements. For CI-based systems, the industry workhorse ESE50 solid state disk is ready to balance CPU speed with lightning-fast I/O. For SCSI-based servers, the EZ5x family of solid state disks is available to supply your most access-time-critical data.

Either way, your client/server computing environment benefits. The ESE50 solid state disk provides 1 gigabyte of nonvolatile capacity to meet your growing database and application needs — and does so at a very competitive price. The EZ5x products support your migration to open SCSI 2 standards and feature StorageWorks packaging. In addition, an integrated Data Retention System with continuous backup is built in to support a virtually limitless number of power failures.

The best news? Both of these high-performance solid state disk products are available for your client/server computing environment today.

You Ask — We Answer

With so many different storage products on the market, you may be asking yourself some important questions. Why solid state disks for my client/server environment? And next — why Digital? Here, we answer those questions, plus a few more.

Why should I consider solid state disks?

There's no doubt about it. The "output" of computing is becoming more and more important to businesses today. In some cases, the output is the business — and optimum performance is the requirement. Solid state disks provide the lightning-fast access to data (beyond the capability of traditional storage) to unleash maximum CPU power and application performance.

What about price?

Today, Digital's solid state disks are only one-ninth the cost of earlier models (based on $/MB). Through experience and value engineering, we're bringing products to market at prices that allow more and more businesses to utilize the technology. The benefits and fast payback derived from devices purchased "yesterday" for mainframe-class applications can now be realized even sooner on today's client/server platforms.

How do I choose between ESE50 and EZ5x solid state disks?

That's easy. The ESE50 solid state disk provides the highest performance and capacity. And its redundant power supply feature offers the highest availability. If you're already implementing HSC and KDM70 controllers, the ESE50 solid state disk is the choice. If openness is a requirement, the EZ5x solid state disk provides the lowest entry cost and the flexibility of StorageWorks packaging. Cost differential has been removed from the decision. For higher-capacity configurations, the net $/MB cost of the devices is about equal.

Can ESE50 and EZ5x solid state disk drives be used in the same cluster?

Absolutely. The devices plug-and-play beautifully together. The return on your investment in HSC-connected storage continues with the ESE50 solid state disk. And, should SCSI 2 devices be part of your future storage strategy, the EZ5x solid state disk can be added in easily.

What if my client/server applications are based on DSSI storage?

No problem. Digital's got you covered with our native-mode EF5x series of products to support your DSSI system.

For more information or to order Digital's ESE50 or EZ5x solid state disk products, call 800-DIGITAL (800-344-4825) and reference code BFQ. ■

PRODUCT/ORDER NUMBER	U.S. LIST PRICE
ESE50 SOLID STATE DISKS*	
ESE50-AA (120 MB)	$40,000
ESE50-BA (600 MB)	$105,000
ESE50-CA (120 MB to 600 MB Upgrade)	$80,000
ESE50-DA (1 GB)	$135,000
EZ5X SOLID STATE DISKS*	
EZ51R-VA (107 MB)	$13,999
EZ54R-VA (428 MB)	$47,099

* All models contain Digital's integrated Data Retention System to provide the nonvolatility of a magnetic disk if power is lost.

SDI AND SCSI SOLID STATE DISKS AT-A-GLANCE

	ESE50 SOLID STATE DISK	EZ5X SOLID STATE DISK
Interconnect	SDI	SCSI-2
Access Time	0.25 milliseconds	<3 milliseconds
I/O Throughput Potential*	1,800 I/Os per second	300 I/Os per second
Capacity	120 MB – 1GB	107 MB – 428 MB
Packaging	Storage Array Building Block	StorageWorks Building Block
Availability	Integrated Data Retention System	
	Redundant Power Supply	Continuous Backup
Pricing Schedule	DBA (Digital Business Agreement)	DPP (Digital Pricing Program)

*Will vary by CPU, application, subsystem, and workload

OPEN THE DOOR

TO SUCCESSFUL

ELECTRONIC DATA INTERCHANGE

INTEGRATION IS THE KEY — AND DIGITAL HAS IT

Imagine conducting interactive electronic data interchange (EDI) with your customer from start to finish in just 6 seconds. Imagine automating the purchasing process with your suppliers — using EDI from purchase through payment — and realizing 20-to-1 savings. Imagine moving to client/server EDI, off-loading your IBM mainframe, and getting fully audited EDI transactions to and from the mainframe application.

Just think of the savings in time, the significant enhancements in the business cycle, the improved trading partner relations, and, most important, the savings to your company's bottom line.

You don't have to imagine any longer. The above results are real — accomplished by Digital customers using the DEC/EDI portfolio of products and services. The key to EDI success is integration. That's why our portfolio consists of products with superior integration features, plus services that maximize the integration of EDI into your business process.

And who better than a major user of EDI and a leader in systems integration to provide you with the most integrated EDI environment. Digital began using EDI in 1984. We developed and enhanced DEC/EDI software to run our own business, with much success. Today, we're putting that experience and success to work for you.

How EDI Enables Business Improvements

EDI is a form of Electronic Commerce. Specifically, EDI is the automated, computer-to-computer, application-to-application exchange of structured business data between a company and its suppliers, customers, banks, and other trading partners. The data are structured according to standards and represent common business transactions such as purchase orders, invoices, remittance advice, and many more.

But EDI is not the goal itself. It is the key technology that — combined with application integration and other technologies — enables business process improvements, such as just-in-time programs, quick response service, continuous inventory replenishment, cost reduction programs, total quality management, and better cash management.

These improvements are made possible when EDI provides multiple levels of integration, such as integral communications and auditing, application integration across platforms, and integration with workflow, electronic mail, and the X.400 and X.435 international standards.

DEC/EDI products and services do it all. With integrated management and auditing features throughout, the DEC/EDI environment provides the means for EDI transactions to be sent and received, translated, and integrated with applications — including applications on IBM mainframes. In addition, the DEC/EDI portfolio makes integration with electronic mail and messaging a reality.

DEC/EDI Portfolio Integrates with Applications on Digital and IBM Platforms

The DEC/EDI portfolio consists of a comprehensive set of client/server products and services, including:

DEC/EDI Software

DEC/EDI software is composed of three distributable components — communications, translation, and application software servers — that work together to serve the needs of client business applications. DEC/EDI software supports multiple VAN services and direct links, and the X.400, X.435, X.25, OFTP, and bisync protocols. It also supports national, international, and industry-specific EDI syntax standards, including EDIFACT, ANSI ASC X12, ODETTE, and TRADACOMS.

A by-pass capability allows nonstandard or existing EDI systems to participate in the DEC/EDI environment — ensuring protection of your previous investment. DEC/EDI software allows integration of existing and new applications and tracks transactions to and from each application.

FileBridge for DEC/EDI Software

FileBridge for DEC/EDI software — a table-driven, file-based bridge or "mapper" between DEC/EDI software and applications — tightly integrates data into applications, in the format that each application requires. FileBridge for DEC/EDI isolates the mapping process from the business application, minimizing the programming and support required to add new trading partners, to handle varying EDI standards and versions, and to maintain the overall system.

HostBridge for DEC/EDI

HostBridge for DEC/EDI consists of client/server software and services that integrate EDI transactions into applications on IBM MVS-CICS, MVS-Batch, and VSE-CICS mainframes with the same auditing and tracking as with Digital-based applications.

DEC/EDI-ready Third-party Applications

These applications are ready to use with the DEC/EDI product and are pre-mapped using FileBridge for DEC/EDI software. They include:

- Integrated Accounting System (CODA, Inc.)
- Renaissance Financial Series (ROSS Systems)
- DCS/Logistics (Andersen Consulting)
- Mancos (Mancos Computers)
- MDS (Distribution Architects International)
- Distribution Series (ROSS Systems)
- TOLAS (GSI)
- CONTROL:Manufacturing (Cincom)
- MAXCIM, MANMAN (ASK Computer Systems)
- PROMIX (ROSS Systems)
- TROPOS (Strategic Systems International)
- ALLEGRA (SMS)
- Alliance (ASA International, Ltd.)
- POWERDOC*EDI (Fraser Williams)

"Having used EDI for more than one year, we anticipate saving about 700,000 pounds ($1,333,000) annually. For each pound invested in EDI, we will be getting 20 pounds in operation savings."

NEIL WILSON
DIRECTOR OF FINANCE
NORWICH HEALTH AUTHORITY

Standard and Customized Services

A dedicated EDI Practice Center provides the services you need to meet your specific business requirements. Digital also provides comprehensive training and support worldwide.

Integration with the X.435 Standard

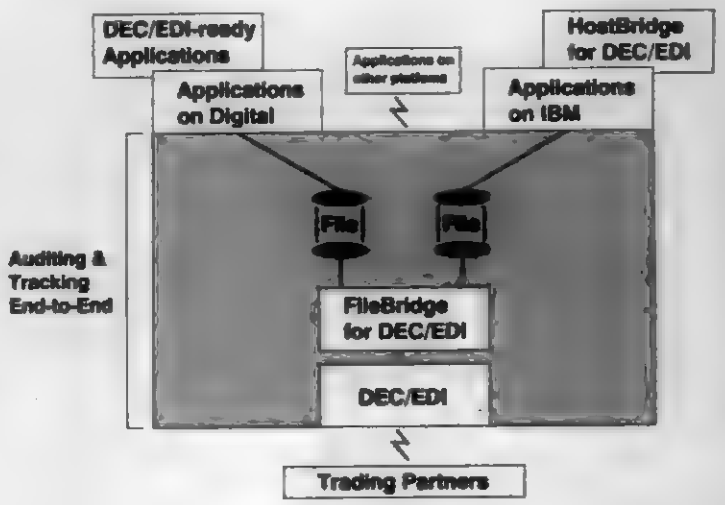
Digital is the first major computer vendor to support the X.435 standard — a standard that is X.400 enveloping for EDI and other data types such as drawings, images, reports, and graphics. In a recent report, the Gartner Group describes X.435 as the "single most important standard for integrated messaging."

Digital's support for the X.435 standard enables businesses to send and receive EDI transactions over the same network that carries their electronic mail. As a result, companies can implement a single, enterprise-wide messaging system for global Electronic Commerce.

According to the Gartner Group, "Companies can cut their costs of implementing EDI and messaging by using a common network for both types of messaging. This is a direct savings that results from beginning with an X.435 product as the base."

And bringing it all together is what Digital does best. We integrate EDI and messaging, EDI and multivendor applications, and EDI with your business — for bottom-line results.

For more information on Digital's DEC/EDI portfolio of products and services, call 800-DIGITAL (800-344-4825) and reference code BPK. ■



EDI INTEGRATION AT ITS BEST

DEC/EDI is client/server software with integrated communications, translation, and application services, plus strong auditing and tracking. Transactions map to applications via FileBridge for DEC/EDI; third-party DEC/EDI-ready applications come pre-mapped for the quickest implementation. Transactions integrate with IBM mainframe applications via HostBridge for DEC/EDI, which includes client software residing on the mainframe.

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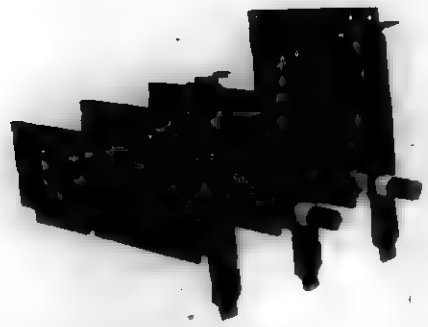
The World at Your Desktop

Digital's **Network Interface Cards** Give You All the Right Network Connections



DEC EtherWORKS 3 NIC

NO MATTER WHERE YOU ARE — in the next office or on the other side of the world — Digital's complete line of network interface cards (NICs) keeps you in constant touch with critical data you need from your workstation, Alpha AXP server, or PC.

And because we understand that all desktop environments are not alike, Digital has designed products that are truly open. Whether you choose the Digital's EtherWORKS family of Ethernet NICs or Digital's FDDI family of NICs for high-speed network computing, you'll receive network device drivers that support multiple operating systems, network operating systems, system buses, and connections. Our network interface cards support such leading standards as Ethernet 802.3, 10BaseT, 10Base2, and ANSI FDDI — including the draft TP-PMD standard.

Digital's NICs:

- Operate with today's major PC operating systems, including PATHWORKS, NetWare, LAN Manager, SCO UNIX, and Windows NT, DOS, and OS/2 environments
- Provide support for ISA, EISA, TURBOchannel, and Micro Channel bus architectures
- Offer cabling connectivity for unshielded twisted pair, shielded twisted pair, and ThinWire and thick wire Ethernet, as well as multimode FDDI-fiber-optic installations

Digital's third-generation NICs are also 100 percent compliant with server and client drivers for all major network operating systems.

Third-Generation Ethernet NICs Offer Leadership Performance

The DEC EtherWORKS 3 family of PC NICs, a portfolio of eight network interface cards, offers industry-leading performance and built-in reliability — allowing you to connect to local and wide area Ethernet networks right from your desktop. As Digital's third-generation network interface card, the DEC EtherWORKS 3 family of NICs incorporates the latest applications specific integrated circuitry (ASIC) technology in a Digital-designed chip. The result? Significant capabilities that result in outstanding performance.

By offering shared memory architecture with 128 KB of on-board packet buffer space, DEC EtherWORKS 3 NICs require fewer system buffers — allowing conservation of precious CPU memory. Plus, built-in dynamic memory management allocates buffers for transmitting and receiving as needed — resulting in automatic tuning and optimal performance, even with heavy network traffic. And, the parallel processing capability of our DEC EtherWORKS 3 NICs allows them to outperform the competition through their ability to process, transmit, and receive packets concurrently.

But wait — there's more. Digital's third-generation NICs are also 100 percent compliant with server and client drivers for all major network operating systems. And, to top it off, they're simple to install. A set of online instructions makes our NICs very easy to configure.

FDDI NICs Fill Your Need for Speed

If it's speed you want — now you've got it. By connecting the computer system to an FDDI ring, Digital's FDDI NICs bring standards-compliant, 100 Mbits/second speed to your workstation, Alpha AXP server, or PC. These NICs are particularly suited for delivering FDDI bandwidth and performance to users running high-speed image and data transfer applications (such as CAD/CAM, medical imaging, molecular modeling and display, video conferencing, and more), as well as very high-volume data processing, multimedia, backup, and client/server applications.

An on-board processor for SMT ensures no extra load on the CPU and keeps CPU utilization to a minimum. Each FDDI NIC utilizes a Digital-developed ASIC for full 32-bit bus master direct memory access (DMA). Combine this with 1 MB of on-board memory and you get industry-leading performance.

Our FDDI NICs also give you configuration options. Your system can be configured as Single Attachment Station (SAS) or Dual Attachment Station (DAS) — providing you, with critical network flexibility. These options support full-duplex FDDI for simultaneous transmit and receive of packets — a process that increases throughput and decreases network latency in point-to-point connections. In fact, once full-duplex mode is enabled, the maximum throughput of Digital's FDDI NICs increases from 100 Mbits/second to 160 Mbits/second. No other FDDI NIC in the industry has achieved that kind of performance.

In addition, the manageable ring purger feature — available only in Digital FDDI NICs — enables them to automatically remove stray frames from the FDDI ring, ultimately increasing the ring's performance.

Like our DEC EtherWORKS 3 NICs, Digital's FDDI NICs are easy to install, easily manageable, through both local or remote means, and Novell and PATHWORKS certified.

To order any of Digital's DEC EtherWORKS or FDDI network interface cards, call 800-DIGITAL (800-344-4825) and reference code BFR. ■

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Staying ahead in consumer electronics — by design

By Lou Lenzi

FIRST PERSON

It seems everyone wants to buy a color television set these days. Business is booming. But while demand for TV sets is almost outstripping supply, profit margins are being squeezed by near-suicidal retail pricing.

What's to blame? An oversaturated retail environment and too many brand names fighting for consumer attention.

From my standpoint as a product developer working in this market, survival depends not only on getting products to market quickly but also on introducing innovative new products and features *and* cost-reduction programs to offset retail price erosion.

As a result, our company has invested heavily in technology and related process changes to maintain our leadership position in this tough market.

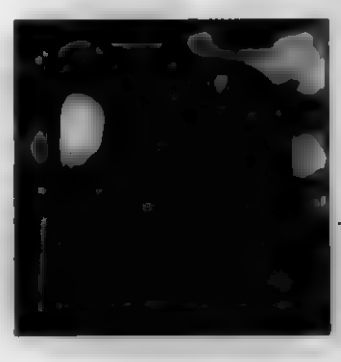
One area in which we've invested is the design and development of cabinet enclosures. This involves developing injected molded plastic parts and related tooling processes. Because plastics tooling is a long lead item requiring significant capital investment, this area has received a lot of attention in terms of new technology applications.

Refining design refinement

Our "team" approach to design refinement deserves a lot of credit for our current success. Personnel from marketing, engineering, manufacturing and sourcing follow the project from concept to production.

We've replaced time-consuming pencil-produced artist renderings with rough three-dimensional study models made of urethane foam. Accurate 3-D computer-aided design (CAD) wire frames are then created from these models.

The CAD database, used initially for technical analysis, can be transferred to a high-quality image renderer. Here, we use the output images for surface verification and interference checking, consumer research and sales and marketing reviews.



In 1973, a 19-in. TV set cost the equivalent of $1,466 (in 1993 dollars). Twenty years later, the comparable product sells for about $220, according to a recent issue of Fortune magazine. TV manufacturers are forced to innovate and slash prices despite "margins that make [those of] PC makers look healthy," Lenzi says. (Pictured is the newest RCA model.)

Costly step moved downstream

Note that we've created no hard models up to this point. All information is being communicated either with the handmade urethane mock-ups or CAD-based soft models.

The entire development team is on board with all critical issues identified. The tooling has been "source released" so a vendor can begin the tool design in parallel with the mechanical design. The final program go-ahead decision is made at this point.

What we've eliminated from this phase is the costly, time-consuming verification model.

Such a model will be built further downstream to verify surfaces prior to tool start and for "selling-in" the new product with retail buyers.

From this point, our process follows the more traditional product development cycle of tool release, initial tool completion, prove-in, preproduction and finally production.

Looking forward, one thing seems certain: The winners in the consumer electronics business will be driven by innovation, short development cycles and low product cost. ■

Lenzi is general manager, America's Design Operation, Thomson Consumer Electronics.

DESIGN INNOVATORS

Industrial Designers Society of America

THE BIOJECTOR FROM BIOJECT, INC. is a noninvasive injection system intended as an alternative to the hypodermic needle. The first version was a market failure. It was difficult for doctors to use, and patients found it intimidating. "It looked like it would hurt you more than a syringe," says Sohrab Vossoughi, president of Ziba Design in Portland, Ore., which Bioject hired to help with the redesign. Ziba worked side by side with the marketing, sales and engineering folks to come up with a friendlier looking version. The interactive design process resulted in an award-winning design that customers like.

ONE PNEUMATIC VALVE, TO GO

One company has gotten its design engineers so involved with marketing that the engineers are now the marketers.

At Ross Operating Valve Co., design engineers spend as much time on the telephone as they do on the dual-screen Intergraph Corp. CAD systems that sit on their desks. And that's fine because the phone is their connection to the true designer — the customer who describes in detail the exact configuration of the pneumatic valve they want.

As the customer explains how he wants the valve ported (where the holes are placed) and how it will be mounted, the engineer is already at work, either designing from scratch or choosing appropriate parts from a library of stock components.

When the design is complete, the engineer develops a "tool path" program and processes the program into machine language. The instructions are then downloaded through a PC linked directly into the computer numerical control machining center.

Ross has been in the valve business for 71 years, producing air-control devices for manufacturers in the automobile, textile, steel and mining industries. Not all of its products are customized; many are still sold as stock products through catalogs.

But the days are gone when engineers would conceptualize in isolation, with only a hint from marketing as to what customers might need. The old process would require weeks and months of design and production.

Today, "the market is created before any product is produced," says Henry Duignan, chief operating officer at Ross. According to Duignan, Ross can make a prototype for $3,000 in eight to 24 hours, compared with $500,000 and six to 12 months to do same job six years ago.

—Mary Brandel

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Awards will be presented in eight categories representing the communications and networking market:

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- Best New Infrastructure Product
- Best New Multimedia and Desktop Application
- Best New Wireless Product

Plus, a grand winner will be chosen as the ComNet '94 Most Innovative New Product or Service.

Judging

A panel of judges will select three finalists in each category prior to ComNet '94, with finalist selection announced on January 10. ComNet show attendees will then view finalists' entries in a special showcase in the main lobby of the Washington, D.C. Convention Center and make the final selection by voting electronically for one winner per category, plus the grand winner. The nine winners will be announced at a special awards ceremony on Wednesday evening, January 26.

Eligibility

All contracted exhibitors introducing a new product, product enhancement and/or product upgrade for the first time at ComNet '94 are eligible.

A new product that has been announced within six weeks preceding ComNet '94, (but not introduced or exhibited in the same form at previous tradeshows) is also eligible.

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Power play

Massively parallel processing promises mainframe power at a quarter of the cost. But trouble with multiple joins and poor file and record locking can bring systems crashing down.

By Andrew Boughton

Unless you've been in hibernation, you know that massively parallel processing (MPP) technology is being touted as hot, hot, hot.

Retailers such as Wal-Mart Stores, Inc., Kmart Corp. and Hallmark Cards, Inc. use MPP servers to handle large volumes of point-of-sale data for short-term product line forecasts. These forecasts form the basis of ordering and delivery schedules and are used for improved marketing analysis.

Deloitte & Touche has also taken the plunge: It uses a 640 MIPS machine that it hopes will eventually eliminate the millions of pages of reports it grinds out and distributes every two weeks.

But "hot" can also refer to all the hot air that MPP is generating. That's because while the technology promises companies the power of a mainframe at about a quarter of the cost, MPP still has many of the growing pains of an emerging technology, including poor systems management and shaky reliability. And, as the anchor for client/server computing, MPP is working under many of the constraints inherent in that environment.

Current users are on the bleeding edge. That leaves potential users wary, with many saying they will wait an average of 14 months to buy an MPP system, according to a recent study of 196 commercial sites by International Data Corp.

What follows on pages 98 and 102 are answers to commonly asked MPP questions about problems, MPP's effect on legacy systems and MPP's future.

What about MPP and legacy systems?

Moving from legacy systems to MPP can be surprisingly smooth but expect some hefty costs.

In most companies, MPP technology rarely replaces a mainframe. It tends to be more complementary with legacy systems than competitive, at least initially.

MPP tends to be more complementary than competitive with legacy systems.

The information systems staff can load data from mainframes and minicomputers onto the MPP server while running old applications on the legacy machines.

Either a direct channel connect or networked solution bridges the old applications with the new relational database server.

Taking the direct channel

For example, to ease the shock of migrating a new service and parts inventory to MPP platforms, Honeywell Commercial Avionics in Phoenix is using direct channel connect to link an MPP database server with the company's mainframe, which runs an old service application.

In this case, the MPP database server looks like a gigantic disk drive to the mainframe, while the database looks like a friendly mainframe to PC and workstation users.

So, applications on proprietary hardware can run against MPP databases. However, there is an important proviso here — there needs to be a high-speed interface to the platform of choice.

The cost of creating such an interface can run into the hundreds of thousands of dollars.

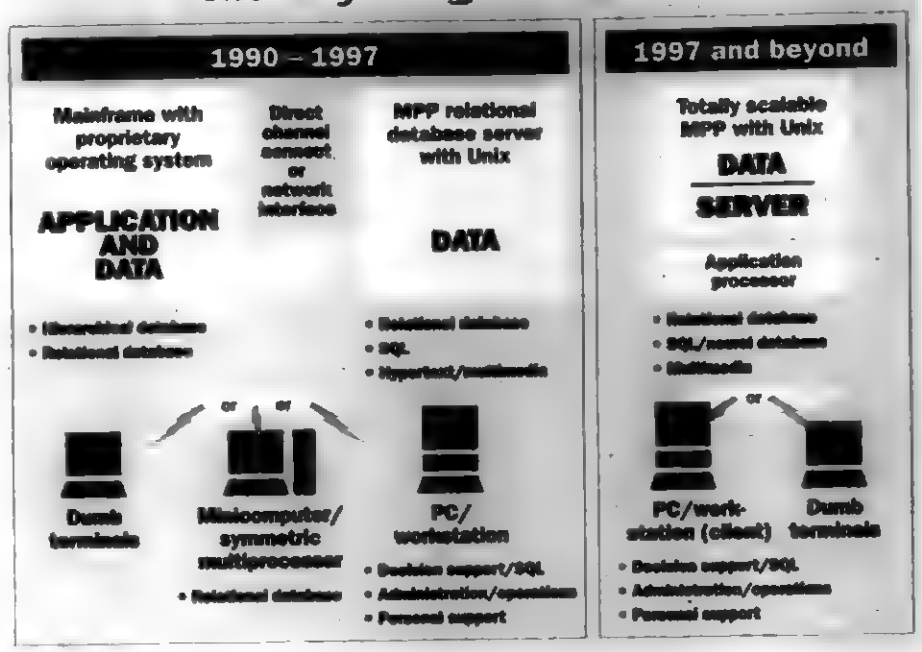
Easing the IS burden

Having such a link between old and new means that the IS staff can write new applications on smaller hardware platforms — typically PCs, workstations and minicomputers — for cutover in the future. This frees developers to work on new software technology under less stressful conditions.

Decision support applications on PCs and workstation platforms can immediately use the MPP data warehouse, with enhanced data access capabilities.

Decision support applications are equipped with SQL interfaces as well as data navigation tools. Even the old administrative applications can be retrofitted with SQL.

The way things will evolve



Source: Andrew Boughton

What is MPP?

The concept of MPP is simple: Take a number of processors and marshal them together to provide powerful and inexpensive large-scale computer systems. Because the componentry is microprocessor-based, it shares the low cost-to-power ratios of the PC. But MPP provides the capabilities of a flexible mainframe; it can, in fact, be considered a sort of "hypermainframe" with MIPS that can handle decision support and operational data.

MPP systems use standard redundant arrays of inexpensive disks (RAID) storage technology to achieve immense and reliable storage capacity — anywhere from 5G to 200G bytes. This capacity is linearly expandable with processing, memory and I/O power.

The systems typically run Unix on front-end processors, which are used as communications controllers, performance and administration monitors and staging platforms for porting application programs to parallel Unix and for interfacing with application programs on client platforms.

The reason MPP has become so attractive for commercial environments is that it is an enabling technology for data warehouses, which, by my definition, are large-scale relational databases that unify fragmented corporate databases. Such powerful database servers tend to operate within a client/server information systems architecture (see chart above). As such, they deliver easy, cost-effective access to huge volumes of data and impressive transaction processing performance.

MPP is the logical second half of the PC revolution because it gives the PC user a personal connection to the enterprise. The fact that it uses microcomputer technology both in the MPP server and PC client adds conceptual neatness to the story.

From a business perspective, MPP technology is about better decision support capabilities. Users get an unprecedented level of control of their operations because MPP frees up access to the information in a company's operational systems and enables intelligent processing of huge volumes of data and images.

Suppliers going after the commercial market

NCR Corp., Dayton, Ohio
Developed a dual high-speed bus across processing and storage modules to avoid contention on a single bus. Uses Intel Corp. chips. The Teradata DBC machine, acquired by NCR, is compatible with the NCR 3600 range.

• **Kendall Square Research Corp., Waltham, Mass.**
Developed a backbone of vast cache memory behind its multiprocessor and multistorage arrays to handle communications and I/O. The cache performs certain operations in live memory, reducing the frequency of disk access. The company claims to replicate in its architecture the shared memory environment of a mainframe with its sequential programming model. Kendall Square Research uses customized processors from Sharp Corp., around which it creates I/O and board circuitry.

• **NCube Corp., Foster City, Calif.**
Designed an architecture that ties processors in close proximity via a "hypercube" structure. Very large-scale integration (VLSI) chips incorporate CPU, memory and communications processors on small boards with huge bandwidths between all processor and disk components.

• **MasPar Computer Corp., Sunnyvale, Calif.**
Developed a hardware architecture with a powerful chip set of multiple RISC processors. Software features include a file storage pattern that enables users to store and access data in the same format as standard Unix.

• **Encore Computer Corp., Fort Lauderdale, Fla.**
Linearly scalable RISC-based MPP systems, with a theoretical growth path of more than 200T bytes of disk capacity and highly scalable memory. Systems have a direct shared memory architecture that may eliminate the single point of failure problem inherent in some products. Encore is testing an enhanced implementation of Oracle 7.1.

• **IBM, Armonk, N.Y.**
Has commercial MPP applications evolving on two fronts. IBM's new eight- and 64-processor SP1 RISC machine is compatible with RS/6000 applications software and operates as a database server and a general-purpose computer-plus-server. The S/390 architecture already employs some parallelisms, using up to eight main processors. It supports Unix and MVS. IBM is reportedly developing a more parallel S/390 design incorporating hundreds of CMOS chips.

• **Cray Research, Inc., Eagan, Minn.**
Released a SPARC-compatible superserver this month with a range of four to 64 symmetric multiprocessors. Designed to work as a database engine with Sun Microsystems, Inc. workstation networks.

Editorial Calendar (January-June, 1994)

Issue Dates	Ad Closings Color*	Ad Closings B&W	Editorial Features	Show Distribution	Ad Readership Study Issue	Response Card Deck
Dec. 27 & Jan. 3	Dec. 10	Dec. 17	**Special Edition:** Annual Forecast Issue			
Jan. 10	Dec. 24	Dec. 31	**Closer Look:** Object Database Management Systems		Starch	Mails: Jan. 12 Close: Dec. 11
Jan. 17	Dec. 31	Jan. 7	**CW Guide To: Spreadsheets and Spreadsheet Utilities** The New Capabilities *Buyers' Satisfaction Scorecard:* Windows Packages from Borland, Lotus, Microsoft, etc. *Firing Line:* Latest Windows Offering			
Jan. 24	Jan. 7	Jan. 14	**Closer Look:** ATM	**ComNet** Washington D.C., 1/25 - 1/27		
Jan. 31	Jan. 14	Jan. 21	**CW Guide To: Departmental Servers and Superservers** Matching a System to Departmental Needs (including Alpha, Tricord, Netframe, Sun, RS/6000, NCR, Sequent, Wyse, Compaq) *Buyers' Satisfaction Scorecard:* Leading RISC Servers *Firing Line:* Latest Server Product	**Executive Technology Summit** Tarpon Springs, Florida 2/2 - 2/4		
February		Dec. 27	**CLIENT/SERVER JOURNAL**	All Shows Feb. - April	Harvey	
Feb. 7	Jan. 21	Jan. 28	**Special Quarterly Report:** Re-engineering the Workplace		Starch	Mails: Feb. 9 Close: Jan. 3
Feb. 14	Jan. 28	Feb. 4	**CW Guide To: Management Tools for Large Networks** What Works When Systems are Distributed *Buyers' Satisfaction Scorecard:* Multivendor Network Management Software from DEC, HP, IBM,Sun, etc. *Firing Line:* Latest Management Package	**Networks Expo** Boston, 2/15 - 2/17		
Feb. 21	Feb. 4	Feb. 11	**Closer Look:** Windows and OS/2 Imaging Software			
Feb. 28	Feb. 11	Feb. 18	**CW Guide To: Work Flow Software** The Reality Behind the Promises *Buyers' Satisfaction Scorecard:* Leading Work Flow Software Systems *Firing Line:* Latest Work Flow Managers	**Groupware '94** Boston, 2/28 - 3/3		
Mar. 7	Feb. 18	Feb. 25	**Closer Look:** Desktop Laser Printers		Starch	Mails: Mar. 9 Close: Jan. 31
Mar. 14	Feb. 25	Mar. 4	**CW Guide To: RAID** Choosing Among the Various Levels of Disk Array Technology *Buyers' Satisfaction Scorecard:* Leading Server-based RAID Systems *Firing Line:* Latest Mainframe RAID Subsystem			
Mar. 21	Mar. 4	Mar. 11	**Closer Look:** Unix Workstations	**UniForum** San Francisco, 3/23 - 3/25		
Mar. 28	Mar. 11	Mar. 18	**CW Guide To: Wireless Networks The** Spectrum of Technologies, Including LANs, WANs and Radio Frequency *Buyers' Satisfaction Scorecard:* Leading Wireless LANs *Firing Line:* Wireless Services Product			
Apr. 4	Mar. 18	Mar. 25	**Closer Look:** Personal Productivity Software			
Apr. 11	Mar. 25	Apr. 1	**CW Guide To: NT vs. OS/2 vs. Unix** Desktop and Server Choices *Buyers' Satisfaction Scorecard:* Leading Server Operating Systems from IBM, Microsoft , Sun, etc. *Firing Line:* Latest Desktop Operating Systems from a Leading Vendor		Starch	Mails: April 13 Close: Mar. 17
Apr. 18	Apr. 1	Apr. 8	**Management Special:** IS Architecture in Times of Change	**AIIM** New York 4/18 - 4/21 **SIM Conference** Florida, 4/20 - 4/22		
Apr. 25	Apr. 8	Apr. 15	**CW Guide To: Data Access Tools** New Tools for Quick Access to Data Buried in Older Flat-file and Hierarchical Databases *Buyers' Satisfaction Scorecard:* Leading SQL-based Data Access Tools *Firing Line:* Latest Data Access Tool from a Leading Vendor			
May		Mar. 30	**CLIENT/SERVER JOURNAL**	All Shows May - July	Harvey	
May 2	Apr. 15	Apr. 22	**Closer Look:** Distributed Computing Environment	**Interop + Networld** Las Vegas, 5/2 - 5/6		
May 9	Apr. 22	Apr. 29	**CW Guide To: Mobile Computing** From Notebooks to PDAs *Buyers' Satisfaction Scorecard:* Leading Notebook Computers *Firing Line:* Latest Sub-notebook Product from a Leading Vendor	**International DB2 Users Group** San Diego, 5/8 - 5/12		Mails: May 11 Close: April 14
May 16	Apr. 29	May 6	**Special Quarterly Report:** Re-engineering the Workplace		Starch	
May 23	May 6	May 13	**Windows World Open Supplement** **CW Guide To: The Impact of OLE 2.0** What OLE can do for IS and How to Make Sure Your Favorite Desktop Software Vendor is Up to Speed *Buyers' Satisfaction Scorecard:* Leading OLE Applications *Firing Line:* Latest OLE Development Tool	**Windows World Comdex Spring** Atlanta, 5/23 - 5/26 **DB Expo** San Francisco, 5/24 - 5/27		
May 30	May 13	May 20	**Annual Job Satisfaction Survey** How IS Professionals and Managers Really Feel About Their Jobs and Careers			
June 6.	May 20	May 27	**CW Guide To: Distributed DBMS** Selecting the Right Engine for a Distributed Database Architecture *Buyers' Satisfaction Scorecard:* Leading Relational DBMS *Firing Line:* Latest Relational DBMS Product	**Computerworld Smithsonian Awards** Washington, DC		Mails: June 8 Close: May 2
June 13	May 27	June 3	**Closer Look:** AS/400		Starch	
June 20	June 3	June 10	**CW Guide To: Mainframes** How Big Iron Vendors are Answering the Challenges of the Mainframe's Changing Role *Buyers' Satisfaction Scorecard:* Leading Mainframes from Amdahl, HDS, IBM, etc. *Firing Line:* Latest Mainframe Model			
June 27	June 10	June 17	**Closer Look:** PCMCIA Cards	**PC Expo** New York, NY, 6/28 - 6/30		

Editorial contacts (508) 879-0700 CW Guide: The Guide includes a package of articles on the stated topic, in addition to Buyers' Scorecard and Firing Line
Features Editor: Joanne Kelleher, *Management Features:* Allan Alter, *Closer Look:* James Connolly, *CW Guide Articles:* Mary Brandel & Derek Slater, *Buyers' Satisfaction Scorecard:* Michael Sullivan-Trainor, *Firing Line:* Garry Ray
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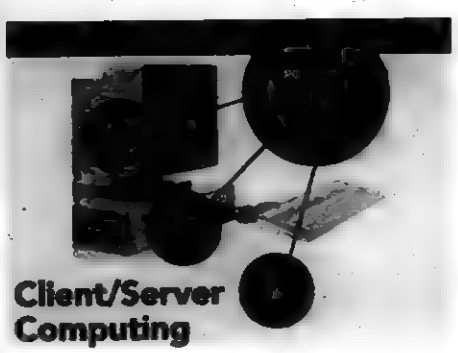

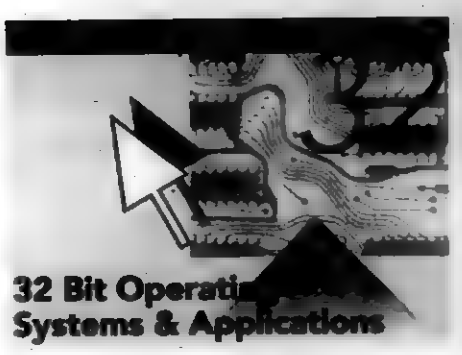

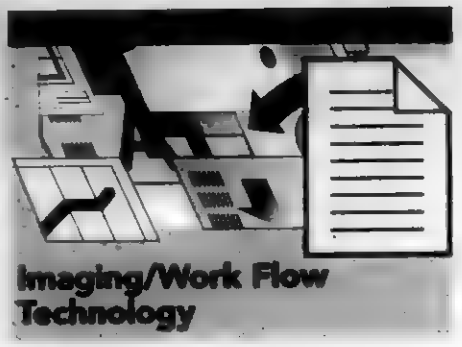

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What are MPP's problems?

Here are the key roadblocks to watch out for in MPP:

• **The lack of effective file and record locking facilities in some MPP databases.** This problem has caused major headaches because decision support scans and real-time transactions for multiple applications regularly collide. If your database architecture is not designed for general-purpose, mixed-load computing, you'll run into difficulties as you port more and more applications.

Some sites running a mixed work load against databases with poor file and record locking facilities report going down up to 15 times a day. That's because access contention results in a "deadly embrace" in which the system is unable to sort out the priority of competing instructions for two or more different users.

Some sites report going down up to 15 times a day.

Even for those systems that automatically recover in a few seconds to a few minutes, things aren't peachy. Disks are left with a lot of junk data on them that the information systems staff must clean with tedious maintenance procedures.

To help solve contention problems and speed up performance, MPP databases are often stratified into levels of operations and decision support data. In this way, the company gets a hierarchy of increasingly aggregated or summarized decision data above the operational data on the server.

• **Lack of large-scale systems management facilities.** Systems administration software, network management and security for DOS and Unix have been poor on the MPP architecture to date. These problems have long plagued distributed PC-based systems.

• **Poor transaction monitoring facilities and performance levels on some architectures.** Because simple transactions such as order processing cannot take advantage of a parallel architecture (the transaction is so simple you can't spread the load across processors), such transactions tend to use low-speed processors. Programmers have had to relegate some transaction processing activity to the background.

• **Middleware and communications problems associated with the client/server architecture.** The lack of connections between PC LANs and data servers can be a real showstopper for users implementing client/server MPP systems. Each time IS has to write a new interface, the direct cost can be as much as $150,000 and may delay a project for many months.

Interfaces between servers and legacy mainframes can cost well into hundreds of thousands of dollars to write, especially for high-speed direct channel connections. Find out right up front whether your MPP supplier has a direct channel connect capability to existing mainframes.

• **True parallel versions of major databases are in their infancy.** At this point, many users are stuck having to develop applications on lower-performance, nonparallel versions. For instance, Oracle Corp.'s Oracle 7.0 is not a true parallel database, and although Release 7.1 reportedly offers full parallel query capabilities, most MPP suppliers still have beta versions running in test mode only. Sybase, Inc. has not released a true parallel version of its product, but the database is said to be scalable.

• **Relational database technology has a tough time with multitable joins.** Efficiency is a key problem for most relational databases when handling many table joins. In fact, many-way joins involving, say, eight-way tables are simply impossible even on the fastest hardware; in these cases, performance can slow from seconds or minutes to hours or days.

This inability of relational to handle multiple joins is problematic because the key MPP application — decision support inquiries — requires lots of joins.

MPP suppliers are working around relational's constraints by supplying query decomposers that automatically break SQL programs into parallel pieces that are executed separately. The results are merged at the end.

While the decomposer can speed up some queries tenfold, relational database management systems' limits on multitable joins curtail the promise of free-format data access. The IS staff may still have to write many inquiries as standardized reports.

• **Some MPP machine architectures are vulnerable to a single point of failure.** These architectures trade off reliability for performance gains. Certain sites with such architectures have reported a mean time between failure of anywhere between seven and 24 hours.

MPP buy (the numbers)

Sites are waiting a while to buy MPP because it takes that long to evaluate such a major purchase. In a survey of 136 commercial sites,

16.3% have investigated MPP.

5.1% are considering its purchase but will wait an average of

14.2 months before buying.

82.5% say MPP's price/performance is what led them to consider the technology.

Source: International Data Corp., Framingham, Mass.

Price/performance?

In a test situation, MPP systems have run at roughly twice the speed of the most powerful mainframes at about a quarter of the cost for hardware and software.

For instance, in a Transaction Processing Council benchmark (TPC-B), a 64-processor NCube machine ran the Oracle Corp. Parallel Server database at 1,073 transactions per second with a cost of $2,500 per transaction. Other vendors have gotten similar results.

Transaction speed reportedly increases linearly as you scale up the number of processors, I/O channels and disk drives.

Real-world thinking

But keep in mind that in the real world, the speed you get depends significantly on the nature of the work performed.

At this point, gains are better for decision support queries than on-line transaction processing.

It may not be cost-effective, for instance, to run a purpose-specific, on-line marketing database with 45G bytes of data without a high-performance database server. MPP's price/performance benefits also make sense for smaller relational database applications in factories, such as those applications used for on-line materials tracking and analysis that run anywhere from 10G to 40G bytes. These are only cost-effective using a high-performance parallel server.

MPP offers savings over mainframes in the areas of power consumption and system housing requirements. However, I have not yet seen price/performance comparisons that take into account all factors as a whole — system reliability, power consumption, system housing requirements, application and system software costs, data center administration and maintenance overhead, retraining and systems integration costs and so forth.

What is MPP's future?

Watch these MPP developments in the '90s:

• Work is underway to incorporate object-oriented programming capabilities into the MPP environment.

• MPP needs an efficient relational database capable of handling many more table joins than is now possible.

The answer to the call for an efficient database, however, may not have anything to do with the relational model at all. New database technologies in development — with multimedia and imaging at the core — may take greater advantage of MPP architecture.

Hypertext, neural networking and advanced image management techniques are being incorporated into existing database technology, enabling users to do tasks such as search large databases for patterns or find matches seamlessly across text and database records.

• MPP will benefit from advances that will let systems store data as an unstructured pile with "threads" for access.

Such a pile-and-thread setup will enable less rigid storage structures, which help get around relational's multitable join limitations.

• Users want stable highly parallel versions of their databases on the major MPP hardware platforms. I don't think we'll see that happen until well into 1994.

All these future technical hot spots, however, will pale in comparison to the total sea-change that will happen to the information systems staff. Developers won't be wedged between the mainframe's glacier-like development environments and individual users' fragmented demands. Instead, they will consult with users without losing control of the systems environment.

Boughton is a New York consultant concentrating on MPP. He is collaborating on a book on MPP and the role of the chief information officer.

Computer Careers

What the heck is a

By Howard Dresner

If you're an application developer or database administrator looking for a change, there's hope: An emerging role for information systems professionals is taking shape.

The people who fill this new role will be involved in getting corporate data — previously locked away in legacy systems or dispersed on many platforms throughout the firm — into the hands of managers who need to analyze it.

Until now, financial analysts and experts in operations research were the ones who downloaded and analyzed financial, sales, human resources and other data. But in today's ferociously competitive environment, managers and end users need direct access to this information. It's their only hope of making quick and accurate decisions to keep up with competitors.

Managing resources

In their effort to better manage their resources, many companies today have begun to use business intelligence software. These products range from low-end query and report tools to advanced decision-support tools up to executive information systems.

These types of tools enable users to explore information from internal and external sources, help anticipate future trends and accurately set business goals.

But gaining access to corporate data is not as easy as buying a tool. Specialists are needed who can gather, prepare and distribute the data as well as develop the applications that manage the data. While many companies are performing these tasks on an ad hoc basis, IS roles are being formalized. Here is your chance to get a head start.

▶ **Business application specialist/relationship manager:** The business application specialist acts as a liaison between the business unit and the IS department. Also known as an account executive, this person works on a team to develop the business intelligence applications.

The specialist works with users to pin down information requirements in advance, making sure that business and user needs are met. Once the data requirements are understood, a prototype is developed.

The best candidates for this role come directly from the business unit. If someone on the IS staff wanted this position, he would need to learn the critical business issues.

▶ **Database preparation/distribution specialist:** This is one of the more promising roles for IS staffers. It is essentially a retreaded database administrator position with an emphasis on data warehousing and conditioning.

After a team defines which mission-critical data it needs to access, the database preparation specialist locates, acquires and distributes the data.

Much of the data may be on a number of host systems, application databases and file systems; therefore, good investigative skills are required. If the data is owned by an unrelated organization, the database specialist may find himself negotiating for it.

The data conditioning part of the job includes translating coded fields into intelligible data, homogenizing join fields, deleting irrelevant columns and removing redundant data. When clean, it ■ downloaded to users' servers.

▶ **Business intelligence modeling/statistics consultant:** The statistics consultant assists the business application specialist in building complex modeling applications, using sophisticated forecasting techniques and inferential statistics. He spends most of his time analyzing the data and determining how to best present it to users.

Often this individual can be recruited from the ranks of former, dedicated information analysts who are used to analyzing data, applying statistics and models and churning out reports.

Dresner is a program director at Gartner Group, Inc. in Stamford, Conn.

Business application specialist/relationship manager

Role: To work with users to prototype business intelligence applications.

Skills:
- End-user and business experience.
- Experience working with people in various disciplines.
- Aptitude in business intelligence fourth-generation languages, and modeling techniques.

Database preparation/distribution specialist

Role: To locate, negotiate access to, extract, prepare and distribute data.

Skills:
- Strong database experience including SQL, nonrelational databases and file systems.
- Strong understanding of business relationships of data, techniques and tools for merging and cleansing data.
- Training in data preparation tools and business intelligence data structures and dictionaries.

Business intelligence modeling/statistics consultant

Role: To assist business application specialists in building very complex modeling applications.

Skills:
- Expertise in operations research, statistics and modeling techniques.
- Training in business intelligence fourth-generation language tools and modeling capabilities.

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MAKING THE GRADE

Tips for certification test takers

By Rob Williamson

Network professionals wanting to increase their net worth are looking into technical certifications. Since the inception of Novell, Inc.'s Certified NetWare Engineer (CNE) program in 1990, more than 26,000 CNEs have been awarded.

Preparation for these exams is not cheap, however. At $85 per test and even more for books and class time, costs are steep, especially with no money-back guarantees. Even so, there are ways to increase the odds of passing.

Novell offers three certification designations: Certified NetWare Administrator (CNA), Certified NetWare Engineer (CNE) and Enterprise Certified NetWare Engineer (ECNE).

A CNA primarily handles network administration and is responsible for tasks such as adding and deleting users, maintaining security, configuring printers, backing up servers and creating log-in scripts.

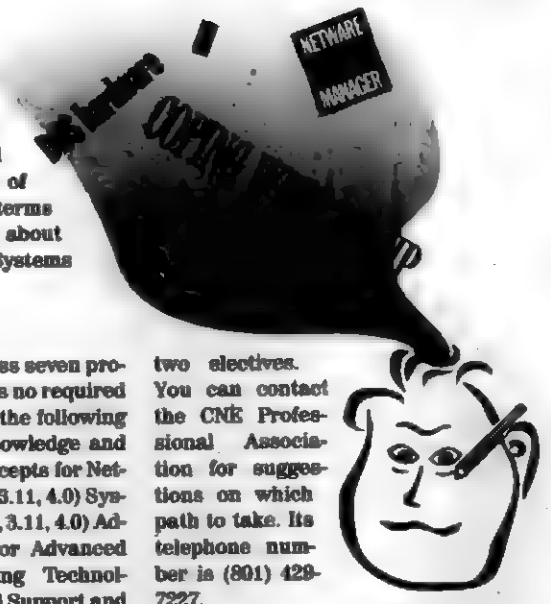
Each NetWare version requires a separate CNA certification. When preparing, you may want to spend more time on areas that do not fall into your daily network administration duties. Problem test areas include questions on handling memory in a networked environment and printing and capturing commands.

Novell's CNA courses include NetWare System Management, which features NetWare basics, security and customization of the environment; and NetWare Advanced System Management, which teaches network performance optimization and protocol support.

If you administer a Novell network already, you may not need these classes to pass the test. If you are unsure, Novell offers an assessment disk that helps gauge knowledge and provides sample test questions. The same information can also be downloaded from CompuServe.

The next certification level is a CNE, which focuses on hardware and software. CNEs cover operating system installation, network changes and expansion, wiring topology and troubleshooting. Again, a separate CNE certification is required for each NetWare version.

Test takers may find the questions on CNE protocols particularly challenging if they are unfamiliar with mainframe technology. The protocol coverage consists mostly of mainframe concepts and terms and requires knowledge about protocols such as Open Systems Interconnect and SNA.



Put to the test

Novell requires CNEs to pass seven proficiency tests. While there is no required order, Novell recommends the following path to build upon the knowledge and skills learned: DOS/PC Concepts for NetWare Users, NetWare (2.2, 3.11, 4.0) System Manager, NetWare (2.2, 3.11, 4.0) Advanced System Manager or Advanced Administration, Networking Technologies, NetWare Service and Support and two electives. You can contact the CNE Professional Association for suggestions on which path to take. Its telephone number is (801) 429-7227.

The most specialized certification from Novell is the ECNE, which concentrates on issues such as interfacing networks, gateways, TCP/IP and internetworking. To become an ECNE, you need 19 core operating systems and elective credits, many of which can be attained through the CNE certification process. The advantage of going for the ECNE is you can take courses that interest you.

There are several ways to prepare for testing, including courses, self-study videotapes and computer-based training. Classroom courses range from $900 to $400 per person. Multimedia training ranges from $295 to $1,195 per course.

TIPS FOR TESTERS

- **Plan on taking the tests within two weeks of completing courses.**
- **Don't cram. Retention rates drop significantly when you do.**
- **Don't take two or three tests in one day.**
- **If you decide to try out Novell, Inc.'s assessment disk, you should be able to answer 90% of the questions correctly to be in passing range on the real tests.**

James Aiello, manager of the product test center, National Education Training Group in Naperville, Ill., has taken and passed three of the required seven tests for the CNE. He suggests:

"Read the books provided by Novell. In many cases, the phrasing of the test questions is the same. They're very expensive, however."

Williamson is the product manager for client/server and networking for the National Education and Training Group in Naperville, Ill.

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SYSTEMS ANALYST (Ref. #77980) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: analysis, design & development of an integrated welfare sys. The responsibilities include process modelling, data modelling, overall design & development of Monthly Reporting part of the sys, & meetings with users to gather reqs using the following h/ware, s/ware & languages: IBM 3090, MVS/ESA, DB2, CICS or IMS DC, JCL, VSAM, REXX, TELON, ADW & EXCELERATOR. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the job offered or in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, app development & using IBM 3090, MVS/ESA, DB2, CICS or IMS DC, JCL, VSAM, REXX, TELON, ADW & EXCELERATOR. $40,900/yr. 40 hrs/wk.

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SOFTWARE ENGINEER (Ref. #81693) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl enhancing & customizing banking application of SHS (Item Processing Sys) pkg, incl redesign of its modules, database modifications & sys testing. Duties require using UNISYS V series & CP2000 Comp, DMS II & Novell Netware s/ware, COBOL & CLIPPER languages & algorithms. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the job offered or in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, s/ware development & customer support for Item Processing Sys, development or use of Sagebrush; & using UNISYS V series, DMS II, COBOL, Clipper & Novell Netware. $34,000/yr. 40 hrs/wk.

SYSTEMS ANALYST (Ref. #81703) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl Manufacturing Sys, Financial Accounting Sys, Purchasing Sys & Direct Store Delivery/Integrated Retail Pricing Sys. Responsibilities incl process flow & dataflow design, data modelling identification, tech support & overall design of the sys & meetings with users to gather reqs. Tech support provided will be for design of apps on the IBM 3090/E58000 mainframes & MVS/XA, MVS/ESA operating sys using the following s/ware & languages: TSO, ISPF, DIALOG MANAGEMENT SERVICES, COBOL II, C, DB2, IMS DB, IDMS DB/DC, VSAM, REXX, JCL, CLIST, PANVALET, CASEPAC, EASYTRIEVE, DESIGN/I, BSTALL/I & CMS. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, Assistant Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the job offered or in the related occupation in lieu of the required ed & exp. REL EXP: in whole or in part, s/ware development incl financial accounting sys; developing or supporting manufacturing sys, & using IBM 3090/E58000, MVS/XA, MVS/ESA, ISPF, DIALOG Management Services, IDMS DB/DC, VSAM, REXX, JCL, CLIST, PANVALET & CASEPAC. $34,000/yr. 40 hrs/wk.

SOFTWARE ENGINEER (Ref. #70163) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl researching & analyzing s/ware sys for a variety of apps. Duties incl developing s/ware for implementing, enhancing & customizing mainframe & UNIX platform based apps; database design & performance tuning, & using the following h/ware, s/ware, languages & tech: IBM 3090, IBM 9370/9000, UNIX platforms, ORACLE, DB2, NATURAL, CICS, PL/1, C, ASSEMBLER, IEW, structured sys anal & design tech. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal, Sys Prog, Prog, Prog/Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, s/ware development, database performance tuning, & using IBM 3090, UNIX, ORACLE, DB2, NATURAL, CICS, PL/1, C, ASSEMBLER, IEW & structured sys anal & design tech. $34,000/yr. 40 hrs/wk.

SOFTWARE ENGINEER/ENGINEERING APPLICATIONS (Ref. #81593) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys, incl manufacturing, Electronic Design Automation & Mechanical Design Automation. Duties incl: analyzing current design procedures; designing, developing & implementing a drawing office management sys for both electronic & mechanical design environments to incorporate a paperless communication between the design & manufacturing sections, incorporating the sys using IBM PCs, Workstations, Scanners, Plotters, CAD s/ware for Electronic Design & Mechanical Design like AutoCad, I-Deas, Workview, AutoArchitect, CAD Overlay, Animation tools & multimedia tools across a Novell LAN & existing heterogeneous network. ED & EXP: Bachelor's in Mechanical or Industrial Engg & 2 yrs exp in the job offered or 2 yrs exp as Sys Anal or Designer-Engg Technology, S/ware Engg, Product Estec or Business Development Manager. REL EXP: in whole or in part, developing & incorporating CAD apps in areas of manufacturing, Electronic Design Automation & Engrng design, development of drawing office automation or management sys, & using AUTOCAD, I-DEAS, WORKVIEW & PLOTTERS. $43,000/yr. 40 hrs/wk.

SOFTWARE ENGINEER (Ref. #79993) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: development & maintenance of customized reselling apps, incl program development, database modifications, unit sys testing. Duties require using UNISYS 6000, UNIX based machine, UNIX, INFORMIX 4GL & C. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, development of commercial s/ware using UNIX based comp, INFORMIX, UNIX & C. $34,000/yr. 40 hrs/wk.

SOFTWARE ENGINEER (Ref. #9463) to Analyze, design, develop & implement comp s/ware for client's EDP sys, incl Client Server CRS Sys Data acquisition, entry, remote data collection, management & reporting. The responsibilities incl data-base design, front-end client development, remote queries & communication between dissimilar platforms; developing & maintaining SQL server gateway, distributed transactions, transparent network access & visual basic objects using each of the following: IBM PS2, VAX clusters, Token Ring, SNA, MS Windows (3.x), SDK, Visual Basic, Visual Basic COK, PowerBuilder, C, C++, GUI, Microsoft SQL Server, SQL Server, OS2, OS/2-PM, TCP/IP & LAN Server. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 1/yr exp in the job offered or 1/yr exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: design & development of database oriented sys, customizable front end & determining distributed apps development strategies on network, & using IBM PS2, Token Ring, MS Windows, C, C++, PowerBuilder, SQL Server, LAN Server, OS/2 & TCP/IP. $34,200/yr. 40 hrs/wk.

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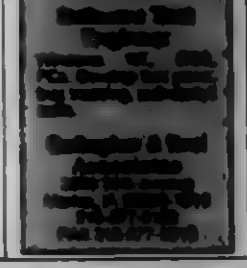

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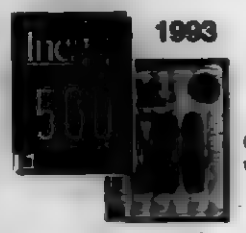

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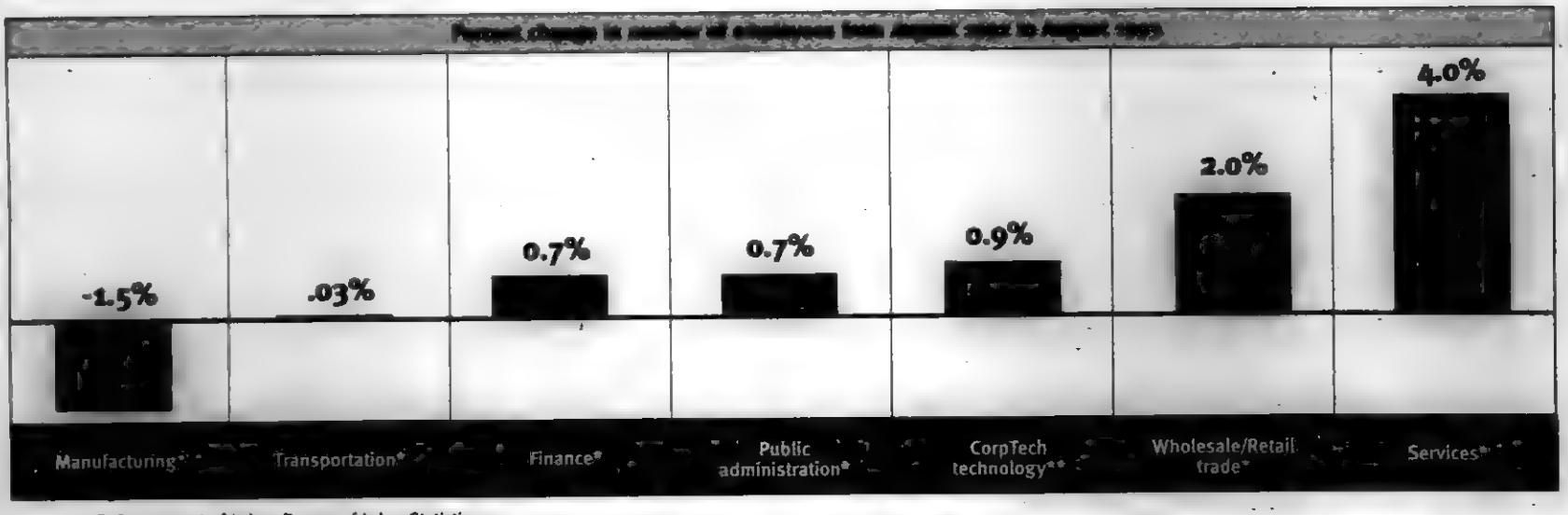
The service industry continues to hire more than other segments while manufacturing continues to cut back



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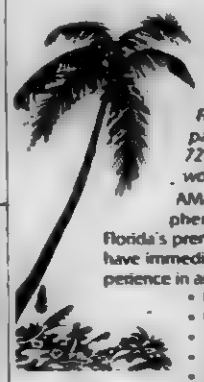

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To Build or Not to Build

Customizing Packaged Applications Rather Than Building From Scratch May Save on Development Resources but Also Presents New Integration Challenges

By David Baum

Rising software development costs are causing more and more companies to question whether to build or buy software.

While there are no cut-and-dried answers, experts agree on a strong trend toward customizing packaged solutions.

"If you look at all the types of software used, the commodity level is slowly moving up," observes John Rymer, an analyst at the Patricia Seybold Office Computing Group in Boston. More problems are becoming better understood and are being solved by packaged solutions.

"So don't assume your needs are too specialized to lend themselves to an off-the-shelf solution until you've taken a good look around," Rymer adds.

Building from scratch

Most companies still build applications from scratch when it will clearly bring a competitive advantage or when a truly unique problem needs automating.

But even when developers decide they need to build a system themselves, they can usually find packaged components as a starting point, says Donna Morea, a vice president at American Management Systems, Inc. in Fairfax, Va. "Packaged applications and software components for PCs have especially proliferated."

"Years ago, packaged software was all proprietary," adds Nigel Smith, a systems analyst at Shell Oil Co. in Houston. "But so much of it now utilizes open interfaces, making it easy to integrate these packages with other applications at your shop."

Often, the real challenge is getting management to buy into these new software strategies, Smith adds.

While packaged solutions may save on programming resources, there are plenty of other costs to watch. For instance, organizations still wrestle with database integration issues, such as providing connectivity between centralized corporate data and local front-end applications. Once these links have been established between the desktop and the rest of the world, there are also specific connectivity issues to resolve among the various front-end applications.

These integration tasks can end up costing far more than the original software and have fueled the fire for today's application suites, saving the time developers spend tying disparate applications into a cohesive environment, explains John Murphy, president of Metro Computing in Gibbsboro, N.J.

> "Companies actually build less than a third of their PC applications from scratch anymore," estimates Donna Morea, vice president at American Management Systems in Fairfax, Va. The spectrum of packaged solutions is narrower at the high end, however, where mainframe systems still predominate.

Application suites

Memory and disk requirements for suites can be substantial, however, often forcing hardware upgrades. Networks may also need beefing up to handle the new workgroup computing habits encouraged by application suites such as shared editing sessions and the exchange of compound documents.

The real cost for packaged software, however, is upgrades. According to Murphy, the typical PC program is updated about once every 1.4 years. "For a five-year outlay, you can plan to spend two to three times the initial purchase price just for upgrade costs."

Murphy recommends not taking every update, unless it represents a substantial productivity increase. "Sometimes all you're paying for is a few new bells and whistles," Murphy says.

In the future

However, there is something to look forward to. In the not too distant future, virtually all applications will be made up of prefabricated parts snapped together from object-oriented class libraries, predicts Dan Shafer, editor of the "Inventive User Letter" and president of Graphic User Interfaces, Inc. in Redwood City, Calif.

The issue for companies will no longer be "to build or to buy" but "where to find the right parts and how best to snap them together.

"You will buy a set of class libraries that answers 85% to 90% of your needs," Shafer says. "The rest of the application might be constructed from packaged software components or written by hand."

Shafer points to the burgeoning market for add-on modules created by Microsoft Corp.'s Visual Basic. The new tools and programming techniques will be even more sophisticated, however.

Most programming to date has been similar to designing and building completely customized houses, with even the bathroom fixtures specially made instead of ordered off-the-shelf.

But programming with tomorrow's object-oriented class libraries and add-on modules is analogous to ordering entire rooms as units and joining them together with minimal effort, according to Shafer.

Once written, these self-contained, reusable chunks of software code can be mixed and matched by programmers to create new applications without having to start from scratch each time.

Does the package meet at least 50% of your business requirements out of the box?

Will the vendor work with you to customize the product?

Source: Donna Morea, vice president, American Management Systems, Fairfax, Va.

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.

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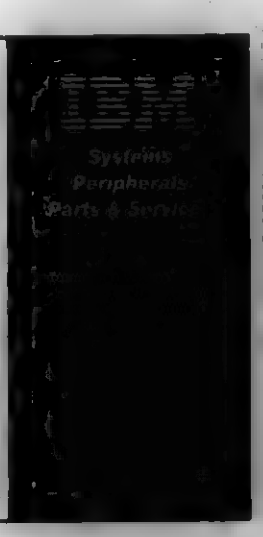

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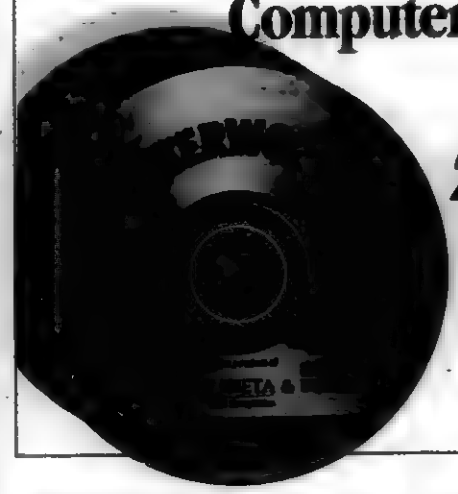

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Percent

Group I Software	31.3
Microcom Inc.	26.1
Cambex Corp.	20.0
Adaptec Inc.	14.8
Ingram Corp.	13.3
Northern Telecom Ltd.	10.2
Cordall Square Research	9.1
Cabletron Systems	7.9

Dollar

3M Corp.	3.88
Northern Telecom Ltd.	2.75
Group I Software	2.50
Autodesk Inc.	2.13
Informix Corp.	2.00
Octel Communications Corp.	1.88
Apple Computer Inc.	1.50
ITT Corp.	1.25

Losers

Percent

Zeos Inc.	-23.8
Spectrum Software	-20.0
Peoplesoft	-19.5
Wyse	-18.5
Lattice Semiconductor	-17.7
Centigram Communications	-17.4
Wordstar	-16.7
Data Race Inc.	-16.0

Dollar

Synoptics Communications	-9.25
Zilog Inc.	-9.00
DSC Communications	-8.00
Peoplesoft	-7.00
Motorola Inc.	-6.75
Micron Technology	-6.13
Texas Instruments	-5.88
Centigram Communications	-5.75

THE BIGGEST CHANGES IN PUBLICLY TRADED NEWBRIDGE NETWORKS, INC. LAST WEEK FOR EXISTING STOCKHOLDERS MAY CALLING TO ENTER THOSE. NEWBRIDGE ANNOUNCED FINANCIAL RESULTS IN LINE WITH ANALYSTS' PREDICTIONS, BUT THE STOCK FELL OVER CONCERNS THAT EARNINGS MOMENTUM IS SLOWING.

[redacted]

Riding the cycle

Strong starts and summer slumps characterize the typical yearly pattern for semiconductor stocks.

Chip stocks are often referred to as cyclical stocks because the semiconductor business usually follows both seasonal and macroeconomic cycles, said Gerald Fleming, vice president at Fahnestock/Christopher in New York.

"There is a seasonal pattern where people tend to order fairly heavily at the beginning of the year. Then it slows down as you head into summer, then starts to pick up again at the end of the year," Fleming said. "In terms of the longer cycle, it's tied to the economic cycle because all electronic devices are driven by consumer spending."

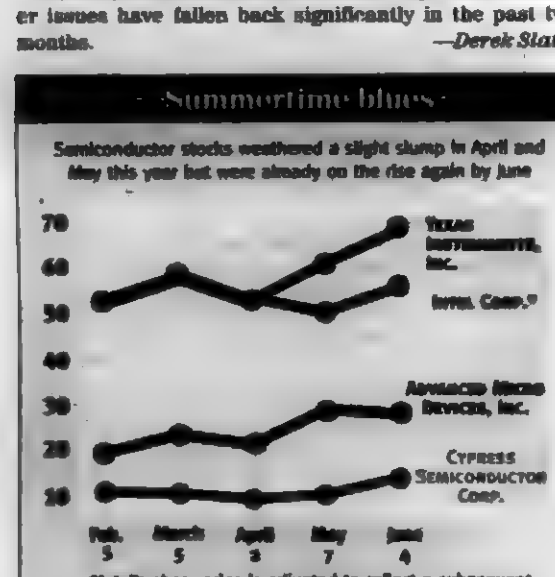
This year, though, semiconductor issues bulled their way through the summer with little drop-off (see chart). Many of the stocks reached new peaks in the September time frame, becoming "somewhat overheated" because the traditional summer slump never materialized to keep valuations modest, according to an industry perspectives report by Lawrence Borgman at Josephthal, Lyon & Ross, Inc.

As a result, **Intel Corp. (INTC), Advanced Micro Devices, Inc. (AMD), National Semiconductor Corp. (NSM)** and other issues have fallen back significantly in the past two months.

—Derek Slater

Summertime blues

Semiconductor stocks weathered a slight slump in April and May this year but were already on the rise again by June



*Intel's share price is adjusted to reflect a subsequent 2-for-1 stock split

Exch	52-Week High	52-Week Low		Nov. 19 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						
OTC	40.00	19.63	3 COM Corp.	33.25	-2.50	-7.0
NYS	91.13	66.50	American Info Techs Corp.	76.75	-4.00	-5.0
NYS	65.00	45.75	AT&T	56.25	-1.13	-2.0
OTC	4.44	0.94	Abtel Communication Corp.	3.25	0.06	1.9
OTC	24.50	12.50	Banyan Systems Inc.	22.25	-0.75	-3.3
NYS	69.13	46.75	Bell Atlantic Corp.	59.13	-2.25	-3.7
NYS	63.88	48.13	BellSouth Corp.	54.75	-1.88	-3.3
NYS	14.75	4.25	Bolt, Beranek & Newman	11.63	-1.25	-9.7
OTC	18.50	9.50	Brooktrout Technology	13.75	0.00	0.0
NYS	139.00	70.75	Cabletron Systems	94.75	-4.63	-4.7
OTC	36.50	10.25	Centigram Communications	27.25	-5.75	-17.4
OTC	55.50	22.88	Chipcom Corp.	45.25	-5.25	-10.4
OTC	59.25	34.38	Cisco Systems Inc.	56.00	0.13	0.2
OTC	18.38	8.00	Compression Labs Inc.	14.75	-1.25	-7.8
OTC	36.00	21.75	CrossComm	29.25	-1.25	-4.1
OTC	6.63	1.75	Data Switch Corp.	1.88	-0.25	-11.8
NYS	19.88	12.38	Digital Comm. Assoc.	18.75	0.00	0.0
OTC	12.00	3.50	Digital Systems Int'l Inc.	3.75	-0.06	-1.7
OTC	73.13	17.75	DSC Communications	58.88	-8.00	-12.0
OTC	9.50	4.75	Fibronix Int'l Inc.	5.63	0.13	2.3
OTC	24.00	8.75	Filenet Corp.	18.00	0.25	1.4
OTC	4.38	1.63	Gandalf Technologies Inc.	2.88	-0.25	-8.0
OTC	2.06	0.69	Gateway Communications	0.97	-0.03	-3.1
NYS	15.75	4.63	General Datacomm Inds.	10.13	-0.75	-6.9
ASE	3.75	2.00	Go Video	2.44	0.00	0.0
NYS	39.88	33.13	GTE Corp.	36.50	-0.75	-2.0
NYS	94.75	69.00	ITT Corp.	93.00	1.25	1.4
OTC	29.88	18.25	MCI Communications Corp.	25.63	-0.63	-2.4
OTC	6.50	1.50	Micpocom Inc.	3.63	0.75	26.1
OTC	24.25	3.50	Netoix Corp.	6.13	0.38	6.5
OTC	19.00	6.50	Network Computing Devices	7.50	-0.25	-3.2
NYS	11.50	5.38	Network Equipment Tech.	10.00	-0.63	-5.9
OTC	20.13	8.00	Network General	13.25	-0.88	-6.2
OTC	15.00	6.88	Network Systems Corp.	8.00	0.00	0.0
OTC	73.88	14.63	Newbridge Networks Corp.	55.75	-9.25	-14.2
NYS	46.00	21.38	Northern Telecom Ltd.	29.63	2.75	10.2
OTC	35.25	17.00	Novell Inc.	23.13	-0.13	-0.5
NYS	48.88	40.31	Nynex Corp.	41.25	-1.63	-3.8
OTC	30.00	19.00	Octel Communications Corp.	26.00	1.88	7.8
OTC	6.13	3.75	Perkil Data Comm Networks	5.38	0.00	0.0
OTC	30.50	14.50	Picturetel Corp.	20.63	0.38	1.9
OTC	11.50	3.63	Proteon Inc.	7.13	-0.25	-3.4
NYS	38.88	17.75	Scientific Atlanta Inc.	31.13	-2.75	-8.1
NYS	47.00	34.19	Southwestern Bell Corp.	41.00	0.13	0.3
NYS	40.25	24.38	Sprint Corp.	33.63	-0.50	-1.5
OTC	27.00	12.50	Standard Microsystems Corp.	23.13	-1.75	-7.0
OTC	19.75	10.00	Stratacom Inc. (H)	17.00	-1.75	-9.3
OTC	42.75	20.00	Synoptics Communications	26.75	-3.25	-10.8
OTC	9.88	2.88	Telebit Corp.	6.88	-0.25	-3.5
OTC	17.88	5.13	Telemajics Int'l Inc.	15.00	-0.13	-0.8
NYS	35.25	17.00	US Robotics	24.50	-3.50	-12.5
NYS	50.75	36.63	US West Inc.	46.50	-0.50	-1.1
OTC	58.25	29.50	Wellfleet Communications (H)	55.25	-2.50	-4.3
OTC	19.50	7.25	Xidcom	15.50	-1.75	-10.1
Personal Workstations						
OTC	5.56	2.50	Advanced Logic Research	3.50	0.00	0.0
OTC	65.25	22.00	Apple Computer Inc.	33.25	1.50	4.7
OTC	24.25	12.75	AST Research Inc.	22.50	-1.25	-5.3
NYS	9.25	2.50	Commodore Int'l.	3.88	-0.13	-3.1
NYS	78.00	39.25	Compaq Computer Corp. (H)	67.00	-1.75	-2.5
OTC	49.88	13.50	Dell Computer Corp.	23.75	-2.38	-9.1
NYS	89.25	60.50	Hewlett Packard Co.	71.88	-5.25	-6.7
NYS	46.75	23.50	Silicon Graphics	43.13	-2.25	-5.0
OTC	41.00	21.13	Sun Microsystems Inc.	26.50	0.25	1.0
NYS	47.50	24.63	Tandy Corp.	45.88	-0.75	-1.6
OTC	7.00	2.50	Zeos International Ltd.	6.00	-0.63	-13.5
Large Systems						
ASE	8.50	4.38	Amdahl Corp.	4.88	-0.13	-2.5
NYS	8.75	3.63	Convex Computer	5.50	0.25	4.8
OTC	5.38	2.25	Cray Computer	2.75	0.00	0.0
NYS	30.88	20.38	Cray Research Inc.	26.50	-0.25	-0.9
NYS	13.88	7.75	Data General Corp.	9.38	-0.50	-5.1
NYS	49.25	30.38	Digital Equipment Corp.	36.38	-1.75	-4.6
NYS	47.38	32.50	Harris Corp.	45.00	-1.50	-3.2
NYS	68.88	40.63	IBM	51.88	0.00	0.0
OTC	25.75	9.50	Kendall Square Research	11.75	1.00	9.3
NYS	141.50	84.75	Matsushita Electronics	134.25	-2.25	-1.6
OTC	23.75	12.75	NetFrame	16.00	-1.25	-7.2
OTC	26.00	9.25	Parallan Computer	16.50	-1.50	-8.3
OTC	23.25	8.50	Pyramid Technology	14.25	-1.00	-6.6
OTC	24.00	11.25	Sequent Computer Sys.	16.88	-1.88	-10.0
OTC	6.00	1.38	Sequoia Systems Inc.	5.00	-0.25	-4.8
NYS	41.25	20.25	Stratus Computer Inc.	28.38	0.63	2.3
NYS	16.88	8.50	Tandem Computers Inc.	11.00	-0.63	-5.4
OTC	27.50	10.63	TriCord Systems (H)	24.00	-2.75	-10.3
NYS	13.88	8.38	Unisys Corp	11.63	0.00	0.0
Software						
OTC	37.00	14.50	Adobe Systems Inc.	20.75	0.88	4.4
OTC	25.25	11.75	Aldus Corp.	20.50	-2.50	-10.9
OTC	10.00	5.50	American Software Inc.	6.63	-1.13	-14.5
OTC	28.13	9.50	Ase Computer Systems	13.63	-1.63	-10.7
OTC	56.75	37.00	Autodesk Inc.	43.38	2.13	5.2
OTC	7.25	2.38	Bachman Info. Systems	2.75	-0.13	-4.3
OTC	43.00	24.00	BGS Systems Inc.	25.00	-1.00	-3.8
OTC	84.13	38.75	BMC Software Inc.	48.75	-0.25	-0.5
OTC	28.25	20.38	Boole & Babbage	26.50	-0.50	-1.9
OTC	27.25	12.75	Borland Int'l. Inc.	15.88	-1.63	-9.3
OTC	5.00	2.75	CE Software	3.25	-0.38	-10.3
ASE	40.25	16.41	Cheyenne Software Inc.	28.38	-4.38	-13.4
OTC	19.50	8.25	ChipSoft	17.50	-0.88	-4.8
OTC	10.50	5.63	Cognos Inc.	8.75	-0.13	-1.4
NYS	44.00	17.13	Computer Associates (H)	41.13	-1.25	-2.9
NYS	6.50	2.13	Computervision Corp.	3.25	0.13	4.0
OTC	34.25	19.25	Compuware Corp.	24.13	-1.63	-6.3
OTC	14.75	5.75	Comshare Inc.	9.75	-0.50	-4.9
OTC	37.00	10.75	Corel Corp	31.50	-3.38	-9.7
OTC	15.25	4.13	Easel Corp. (L)	4.25	-0.25	-5.6
OTC	25.25	15.75	4th Dimension	21.88	-2.13	-8.9
OTC	19.25	5.25	Frame Technology	9.75	-0.50	-4.9
OTC	17.50	8.00	Group I Software	10.50	2.50	31.3
OTC	35.25	14.00	Gupta	15.25	0.00	0.0
OTC	12.00	4.88	Hogan Systems Inc.	10.25	-0.75	-6.8
OTC	27.75	11.25	IMRS	24.00	-0.25	-1.0
OTC	44.75	27.00	Information Resources	36.00	-2.63	-6.8
OTC	27.25	13.38	Informix Corp.	17.50	-1.50	-7.9
OTC	14.00	8.50	Intergraph Corp.	9.63	-0.88	-8.3
OTC	13.63	4.88	Interleaf Inc.	7.25	-0.63	-7.9
OTC	25.25	4.75	Intersolv Inc.	8.75	0.13	1.4
OTC	18.25	7.75	Knowledgeware Inc.	15.25	-0.25	-1.6
OTC	54.75	15.50	Legent Corp.	23.50	0.50	2.2
OTC	50.75	18.75	Lotus Development	46.75	-1.25	-2.6
OTC	23.00	4.25	MathSoft	6.63	-0.25	-3.6
OTC	21.25	4.50	McAfee Associates	6.25	0.00	0.0
OTC	11.63	3.38	Mecca Software	6.63	0.13	1.9
OTC	13.75	7.63	Mentor Graphics (H)	13.50	0.50	3.8
OTC	46.00	19.75	Micro Focus	20.25	-2.25	-10.0
OTC	13.25	4.38	Micrografx Inc.	7.63	-0.63	-7.6
OTC	98.00	70.38	Microsoft Corp.	80.25	-1.75	-2.1
OTC	32.75	9.44	Oracle Corp. (H)	30.50	-1.25	-3.9
OTC	44.75	22.50	Parametric Technology	34.75	-4.38	-11.2
OTC	40.50	23.50	Peoplesoft	28.88	-7.00	-19.5
OTC	7.13	3.50	Phoenix Technologies	4.31	-0.44	-9.2
OTC	40.00	22.00	Powersoft	32.50	-2.50	-7.1
OTC	39.75	13.50	Platinum Software	23.38	-0.38	-1.6
OTC	25.00	7.25	Platinum Technology	9.75	-0.38	-3.7
OTC	61.50	32.25	Progress Software Corp.	49.25	-0.75	-1.5
OTC	6.63	1.94	Quarterdeck Office Sys.	2.31	-0.13	-5.1
OTC	32.00	16.00	Rainbow Technologies Inc.	21.50	-3.50	-14.0
OTC	11.38	4.25	Rasterops	7.50	-0.50	-6.3
OTC	15.25	6.50	Ross Systems	8.25	0.00	0.0
OTC	28.75	17.25	Saphers Intl. Corp. N.V.	21.13	-2.88	-12.0
OTC	14.50	5.50	Software Publishing Corp.	6.25	-0.25	-3.8
OTC	17.25	5.25	Software Toolworks Inc.	13.13	-1.38	-9.5
OTC	2.88	0.75	Spinnaker Software	2.25	-0.56	-20.0
OTC	13.75	6.50	State of the Art	8.75	-0.75	-7.9
NYS	33.63	17.63	Sterling Software Inc.	28.50	-4.13	-12.6
OTC	21.63	9.63	Struct. Dynamics Research	17.88	-0.63	-3.4
OTC	77.50	38.25	Sybase Inc.	60.25	-1.25	-4.5
OTC	20.50	9.25	Symantec Corp.	17.63	-1.38	-7.2
OTC	25.50	10.00	System Software Assoc.	14.75	-2.00	-11.9
OTC	6.50	2.75	Trinzic Corp.	5.63	0.25	4.7
OTC	26.50	13.50	ViewLogic Systems	22.13	-1.38	-5.9
OTC	22.50	5.50	Walker Interactive Systems	9.00	-0.50	-5.3
OTC	3.19	0.84	Wordstar	1.25	-0.25	-16.7
Semiconductors						
NYS	32.88	14.25	Advanced Micro Devices	18.63	-1.25	-6.3
NYS	28.00	12.25	Analog Devices Inc.	22.13	-2.25	-9.2
OTC	38.63	14.75	Atmel Corp.	25.13	-2.63	-9.5
OTC	6.63	2.75	Chips and Technologies	6.50	-0.13	-1.9
OTC	39.75	13.00	Cirrus Logic	33.38	-2.62	-7.3
NYS	16.75	8.63	Cypress Semiconductor Corp.	12.63	-0.38	-2.9
NYS	19.00	11.75	Dallas Semiconductor	14.50	-1.08	-6.5
OTC	74.50	34.50	Intel Corp.	58.50	-4.25	-6.8
NYS	19.25	8.75	LSI Logic Corp.	14.50	-0.25	-1.7
OTC	26.75	12.75	Lattice Semiconductor	12.75	-2.75	-17.7
NYS	63.63	16.25	Micron Technology	38.88	-6.13	-13.6
NYS	107.50	48.75	Motorola Inc.	96.25	-6.75	-6.6
NYS	21.75	10.13	National Semiconductor	15.88	-1.75	-9.9
OTC	15.75	6.50	Sierra Semiconductor	8.13	-0.63	-7.1
OTC	52.75	25.75	SynOpsys	44.88	-3.63	-7.5
NYS	84.25	45.13	Texas Instruments	59.63	-5.88	-9.0
OTC	18.88	6.50	VLSI Technology	13.38	-0.75	-5.3
OTC	14.38	6.75	Weitek	9.38	-2.13	-18.5
ASE	10.25	3.63	Western Digital Corp. (H)	9.75	-0.38	-3.7
OTC	54.50	20.00	Xilinx	37.50	-2.75	-6.8
OTC	40.75	18.00	Zilog Inc.	29.25	-9.00	-23.5
Peripherals and Subsystems						
OTC	24.75	10.50	American Power Conversion	18.50	-2.38	-11.4
OTC	22.75	15.50	Banctec Inc.	21.00	0.75	3.7
OTC	18.00	3.50	Cambex Corp.	5.25	0.88	20.0
ASE	18.38	3.88	Cognitronics Corp.	4.50	0.63	12.2
NYS	25.50	9.00	Conner Peripherals	13.75	1.00	7.8
OTC	38.50	17.25	Creative Technologies Inc.	24.50	-3.25	-11.7
OTC	30.75	6.50	Data Race Inc.	10.50	-2.00	-16.0
ASE	12.50	7.50	Dataram Corp.	9.63	-0.13	-1.3
NYS	39.00	9.25	EMC Corp.	31.13	-3.25	-9.5
OTC	10.50	5.25	Emulex Corp.	8.13	-0.25	-3.9
OTC	20.00	14.00	Evans & Sutherland (H)	17.63	-0.38	-2.1
OTC	20.63	7.50	Exabyte	15.75	-0.13	-0.8
OTC	34.00	11.34	Intelligent Info. Systems	25.63	-1.75	-6.4
OTC	8.63	2.50	Iomega Corp.	3.25	-0.25	-7.1
OTC	14.25	5.75	IPL Systems Inc.	7.50	0.50	7.1
OTC	24.00	13.75	Komag Inc.	16.50	0.00	0.0
OTC	19.63	4.38	Maxtor Corp.	6.75	0.25	3.8
OTC	10.00	5.75	Micropolis Corp.	7.38	0.13	1.7
NYS	117.00	97.25	3M Corp	108.63	3.00	2.8
OTC	8.00	4.00	Peritronix Inc.	7.25	0.25	3.6
NYS	17.25	7.50	QMS Inc.	10.38	-0.13	-1.2
OTC	17.88	9.38	Quantum Corp.	14.00	-0.13	-0.9
OTC	7.75	3.13	Radius Inc. (N)	7.75	0.25	3.3
NYS	17.75	11.75	Recognition Equipment	16.00	-0.50	-3.0
OTC	13.25	3.63	Reson Inc.	4.13	-0.13	-2.9
OTC	25.13	13.13	Seagate Technology	23.88	-0.75	-3.0
NYS	45.00	18.00	Storage Technology	28.50	-1.50	-5.0
NYS	27.88	17.63	Tektronix Inc.	22.38	-0.38	-1.6
NYS	88.88	69.00	Xerox Corp.	81.75	0.13	0.2
Services						
NYS	4.38	1.63	Allegion Inc.	3.25	-0.25	7.1
OTC	23.75	14.88	American Mgmt. Systems	19.88	-1.38	-6.5
NYS	4.75	2.38	Analcomp Inc.	3.88	0.50	14.8
OTC	23.84	14.16	Analysts Int'l.	17.38	-0.38	-2.1
NYS	56.13	46.88	Auto Data Processing	54.38	0.13	0.2
NYS	19.88	13.00	Ceridian Corp.	18.63	0.13	0.7
NYS	21.00	13.13	Comdisco Inc.	18.50	-0.63	-3.3
OTC	13.38	5.16	Computer Horizons	12.63	0.63	5.2
NYS	98.00	70.00	Computer Sciences	98.00	-0.13	-0.1
NYS	9.00	6.00	Computer Task Group	6.63	-0.13	-1.9
NYS	37.00	19.00	CompUSA Inc.	26.25	-0.13	-0.5
OTC	14.13	8.00	Control Data Systmes Inc.	9.13	-0.63	-6.4
OTC	15.88	7.00	Corporate Software	15.63	0.13	0.8
OTC	11.75	6.63	Egghead Discount Software	8.38	0.25	3.1
NYS	35.88	26.00	General Motors E (EDS)	28.63	-2.13	-6.9
OTC	25.50	13.25	Inacom Corp.	17.00	2.00	13.3
OTC	24.38	8.50	Intelligent Electronics	23.13	-0.13	-0.5
OTC	17.00	9.63	Meisel	14.63	-1.00	-6.4
OTC	35.50	6.50	Microage Inc. (H)	33.00	0.00	0.0
OTC	37.75	21.50	Paychex (N)	34.25	-2.75	-7.4
NYS	87.25	21.63	Policy Management Sys.	86.00	0.00	0.0
NYS	43.63	24.13	Reynolds and Reynolds	41.50	-1.25	-2.9
OTC	24.00	13.38	SEI Corp.	22.75	0.00	0.0
OTC	26.00	17.50	Shared Medical Systems	22.25	0.13	0.6
OTC	12.63	5.75	SHL Systemhouse	6.75	-0.75	-10.0
OTC	30.75	20.00	Software Spectrum Inc.	21.25	-2.25	-9.6
OTC	42.75	26.25	Sungard Data Systems	36.75	-0.88	-2.3

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Computer Industry

Briefs

HP results rise

Hewlett-Packard Co.'s fiscal fourth-quarter profits soared 87% to $298 million, and revenue rose 32% to $5.7 billion. The strong fourth quarter boosted the Palo Alto, Calif., firm's fiscal 1993 earnings to $1.17 billion, a 114% increase from the year-earlier period, on revenue of $20.3 billion, a 24% climb from 1992. While orders are strong, HP cautioned that inventories and the cost of sales are too high.

Wang posts profit

Wang Laboratories, Inc. reported an $11.9 million first-quarter operating profit, ending a string of five straight operating losses. Accounting procedures related to Wang's emergence from Chapter 11 bankruptcy protection boosted net income in the quarter ended Sept. 30 to $306.3 million. Revenue declined 41% in the period to $210.9 million, reflecting Wang's shift from hardware to software.

Sterling takes a hit

Sterling Software, Inc. reported a $48.6 million fourth-quarter loss, caused primarily by a restructuring charge to cover its acquisition of System Center, Inc. Revenue in the period ended Sept. 30 increased 5% to $110.7 million, the Dallas software developer said. For the year, Sterling lost $38.6 million; revenue increased 9% to $411.6 million.

SHORT TAKES Sapiens International Corp. in Carey, N.C., posted third-quarter net profits of $2.1 million on revenue of $15.2 million. ... Ten-year-old Spectrum Information Technologies, Inc. in Manhasset, N.Y., reported second-quarter net earnings of $646,000 — the first time it has strung together consecutive profitable periods — on revenue of $24.4 million. The company also agreed to acquire C.P.U., Inc., an $18 million, Rochester, N.Y., systems integrator.

Database market

Relational threat stalks object DBMS makers

By Kim S. Nash

■ Already struggling object-oriented database vendors will soon face the added risk of being stamped out completely as relational database companies such as Sybase, Inc. and Oracle Corp. talk up plans to "objectize" their products in the next year.

Objectivity, Inc., Versant Object Technology Corp. and three or four other small, privately held firms accounted for the bulk of the $32 million in object-oriented sales last year (see chart). The market is expected to double in 1993, according to International Data Corp. (IDC) in Framingham, Mass., but even that kind of growth may not keep shaky object-oriented vendors afloat, observers said.

Source: International Data Corp., Framingham, Mass.

"It's questionable whether the market can expand fast enough for all to survive," said Jacob Stein, an independent object-oriented database consultant in Oakland, Calif.

No profits

The major players are half a decade old, and with one possible exception, they are not making any money, according to analysts. No firm sells more than $10 million worth of products per year, with each of the Top 5 selling an average of $4 million to $7 million worth, according to concensus estimates. With that in mind, Stein predicted that at least one or two firms will either be acquired or will fold during the next 12 to 18 months.

Object-oriented database vendors find themselves in a catch-22 of sorts. Much as it was with artificial intelligence, there are plenty of ideas for using object database technology but few that match immediate business needs. Without those sales, providers weaken. In turn, information systems managers with an interest are loath to buy from such weak players.

Compounding that issue are tantalizing proclamations about future object plans from stronger, more established relational database companies, which gives IS yet another reason to wait.

For example, mainstream IS departments — as opposed to specialized technical and engineering groups — accounted for just 4% of the $32 million object databases market, according to Steve McClure, an analyst at IDC. The rest went to people working on complex niche applications such as geographic information systems and intricate systems required to monitor large phone and data networks.

New ways of thinking

While object systems are expected to enable as-yet undiscovered programs, "it's a hard sell in some ways because you have to get people thinking in new ways," said Dave Banks, president of Versant.

Meanwhile, there is little need for an object-oriented system to store and send the data that traditional business applications produce, analysts, vendors and users said. But that's not the point of object-oriented databases by and large, according to proponents.

A major difference between relational databases and their object-oriented cousins is that the latter were built to handle complex models that do not sit in rows and tables.

For a relational database to accommodate a model, the system would have to break the model down into small pieces, each with coordinates that could be plotted on a grid. Cells within tables would hold those coordinates. When a user wanted to view the model, he would have to write a complex query asking the database to reconstruct it. That involves searching for all the information pertaining to the model, probably by way of several joins. The task would take a fair amount of time to process.

Gain is the name

Objectivity's object-oriented database lives at the heart of Sybase's multimedia application development tool set, dubbed Gain Momentum. Gain is part of a broader object-oriented product line Sybase unveiled in August.

Compare this to the way an object-oriented system would fetch the same model. The database uses pointers to locate the model, which it stores intact. The process could be 100 times faster, McClure said.

Tough transitions

Some object-oriented vendors are trying to break out beyond the scientific and engineering realms, but several factors may conspire to rough up the transition, including the following:

- No uniform way to talk to object-oriented databases; each product has its own language for querying the database. Analysts said the market needs a standard that is similar to SQL in the relational world.
- Lack of off-the-shelf third-party software packages for object databases.
- Few links between object-oriented databases and relational databases. However, object vendors are starting to provide ways to allow data from both to coexist and interact.

Building it up

IBM bought an estimated 20% stake in Object Design, Inc. in April for about $27 million. By mid-1994, IBM plans to build Object Design's DBMS into AD/Platform, a reincarnated version of IBM's mainframe-based AD/Cycle application development environment.

For example, some vendors, such as Montage Software, Inc. and UniSQL, Inc., are taking a hybrid approach to the object vs. relational issue. Montage touts its flagship database as an "object/relational" system that lets users store, query and manipulate objects — video, blueprints, three-dimensional drawings, etc. — using relational techniques such as SQL.

The goal is to let users hang on to relational applications and databases by gradually introducing object technology into the IS shop, said Michael Stonebraker, who co-founded 15-month-old Montage with venture capitalist Gary Morganthaler. Such combination object/relational systems hold promise, according to McClure.

Adding two, getting one

There are users waiting for that marriage. Take Jay Parekh, senior manager of software development at BT North America, Inc. The San Jose, Calif., division of BT runs the world's biggest data network, formerly known as Tymnet. Global firms such as J. P. Morgan and Co., Holiday Inns, Inc. and Pittman Moore are customers. The system that manages that massive network runs against Versant's object-oriented product.

Although Parekh said he is quite pleased with object technology, he said he will not invest further in either object-oriented or relational products until vendors come up with a solid way to get the two different systems working together.

The relational answer is to tack object extensions onto relational database management systems. Although such a move would not put relational databases on par with object-oriented systems, it would buy them mind share, observers agreed. That strategy could hurt object-oriented sales.

Hence, the main challenge for object database makers during the next year or so is to cultivate enough mainstream IS users who will be able to stump for object-oriented technology when relational firms start to push their own.

Wysiwyg

What is your favorite restaurant in the world?

"Normally, I don't think about the food I eat and whether it is good or bad. However, when I ate at Moulin de Mougin in France, the food was absolutely incredible. . . . I have never eaten a meal so wonderful before or since."

—Richard Rabins, Co-chairman, Alpha Software Corp.

"On the last night of a European product tour, we went out to dinner at a loud yet elegant restaurant called Sal n Pepe. After several days of meals on the run and airport food, that Italian restaurant in London really made an impression on me."

—Ron Zambonini, President and COO, Cognos Corp.

—And here's a recipe you can try for your holiday table

Thanksgiving Cranberry Corel-ish

- 2 cups fresh cranberries
- 1 apple, unpeeled
- 2 oranges, peeled and seeded
- 1 8-oz. can crushed pineapple, undrained
- 1 cup sugar
- 1 cup chopped pecans

In food processor, chop cranberries and place in large bowl. Chop apple and oranges, adding to same bowl. Add remaining ingredients. Mix and chill.

Fat reducer: Reduce the nuts to ½ cup or omit altogether.

Recipe taken from *Quick Bytes: Computer Lover's Cookbook* by Diane Pfeifer (Strawberry Patch, Atlanta). Illustrations by Fran O'Neill

The 5th Wave *by* Rich Tennant

"I SUPPOSE THIS ALL HAS SOMETHING TO DO WITH THE NEW MATH."

Inside Lines

Maybe now that it's out in the open . . .

Daniel Gesteiger from the Gesteiger & Delonas consulting firm in Boston reports that Lotus' 1-2-3 for Windows Release 4 may not scale as well as promised. He says 1-2-3 has been crashing when he employs the File Combine operation on spreadsheets that have more than 6M bytes of data. While most users won't create 6M-byte spreadsheets, the rolling up on several spreadsheets from multiple users in a workgroup into a single master file will push that limit. Lotus executives last week said they have yet to encounter that problem but are looking into it.

Trying harder

Hewlett-Packard last week quietly outlined for customers a host of forthcoming 3000 products, including enhanced backup, patching and subsystem upgrades. HP committed to a May delivery of the modified version of the MPE/IX operating system, called 5.0, and to a September shipment of the full version. HP is mindful that its 55,000 HP 3000 sites helped it reach last week's milestone: The $20.3 billion company reported $15.5 million in computer business [see story page 119], thereby passing Digital as the No. 2 industry vendor.

Pumping up CASE

Meanwhile, HP is expected to announce a Cobol version of its SoftBench CASE framework next week, a company insider said. SoftBench for Cobol will be aimed at mainframers who want to move applications to Unix hardware. The product was designed to keep mainframe code in place but mask it at the user level with a graphical Unix-based interface, the source said.

Something to warm phone company hearts

According to sources, Digital's customer service unit is promising some changes to make it more user-friendly, including less pressure on its telephone support workers to close calls quickly. With some users complaining they were being rushed, Digital will now evaluate its workers more on customer satisfaction than on call volume, the sources said. Longer-term, they added, Digital plans to streamline its service contracts, support on-line updates and integrate its disparate contract administration databases. The moves are expected to be disclosed at the Digital Equipment Computer Users Society (Decus) conference in San Francisco next month.

'And the survey says . . .'

Also at Decus, Digital plans to hand out a survey asking users to list their key buying considerations and then rate the company on how well it is meeting the criteria. Digital officials said they plan to use the feedback to set priorities and goals for an ongoing reengineering of its customer supply chain. The survey is also part of an effort by Digital to convince users that, for a change, they have its ear.

Dynamic duo

Oracle and Novell are expected to make a joint announcement today that OracleWare is shipping to Netware resellers. The bundle of Oracle's database and either Novell's Netware or UnixWare operating systems was announced in June and will be priced at about $250 per user, according to Oracle CEO Larry Ellison.

Parting is such sweet sorrow — if you are former Apple Chairman John Sculley. Besides cleaning up when he signed on with Spectrum Information Technologies, Sculley received a severance package worth $4.1 million, according to a published report. Apple will buy his Silicon Valley home and pay moving expenses to Connecticut. Sculley also gets a cash award of $1 million, consultant's fees for the next year and immediate vesting of stock options he has not yet earned. And this from a company that was forced to lay off 2,500 people earlier this year in order to "trim the fat." Phone, fax or CompuServe News Editor Alan Alper at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's *24-hour voice-mail tip line at (508) 820-8555.*

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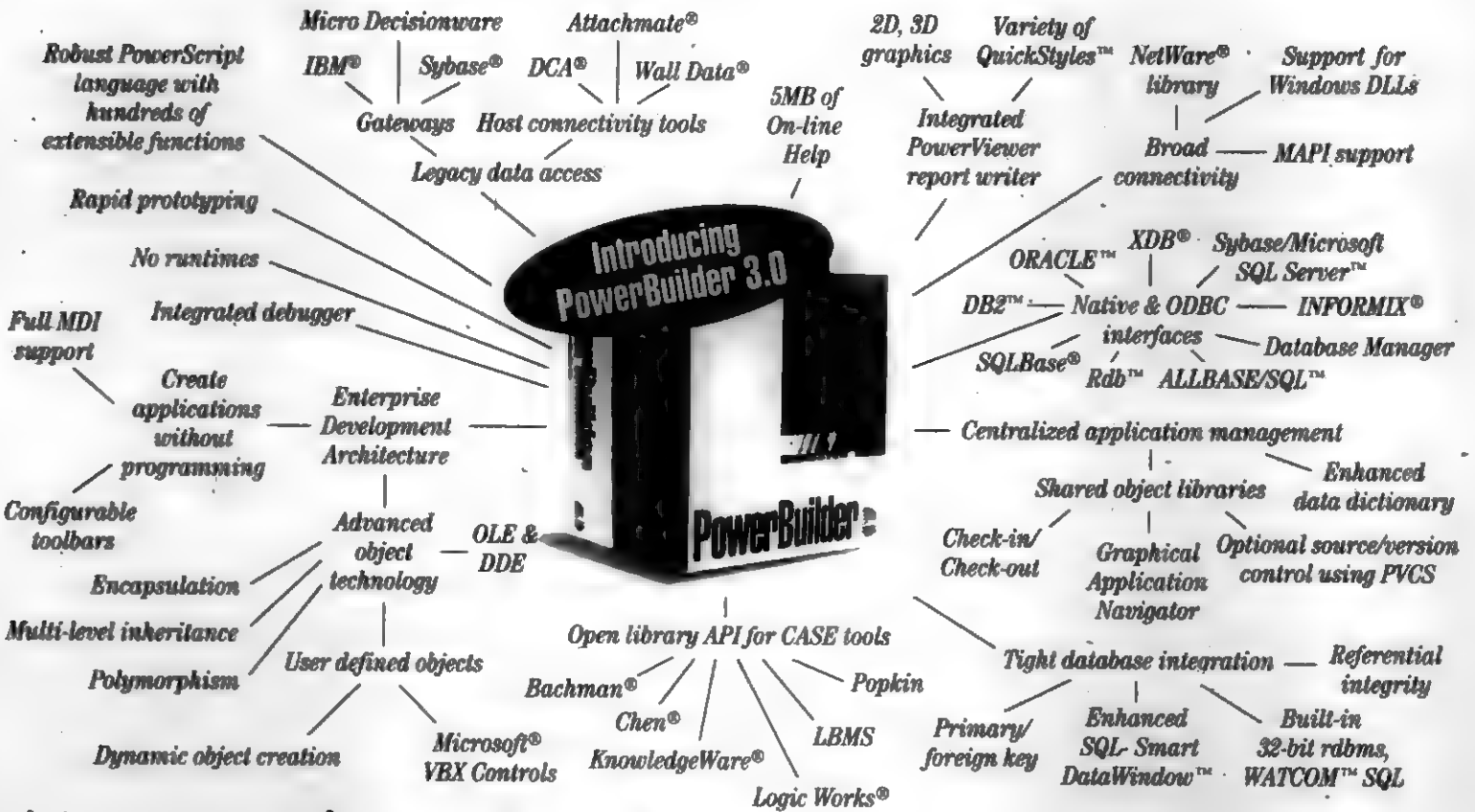

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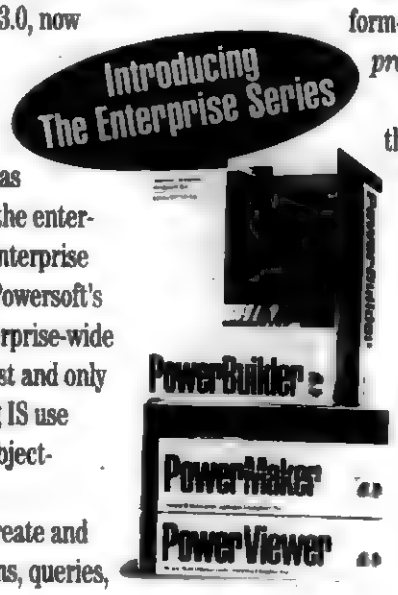

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COMPUTERWORLD

Microsoft takes the catch out of MAPI

By Lynda Radosevich

■ Microsoft Corp. last week began to deliver on its year-old promise to let corporate and third-party developers access messaging services via Windows without buying Microsoft's messaging products.

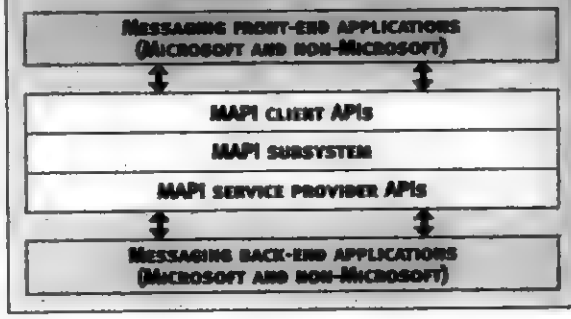
The company said it has begun limited shipment of a software developer's kit for its Messaging Application Programming Interface 1.0, which is also known as "extended" MAPI. Microsoft will demonstrate and more broadly distribute the developer's kit at the Win32 Professional Developer's Conference, to be held Dec. 13 in Anaheim, Calif.

Extended MAPI is a messaging system that is meant to allow different vendors' desktop applications and back-end messaging services to work together via Windows. Its advantage is that users can choose standard desktop inter-

MAPI, *page 10*

More MAPI

Extended MAPI (MAPI 1.0) includes client and service provider APIs that will allow MAPI-capable clients to access any MAPI-capable back-end service



IBM pumps client/server

'Starter kits' will integrate other vendors' products with its own

By Johanna Ambrosio and Elisabeth Horwitt

IBM will shore up its client/server offerings early next year with "starter kits" that will include other vendors' products for specific applications, according to sources close to the company.

Later in the year, IBM will make public a framework detailing standards that it will support in its attempt to integrate multivendor environments in customer shops. Although IBM has not settled on a permanent name, internally the framework is called the Open Distributed Computing System blueprint (see chart page 12).

These moves — along with the increasing popularity of OS/2 as a corporate server desktop operating system — will likely strengthen and clarify IBM's confused client/server hand, users and observers said. "It would be helpful to know what they are going to do," said Wade Brown, executive vice president at Washington National Insurance Co.

Although IBM has recently gotten its client/server strategy together (see story page 12), it has been a long time in coming. "There are so many factions and businesses within IBM, it is tough to get consensus on anything," said Judith Hurwitz, an independent consultant in Watertown, Mass.

IBM's Client/Server Computing Unit, formed in November 1992, claims to have implemented client/server systems at roughly 90 customer sites, but its bottom-line impact on IBM's business has been negligible so far.

IBM, *page 12*

Outsourcing EDI

Nintendo playing no games with holiday product deliveries

By Bart Halper

Santa Claus may soon be delivering by reindeer and sleigh, but when it comes to video game cartridges, he will have plenty of help from an electronic data interchange network that Nintendo of America, Inc. is outsourcing from Unisys Corp.

The Redmond, Wash., subsidiary of $1.2 billion Nintendo Co. recently contracted with Unisys to serve as the linchpin in a "Fast EDI" scheme. The plan is intended to slash from an average of five weeks to an average of [illegible] days the amount of time it takes Nintendo cartridge licensees to ship products to some 15,000 retail outlets in the U.S.

Phil Rogers, Nintendo's vice president of operations, estimated that Fast EDI could annually process the sale of some $5 million cartridges, valued at about $400 million.

Fast EDI will permit licensees to use Nintendo's North Bend, Wash., central warehouse rather than store products in hundreds of warehouses around the country. It will offer EDI services at a [illegible] of the price the licensee

Nintendo, *page 16*

Brokerages seeing IS dividends

By Thomas Hoffman

The dizzying pace of the brokerage industry's three-year profit climb stems in large part from the increasingly important role of information technology as a business strategy enabler and cost-cutting tool.

Industry leaders such as Merrill Lynch & Co. and Salomon Brothers, Inc. are not only padding the bottom line through data center consolidations (see story page 14) and resulting cost savings, but they are also outpacing other vertical sectors through their early adoption of advanced technologies.

Merrill Lynch Executive VP Edward Goldberg

"While the rest of the world stood still for the past three years, Wall Street was surging ahead with new technologies," observed Daniel G. Grant, president and chief operating officer at Tangent International, a New York-based financial systems integrator.

Brokerages, he added, are light-years ahead of other vertical markets in exploring advanced technologies such as massively parallel processing systems, neural networks and object-oriented programming tools in a never-ending bid for competitive advantage.

One reason brokerages have been able to adopt these leading-edge technologies so quickly is that they embraced business process re-engineering dictums. Edward Goldberg, executive vice president of operations, systems

Brokerages, *page 14*

Wall Street has pioneered the use of Unix, neural networks and expert system tools.

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INSIDE

NETWORKING WITH THE ENEMY

CAN OPPONENTS GAIN a mutual competitive edge through cooperative networks? Manufacturers in Erie, Pa., found a way, while Wall Street's best and brightest did not. Page 8a.

HARRY BROWN, *president of Erie's EBC Industries, Inc.*

BETA LIVING COMPANIES THAT BETA-TEST products say the jump they get on new technology is worth the six-figure costs and staff stress that come with the territory. Page 22a.

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ENTERPRISE NETWORKING

■ **Steven Hansen**, director of IS at **The Toro Co.**, is rebuilding the company's EDI systems to provide the quick response its retail customers now expect. *Page 55*

Executive Briefing

Walking the edge. Technological brinkmanship has become a less popular pursuit in these austere times, but some companies still say the rewards of early adoption justify the risks. **Brokerage firms** have invested aggressively in new technologies such as massively parallel processing. *Page 1* And companies such as **Citicorp Mortgage** and **Chevron Canada** say the competitive edge they get from serving as beta sites makes up for the hassles. *Page 111*

Messaging difficulties. Companies that are used to mainframe-based scheduling packages are often surprised and disappointed when they make a switch to **PC-based mail-enabled scheduling packages**, which operate on a much slower store-and-forward basis. A couple of new products can help, but some companies are rethinking whether the concept of using E-mail as the foundation for scheduling makes sense. *Page 47* The huge **volume increases in messaging traffic** caused by mail-enabled applications are also causing PC servers to hit the wall. At **BellSouth Telecommunications** in Birmingham, Ala., for example, performance erodes substantially with more than a couple of hundred users per server. *Page 55*

Salomon's Robert Cunliffe says the brokerage will be down to one mainframe by 1994. See story page 14.

The EDI bandwagon is getting crowded. Lawn and turf products supplier, **Toro**, has launched a major revamp of its EDI system to provide faster response and better service to retail customers. *Page 55* Other companies are going even further and banding together in **collaborative EDI networks** that include customers, suppliers and competitors. *Page 81* At this point, there are so many **EDI support groups** and organizations that it's hard to figure out where to turn first. Tip: Start by finding a local user group to collect recommendations. *Page 85*

Reflections on Comdex: This show is a great place to check the vital signs of the industry and, according to **Charles Babcock** and **Paul Gillin**, there were some troubling symptoms on display. Babcock says the event reflected an industry in turmoil, where nothing is quite what it seems. *Page 6* Gillin worries that the fantasy isn't just show and that vendors really are oblivious to the real-world concerns of customers. *Page 37*

Latest victims of computer-driven job obsolescence: Crash car dummies may be out of work soon if General Motors and Los Alamos National Labs go ahead with proposed research on crash simulation. *Page 68*

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■ **Novell** to bring NetWare **multimedia service** to Windows users. *Page 4*

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■ Would you allow competitors on your network? You may have to. *Page 81*

■ **EDI** isn't that hard, if you know where to get information. *Page 85*

THE CW GUIDE TO MAINFRAMES

Joseph Vincent

■ You *can* squeeze better performance out of that old mainframe. Joe Vincent at Humana says that with current tools, 100% CPU-busy is achievable. **Buyers' Scorecard:** Users say Landmark Systems' MVS performance monitor is tops. **Firing Line:** The Unisys 2200/500 offers high performance/low environmental cost. *Page 93 to 109*

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■ **Beta testing:** the good, bad and the downright ugly. *Page 111*

COMING NEXT WEEK

IN THE DEC. 6 ISSUE, LOOK FOR OUR SPECIAL SECTION ON "THE STATE OF OPEN SYSTEMS '93," FEATURING AN EXCLUSIVE LOOK AT RESULTS FROM X/OPEN'S LATEST WORLDWIDE SURVEY.

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■ You'll rise faster with command of both **old and new** development tools. *Page 122*

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■ **IBM** has a good shot at a comeback, writes **Bill Laberis**, but old habits will be hard to break. *Page 32*

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Sun makes its Next move

Licenses NextStep, makes $10 million investment

By Melinda-Carol Ballou and James Daly

SunSoft, Inc. and Next Computer, Inc. last week moved to unite their object technologies, throwing down a challenge to Taligent, Inc. and Microsoft Corp., which are developing their own environments.

Under the terms of the deal, SunSoft will license Next's NextStep object application environment and incorporate portions of it into Solaris, Sun's Unix derivative. However, Sun officials said they will maintain compatibility with existing Solaris applications.

Also, Sun is investing $10 million in Next, which will give the Redwood City, Calif., company much-needed cash, analysts said.

Next will license Sun's object and distributed computing technology including Network File System, Sun's Object Management Group (OMG)-compliant object broker and Sun's interface definition language. Next will also port NextStep to the SPARC architecture.

Some industry analysts questioned the impact of Sun's move on the Common Open Software Environment initiative (COSE). Sun officials intimated that COSE's Common Development Environment would ultimately comply with OpenStep. In order for this to happen, however, Sun must get key COSE members to sign on, which is not a foregone conclusion, analysts said.

The Sun/Next alliance is expected to speed time to market for an object-based version of Solaris by two or three years, SunSoft officials said. Although the partners did not announce ship dates, SunSoft President Ed Zander claimed they would get "off the ground" with their offering well before the middle of 1995 to coincide with the appearance of both Taligent's and Microsoft's object environments.

License requirements

Next will make NextStep available for licensing to anyone able to prove compliance with a specification that Next will make generally available by the end of June 1994. Dubbed OpenStep, the spec will include the application programming interfaces for NextStep and portions of the technology that are not specific to the Mach operating system kernel, such as the object framework and user environment now shipping with NextStep Release 3.2.

SunSoft last June released an early developer's version of its Distributed Object Environment that includes low-level object services, an object broker compliant with the OMG's Common Object Request Broker Architecture and an interface definition language. The addition of NextStep's development environment will enable the Mountain View, Calif., developer to market a complete commercial offering, industry analysts said.

Next's Steve Jobs *(left) and* **Sun's Scott McNealy** *are objects of each other's desire*

"Developing object-based technology to create applications quickly is not something to be taken lightly — what Next has done is nontrivial. Sun could not reinvent it," said Rikki Kirzner, an analyst at Dataquest, Inc. in San Jose, Calif.

Some developers looked favorably on the announcement, saying they like NextStep but have been concerned about its longevity and broad appeal. "We've been interested in developing to Next for a while, but there simply wasn't the market to justify it. Now we'll plan to move ahead," said David Knight, vice president of marketing at Isocor Corp.

Not quick to sign

Some Sun users reacted favorably but said they are waiting for definitive product announcements before they sign on.

"NextStep is a very powerful object-oriented development environment, and this is welcomed news," said one source in information systems operations at a major Wall Street brokerage house. "But we don't know what the details are, and we'll have to see — they're going to use Objective *C*, which means additional training for which we'd have to budget."

But some industry analysts questioned SunSoft's strategy of bundling its object environment with Solaris.

"There is a fundamental flaw when the user has to choose a particular operating system to adopt the product," said John Rymer, an analyst at Patricia Seybold Office Computing Group in Cambridge, Mass. "Others such as Taligent are packaging their technology so that it targets multiple operating systems and not just one. Some users may look at this and say, 'If I have to choose between NT and Solaris, I'll say thanks but no thanks.'"

Multimedia

Novell to add digitized video to NetWare

By Elisabeth Horwitt

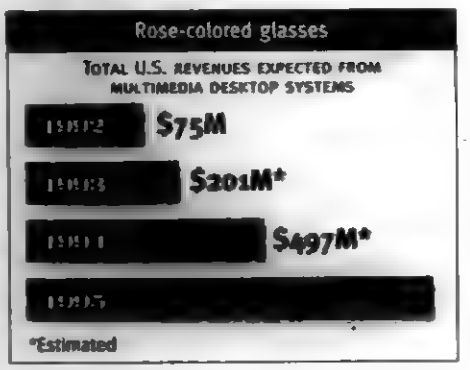
Novell, Inc.'s Multimedia division is expected this week to begin shipping software that will allow Microsoft Corp. Video for Windows users to download live multimedia presentations from a NetWare server. The alternative is to stuff local PC hard drives with digitized video files that take up about 10M bytes per minute, according to a spokesman for Novell's Natick, Mass.-based division.

Novell Multimedia, formerly Fluent, Inc., will ship NetWare Video 1.0, software that turns NetWare into a full-motion audio/visual server for Windows clients, said Paul Armstrong, a product line manager at the firm.

The product does not support videoconferencing since it does not provide a way for audio/visual material to be delivered in real time over an internetwork backbone, Armstrong said. However, it will enable a NetWare server to store multimedia material in a file and send it to a remote server, which can deliver the material in real time to local PCs.

NetWare Video can take any file built using Microsoft's AudioVisual Interleaf format and "play it directly to a client" over a LAN, Armstrong said. NetWare Video 1.0 is said to support rates of up to 30 frame/sec., the speed used for television video.

The software can lower the rate of transmission according to traffic loads on the LAN and the frame speeds a client PC can handle, Armstrong said. A 386-based 50-MHz PC can handle 15 frame/sec., while an Intel Corp. Pentium box can handle the upper limit.



However, users are likely to be more concerned about clogging up their server disks than overloading the LAN medium, which is getting faster all the time with Fast Ethernet and FDDI, said Glenn Fund, president of the Boston Area Novell Users Group and network administrator at a large Northeast defense electronics contractor. "Full-motion video takes up a lot of [disk] space; we have enough problems [ensuring server capacity] for regular DOS and Windows applications."

NetWare Video works with the multimedia editing, generating and embedding tools that come with Video for Windows, such as Object Linking and Embedding (OLE) 2.0, Armstrong said. Users can use OLE 2.0 to integrate video clips with an application, such as a spreadsheet, or electronic mail. "So you could send out [an E-mail] notice to your sales force, 'Here's a new product, [a video of] what it looks like and Joe Schmo saying 'Go out and sell it.'"

Upcoming versions of NetWare Video will support other client environments. A likely candidate is Apple Computer, Inc.'s Quicktime. At this time there is no equivalent multimedia user interface standard for Unix, Armstrong said.

Video 1.0 will be available in five-, 10- and 25-user packages, priced from $100 to $200 per seat. The product will run as a NetWare Loadable Module on either NetWare v3.11 or 4.01.

On the tube

Third parties will tomorrow announce support of NetWare Video, Novell's multimedia service for Windows, including the following:

- **Intel, whose Indio software compresses video, digitizes it on hardware and decompresses it in software to be presented on a regular PC. Video 1.0 will support other leading compression formats as well, said Paul Armstrong, product line manager at Novell Multimedia.**
- **Synoptics Systems, Inc. and other hub vendors will provide links between servers and PCs.**
- **Compaq Computer Corp. will provide a hardware platform for the server.**
- **Lotus Development Corp. will provide Notes multimedia support for NetWare Video, enabling users to incorporate multimedia presentations into Notes workgroup transmissions to be routed around the office. —*Elisabeth Horwitt***

Correction

Due to a writing error, an Inside Lines item in the Nov. 22 issue misstated Hewlett-Packard Co.'s computer fiscal 1993 revenue. It is $15.5 billion.

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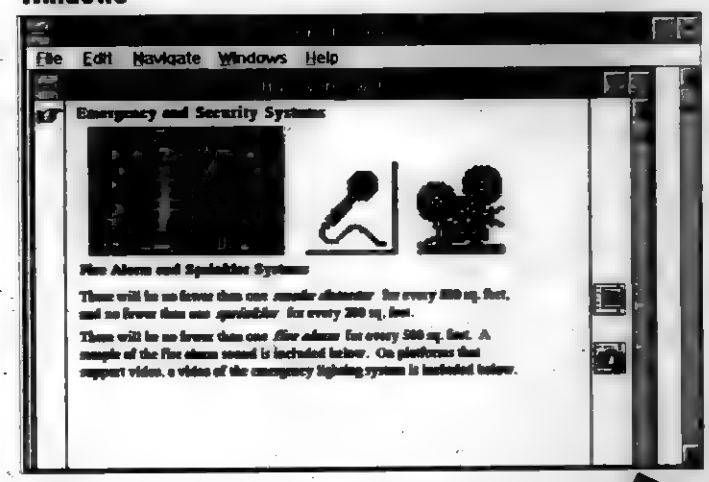
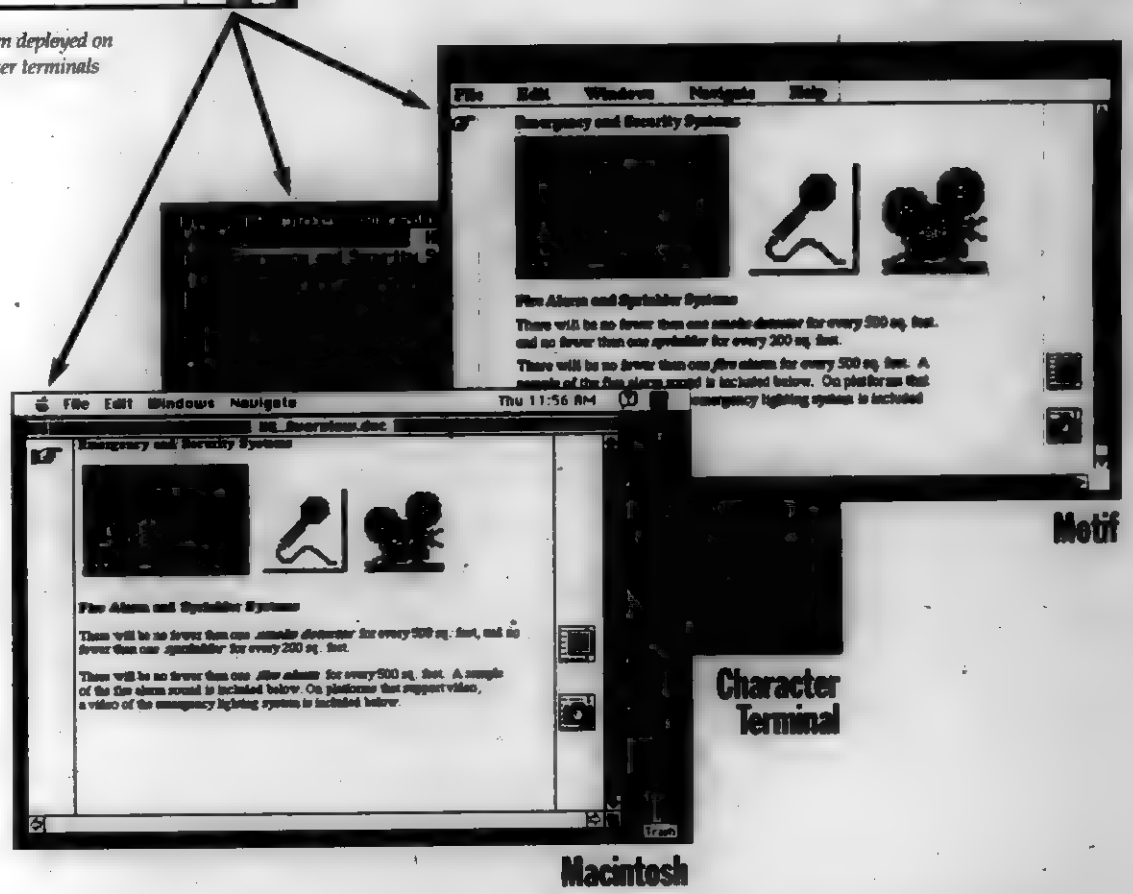
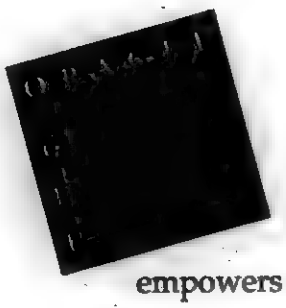


This application was designed in Windows, then deployed on Windows, Motif, Macintosh, and even Character terminals without any programming.

"CDE's portability has been a great advantage to us, having developed the original system on UNIX we were able to port with no additional code to Microsoft Windows. It also allows us to offer the system to a much wider user base than if it had been available for only one of these environments."

Chris Nicholls
Manager IS Dev.
British Telecom, UK





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An industry turned topsy-turvy

Apple showed the Macintosh running Windows applications, but that was not the only thing that seemed inside out at this year's Comdex.

Sun showed users on SPARCstations how to move data from Windows into a Unix program.

IBM stole a march on Apple and seized the mantle of enhancing the user interface. The company said it will make computers accessible through voice, touch, pen, gestures and probably beseechful prayer, although it neglected to include the latter on its laundry list.

Gallagher, the comedian, showed everybody how to laugh at IBM's expense. That is, straitlaced IBM paid him to make fun of the company. His off-color jokes, he said, were "just another shade of blue."

If the world seemed upside down in Las Vegas, it's just another sign of an industry in deep ferment. Old enemies showed up as allies, while old friends eyed each other suspiciously.

IBM and Apple, for example, showed PowerPC prototypes speeding through applications, lending credibility to the RISC architecture as a competitor to Pentium.

Comdex confirmed what we'd all begun to suspect: The industry is in deep ferment, and all the old direction markers are gone.

Charles Babcock

Many observers think Intel and Microsoft march in lockstep as they garner the profits of the desktop revolution. Indeed, they were arm in arm Monday as they urged board makers to follow "plug-and-play" standards at the Sahara Hotel. But Microsoft spokesman Carl Stork had hardly left the room before Pentium marketing manager Curt Nichols said, in response to a question, that the portability of Windows NT was not to be taken too seriously. Sure it could run on non-Intel platforms, but Windows NT "is not in the mainstream" like DOS or Windows, so its appearance on other platforms wasn't going to undermine Intel.

Underneath the surface tension, deeper currents were at work. For one thing, there were few open system evangelists in evidence, and there was little need for them. What manufacturers are coming up with today is often more open than their predecessor products. IBM spokesmen, for example, said PowerPCs will be available in mid-1994 to run Windows, AIX, Solaris, Taligent, the version of OS/2 known as Workplace/OS, and Windows NT. New Macintoshes based on the PowerPC will run all existing Mac software and at the same time they will be able to run Windows applications under Insignia Software's emulation program.

Nichols explained to his Sahara listeners that smart people wouldn't want to do that. Running an application in emulation was like reading a French novel and "translating it word-for-word from a French dictionary." But the Windows applications I saw running on a Mac PowerPC looked like they had thrown the dictionary away. They ran at 386, perhaps 486, speed.

In Comdex technical sessions there was a growing awareness of cross-platform development environments, one-time development of an application for multiple graphical user interfaces and gateways to multiple SQL databases. Technology with the portability built in, such as Windows NT and the PowerPC, will automatically swing the door to open systems a little wider.

At the same time, the scramble to be where the growth is has led to slippery alliances and topsy-turvy arrangements. At times, what used to be up was down and what used to be hot was suddenly cool.

When asked about the operating temperatures of future Pentium chips, the redoubtable Mr. Nichols didn't hesitate: "There is no problem with heat dissipation whatsoever. The Pentium processor actually runs cooler than the 1486." It runs cooler, that is, if you package it in an Intel-approved manner. Ah, could we have the specs on that fan, Mr. Nichols?

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Digital, Lotus talk groupware pact

By Craig Stedman

Digital Equipment Corp. and Lotus Development Corp. are negotiating an agreement that will have Lotus develop Alpha AXP versions of its Notes groupware software for Digital to resell. The two companies are also looking at integrating Notes with Digital's LinkWorks application framework software.

Howard Dresner, a program director at Gartner Group, Inc., a consulting firm in Stamford, Conn., said the Notes support could give Digital a fulcrum to use in selling both Alpha systems and LinkWorks. Meanwhile, Lotus would get access to the large All-In-1 installed base through Digital's own sales force.

"Lotus really wants to get Digital as a channel" for Notes, Dresner said. He expects an agreement in the first quarter of 1994 and expects Notes for Alpha shipments late next year.

Dilip Phadke, LinkWorks group marketing manager at Digital, confirmed that the companies are in negotiations and said a first-quarter announcement "is possible."

Phadke said Digital and Lotus "are still evaluating what we can deliver in what time frames." He noted that some capabilities for supporting Notes under LinkWorks might be available by next summer.

Dresner said he expects Lotus to agree only to "rudimentary" integration of the two products, such as supporting LinkWorks as an alternate repository for Notes objects. "Lotus doesn't want to do anything to screw up its Notes business, nor do they want to play favorites," he said.

Lotus declined to comment.

Integrating groupware

While Notes and LinkWorks are both put in the groupware category, Digital is positioning LinkWorks as a tool for integrating various applications across workgroups. "If you really look at the products and their target markets, they're not the same thing," Phadke said.

Conrad Wiser, manager of Martin Marietta Corp.'s data center in King of Prussia, Pa., agreed Notes and LinkWorks are more complementary than competitive. He said an Alpha AXP version of Notes would catch his attention. "We'd look at it right up front, absolutely."

Integrating Notes and LinkWorks would make for an even more interesting product offering, he added. "We're very concerned about [application] integration. That's one of the most difficult things in software development."

Ambra to flex notebook muscle

By Stephen P. Klett Jr.

Ambra Computer Corp. today will unveil two low-end notebook lines designed to take on Gateway 2000, Inc., Toshiba American Information Systems, Inc. and — to a degree — parent company IBM.

The Subnotebook (SN) and Notebook (N) series are based on Intel Corp. 1486 microprocessors and cost from $1,399 to $3,999. The series have battery lives of two and 2½ hours, respectively, Ambra said, and are slated to ship next week.

Analysts said Ambra's price points and features were in line with Toshiba's recent introductions [CW, Nov. 8], but some were skeptical of its ability to deliver the machines in volume.

Tastes great, less filling

Ambra's notebooks offer a wide range of performance choices at aggressive price points

	SN series, 425C	N series, 430T
CPU	25-MHz 486SX-SL	50-MHz 486DX2
Memory	4 MB	8 MB
Hard disk	170-MB removable	340-MB
Expansion	Option, type I slot	
Color screen	7.8-in. passive-matrix	9.5-in. active-matrix
Weight	6 lbs.	
Dimensions	11- by 7- by 1.9-in.	11- by 8.6- by 2-in.
Price	$1,399	$3,999

"On paper, [the notebooks] are very attractive and aggressively priced," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "But the problem for Ambra has been supply," he said. "The big question remains of whether they can deliver — in quantity — on the date they say they will."

Initial troubles

Ambra's first notebook offering — the NC425 — faced backlog troubles right out of the gate [CW, Aug. 30]. The Raleigh, N.C., company made adjustments to avoid further backlogs, including more optimistic forecasting and signing a new manufacturer, which Rich Ritzema, product manager at Ambra, declined to name.

Also, by offering passive-matrix versions of the high-end N series, Ambra hopes to avoid backlogs associated with the high demand for active-matrix technology.

Ritzema said Ambra is targeting Gateway and Toshiba, but it could win some IBM customers fed up with waiting for IBM's ThinkPad 500.

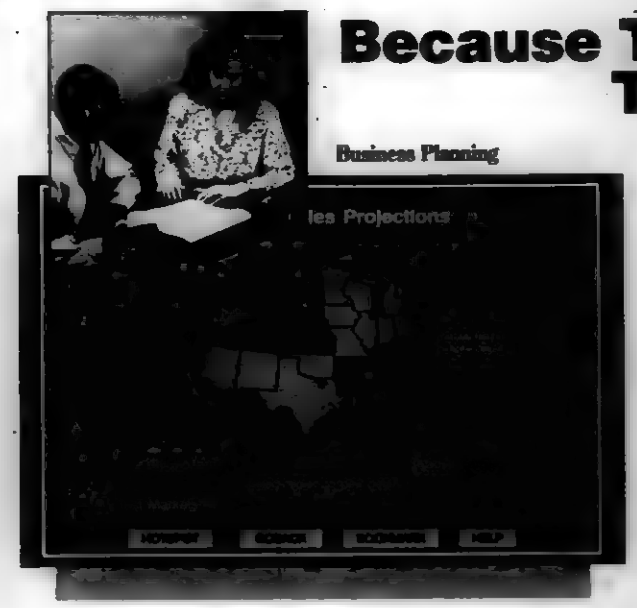
While Ambra has a price/performance advantage over Gateway, analysts said Ambra may face a tough uphill climb against Toshiba, which they said holds the upper hand because it does most of its own manufacturing while Ambra relies 100% on OEMs.

While users said they were impressed with the products' features, some were wary about moving to the Ambra brand name.

"The new lines sound good, but they strike me as being the absolute low end for IBM so I probably won't look at them," said William I. Lodge, project manager at The Turner Corp. in New York.

Other users said they may look at the machines.

"Ambra has as much credibility as any other brand and being part of IBM rather than some other third-tier vendor certainly helps them," said Donna O'Driscoll, assistant vice president of corporate information systems at New York Life Insurance Co. in New York.



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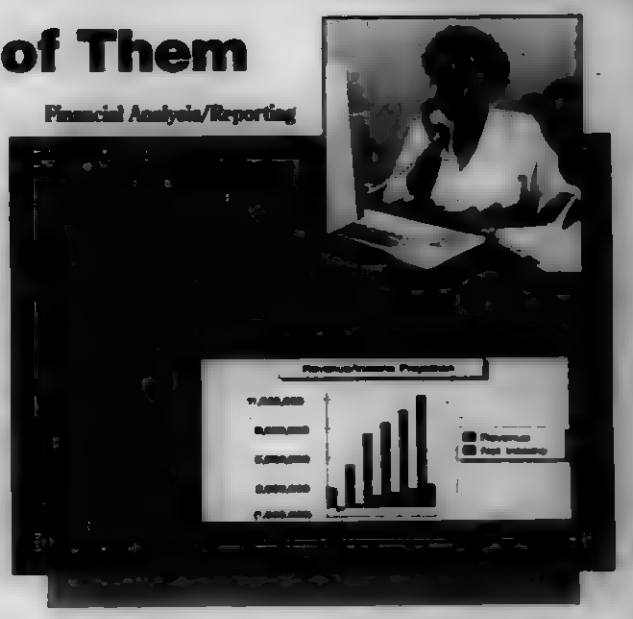

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News Shorts

NCR unwraps voluntary leave program

Following its announcement last month that it will trim its worldwide work force of 54,000 employees by 12% to 15%, **NCR Corp.** last week unveiled a voluntary separation program for 25,000 employees in the U.S. Officials at the Dayton, Ohio, computer arm of **AT&T** have not yet estimated the charges for the program, which will begin in the first quarter of 1994.

Health providers urged to go with X12

A health care industry task force, filling in many of the technodetails missing from the Clinton administration's health care reform legislation, last week called for large insurers, medical groups and employers to implement ANSI X12-based electronic billing and payment networks by the end of 1994. The **Workgroup for Electronic Data Interchange** said basic X12 standards are in place for electronic medical claims, and it will publish implementation manuals by mid-1994 for doctors, hospitals, payors and electronic data interchange vendors. It remains to be seen whether the industry can meet the aggressive deadline.

Developer arrested for installing virus

The president of a small New York software developer firm was arrested last week for computer tampering. He allegedly had one of his technicians install a Trojan horse computer virus into one of his client's systems to ensure that the customer would pay for overdue licensing fees. Michael Lofaro, 29, president of **MJL Design**, and John Puzzo, 22, an MJL technician, were both charged with first-degree computer tampering, a felony charge that carries a maximum sentence of four to seven years' imprisonment.

Suit against Apple is thrown out

A California state court has thrown out a wrongful-dismissal lawsuit filed against **Apple Computer, Inc.** by former Executive Vice President Albert A. Eisenstat. The 63-year-old Eisenstat alleged that he was forced from his post at Apple earlier this year because of age discrimination. The state Superior Court in San Jose, Calif., said a mediator found the allegations unsupported by the facts and dismissed the charges "with prejudice," meaning they cannot be refiled. Apple and Eisenstat were unavailable for comment.

SynOptics switch gains WAN links

SynOptics Communications, Inc. said it will today announce wide-area interfaces for its LattisCell Asynchronous Transfer Mode (ATM) switch, which began shipping in August. Today a workgroup switch, the LattisCell will gain direct interfaces to T3 (45M bit/sec.) and Synchronous Optical Network (Sonet) networks, said John Jaeger, product line manager. SynOptics also announced ATM adapter cards for **Sun Microsystems, Inc.** Sbus computers. A fiber card is $1,795, and an unshielded twisted pair connection will cost less than $1,300, Jaeger said.

SHORT TAKES Geoff Squire, head of New Business Opportunities at **Oracle Corp.**, stepped down last week, a month after Oracle moved Squire to a less visible position than his former post as chief executive officer of International Operations. . . . Richard Hackborn, **Hewlett-Packard Co.**'s executive vice president and head of its Computer Products Organization, will retire, effective tomorrow. Richard Belluzzo, who was executive vice president and general manager of the Hardcopy Products Group, will take over but will continue to oversee HP's printer business in addition to Computer Products' PCs and PC LANs.

More news shorts, *page 16*

Cisco 9.2 upgrade may cost

By Joanie M. Wexler

■ With the next release of Cisco Systems, Inc.'s router software looming on the horizon, the day is quickly approaching when some veteran customers will have to decide whether to invest millions in new router hardware.

Cisco's Release 9.2 is expected to ship early next year bearing key features that allow networks to scale up in size, according to beta customers and others familiar with the 9.2 blueprint. These include faster routing table updates, more sophisticated IP address management capabilities and enhanced tunneling and X.25 encapsulation techniques.

However, 9.2's code size is "so big, it won't run on the bulk of Cisco's installed base," said one 9.2 beta customer, who requested anonymity. The user, who runs a medium-size Cisco network, said he is looking at a $5 million upgrade in either memory or new routers so he can take advantage of 9.2.

Another 9.2 beta customer said he has not seen this degree of hardware strain, but noted that his test version does not include Enhanced IGRP, the faster version of Cisco's routing table update algorithm expected in 9.2. The user, who also asked not to be identified, did say that Cisco "will eventually run into a problem with the old processors." The hardware platform "seems to have a 2M-byte limit" on the size of the code.

This is an issue "most Cisco users will face in the next 12 months," said Val Sribar, program director at Meta Group, Inc., a consultancy in Stamford, Conn.

Sribar said while the horsepower problem tends to surface across many vendor product lines today because of rapidly changing technology, Cisco's continued sales of its former high-end AGS+ router after the introduction of its 7000 platform last January [CW, Jan. 18] has continued to widen the migratory chasm.

Cisco, however, said it does not plan to force users off of old platforms in favor of the 7000 and other compatible 7000 family members rumored to be in the works at the high end, midrange and low end.

"Most users are positioned to grow," said Senior Vice President John Chambers. Most AGS+ routers sold in the past 18 months shipped with the required memory upgrade, he explained.

Pluses and minuses

The 7000 brought users some of the increased capacity, redundancy and hot-swappability features for which they had been clamoring. On the flip side, the new model did not represent a quantum architectural leap in performance, limiting its future-proofing appeal, and introduced a new form factor for interface cards that rendered older routers' cards incompatible with the newer platform.

These changes and the memory factor could open a door to vendors looking to penetrate Cisco's installed base of about 125,000 devices, since some users, when faced with expensive upgrades, will be more likely to reevaluate other vendors.

"The fact that it is such a substantial investment to upgrade means we'd stop and take another look at the marketplace," said Greg Hardison, telecommunications supervisor at McDermott, Inc., a Cisco shop in New Orleans.

Ron Cramer, a systems programmer at Cargill, Inc. in Minneapolis, indicated he might not be motivated to upgrade at all because of the expense and the labor involved in changing his widely distributed network.

"I'd have to be sure of the advantages of the new code first," he said.

NETWORKING

What's new

While Cisco would not comment last week on the alleged resource-hogging 9.2, industry observers said it will include the following:

- **Enhanced IGRP.** A faster version of Cisco's proprietary IGRP routing algorithm will minimize delays that would otherwise multiply out of control across expanding networks. Cisco said last May it would support Enhanced IGRP by mid-1994, though observers expect it earlier in the year with 9.2.
- **IP mapping.** For companies with unique IP addressing schemes, 9.2 will reportedly translate them to standard IP addresses for communicating over wide-area networks with other IP users.
- **Enhanced tunneling.** Expected to allow the encapsulation of any protocol within IP all the way through a logical network.

Informix resets DBMS

By Kim S. Nash

Informix Software, Inc. last week unveiled a rebuilt version of its OnLine database to run on symmetrical multiprocessing machines and, eventually, massively parallel processing (MPP) machines.

As expected, Informix detailed features and release schedules for multiprocessing support, dubbed Dynamic Scalable Architecture (DSA) [CW, Nov. 15]. Sequent Computer Systems, Inc. co-built the DSA with Informix and will be the sole hardware provider of the technology for six months after it ships.

DSA will be rolled out in the following phases:

- ▶ OnLine 6.0, which ships Dec. 20, will have some parallel functions such as indexing and sorting.
- ▶ OnLine 7.0, due out early next year, is expected to contain full parallel processing support, such as the ability to split and answer user queries across several CPUs. Support for loosely coupled machines is also expected.
- ▶ OnLine 8.0, due out in 1995, will take Informix to MPP machines, such as those from Kendall Square Research Corp. or NCR Corp.

A key piece of DSA is built-in on-line backup and recovery in a multiprocessing environment, part of which lets users copy and restore selected parts of a database table, rather than an entire table. That approach could save time for users with multigigabyte databases, said Chris Le Tocq, senior analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif.

Informix claimed that because OnLine 6.0 sports a new 32-bit, multithreaded structure, users will have less trouble migrating to and administering the product than they might with other multiprocessing databases. By contrast, Oracle Corp.'s multiprocessing features are add-ons to a uniprocessor product and rely partly on the multithreaded functions embedded in hardware and Unix and other operating systems.

No big change for users

However, such differences should not affect users or database administrators much, analysts said.

Symmetrical multiprocessing machines and MPP platforms are an option for users who want to move several-gigabyte applications off of mainframes. But migrations have been scant, partly because relational database makers could not provide enterprise-strength products for that hardware, analysts said. Now, with announcements from Informix, Sybase, Inc. and Oracle, symmetrical multiprocessing machines and MPP "could be the platform for high-caliber client/server," according to Herb Edelstein, analyst at Euclid Associates in Potomac, Md.

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MAPI

CONTINUED FROM PAGE 1

faces and have them work across multiple back-end services, including popular LAN and host-based systems. The disadvantage is it limits users to Windows-based client applications.

"In the long term, a Windows-only messaging solution might work for us, but in the short term, Windows is not that dominant [here]. People outside of our headquarters still have DOS-based machines," said Brian Moura, an assistant city manager for the city of San Carlos, Calif.

Microsoft plans to wrap MAPI 1.0 into the upcoming Chicago version of Windows and the upcoming Cairo version of Windows NT, according to MAPI product manager Chris Williams. Also, the MAPI kit will allow developers to add the extended MAPI capabilities to current Windows and NT versions.

More messaging options

MAPI 1.0 includes object-oriented APIs for front-end clients and back-end services, and a messaging middle layer that includes limited transport, message store and address book functions. Previously, Microsoft made available only a "simple" set of MAPI client APIs that required developers to use Microsoft Mail for messaging services.

Of course, Microsoft will offer MAPI 1.0-compliant front- and back-end products. It will ship an electronic-mail client, code-named Capone, free with Chicago in the second quarter of 1994. Separately and also in the second quarter, it will offer its NT-based Enterprise Messaging server for transport and directory services, Williams said.

However, plenty of other vendors have committed to adapting their products to plug into extended MAPI:

- **Isocor Corp.** is working closely with Microsoft to provide back-end services that would allow MAPI-based electronic data interchange clients to access global X.400-based networks.
- **AT&T and CompuServe, Inc.** said their messaging services will natively support MAPI clients.
- A **WordPerfect Corp.** official said the company plans to enable its Office messaging suite to act as a MAPI service provider.
- **Lotus Development Corp.** said its upcoming Lotus Communications Server will be a MAPI service provider.
- **Beyond, Inc.** said it will develop its BeyondMail software as a MAPI client.

Star Enterprise, a Houston-based petroleum refining company and a dedicated Windows shop, uses simple MAPI to distribute database reports using Microsoft Mail.

"If outside products are already mail-enabled using extended MAPI, that's great because it prevents us from having to modify them to do it," said systems analyst Michael Harrison.

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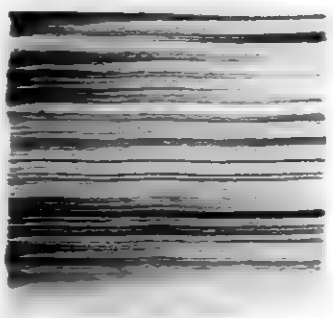

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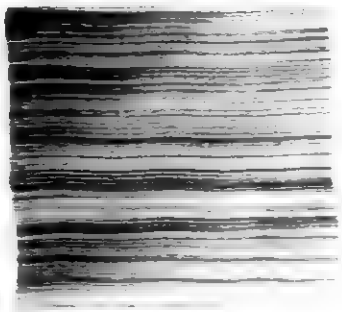

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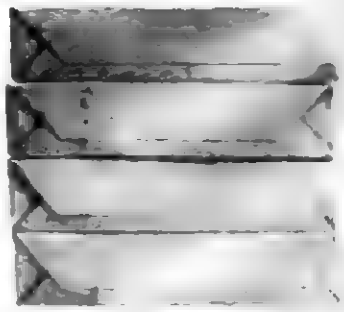

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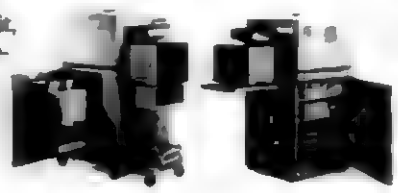

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Uneven match

Playing Microsoft's extended MAPI against the Lotus-driven Vendor Independent Messaging (VIM) specification is not a comparison of equals, analysts and officials at both companies said.

That is because VIM does not provide a back-end API or service-provider interface for linking non-Lotus transport and directory services to VIM clients.

Although VIM is widely used by third-party developers interested in accessing the large CC:Mail and Notes markets, it is not the standard API Lotus intended it to be.

"We told the press we would write to VIM but backed away" because VIM does not offer the service provider interface and because Lotus' VIM support seems somewhat halfhearted, a source at WordPerfect said.

Lotus is making good on earlier promises to support MAPI. It is getting ready to deliver by year's end two pieces of software based on Windows Dynamic Link Libraries that will translate MAPI commands to VIM commands and vice versa, according to a VIM product manager. — *Lynda Radosevich*

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OS/2 development

OS shifts draw developers' ire

By Ed Scannell

Recent adjustments to IBM's Personal Software Products group's delivery plans for its Workplace OS variants is causing some OS/2 developers to push back their own development schedules.

At the recent Comdex/Fall '93 show, IBM officials said OS/2 on Intel Corp.-based platforms and AIX on RISC-based platforms should enjoy long lives and that Workplace OS would not replace them any time soon.

Conversely, some developers said they thought Workplace OS, a portable version of OS/2 based on IBM's microkernel technology, would play a more strategic role sooner.

The message "tells us we should give it less priority because they can't give us any hard and fast plan to write to," said one long-committed OS/2 developer, who requested anonymity.

"We sense Workplace's functionality is getting pushed out further in the cycle, and that was not our understanding a couple of months ago," said another OS/2 developer. "Maybe they think [Windows] NT is becoming a non-issue and they can hold on with AIX. But that might be a risky strategy."

Company line

In response, IBM officials last week said what they have said before: Any and all technical investment in OS/2 and AIX can be carried forward to Workplace OS.

If developers write 32-bit OS/2-compatible applications and gradually integrate technologies from the OpenDoc consortium, such as IBM's Systems Object Model, their migration to Workplace OS should be smooth, a spokesman said.

Personal Software Products wants to get Workplace OS up and running on Intel first to create a stable environment on which to port its RISC-based PowerPC-based systems, which are due by the middle of next year, according to developers familiar with IBM's plans. The latter platform is where they hope to make the most market impact.

"While it will be up and running on Intel first, they want to productize on PowerPC first," another developer said.

Personal Software Products is scheduled to hold a two-day briefing for developers this week in Boca Raton, Fla., on a "Workplace OS Release 1.0 functional update," according to a letter sent to some developers. The company is also expected to lay out specific plans for what versions it will roll out and when.

IBM officials two weeks ago said they would first deliver Workplace OS with a Unix personality, or look and feel, for the Intel platform; it should enter beta testing either next month or early next year.

Next, IBM will deliver a beta version of Workplace OS with an OS/2 personality for its RISC-based PowerPC-based PCs, probably in the first half of next year.

Unix on OS/2

Later in 1994, the company will produce a version with a Unix personality on top of OS/2 for the PowerPC and then a version of OS/2 for Intel systems with an AIX personality layered on top.

Earlier this year, company officials indicated Workplace OS would reside both on servers and clients.

More recently, however, James Cannavino, IBM's senior vice president of strategy and development, said the operating system would likely debut on the upcoming PowerPC-based desktop systems delivered by IBM's Power Personal Systems division. Those systems are due about the middle of next year.

IBM pumps client/server

CONTINUED FROM PAGE 1

Although IBM spokesmen refused to comment on the forthcoming products, details were available from sources close to IBM.

IBM's starter kits will be introduced in the first quarter of next year and will feature hardware and software from IBM and other vendors to handle tasks such as systems management, decision support and distributed databases, according to sources close to the company.

"As customers move to client/server, they will know that this particular set of products works together, and they won't have to do their own testing from scratch," said one source familiar with the plan.

Place to start

About four or five such starter kits are planned; the testing and integration work is being done in a laboratory in Endicott, N.Y., under the auspices of the Client/Server Computing Unit. These kits will then be offered worldwide to IBM's open systems centers, which provide service and support to IBM sales offices, as well as to customers themselves.

The blueprint will break out how IBM will tie together various pieces of client/server technology from multiple vendors based on open standards such as the Open Software Foundation's Distributed Computing Environment (DCE). Consultants who have seen it compare ODCS to a "Chinese menu" approach. For example, any computer that supports DCE can play within the IBM scheme of things.

Within ODCS, IBM will detail what it will support in the areas of systems management, database management and application development, among others. Objects and multimedia standards reportedly play big roles across the lines.

The blueprint is "definitely not IBM-centric," said Peter Schay, a Gartner Group, Inc. vice president who was briefed by IBM. In that way, it is unlike Systems Application Architecture (SAA), which IBM unveiled in 1987 as a means of tying together its disparate product lines.

"This does not smell, feel or look like SAA," said Frank Dzubeck, president of Communications Network Architects, Inc. in Washington. "IBM got its head screwed on right this time."

IBM is downplaying ODCS — under development for at least two years — because of the negative feedback it received from its failure to fulfill all the promises made in SAA. This time around, sources said, the blueprint will be announced when there are new versions of products — including a package that backs up LANs on a mainframe — that support the blueprint.

Dual role

Another reason IBM is not making a big deal about ODCS is that architecture is not all that important in today's world.

"I'm more interested in what's delivered rather than what's talked about in theory," said Tom Loane, vice president at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla. "I get less inspired with strategy because the world is changing so fast."

Nevertheless, ODCS is expected to fill a dual role: to help internal IBM developers know which standards are important to their customers and to help customers understand where IBM is heading with client/server in the next three to five years.

"Strategy is important to us because we view the acquisition of technology to be a long-term investment," said Robert Lukas, assistant vice president at ITT/Hartford in Hartford, Conn.

"Unfortunately," Lukas added, "you can't always be assured that the strategy is long term."

Big Blue print

Standards that IBM will support in its open blueprint include:

- X.500.
- Message Queue Interface.
- Common Open Software Environment.
- The Open Software Foundation's DCE and Distributed Management Environment.
- X/Open portability guides and database architecture.
- Transaction processing environments ranging from IBM's CICS to Transarc's Encina.
- The Object Management Group's Corba as well as IBM's Distributed Systems Object Model.

Getting started

Hardware and software such as the "starter kits" coming early next year are only two elements in IBM's plan to attack the client/server market. Rounding out the mix are consulting, other kinds of services and training that the company has provided to its employees, an IBM executive said.

Peter Tarrant, IBM's director of client/server marketing, outlined the company's strategy during a telephone interview with *Computerworld* last week. He said the company defines client/server as allowing "any end user to get access to any resources they require to do their jobs — anytime, anywhere and in any form." This requires IBM to work with third-party vendors, particularly in the applications arena, to help customers move to client/server.

The company has already provided client/server classes to at least 70% of its customer service representatives as well as to product specialists on the sales force, among others, Tarrant said. In addition, some 50 field service centers — which provide systems integration, network installation, application development and other services to customers for a fee — are being staffed up.

In fact, to ensure adequate numbers of people in the right kinds of skill areas, the number of service centers will probably drop by about 10 or so. That is because of the number of people who have left IBM during the past few years, Tarrant said. The company will need to consolidate service centers to make sure there are enough experts in the needed fields.

"We've changed our skill mix quite a bit," Tarrant said. "We've hired 4,000 people this year" from other vendors, including Hewlett-Packard Co., Digital Equipment Corp. and Andersen Consulting. IBM has also gleaned client/server technical expertise from contracts performed by its Integrated Systems Solutions Corp. outsourcing subsidiary. For example, he said, its outsourcing deal with McDonnell Douglas Corp. "provided a lot of DEC skills, and those people now work for us. We can put them on an engagement helping other people somewhere."

Tarrant claimed that at least 80% of the work these field service centers are doing involves client/server to some degree. — *Johanna Ambrosio*

Enterprise Client/Server: The New Organization

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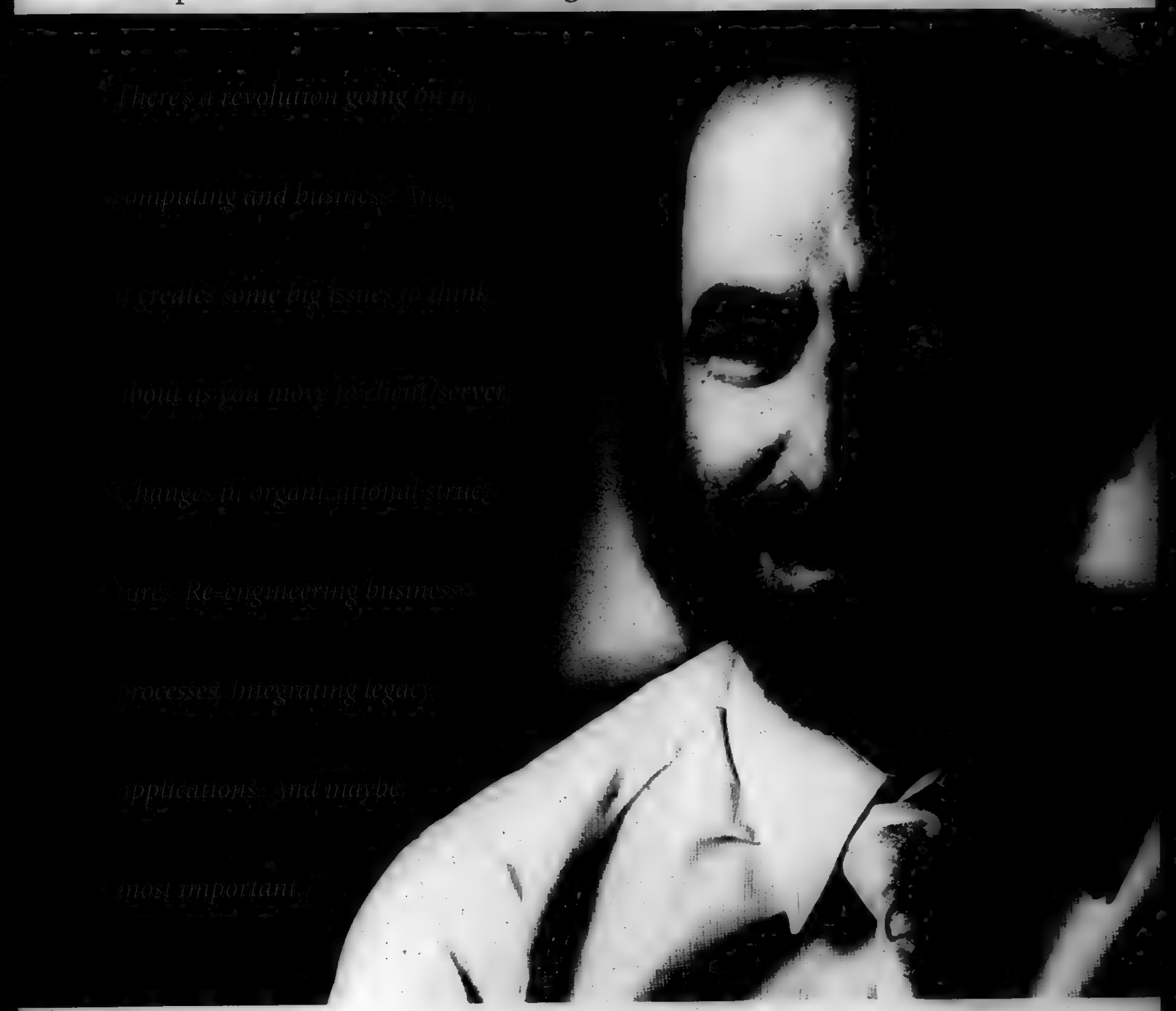

When Bob Epstein, Executive Vice President and a founder of Sybase, talks about computing and business, people listen. After years of developing client/server products and talking with customers, he's seen what works, and what doesn't. Hear what he has to say in a remarkably candid recorded conversation. **For your copy of *"Client/Server And The New Organization,"* call 1-800-SYBASE-1.**

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Wall Street consolidates its assets

By Thomas Hoffman

At the same time as Wall Street is investing hundreds of millions of dollars in its technical infrastructure and making way for new architectures, it has been raking in similar amounts of savings by consolidating data centers and reducing head counts.

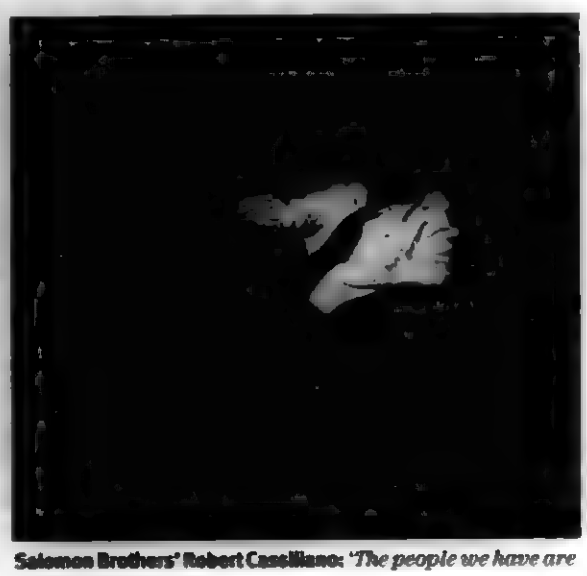
A drastic approach at Merrill Lynch & Co. has resulted in a savings of $100 million — 30% of which was realized by cutting 900 positions — over the course of a just-completed five-year data center consolidation project.

Rival Salomon Brothers, Inc. has been consolidating its big iron in a shift away from host-based processing as part of its move to Unix-based distributed computing. This five-year effort has so far saved "tens of millions of dollars," but it has cost only 9% of the information systems work force its jobs. That is because Salomon retrained most of its employees in Unix.

Reduced by half

Since 1988, the brokerage has consolidated four IBM mainframes into the two that are situated at its Rutherford, N.J., data center, according to Robert J. Cassiliano, senior operating officer responsible for management of the facility.

In the past two years, Salomon has phased out 33 Prime Computer, Inc. minicomputers once used in its London, Tokyo and New York offices for presales modeling and analytics. In addition, two IBM 3090 mainframes and a slew of IBM 4381s used for analysis and processing were scrapped and replaced by more cost-effective Unix workstations.



ALEXOLD SOLOMON

Salomon Brothers' Robert Cassiliano: *'The people we have are our biggest strength'*

Further plans call for phasing out an IBM 3090 600E by year's end and reducing the capacity on its remaining ES/9000 942 machine from 225 MIPS to 165 MIPS by 1996. That effort will be assisted by off-loading front-end development and processing onto Sun Microsystems, Inc. workstations using PC and Windows-based tools.

These efforts have enabled Salomon to cut its mainframe support staff by 115, or about 9% of its 1,300 IS staffers worldwide. So far, 95% of the remaining IS staff has trained on Unix.

People power

"We don't want people leaving because they're not trained on the technology. The people we have are our biggest strength," Cassiliano said.

At Merrill Lynch, data center consolidations have gained fame as the "red dot program." The tag comes from Merrill Lynch Chairman Daniel P. Tully's penchant for placing a red dot on, and ordering the removal of, any piece of equipment that cannot be cost-justified.

Merrill Lynch has consolidated from 14 to two data centers in the past five years, a move completed last April.

However, in the past three years, Merrill Lynch has increased its MIPS capacity by 100%, from 725 MIPS to 1,450 MIPS, according to Howard P. Sorgen, Merrill Lynch's senior vice president and managing director of global information services.

"At one point, we thought maybe we could outsource all of our data centers to IBM. Well, they came back and said they couldn't do it any better than how we're doing it," said Edward Goldberg, executive vice president.

Hot commodity

Among the early adopters of Unix, brokerages say they have benefited from a greater availability of vertical applications, greater system modularity and the ability to downsize. At Salomon Brothers, a foray into Unix has enabled the company to retire more than 35 pieces of big iron — including two IBM mainframes, 33 Prime minicomputers and a handful of IBM 4381s, while adding in more than 3,000 Unix workstations. Salomon spent $250 million developing a two-story, 1,000-seat Unix trading environment that is Sun-based, said Robert J. Cassiliano, senior operating officer responsible for Salomon's Rutherford, N.J., data center.

Brokerages

CONTINUED FROM PAGE 1

and telecommunications at Merrill Lynch, for example, recentralized portions of that company's information systems division to regain cost controls on departmental information technology projects. "I know every dime that's spent in this firm," he said.

"If you want to get a feel for what the pulse of technology is, financial services is where it's at," Grant said.

Take supercomputing. Where else might one find a company that already has three MPP machines installed and is about to take delivery of a fourth? Prudential Securities, Inc. has two 32-processor Intel Corp. i860 machines it uses for mortgage securities, portfolio management and risk management evaluations, as well as an Intel Paragon MPP system deployed to conduct quantitative analyses of mortgage securities. In December it will receive an IBM SP/1 machine to determine arbitrage opportunities for its customers, according to David Audley, director of financial strategies at Prudential.

The MPP machines "allow Prudential to keep up with rapidly changing market conditions while constantly updating complex securities portfolios that they couldn't otherwise do with mainframes," noted David Frankel, director of technology at The Smaby Group, Inc., a Minneapolis-based high-performance computing market research firm.

Although several brokerages, including Morgan Stanley & Co., are still running 4- or 5-year-old Y-MP supercomputers from Cray Research, Inc. to perform in-depth market analyses, other firms such as Fidelity Investments, Inc. are reaping cheaper costs-per-GFLOPS by shifting to MPP machines such as Thinking Machines Corp.'s Connection Machines, NCR Corp.'s 3600 and Teradata Corp.'s DBC/1012 systems, according to Derek Stubbs, a consultant at Advanced Forecasting Technologies, Inc. in Vicksburg, Mich.

That kind of benefit had Fidelity plunking down $3.9 million earlier this month to upgrade and expand its NCR Teradata DBC/1012 MPP-based decision-support systems.

Merrill Lynch's Howard P. Sorgen: *Talking with IBM about ATM*

Because the biggest bucks on Wall Street these days are being made in several emerging markets, including derivatives, portfolio management and risk management, it makes sense that derivatives leaders are among the most avid technology consumers.

For example, Goldman, Sachs & Co., among others, is revolutionizing its trading operations by creating "middle-office" operations. These are functional environments that integrate distributed Unix-based client/server trading floors with mainframe-based back-office operations. This is done using object-oriented programming tools such as Powersoft Corp.'s PowerBuilder, according to Deborah Williams, an analyst at The Tower Group, a Wellesley, Mass., financial services information technology consultancy.

"The ability to run arbitrage schemes and come up with new derivatives products has been almost wholly dependent on a firm's use of technology," Williams said.

But not all advanced technology projects have been successful.

For example, First Boston Corp. spent $200 million on a failed back-office restructuring project based on object-oriented programming, called Newark 2000, in the late 1980s. "It's an example of a company that tried to redo its whole back-office system and bit off more than they could chew," Williams said.

But the First Boston project was not a total flop. In 1990, the brokerage spun off the object-oriented group into Cary, N.C.-based Seer Technologies, Inc., which is now a $35 million software developer.

Brokerages have also led the way in deployment of Unix-based systems (see story above) and in the production use of neural networks and artificial intelligence tools to analyze and forecast derivatives and future prices of stocks, bonds and securities.

Already on board

On the distributed front, most brokerages, including Prudential, Fidelity and Merrill Lynch, are well-entrenched in Unix-based client/server environments. The bulk of these systems are Sun Microsystems, Inc.-based and are used in mutual funds forecasting, according to Stubbs.

Merrill Lynch, at least, is looking at Asynchronous Transfer Mode (ATM). Howard P. Sorgen, senior vice president and managing director of Merrill Lynch's global information services, said the firm has been talking with IBM about its ATM fast-packet switching technology plans. Although Merrill Lynch has not committed to any vendors, Sorgen said Cabletron Systems, Inc. and Cisco Systems, Inc. will be the brokerage's respective hub and router partners of choice when the company moves to ATM by mid-1994.

Though Wall Street brokerages are expanding most of the advanced technology frontier, the use of analytical tools is not restricted to lower Manhattan. Some of the hottest action is occurring in Japan.

Yamaichi Securities Co. in Tokyo has been using fuzzy logic technologies to model the U.S. economy and forecast the direction of interest rates here to determine investment decisions in specific vertical markets, according to Stubbs.

Brokers fight fraud with IT detectives

By Thomas Hoffman

The use and abuse of technology by power brokers seeking to line their pockets with money obtained through illegal transactions is the underside of Wall Street's love affair with technology.

Perhaps fighting fire with fire, firms such as Prudential Securities, Inc. and Salomon Brothers, Inc., both of which have been rocked by securities scandals, have tried using information technology to help brokerages detect incidences of unusual trading activity.

There are no guarantees, however. Salomon, which has been using its security tools for 10 years, apparently was unable to thwart overbidding on treasury auctions by a few traders in the mid- to late '80s.

CIO Bill Anderson *says Prudential is monitoring trade activity*

In Prudential's case, the brokerage was nailed for practices that occurred in the 1980s prior to putting security measures in place.

Without admitting or denying any wrongdoing, Prudential Securities last month shelled out more than $330 million to settle charges that it improperly sold more than $7 billion in limited partnerships in the 1980s.

Time to atone

For the past three years, a seemingly chastened Prudential Securities has been using programs written in Cobol CICS on its IBM mainframes. They are used to monitor trade activity among its stockbrokers, according to Bill Anderson, Prudential Securities' executive vice president and chief information officer.

One of the systems, called Shortstop, conducts on-line, real-time checks of trading activities before the trades are executed based on predefined authorization limits per stockbroker.

A system called Backstop was designed to identify futures (commodities) activity that exceeds predefined dollar authorizations. Exceptions from both systems go to regional and branch management for review and/or approval, as well as to the home office margin department, which helps ensure the effectiveness of the process.

Regulatory requirements

Brokers who buy and trade stocks on the New York Stock Exchange and other exchanges are required by Securities and Exchange Commission regulations to have Series 7 licenses. The registrations for those licenses are kept on-line at Prudential Securities, Anderson said. But because Shortstop and Backstop are used by Prudential Securities and not Prudential Insurance, they were not able to detect unlicensed trading by Prudential insurance agents.

For the past decade, Salomon's surveillance departments have been using a mix of Windows-based PC and Unix-based software, written in-house, to identify trading activity that would call for additional scrutiny based on a variety of parameters. For example, the firm is using the software to identify trading between counterparties and short-term trading, two indicators of trading that call for additional scrutiny, according to Frederick M. Krieger, chief compliance counsel at the $15.37 billion brokerage.

Although Krieger could not quantify the extent to which the systems have eliminated fraud, he said the increasing sophistication of the systems has enabled a more effective use of time by compliance and supervisory personnel.

Although Salomon, Prudential Securities and other brokerages regularly use in-house software tools to monitor their risk management and portfolio management trading operations to reduce and eliminate fraudulent dealings, the surveillance technologies can often be circumvented by wily brokers.

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News Shorts

CompuAdd CEO resigns

CompuAdd Computer Corp. said Bill H. Hayden is stepping down as chief executive officer of the Austin, Texas-based mail order company, which recently emerged from Chapter 11 bankruptcy protection. Richard W. Krause, CompuAdd's president and chief operating officer, will take on the duties of CEO until a successor is named. Hayden's departure comes on the heels of CompuAdd's announcement that it has begun preliminary merger talks with Zeos International, Inc. [CW, Nov. 8]. Hayden will reportedly turn his attention to running his point-of-sale software company, CompuAdd Information Services.

DOD selects development contractor

The U.S. **Department of Defense** last week awarded its Integrated Computer-Aided Software Engineering (ICASE) contract to **Lockheed Missiles and Space Co.** in Sunnyvale, Calif. The 10-year, $400 million contract, which includes subcontracts to IBM, Hewlett-Packard Co. and others, will provide CASE tools throughout DOD for the development of Ada applications. The tools will be integrated with Pentagon repositories of reusable software components. ICASE is a cornerstone of DOD's Corporate Information Management initiative, a program aimed at cutting information systems costs while boosting IS effectiveness.

Morgan Stanley names new CIO

Kevin Parker, who most recently headed **Morgan Stanley & Co.**'s Tokyo-based international equity derivatives trading group, was recently named managing director and chief information officer at the New York-based brokerage. Parker's charter includes the restructuring of Morgan Stanley's front- and back-office environments. Parker replaces managing director Gary Goehrke, who is now in charge of the comptroller's office. Parker reports to Carter McClelland, the firm's head of administration and operations.

CA, American Fundware settle

Following a September Federal Court award of $8.5 million to **Computer Associates International, Inc.** for **American Fundware, Inc.**'s misappropriation of CA trade secrets in the late 1970s and early 1980s, the two firms last week announced a resolution of the dispute. Under the agreement, American Fundware will pay CA an undisclosed amount of cash plus a royalty on all its revenue over the next 10 years. Meanwhile, CA will continue to license technology to American Fundware for use in its PC Fund and Fundware PC-based fund accounting programs.

Apple, Fujitsu to do multimedia packs

Apple Computer, Inc. and **Fujitsu Ltd.** have agreed to develop compatible software for their respective multimedia platforms in Japan. Under the agreement, Apple will license QuickTime to Fujitsu, and the two firms will develop a set of common software development guidelines that will enable independent software vendors to develop multimedia applications that will run on both Fujitsu and Macintosh computers.

SHORT TAKES **Oracle Corp.** and **Novell, Inc.** said the first of several expected Oracle database and Novell operating system bundles will be in user hands by Dec. 18.... **Computer Associates** and **Symbol Technologies, Inc.** have introduced ScanPac, which combines two new modules of CA's AccPac Plus Accounting software with Symbol's LaserTouch bar code scanners.... **Digital Equipment Corp.**'s PC business unit has signed a distribution agreement with a Chinese computer company and is exploring setting up a PC manufacturing plant in China.

UK tax agency will outsource to EDS

By Mark Halper

Electronic Data Systems Corp. and Inland Revenue, the UK's tax service, said last week they expect to sign by April a 10-year outsourcing deal, worth up to $2 billion, for EDS' EDS-Scicon Ltd. subsidiary to take over information technology services. But before it can close the deal, EDS must first face questions regarding data confidentiality and labor.

The announcement comes one week after Computer Sciences Corp. beat out EDS for a tentative $1.35 billion deal with British Aerospace PLC [CW, Nov. 22]. Computer Sciences also bid for the tax job.

EDS plans to invest $105 million to purchase information technology equipment from Inland and to hire 2,000 of its 2,500 information technology workers. About 300 workers would stay with Inland. Inland's information technology budget is estimated at $375 million.

The two parties said they expect to complete the deal in stages. They were unspecific about the technology changes EDS would implement or whether EDS would use its own processing centers.

A civil servant union at Inland has voiced its objection to the pact and is lobbying members of Parliament and major British companies to intervene, contending that the arrangement undermines the confidentiality of mountains of financial and personal data that companies and individuals provide.

Union distrust

"We believe there's an increased risk to confidentiality," said Bill Hawkes, assistant secretary of the Inland Revenue Staff Federation, which represents most of the 2,500 information technology workers at Inland.

Inland stated last week that it and the British government "attach the greatest importance to safeguarding the privacy" of taxpayer information. An Inland spokeswoman said Inland would retain ultimate responsibility for confidentiality and would use "legal sanctions" to punish any leaks.

An EDS spokesman responded that EDS customarily safeguards "very confidential, proprietary information."

The union was scheduled to meet with EDS last Friday, after press time. Its first demand was for EDS to recognize the union as the representative of the information technology workers, Hawkes said.

"They've avoided being unionized up until [recently]," said Merrill Lynch analyst Steve McClellan.

Hawke said one positive sign is that EDS recognized the union in a recent deal with the UK's Drivers and Vehicle Licensing Agency.

The EDS spokesman said EDS has no union workers in the U.S., but it operates differently in Europe, where "there are different regulations and different laws" regarding workers' rights.

Furman Selz, Inc. analyst Terry Quinn questioned how profitable the outsourcing deal might be for EDS once it meets various union demands. Government sector jobs are less profitable than private sector jobs, even without union issues, he noted.

Nintendo

CONTINUED FROM PAGE 1

would have to spend implementing its own system, Rogers said.

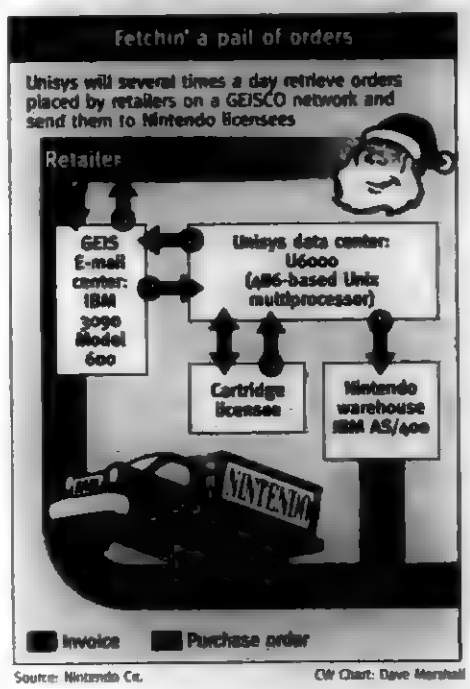
Some 11 retail chains and three licensees have signed up to process orders and invoices in the next year through the Unisys system, executives at Nintendo and Unisys said. The EDI network ties into an electronic-mail network provided by General Electric Information Services (see chart). "Several thousand" orders have already been processed through it, Rogers said.

Rogers said nondisclosure terms prohibit him from identifying participating retailers and licensees. One source said Kmart Corp. and Woolworth Corp. have signed on. About 30 licensees are expected to sign on.

A Kmart spokeswoman said she could not confirm or deny participation. Phone calls to Woolworth were not returned. Jim Mattecheck, a district manager at Unisys, confirmed that 11 retailers are using the system.

About two-thirds of all Nintendo-made games, including its Jurassic Park title, were designed by licensees, who are responsible for distributing their products. Many of these companies are small outfits that cannot afford the investment to install and support EDI connections among them, retailers and Nintendo, Rogers claimed.

Rogers estimated that if licensees were to set up a comparable EDI system on their own, it could cost them between $20,000 and $500,000 each. While some have rudimentary EDI systems, the Unisys project provides considerable sales administration, such as credit and location checks, that across companies any transaction.



Source: Nintendo Co. CW Chart: Dave Marshall

"What Unisys came up with was a design that lets the licensee have a sophisticated hookup to retailers without spending a large investment up front," he said. "It's designed to facilitate the distribution of hundreds of thousands of cartridges on a yearly basis."

Ken Jones, director of inventory management at Toys R Us, Inc. in Paramus, N.J., observed that "a hefty percentage" of Nintendo licensees are not tied to Toys R Us through EDI and could benefit from the program. "Without [EDI], the product is definitely slowed down in terms of how fast it goes out to the sales floor," Jones said.

Nintendo is charging each licensee a fee for each cartridge it sells using the EDI system for ordering invoicing. Nintendo in turn pays a per-cartridge fee to Unisys. The arrangement marks the latest twist in the move toward tying the price of outsourcing deals to business results [CW, June 21]. Rogers declined to name the fee amounts.

Charlie McMurtry, a strategy manager at Wal-Mart Stores, Inc. in Bentonville, Ark., said he was skeptical about the program, noting that Wal-Mart already uses EDI links with Nintendo licensees.

But Rogers said Fast EDI would provide more elaborate support than what retailers now receive.

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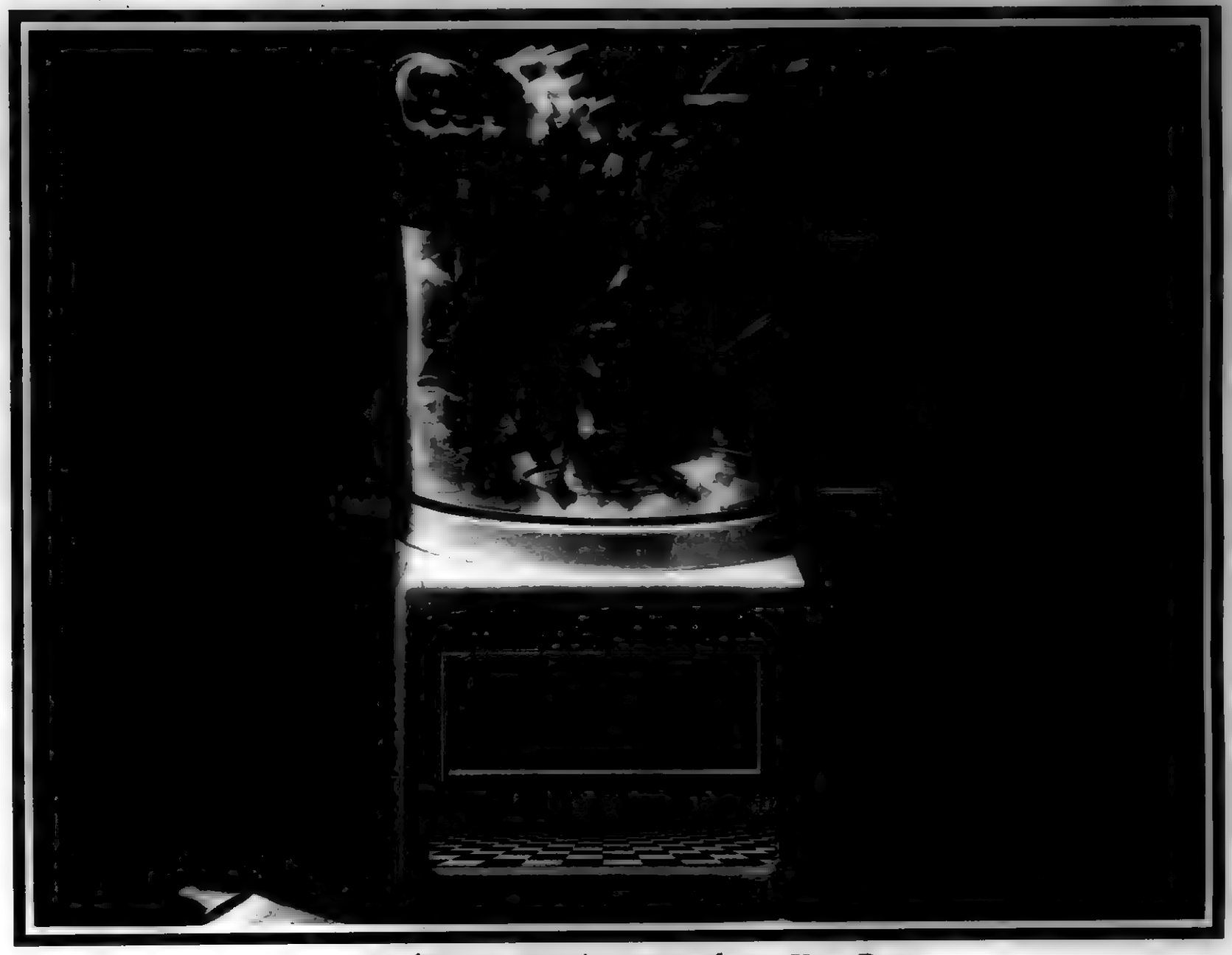

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Novell reaches for work-flow boost

By Michael Vizard

Novell, Inc. last week said it has signed a deal to bundle work-flow technology from Reach Software Corp. in Sunnyvale, Calif., with its AppWare development kits.

AppWare, which is scheduled to be available next year, is Novell's development platform for creating NetWare applications that will run on multiple platforms. By adding work-flow support to the kit, Novell is preparing for the next generation of network applications.

"A year from now there won't be an application that doesn't have work flow built in," said Brownell Chalstrom, president of Chalstrom Consulting in Alameda, Calif. "Novell is one of the first companies to recognize this and put work flow in its standard application development platform."

However, information systems directors should be cautious because Novell is still evolving its work-flow strategy for NetWare. "AppWare and NetWare aren't necessarily using the same work-flow strategy," said Bruce Silver, an industry analyst at BIS Strategic Decisions in Norwell, Mass.

In fact, Novell is still determining whether it will compete or cooperate with Lotus Development Corp.'s Notes, which will be available as a NetWare Loadable Module in the first quarter. Lotus will position Notes as a work-flow application development platform at its LotusSphere conference next week.

Action Technologies, Inc. in Sunnyvale, Calif., will announce at LotusSphere that it is shipping its work-flow offering for Notes. Reach last week announced its intention to ship its WorkMan for Notes offering late in the first quarter of 1994. ViewStar Corp. in Emeryville, Calif., is also working to bring work-flow tools to Notes in 1994.

A dubious advantage

Industry analysts said Lotus has an edge in the work-flow arena because Notes supports synchronized replication of databases, which allows users to more easily share updates of documents. But many customers may opt for lower-end work-flow solutions. These would only incorporate AppWare applications that support Reach's technology running in conjunction with an SQL database.

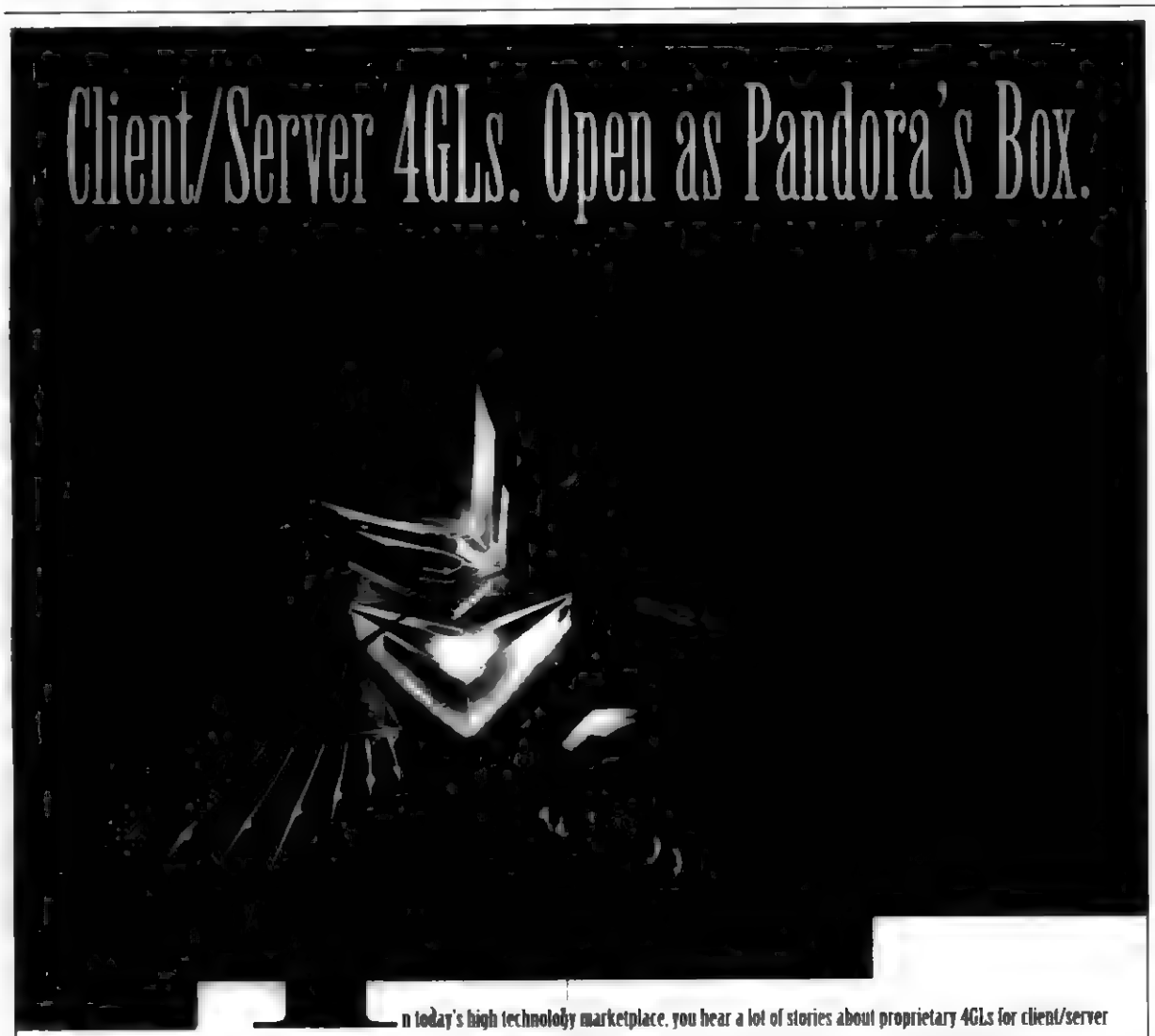
For example, Pacific Gas & Electric Co. (PG&E) in San Francisco is looking to adopt Reach technology running on top of Notes, SQL databases, various electronic-mail systems and Banyan Systems, Inc.'s Vines.

PG&E has not decided if it will use Reach on top of Notes or on E-mail. "Work flow tends to make more sense with a document-oriented database like Notes, but then you have to factor in the additional cost of Notes for someone who doesn't have it already," said Alex Jauch, a team leader at PG&E.

However, because Reach is supporting multiple back-end systems, Jauch said PG&E will start going forward on work-flow application development. "We'd like to have a trouble-ticketing system that could automatically punch something up to a higher priority," Jauch said.

For its part, Lotus is hoping its alliances can shore up its work-flow presence before Novell and other rivals such as Microsoft Corp. can implement their strategies.

"There's a huge pent-up demand for work flow because Lotus has been out creating demand for Notes as a work-flow platform," Chalstrom said. "But Notes by itself is not a very good work-flow platform."



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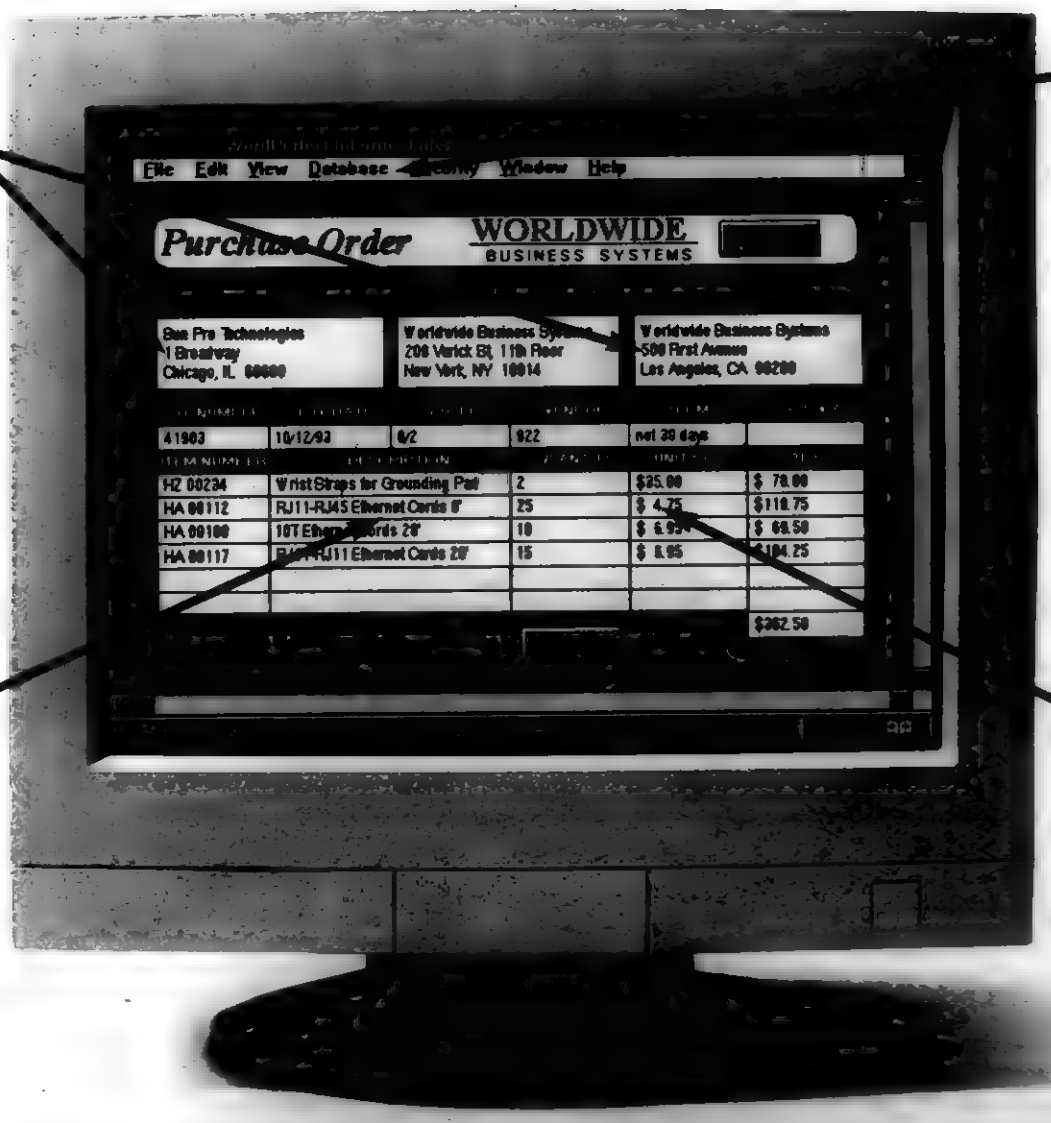

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WordPerfect INFORMS

Legent rolls out LAN-based backup tool

By Gary H. Anthes

Legent Corp. last week introduced data backup and recovery software that creates local disk files for fast recovery and sends backups to a mainframe for tape-based archiving and disaster recovery.

Enterprise Storage Manager (ESM) is also able to recognize duplicate files coming from multiple desktops or servers so that only one copy is retained, reducing storage requirements and network traffic, according to the Herndon, Va., company.

"The fundamental idea of backing up to another LAN server and sending disaster recovery [backup] to a mainframe is a great idea, and it's unique," said Glen McDermed, an analyst at Gartner Group, Inc. in Stamford, Conn. "You get high performance and the security of the mainframe backup facilities."

Replaces tapes

Star Enterprises, a $7 billion partnership between Texaco, Inc. and Saudi Refining, Inc., is installing ESM at its Houston headquarters and will roll it out to sites with thousands of workstations and servers. It will replace the current practice of doing full server backups each night using 4mm and 8mm tapes and PC-based backup tools, said Tom Bernhardt, technology analyst.

Bernhardt said that will allow Star to piggyback onto the existing disaster recovery program that is in place for Texaco's mainframes, which Star uses. The ability of ESM to do incremental backups, avoid duplicate backups and compress data will reduce storage and transmission costs, he said.

Existing PC backup schemes are not robust enough, Bernhardt said. For example, Star lost data a year ago when a server failed and the company discovered that the backup software destroyed data after backing up 64,000 files, he explained.

Other users may be even more at risk, according to Legent. "Over 85% of all LAN servers are not backed up," said Phil Carrai, vice president of the company's resource management unit.

ESM uses binary object technology, for which Legent is seeking a patent, to eliminate duplicate data at three levels — server, site and enterprise. For example, if thousands of copies of new PC software are sent from a mainframe to departmental servers and from there to desktops, ESM will recognize that it is getting the same data multiple times when individual end users run their incremental backups the next day. Only one copy will be saved.

Worthwhile, but complex

McDermed called ESM a "high-risk, high-reward solution." He said the complexity of the product would require users to take great care when reconfiguring LANs. "This is something you get into gradually," he said. "Gain some experience with it before making an all-out commitment."

ESM comes with a programmable Automated Systems Operations feature that lets users automate their backup and disk-space practices, policies and priorities.

The software will initially support OS/2, with plans to add support for Novell, Inc.'s NetWare and Microsoft Corp.'s Windows NT in 1994. Legent said it is considering a Unix version.

ESM will be available on a limited basis in December and will be generally available in April. Pricing starts at $30,000, depending on the number of LANs and the amount of storage.

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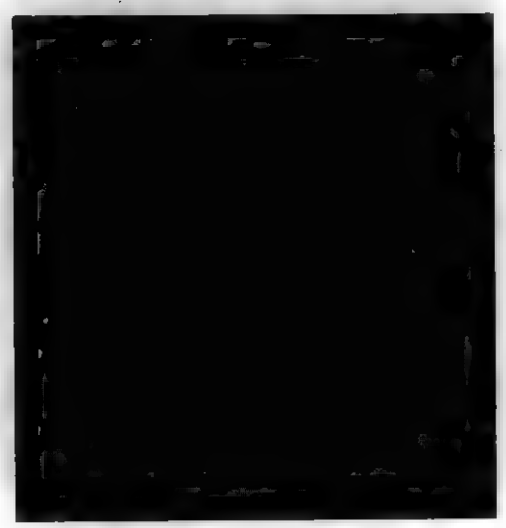

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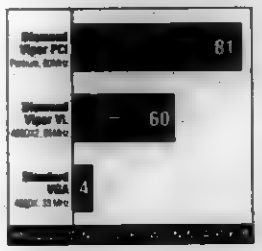

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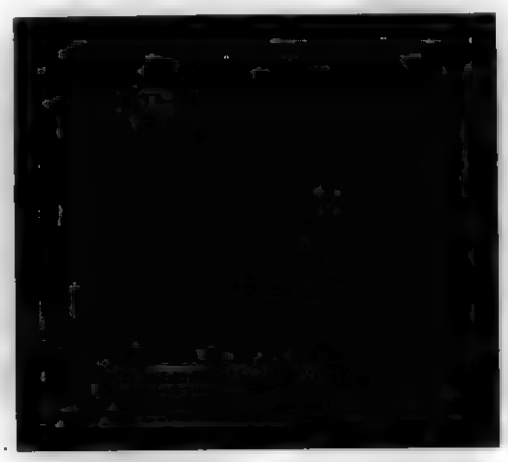

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Software vendors converge on database market

IS managers to referee end-user query tool battle royale

By Michael Vizard and Kim S. Nash

It looks like information systems managers are going to have to arbitrate a showdown brewing between the PC software and relational database camps over who can provide the best tools for querying relational databases.

On one side, relational database makers such as Oracle Corp. and Sybase, Inc., historically weak on PC platforms, plan to enhance their end-user ad hoc query tools with more graphical interfaces over the next several months.

On the other side, PC powerhouses such as Microsoft Corp. and Lotus Development Corp. have already stepped up efforts to provide relational links to their PC applications through the addition of SQL links.

Smack in the middle is a slew of small to medium-size query tools companies that have already carved out niches to provide these tools. But as the market matures, many of the functions previously associated with many of these tools are being incorporated into PC applications such as spreadsheets and databases.

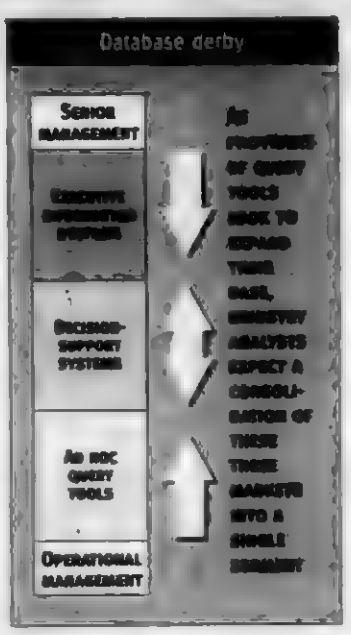
As client/server technology matures, the number of end-user query tools is proliferating, noted Peter Kastner, a vice president at Aberdeen Group in Boston. "As a result, IS is starting to put more controls on in order to limit the number of products they have to support," he said.

Big $$ market

According to Gartner Group, Inc., the business information systems arena is a $600 million market encompassing decision-support systems, executive information systems and data access tools.

"There is a fair amount of convergence in the market, and it's a complete free-for-all. Some people are not going to make it," added Brent Williams, an analyst at International Data Corp.

With that in mind, many suppliers of ad hoc query tools seeking to insulate themselves from larger competitors such as Lotus and Oracle are trying to reposition themselves. For example, IRI Software in Waltham, Mass., which once specialized in executive information systems, now portrays itself as a marketer of a proprietary multidimensional database designed specifically to run ad hoc queries on data that has been imported from an SQL database. Other companies taking similar approaches with multidimensional database engines include Comshare, Inc., Pilot Executive Software, Kenan Technologies, Inc. and Arbor Software Corp.



But does it have what it takes?

IRI Software President Jeffrey Stamen claims IS managers will discover that PC software applications do not have the level of sophisticated drill-down analysis capabilities that power users require, and that SQL database providers are focused primarily on transaction processing and structured data rather than on end users.

In addition to providing a platform dedicated to handling ad hoc queries, multidimensional databases will improve SQL database performance by offloading ad hoc queries from those databases, Stamen noted.

But other suppliers of end-user query tools maintain that there is no need to support a separate database engine for ad hoc queries. For example, SAS Institute, Inc., Business Insight, Inc. and Business Objects, Inc. have opted for an approach that uses their decision-support software to preprocess data in the SQL database engine itself before sending it to a client system, as opposed to requiring users to adopt another database engine to support ad hoc queries.

In the short term, however, PC software providers may have an edge over the makers of end-user query products and SQL databases because they have incorporated much of the functionality of a low-end query tool into widely used Windows applications that users are familiar with.

"The products that come from the database vendors rarely have all the features that end users want," said Howard Dresner, an industry analyst at Gartner Group, Inc. in Stamford, Conn. "They tend to be based on technical issues rather than providing intuitive tools for users."

For example, the Health Care District, which manages hospitals for Palm Beach County, Fla., deployed a client/server application based on tools and databases from Informix Software, Inc. in Menlo Park, Calif. But Lloyd Chesney, who served as special coordinator for the project, said doctors rejected the user interface provided by the query tools from Informix. As a result, Chesney is now deploying Paradox for Windows from Borland International, Inc., as a front-end query tool to the Informix database.

And PC software vendors are promising to extend that base by adding more sophisticated analysis capabilities to their applications using intelligent agents and object technology.

But database vendors are working to plug this gap in their lineup. Sybase, for example, plans to add a Windows-based tool next year as part of its BuildMomentum development tool kit as a companion to Sybase's Unix query tool, Data Workbench, a spokeswoman said. Oracle, too, has graphical enhancements afoot for several tools in its Cooperative Development Environment line.

"The database vendor focus for these tools has a lot of merit because IS needs to keep control of the implementation, as opposed to letting individual departments go out and buy all their own query tools," Kastner said.

However, Williams noted that the database vendors have been late to market with graphical tools. "In some cases, database vendors will have an advantage because they have a direct sales force, but they've also been displaced in a lot of accounts already by PC vendors," he explained.

Client/server

Information Builders to broaden EDA/SQL

By Melinda-Carol Ballou

Information Builders, Inc. will introduce a range of products next month that it said will extend the reach of its EDA/SQL middleware into the CICS client/server realm.

The New York software developer is expected to reveal the following:

- Software that will enable users to implement transactions from any supported EDA client — Windows-based PCs or Unix workstations, for example — against either CICS/ESA or IMS databases on an MVS/ESA mainframe.
- A client/server engine for CICS/ESA that will let any EDA-enabled tool access and update data under the control of the CICS applications, according to Information Builders officials. Previously, the company only offered client read-only access to CICS for EDA/SQL.
- A DB/2 server and gateway for IBM's Distributed Relational Database Architecture (DRDA) that will allow DRDA users to access both relational and nonrelational data on the range of platforms supported by EDA/SQL, Information Builders officials said.
- Products developed jointly with Lotus Development Corp. and Dun & Bradstreet Software that will enable those companies' users to access corporate data available on the 35 platforms and more than 50 databases that EDA/SQL supports.

While earlier versions of EDA/SQL have been criticized for lackluster performance, the new Information Builders products use a rewritten version that addresses those issues, according to company officials and some industry analysts. Dubbed EDA/SQL 3.0, the new release will be generally available by mid-1994, officials said.

The EDA/SQL transaction server, which will debut at Database World in Chicago next week, will allow users to integrate desktop tools such as Powersoft Corp.'s PowerBuilder with CICS or IMS to create applications for the client platforms supported by EDA. The server uses a VTAM-based engine to invoke a CICS or IMS transaction program called from the EDA/SQL client.

Current EDA/SQL users with multiple CICS applications spoke about the potential of the transaction server.

"We have a lot of APIs to proprietary systems that have CICS interfaces," said Mike Onders, associate vice president of applications engineering at the information services division of the Society Management Co. in Cleveland. "The EDA [transaction server] would open up a few more doors to get access to [and manage] that data."

Shipping soon

The DRDA DB/2 Server and Gateway for EDA/SQL will ship during the second quarter of 1994 and will range in price from $15,000 to $25,000. Also required is the generic EDA/SQL environment, which starts at $8,000. The price for the EDA/SQL transaction server on CICS/ESA and IMS/ESA ranges from $28,500 to $48,500. The product will ship next month.

Adding support

D&B Software, meanwhile, is adding EDA/SQL support to its Advanced Manufacturing Applications Product Suite in SmartStream, its client/server application scheme.

Information Builders also plans to announce that it has developed, with Lotus and third-party vendor Bond Technologies, Inc., software that will bring data residing on EDA clients into Notes documents.

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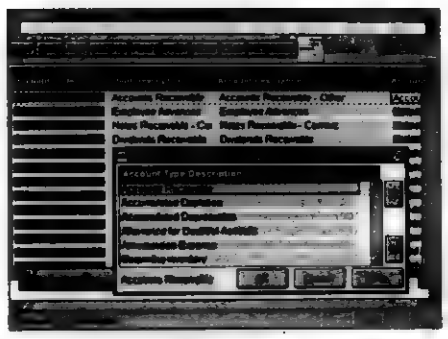

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Years? Sure. Look under the covers of the latest pronouncements of resurgence and you'll see the familiar "customer-driven" moniker. That was what drove the company's image campaign in 1987, its self-proclaimed "Year of the Customer."

So what is new and improved, if anything?

There are several new and different factors that are conspiring to give IBM a real shot at a comeback. Make no mistake about it, this is a company that has a long way to travel before it is healthy and viable again, no matter how loudly company officials might crow about IBM's "great underlying strengths."

Most significantly, under the direction of Jim Cannavino as chief strategist, IBM will continue to map a bottom's-up strategy emphasizing the desktop. This is no small change, as clearly the large systems powers have continued to lead and mislead the company, even during the long demise of the last three years.

The prospects are excellent in hardware and software. As a key element in the client/server world, OS/2 is gathering steam as Windows NT takes shape more slowly than most would have thought. Our own survey of top corporate customers showed only a quarter of the 238 companies we questioned had even tested NT. (Although those that did generally liked it more than OS/2.)

The fact remains that corporate customers are going to take a measured approach to NT implementation. Microsoft is making big promises, such that 40% of the customers we surveyed claimed they'll buy NT in the future. But a buyer's "plan to purchase" is directly related to a vendor's "ability to deliver." And right now, IBM can deliver more with OS/2 than Microsoft can with NT.

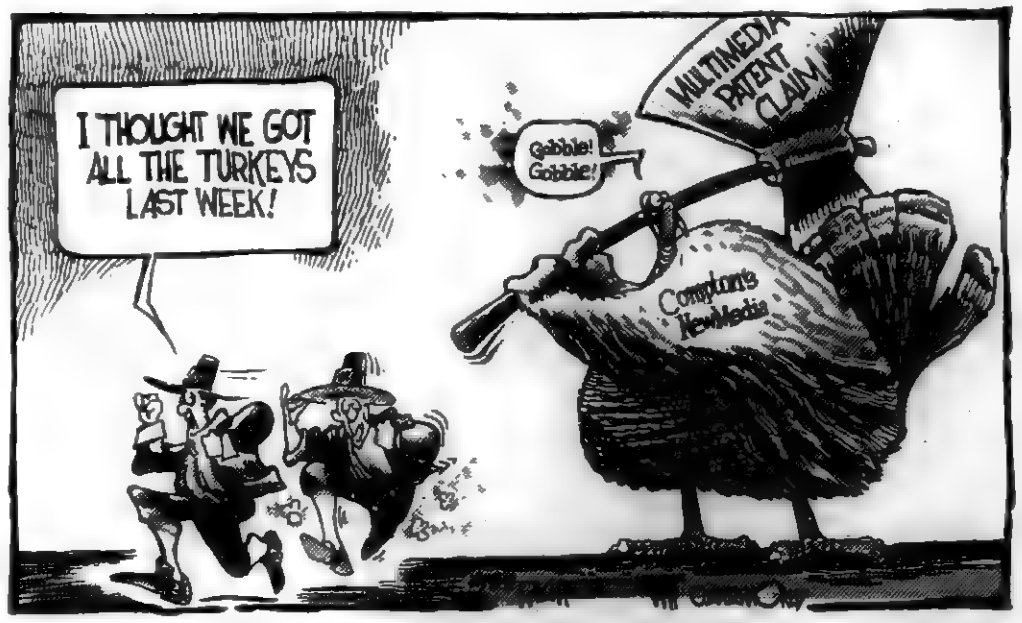
On the hardware front, IBM has an opportunity to do what it failed so miserably at in the '70s and '80s, and that is to provide a scalable architecture. The PowerPC architecture, jointly developed with Motorola and Apple, promises just that, while giving a fat and happy Intel the first threat to its 75% microprocessor market share. Compared with Intel's Pentium, the PowerPC is faster, much cheaper and much smaller.

But what about that oppressive, subordinating IBM culture that so effectively snuffed out the entrepreneurial spirit wherever it sprung up? In a recent interview with us, Cannavino sounded like a man charged with a culture-kill mission (see story page 137). Asked if the most sacred of IBM deities — account control — is dead, he replied in the affirmative.

Being great is one thing. Being great twice is another, because the tendency is to employ the same strategy in two very different circumstances. Whether IBM can avoid doing so will determine if there's a new IBM emerging or just the old one continuing to submerge.

Bill Laberis

Bill Laberis, *Editor in chief*



Cyberpunks and other villains

It was about 1976 when *Computerworld* uncovered the evil "hackers" that moved among us. Now, in a long overdue repeat of this public service, we are warned to watch out for those "cyberpunks" who carry stun guns at their side ["Nerds with an attitude," CW, Nov. 8]. Thank you, oh vigilant watchers!

I need your advice on some other suspicious figures in my company. I think that what I have seen them doing is called "writing."

Some of them use pens or even pencils. This is suspicious, pointless behavior, because how can you compile something written on paper? Paper is for printouts, of course.

I overheard one of them say that he was a "free-lancer," whatever that is. It sounds violent, kind of medieval.

He was apparently sending his writings out of the company, to something called a "magazine." While I'm not sure what the point of this activity could be, he's obviously not doing this for the corporate good.

The patterns of his behavior seem ominous to me. I hope you can investigate his type and see if there are any others like him in other organizations.

To help you spot him, he often wears tweed jackets and has what I take to be a manual for his misbehaviors, called something like Strunk and White.

Joshua Stern
Los Angeles

EDS says: No deal, no sale

It was noted in the Oct. 11 Inside Lines column under the heading "The partial plan" that rumors were circulating concerning the sale of Electronic Data Systems by General Motors and, according to the article, "a more likely development is that EDS will shed some operations."

It was stated that EDS had "put its automated teller and Cummins Cash units on the block."

This is not true. Both of these areas are vital contributors to the success of EDS and the services we provide our customers.

John E. Norton
Freight Services
EDS Travel and Transportation Group
Plano, Texas

Where was news of WorkPlace OS?

"Nuts, bolts and chips" [CW, Nov. 15] presented a very obvious slant toward Windows NT and its supposed role in the next generation of PCs.

The "PowerPC 601" chart implies that DOS/Windows applications could be executed in emulation mode under Windows NT while the text of the article correctly states that a recompile of the application software would be necessary. Readers are being misled into believing that their DOS/Windows applications would execute on the PowerPC when using Windows NT.

The industry analysts also fail to mention IBM's WorkPlace OS as a strategic operating system for the PowerPC. I was under the impression that IBM had designed WorkPlace OS explicitly for the PowerPC platform.

Why was it not included in the article?

My subscription to *Computerworld* is based on a belief that the newspaper has historically provided timely and relevant information in an objective manner. Please, leave the hyping of Microsoft operating systems, environments and products to the Microsoft marketing department.

David Loader
Sugar Land, Texas

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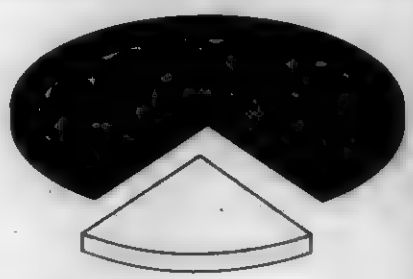

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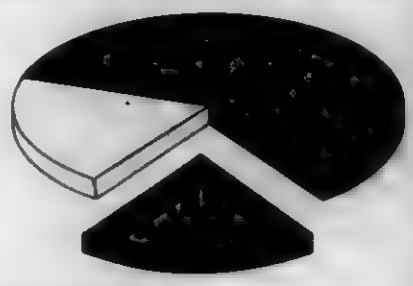

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Work escapes the office

Ellis Booker

Three years ago, long before anybody floated the phrase "virtual office," I was standing in my kitchen in Chicago calling a senior information systems executive at a New York bank.

I was in my kitchen because it was 6:30 a.m. in Chicago and 7:30 a.m. in New York, and this time was the only possible "window" during which I could reach him, as he had curtly explained to me the day before.

I dialed, the executive picked up and we commenced a formal, businesslike interview.

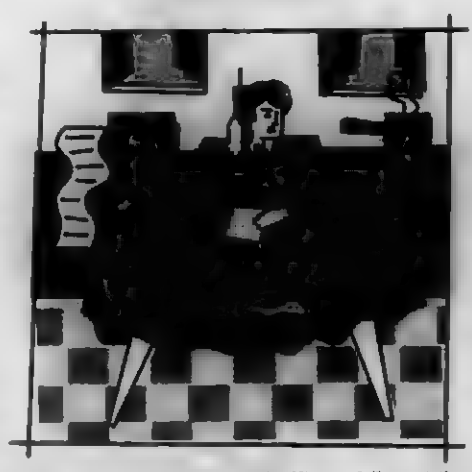
Then, disaster. My sons, ages 3 and 5, galloped down the stairs.

"Breakfast!" they bellowed, not quite in unison. "Eggs. . . . No, cereal!" I clamped my hand over the receiver and hissed, "Go away. Daddy is on the *phone*. Daddy is *working*."

They smiled and galloped back upstairs. I gingerly resumed the interview, praying that the executive on the line would merely assume he had heard the Xerox repairman telling me about his breakfast preferences.

If the bank executive heard children in the background, he didn't say. Likewise, I didn't volunteer that I was at my kitchen table wearing a bathrobe.

In the intervening years, however, I've detected a subtle but important shift in what can be called the social acceptance of the "kitchen call-back." Conducting business from places



other than the traditional office, while not the rule, is no longer deemed an offense.

There are, it seems to me, at least three reasons for this welcome shift:

•Store-and-forward. Technologies such as voice mail and electronic mail detach work from time and place constraints and encourage workers to check for messages from wherever or whenever. Often, the wherever is home, and the whenever is after "The Simpsons."

•Portables. Everyone I know owns a modem-equipped laptop computer from which they often work at home or from a deck chair at a neighbor's cookout (more on obsessive workers another time). The coming generation of personal digital assistants will add momentum to this trend.

Affordable and easy-to-use wireless networks will complete the circuit, making it possible to log on to the office server while riding the subway, sitting in the dentist office or lounging on a beach.

•Feminism. The women's movement and the influx of women in the work force has changed U.S. culture for the better in many ways, including smudging the once clear line between work life and home life. Today, reasonable people view these realms as two parts of a single engine.

From the perspective of my kitchen, things are definitely changing. Two nights ago, I interviewed a guy from a Fortune 100 pharmaceutical firm. He called me from his cellular phone at 8 p.m. I was in my kitchen putting away dinner plates. He was standing in a concession line at a ballpark in Boston. Neither of us made any effort to disguise where we were. We even chuckled about it. And then we had a good talk.

Booker is *Computerworld*'s Chicago bureau chief.

Client/server: It could get bloody

Michael Schrage

Remember the agony of being trapped in the slowest bank line? No matter how carefully you calibrated the queues or analyzed the tellers, you invariably picked the line filled with transactions too complex for your teller to execute without help or with customers who had more long-winded questions than hard cash. It just wasn't fair.

Then, of course, the banks did something clever (no, not ATMs). They junked the one-teller-per-queue concept and substituted a giant single line through which customers fed out to individual tellers. Even though this statistically increased the average waiting time, the single queue dramatically reduced the variance between lines. While single queues may not be more mathematically efficient, they're a clear example of a "recentralization" innovation that ultimately seems fairer and less frustrating.

As companies relentlessly continue to decentralize their information processing through the medium of client/server architectures, one can't help wondering if they will inadvertently recreate the kind of tensions associated with bank queues and seeing someone who came in after you get faster and better service. In a bank, of course, this merely boosts your blood pressure; in companies with tight budgets, it's an open invitation to vicious organizational infighting.

In a corporate environment where departments have wildly different skill levels and competencies — which is most of corporate America — information technology decentralization is unfortunately more likely to be a source of fragmentation than flexibility. Instead of creatively linking the organization in productive new ways, client/server infrastructures will likely widen the gaps and exacerbate the stresses among departments.

Client/server decentralization could be an open invitation to vicious organizational infighting.

Why? Because organizational decentralization inherently promotes organizational disparities. While it may be true that client/server architectures will allow seamless integration of data and processing, it will prove equally true that some departments are better at building applications and utilities than others. The wider and more pervasive the variances, the nastier the organizational disputes.

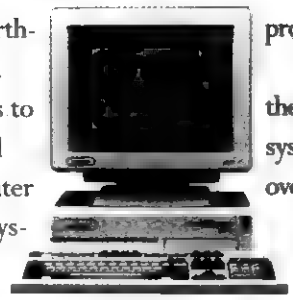
Suppose, for example, some parts of the organization can exchange information electronically with key customers and suppliers, but others can't yet. How does that affect the internal balance of power? Suppose, with its client/server platform, one division can perform more persuasive data analyses on a customer base than its rival division. Who gets the extra funds from the head office? What happens when one department continually lags two or three quarters behind in the implementation of enterprisewide upgrades?

Now you're welcome to respond that good old Darwinian pressures of the internal marketplace will determine who wins and who gets fired, but then you're effectively conceding that decentralized/distributed information technology will become as much an organizational battleground as a medium for productivity.

The real difficulty for information technology leaders won't be implementing client/server decentralization and assuring seamless integration but managing and alleviating the disparities that these architectures will inevitably create. You can bank on it.

Schrage is a fellow at the MIT Sloan School Center for Coordination Science and the MIT Media Lab. His Internet address is schrage@media-lab.mit.edu.

All the horsepower in the world is worthless if you can't make the most of it. And the same is true when it comes to computers. Performance is determined not only by the chip, but by the computer around the chip. After all, if the subsystems slow you down, having a powerful



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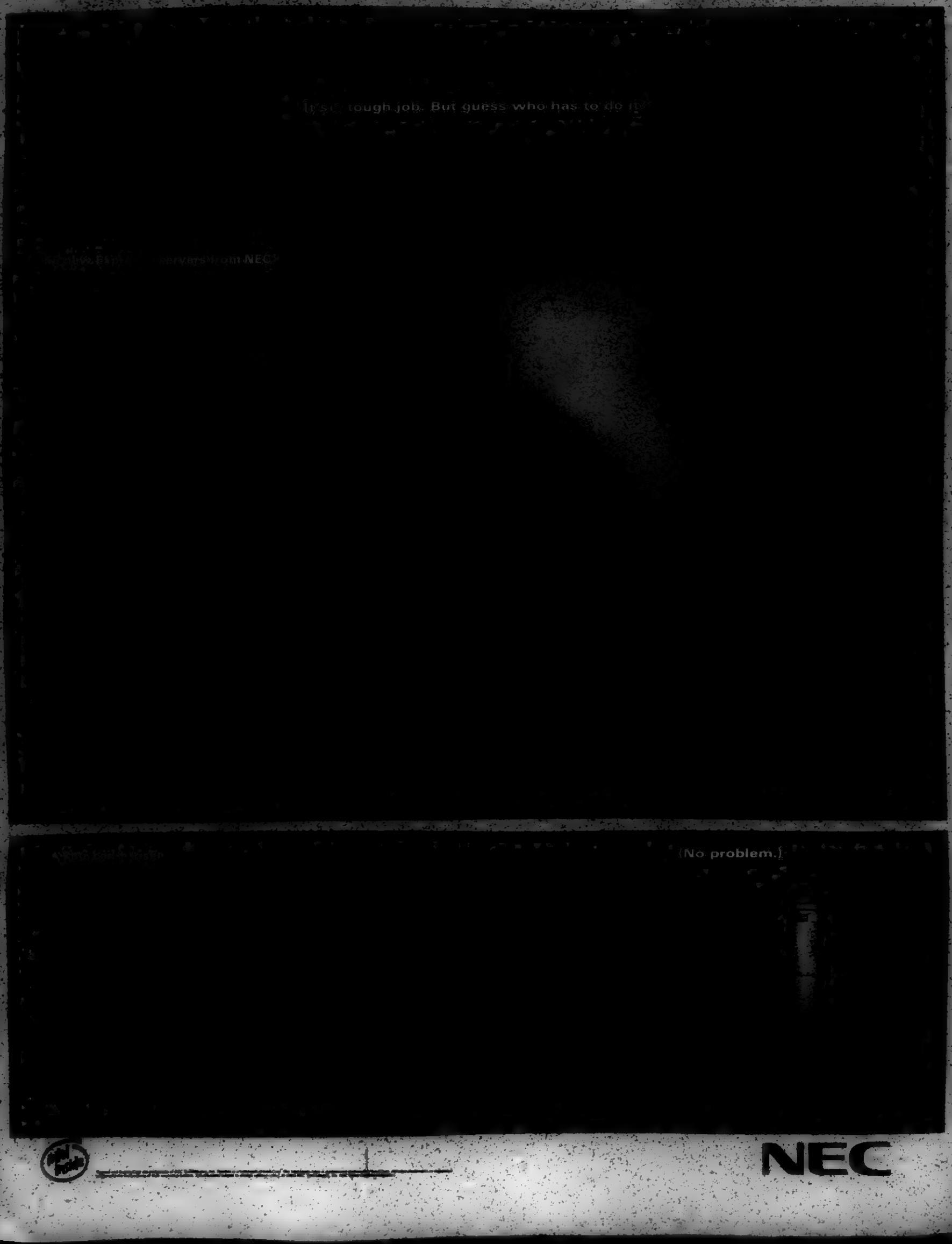
tough job. But guess who has to do it.
servers from NEC.
(No problem.)
NEC

Paul Gillin

Comdex: No gain for users

This year's Comdex was sort of like a big bowl of popcorn: large and appetizing, but when you come right down to it, mostly air.

Vendors reached new heights of idiocy, using stunts to attract attention (anyone who can draw a link between LANs and a comedian juggling knives and riding a unicycle wins a free Ginsu). And attendees gaped in awe at jury-rigged demos like cavemen seeing a Coke bottle for the first time. It was all very pretty, but it did very little to advance the state of the art.

Case in point: The big stories at Comdex were about technologies that let users install add-in boards quickly and painlessly, link graphics seamlessly into computer hardware and integrate networks with the operating system. In short, after nine years, the PC industry has finally succeeded in remaking the Macintosh. I guess this is important in some parallel universe, but to users struggling to get two E-mail systems to talk to each other in the real world, it seems pretty trivial.

The PC industry has always had an incredible capacity for self-congratulation, and Comdex is its annual self-conferred reward for a job well-done. But the unrelenting spew of "smaller, faster, cheaper" is wearing thin as the problems facing corporate IS become more complex and resistant to a quick fix with a hot box.

The last interesting Comdex was in 1991, when Windows' presence was beginning to be felt and software vendors experimented with some really new ways of doing things. In the two years since, the software business has lapsed back into its more comfortable habit of cramming each shrink-wrapped box with more features that fewer people will use.

Gizmos galore

Hardware makers are happy to take cover briefly from their self-destructive price wars and strut their new Whizzer machine with the Ronco Wonder Chip that will draw Madelbrot diagrams twice as fast as the other guy's. I'm sure this is interesting to someone but probably not to the 75% of buyers who still use their machines principally for word processing, spreadsheets and E-mail.

The basic disconnect of Comdex struck me while I was standing in a long phone line just off the show floor. A fellow in front of me, evi-

Comdex, *page 38*

Drag and drop for DOS

Workplace Shell for DOS nears beta testing stage

By Ed Scannell

IBM's Personal Software Products group finally showed off an early version of its Workplace Shell for DOS at this month's Comdex/Fall '93, saying the product would enter beta testing in the next month or so.

Just like its big brother — the version that sits on top of OS/2 2.1 — Workplace Shell for DOS gives DOS users the ability to drag and drop files to other directories or be printed. Users can also resize and scroll through windows.

Users will not get preemptive multitasking, but they will be able to rapidly switch tasks among several DOS and Windows applications.

Big fish

Although ready for a decline, worldwide shipments of DOS and DOS applications today still represent a large market

Source: Dataquest, Inc., San Jose, Calif.

Unlike the hefty memory and disk storage requirements for the OS/2 version of the Workplace Shell, DOS users need only an 80286-based system with 1M byte of memory to operate the program.

The DOS version of the shell gives Personal Software Products a unified look and feel to its operating systems line, which may reduce training costs at some large corporate accounts using both DOS and OS/2 2.X.

But whether it allows IBM's DOS 6.1 to significantly cut into Microsoft's almost monopolistic control of the DOS and Windows market is questionable.

Marketing machine

Microsoft has already sold well over 5 million retail copies of DOS 6.0 and maybe twice that many through its hundreds of OEM contracts, according to estimates by Microsoft. IBM has sold about 300,000 copies of PC DOS 6.1.

If IBM had been able to ship PC DOS 6.1 in tandem with Workplace for DOS last spring when Microsoft's MS-DOS 6.0 was getting hammered for bugs, IBM could have built some momentum, some corporate users said.

"Last spring IBM could have sold the story that it had a more solid product and offered some significant value add [over MS-DOS 6.0] with a superior interface," said Mike Drips, a consultant and corporate beta tester of DOS and Windows in Tampa, Fla. "But now it might be tough to sell that story."

Window of opportunity

Microsoft is not expected to deliver the 32-bit version of Windows 4.0, which is said to have somewhat of an object-oriented look and feel, until late 1994. The more optimistic believe this means IBM has a chance to make more than pocket money.

"If users feel comfortable about its [PC DOS 6.1's] stability, and this shell lets them more easily get at DOS functions — easier than Windows — they should win over some corporate fans," said one user who has toured through an early version of Workplace for DOS.

Workplace Shell, *page 38*

Upcoming PowerBooks ready for PowerPC board swaps

By James Daly

Users of Apple Computer, Inc. PowerBooks who want to take advantage of the speedy PowerPC chip are beginning to see an upgrade path hacked out by both Apple and third-party developers.

Analysts familiar with Apple's plans said the company will introduce a family of PowerBooks based on Motorola, Inc.'s 68040 microprocessor by the middle of next year. That is the chip Apple has targeted as the springboard to the RISC-based PowerPC.

Unlike other PowerBooks, the new models will have processors mounted on easily removed daughtercards, making it easy to replace them with the PowerPC 603 processor designed for the Macintosh portable line. The power-efficient PowerPC 603 is comparable in performance to the 601, which is expected to begin shipping in entry-level models in March.

Analysts said exact pricing has not been established for the upgrade boards, but it is likely they would cost from $1,000 to $1,500 and operate in the 66- to 88-MHz range. Apple is also expected to offer 603 upgrades for the Duo line as well.

Honorable intentions

Another upgrade offering is being developed by Reply Corp. in San Jose, Calif. At Comdex/Fall '93, Reply announced its "intention to develop" PowerPC 603-based logic board upgrades for 680x0-based Macintoshes.

In March, Apple is expected to ship several entry-level desktop Macintoshes based on the PowerPC 601 chip, which is a collaborative effort among Apple, IBM and Motorola.

Apple spokeswoman Betty Taylor said the company intends to provide PowerPC upgrades for 68040-based Macintoshes, including the Macintosh Centris 610, 650 and 660AV; Macintosh IIVX and IIVI; Performa 600; and Quadra 900 and 840AV systems. Developers such as DayStar Digital, Inc. have promised to make upgrade cards available for the Quadra 700, 900 and 950 models.

The upgrade plans are welcome news for Macintosh fans such as Brian Comnes, manager of the information center at DHL Airways, Inc. in Redwood City, Calif. "We have to make plans for the future, so it's good to hear that we're getting some direction," Comnes said.

The PowerBook has been a hot seller since Apple introduced it at Comdex/Fall '91. The company recently claimed to have sold its millionth PowerBook. In addition, research firm International Data Corp. (IDC) says PowerBook sales will be up 32% this year, from 440,000 in 1992 to 580,000 in 1993.

Leader no more

Recently, however, some users have begun to criticize Apple for not staying technologically abreast of the competition [CW, Nov. 15]. "The PowerBook just doesn't leap out from the pack the way it used to," said Eric Lewis, an analyst at IDC.

The PowerPC upgrade path is an important move for Apple but not the only surprise the company has planned for the line.

Sources at Apple said engineers are busy trying to add a PCMCIA card to a 68040-based PowerBook by next year. PCMCIA cards are tiny devices that contain hard drives, modems or additional memory.

UPS delivers new bar-code system to public domain

By Michael Fitzgerald
LAS VEGAS

Drivers for United Parcel Service, Inc. will be carrying a new handheld computer in their delivery trucks this holiday season.

UPS recently announced a complete upgrade to its delivery system and some new technologies here at Comdex/Fall '93, including the following:

•The Delivery Information Acquisition Device (DIAD) II. UPS designed the 7- by 12-in., cellular-equipped DIAD II, which uses the company's proprietary software. To be built by Motorola, Inc., it replaces the 3-year-old DIAD I.

•Maxicode, an alternative bar code that stores significantly more information in the same space as a conventional bar code.

•The Customer Interface Device (CID), a tool to let UPS drivers upload and download package information at the pick-up site.

Lynn Newport, vice president of research and development at UPS, said it took five years and some $5 million in development costs to build just the Maxicode symbol and related technology, which the company bills as a competitive advantage. For instance, customers who choose the Maxicode or CID systems may find themselves locked into a particular way of sending packages.

MARK DI LEONARDO

Lynn Newport, vice president of R&D, *said UPS is looking for a competitive advantage from its new in-house-designed technology in the tight package-delivery market*

It's a battlefield

In the battle for account control among the major package delivery services, "it's definitely part of the strategy to bond with the customer" through the use of technology, Newport said.

While UPS will put its Maxicode bar-code alternative in the public domain, it will stipulate that certain related technologies, such as a camera that reads Maxicode, not be sold to competitors such as Federal Express Corp.

Newport estimated it would take a decade to outfit all of UPS' 1,400 facilities with Maxicode systems. DIAD II, in contrast, will be out much faster. UPS has purchased 21,000 DIAD II units to roll out before Christmas and expects to give all of its 55,000 drivers the new system by the end of 1995.

The DIAD II weighs almost a pound less than the clipboard-sized DIAD I. It is also backlit, smaller and better balanced than its predecessor, according to UPS.

Jim McFadden, a UPS driver, said he and his colleagues tend to type with their thumbs while walking, and new dual-function keys and a smaller keyboard make it possible to reach all of the keys.

CID has a parallel connector so it can attach to both printers and PCs. The PC would recognize it as a virtual disk drive. The CID system goes into alpha testing next year.

Comdex

CONTINUED FROM PAGE 37

dently a PC support specialist in some user company, was shouting into the phone and gesturing angrily. From what I could hear, it seemed some crucial network component back at the office had gone on the fritz, and the poor guy was the only person in the company who knew what was wrong. He was demanding that whoever was on the other end of the line get the vendor out to the site and fix the @%!$% thing.

I felt bad for the guy. A few feet away from him stood the doors to a computer Disney World, a place where E-mail always reaches its destination, packets always switch and everyone goes home at 5 p.m. On stage at a vendor booth, the accountant in Tucson, Ariz., was sharing the document with the manager in Philadelphia while both cracked jokes and marveled at how easy it all was. Shows started every half hour.

Meanwhile, the real world went on outside. Corporate users attempting to connect their network operating systems were foiled by the fact that the CEOs at the two most important companies in the PC industry hate each other. The dominant user interface on the desktop continued to be based on a model designed in the early 1970s and commercialized nearly 10 years ago. Open systems were open only so long as you used one vendor's open system.

The juggler with the knives would have had a hard time making a joke out of that one. Pass the popcorn.

Gillin is *Computerworld*'s editor. His MCI Mail address is 575-4120.

Workplace Shell

CONTINUED FROM PAGE 37

The product offers users two different ways to look at information — folder views and directory views. Folder views let users organize objects in the way that best suits how they work. Directory views let them look at and change data on their hard drives.

One drawback to the shell now is that there is no software development kit that lets DOS developers rewrite existing or new applications that fully exploit some of the new shell's sexier features.

At Comdex, Personal Software Products President Lee Reiswig said the company is considering offering a development kit, but he declined to say when that decision would be made.

Helping hand

Some of the technology used in the product was licensed from Paper Software, Inc., a small start-up in upstate New York. Earlier this year, the company shipped Version 2.01 of its Sidebar product, which was designed as a Windows shell.

Despite Sidebar's object-oriented look and feel, it takes up a scant 250K bytes of memory, compared with the several megabytes required by OS/2 Workplace Shell.

OLE support penned into Windows report writer for PC, SQL databases

By Michael Vizard

ReportSmith, Inc. launched last week at Comdex/Fall '93 the first Windows report writer for SQL and PC databases that will support Object Linking and Embedding (OLE) 2.0.

As one of the first traditional information systems tools to support OLE 2.0, the latest version of ReportSmith seeks to bridge the gap between traditional PC applications and report writers for databases, the San Mateo, Calif., company said.

To accomplish this, ReportSmith 2.0 will allow users to click on an icon to create a report using SQL. To create compound documents, that data can then be integrated with word processing and spreadsheet applications in Microsoft Corp.'s Office suite that support OLE 2.0.

For example, the Department of Environmental Protection for the state of Maine is using ReportSmith as an end-user query tool for accessing Microsoft's FoxPro databases running on a Novell, Inc. NetWare server and SQL databases from Oracle Corp. running on a Digital Equipment Corp. Ultrix system.

No need to know SQL

"Basically, it allows our users to generate reports on specific topics from their Windows system without ever having to touch a keyboard. ReportSmith provides a common report writer to 95% of our databases and takes away having to know SQL from the users," said Wayne Gallant, systems team leader at the state agency.

With the arrival of Version 2.0, Gallant said, he will start investigating how to better integrate those reports with PC applications via live links created using the Basic derivative from ReportSmith to drive OLE 2.0 and Dynamic Data Exchange (DDE) protocols.

"We'll be looking at OLE and DDE down the road. Right now, we don't have enough experience to work with them yet," Gallant said.

The new version of ReportSmith *now supports OLE 2.0, which should enable PC users to generate reports from within Windows applications*

He said in the short term his agency will take advantage of two other features that are included in the new release. One of those features is improved support for creating labels; the other is the ability to do subqueries on tables that occur in multiple places in a database, a key element for Gallant.

Priced at $299, ReportSmith 2.0 also includes support for cross-tab reporting, default report formats and a draft mode that allows users to preview a report. It is scheduled to be available next month.

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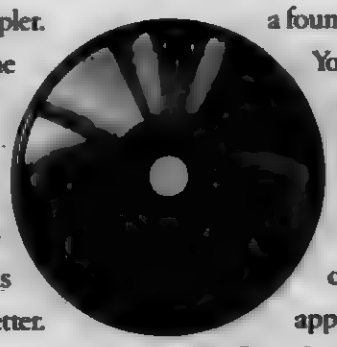

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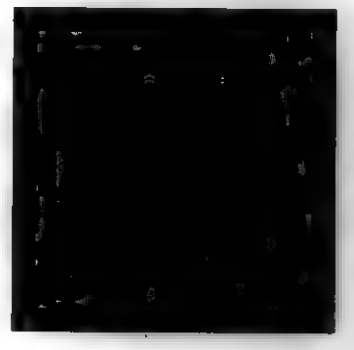

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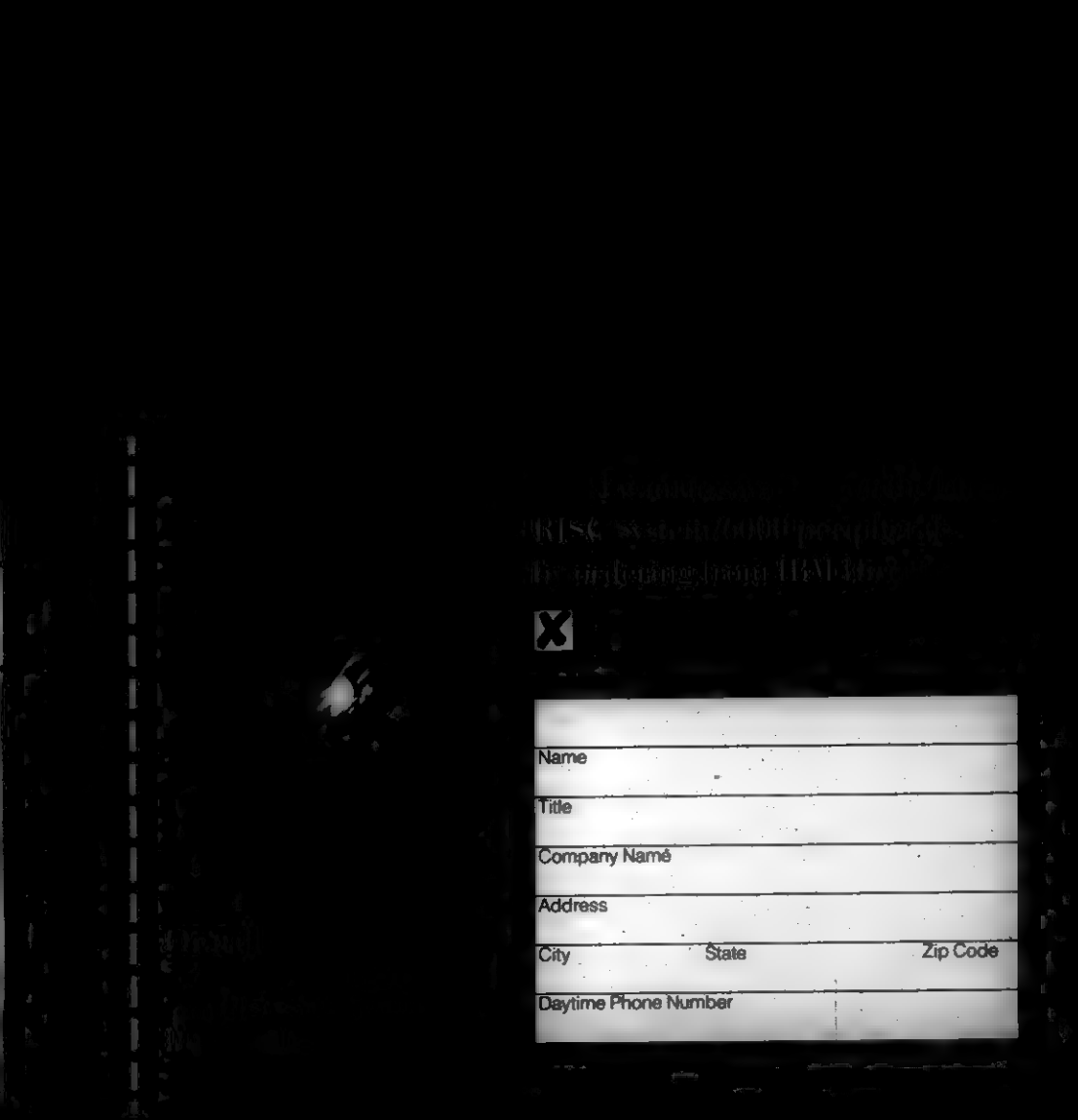

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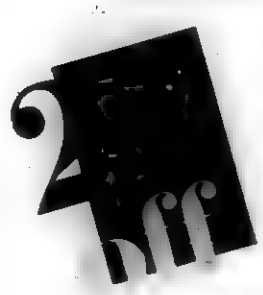

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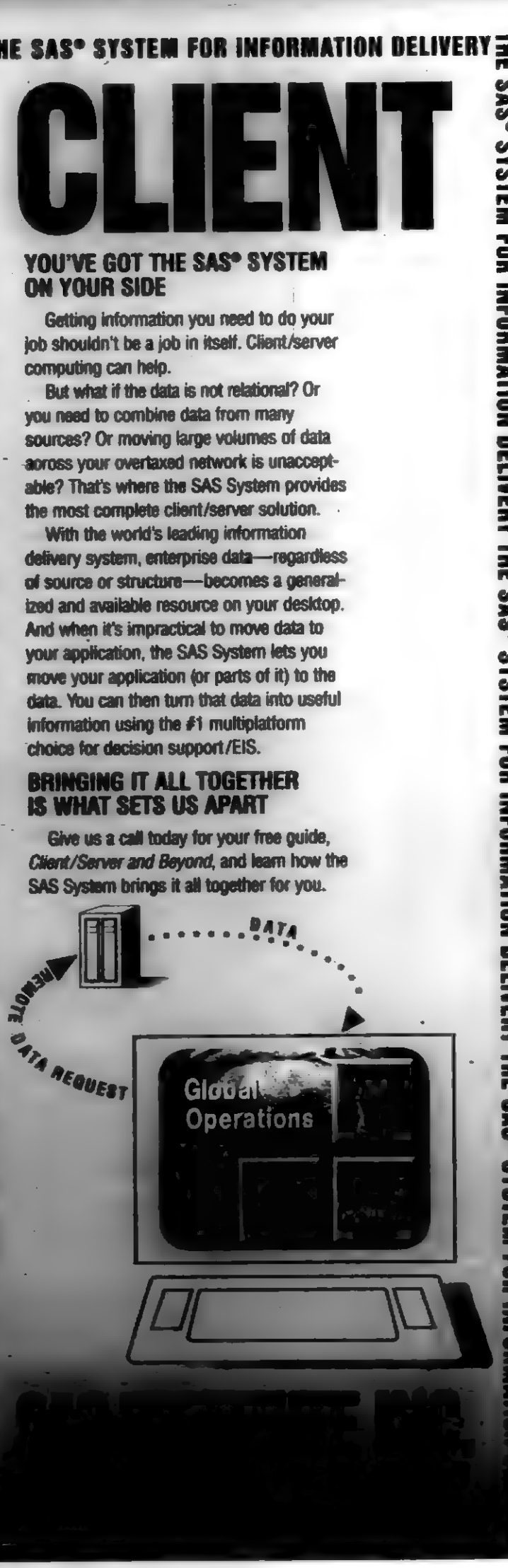

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Carole Patton

OS/2 moves out — alone

With its installed OS/2 user base approaching 3.5 million, IBM can legitimately hoist a blue victory flag over the high-end PC desktop market. But how to apportion this success? Is it due to OS/2 alone or to OS/2's ability to run Windows? IBM will soon release a version of OS/2 2.1, code-named Ferengi, *without* the Windows code — and we'll all find out.

In the IBM vs. Microsoft desktop war, Ferengi (which will be tagged "OS/2 Special Edition" or something similar when it hits the street) represents a critical turning point. In May 1992, when OS/2 2.0 shipped, corporate America still did most of its computing on machines with 2M bytes or less of RAM, an amount insufficient to cope with OS/2's hefty 8M-byte minimum requirement.

At the same time, third-party developers, cashing in on the Windows boom, gave little thought to OS/2. Short term, with few native applications, IBM banked on OS/2's ability to run Windows and DOS programs to keep its advanced, 32-bit operating system alive and viable.

But now IBM must expand its OS/2 user base. And Ferengi, due out this month, may well do the trick. The strategy is based on simple economics: Ferengi will contain no Windows code, but it will interact with Windows 3.1 just as if it were OS/2's embedded Win/OS code. Users will continue to run DOS and Windows applications, but Ferengi will sell for around $39, well below the current retail price for OS/2.

More importantly, sales of preloaded OS/2 could rise dramatically once PC manufacturers realize they won't be paying Windows royalties twice (once for Windows and once for OS/2's Win/OS).

And there's yet another surprise up IBM's sleeve. It's a neat little peer-to-peer version of OS/2 that's still in beta testing. This product requires just 8M bytes of hard disk real estate.

Both Ferengi and peer-to-peer OS/2 should quickly move IBM's operating system onto more desktops. But what Big Blue needs most to win the operating system war is native 32-bit OS/2 applications. Most Windows developers are planning to move their 16-bit applications to Microsoft's Win32s, and these programs just won't run under 32-bit OS/2. Win32s represents a compatibility fork in the Windows-OS/2 evolutionary path. Choosing OS/2 instead of Windows could soon mean taking "the road less traveled."

Or will it? IBM is making a stand. OS/2 has been given an evolutionary plan of its own, leading directly to the new world of objects. All that's needed now is a couple of great software packages to help increase OS/2's retail appeal. Perhaps good word processors like Ami Pro for OS/2 or WordPerfect 6.0 for OS/2, which are both due to ship soon. Or perhaps the upgrade to 1-2-3 for OS/2 and Freelance for OS/2 (both due from Lotus in the first quarter of 1994) will do the trick.

Nice utilities

OS/2 already has some nice utilities, many from small developers. There's Deskman/2, an invaluable helper from Development Technologies, Inc. in Forest Acres, S.C. It's invaluable because each object on the OS/2 desktop has settings (like copy and delete) that are not available elsewhere.

Then there's Golden CommPass, a communications program for automating access to CompuServe. In its first iteration, this program locked up my system on more than one occasion. But its developer, Creative Systems Programming in Mount Laurel, N.J., made the needed fixes, and the latest version (2.1) looks good.

More OS/2 goodies are emerging every day. The latest, CursorPower for OS/2 from North Shore Systems, Inc. in Incline Village, Nev., lets you resize (and redesign) your cursor.

Now, anyone care to guess what "Ferengi" really means?

Patton is president of the Mendham Technology Group in Mendham, N.J., which produces Client/Server summits for corporate strategists. Her MCI Mail address is 401-4869.

Briefs

Ministor PCMCIA products

Disk drive maker **Ministor Peripherals Corp.** announced that CompUSA will carry its line of PCMCIA products.

PCs in the U.S.

Advanced Logic Research, Inc. will supply **Siemens Nixdorf Information Systems, Inc.** with PCs, including the Intel Corp. Pentium-based ALR Evolution VQ, for sale in the U.S.

Pen-based computers

Texas Utilities Electric in Fort Worth, Texas, will use **Fujitsu Personal Systems, Inc.** PoqetPad Plus pen-based computers as part of a project to automate work crew timekeeping and job-tracking data collection.

CAD manufacturing

AutoDesk enters new market

By Ellis Booker

Despite leading the PC-based computer-aided design (CAD) market with AutoCAD, AutoDesk, Inc. in Sausalito, Calif., has so far struggled to crack the manufacturing market.

That could change with a AutoCAD companion product introduced with much fanfare earlier this month at the Autofact trade show in Chicago.

Called AutoCAD Designer, the three-dimensional solid-modeler is aimed specifically at manufacturing engineers responsible for designing parts. A so-called "associative" design tool, Designer permits users to modify drawings and have these changes dynamically updated on a detailed manufacturing diagram or vice versa.

The "CAM" side

Analysts said Designer finally addresses the "CAM" side of AutoDesk's computer-aided design/computer-aided manufacturing (CAD/CAM) product line.

However, migrating users from two-dimensional to 3-D design tools is still a "big step," said Joel Orr, chairman at Orr Associates, Inc. in Virginia Beach. AutoDesk officials agree but said because the tool works within AutoCAD Release 12 — AutoCAD now leads the PC-based CAD/CAM market with nearly 1 million users worldwide — the transition will be much easier.

"In the past, design tools of this quality were either out of the price range of most customers or too complex," said Ken Spenser, general manager at AutoDesk Mechanical Division. "Now, 3-D design and manufacturing is no longer for the few."

In the future

The first release of Designer does not handle part "assemblies" used in complex manufactured machines such as cars and lawnmowers. Future versions will be able to handle these items, AutoDesk officials said. The current product is "capable of modeling 80% of the objects you'd find in a garage," they added.

Designer will be available in the first quarter of next year for $1,500. It requires an 386/486-based PC running DOS 3.3 or higher with a minimum of 8M bytes of RAM and 5M bytes of hard disk space.

As part of the Designer announcement, AutoDesk released the next version of AutoSurf, its surface-modeling tool for AutoCAD.

Like Designer, AutoSurf runs within AutoCAD Release 12 and will be available in the first quarter of 1994 for $1,500.

Comdex products

Canon Computer Systems, Inc. introduced the BJ-10Sx, an enhanced performance, lighter-weight model of its Bubble Jet printer.

According to the Costa Mesa, Calif., company, the printer features a 1.9-in. profile, weighs 3.7 pounds and delivers 360 dot/in. laser-like output. It is 30% faster than its predecessor.

The BJ-10Sx can operate with either AC power or an optional battery pack that lets users print up to 40 pages from a single charge.

The product employs a high-resolution 64-nozzle print head that produces 360 dot/in. resolution on letter and legal-size plain paper, envelopes or transparencies.

The BJ-10Sx costs $349.

▶ *Canon Computer Systems*
(714) 438-3000

Dolch Computer Systems introduced the PAC-586, a Pentium-based portable computer.

According to the Milpitas, Calif., company, the PAC-586 delivers 47 MIPS and comes standard with five full-length slots and 275W of system power.

The platforms can accommodate a combination of three drives to include a floppy drive, a hard drive up to 1G byte in size and a 5¼-in. drive such as a CD-ROM drive, the company said.

The product is available in XT/AT bus configurations with Pentium processors running at 60 and 66 MHz.

PAC-586 pricing begins at $6,000.

▶ *Dolch Computer Systems*
(408) 957-6575

Leading Edge Products, Inc. has added advanced features to its WinTower 486 and WinPro 486E line of PCs.

According to the Westboro, Mass., company, the models are based on Intel Corp.'s 486SX/25-, 486SX/33-, 486DX/33-, 486DX2/50- and 486DX2/66-MHz chips.

The systems offer 4M bytes of memory, expandable to 64M bytes on the motherboard, and a socket for quick microprocessor upgrades.

Other features include 1M byte of video RAM (upgradable to 2M bytes), 64K bytes of external cache (upgradable to 256K bytes), FlashBIOS technology, five drive bays, four 16-bit XT/AT bus expansion slots, dual floppy drives, one parallel port, two serial ports and a mouse port.

The units also come equipped with a 200W power supply, keyboard and a mouse. Preinstalled software includes Microsoft Corp.'s Windows 3.1, DOS 6.2, Works for Windows, Money, Productivity Pack, Entertainment Pack 4 and the company's Utilities Control Center.

Prices range from $1,359 for the WinTower 486SX/33 MHz with a 170M-byte hard drive to $2,199 for the 486DX2/66 MHz with a 345M-byte hard drive.

▶ *Leading Edge Products*
(508) 836-4800

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But it's the Working Together® features of 1-2-3 that are redefining the spreadsheet. These unparalleled workgroup capabilities are not only improving the way people work with spreadsheets, they're improving the way people work with each other.

> *Users who often collaborate on developing and refining worksheet data...will find Release 4 indispensable.*
> PC/WEEK, 5/3/93

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The first level of Working Together is net-

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working. Every 1-2-3 package can be installed on the network right out of the box. No special version is required. And because 1-2-3 and all other Lotus Windows applications are mail-enabled, you can quickly and easily share your data with others on the network. And vice versa.

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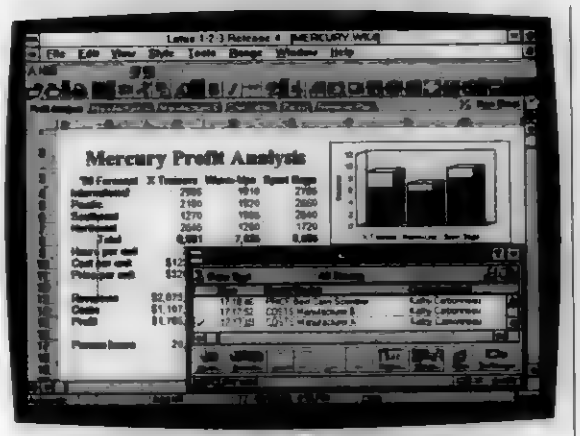
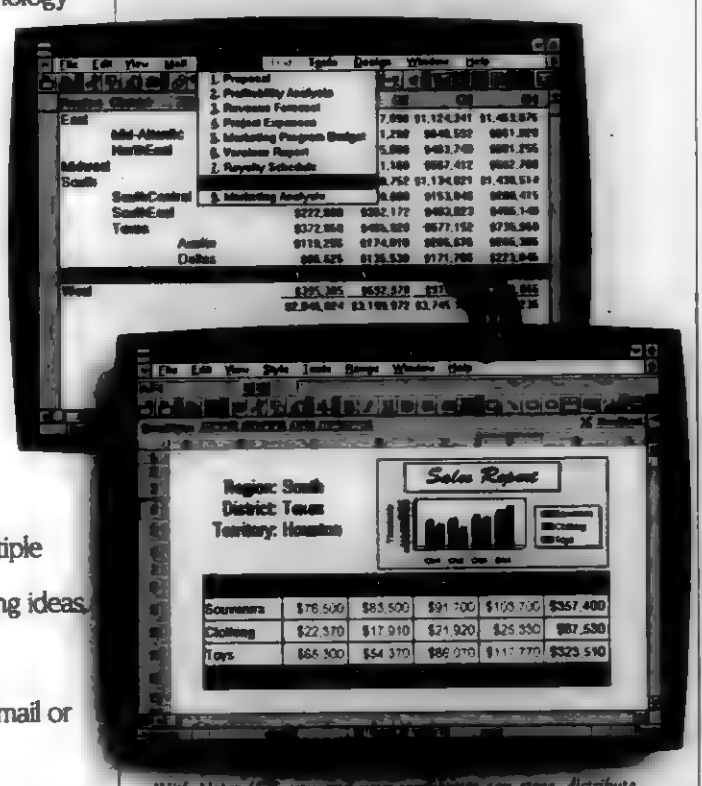


Version Manager lets each member of your workgroup know who made what changes to a file, when and why.



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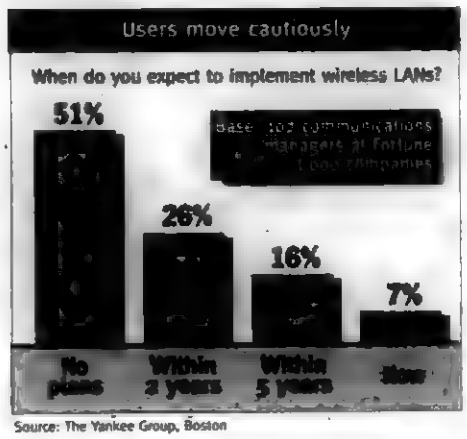
LAN group votes on wireless standard

By Stephen P. Klett Jr.

Users frustrated by the drawn-out wireless standards process recently got a boost following a meeting of the Institute of Electrical and Electronics Engineers, Inc. (IEEE) in West Palm Beach, Fla.



Source: The Yankee Group, Boston

In a move that brought interoperable wireless LAN products closer to reality, the 802.11 wireless LAN committee voted to base the forthcoming standard wireless media-access control (MAC) protocol on a proposal called DFW MAC that was submitted by Xircom, Inc., NCR Corp. and Symbol Technologies, Inc.

The goal of the protocol — which defines how wireless devices interact with a network — is to allow mobile users to roam freely throughout a building or campus while maintaining a continuous, seamless connection to network resources.

"This is definitely a milestone that will keep wireless going forward," said Lt. Fred Taylor, an engineer in the interoperability test center at the U.S. Air Force Command and Control Communications and Computer Agency in Scott Air Force Base, Ill. The center is testing various forms of

Wireless, *page 50*

DEC plans PC servers

By Craig Stedman

■ Digital Equipment Corp.'s PC business unit plans to introduce next spring a line of multiprocessor LAN servers in an attempt to become more competitive with the likes of Compaq Computer Corp. and IBM in that part of the market, where Digital has only a minor presence now.

The servers initially will be sold with up to four Intel Corp. Pentium microprocessors, said Lex Dekkers, a PC product line manager at Digital. But he added that the servers will also eventually support Digital's own Alpha AXP chips, a modular approach the company is also using on recently introduced DECpc XL single-user machines [CW, Nov. 8].

Other features planned for the servers include uninterruptible power supplies and support for redundant arrays of inexpensive disks, Dekkers said. Analysts noted that they also expect Digital to use advanced SCSI-2 storage and Error Correcting Code memory in order to match Compaq and IBM.

Single multis
Digital also plans to go the multiprocessor route at the single-user level next year. The company said dual-processor versions of its Pentium-based DECpc XL premium systems should be ready by springtime, the same general time frame targeted for the multiprocessor server rollout. Also in the pipeline for first-half release are slim-line desktop models of the DECpc XL.

Digital's existing LAN server, the DECpc 400ST, is limited to a single processor and will be 2 years old by springtime. "They definitely need some updating at the server end," said Randal Giusto, a PC analyst at WorkGroup Technologies, Inc., a consulting firm in Hampton, N.H.

Dave Yakerson, network administrator at Bridgeport Hydraulic Co., a private-sector water utility in Bridgeport, Conn., said the multiprocessor server plans sound intriguing, but he added that Digital first needs to "iron out some of the little bugs" in its desktop PCs.

"If their quality assurance could improve, and I'm not talking drastically, then I would trust them in putting in a real file server," he said. Yakerson, who uses AST Research, Inc. servers, said Bridgeport Hydraulic has had problems with floppy drive failures on Digital's desktop machines.

Steve Williams, network administrator at the Santa Clara Valley Medical Center in Santa Clara, Calif., said the minicomputer-like features expected to be provided with the upcoming servers could make it easier to down-

Multiprocessors, *page 48*

E-mail scheduling faces challenge

By Lynda Radosevich

While the main players in the PC-based electronic-mail market — Lotus Development Corp., Microsoft Corp. and WordPerfect Corp. — are jockeying to promote their mail-enabled scheduling programs, some users are finding that scheduling based on E-mail is not the best idea.

That is because scheduling packages that rely on E-mail are subject to its untimely store-and-forward nature. Updates to corporate calendars only happen as often as the E-mail post office exchanges messages. In companies that are downsizing from mainframe-based office packages, which operate in real time, the delay can be annoying.

Campbell Services *is promoting OnTime as an alternative to E-mail based schedulers*

Terry Sovil, a project manager at GE Capital Fleet Services in Eden Prairie, Minn., said one of the many benefits to any mainframe-based system is that data is always truly up-to-date because it exists only once. On the LAN, information resides on different servers, and the related delays in updating calendaring information can be troublesome, "especially if you are dealing with hectic schedules and rooms that are in demand."

To avoid such delays, Pfizer, Inc.'s U.S pharmaceutical group in New York decided to use a calendaring and scheduling package that allows meeting organizers to search attendees' calendars in real time and book meetings on the spot.

Pfizer evaluated "over a dozen" packages, including Lotus' Organizer, and picked OnTime Enterprise for NetWare from Campbell Services, Inc. in Southfield, Mich., for its real-time capabilities, said Todd Greeno, manager of internal consulting.

OnTime services are implemented as Novell, Inc. NetWare Loadable Modules rather than as E-mail extensions, and the system uses the NetWare Directory Services in NetWare 4.0, eliminating the need for multiple directories. Although it does not depend on E-mail for its transport, it can send meeting notifications to users via the popular E-mail packages, according to Campbell President Donald Campbell.

Although the E-mail-based packages Greeno tested allowed varying degrees of group searching, they did not have immediate access to calendar information, the ability to book meetings on the spot and security features that let users share calendar information without giving away details about their appointment, he said.

Despite the store-and-forward delay factor, GE Capital Fleet is leaning toward Lotus' Organizer as its group scheduling package to run on top of CC:Mail and Notes. One method to shorten the E-mail-related delay is simply to propagate E-mail exchanges more often, Sovil said. However, that increases the messaging network traffic, he added.

Checking up on the postman

To help manage an increased E-mail load, Uniplex Enterprise Systems Group in Greenwich, Conn., recently began shipping software that monitors E-mail systems through graphical representations of the mail network.

Called MailWatch, the software polls E-mail post offices to make certain they respond in a timely manner. If not, the software sends an alert to the E-mail administrator and changes the graphical representation of the post office from green to yellow or red. Pricing begins at $5,000; the software works with Lotus' CC:Mail and Microsoft Mail on Windows- and OS/2-based computers. —*Lynda Radosevich*

Cheryl Gerber

Very little flow in work flow

If work-flow technology is being used to automate business forms or alleviate the drudgery of serial processes in manufacturing — which it often is, to great effect — flexibility isn't an issue. But when work flow moves out of those static and predictable chores and enters the fluid, changeable realm of human processes, its rigidity *does* become a problem.

The question is whether developers can effectively build software to automate ad hoc human processes.

Looking at current work-flow products, it seems to me that this software is suited only for simple and predictable situations and probably won't ever acquire enough features to accommodate human nature.

Brownell Charlstrom, a leading work-flow consultant, is much more upbeat. While conceding that effective implementation of the technology has a long way to go, he maintains that "work flow is suitable for any place where human processes happen." What critics have to understand, Charlstrom says, is that "today's work-flow products are baby steps. Every product on the market is in Release One."

Among the deficiencies of the current crop is the complete lack of support for mobile computing. As far as I know, there is not one off-the-shelf or customized work-flow product that gives users the freedom to create a simple work-flow process on the fly and send it from a laptop. There is also no support for wireless computing. Given the growth of those two forms of computing and the fact that every day more business processes require participation from afar, this may be the most glaring problem of all.

But then there is also the highly proprietary, arcane nature of the work-flow development process. The fact is that every work-flow — and workgroup — vendor has its own proprietary scripting language, and the programming is done in two basic ways: with logic expression or drawing products. Only a few trained developers know how to program work-flow applications in these private languages. The lack of a standard, open method for programming these applications is a serious shortcoming. I'm not inclined to want to see another standards group form, but there might be a real case for one in this instance.

I'd also like to see more specific information in work-flow applications, something Charlstrom calls "easier process specification." For example, I don't just want to know how purchasing is handled in Company A, I want to know how purchasing in Company A is different from purchasing in Company B.

> **If work flow is going to automate human activities, the technology must be in the hands of the users.**

And how about more "If . . . then" options? For instance, what happens if the work-flow process is set up for Administrator A to send a document to Administrator X, but X isn't available? Work-flow applications today assume that everyone is static and routines never vary; that unpredictable human things don't happen.

Susanna Opper, a groupware consultant, likens the use of work-flow processes to The Nine Dot Puzzle, where the solution comes from connecting all the dots without raising the pen or going outside the nine dot area. There are lots of artificial constraints.

If work flow is going to automate real human activities, the technology must be in the hands of the users and must give them the ability to perform real functions as necessary, no matter where they are. They shouldn't have to know a difficult, private language and Boolean algebra to automate a new idea in an ad hoc process.

If work-flow vendors don't make the technology less arcane and more accessible, they can expect to be pushed aside by the likes of Microsoft and Apple, which plan ad hoc work-flow type functionality in Cairo and the Open Collaboration Environment. And they better move quickly, because they probably have less than a year to prepare for that competition.

Gerber is a free-lance technology writer based in San Francisco. She can be reached on CompuServe at 73142,64.

Storage business

Digital adds NetWare

By Craig Stedman

Digital Equipment Corp.'s storage business unit recently expanded its StorageWorks line for non-Digital platforms, introducing a series of products that support Novell, Inc. NetWare v3.11 clients and servers. It also added more models for use with Sun Microsystems, Inc.'s systems.

Digital released an initial set of Sun products last summer in its first storage foray beyond its own customer base.

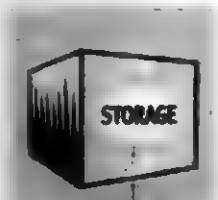
The company now is marketing desktop and deskside subsystems, optical jukeboxes and a redundant arrays of inexpensive disks (RAID) unit for both the NetWare and Sun environments.

Most of the products introduced earlier this month are shipping now, Digital said. The company is trying to entice NetWare and Sun resellers to sign on to market its devices, although it has not yet disclosed any agreements along those lines.

Digital has high hopes for the off-base storage business, and J. Michael Casey, vice president of storage research at Computer Intelligence/InfoCorp in Santa Clara, Calif., said the breadth and modularity of the company's product line are points in its favor.

High competition

Pricing for StorageWorks is also "relatively aggressive," Casey added, but he noted that competition is heavy in both the NetWare and Sun storage markets. Digital's sales in those markets are unlikely to approach the size of the business the company gets from within its customer base, Casey said.



Solutions

All of the StorageWorks for Sun products except Digital's RAID Array 110 support both SunOS 4.1.3 and the newer Solaris 2.x operating system. The RAID unit, which was originally scheduled to ship last summer, is compatible only with SunOS at first. Solaris support is scheduled to be added in early 1994, Digital said. The array scales from 56 bytes of disk storage to 600 bytes on a single controller.

Fara Yale, an analyst at Dataquest, Inc. in San Jose, Calif., also had words of praise for Digital's technology and pricing.

However, the attempt to build up indirect channels requires a major investment, and Digital still needs "to prove that its commitment is truly long term," she added.

Digital officials said the company is looking to expand the StorageWorks line to other platforms early next year.

Sources indicated that Apple Computer, Inc.'s Macintosh line and Hewlett-Packard Co.'s HP 9000 Unix systems are likely to be among those targeted by the company.

Briefs

IBM works with ICL

ICL and IBM announced an agreement under which ICL's Search Accelerator, a specialized package of hardware and software designed to off-load parallel searches of relational database tables, will be available for the IBM RS/6000 line of Powerservers.

Platinum expansion

Hewlett-Packard Co. and Platinum Software Corp. announced a marketing agreement under which Platinum's Sequel to Platinum financial accounting product is being made available on HP 9000 workstations and servers. In a similar agreement, Platinum and Sun Microsystems, Inc. said the Platinum package is now available on Sun SPARCserver systems.

ASK, Sun expand deal

The ASK Group, Inc. has expanded its partnership with Sun by adding a series of worldwide cooperative technology, marketing and sales programs.

Maestro ported to NCR, Sun

Unison-Tymlabs ported its Maestro for Unix networked work-load management software to NCR Corp. and Sun platforms.

Multiprocessors

CONTINUED FROM PAGE 47

size off VAX/VMS machines and switch more operations to Novell, Inc. NetWare LANs.

The hospital has two of the 400ST servers, and Williams said he would likely stay with Digital as a supplier as long as the new machines have competitive prices.

"They're always a little bit late compared to AST or Compaq, but they get there," he said, speaking for himself and not on behalf of the medical center.

Chuck Venter, a Meta Group, Inc. analyst in Westport, Conn., said Digital's service capabilities could help get it accepted as a viable LAN server vendor. "IBM exploits that when it does things right, and I think that's something Digital can also use to its advantage to move forward," he said.

A long way to go

Venter added, however, that Digital still faces a tough haul to get its name on the list of companies that users routinely consider for server buys. He said users outside of Digital's installed base mainly think of Compaq and IBM when it comes to servers.

Giusto noted that Digital will have to try to find a way to keep its servers from being viewed as a me-too answer to Compaq's ProLiant family.

"It's going to be difficult to differentiate beyond the Alpha capability, and in users' minds, Alpha is still a big question," he said.

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Wireless

CONTINUED FROM PAGE 47

wireless technology for applications such as video teleconferencing.

Taylor said a standard MAC protocol was particularly good news for sites such as Scott Air Force Base, which buy mostly off-the-shelf products instead of developing their own. "It definitely will make things easier for us," he said.

Xircom, NCR and Symbol had been pushing their own separate but similar protocols for standards consideration but agreed to combine their technologies in hopes of speeding up the standards process. This cooperation was a primary reason why DFW MAC beat out competing proposals, including one from IBM.

DFW MAC is based on Xircom's Netwave MAC technology, which Xircom submitted to the IEEE for standards approval in September. DFW stands for Dallas Fort Worth, which is where the three companies drafted the proposal.

While a formal standard is still roughly two years away, 802.11's adoption of the proposal enables vendors to begin developing interoperable wireless LAN products. Users should start seeing products conforming to the standard that run on various physical layers, such as direct-sequence, spread-spectrum radio and infrared, by the middle of next year.

Other users said they were more interested in a communications standard.

"A MAC standard is nice, but right now the biggest standard for us is in the communications area — setting a standard for wireless transmission speeds to help cut out interference," said Joe Potocny, MIS director for the city of Mission Viego, Calif. However, Potocny said the MAC standard could be more significant for the city in a year or two, when it plans to integrate mobile users.

A wireless pioneer, Mission Viego installed Motorola, Inc.'s Altair Plus wireless LAN in 1991 to support the municipality's 90-plus users. By going wireless, Potocny said he was able to eliminate 80% of the city's network cabling and 90% of its network problems, which he blamed mostly on wiring connections and cabling distances.

Cost still high

Analysts said cost was still a major hurdle for wireless MAC. The Yankee Group estimates the average cost of installing a wireless LAN at $1,170 per user, compared with $760 and $880 for Ethernet and Token Ring LANs.

Analysts said a standard MAC protocol was necessary but downplayed its impact. "Essentially, it's a window dressing, but it ensures users of some level of compatibility," said Dave Mack, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "It's not going to turn on the manufacturing faucet overnight."

Analysts cautioned that standards are never a onetime issue and that users should not be surprised to see a new set of standards developed a year from now or significant modifications made.

Proponents of the standard acknowledged that there was still a long road ahead. "We're not asserting that this is 'the standard' because it's not written in stone yet.... Other companies can still contribute and tweak it," said Phil Belanger, director of marketing for wireless products at Xircom in Calabasas, Calif., and a co-author of the protocol. "However, it does lay a foundation that will allow us to move ahead faster."

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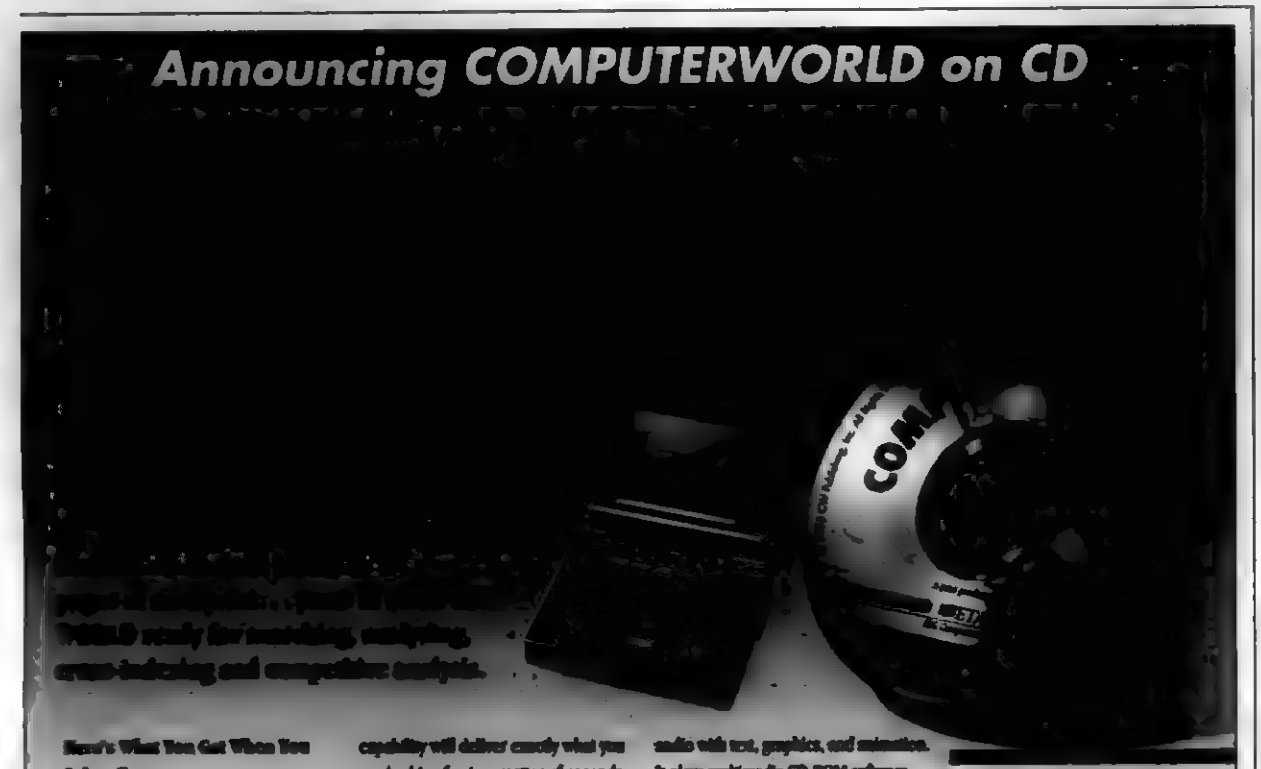

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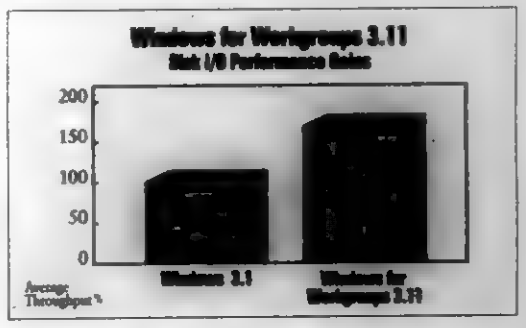

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Intel, Unisys Said to Plan to Develop Commercial Uses of Parallel Processing

Intel Corp. and Unisys Corp. are teaming up in the race to develop a form of high-performance computing power known as parallel processing for the commercial market, industry officials said.

Intel and Unisys declined to comment.

Their development agreement, which is scheduled to be announced today in Santa Clara, Calif., is an attempt by [illegible] the building blocks currently [illegible]

to bear fruit until 1995. And it will face stiff competition from others who have already entered the market or are planning to soon. Among larger companies, that includes International Business Machines Corp., which is planning to [illegible] parallel entry by year end.

One parallel-computer [illegible] always focused on [illegible] in Teradata, [illegible] Tolephone & [illegible] has done. [illegible]

Parallel box draws near

IBM is essentially on schedule with its Enterprise System/9000 parallel processor announcement set for later this year, a company executive said last week. But the unveiling will likely take place in October — or even later.

The machine, intended to handle complex database queries and off-load that [illegible] from the regular mainframe, will be [illegible] many as 50 processors in [illegible]0. It will con[illegible]

THE PARALLEL UNIVERSE GROWS

Unisys, Intel, and IBM are moving into "alternative mainframes"

If two heads are better than one, why not a dozen? Or 50, or 100? That's the latest thinking in the commercial data processing market. For 40 years, mainframers such as IBM and Unisys have struggled to build the fastest single computer possible. But now they're bumping into fundamental physical limits, making each new speedup terribly expensive. So, the commercial mainframe industry, like supercomputers before it, is turning to parallel processing, ganging together cheap microprocessors [illegible] computing [illegible]

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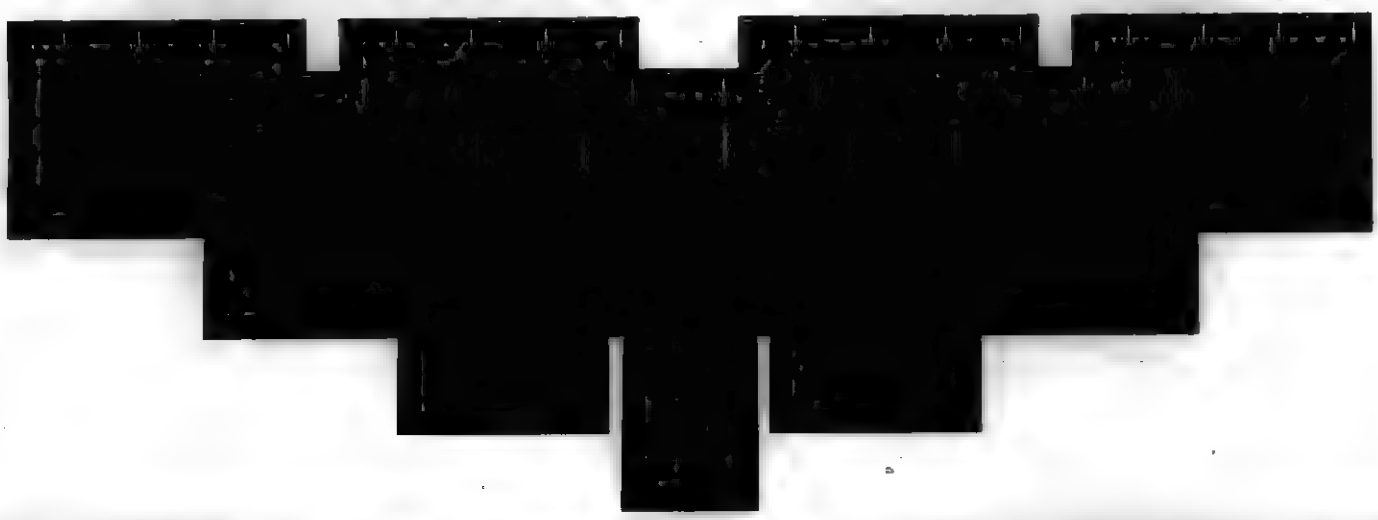

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Lawnmower maker cuts an EDI path

By Thomas Hoffman
MINNEAPOLIS

The Toro Co.'s 1991 acquisition of Lawn-Boy, Inc. was strategically designed to help the lawnmower maker compete more effectively against John Deere & Co., Jacobsen and other players.

Toro furthered those efforts this year by adding finished-goods satellite warehouses to improve shipping cycles of its lawn and turf products, snowblowers and irrigation equipment to mass merchants such as Wal-Mart Stores, Inc. and The Home Depot, Inc.

Toro's Steven P. Hansen: *Business users need more access to information*

Now the $684.3 million firm is building on those efforts with a strategic initiative to establish electronic commerce connections, including electronic data interchange (EDI) capabilities, with its customers, according to Steven P. Hansen, Toro's director of information services.

"For mass merchants, electronic commerce is an invaluable requirement," said Raymond E. Cabillot, a consumer products analyst at Piper Jaffray, Inc., a Minneapolis brokerage house.

"EDI is becoming more of a necessity because the larger companies like Toro don't want distributors calling them about price changes. They'd rather receive those changes in an electronic format or in real time," Cabillot said.

Rather than implementing wholesale changes to its electronic networks, Toro is taking a pragmatic approach to its system redesign. Toro has suffered from weak financial performance during the past few years due to poor market conditions for consumer durables. This situation has forced the company to restructure, keep its allocations for information systems flat and limit its development of PC and LAN systems, Hansen said.

In fact, Toro installed its first electronic-mail system only last January to support communications among its 1,200 manufacturing staffers.

"Management has historically been conservative in administrative and MIS spending," said Hansen, who joined the company five years ago after heading up application development for operations and logistics systems at Pillsbury Co. Besides, Toro has only a 70-person IS staff serving 4,000 corporate users, so it can ill-afford to distribute the bulk of its resources to retrofit its IS, Hansen noted.

Instead, the company is overhauling its finished goods distribution management system one piece at a time. "We need to enable our business users to have much more access to information than they have now. Our information is not nearly accessible enough today, but we plan on taking an evolutionary rather than revolutionary approach," Hansen said.

Changing times

Toro's operations, including its finished goods distribution management system, operate on an Amdahl Corp. 5890-300E plug-compatible mainframe running Cobol-based IBM CICS and IMS batch applications. The finished goods distribution system is being modified to incorporate EDI for electronic commerce with its pri-

Lawnmower, *page 58*

Messaging users switch to RISC servers

By Lynda Radosevich

■ Faced with PC-based electronic messaging servers that don't scale well, users are increasingly turning to RISC-based hardware to run their messaging systems, according to some users and industry watchers.

The move is driven by the fact that electronic mail is becoming the enterprise-wide platform for other applications, such as forms routing, process automation and group calendaring and scheduling. The switch to bigger servers is necessary to provide performance, reliability and a single point of administration, observers said.

"Scalability, redundancy and reliability are big messaging issues. We have to find a way to solve the network systems management problem, and we certainly can't do that with DOS or Windows PCs," said John Gustafson, information technology specialist at 3M Corp.

The advantages that bigger servers have over PC servers — a capacity for larger databases, more memory, better performance and fault tolerance — are not unique to E-mail, but they can significantly enhance E-mail operation.

For instance, WordPerfect Corp. announced at Comdex/Fall '93 a version of its Office messaging software that works as a Novell, Inc. NetWare Loadable Module on Hewlett-Packard Co.'s PA-RISC computer. The midrange version of the RISC station can manage an estimated 500 users and 20 messages per second vs. 250 users per post office and one message per second on a DOS-based 486 computer, according to a WordPerfect engineer.

BellSouth Telecommunications, Inc. in Birmingham, Ala., found that Lotus Development Corp.'s DOS-based CC:Mail post office servers can handle only a couple hundred users per server before speed performance dips below an acceptable level, according to Julie Ferris, a BellSouth strategic planner.

"One division's CC:Mail base went from 1,000 to 3,000 users, and the management issues they are dealing with now are almost killing them," she said. The issues include the technical and

RISC, *page 56*

The great divide

Observers said they expect the messaging-server market to divide into lower-end and higher-end servers, just as the router market did a few years ago. At the higher end are messaging servers for corporate backbones running on RISC-based machines, such as those from SoftSwitch, HP and Digital.

At the lower end are upcoming messaging servers such as Lotus' Communication Server (LCS) and Microsoft Corp.'s Enterprise Messaging Server (EMS). The LCS, for example, will run on the major Unix operating systems, and the EMS will run on NT. However, analysts said these LAN servers will likely be Intel computers rather than RISC machines. That is because they expect the Lotus and Microsoft servers to be used in small to medium-size messaging network segments.

Apple makes Newton announcements

With 170,000 road warriors milling about Comdex/Fall '93, Apple Computer, Inc. thought it was time to announce a bevy of developments regarding its portable Newton MessagePad. They included the following:

▶A staged introduction of NewtonMail will commence immediately, with full commercial release in the next 60 days. A recently launched test pilot will be followed by a limited commercial release to Newton users who sent in response cards packaged with the MessagePad.

NewtonMail enables Newton users to exchange text messages with those on CompuServe, America OnLine, MCI Mail, AppleLink, SprintMail and EasyLink, as well as other online services accessible via the Internet. General availability will begin in early 1994. Fees will start at $6.95 per month.

▶The Newton Connection Kit for Windows began shipping last week. The application enables information to be exchanged between Windows-based PCs and the Newton MessagePad. The package costs $165.

▶Also shipping is the Fax Modem Card, which allows users to communicate via NewtonMail and other on-line services and to send faxes anywhere. The retail price is expected to be about $220.

▶Apple also announced an agreement with Megahertz Corp. in Salt Lake City to produce a PCMCIA modem for the MessagePad. The modem will slide into the Newton's PCMCIA slot to give it fax capabilities.

▶Also displayed was a new family of remote access products. The $1,799 Apple Remote Access Multiport Server, $249 Remote Access Personal Server and $69 Remote Access Client allow users to access information and services over a variety of connections, ranging from telephone lines to cellular phone links. Apple will also deliver a remote access client for Windows early next year.

—James Daly

Net server speeds the answers to FAA planners

By Elisabeth Horwitt

Sometimes the simplest way is not the best way, as the Federal Aviation Administration's Aviation Capacity Branch has discovered.

The branch, residing at the FAA's Technical Center in Atlantic City, uses an IBM 3090 mainframe to run complex simulations of airport traffic scenarios under a variety of conditions. The results of those simulations are fodder for a series of comprehensive studies that analyze current airport and airspace conditions.

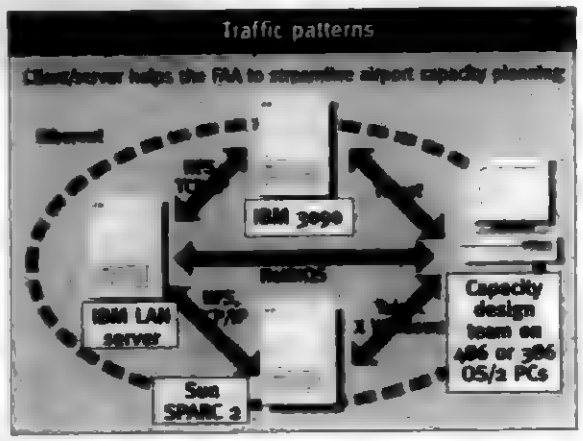
Airport management and commissions also use them to plan for aircraft capacity and flight volume in the future. The studies factor into account every conceivable factor and condition and take between six months and two years to complete.

However, staff productivity was suffering because of a traffic bottleneck created by the 2.4K bit/sec. modem links between the center staff's PCs and the mainframe, according to Andy Lamb, computer specialist at the Technical Center.

Paper chase

The staff would end up poring over a printout of the simulation's results, which would use between three pages and a whole box of printout paper, depending on the simulation program, how long the simulation was running and what printer options were available, Lamb said. They would then have to manually reenter the data into a PC-based spreadsheet program for analysis, Lamb said. This method was time-consuming and vulnerable to entry errors.

The original plan for addressing the situation was to get a faster modem: say 9.6K bit/sec. However, this would only provide a slight throughput improvement and did not address the printout and manual input limitations.



Instead, the center set up an IBM LAN Server on OS/2 that communicates with the mainframe and with a Sun Microsystems, Inc. SPARC 2 workstation, using Sun's Network File System (NFS). Users can copy files from the mainframe to their own PCs or to the Sun system across drives on the LAN Server. They can also use the X Window System to view graphics scenarios on the SPARC 2. All of the systems are connected via TCP/IP over a 10M bit/sec. Ethernet with network interface cards supplied by CNet Technology, Inc. in San Jose, Calif., and 3Com Corp. in Santa Clara, Calif.

Under the new system, users can create simulation input files on a server drive then tell the mainframe, over a TCP/IP Telnet link, to access those files and run the simulation. The output files of the simulation, which typically are about 2M bytes, can then be downloaded to the LAN Server via NFS over Ethernet in about 20 seconds, compared with the two hours it took over the 2.4K bit/sec. modem link, Lamb said.

Users can copy the files from the mainframe's M drive to the Sun workstation's N drive on the LAN Server then use the Telnet link to the Sun workstation to "fire up a graphic simulation" and view it over an X Window connection, Lamb said. The simulation is animated, showing airplanes taking off, landing and taxiing to the gate, he added.

From an hour to 30 seconds

Furthermore, rather than getting a whole printout of the simulation results, the user can copy the relevant pieces directly to a Lotus Development Corp. 1-2-3 spreadsheet, Lamb said. This reduces the time it takes to load the numbers from an hour manually to about half a minute electronically, he added.

The Aviation Capacity Branch has also upgraded its users from 386-based PCs with 4M bytes of RAM to 486-based PCs with 16M bytes of RAM. In addition, the center installed Lotus 1-2-3 on the Sun workstation so that if users' spreadsheets overload their local PCs, they can copy and paste the spreadsheet from their workstations to the Sun system in an X Windows system then run the program on the SPARC 2, with its 128M bytes of RAM, Lamb said.

The end result, Lamb said, is that the capacity teams will be more responsive and accurate in the reports they send to the FAA Capacity Office in Washington and to airports under study. "We suggest alternatives; it's up to the airports what to do," he noted.

ON SITE

Federal Aviation Administration
Atlantic City, N.J.

Challenge: To find a more efficient, less error-prone way for airport capacity design team members to download and analyze the results of air traffic simulations.

Technology: Cabletron Systems, Inc. hubs, IBM LAN Server, OS/2 workstations, Sun SPARC 2 graphics workstation, TCP/IP, Telnet and Sun's NFS communications protocols.

Results: Cut total time for downloading simulation results from hours to seconds; eliminated manual reentry as a potential source of error.

Massively parallel processors

Clustering takes stage at supercomputer show

By Ellis Booker

While massively parallel processing (MPP) machines are gaining respectability as commercial computing platforms, advances are quickly being made in the science of logically configuring powerful workstations across extremely high-speed LANs.

IBM, Hewlett-Packard Co., Digital Equipment Corp., Silicon Graphics, Inc. and others demonstrated this "cluster" approach to parallel computing at the recent Supercomputing '93 show in Portland, Ore.

Although clustering is appealing because it promises a scalable way to do parallel processing with existing hardware resources, MPP vendors pointed out it is limited principally by two factors: The available speeds of LANs and the "latency" problem, which refers to the idle time one processor spends waiting for an instruction or a piece of data to be delivered from another.

One exception among the MPP naysayers is John M. Harte, president of supercomputer company MasPar Computer Corp. in Sunnyvale, Calif. Harte would not dismiss the competitive threat and said clusters would indeed be suitable for some kinds of high-performance parallel computing. "For general-purpose jobs," he said, "MPP will run head on into the buzz saw of 200-MHz workstations connected by ATM networks."

Asynchronous Transfer Mode (ATM) was, in fact, the hot networking topic.

Booth displays

Arguably ahead on the clustering curve are partners Convex Computer Corp. and HP. They have announced hybrid systems for HP Apollo 9000 workstations linked to Convex supercomputers, and HP's cluster product runs specialized software developed by Convex. HP's booth featured four HP 9000s linked via a Fiber Channel Extended Industry Standard Architecture adapter board running a parallel application.

Also at the show, Convex announced a software environment and MPP development tools for its Exemplar scalable parallel processing system. Convex said the environment, which has a scalable operating system that is binary compatible with HP/UX, will ease the porting of off-the-shelf and custom applications to its supercomputers, which use HP's PA-RISC technology.

ATM trial
Demonstrating the possibilities of ATM, Scinet, the show floor data network at Supercomputing '93, used ATM as its backbone for the first time.

"The wonderful thing happening out there is that people are recognizing that legacy systems are out of gas," said Paul Koontz, director of marketing at the Supercomputer Systems Division of Silicon Graphics, Inc. in Mountain View, Calif.

On the other hand, nagging migration issues remain. Or as James R. Kasdorf, director of supercomputing at Westinghouse Electric Corp. in Pittsburgh, framed the problem: "Phase one is your legacy mainframe running Cobol. Phase three is an MPP running an object-oriented relational database. Phase two ... a miracle occurs."

RISC

CONTINUED FROM PAGE 55

administrative headaches of setting up mail and address list exchanges among many small post offices and losing messages because of the inability to track mail across so many servers.

To avoid these problems in the future, BellSouth has chosen an X.400 messaging platform based on HP's HP 9000 workstations and HP's OpenMail messaging software. It gives the company a scalable messaging backbone with centralized address and messages stores and management capabilities [CW, Nov. 25].

Faster migration

According to Terrence McCarthy, managing director at Neoteric, Inc., a messaging and workflow systems integrator in New York, users are moving much more quickly to RISC than expected, due in part to the increasing popularity of X.400-based messaging servers on RISC boxes from SoftSwitch, Inc., HP and Digital Equipment Corp.

"If you are using messaging as a critical service on which other services reply, you don't want that to go down. So in the same way you see these bulletproof machines used as file servers, you'll see them used as messaging servers," said Mary Petrosky, an analyst at The Burton Group's San Mateo, Calif., office.

Guess Who's Got The World's Most Popular TCP/IP Network Software For PCs?

If you guessed SunSelect™ and its PC-NFS® networking software, you're right. Every day more companies of all sizes – in the United States, Europe, Asia and beyond – are choosing PC-NFS software to connect PCs to their TCP/IP networks. Because SunSelect is a Sun Microsystems business, these companies know they're getting the product strength and support they need.

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Newspapers to go digital

By Gary H. Anthes

Two major papers are taking the black smudge out of the daily news.

Some of the news that is fit to print will soon be available electronically from *The New York Times* and *The Washington Post*. The *Times* said recently it will work with Nynex Corp. to develop an interactive fax service that will send news and other information to subscribers at times and places selected by users.

The prototype service will employ store-and-forward technology.

"The service will give subscribers the opportunity to receive articles on topics of personal interest, no matter where they happen to be at the time," said James A. Cutie, president of The New York Times Co.'s Information Services Group. About 1,000 customers will participate in the market test next spring, the *Times* said.

The *Times* and Nynex said they will work with fax equipment providers to develop the service and to develop a low-cost fax printer for home use.

The Washington Post Co. announced it was establishing Digital Ink Co., a subsidiary that will bring the *Post* to subscribers via fax, computer and telephone. One of the first offerings will be an online version of the *Post*, scheduled for debut next July. This will allow subscribers to communicate with one another and with newspaper staffers via electronic mail, according to the *Post*.

Electronic choices

The *Post* will roll out other electronic products based on its editorial pages and information from affiliated businesses such as *Newsweek* magazine, the company's broadcast and cable divisions and its Legi-Slate government information database service.

The products will combine text, graphics, photographs, moving pictures and sound. They will be available via computer, cable television and wireless communications devices, according to the *Post*.

Lawnmower maker

CONTINUED FROM PAGE 55

mary retailers. "Major logistical changes were needed to support mass merchandiser requirements like quick response," Hansen said.

Until 1991, Toro had served all of its North American distributors from one warehouse in Lakeville, Minn. But additional distribution channels for Toro products accelerated the company's need to set up satellite warehouses.

Toro programmers wrote the original EDI application in 1987. Now they are reworking that package to help Toro serve its wider distribution channels. Toro retailers have used the EDI system for parts ordering, but it was developed before EDI standards such as the ANSI X.12 standard had matured.

Speedy turnaround

The existing EDI system will be amended to include features such as invoices for parts replacement, which is currently paper-based. Hansen said invoices that have historically taken four to five days to turn around with customers will be processed overnight once the features are added to the EDI system.

The Toro-developed features will be aided by translation software called Gentran from Sterling Software, Inc. Hansen said Toro has committed $600,000 to the electronic commerce projects, with $500,000 to be earmarked for each of the next few years.

Toro's retailers are connected to the proprietary electronic commerce system via modem connections, Hansen said. He added that 75% of the company's orders are routed to them electronically. And as Toro adds EDI standards to the system, Hansen said he expects the company to expand its ability to send outbound invoices to retailers. Only a fraction of those are handled on-line today. Sterling also provides Toro with EDI transmission through its Ordernet service.

Hansen said the project is being overseen by an EDI executive review board, which includes the general managers of Toro's divisional business units. "Getting input from top management throughout the company is essential to the success of the project so that we're all on the same page in terms of making sure the system requirements are met," Hansen said.

He said the electronic commerce initiative is not intended to save costs but rather to improve Toro's service and responsiveness to its customers.

ON SITE

The Toro Co.
Minneapolis

Goal: To extend its existing electronic commerce system to meet inventory cycles of customers such as Wal-Mart.

Technology: Amdahl 5,890-300E mainframe; Sterling Gentran translation software; IBM CICS and IMS batch applications.

Anticipated benefits: Hundreds of thousands of annual paper invoices replaced by EDI connections.

[redacted]

Microdyne Corp. has unveiled the 3270 Workstation for Windows SNA Gateway, a Windows-compatible IBM 3270 emulator.

According to the Alexandria, Va., company, the product is a member of the SAA Solution family of hardware and software products for Novell, Inc.'s NetWare-based networks operating under IBM's Systems Application Architecture.

An object-oriented configuration utility that includes all the elements needed to set up a host session is provided.

A single-user license costs $395; a gateway license is priced at $6,995, the company said.

▶*Microdyne*
(703) 739-0500

Product short

Socket Communications, Inc. has introduced PageCard, a dual-mode wireless messaging device. PageCard combines a stand-alone LCD alphanumeric pager with a universal PCMCIA interface and can be used for automated business messaging. It interfaces seamlessly with electronic-mail, scheduling, spreadsheet and word processing software when used with send/receive messaging software for Windows. Cost: under $495. Socket Communications, Hayward, Calif. (510) 670-0300.

Briefs

Nextel gains Motorola licenses

Nextel Communications, Inc., a radio dispatch company with plans for broader services and markets, recently acquired more than 2,500 specialized mobile radio licenses in 21 states from **Motorola, Inc.** for $1.6 billion in stock. Nextel plans to combine the local Motorola systems with others it already owns to create a digital network for voice, data and paging services.

AT&T, Mead Data unveil news service

AT&T Easylink Services and **Mead Data Central, Inc.**, owner of the Nexis information service, have introduced a service that filters and transmits news stories to electronic-mail boxes or fax machines. The Pubcite service drops an electronic table of contents from one of more than a dozen general interest and technology trade publications into a subscriber's AT&T Mail E-mail box. Users pay an annual $26 subscription fee per publication and a $4.75 charge for each article they order.

Companies enter ATM market

Standard Microsystems Corp. and **Newbridge Networks** have teamed to develop Asynchronous Transfer Mode (ATM) products. Both companies can enter the ATM adapter, workgroup and enterprise switch markets with their own products.

FCC cites toll fraud liabilities

The **Federal Communications Commission** has proposed a comprehensive review of private branch exchange (PBX) and telephone toll fraud policies that holds customers liable for losses. Commission members suggested that manufacturers and carriers have an obligation to provide more information to customers about the possibility of toll fraud, which caused an estimated $4 billion in losses last year.

ATM specs and trials emerge

Bellcore, the research arm of the seven regional Bell operating companies (RBOC), has issued requirements documents for the RBOCs' deployment of ATM permanent virtual circuit services. Permanent virtual circuits require users to know with whom they will be communicating in advance and "nail up" communications links with those sites. Subsequent switched virtual circuits will allow customers to communicate with others on the fly.

Superhighway ethics

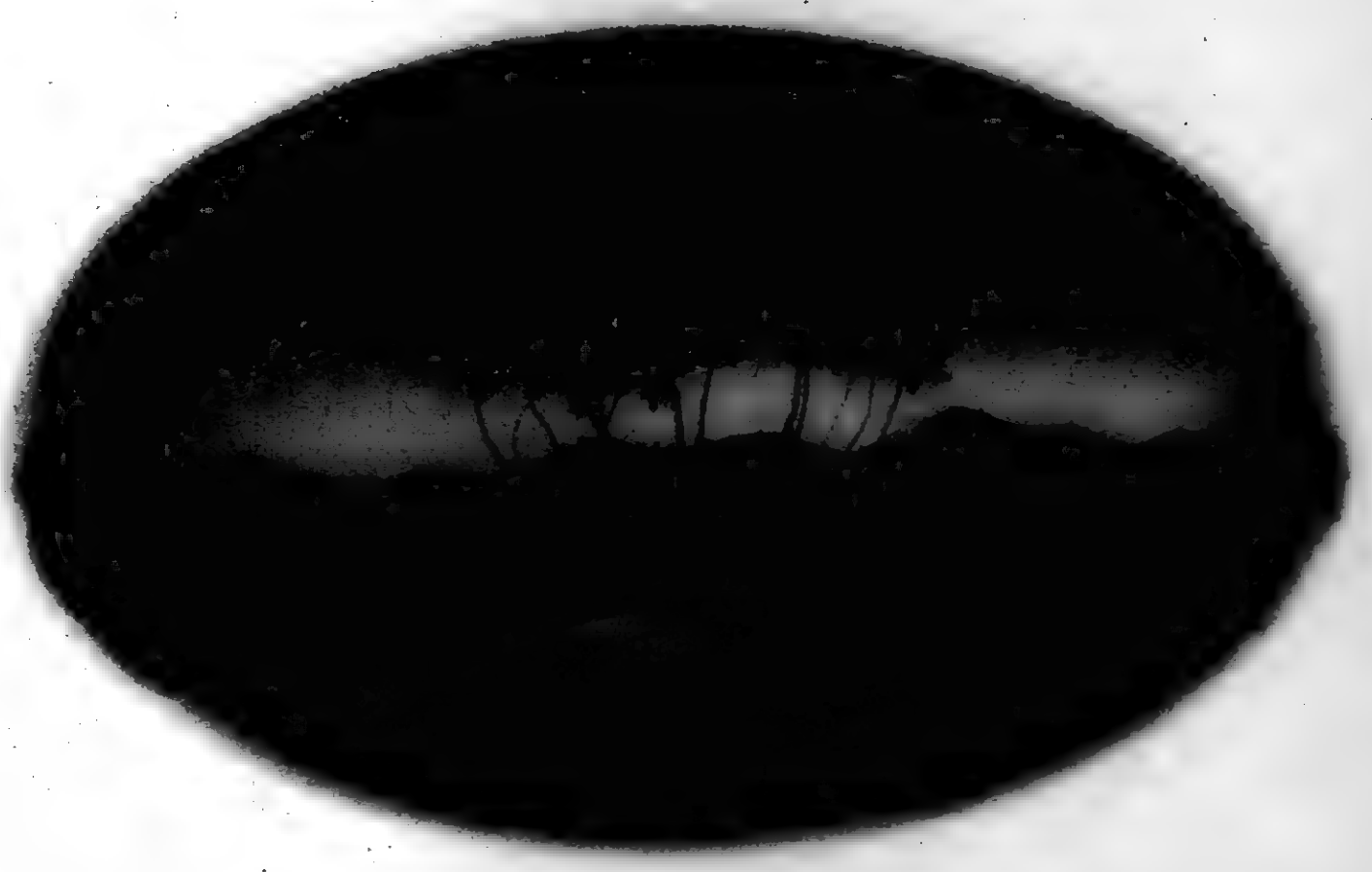
More than 70 public interest groups formed the **Telecommunications Policy Roundtable**, a coalition devoted to ensuring universal access to the digital "information superhighway." Focusing on issues such as privacy, electronic democracy and affordable use by disadvantaged groups, the coalition hopes to balance the commercial interests embodied in recent media megadeals.

NetView association gels

IBM and **Digital Equipment Corp.** said they have completed combining their organizations for recruiting and certifying network and systems management application vendors into a single NetView Association.

Embarc welcomes PDAs

Motorola's Embarc paging network has added support for three personal digital assistants: the Tandy Z-PDA, Casio Z-700 and the Grid 2390. This means users of these devices who subscribe to Embarc can receive one-way electronic mail and various information services via the Embarc network.



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As anyone who's ever been in the desert can tell you, things aren't always as they appear. Whether it's an oasis in the sand. Or a suite of application software in the office.

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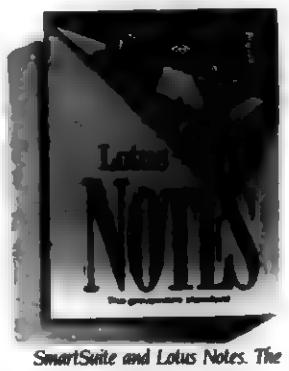
FREELANCE GRAPHICS® 2.01	COUPON FOR POWERPOINT® 4.0
APPROACH® 2.1	ACCESS™
ORGANIZER™ 2.1	COUPON FOR 1 SEAT OF MICROSOFT MAIL
INTEGRATION	
LOTUS APPLICATION MANAGER	MICROSOFT OFFICE MANAGER
COLLECT & COPY	
DDE, OLE	DDE, OLE (2.0 IN WORD)
CONSISTENT USER INTERFACE	SEMI-CONSISTENT USER INTERFACE
WORKGROUP	
ALL APPS MAIL-ENABLED	ALL APPS MAIL-ENABLED
VERSION MANAGER™	SCENARIO MANAGER
INTEGRATED WITH NOTES® THRU NOTES/FX™	
VALUE	
$249 COMPETITIVE UPGRADE	$349 COMPETITIVE UPGRADE

And while Microsoft claims Office is going to fully maximize cross-product integration and consistency, Lotus is already way down the road to achieving precisely that across all five applications. Sharing the same user interface. With common menus. And

MAYBE YOU'D BETT LOOK AT MICROSOF

in reality, Lotus® SmartSuite® achieved that distinction over a year ago.

A closer inspection will also demonstrate that not all of Microsoft Office's five applications are designed for general business users. And some new versions aren't yet available at all. Lotus SmartSuite, on the other hand, has five of the leading, award-winning, most



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Client/server gains more tools

By Kim S. Nash

A lack of systems management tools designed to minister to client/server systems has kept some users from putting such schemes into production. However, relational database makers have begun to address the problem by teaming up with historically mainframe-oriented utilities firms such as BMC Software, Inc. and Legent Corp.

Oracle Corp., for example, has promised to release programming information about the Oracle 7 database to several utilities makers, which will build or port versions of existing performance monitoring, capacity planning and other tools to Oracle. The ASK Group, Inc. has said it is seeking similar deals for its Ingres database.

Sybase, Inc., meanwhile, has been working with Tivoli Systems, Inc. since 1991 to develop a framework for client/server management tools that would rival mainframe cousins in functionality. And Informix Software, Inc. outlined client/server management plans last week.

Although database/utility couplings are not expected to bear fruit until mid- to late 1994, observers are enthusiastic that database companies are stepping up to the systems management plate.

Other client/server advocates, including applications makers such as PeopleSoft, Inc. and IMRS, Inc., have shrunk into the background when performance monitoring, capacity planning and other management and administration topics arise, said Paul Cubbage, an analyst at Dataquest, Inc. in San Jose, Calif.

The fact that database makers are taking at least some responsibility for making client/server more workable "is progress," Cubbage said.

For now, some users are relying on relational databases themselves, coupled with savvy database administrators, for effective perfor-

Tools, page 68

Prolific pairings

Major database makers aligning with systems management firms to build client/server administration tools

VENDOR	PARTNERS	EXPECTED JOINT PRODUCT AVAILABILITY
Oracle	BMC Software, EcoSystems, Epoch Systems, Legato, Legent, OpenVision, Patrol Software	Mid-1994
Sybase	Tivoli, Epoch Systems	Some out now; others due mid-1994
Informix	Outlined plans include HP, OSF and OpenVision	Mid- to late 1994
The ASK Group	Details are only vague; expected to include BMC Software and Legent	April 1994

Minicomputers

HP responds to user requests on 3000 line

By Mark Halper

PALO ALTO, CALIF.

Three weeks after raising a few eyebrows over its long-term proprietary minicomputer commitment, Hewlett-Packard Co. has ameliorated user concerns by outlining a solid dedication to the box and its MPE/IX operating system.

The company told HP 3000 users in a private broadcast on Nov. 18 that its next-generation MPE/IX — Version 5.0 — will be available in May and will include a number of user-requested features, according to Eric Fisher, principal at Fisher Systems Consulting in Groton, Mass.

Furthermore, HP said it will today add a dual-processor machine to the midrange of its HP 3000 line and will offer users a board upgrade to that box, called the Series 987/200, for a third the price of the system. The company priced a 100-user version with 64M bytes of memory, 1G byte of storage and four I/O slots at $188,320.

An HP spokesman confirmed that HP will ship MPE/IX 5.0 in the spring but declined to commit to a month.

In one warmly received move, HP told users that 5.0 will return to backup procedures built into MPE/IX 4.0. HP had set off a ruckus when it switched to backup procedures with the intervening Release 4.5, leading 4.5's few users to complain about storage and backup difficulties [CW, April 12].

"There was such a huge cry from the users saying 'Don't

HP, page 66

ASK enhances Ingres database

By Kim S. Nash

Users and analysts applauded The ASK Group, Inc.'s object-oriented and connectivity enhancements to its Ingres database announced earlier this month, saying the new features will be useful in moving applications off mainframes to a client/server setup.

The follow-on to Ingres 6.4 — renamed OpenIngres — is expected to include additional gateways to help Unix users get at data housed in IBM mainframes, support for Open Database Connectivity (ODBC) standards and a distributed transaction processing monitor, the company said. The products are slated to ship in April 1994 [CW, Nov. 15].

"The biggest news here is that ASK is showing they fully support the Ingres side of their business. They're not going to let it flounder," said David McGoveran, president of Alternative Technologies in Boulder Creek, Calif.

The Ingres database and add-on tools sport strong technology but have lacked a powerful marketing organization to back the products, McGoveran said, echoing statements from users and other analysts.

OpenIngres and accompanying products should relieve Ingres users who may have been concerned that the Ingres database was falling behind competitors such as Oracle Corp. and Sybase, Inc., added Paul Cubbage, an analyst at Dataquest, Inc. in San Jose, Calif.

Ingres holds 12.5% of a $1.4 billion worldwide relational database market, compared with larger chunks for rivals (see chart). Further, while Sybase and Informix have gained ground at Oracle's expense, Ingres' share has been unchanged, according to Bill Shattuck, an analyst at Montgomery Securities in San Francisco.

However, Ingres has been strong in Europe, a phenomenon the company seeks to transport to North America via a streamlined sales, marketing and support organization put in place this year. Where ASK formerly had separate sales, marketing and support groups for each product line — tools, applications and database — the company now has one unified group serving all the branches.

Also part of Openingres is a gateway to IBM CICS/VSAM systems and a database replicator announced in June and due to ship this month.

First in line

ASK signed four joint development and marketing agreements with Sun Microsystems, Inc., one of which calls for ASK products to be available on Unix systems from Sun before machines from other Unix vendors.

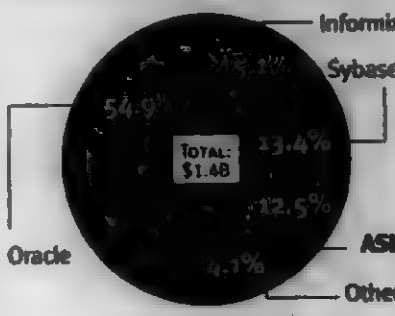
New customers?

Openingres should spark new interest in the product line, especially as companies seek to tie legacy data housed on mainframes to Unix systems, said John Van Den Hoven, manager for database and enterprise information systems at Noranda, Inc. The Toronto-based conglomerate started moving financial, human resource, materials management and other large applications off mainframes to Hewlett-Packard Co. HP 9000 Unix-based servers and workstations running the Ingres database.

Van Den Hoven said he sees "a lot of potential uses" for the Ingres Replicator, which copies and synchronizes data in separate databases in remote sites. Gathering data such as employee vital statistics from several decentralized divisions could be made easier with Replicator, he said.

Up and down

Though The ASK Group ranks only fourth in overall relational database market share . . .



WORLDWIDE MARKET SHARE BY LICENSE REVENUE, 1992

. . . it shows strength in the service and maintenance segment

WORLDWIDE MARKET SHARE BY SERVICE REVENUE, 1992

Source: Montgomery Securities, San Francisco

Number of TPC-C Benchmarks* Published to Date.

TPC-C benchmarks emulate a complex OLTP environment characterized by:

- multiple on-line terminal sessions
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- moderate system/application execution
- transaction integrity
- simultaneous execution of multiple transactions
- multiple transactions with a range of complexity
- complex database
- contention on data access and update

Hardware vendors that have used INFORMIX-OnLine to publish TPC-C benchmarks include: Hewlett-Packard, IBM, ICL and NCR.

*UNIX TPC-audited benchmarks published by hardware manufacturers as of 11/1/93.

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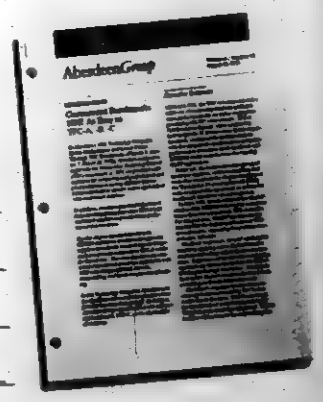

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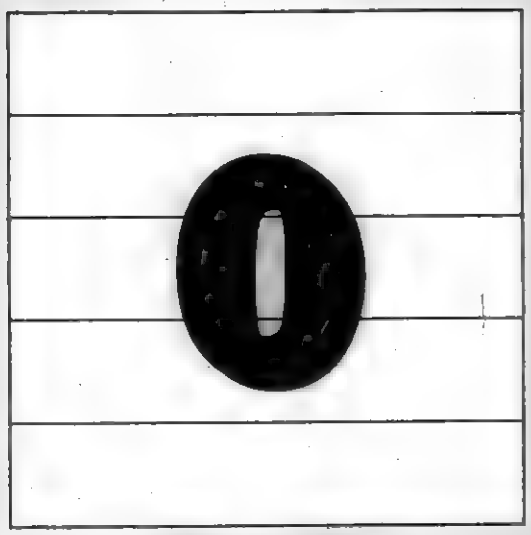

Oracle

Sybase

Source: Transaction Processing Performance Council (TPC), 1993.

When the Transaction Processing Performance Council designed the new TPC-C benchmarks, they had a real-world performance test in mind. Unlike earlier, simpler TPC benchmarks, TPC-C mirrors transaction-intensive business applications that run a company's day-to-day operations—like yours.

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—The Aberdeen Group, August 12, 1993

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Ted Krum

Get bargains, give up service

An upscale department store with lavish interiors and attentive staff can't make money selling $5 plastic housewares. Low-priced products sell in plenty, but they require less expensive sales channels and service policies to be profitable.

This principle applies just as well to computer systems, and it suggests some hard adjustments ahead for large system customers.

Base prices of large and midrange open systems have fallen to a fraction of their mid-1980s levels for familiar reasons: standardization, adoption of low-cost PC technology and dramatic advances in processor design. Competitive pressure from open systems has backed proprietary systems into the same corner, forcing vendors to slash the exorbitant premiums (five times or more those of just a couple of years ago) that they charged for hardware, software and service.

Today, Hewlett-Packard and Digital offer proprietary product lines priced near parity with their Unix systems on a price/performance basis. The AS/400 may be next, cutting even more deeply into IBM's lucrative commercial business.

Lost support

As vendors adapt to their bargain-basement pricing environment, IS managers face diminishing pre- and post-sales support. Of course you save on the front end and in many cases from downsizing moves as well, but if the out-of-pocket costs for installing, integrating and supporting new hardware double and triple, those savings will quickly vanish.

Minicomputer and database server customers can expect the same changes PC buyers started to experience six or seven years ago. Vendors will target smaller direct sales forces and support teams at the largest national accounts, leaving smaller customers to resellers.

It seems unlikely that we will ever be able to buy a VAX at everyday low prices at Sears. Still, Sun now has a mail-order catalog for low-margin expansion products and HP is distributing workstations through specialty retailers such as Intelligent Electronics. Customers can even order Silicon Graphics Indigos over an 800 number.

These cut-rate approaches have met with some success because traditional workstation customers can install and maintain their own systems. But larger systems aren't so easy, and the user population isn't as technical. Corporate users need more service, and service means head count.

Right now, a department of 250 people might require only one mainframe operator, but that presupposes the operator has access to vendor staff for installation, preventive maintenance and system software support. PC LAN administrators might be able to serve one-third as many users and couldn't pay their vendor enough to assist them on site.

The result is that today's network administrators are more highly skilled, have more job mobility and demand bigger salaries (up 5.4% last year) than mainframe/mini managers (up 3.2%).

Staffing up to handle chores the vendors used to perform isn't a happy prospect, but it might be preferable to paying proprietary systems vendors for access to their staff for a couple of reasons. First, these vendors may not really want or be able to handle the business anymore. And second, companies that go in for service revenues may have such poor profitability that they won't be able to offer the latest technology.

Krum is a senior research analyst at RCB International in Stamford, Conn. He can be reached by E-mail at Tedkrum@aol.com.

Talking computers take on tougher tasks

By Johanna Ambrosio

■ Talking computers are not just the stuff of science fiction movies. In fact, some data centers are using voice technology for tasks ranging from operating the help desk to broadcasting system outages.

"It's available and very effective," said Arnold Farber, president of consulting firm Farber-LaChance in Richmond, Va. "Voice is a very natural interface, and I think we'll be doing even more with it."

However, Farber and users warned, it is not necessarily a no-brainer to implement. "It takes a little while to get the development process down. But once you learn it, it really helps improve utilization of the system."

Most of these systems attach to the mainframe through a PC or some other means. Through these, help desk operators, data center employees and others are able to "hear" what is going on inside the machine.

Canadian Tire Corp. in Toronto uses InterVoice, Inc.'s systems to assist the help desk in responding more quickly to end-user requests to help automatically change or reset user IDs or restore printer operations. It also allows Canadian Tire to broadcast general systems news.

"It frees up help desk operators to do analysis and problem-solving," said Diane Miller, manager of service quality. A menu guides users through the selection process and allows them to opt to speak to a human operator.

It has been a learning experience. "We thought we would start off with a nice easy application, user IDs. Little did we know," Miller said. That process did not prove to be simple to automate. "We hit a brick wall because the options we had to automate with turned out not to be easy for the customer. You have to know the customer, what their limitations are and whether it will be easy for them to use."

Still, it can be worth the effort. Leah Larson at Computer Sciences Corp. in Fort Worth, Texas, programmed the voice-response unit for the help desk. "We've automated 35% of our calls. That may not seem like a lot, but we are accomplishing more with less. We've had to increase our staff less than what we would have had to based on the number of calls we handle."

AT&T's western data center uses a speech-synthesis device to translate the text messages going across a giant console in the command center into speech. "That seemed pretty good at the time," said Rick Reynolds, a senior programmer who handles technical planning at AT&T in Pleasanton, Calif. "So now you've got a sound and you can turn around to see what's going on."

Unfortunately, he said, the choice of five voices with the unit was not sufficient. None were really understandable. "We call the one we wound up with 'Sven,'" Reynolds said. "It's got a thick Swedish accent, and even with the bass turned way off on the stereo system you can't understand it all the time."

If the voice unit is being used to broadcast system outages in the data center, it is important that implementors carefully pick and choose the amount, length and type of messages that are broadcast. "If you keep saying something over and over again, people stop paying attention," said Julie Hawkes, manager of VM systems support and automation at Rolm Corp. in Santa Clara, Calif. "It's human nature."

Rolm solved this problem with a system called Commensa from Votek that allows users to broadcast different messages to different places. "The console room wants to know systems status, but the help desk doesn't care about tape mounts," Hawkes said. "You have to think about what kinds of announcements you want to make." She said it may be very effective to use managers' voices for some announcements. Other options include sounds like train wrecks or car crashes to signal a major system outage.

Another use of voice technology is to attach the mainframe to some kind of paging system that automatically dials the on-call person as soon as a batch program abends.

HP

CONTINUED FROM PAGE 63

do that,' they made the change," noted Jerry Kopecky, manager of MIS operations at IVI Travel, Inc. in Northbrook, Ill. "They listened to their users."

Other enhancements included in 5.0 are support for 2,700 users, support for Microsoft Corp.'s Object Database Connectivity, fast and wide SCSI, 8G-byte tape drive support and built-in Posix training.

But while users lauded HP for the planned MPE/IX improvements, the broadcast's most poignant pronouncement came in regard to longer-term plans.

"I have never heard this before, but when people were asking what is beyond Release 5, the HP people said absolutely, positively, they're working with Interex [an HP user group] and customers on systems improvements," Fisher said. "Is there life after 5.0? Absolutely."

While HP constantly expresses support for the 3000, loyal users are painfully aware that Unix is, after all, the higher-growth sector. HP often adds power to its HP 9000 Unix minicomputers before making companion moves to the 3000.

Today's 987/200 unveiling comes five months after HP added a similar machine to the 9000 line.

And earlier this month, when HP unfurled its top-of-the-line mainframe alternative minicomputers, it topped off the 3000 Edition at eight processors while pushing the 9000 to 12, rekindling some concerns among 3000 users sensing abandonment.

HP said the HP 3000, with its more robust MPE/IX operating system, is a more powerful system requiring fewer processors than the HP 9000 with HP/UX.

Users said they are confident in HP's commitment.

"If long term means 20 years, I don't see it," Kopecky said. "But if long-term is five to eight years, I'm satisfied I'll have a 3000 in the long term."

What users are less certain about is how long HP will continue to offer MPE/IX and HP/UX as two separate operating systems. MPE/IX, with its Posix compliance, is moving more into the Unix world, although it is a higher-performance operating system without all of HP/UX's openness.

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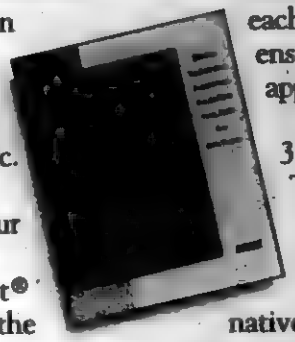

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The 30-minute risk analysis

By James Daly

In the time it takes you to gobble a turkey sandwich at lunch, Don Erwin can pinpoint the security holes in your system.

Erwin, a security analyst at Dow Chemical Canada, Inc., has helped develop a way to take the terror out of systems risk analysis, which is often perceived as a lengthy, expensive affair that outside consultants perform with minimal employee contact.

"The result is that you've got a bunch of end users who don't understand or want the recommended controls and who are lax on following up on the recommendations," Erwin said.

He and his coworkers in the Midland, Mich., offices have created the Risk Analysis Matrix to develop a subjective risk assessment and action plan. The matrix is cheap, created by end users and can be completed in minutes.

No way, you say.

Erwin would disagree. The Risk Analysis Matrix is not only a staple of Dow's security program, he thinks it should be a cornerstone of yours. "A lot of systems managers find security to be a daunting proposition and don't know where to start," Erwin says.

Security consultants have praised the Dow plan for its ability to provide perspective. "Security consultants sometimes give the mistaken impression that you have to go for the big solution when in fact you can take smaller concrete steps that can have a very desirable effect," said Andrew Wolfe, a principal at the Lipa Strategic Technologies consulting firm in Salem, Mass. "Companies need to empower themselves, not count on someone else to do it."

Q & A charts

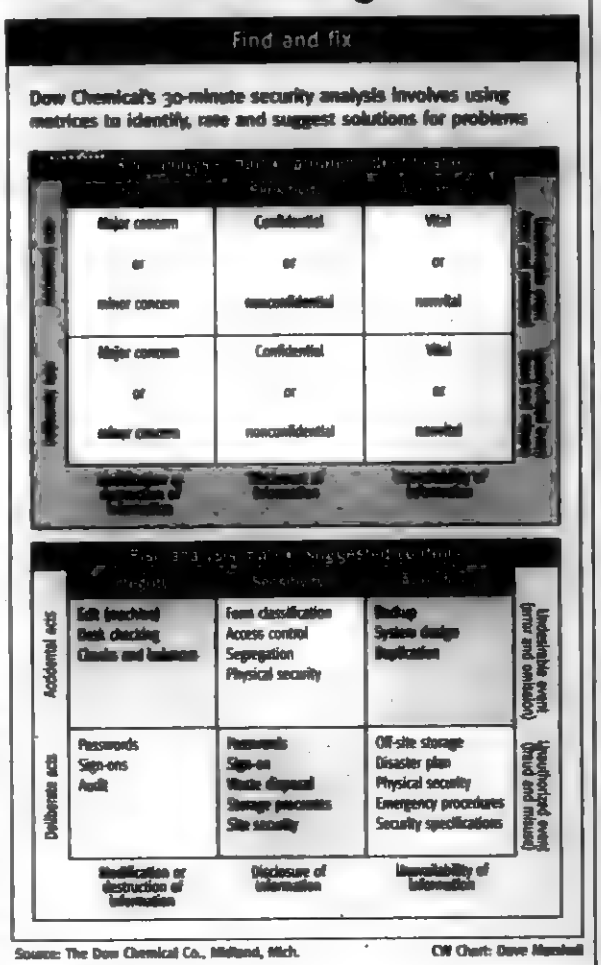
The Risk Analysis Matrix is essentially a grid question-and-answer chart that lets users home in on what needs protecting. Erwin first classifies undesirable events in terms of their effect on data. On the grid's vertical axis he creates three columns that pertain to security objectives: data integrity (unauthorized modification or destruction of data); data sensitivity (unauthorized disclosure of data); and data availability (unavailability of data or system services).

The horizontal axis pinpoints what he is trying to protect the data against. There are two choices: accidental acts (such as an error or omission) and deliberate acts (such as a hacker or employee fraud).

Erwin then assembles employees with expertise in the department you need to protect. For example, if Dow wants to install a LAN at a regional sales office, Erwin would invite someone from sales, a LAN technician and maybe someone from the office's clerical staff.

He quickly sketches out the matrix on an overhead or flip chart and asks each participant to think about the risks associated with each square in the matrix.

"For instance, I'll ask them to come up with things that could happen because, say, data was accidentally modified by someone on staff," he says. "There are no right or wrong answers. Contributors must not feel intimidated in voicing their concerns."



Source: The Dow Chemical Co., Midland, Mich. CW Chart: Dave Marshall

The process is repeated for each of the other squares (harming the integrity of data because of deliberate acts, unauthorized disclosure of data as a result of an employee accidental act, etc.) until the chart is complete.

Participants then come up with controls that would address each of the security holes. Example: Sensitive documents might need to be shredded to guard against dumpster diving. Or a tape backup system may need to be developed in case the main server is accidentally fried by electricians working on the building's wiring system. Some controls may patch several holes at once, Erwin said.

Team members are then assigned responsibilities to implement the various controls. Because the end users choose the controls, there is a greater chance of their being accepted and implemented, Erwin said.

It is then up to management to decide if the costs to prevent these risks are higher than the risks themselves. "But at least you have taken the first move toward getting your arms around the problem," Erwin said.

Supercomputers

Computer model simulates car crashes

By Ellis Booker

Hurling crash dummies through windshields is expensive and time-consuming, but it has been the only way to study structural car damage and human injury at the same time.

A project proposed by Los Alamos National Laboratory in New Mexico and General Motors Corp.'s Research and Development Center earlier this month could change that.

The two organizations said they hope to work together to develop a computer model that integrates the now parallel work being done through separate car crash and occupant injury simulations. The proposed model would run on Cray Research, Inc. supercomputers at Los Alamos.

Vehicle damage and human injury simulations exist today but are studied separately. The hope is to develop one model able to simulate damage to soft tissue and vehicle damage.

The $3 million to $6 million project is due to kick off in 1995 and run for three years if Los Alamos gets the OK from the Department of Energy's Defense Programs office, which will largely fund the research. GM has already committed $200,000 for the project.

Client/server tools

CONTINUED FROM PAGE 63

mance tuning, backup and recovery and other management tasks commonly handled by discrete tools in mainframe scenarios.

The World Cup '94 is constructing a large client/server system to handle press and attendee queries over a wide-area network stretching across nine time zones. The system was designed to funnel and respond to requests from 1,000 concurrent users.

Much of the systems monitoring and management has so far been done using features of Sybase's System 10 database and add-on tools, according to Bud Bensick, a vice president at Electronic Data Systems Corp., which is handling systems integration for The World Cup.

At a conference in Cupertino, Calif., last month, dubbed Software Independence, executives from Sybase and Oracle as well as Tandem Computers, Inc. and Novell, Inc. talked about systems management plans and how to make software more open and easier to manage.

However, users and analysts who questioned the vendors seemed frustrated by a lack of product specifics. One user noted that when all was said and not done, it is still the user's onus to get systems from different vendors talking to one another. Partnerships among database companies and systems utilities firms are an attempt to quell that sentiment (see chart page 63).

Vendors frequently blame one another when a user calls in with problems, according to Brian Sommer, an analyst at Andersen Consulting. "It's the 'who do you shoot?' problem," he said.

Who's to blame?

By definition, client/server computing calls for pulling together hardware and software from various vendors. When glitches occur — a network goes down, a database crashes — users have a tough time getting help unless they can pigeonhole the problem to a specific product, he explained. "Everyone seems to know [client/server systems management] is a problem, but there's a lot of finger-pointing going on."

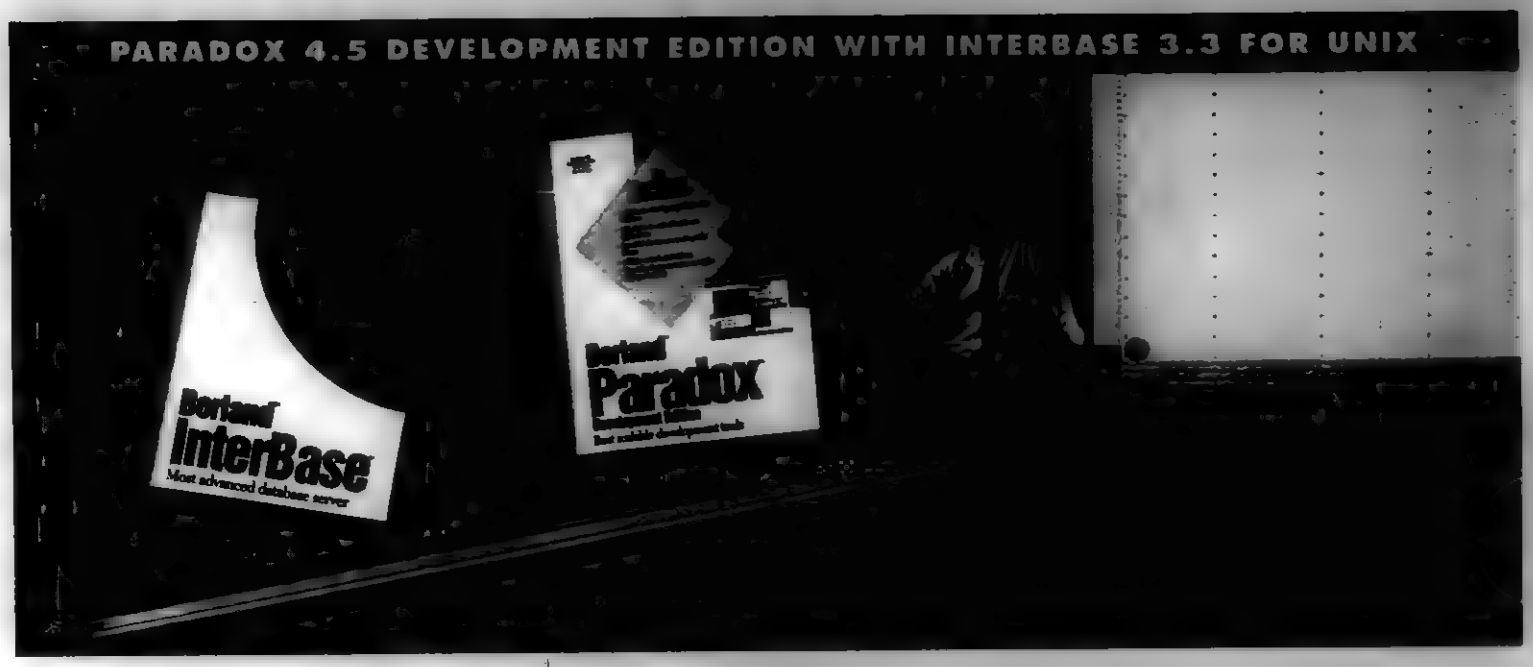
"I don't have a good answer" to the systems management question, said David Cochran, technical coordinator of architecture at Atlanta-based Delta Air Lines.

Luckily, Cochran does not need an answer now because the airline is still in the prototyping phase for many of the mission-critical client/server systems planned, he said. Delta is using Sybase's System 10 database products to anchor its efforts, which include internal corporate applications such as human resources and external airport systems such as gate agent information.

Cochran said he will watch Sybase for systems management products in the coming year.

"Client/server isn't as easy as you think," said John Van Den Hoven, manager for database and enterprise information systems at Noranda, Inc.

The Toronto-based company has taken a stab at a few contained, departmental client/server projects in the Hewlett-Packard Co. HP/UX environment but has basically stalled more ambitious client/server efforts until tangible management tools arrive. Furthermore, Noranda is looking for tools that conform to Distributed Management Environment standards, Van Den Hoven said.



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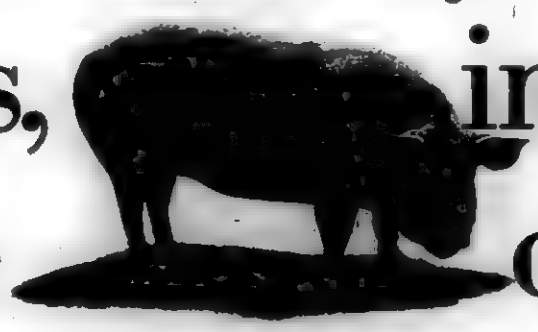
savvy enough to always be in of companies,  industries, and all those other us don't understand?

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Users test Sterling's Solve: tool set

By Jean S. Bozman

Sterling Software, Inc.'s new Solve: series of object-oriented systems management tools, unveiled last month, promises ease-of-use advantages over the tool set it replaces, the procedural code Solve: packages. Sterling got those packages when it acquired Systems Center, Inc. in Reston, Va., earlier this year [CW, July 5].

The new Solve: series has four components for problem management, change management, configuration management and asset management, said Michael Matthews, vice president of marketing at Sterling's System Management Division. The modules are priced at $25,000 apiece for use on midrange IBM mainframes. Prices vary by processor size, he said.

Some Sterling users who have seen early versions of the product said it looks far easier to use than the procedural code products, which have complex scripting procedures.

Going Down Under

Longtime Sterling NetMaster site Telecom Australia in Melbourne has been testing the new Solve: code for a year, and it plans to put it into production next month. The object-based code allows each of the Solve: modules to swap data with the others, said systems management engineer Nick Lukies.

"I can reuse the code in the scripts," Lukies said. "The real advantage is when you use the [modules] together, there are no real boundaries between them. We end up with applications that are developed quickly, with greater functionality."

"I think it's very user-friendly," said Jackie Morris, manager of technical support at Lomas Information Systems, Inc., a mortgage services company in Dallas. "Users can quickly write a script to do searches." Morris also liked the ability to customize screens.

Lomas uses Sterling's NetMaster, a network manager designed by Systems Center, and IBM's mainframe-based InfoMan for systems administration, Morris said.

The object-oriented technology in the Solve: software anticipates the use of objects as agents for enterprise systems management by the mid-1990s, industry analysts said.

Sterling chose to build its own object-oriented system and enterprise data repository rather than use industry-standard C++ and the Object Management Group's Common Object Request Broker Architecture spec, analysts said.

The analysts said the four Solve: packages will compete with IBM's InfoMan as well as Computer Associates International, Inc.'s NetMan and PNMS from Peregrine Systems, Inc. in Carlsbad, Calif. Solve: runs under IBM's MVS, MVS/ESA and MVS/XA operating systems but has not yet been ported to Unix systems, analysts noted.

Matthews said users can expect a Unix version, along with support for Microsoft Corp.'s Windows 3.1, in the next release, due next year.

The new Solve: software has been available for several weeks but is in use primarily at beta sites. "I would consider them to be in an early release," said Bruce Allen, a vice president at Meta Group, Inc.

Brief

IBM, Digital fuse prints

IBM's printing systems company, Pennant Systems, and Digital Equipment Corp. announced they will jointly develop a standards-based print management framework for distributed computing environments. The framework will conform to the International Standards Organization Document Printing Architecture Standard 10175, which defines print objects, attributes and protocols for submitting print requests across heterogeneous systems.

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System Software Associates, Inc. has introduced three business applications designed to help manufacturers and distributors tailor operations around customer demands, automate warehousing and better manage credit procedures.

According to the Chicago company, the new applications integrate with more than 50 of the company's other Business Planning and Control System/Advanced Solution applications.

Configuration Management automates the configuration and order-entry processes that follow a customer request for a make-to-specification product.

Warehouse Management automates the management and flow of products through a warehouse.

Credit and Deductions Management evaluates customer credit data to help credit and sales managers review customers' credit eligibility.

Each of the products is priced from $5,000 to $120,000.

▶ *System Software Associates*
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Candle Corp. has announced Omegamon II for CICS Version 100 and Omegamon II for DBCTL Version 110, performance monitors for on-line transaction processing.

According to the Santa Monica, Calif., company, both products incorporate a Common User Access interface and are integrated with OmegaCenter for the Transplex, an enhanced implementation of Candle's integrated solution for enterprisewide availability management.

Omegamon II for CICS offers features such as resource-limiting automation, expanded historical reporting, extended context-sensitive help and third-party support.

Features for Omegamon II for DBCTL include a Common User Access interface, single point of control with Transplex Navigation, historical reporting and a transaction-reporting facility.

Omegamon II for CICS prices range from $43,000 to $97,000; Omegamon II for DBCTL ranges from $28,500 to $64,500.

▶ *Candle*
(310) 829-5800

Hawkeye Information Systems has announced Release 7.0 of PathFinder, documentation and analysis software for IBM's AS/400.

According to the Fort Collins, Colo., company, PathFinder offers a cross-reference "refresh" function for libraries that automatically documents all objects residing in that library; cross-reference history information that includes CPU time used to build or refresh the cross-reference files; and a scan source member option that has been enhanced to scan by date range and can scan a specified source type.

A grid report that provides a matrix of devices attached to local or remote workstation controllers has been added to the network configuration flow-chart options.

License fees for PathFinder Release 7.0 cost $5,500.

▶ *Hawkeye Information Systems*
(303) 498-9000

ASA International Ltd. and **Oracle Corp.** have announced that ASA's data collection system, SmartTime, is being released for the Oracle database using SQL Forms.

According to ASA International in Framingham, Mass., SmartTime automates time and attendance recording and activities such as work-in-process tracking, labor reporting, inventory movement and quality control.

The product costs $300 per client. Server prices range from $5,000 to $100,000.

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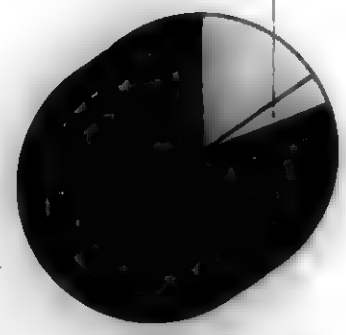

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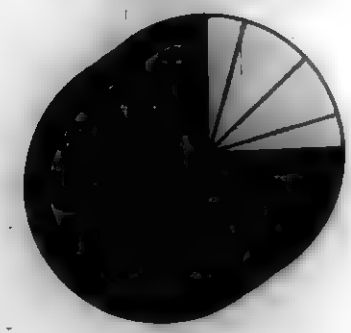

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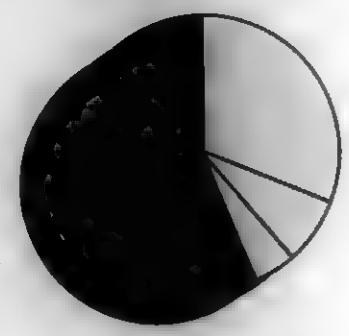

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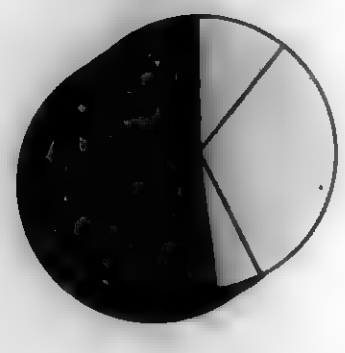

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Melding Unix, Windows worlds

Users consider options for migrating applications

By Melinda-Carol Ballou

Corporate sites with mixed environments are finding that Windows emulators may just not cut it for migrating key applications over to Unix and other operating systems.

To make the move, some of those sites are looking at two main vendors for tools that support Microsoft Corp.'s Windows application programming interface and Microsoft Foundation Classes (MFC): Bristol Technology, Inc. in Ridgefield, Conn., and Mainsoft Corp. in Mountain View, Calif.

While emulators such as Sun Microsystems, Inc.'s Wabi can be used for low-end applications, according to industry analysts, software demanding more robust performance requires tools such as those from Bristol and Mainsoft.

"Many ISVs and corporate IS people can write for Windows and successfully use emulators like Wabi, but those emulators can also be slow and problematic," said Scott Winkler, a director at Gartner Group, Inc., a consulting firm in Stamford, Conn. "Bristol and Mainsoft offer a robust environment to create one source for an application and have it live in Windows and on other operating systems."

Some corporate information systems users agreed.

One group of developers at Electronic Data Systems Corp., who created an overdrive analysis program for modeling vehicle systems for General Motors Corp. in Troy, Mich., is evaluating the tools, according to Stuart Slack, an engineer at the site. An analysis group there is running compute-intensive software on Unix workstations but wanted access to the original PC application, Slack said.

"We want to have data exchange so that the models we create on the PC will run on Unix and will be exactly the same across groups," he said.

Cost savings

Others said the software saved them the cost of retraining or bringing in Unix gurus.

"We're primarily a Windows shop, and we didn't have to hire Unix programmers — the tools enable us to have applications with a single set of source code running under Windows and Unix," said Linda Jojo, program manager at General Electric Co. in Schenectady, N.Y., who used Bristol's Wind/U tools to move a scheduling database from Windows to Hewlett-Packard Co.'s HP/UX.

Mainsoft began shipping its MainWin software developer's kit last month; Bristol began shipping the latest version of its Wind/U software earlier this fall. Both plan to offer support for Win32s early in 1994 to enable developers to move their code to Microsoft's Windows NT.

Developers can use these tools with applications created with a variety of C or C++ development environments, including Microsoft's Visual C++ and Symantec Corp.'s C++ Professional.

Mainsoft's MainWin software developer's kit is priced at $5,000 for the first copy and $2,000 for additional copies. Runtime copies for Unix workstations are priced at $195.

Bristol's Wind/U SDs is priced at $9,950.

Candidates

Possible scenarios for using Mainsoft or Bristol tools to move Windows source code to Unix:

- A site where high-end CAD software is running on Unix workstations, but less compute-intensive modeling software is running on PCs, and groups need to share the application in order to work together.
- Oil analysis applications running on Unix machines needing access to PC data.
- PC productivity applications being ported to Unix by software vendors or corporate IS.

Multimedia tools

ScreenCam gives voice to applications

By Michael Vizard

As part of a bid to reduce end-user training costs, Lotus Development Corp. has moved into the application development arena with a tool that allows developers to incorporate verbal instructions while walking users through an application.

Called ScreenCam, the multimedia tool allows an application developer to capture sound, application screen activity and cursor movement in a single integrated file.

Within an application, developers can use ScreenCam to add online voice tutorials that highlight how a specific feature in the application is used.

"ScreenCam is going to be great. We can now add the same type of help utilities plus voice that are in standard PC applications to our in-house applications. I think we'll use it with every application we have," said Sheldon Laube, director of information technology at Price Waterhouse.

While ScreenCam incorporates audio, the tool does not support video. According to Steve Barlow, product manager for Lotus' multimedia products, video has been slowing down the adoption of multimedia products because they require too much memory and disk resources to create relatively small video images.

Because ScreenCam supports audio only, Barlow said application developers will be able to deploy it on applications on any 80386-class system that supports a sound card. ScreenCam itself requires only 1M byte of memory.

In fact, Compaq Computer Corp., Inmac and DSP Solutions plan to bundle ScreenCam with future products, Barlow said.

In addition, Lotus plans to add ScreenCam to its applications in 1994, including a version of 1-2-3 for Windows announced at Comdex/Fall '93.

ScreenCam will ship later this quarter.

Pact excites Smalltalk users

By Jean S. Bozman

Object Design, Inc.'s collaboration with ParcPlace Systems, Inc. will ease users' worries about where to store their Smalltalk objects, users and analysts said in the wake of the companies' recent joint announcement.

The collaboration will provide a Smalltalk-compatible object database for those who store their objects in relational databases or those who use vendor-specific links to object databases.

The two firms recently said they have started to integrate Burlington, Mass.-based Object Design's ObjectStore object-oriented database with ParcPlace's Smalltalk object language. The resulting interface should be completed by mid-1994 and available by the end of 1994, said Richard Dym, marketing vice president at Santa Clara, Calif.-based ParcPlace.

Object Design also plans to submit the interface to the Object Database Management Group as a standard link to all object databases, said Gene Bonte, Object Design's vice president of product management.

Some users said the integration will make production applications easier to manage.

"It is always better for us if the language provider steps up to support all the functionality," said Donald Chaney, applications development manager at DHL Airways, Inc. in Redwood City, Calif. "We try to limit the number of vendors we have to deal with for problem determination." DHL uses a Sybase, Inc. relational database to store Smalltalk objects created in ParcPlace's VisualWorks development environment.

Mapping help

Other users said they believe the link will ease the problem of "mapping" Smalltalk objects into relational databases or dissimilar object database management systems. It will help users extend departmental Smalltalk prototyping and simulation applications across enterprises, said one West Coast user who did not wish to be named.

"Traditionally, they haven't had many persistent-object alternatives, compared to C++ users," he said.

Industry analysts agreed, saying the C++ market is about 10 times larger than the multivendor Smalltalk market, thus limiting object-storage choices. Other Smalltalk vendors include Digitalk, Inc., Easel Corp. and IBM.

Object, *page 76*

Briefs

Sun object assembly

Oberon Software, a small vendor of object-oriented tools, said it will mesh its SynchroWorks visual tools with **SunSoft, Inc.**'s Project DOE (Distributed Objects Everywhere) environment. The visual tools reportedly will help Sun users at commercial sites assemble code from objects. SynchroWorks for Solaris 2.x will ship with SunSoft's Project DOE developer's release by year's end, SunSoft said.

Software engineering

Rational in Santa Clara, Calif., has created a Commercial Operations Group that will provide software engineering services to Fortune 1,000 companies.

HP port to Stratus

Hewlett-Packard Co. said it will port its SoftBench Framework application development technology to **Stratus Computer, Inc.**'s Unix-based fault-tolerant systems.

Borland licenses Q+E

Borland International, Inc. has licensed **Q+E Software**'s database access technology, Q+E Extend, for use with future Borland products. Borland previously used Q+E Extend with its Quattro Pro for Windows spreadsheet.

LaserData, Progress pair

LaserData, Inc. in Tyngsboro, Mass., and **Progress Software Corp.** in Bedford, Mass., announced an agreement to cooperate on client/server document management applications. LaserData joined the Progress Open Access Program, which provides development support and joint marketing for companies that interface their software products with the Progress application development environment. In a separate announcement, Progress said it has joined **IBM**'s Market Development Program, under which IBM and Progress will conduct joint marketing activities to promote the Progress Application Development Environment to IBM RS/6000 users.

ICS ships Builder Xcessory

Integrated Computer Solutions, Inc. in Cambridge, Mass., is shipping Builder Xcessory Version 3.0, a major release of its graphical user interface (GUI) builder for Open Software Foundation Motif environments. The new version integrates C++ object-oriented programming with Motif development and provides Motif 1.2 and international support. The company said Sun Microsystems, Inc. subsidiary SunExpress will distribute the version for Solaris platforms.

Company offers video course

Human Factors International, Inc. in Fairfield, Iowa, is offering a video training course, "How to Design Usable GUIs for Corporate Applications." It costs $895 for two videos and four reference guides.

Smalltalk

CONTINUED FROM PAGE 75

Some Smalltalk users avoid the mapping problem altogether. The Snohomish County Public Utility District in Everett, Wash., uses Smalltalk objects to trigger Digital Equipment Corp. Rdb relational database updates on a Digital VAX server.

"Objects on the desktop invoke a method or transaction" on the VAX, explained Craig Gowdey, manager of systems development.

The relational database storage method involves "flattening" the objects to wedge them into the confines of a table-based geometry. "The standard answer from object database companies is that it's like disassembling your car to put it in the garage and having to build it up before you drive it away," said Adrian Bowles, director at Atelier Research in Westport, Conn.

Object DBMS storage is more compatible with Smalltalk objects but depends on proprietary links. The ODI/ParcPlace interface could simplify that translation task. "The logical model for the database matches more or less directly with the object model in the application," said Steve McClure, manager of object technologies program at International Data Corp. in Framingham, Mass.

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Qualix Group, Inc. has announced XvM, an application programming interface (API)-level product designed for porting applications from OpenLook to Motif.

According to the San Mateo, Calif., company, XvM is a library for graphical user interface applications that supports the XView API to create Motif-compliant applications.

The product can be used as a replacement for existing XView applications when converting to a Motif look and feel.

XvM costs $495 per single-user binary and $5,000 for source per building.

▶ *Qualix Group*
(415) 572-0200

Intermetrics, Inc. has introduced a software development tool kit for IBM's Mwave-based systems.

According to the Cambridge, Mass., company, the Intermetrics Mwave Toolkit enables developers to write Windows- and OS/2-based applications by accessing the capabilities of the technology platform (fax, modem, audio, answering machine) and adding new system capabilities by programming the Mwave digital signal processor.

The tool kit includes the Mwave Manager application programming interface (API) and Driver API specifications for building Windows and OS/2 applications.

Other features include an ANSI C compiler, an assembler, a real-time software oscilloscope debugger, a digital signal processor library, linker/librarian and system utilities for application integration and development targeted at the Mwave digital signal processor.

One copy of the tool kit costs $495.

▶ *Intermetrics*
(617) 661-1840

Applied Logic Programming, Inc. has announced VIA/Visual Information Assistant for Windows.

According to the Wynnewood, Pa., company, the product is a graphical user interface, object-oriented application development tool that does not require programming.

Users can design an information structure integrating data from a wide variety of disparate sources.

Using client/server technology, VIA accesses data by "launching" other applications or through Dynamic Data Exchange and Dynamic Link Library mechanisms. User-defined information structures can be graphically displayed and navigated, providing hyperdata, hypertext and hyperquery search-and-reporting capabilities.

VIA prices range from $295 to $795, depending on access options.

▶ *Applied Logic Programming*
(215) 649-4749

MetaSolv Software, Inc. has introduced PowerFrame, a reusable class library for Powersoft Corp.'s PowerBuilder Version 3.0.

According to the Dallas company, the product provides an application architecture or technical framework upon which users can build any type of client/server business application.

The product consists of three components: a reusable application architecture designed as a suite of inheritable window classes; a comprehensive client/server security system that can be used to prevent unauthorized access to applications; a sample application that demonstrates the use of the application architecture, security and other PowerFrame features.

Each component can be customized and extended to meet requirements, because PowerFrame is delivered in a class library format.

A single-developer copy of PowerFrame costs $695.

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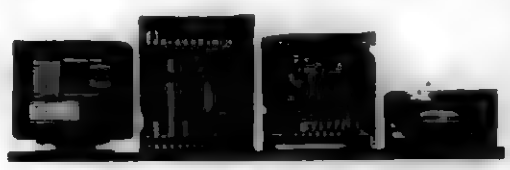

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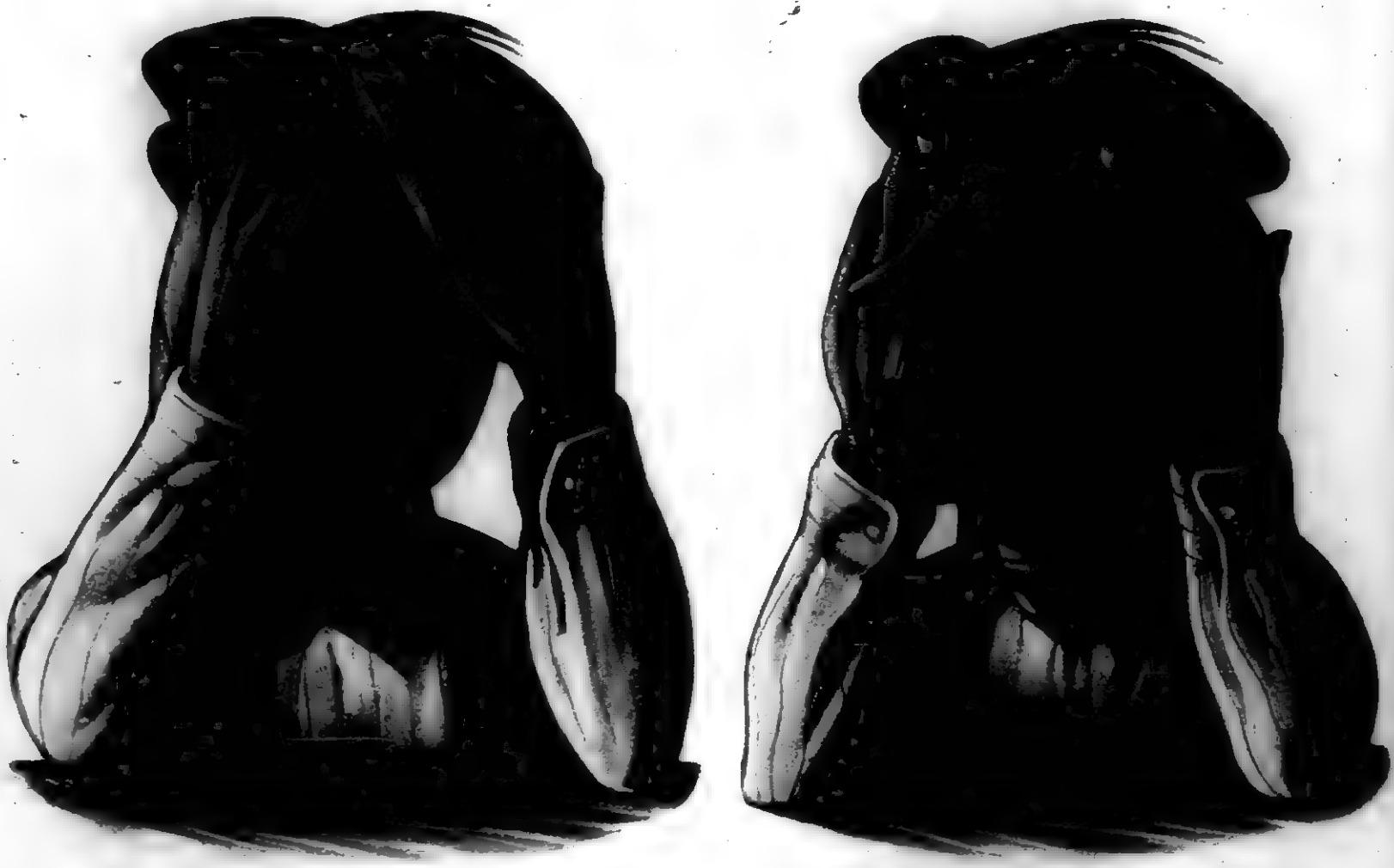

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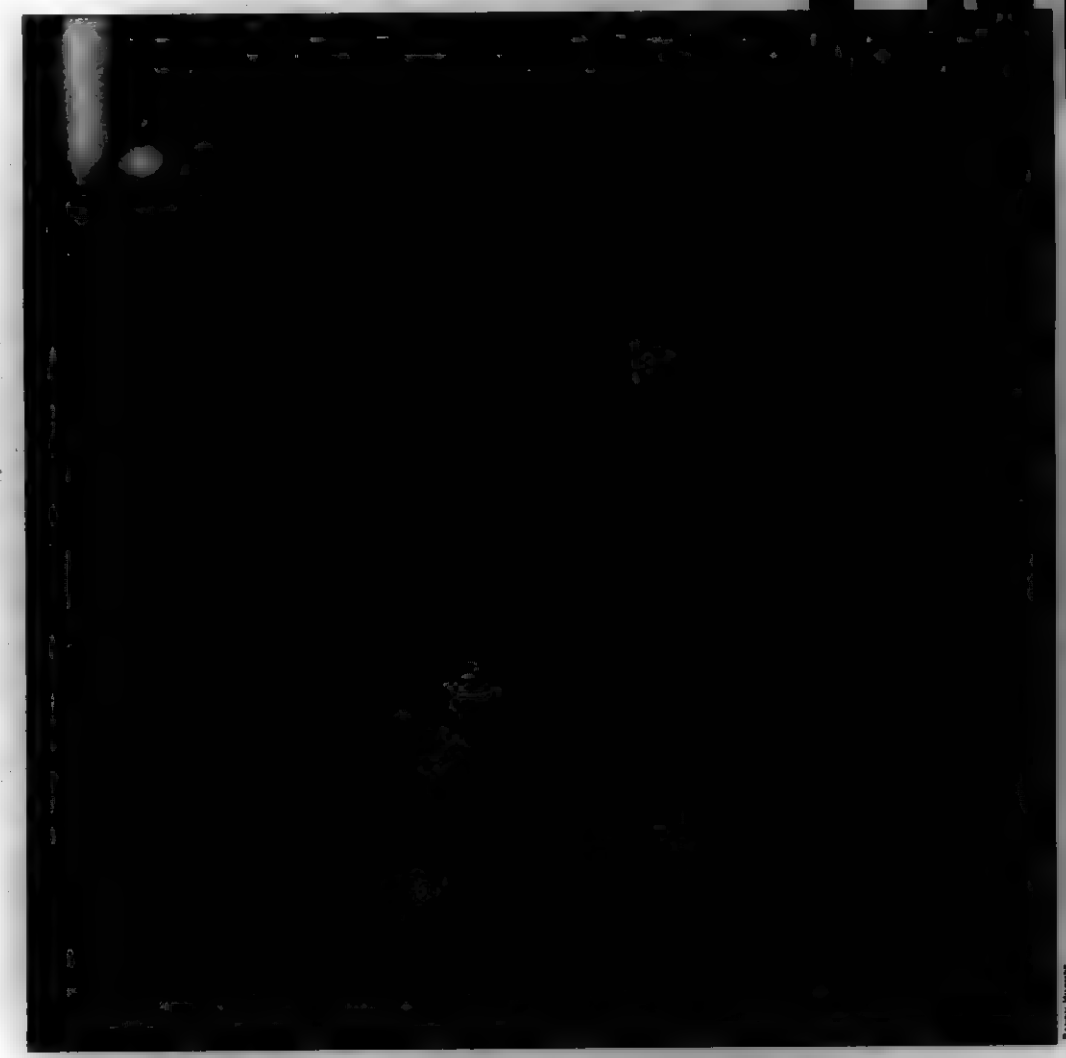

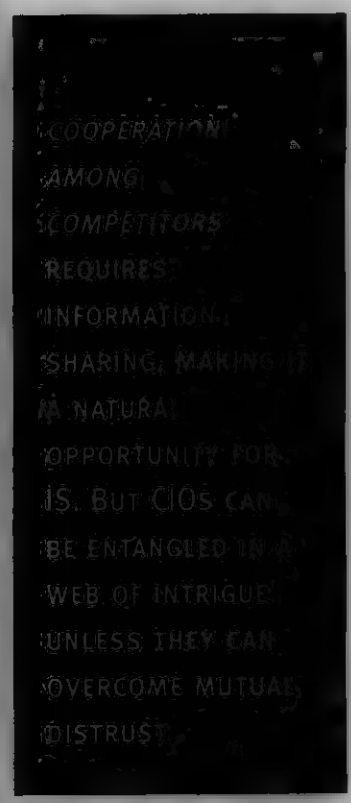

Randy Hurets

EBC Industries' Harry Brown: *"If you can't abide by the rules, then you should leave."*

BY ROCHELLE GARNER

Harry Brown was not amused. Word had gotten back to him that one of the companies invited into his carefully wrought network of suppliers and, yes, competitors wasn't playing fair: It was going after projects on its own instead of with the team.

"I said, 'If you can't abide by the rules, then you should leave.' They agreed and walked out."

Big mistake on its part.

The renegade manufacturer lost business because it didn't have the clout of Brown's network — an informal team of companies from around Erie, Pa., in the same small-parts business.

In contrast, Brown's EBC Industries, Inc. (Brown is its president) and all of its 11 allied suppliers and competitors have been grow-

Networking, *page 84*

Need EDI ideas? See our guide to user groups.

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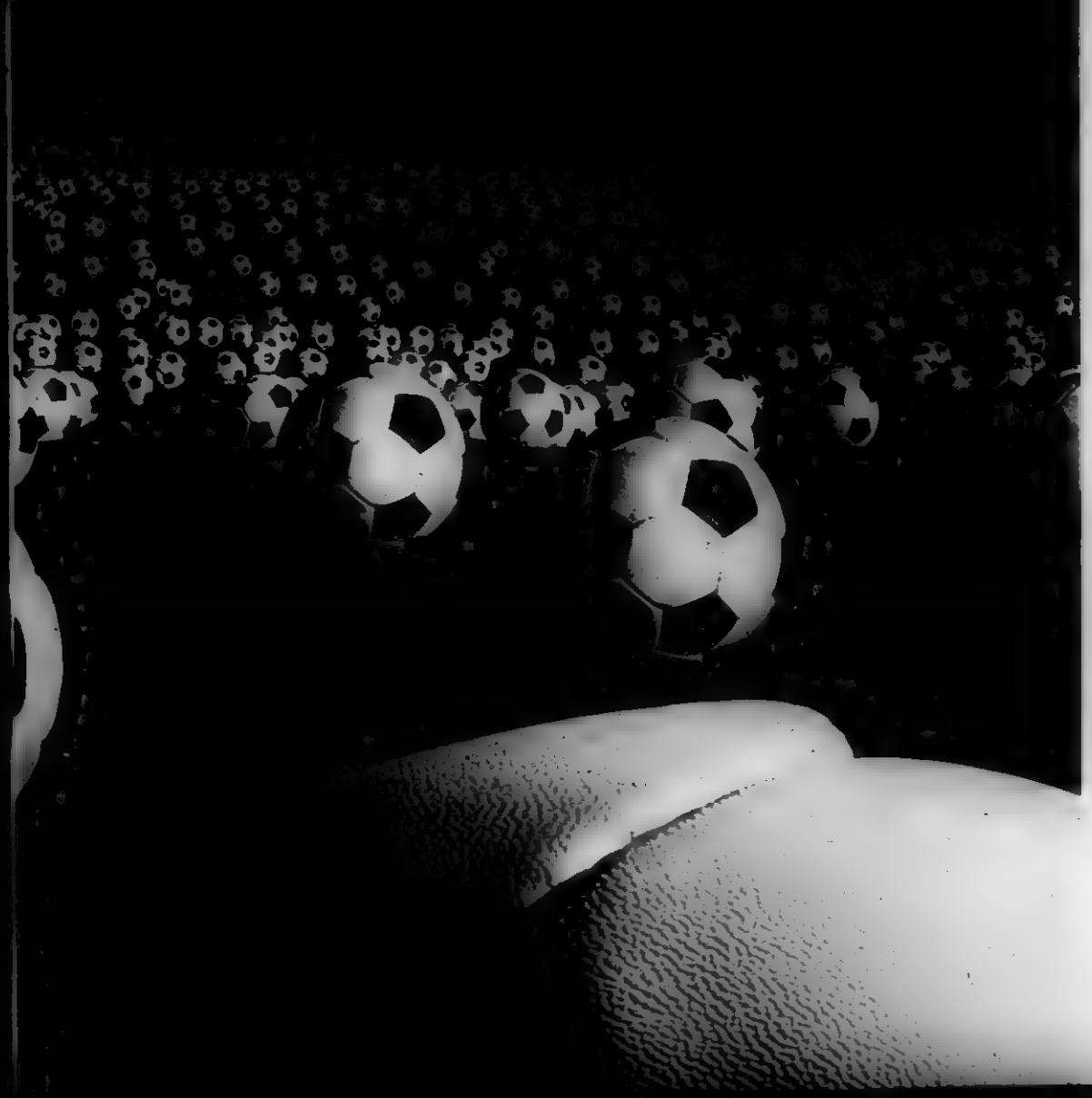

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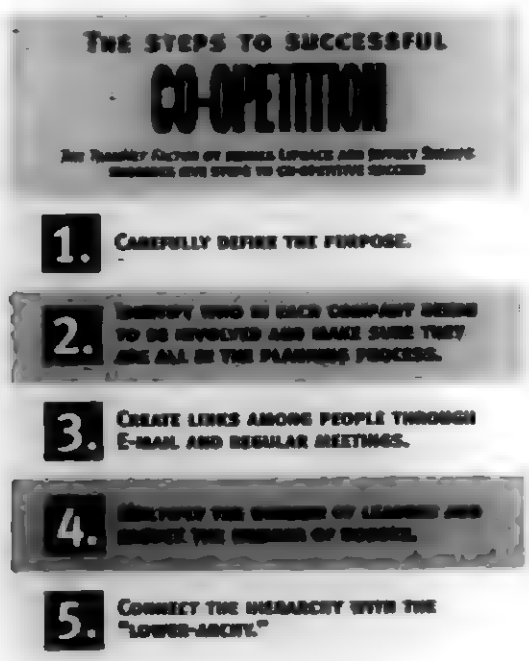
Networking

CONTINUED FROM PAGE 81

ing at 12% to 15% every year since he cobbled together the network in 1988. EBC has grown from 68 employees to its current 93 and from less than $4 million in sales to $6.4 million expected by year's end.

That incident highlights the glories and potential pitfalls in the growing trend of "co-opetition."

Not familiar with the term? Get used to it — the word could become as prevalent as the phrase "virtual corporation."



Both embrace the concept of companies reaching across corporate boundaries to engage in mutually beneficial projects. But co-opetition, management pundits say, goes even further to include the notion of competitors working together toward a shared goal while continuing to compete.

For example, EBC gladly shares its electronic data interchange (EDI) expertise and inventory database with team members working on the same job. But should any member step on another one's territory, the members politely but firmly tell the violator to stop.

Some unsuccessful

Not everyone has had Brown's success. Others have ventured into collaborative waters only to find themselves mired in a swamp of distrust, churning through investment dollars without earning a single cent of return.

Take Electronic Joint Venture (EJV) Partners. Like the Erie network, New York-based EJV Partners embodied the shared vision of competitors. But rather than laid-back, small-parts manufacturers from the green valleys of Pennsylvania and Ohio, these companies were six of Wall Street's leading bond-trading firms.

Their goal was enormous profit. The result so far has been an industry joke.

Three years ago, the bond-trading market hungered for data and analytical tools to more confidently buy and sell bonds. Sure, Bloomberg Financial Services, a financial news service, provided some information. But only some.

London's Reuters Holdings PLC, one of the largest market data companies in the world, approached New York-based Goldman, Sachs & Co.'s senior bond traders with a deal: Help us start a service to compete against Bloomberg. The business side called in James K. Burns, then Goldman, Sachs' chief information officer, to evaluate the prospect.

The idea looked great. So great, in fact, that Burns, along with Salomon Brothers, Inc.'s Mark Sternberg, with whom he discussed the project, decided to eliminate the middleman.

"We both agreed: Why share this with Reuters?" said Burns, now president and CIO of SHL Systemhouse, Inc., a systems integration and outsourcing organization based in Canada and New York. "But we also said whatever we would do would start off behind Bloomberg, so we needed more partners."

Eventually, Goldman and Salomon recruited CitiBank NA in New York, The First Boston Corp. in New York, Morgan Stanley & Co. in New York and Lehman Brothers, Inc. in New Haven, Conn. Each partner would donate data and software that the resulting service company — EJV Partners — would turn into a data and analytics system powerhouse certain to lure business away from Bloomberg.

Only it hasn't turned out that way. Every partner had a different idea of how to deliver the information: with a cutting-edge system that would take time to build or with a "reasonable" package that it could sell almost immediately. Cutting-edge won, and Bloomberg continued to gain ground with more customers.

But the problems ran deeper. While EJV Partners won't confirm or deny it, word throughout the halls of Wall Street holds that the six partners continually bickered over what facts, analytics and software they would give to the venture, holding out the best information for themselves.

Whatever the reason, the initial bond-trading system sucked eggs.

"When we evaluated EJV's system, it became clear that the marginal benefit over Bloomberg just wasn't worth the cost," says Tony Coffey, portfolio manager at Franklin Resources, Inc. in San Mateo, Calif.

In more than a year and a half, not one customer bought the system. Zip. EJV Partners' employment fell from 180 to its current 110. The firm's chief executive officer also felt the ax and was replaced last summer by Thomas Wendel. However, EJV Partners released a new, more capable system last summer that is finally winning customers.

"We've gone from [having] no paying customers to between 15 and 20 in the past four months," says Dick MacWilliams, EJV Partners' head of sales and marketing. Six of those paying customers are EJV Partners' original partners. What went wrong?

Agreeing to agree

"It's always difficult getting competitors to agree on common goals, common standards and common methodologies," MacWilliams says. "And when you have partners contribute more than just money, decision-making becomes even more complex."

EJV Partners management operated like the multiheaded Hydra, each with its own idea of how things should work.

That, maintains Jessica Lipnack, co-author of *The TeamNet Factor*, can be a common source of failure. Lipnack, who actively promotes the idea of co-opetition, says participants must define with hard-edged clarity the purpose of their project. "That purpose is the glue holding the teamnet together," Lipnack says. "Without it, the project will fail."

Her point transcends mere platitude. After all, a traditional hierarchy contains rules, regulations and policies that people can follow. "But in a [teamnet] network, all you have is the shared agreement of what needs to be done," she says.

Perhaps one way to ensure clarity of purpose is with a disinterested arbitrator. That's one role Electronic Data Systems Corp. is playing as it helps four California managed-care plans develop the California Health Information Network (CHIN).

"I constantly have to weigh in the back of my mind what is competitive information," says Joseph Sinsangkeo, manager of information systems technology at HealthNet in Woodland Hills, Calif. "That's where EDS and [Health Information Technologies] play a role — as keepers of company-specific information. And a lot of times they'll come back and say, 'You all have a lot more in common than you realized. Are you willing to share?' "

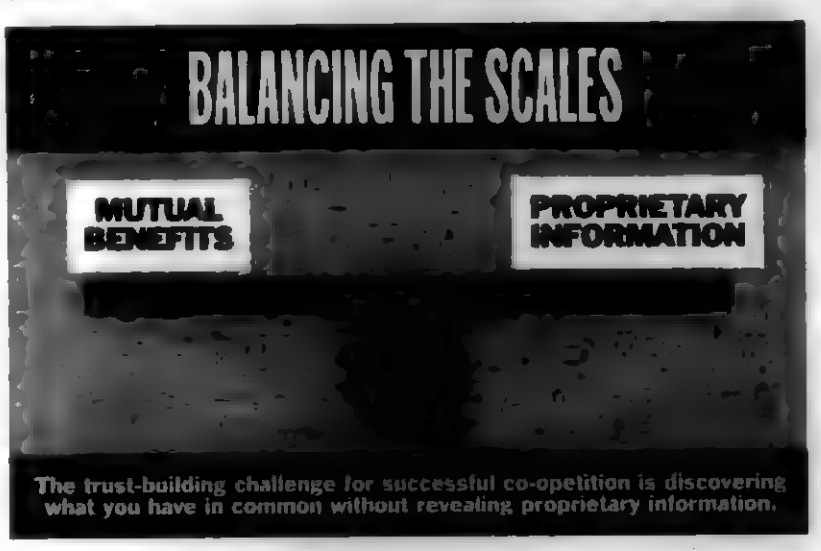
And while EDS' role as information broker is important, so is the relationship among the four partners. Every week, IS representatives from the four, along with representatives from EDS and Health Information Technologies, hold conference calls to work out implementation concerns.

Every month, CIOs and top business executives meet to hash out larger issues, such as choosing where the January pilot will roll out. Each member has an equal voice, which it exercises loudly and clearly. It's as if the project leaders had read Lipnack's book, with its admonition to meet regularly, push information both up and down the hierarchy and create more leaders (and fewer bosses) throughout the team.

Fewer the better

It is also wise to limit the number of partners in the group at the outset and let the membership increase as it learns to work together.

For example, when CHIN finally goes on-line, partners will pay per transaction. And since volume will lead to volume discounts, participants hope to recruit as many competitors, IPAs and medical groups as possible.



The trust-building challenge for successful co-opetition is discovering what you have in common without revealing proprietary information.

Initially, Dallas-based EDS and its partner, Health Information Technologies in Princeton, N.J., were setting up an EDI system to transmit uniformly formatted claims/encounters, eligibility information and referral authorizations among health care plans, independent physicians associations (IPA) and medical groups. For the competitors — PruCare, HealthNet, TakeCare and Blue Cross/Blue Shield of California — the challenge is to discover what they have in common without revealing proprietary data.

That, however, will be much later. For now, the aim is to keep the process running, which means limiting the players to four.

"I think the difficulty of reaching agreement increases exponentially as you add people," says Linda Hutchinson, senior systems consultant at PruCare. "But the nature of the project is that by having four of us cooperating, we will accomplish more than any one company could do alone."

This kind of openness and lack of for-

Networking, *page 88*

EDI IDEA FACTORIES

Need to jump-start your EDI efforts? Regional, industrywide EDI groups and standards bodies offer support.

BY LESLIE GOFF

When G. Patrick Galvin had to make a decision about which electronic data interchange (EDI) organizations he should join on behalf of his company, he says he considered four factors: how to educate his staff, how involved his group needed to be in standards setting, which groups could help him find potential business partners and how much money he was willing to spend on membership fees.

As vice president of information services at the Lincolnshire, Ill.-based Prescription Services division of Caremark International, he had to jump into the EDI fray quickly.

Galvin had been involved with EDI organizations while at Federal Express Corp. before he joined Caremark, but his new company, which he joined in September 1992, had only minimal electronic funds transfer applications in place. Caremark is a provider of alternative health care services such as mail-order pharmacies, in-home therapy and orthopedic care.

"EDI is the means to improving a company's profitability," Galvin says. "I saw many opportunities for us to implement trading partner relationships with drug manufacturers and our customers."

Deciphering the alphabet soup of EDI organizations across the U.S. can be as difficult as implementing EDI, however.

Some 32 active local and regional cross-industry user groups provide networking opportunities and educational forums. The groups are like "idea factories" that help "jump-start the imaginations of their members," says Don Waltzer, director of information systems at Spectrum Office Products in Rochester, N.Y., and founding chairman of the Rochester EDI Users Group.

The Electronic Data Interchange Association, a national EDI information clearinghouse, promotes EDI implementation and standards, trains EDI users, monitors legislative and regulatory activity, forms task forces among members and works with the standards bodies.

Industry-specific groups develop and promote standards within their respective industry segments and represent members before the American National Standards Conference ANSI X12 — the domestic interindustry standards body — and the Pan American Edifact Board (PAEB) — the regional representative of the global UN/Edifact standards body.

Both X12 and the PAEB accept corporate memberships and are overseen by the Data Interchange Standards Association, Inc., which also disseminates EDI information, including an annual listing of EDI publications, industry guidelines, local user groups and industry-specific groups.

Tapping resources

For staff training, Galvin tapped the educational resources of the Electronic Data Interchange Association, of which he had been a member since his Fedex days. (He now serves on the board of directors.) Next he encouraged his applications developers to join the Greater Chicago EDI Forum as a means of learning from colleagues and staying abreast of new developments.

"Local user groups make for great networking opportunities," he says. "They can really help when you're just starting out and gathering the initial information you need."

Most of these groups were started by EDI implementors who wanted to forge bonds with colleagues in their area to share ideas and war stories, such as Atlanta's EDI Business Forum, initiated by three colleagues over a business lunch five years ago.

"They offer technological and emotional support," Waltzer says. "Typically, companies get into EDI because they have to, and it has a language all its own. So in user groups you find a sympathetic shoulder."

Their missions and memberships differ from city to city, however, says Gay Slesinger, U.S. EDI marketing manager at Digital Equipment Corp. and founder and leader of the EDI Forum of New York City.

She suggests that before joining, prospective members should ask a few basic questions regarding the mix of participants: whether the group is oriented toward technical implementation, business issues or socializing with peers; vendor affiliations; and fees.

Fees also vary, ranging from voluntary participation to less than $100 per year for individual memberships to several hundred dollars for annual corporate memberships, Slesinger says.

Industry-specific groups are less sympathetic and more political, working to develop industrywide standards and promote consistent industrywide EDI implementation.

The benefit to a company of belonging

EDI, *page 88*

NATIONAL CROSS-INDUSTRY EDI ORGANIZATIONS

The following organizations are national in scope and serve all industry segments in the development, maintenance and promotion of EDI standards or in the education of EDI implementors and the promotion of EDI use in general.

GROUP & CONTACT	SERVICE
ANSI Accredited Standards Committee (ASC) X12 c/o DISA (see address below) Harriett Rusk, 1993 president, (703) 548-7005	Chartered by American National Standards Institute to develop uniform standards for domestic interindustry EDI for order placement and processing, shipping and receiving, invoicing and payment and cash application, etc.
Data Interchange Standards Association, Inc. (DISA) 1800 Diagonal Rd., Suite #355 Alexandria, Va. 22314-2853 Harriett Rusk, 1993 president, (703) 548-7005	Secretariat and administrative arm of ASC X12 (see above) and the Pan American Edifact Board (PAEB, see below). Manages X12 membership, balloting, standards development and maintenance, publications, annual conference and exhibit, X12 Committee Meetings, etc.
Electronic Data Interchange Association (EDIA) 225 Reinekers Lane, Suite #550 Alexandria, Va. 22314 Helen Cook, manager of member services, (703) 838-8042	Promotes EDI use, with focus on the business impact and benefits of EDI, and educates EDI implementors; acts as a clearinghouse for a wide range of EDI information.
Pan American Edifact Board (PAEB) c/o DISA (see address above) Carrie Spencer, administrator, (703) 548-7005	Develops Pan American regional consensus on international EDI standards; represents region to UN/Edifact in development, maintenance and promotion of international standards.
UN/Edifact UN/ECE Trade Division Palais de Nations CH-1211 Geneva 10, Switzerland Address correspondence to Hans Hansell, 41-22-917-2457	Develops, maintains and promotes international EDI standards; coordinates activities of international regional representative bodies, such as PAEB (see above), with regard to EDI standards; operates under auspices of the United Nations.

LOCAL AND REGIONAL EDI USER GROUPS

The following is a complete guide (in alphabetical order, by city) to active regional and local user groups, according to the records of ANSI's X12 Education and Training Task Group. For more information, contact the person listed or call John Goetzman, vice chairman of the task group, at (800) 367-4272.

CITY	GROUP	CONTACT
Austin, Texas	Central Texas EDI Users Group	Ralph Gagne, (512) 835-0917
Atlanta	EDI Business Forum	Sheila Robinette, (404) 715-4804
Boston-Hartford	New England EDI Users Group	Bob Mykiewicz, (203) 277-1975
Chicago	Greater Chicago EDI Forum	Rich Millet, (312) 732-5410
Columbus, Ohio	Central Ohio EDI Users Group	Adrian Dalton, (614) 761-6821
Dallas-Fort Worth	Dallas-Fort Worth EDI Bus. Forum	Michael Mrozek, (214) 618-5020
Denver	Colorado EDI Users Group	Dan Davis, (303) 279-2884
Detroit	Michigan EDI Users Group	Lydia Maes, (313) 442-8540
Greensboro, N.C.	Piedmont EDI Business Forum	James Pitts, (910) 741-4920
Harrisburg, Pa.	Central Pa. EDI User Group	Mark Caruso, (717) 960-5102
Houston	Texas Gulf Coast EDI User Group	Betty Zimmerman, (713) 975-4475
Indianapolis	AIAG User Support Group*	Barbara Dotty, (317) 638-2424
Jacksonville-Miami-Orlando-Tampa, Fla.	Florida EDI	Margo Nast, (904) 268-03010
Kansas City, Mo.	EDI Business Forum of Greater Kansas City	Bob Browne, (816) 880-7795
Los Angeles	Southern California EDI Roundtable	Kelley Carlson, (213) 236-6225
Milwaukee	Bar Code/EDI User Council	Mark Thibadeau, (414) 375-1150
Minneapolis-St. Paul	EDI User Group	Dan Thibadeau, (612) 681-6900
New York	EDI Forum of New York City	Gay Slesinger, (212) 858-2882
Omaha	The Midlands EDI Association	Steve Brownfield, (402) 499-0300
Philadelphia	Delaware Valley EDI Roundtable	Jeff Brooks, (215) 968-8241
Phoenix	Arizona EDI Roundtable	Dave Darnell, (602) 633-5910
Pittsburgh	Greater Pittsburgh EDI Partners	Warren Smith, (412) 234-1479
Portland, Ore.	Portland Initiative	Mark Peterson, (503) 231-6000
Richmond, Va.	Virginia EDI Forum	Bruce Chambers, (804) 281-3134
Rochester, N.Y.	Rochester EDI Users Group	Don Waltzer, (716) 424-5000, x2257
St. Louis	Greater St. Louis EDI Forum	Susan Watson, (314) 235-3809
San Diego	San Diego EDI Users Group	Ann Templeton, (619) 594-5450
San Francisco	Northern Calif. EDI User Group	Suzanne Murphy, (415) 241-4550
Seattle	Northwest EDI Roundtable	Mark Gorenstein, (206) 281-5400
Tulsa, Okla.	Green County EDI User Forum	Karen Raper, (918) 835-3111; or Sally Adams, (918) 586-8105
Washington	Wash., D.C. EDI Users Group	Teresa Tee, (301) 258-7400
Woodbridge, N.J.	EDI Forum of New Jersey	Paul Daisy, (908) 972-2970

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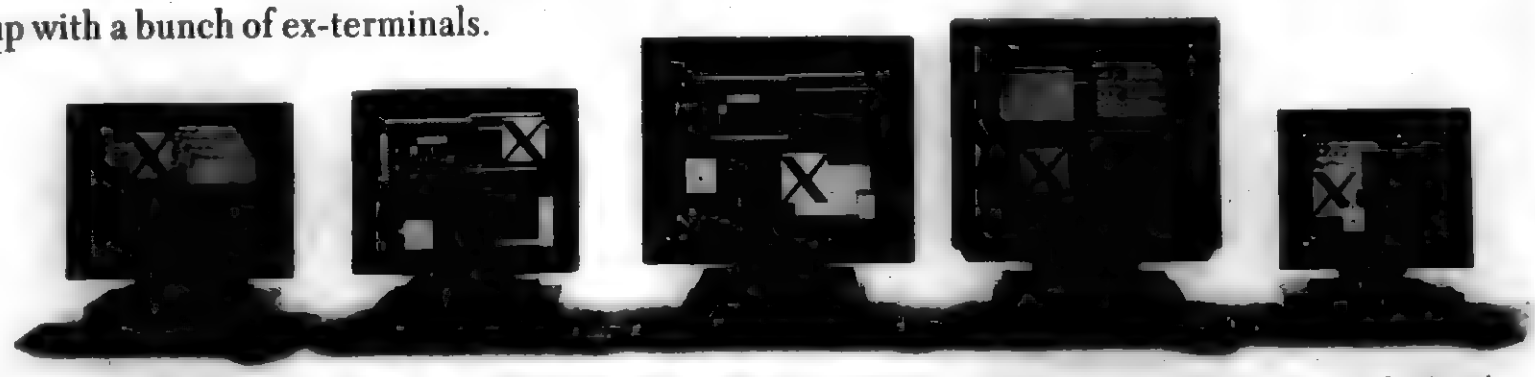
Only five X-Terminals meet the most stringent demands imposed by Wyse. Choose anything less and you just might end up with a bunch of ex-terminals.

without sacrificing productivity.

With Wyse you can do just that. Compatibility with Sun, DEC, SCO ODT, HP, IBM RS/6000 and other standard UNIX platforms is assured. Fast text and graphics operations are provided by more than 100,000 XStones of performance.



WX-17M. 17" monochrome X-Terminal. 1280 X 1024 resolution. MIPS R3000A Architecture at 25 Mhz.

WX-17C. 17" color X-Terminal. 1280 X 1024 resolution. MIPS R3000A Architecture at 40Mhz.

WX-19C. 19" color X-Terminal. 1280 X 1024 resolution. MIPS R3000A Architecture at 40 Mhz.

WX-19M. 19" monochrome X-Terminal. 1280 X 1024 resolution. MIPS R3000A Architecture at 25 Mhz.

WX-15C. 15" color X-Terminal. 1024 X 768 resolution. MIPS R3000A Architecture at 40 Mhz.

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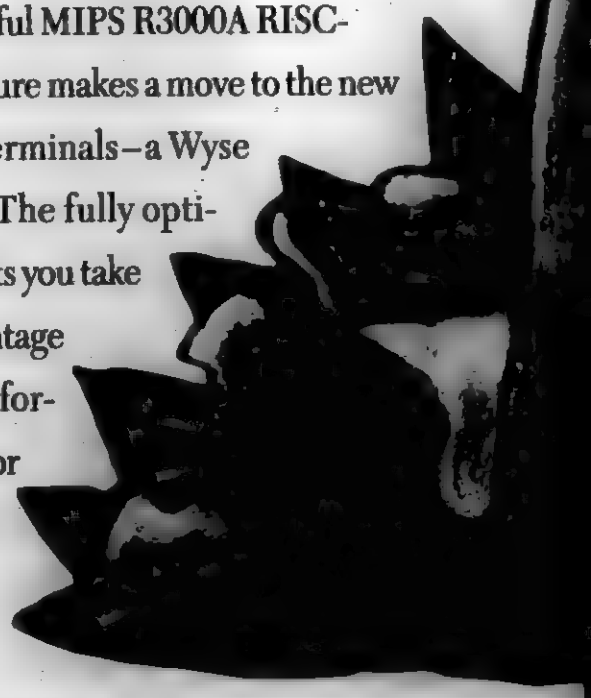
The powerful MIPS R3000A RISC-based architecture makes a move to the new WX series of terminals—a Wyse move indeed. The fully optimized server lets you take complete advantage of the high performance processor for X-specific applications.



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And the easy-to-use software allows you to access all your local clients with a simple keystroke.

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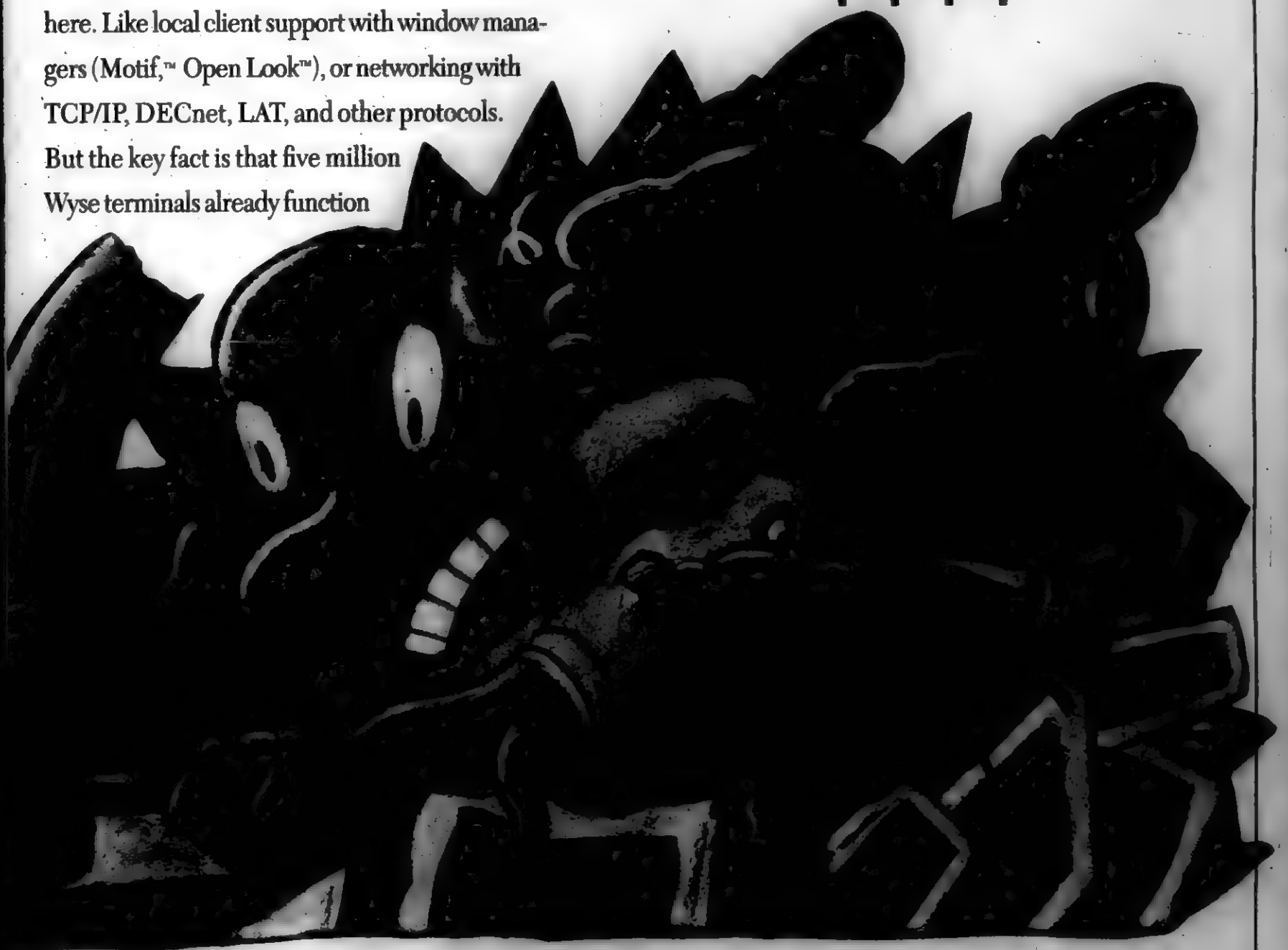
Sure, we could list a few dozen other features here. Like local client support with window managers (Motif,™ Open Look™), or networking with TCP/IP, DECnet, LAT, and other protocols. But the key fact is that five million Wyse terminals already function reliably in the business world. Which makes it a sure bet that the new WX line will be hard at work long after others have become X-tinct. Call 1-800-GET-WYSE for details on the new family of X-Terminals from Wyse.

WYSE



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Networking

CONTINUED FROM PAGE 84

mality among members is what's so intriguing about a network of erstwhile enemies, says Brown at EMC. "We all just call, ask to come over and discuss the topic."

Taking the team approach

Interested in a particular job? Just tell the other players; they might want to vie for it, too. Want a new computer-numeric control program for your milling machine? No problem: EBC's programming staff will send one over.

The team approach has helped each member reach independent goals in ways otherwise not possible. In Brown's case, his goal was big, lucrative contracts that were beyond his reach. Brown, quite simply, needed help.

When he first took over what was then called Erie Bolt Corp., the manufacturer of parts for the transportation and defense industries was losing $100,000 a year.

Worse, much of the shop floor equipment had been cannibalized to keep other machines operating. Then an order came in that EBC couldn't fill.

"So I went to my competitors, explained my dilemma and proposed that we go after contracts together," he says.

As it happened, one of those competitors, Joseph Dyson & Son in Painesville, Ohio, saw this as the opportunity to expand. It was the beginning of a beautiful relationship — one that eventually grew to include up to 12 suppliers and competitors that team up against much larger forces bidding on the same contract.

"We still compete. But we cooperate on areas where individually we couldn't do it alone, either because of equipment or capacity reasons," Brown explains.

That's the ticket

That attitude is just the ticket needed to succeed and one that is obviously not being lost on the CHIN group. Chances are, the four players in the CHIN group will succeed. Somehow, whether through common sense or just plain luck, they've established a way of interacting that promotes trust, open communication and a constant eye on the project's objective.

Those ingredients — crucial for any co-opetitive venture — are damnably difficult to instill among allied competitors. Just ask EJV Partners' members.

So before you enter the oh-so-brave world of collaboration, ask your gut if you and your potential partners can work together. If the answer's yes, prepare to work long and hard. If it's no, back out. ■

Garner is a free-lance writer in San Carlos, Calif.

INDUSTRY-SPECIFIC EDI ORGANIZATIONS

Note to the reader: The following is merely a sampling of industry-specific EDI organizations that develop and promote EDI standards within their respective industry segments. For a more comprehensive listing, contact DISA at (703) 548-7005.

GROUP	CONTACT
AUTOMOTIVE Automotive Industry Action Group (AIAG) 26200 Lahser Rd., Suite #200 Southfield, Mich. 48034	Nancy Tilley, membership coordinator, (313) 358-3570
CHEMICAL Chemical Industry Data Exchange (CIDX) P.O. Box 4159 Trenton, N.J. 08610	Debbie Hart, administrator, (609) 588-7088
ELECTRONICS Electronics Industry Data Exchange (EIDX) c/o Electronics Industries Association 2001 Pennsylvania Ave., NW Washington, D.C. 20006	Patti Rasher, secretariat, (202) 457-4982
FINANCIAL National Automated Clearinghouse Association (NACHA) 607 Herndon Pkwy., Suite #200 Herndon, Va. 22070	Deborah Shaw, director, network development or Maggie Scarborough, senior director, product development (703) 742-9190
HEALTH AND HEALTH CARE Health Industry Business Communication Council (HIBCC) 5110 North 40th St., Suite #250 Phoenix, Ariz. 85018	Robert Hamblin, president, (602) 381-1091
PETROLEUM Petroleum Industry Data Exchange (PIDX) c/o American Petroleum Institute 1220 L St., NW Washington, D.C. 20005	John Cobleski, EDI coordinator, (202) 682-8491
RETAIL/GROCERY/WAREHOUSING Uniform Code Council (UCC) 8163 Old Yankee Rd., Suite J Dayton, Ohio 45458	Christine Frazwell, EDI coordinator, (513) 435-3870
TRANSPORTATION American Trucking Association's Management Systems Council (ATA/MSC) 2200 Mill Rd. Alexandria, Va. 22314-4677	Douglas Anderson, director of technical services, (703) 838-1721

EDI idea factors: industry groups

CONTINUED FROM PAGE 85

to an industry-specific group is influence with X12 and PAEB without having to join those organizations, and in setting standard implementation guidelines within the industry itself.

Corporate membership in these groups costs thousands of dollars per year. Galvin's cost-consciousness has led him to choose the National Council for Prescription Drug Programs (NCPDP) over the Health Industry Business Communications Council, a national group that develops and promotes EDI standards in the health care industry.

"Our need right now is to develop relationships with drug manufacturers and NCPDP helps us set those up," Galvin adds.

"There's a lot of standards setting going on in that group, and now it's integrating what it has developed into the X12 arena." ■

Goff is a free-lance writer in New York.

Calendar

DEC. 12-DEC. 18

"Electronic Government: Policies for Redesigning Government and the Workplace and for Improving Communications with Citizens." Washington, Dec. 12-14 — Sponsored by the State Information Policy Consortium. Contact: National Association of State Information Resources Executives, Lexington, Ky. (606) 231-1905.

Lap and Palmtop Exposition and Conference. Toronto, Dec. 13-14 — Contact: Laptop Expositions, New York, N.Y. (212) 682-7968.

Re-engineering: The Implementation Perspective. Boston, Dec. 14-16 — A seminar providing an introduction to the concepts and objectives of re-engineering with an analysis of the business factors driving it. Instructor will be Michael Hammer, The Center for Re-engineering Leadership in Cambridge, Mass. Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

JAN. 2-JAN. 9

Third Annual ShowBiz Expo. New York, Jan. 6-8 — Contact: ShowBiz Expo, Los Angeles, Calif. (213) 668-1811.

1994 International Winter Consumer Electronics Show. Las Vegas, Jan. 6-9 — Contact: Electronic Industries Association, Washington, D.C. (202) 457-8728.

JAN. 9-JAN. 15

ObjectWorld. Boston, Jan. 10-13 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JAN. 16-JAN. 22

Client/Server Conference & Exposition. San Jose, Calif., Jan. 18-21 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-7460.

Re-engineering: The Implementation Perspective. Boston, Jan. 19-21 — Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

Storage & Interfaces '94 International Technology Conference. Santa Clara, Calif., Jan. 19-27 — Nine separate but related forums and seminars will be offered during these dates. Contact: Technology Forums, St. Peter, Minn., (507) 931-0967.

Nomda/Landa Emerging Technologies Expo '94. Orlando, Fla., Jan. 20-22 — Contact: Nomda/Landa, Kansas City, Mo. (816) 941-3100.

JAN. 23-JAN. 29

Demo '94. Palm Springs, Calif., Jan. 23-26 — Contact: InfoWorld Editorial Events, San Mateo, Calif. (415) 312-0545.

ComNet '94. Washington, Jan. 24-27 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Fourth Annual "Achieving Quality Software" Tutorial and Conference. San Diego, Jan. 26-28 — Speakers will be Barry Boehm, University of Southern California; and Ron Radice, director of the Software Process Program. Contact: Vince Heald, Beck-Eilman Agency, La Mesa, Calif. (619) 469-3500.

10th International Conference on Engineering Information Systems: Product Data Management & Alternatives. Dallas, Jan. 26-28 — Contact: Management Roundtable, Boston, Mass. (617) 232-9080.

JAN. 30-FEB. 5

14th Annual Florida Educational Technology Conference. Tampa, Fla., Jan. 31-Feb. 4 — Contact: Bureau of Educational Technology/Florida Education Center, Tallahassee, Fla. (904) 488-0980.

Executive Technology Summit '94. Sponsored by The Society for Information Management and *Computerworld*. Tarpon Springs, Fla., Feb. 2-4 — Contact: ATI Travel Management, Chicago, Ill. (312) 644-6642.

FEB. 6-FEB. 12

Building Enterprise Architectures. Washington, Feb. 8-10 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

FEB. 13-FEB. 19

Sigda: Workshop on Field Programming Gate Arrays. Berkeley, Calif., Feb. 14-15 — Contact: Association for Computing Machinery, New York, N.Y. (212) 944-1318.

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Plus the whole PS/2 line comes with a three-year on-site warranty with four-hour average response time.**

For more information about the PS/2 Server 95 and entry-level Server 85 models, call 1 800 772-2227.

And find out more about the servers that are *almost* limitless.

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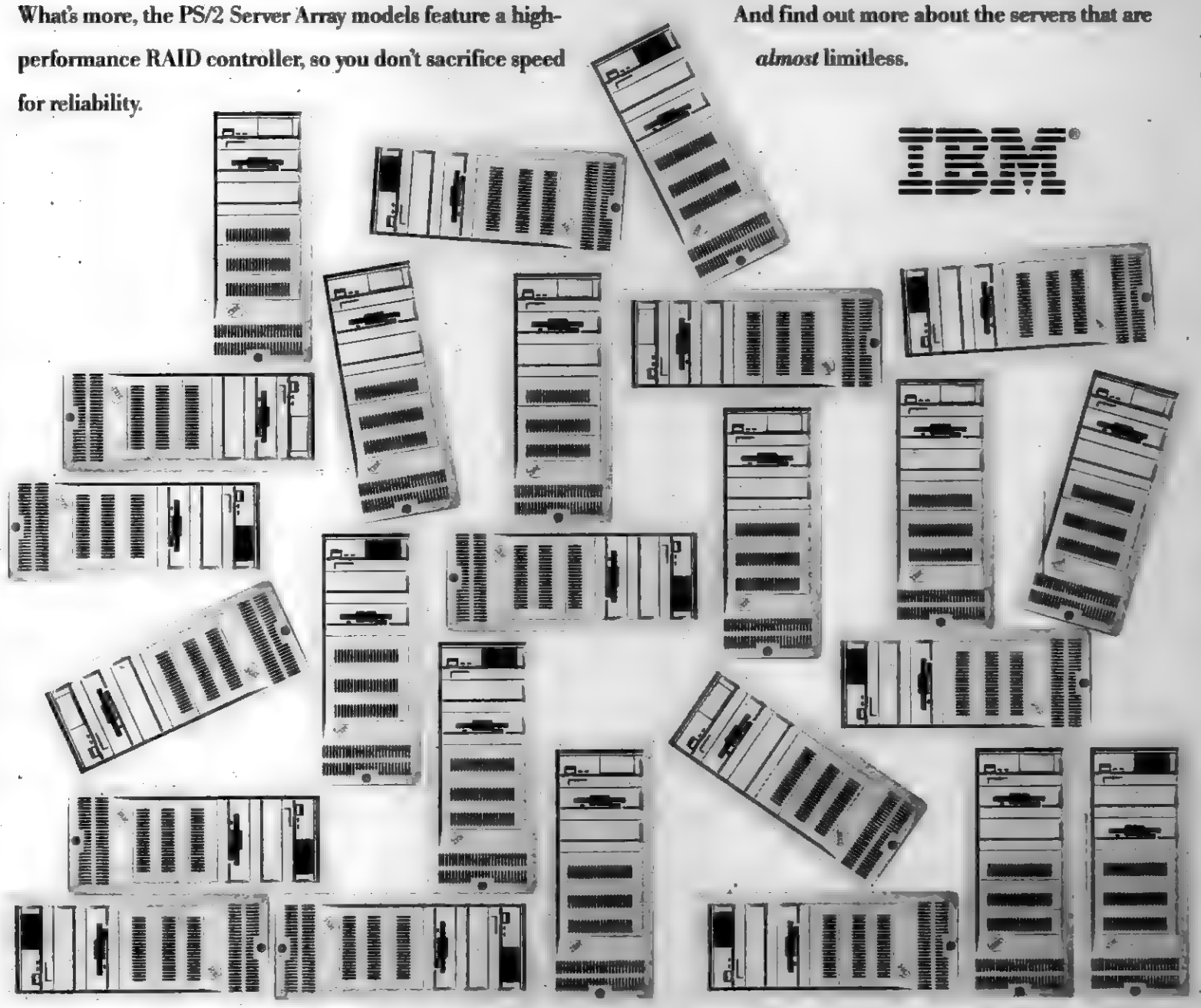

*Please call for model availability. **Available from IBM, M–F, 8 A.M.–5 P.M. in your time zone. Copies of IBM's statement of limited warranty are available upon request, by calling 1 800 772-2227. IBM and PS/2 are registered trademarks and SynchroStream is a trademark of International Business Machines Corporation. Pentium is a trademark of Intel Corporation. © 1993 IBM Corp.

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The DEClaser 1152. The extraordinary new printer that truly is designed to handle anything.

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PUTTING IMAGINATION TO WORK

digital

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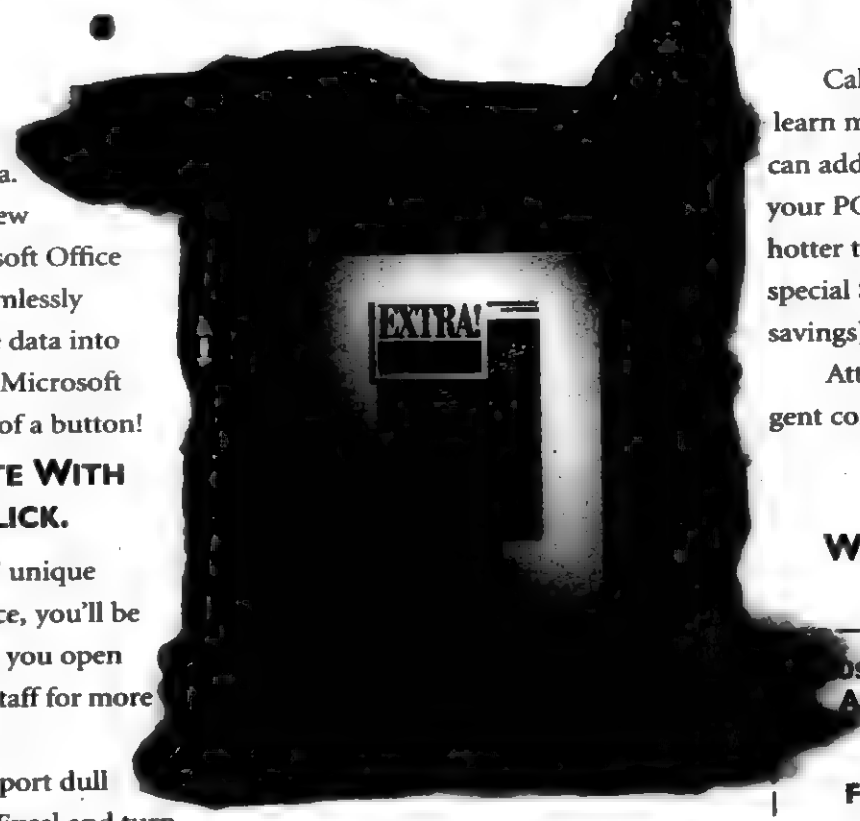

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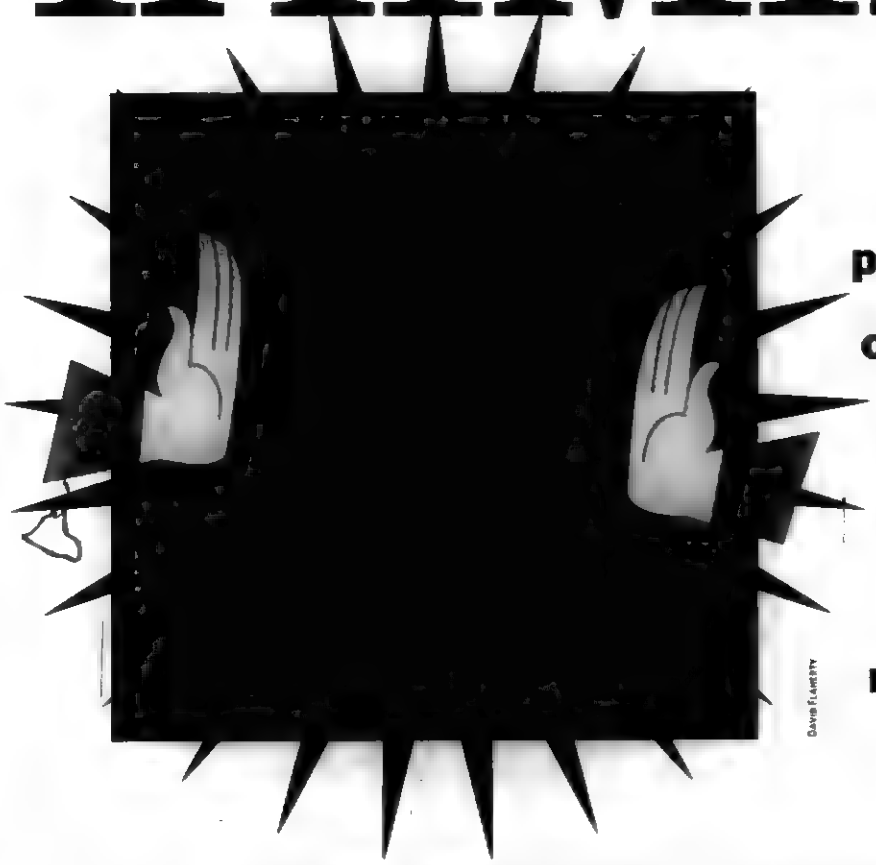
MAXIMIZE

Buy a new mainframe? Probably not. Squeeze what you've got for all it's worth? Very likely.



Tools for automation, performance and optimization are selling madly, as users find no letup in mainframe use.

Not only is the mainframe not dead yet — it's humming quite loudly.

Bad-news downsizing stories. Lower hardware prices. And a realization of how these processing powerhorses can fit into a distributed computing plan. All of these factors have led to something of a mainframe renaissance. You couldn't ask for a better transaction processor, large database engine or super file server.

But "you can pretty much bet that the first answer is going to be 'No' when you go to the CEO and ask for more money for more mainframes," says Paul Mason, manager of system level software at International Data Corp. "It's going to be, 'Can't you get more out of what we have?' "

One popular means of maximizing mainframes is performance monitors (see story page 104). These pinpoint bottlenecks and help with load balancing.

The trouble with these types of tools is that "each vendor has its little niche," says Lane Bradley, system vice president of information technology at Gainsco, Inc., an insurance company in Fort Worth, Texas.

"Data center managers would have to purchase products from hundreds of little vendors to find a unified solution," Lane says.

There's been more innovation in data center automation (see story page 94).

At some point, however, you have to increase capacity, whether through upgrades or by off-loading to other mainframes or other platforms altogether.

IBM just previewed its "transaction server," which is supposed to take on work from CICS or IMS applications to free up mainframe MIPS for other tasks. (For other recent announcements, see page 101.)

Even IBM recognizes that large systems will not always come in today's form factor. Many traditional — and nontraditional — mainframe vendors are looking to offer even lower-priced systems that are smaller and more conducive to today's open environments (see story page 101).

inside

Buyers' Scorecard: Landmark Systems Corp. tallies highest overall satisfaction score among leading MVS performance monitors. **Page 104**

Firing Line: Evaluators of the Unisys 2200/500 said the system meets mainframe performance levels and substantially reduces environmental costs. **Page 109**

AUTOMATE

VENDORS OF DATA CENTER TOOLS STRIVE TO KEEP PACE WITH DISTRIBUTED REQUIREMENTS

By Michelle Louzoun

Data center automation tools may not be the most stylish thing to talk about today, but they soon may be. Data center workloads continue to rise, especially as companies turn to centralized control of their distributed systems.

What's more, vendors of automated tools have been hard at work keeping up with the challenges of distributed environments. The most interesting of these advances are applications that communicate with one another and across platforms, consoles that offer a view of the distributed environment and LAN backup.

Integrated applications

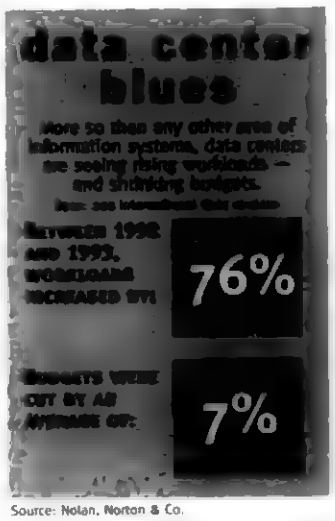
When automation vendors such as Boole & Babbage, Inc., Legent Corp., Candle Corp., Computer Associates International, Inc. and Altai Software, Inc. first began to sell tools that automated mainframe chores, they offered a variety of discrete applications, such as console automation, performance monitoring, report distribution, job scheduling, automatic restarting of programs and problem tracking.

Recently, however, users began demanding that these applications work together. For example, if the scheduling program was running a batch job that failed, it would alert the restart recovery package, which would then try to correct the fault. If the restart recovery software couldn't get the job running, it would alert an operator and/or open up a problem ticket.

This type of integration can dramatically improve efficiency. "An organization could easily see a 30% increase in productivity through integration," says Ross Markley, a systems engineer at Norwest Technical Services, Inc., the processing arm of Norwest Bank in Minneapolis. At a previous position, Markley was working with an in-house integrated suite of applications from CA.

Service levels would also increase. "Operator mistakes are the biggest cause of downtime, lost resources, heartache and poor services," Markley says.

Integration efforts, however, are at an immature stage. "A lot of these products were developed as single-point packages or brought together through acquisition," says Igor Stenmark, program director for software management strategies at Gartner Group, Inc. in Stamford, Conn. "They were not designed using the same database and the same code. The degree of integration is shallow."



"With many of these programs, the interface for each function looks the same, but that's about it," says Phil Arsenault, a systems consultant at Metropolitan Life Information Systems Center in Greenville, S.C.

The most you can hope for with the traditional vendors is for one or two applications to be strongly integrated. Altai, Boole & Babbage, Legent, CA and Candle all offer good integration among several applications.

Newer vendors such as 4th Dimension Software, Inc. are entering the market, hoping to fill that void. "This company was fortunate enough to enter the market just recently and developed all of its products in one monolithic effort," Stenmark says. The Irvine, Calif., company, which introduced products in 1987, offers the best integration with the greatest range of categories, Stenmark says.

Of course, single-vendor solutions preclude you from purchasing the best of the breed. And the quality difference among the various applications is "like the difference between a Rolls Royce and a Ford Escort," Arsenault says. "Some batch-scheduling packages, for example, don't contain documentation in the product itself and can't take prerequisites into account."

Cross-platform suites

It's not enough, these days, for your applications to work well together.

The average corporation has six hardware platforms, says Yossie Hollander, chief executive officer and chairman of 4th Dimension Software. There is a need, therefore, for the integrated applications to work across the distributed environment.

"With enterprisewide automation, you can monitor an entire application instead of just the components," says James Spangler, manager of data center automation at United Parcel Service, Inc. in Mahwah, N.J. "Right now, we monitor specific pieces of hardware. If the AS/400 goes down, we don't necessarily know its affect on our package-tracking system and what other pieces of equipment will

integrated automation products

The following vendors offer suites of data center automation applications that communicate with each other

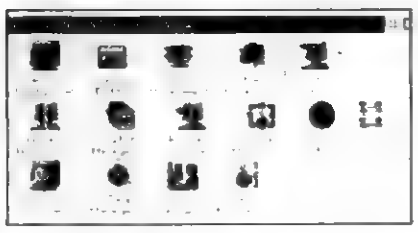
COMPANY	CONSOLE AUTOMATION	PERFORMANCE MANAGEMENT	STORAGE MANAGEMENT	REPORT DISTRIBUTION	JOB SCHEDULING	AUTOMATIC RESTART AND RECOVERY	PROBLEM TRACKING	DATA BALANCING	SYSTEMS COVERED
Altai Software, Inc. Arlington, Texas (Zeus)	●		●	●	●	●		●	MVS, VSE VM
Boole & Babbage, Inc., Sunnyvale, Calif. (Impact and Maineview)	●	●	●			●			MVS, IMS, CICS, DB2
Candle Corp., Santa Monica, Calif. (Omegacenter)	●	●	●			●		NA	MVS, VM, CICS, DB2, IMS, VTAM
Computer Associates International Inc., Islandia, N.Y. (CA/Unicenter)	●	●	●	NA	●	●	●	●	MVS, CICS, IMS, DB2, IES2, IES3 MVS ESA
4th Dimension Software, Inc., Irvine, Calif. (Integrated Operations Architecture)	●		●	●	●	●		●	MVS, Fujitsu MSP
Legent Corp., Herndon, Va.	●	●	●	●	●	●			MVS, VM, VSE, CICS

NA: Not available YES ●

CROSS-PLATFORM SUITES

The following is a list of vendors now developing applications that communicate with each other and across different platforms.

- **COMPUTER ASSOCIATES, ISLANDIA, N.Y. (CA UNICENTER/STAR)**
  CURRENT: An integrated product for HP/UX 9800 and MVS. FUTURE: Sequent, RS/6000, Sun, HP 9700, Data General Aviion in beta test. NetWare, NT planned. EXPECTED GENERAL AVAILABILITY: Third-quarter 1994.
- **4TH DIMENSION SOFTWARE, IRVINE, CALIF. (ENTERPRISE CONTROL ARCHITECTURE)**
  CURRENT: Scheduling module for MVS, AS/400, VAX VMS, Sun, RS/6000. FUTURE: HP/UX (first-quarter 1994), security and report distribution expected in 1994. EXPECTED GENERAL AVAILABILITY: 1996.
- **LEGENT, HERNDON, VA.**
  CURRENT: Underlying technology assembled for MVS, Unix, AS/400, OS/2, NetWare, NT, HP/UX, Sun, VAX VMS. EXPECTED GENERAL AVAILABILITY: Applications to be introduced throughout 1994.



CONSOLE AUTOMATION

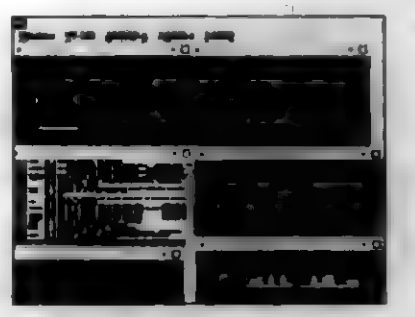
The following is a list of some enterprisewide console automation products.

- **BOOLE & BABBAGE, SAN JOSE, CALIF.**
  Command/Post
- **CANDLE**
  AF/Remote
- **TONE SOFTWARE CORP., ANAHEIM, CALIF.**
  CompuLert
- **MAXM SYSTEMS CORP., VIENNA, VA.**
- **VOTEX SYSTEMS LTD., TORONTO, CANADA**
  Comensa

CENTRALIZED BACKUP

The following is a list of products that provide mainframe backup and recovery for LANs. These packages have components that work on the mainframe and the PC.

- **IBM**
  Adstar Distributed Storage Manager
- **NEW ERA SYSTEMS SERVICES LTD., CALGARY**
  Harbor
- **ENTERPRISE DATA, INC., PARSIPPANY, N.J.**
  Upstream
- **NETWORK SYSTEMS CORP., MINNEAPOLIS**
  User Access
- **STORAGE TEK, LOUISVILLE, COLO.**
  Near Net Storage Manager
- **STERLING SOFTWARE STORAGE MANAGEMENT DIVISION, RANCHO CORDOVA, CALIF.**
  SAMS: Expert, SAMS: Control



AUTOMATED TAPE LIBRARIES

The following is a list of some robotics vendors.

- **STORAGE TEK**
  4400 ACS, POWDERHORN AND WOLFCREEK
- **IBM**
  IBM 3495
- **BOSCH STORAGE SYSTEMS, RICHMOND, MICH.**
  BOSCH STORAGE SYSTEMS 8800 AUTOMATED TAPE LIBRARY
- **EXABYTE CORP., BOULDER, COLO.**
  EXB PRODUCT LINES
- **MEMOREX TELEX CORP., DALLAS**
  AUTOMATED TAPE LIBRARY

eventually be affected. By seeing everything tied together, we will be able to better understand the impact of a problem."

Enterprise automation would also bring some sorely lacking mainframe disciplines such as security, automatic backup and asset management to the distributed environment.

An array of generally available enterprisewide products is expected by 1996, according to Stenmark, from the likes of CA, Legent and 4th Dimension Software.

Console automation

For managers who can't wait to reap the benefits of enterprisewide automation, many of the parts are here today. The pieces won't buy you the same efficiency as a totally integrated product, but you can achieve some very dramatic improvements in head count and service levels.

One important piece is enterprisewide console automation, also known as outboard console automation. These are products that consolidate console messages and performance information from virtually any type of electronic device, including communications and facilities management equipment.

Enterprise console automation tools have been around for the last five years, but they haven't been taken seriously until recently, when people got concerned about distributed systems management.

Outboard console automation tools are usually Unix-based systems that communicate with mainframe performance monitors.

They provide an operator with a single view of the organization and in most cases can be programmed to start applications, fix minor problems and alert the operator of an emergency through speech or a flashing message.

Swiss Bank Corp. in New York has been using Tone Software Corp.'s CompuLert since 1990. "We have one console to monitor 40 different entities, including routers, multiplexers and our legacy equipment," says Roger Best, a network/systems integration specialist at the bank.

The cost of monitoring the bank's disparate computers without automation would be about $12 million a year, according to Best.

Another piece of the enterprisewide management puzzle is automatic software distribution and asset management packages.

These programs provide a centralized way to install applications and transfer mainframe files to update workstations in an organization.

One user says he can install a simple program with a couple hundred kilobytes of memory to 400 workstations in under an hour. A manual installation would take three to four hours, he says, even if all the workstations were in the same place and nobody was working at their machine.

Centralized backup

Mainframes are increasingly viewed as an ideal place to back up data on PCs and LANs.

"The World Trade Center disaster taught us about the need for centralized backup," says Robert G. Simko, executive director of the International Technology Group in Los Angeles. "Companies with centralized backup were up and running in a week. For organizations with databases distributed over different floors and no centralized backup, it took over a month to get their computers running." ■

Lousoun is a free-lance writer based in Great Neck, N.Y.

tape libraries for small shops

Large data centers have enjoyed the benefits of automated tape libraries for a number of years. Now systems are available for any size shop that wants to substitute robotic arms for human ones to do mundane tasks like tape mounting.

"I would say that a data center with 5 to 20 MIPS of processing could start using the junior silos," says Joe Sindelar, a consultant at Bell Atlantic Business Systems Services in Frazer, Pa.

The larger systems had minimum capacities in the thousands of tapes. With products like Storage Technology Corp.'s recently introduced 500-tape library, even small data centers can reap the benefits of automation. The list price for the Storage Tek tape library is $125,000, according to a company spokesperson.

Labor reduction from automated loaders is substantial. "Companies can save anywhere from 10 to 30 operators," says Arnold Farber, president of Farber/LaChance, Inc., a consulting firm in Richmond, Va.

Processing time also decreases. "We expect to knock five to six hours off our back-office processing, primarily because the tapes won't be waiting for operators to load them," says Bruce Grandchamp, manager of computer services at Great Western Bank, which just purchased an IBM tape loader.

—*Michelle Lousoun*

Source: Institute for Computer Capacity Management

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OPTIMIZE

WE ASKED SEVERAL USERS TO RECOUNT HOW THEY MADE THE MOST OF THEIR MAINFRAMES

By Joe Panepinto

Optimization tools usually serve to solve a targeted problem rather than provide an across-the-board fix. Here are some stories to help in your choice.

GTE

Jeff Goodfellow, GTE Services Corp., Camillus, N.Y.

Even though his boss billed him as a "star tuner" at GTE, Goodfellow would rather be considered a "lunch-pail and hard-hat, get-the-job-done" kind of guy. He would rather fully exploit existing tuning methods than bring in exotic new technologies.

"We haven't done any real whiz-bang, in-depth-type stuff, but we've seen plenty of improvement," Goodfellow says.

GTE's data center in Syracuse, N.Y., operates as a zero-profit chargeback center that offers processing to all of GTE's units, including the world headquarters in Stamford, Conn. A simple operation Goodfellow has used to save CPU resources has been to scan the job control language of incoming jobs and reallocate block sizes where appropriate.

Recently, GTE acquired a product called Strobe from Programart Corp. in Cambridge, Mass. It will automate the scanning process, making it easier to find cases where memory blocks are inefficiently allocated.

GTE is also exploiting MVS System Managed Storage (SMS) by writing routines that automate the use of virtual I/O. Virtual I/O saves time because data is written into the mainframe's memory rather than to a direct-access storage device (DASD). While individual jobs can write in the use of virtual I/O onto their job cards, Goodfellow has automated SMS' use so that all jobs writing less than 10 tracks of data can write it to system memory rather than physical DASD.

"Before, everyone wanted to use virtual I/O, but it was eating up memory," Goodfellow says. "Now we've exploited the system so we could force job writing temporary files to use virtual I/O and also force a limit on the amount of memory they could use."

Like other mainframe shops, GTE is obviously concerned with the I/O bottleneck. It uses SyncSort from SyncSort, Inc., so that 75% of sorts are no longer being done in job space but in hyperspace and so have no need for I/O to physical DASD. Also, GTE took another tack to beat the I/O bottleneck — it got a faster storage subsystem.

"We just brought in two of EMC Corp.'s Symmetrix 4832, 90G-byte disk arrays with mega caches and small platters," Goodfellow says. "Our average response time for DASD I/O went from 28 msec. down to 4 msec."

BlueCross BlueShield of Minnesota

Michael Bryant, senior systems specialist, Blue Cross/Blue Shield of Minnesota, Eagan, Minn.

When Bryant first started at Blue Cross, he realized there were more than 300 applications loaded on its two IBM mainframes (600J and 720), and nobody knew if anyone was using them.

"That was a real bee in my bonnet," he says. "I brought in SoftAudit [from Isogon Corp. in New York] and dropped underutilized software that was costing us $150,000 a year in maintenance and update costs."

At the same time as Bryant was taking his first swipe at unused software, Blue Cross was installing an Amdahl Corp. mainframe. As a result, his discovery of the unused software saved the company the costs of replicating the licenses on the new machine.

Mainframe software vendors are reaping benefits from the optimization trend in the form of healthy revenue growth

	Year-ago quarter (in millions)	Latest quarterly revenue (in millions)	Growth
BMC Software, Inc.	$57.5		18%
Boole & Babbage, Inc.	$28.7		9%
Computer Associates International, Inc.	$432.9		20%
Computware Corp.	$55.9		24%
4th Dimension Software, Inc.	$4.3		89%

Ken Blythe, director, office of administrative systems, Pennsylvania State University, State College, Pa.

Like other mainframe shops moving to client/server, Penn State is repositioning its IBM mainframes as a type of superserver by introducing distributed processors on the front and back ends.

On the front end, Penn State is rapidly replacing 3270 dumb terminals with PCs (Unix, DOS and Macintosh machines); on the back end, it has moved its Adabas relational database management systems (from Software AG of North America, Inc.) to RISC-based processors, which feed data to the IBM 3090 and ES/9000 mainframes.

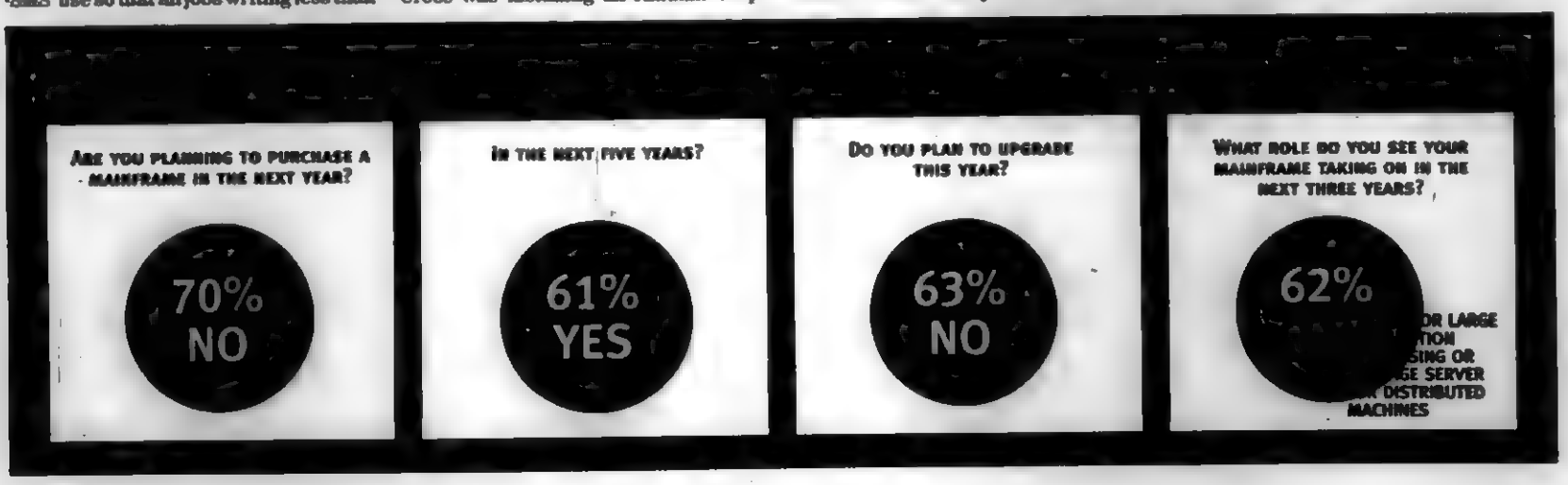
"We realized we could save processing cycles on our mainframes by moving Adabas and all of its associators off the 3270 architecture and onto RISC boxes, which are a lot cheaper and have much faster disk storage," Blythe says. "The way it works now is the mainframe gets calls to Adabas and passes them to the RISC machines. The RISC machines do all the compute cycles for searching, compressing and decompressing the data, then pass the data requested back to the mainframe, which completes the transaction.

"This takes those cycles off the mainframe and extends the life of that mainframe considerably," Blythe adds.

One solution Blythe has purposely avoided involves large (generally mid-range or minicomputer) front-end data servers. Replicating data on such servers means updates are slower to reach the actual mainframe data table, whereas users want changes to be reflected immediately, Blythe says.

For example, a student may make an adjustment to a class schedule, which updates a replicated database on a mid-tier server but not in the database itself. If the student then runs across the hall to the bursar's office to pay a bill, the transaction may not have been recorded yet, resulting in an upset student who has lost faith in the system, Blythe says. ■

Panepinto is a free-lance writer based in Amherst, Mass.



Don't be so quick to rip the mainframe!

FIRST PERSON

By Joe Vincent

By now, you've probably heard the news.

Recent studies say that five-year costs of applications deployed on LANs are 1.5 to 2.8 times higher than costs of mainframe-centric applications. The mainframe also beats LANs in availability, response time, maximum transaction volume and number of users supported. Superior metrics at lower costs — who could want more?

Unfortunately, your CEO has gotten all excited about client/server. So now everyone in IS is working to move your mission-critical applications to a few dozen LANs. Now what do you do?

First, be patient. The five-year cost studies will eventually show up in those in-flight magazine articles and your CEO will demand that everything be moved back again.

Second, let's discard our prejudices about "one-size-fits-all" computing platforms. The future of computing is in applications that span platforms. And the mainframe has an important role to play in that environment that can't be assumed by any other platform.

The consequence is you're going to be required to squeeze more from your existing mainframe resources. "But," you protest, "my production machine is already running at 85% CPU-busy; what can I do?"

First, run your mainframes at 100% CPU-busy, not 85%, as many companies do. CPU time has no shelf life — one can't bottle it over the weekend and uncork it for use on prime shift during the regular workweek.

Competent performance specialists can "tune" mainframes to run at 100%

CPU-busy while apportioning CPU time to various workloads in proportion with the relative importance of those workloads. The previously unused CPU time will be harnessed to "overachieve" service levels and performance targets.

Second, acquire and exploit performance improvement software. System software products are available that virtually eliminate time-consuming processes such as directory searches and program module loads by doing them in memory using "Least Recently Used" algorithms. Products that buffer I/O for VSAM and IDMS are particularly effective at reducing CPU time, I/Os and, consequently, elapsed time, especially for batch processing.

Third, stratify workloads, particularly if you have multiple machines. What does this mean? Every machine should give preferential service to your most important workloads and progressively lower levels of service to other workloads in decreasing order of relative importance.

If you've divided your workloads into production and test machines, you have guaranteed that some lower-priority workload will get better service on your test machine than some higher-priority workload on your production machine. Is that really what you intended?

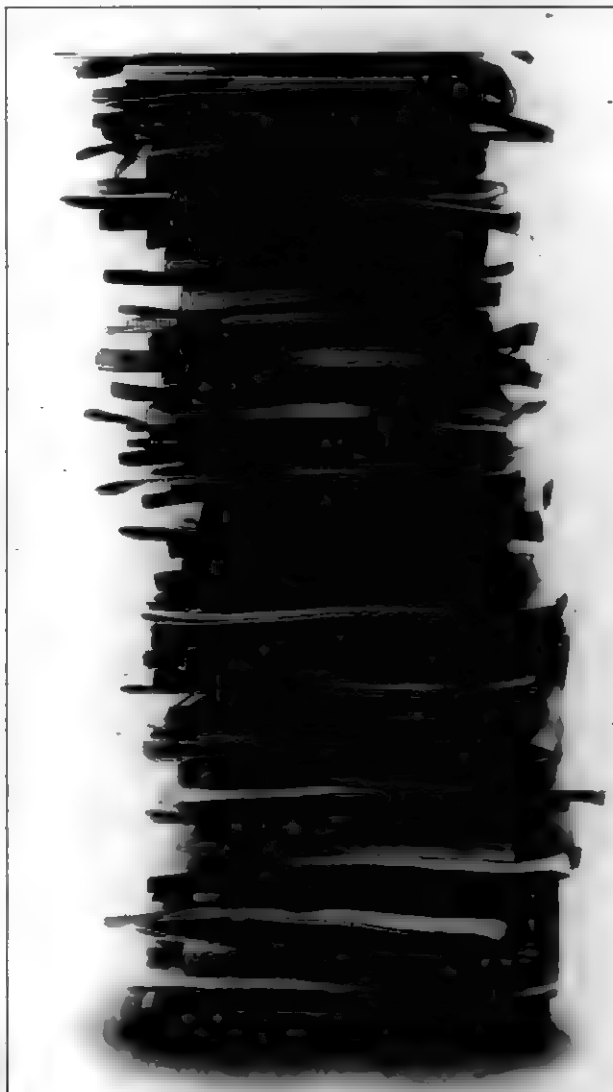
Finally, accept the fact that capacity planning and performance management aren't part-time tasks.

You must be willing to commit the money and people to the job.

Anything sounds good in the abstract, but can you successfully run mainframes at 100% CPU-busy and stratify workloads across multiple processors? Absolutely. We've been doing this at Humana for over 10 years.

Try it; you'll like it. ■

Vincent is director of technical services at Humana, Inc., a health care management firm in Louisville, Ky.



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ALTERNATIVES

NEW MACHINES WILL HAVE ALL THE POWER — WITHOUT THE COST

By James Cassell

TRADITIONAL

- 5,600 to 12,000 circuits per chip.
- Many chips, substrates, boards.
- High inherent propagation delays.
- High power required for increased speed.
- Water cooling required.

ALTERNATIVE

- Scalability equivalent to the largest IBM ES/9000-class machine.
- Typically 20% to 25% of traditional mainframe cost.
- Capable of running OLTP or batch applications.
- Compliant with standards such as Posix, DCE from the Open Software Foundation, TCP/IP and X/Open XPG3.
- An enterprise system operating environment, characterized as being "industrial strength" and "bulletproof."
- Processors of at least 40 MIPS each.

TECHNOLOGY THAT WILL LEAD THE WAY

- Digital Equipment Corp.'s Alpha — used in machines from Digital and Encore Computer Corp.
- Mips Technologies, Inc. MIPS 4400 — used in machines from Tandem Computers, Inc. and Pyramid Technology Corp.
- Sun Microsystems, Inc.'s SuperSPARC — used in machines from Sun, and Amdahl Corp.
- Hewlett-Packard Co.'s PA-RISC — used in machines from HP, Hitachi Data Systems Corp. and Convex Computer Corp.
- Intel Corp.'s Pentium — used in machines by Unisys Corp., AT&T/NCR and Encore.
- IBM's RS/6000 — used in machines by IBM and Groupe Bull.

GENERAL-PURPOSE ALTERNATIVE MAINFRAMES ALREADY ANNOUNCED

- HP 3000CS, Encore Infinity 90, Digital VAX 7000/10000, NCR 3600, Pyramid Nile Series NS100, NS150.
- Meanwhile, subsets of the large-system market, such as OLTP and decision support, are being addressed by vendors, including Kendall Square Research Corp., Tandem, NCube and Thinking Machines Corp.

HOW THE ALTERNATIVE MACHINES WILL BE USED

As users deploy client/server applications, centralized computing will make a comeback. The lower-cost alternative mainframe will gradually replace the traditional mainframe as the enterprise data server.

Its economies of scale and management capability will be used for backup of LAN servers and personal data as well as enterprise, mission-critical data.

Alternative mainframes will also become the "MIPS" server for the enterprise. Yet as the price/performance of alternative mainframes improves to near-workstation levels, large systems, in the form of alternative mainframes, will again be viewed as a cost-effective enterprise solution.

Cassell is vice president and service director of large computer strategies at Gartner Group, Inc. in Stamford, Conn.

THE OBSTACLES IMPEDING ALTERNATIVE MAINFRAMES

Impeding progress is the need for robust, open software to support the full range of operations and applications across and beyond the enterprise. At present, applications have been limited to demonstrations of such obvious candidates as OLTP and database accessing.

WHEN ALTERNATIVES WILL BE IN FULL FORCE

All mainframe vendors will make the transition to core platform technology based on CMOS, incorporating massively parallel designs by 1996. Yet mainframe costs will drop, even for new systems that do not meet the "alternative" criteria. So along with older models, the traditional mainframe will not disappear anytime soon.

The transformation of the installed base will be more gradual. Nevertheless, Gartner Group forecasts that alternative mainframes could gain a 44% share of the large-system market by 1998 if they can penetrate the "glass house" in 1994 and 1995 before the traditionals can make the transition to a competitive offering of their own in 1996.

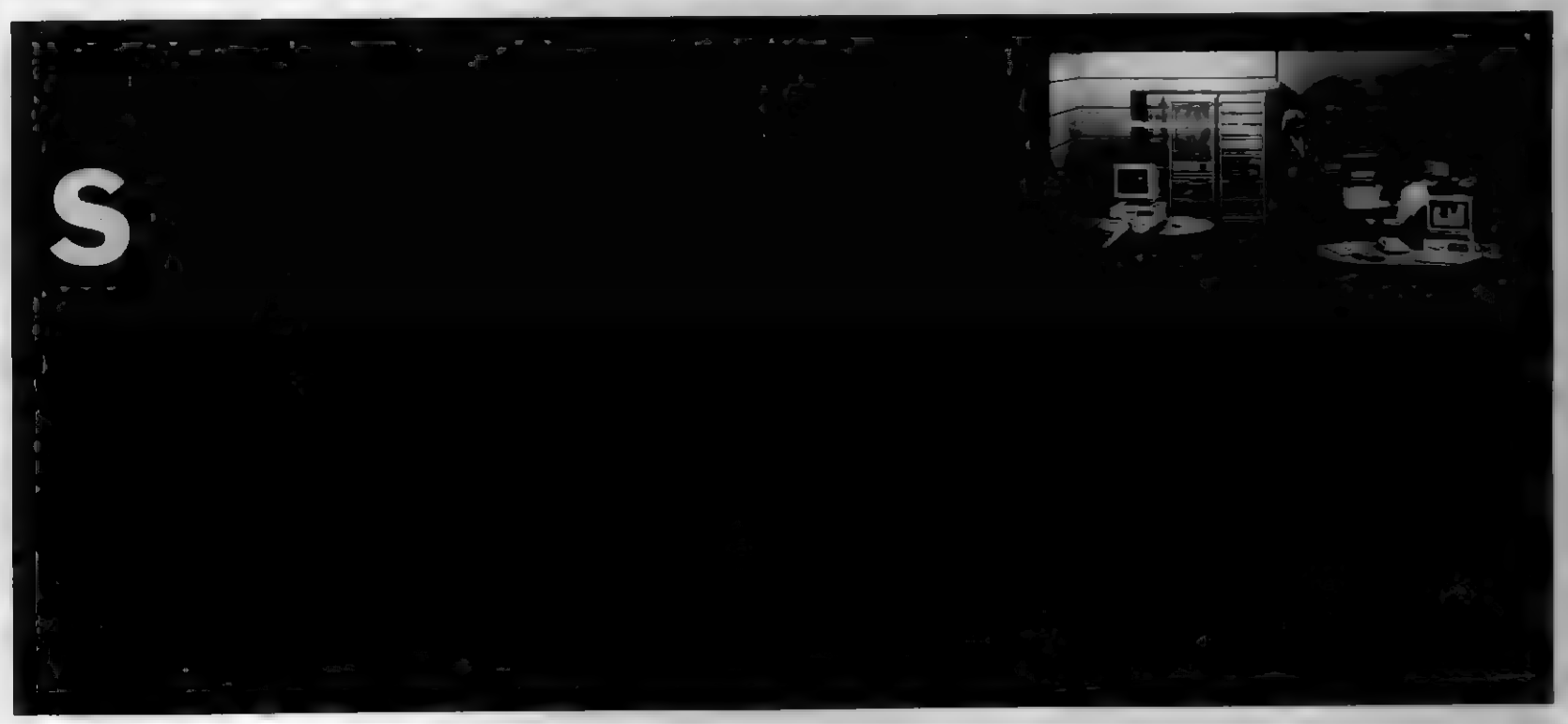
WHERE THE TRADITIONAL VENDORS STAND

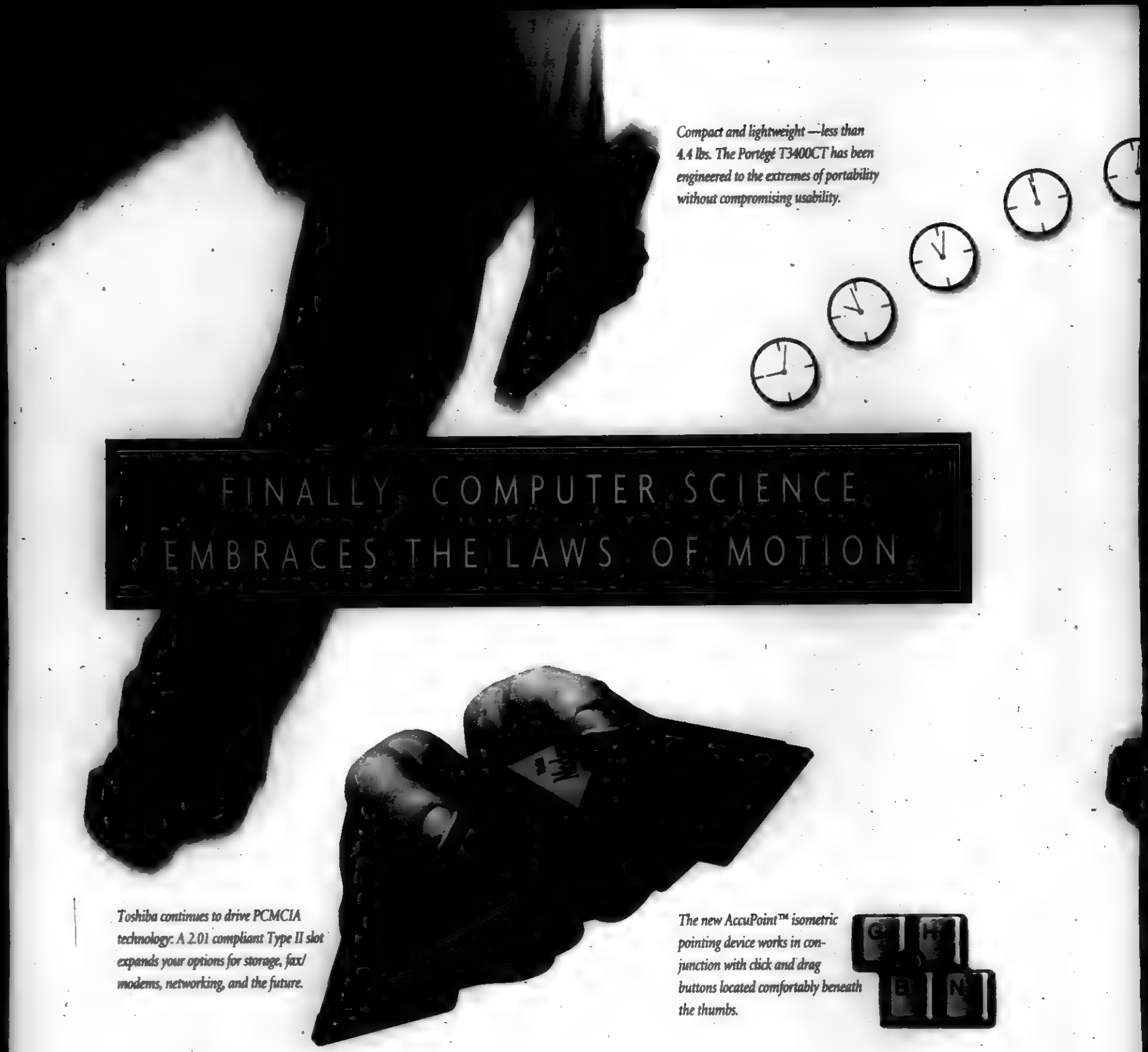
IBM: Its general-purpose alternative mainframe is expected by the end of 1995. Its most difficult challenge is to break through its internal congestion with timely software to support applications on alternative machines.

Digital: Its transition to Alpha puts it ahead of schedule. But with the turmoil it faces in completing its restructuring, it will likely never return to its formerly dominant market position.

Unisys: Its first transition machine — the 2200/500 — fits the definition of an alternative, when used in conjunction with its Extended Processing Complex offering. Its new first-rate management team positions the company for the future.

HP: After a major restructuring, HP was the first vendor to come out with a common CMOS-RISC technology and open systems architecture. It's the best-positioned of the traditional competitors for new enterprise solutions.





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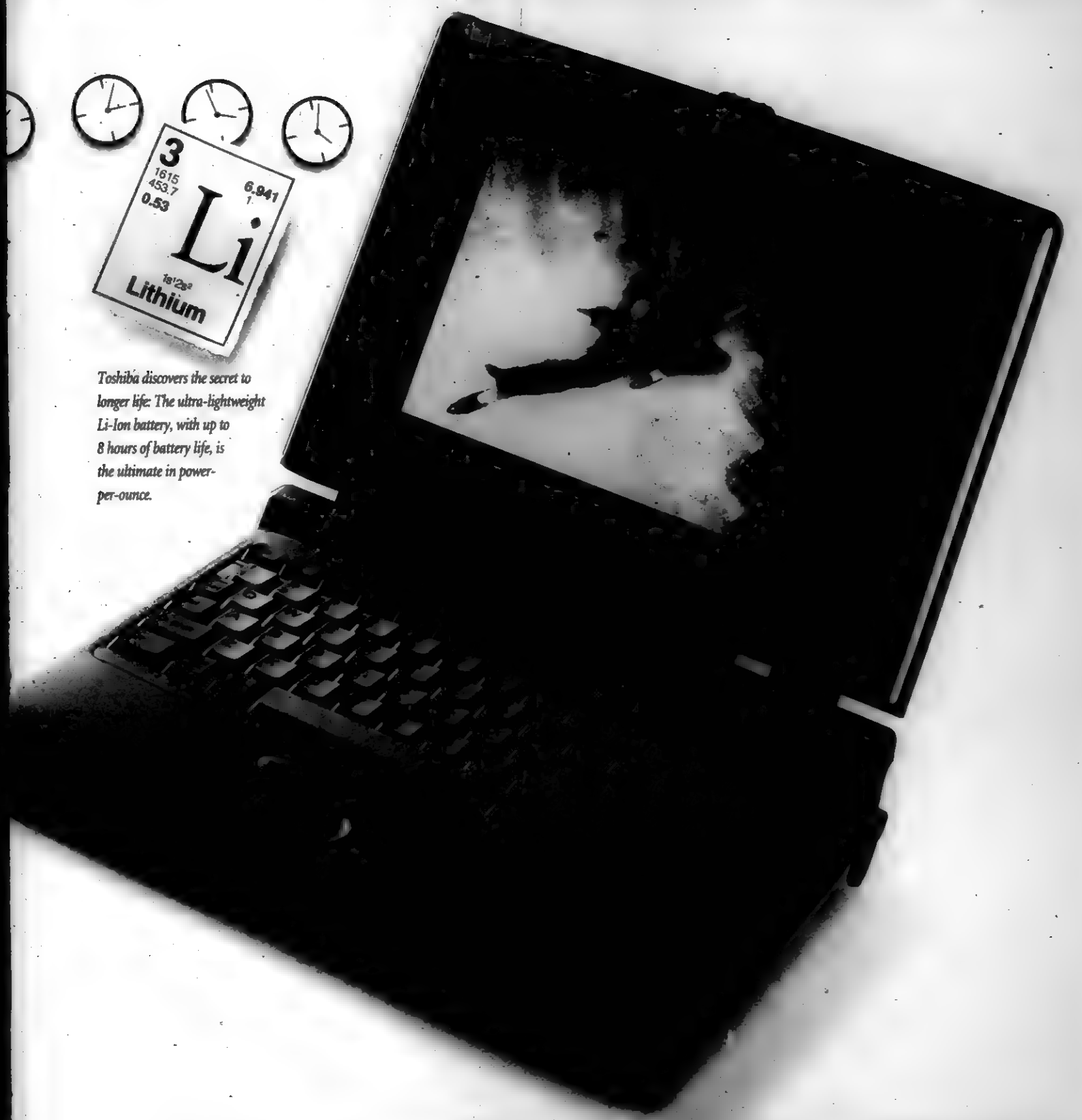

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BUYERS' SATISFACTION SCORECARD

Landmark garners top score in MVS performance software survey

By Kevin Burden

How efficient its core systems perform can be a key factor in whether your information systems department meets the performance and reliability goals required by the company's business.

MVS performance management software can help to ensure a system's efficiency by providing administrators with a means to track down bottlenecks and tune system resources.

Monitors that provide a dynamic window into the system are the most widely used type of performance-enhancing software, according to John Varanelli at New Science Associates, Inc. in Westport, Conn.

Options, options, options

But there are still other products in use. The old-fashioned method of making system adjustments after first analyzing reams of historical data is still in use in conjunction with real-time monitors and is, in fact, the basis of the new generation of monitors.

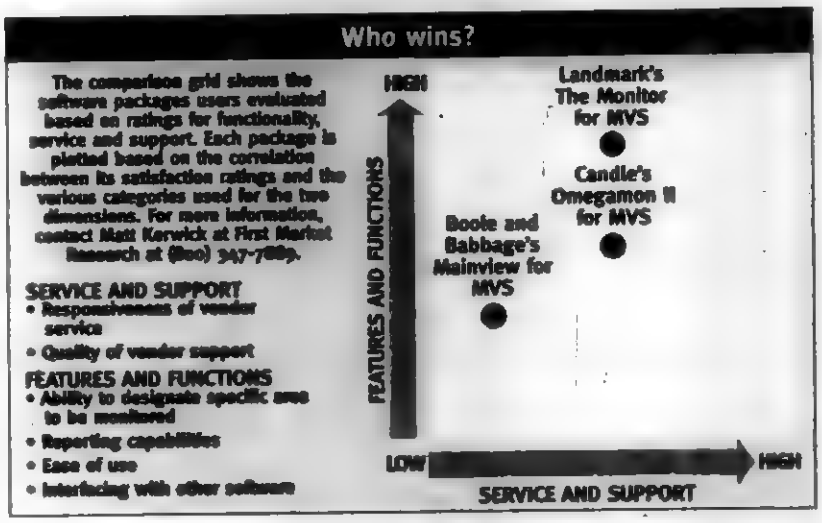
Administrators use historical data to build capacity models and can then predict system performance by simulating changes off-line.

In the Buyers' Satisfaction Scorecard user survey, Landmark Systems Corp.'s The Monitor for MVS (Tmon) tallied the highest overall satisfaction score by achieving the top mark in 14 out of 20 categories. Boole & Babbage, Inc.'s Mainview for MVS scored highest in five areas, and Candle Corp.'s Omegamon II for MVS, which commands the largest market share of the three products, took just one category.

Tmon posted its highest scores for its ability to effectively navigate to the source of a problem and provide a low overhead by its efficient use of the CPU's resources. The area where Tmon was shown up by its competitors was in its reporting capabilities — Mainview's strongest feature.

Mainview users awarded it the top scores for both reporting and historical reporting capabilities. However, users were dissatisfied with its system predicting and "what-if" simulations.

Although Omegamon scored the lowest overall satisfaction rating, users gave it the highest overall reliability score, which in turn was rated to be the most important feature in an MVS performance management system.

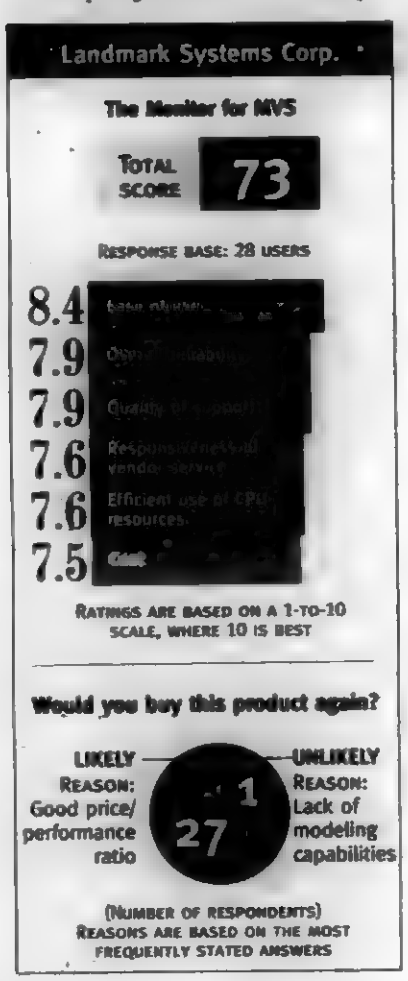


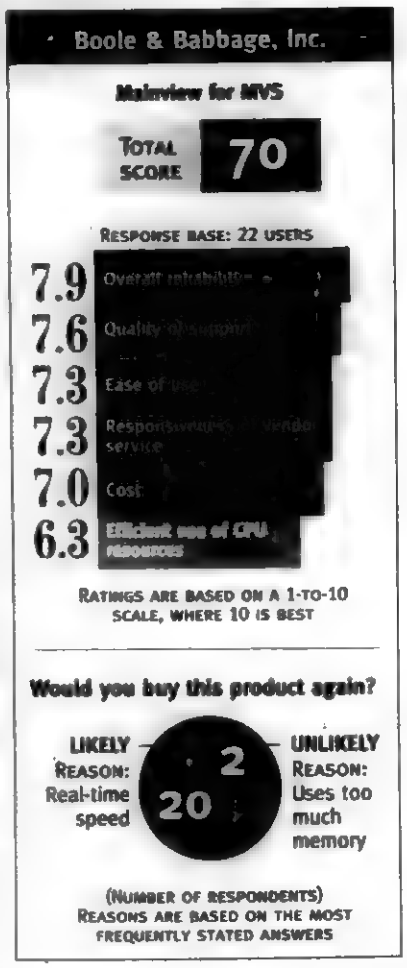
Each of the vendors has made a firm commitment to its service and support offerings. In the categories of quality of support and responsiveness of vendor service, all three scored equally high marks. As with most software products, service and support was rated among the five most important qualities.

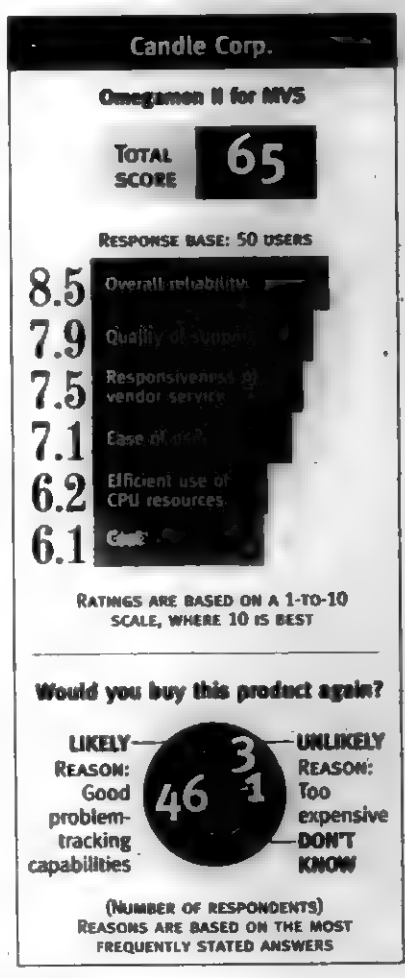
All in the family

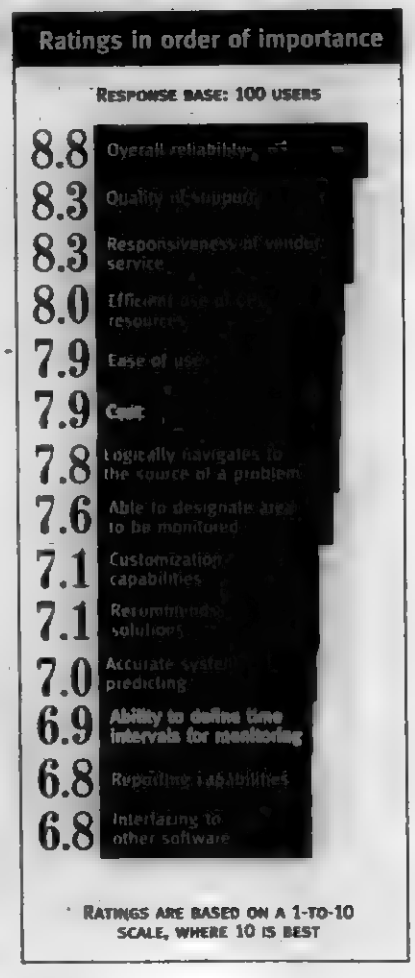
Each MVS monitor reviewed in this Scorecard is part of an integrated solution. Through the integration of each products' components, administrators are able to move through MVS and its interrelated subsystems — such as CICS, VTAM and DB2 — to the root of a bottleneck.

Buyers' Satisfaction Scorecard is a user survey of market-leading products conducted and tabulated by First Market Research Corp. in Austin, Texas. For a complete methodology, contact Kevin Burden at (800) 343-6474, ext. 717. ■









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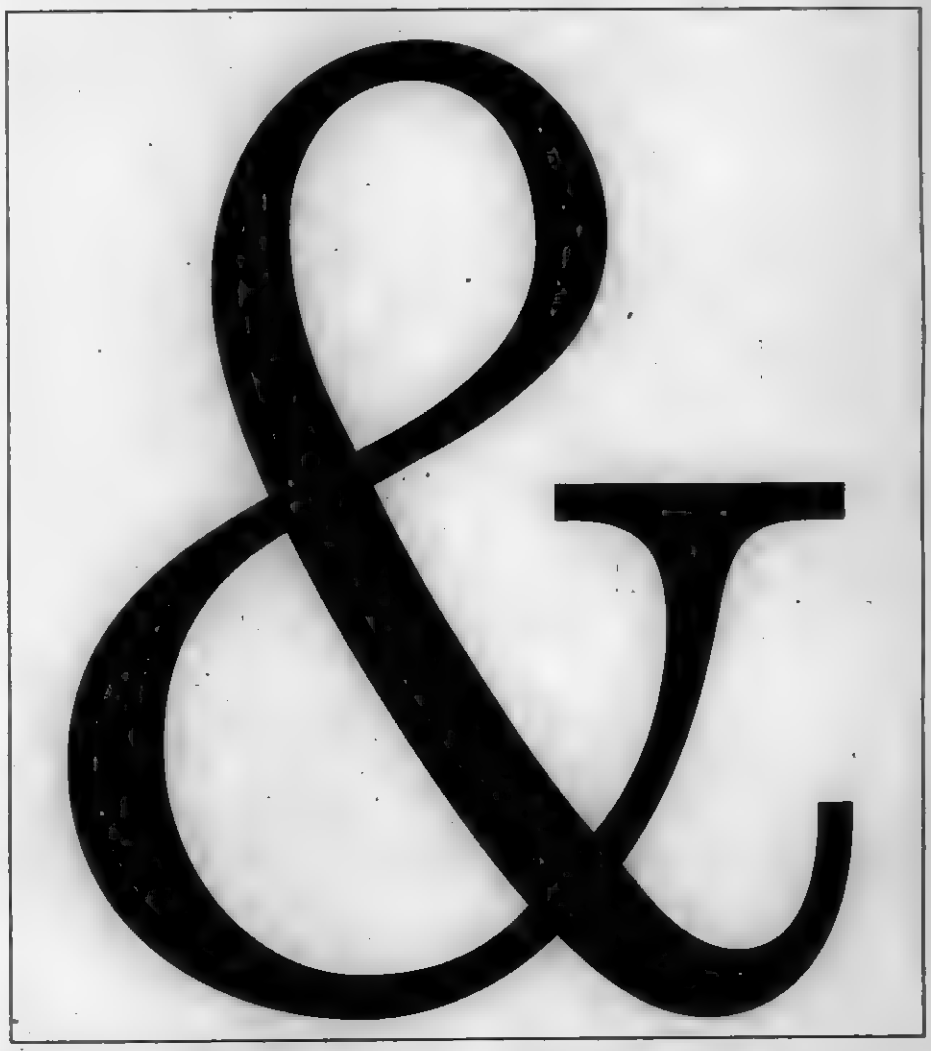

"We recommend that CAP be evaluated by IBM customers attempting to contain costs, protect existing investments in SNA networks, and take best advantage of new UNIX platform opportunities."

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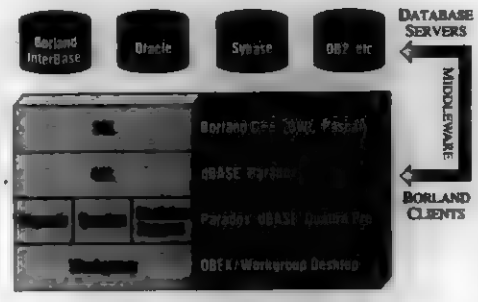

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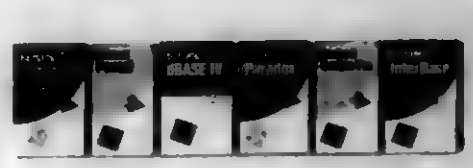

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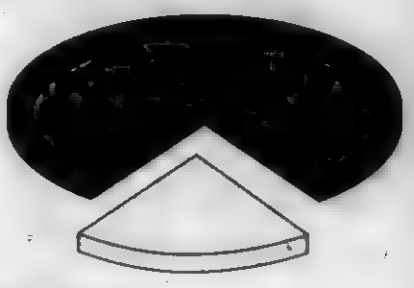

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- ❑ OS/2 (c)
- ❑ Unix (d)
- ❑ Mac OS (e)
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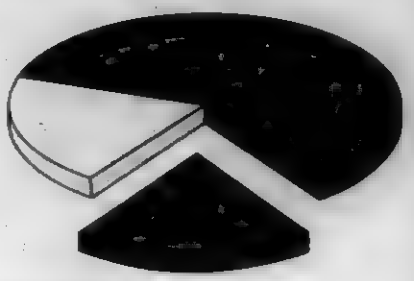

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Unisys 2200/500: Reduces costs, maintains performance

Unisys 2200/500

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

- Unisys Corp.'s 2200/500, released in September, redefines the term "mainframe" by providing big iron performance in a midsize system.
- Evaluators said the system runs all existing applications at equivalent mainframe performance levels while substantially reducing the environmental costs of previous hardware.

Based on cutting-edge CMOS processor technology, the system boasts mainframe performance in a package the size of an average minicomputer.

The air-cooled, 23- by 70-in. unit also eliminates the environmental costs of air-conditioning and water cooling.

The evaluators assisting in this survey included technical managers at a regional electrical supplies firm, a printing supplies company, a computer services firm and an insurance company. All were Unisys customers who had substantial investments in other Unisys hardware. Their experience with the 2200/500 ranged from late evaluation stages to an imminent switch to production.

The ease of code migration won kudos. Ports ranged from 10,000 transaction processing programs at the electrical supplies firm to "a couple million lines of Cobol code," said the computer services evaluator.

Also lauded was reduced floor space, which, according to the insurance evaluator, was "one-tenth" the requirement of existing systems.

The format for this evaluation was created with the assistance of Howard Rubin Associates and Technology Investment Strategies Corp.

Reliability

Because the 2200/500 is a new machine, the evaluators were unable to assess reliability under full production loads.

However, they agreed that the machine would at the very least equal the stability of their current Unisys mainframes.

Performance

All evaluators had run benchmarks and stress tests that indicated performance would at least equal that of previous systems.

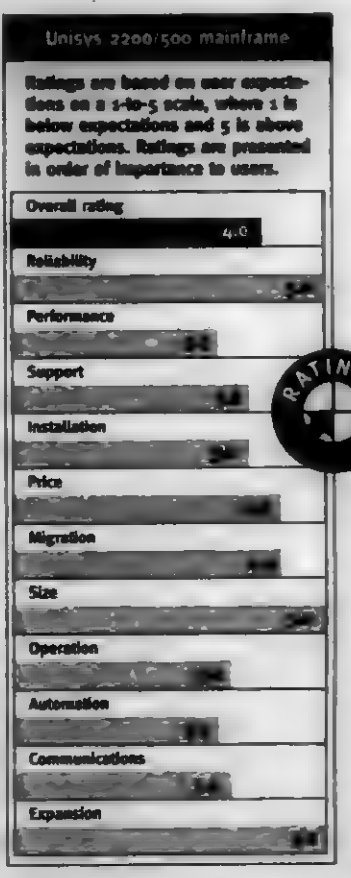
Computer services firm: "We have test suites to get our measurements, and from there we make inferences since we can't benchmark our entire environment. [Performance] looks at least as good as the estimates."

Support

As longtime Unisys shops, the evaluators had extensive experience with the company's support personnel and policies. They agreed that Unisys provided technical support in meeting their requirements.

Electrical supplies firm: "[Unisys] engineers are usually here in 15 minutes."

Computer services firm: "We expect them to be here, and they are."



Installation

The evaluators reported installation times of only a few hours for hardware and software and peripheral configuration.

Electrical supplies firm: "They rolled it up the elevator, down the hall and plugged it in."

Price

The evaluators spent from $1 million to $2 million on the 2200/500, including peripherals. All intended to use existing storage devices, some of which they had recently upgraded in anticipation of the 2200/500.

Printing supplies company: "The maintenance costs for hardware and software are unbelievably [low compared with previous Unisys hardware]."

Migration

Evaluators reported that all of their existing applications and batch utility programs would convert to the 2200/500 without any modification.

Printing supplies company: "It's just a matter of hooking up the disk drives. We've tested all of our applications, and all of them will be running [on the 2200/500]."

Size

About half the size of a home refrigerator, the 2200/500 will leave many shops with a great deal of empty floor space. The printing supplies evaluator said his computer room will look like "a football field" once old mainframes have been moved out.

Computer services firm: "It's dwarfed by the peripherals and communication equipment. You'll have trouble finding it [in the computer room]."

Operation

The evaluators said operating the 2200/500 was little different from other Unisys mainframes. They anticipated no change in the size or work load of their operations staff.

Automation

Because it would be running migrated batch and utility software, the evaluators foresaw no changes in the level or type of automation the 2200/500 offered over previous systems.

Expansion

Evaluators concurred that the 2200/500 is easier to expand than other mainframes. Peripherals can be added on the fly without a system reboot, and configuration is easily handled from software.

Computer services firm: "If you want to add a processor, it's a single board."

Insurance company: "With more memory, it will greatly outperform [existing mainframes]."

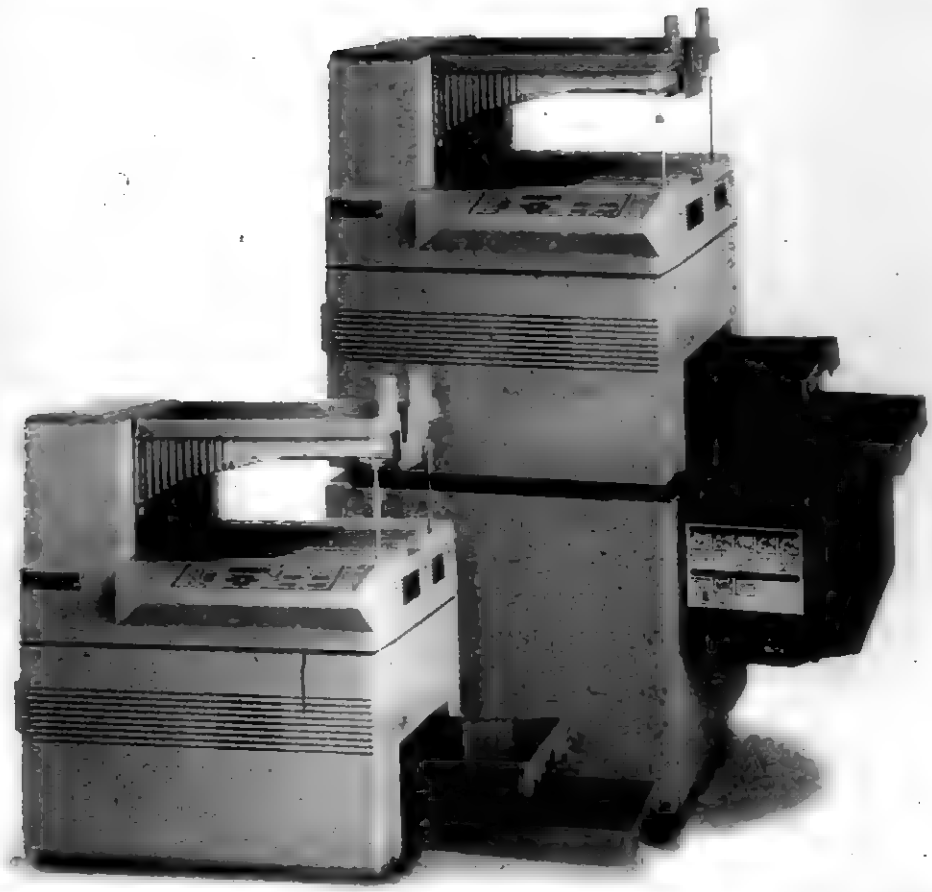
Unisys responds

▶**Third-party applications:** As we roll out Posix, newly available with the OS 2200 operating system, Unisys and its customers will have increasing opportunities to port commercial software. SX 1100, the 2200 implementation of Unix System V, provides another path.

▶**Open systems:** The degree of openness and standards compliance of a 2200/500 system is unparalleled among mid-range and large-scale mainframes on the market. The new Open/OLTP product suite, based on aggressive implementation of the X/Open DTP standards, is an example.

▶**LAN support:** Open 2200/500 systems offer a variety of LAN connections and services for integrating PCs. Windows, OS/2, Unix, Apple Computer, Inc. and Microsoft Corp. Windows NT systems are supported. And we are working on even more support for PC LANs.

Written by Computerworld *senior editor Garry Ray.*



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TECHNOLOGY

ON TRIAL

DESPITE SIX-FIGURE COSTS AND ADDED PRESSURE ON STAFF, COMPANIES BECOME BETA SITES FOR THE CHANCE TO GET A JUMP ON COMPETITORS

BY KIM S. NASH

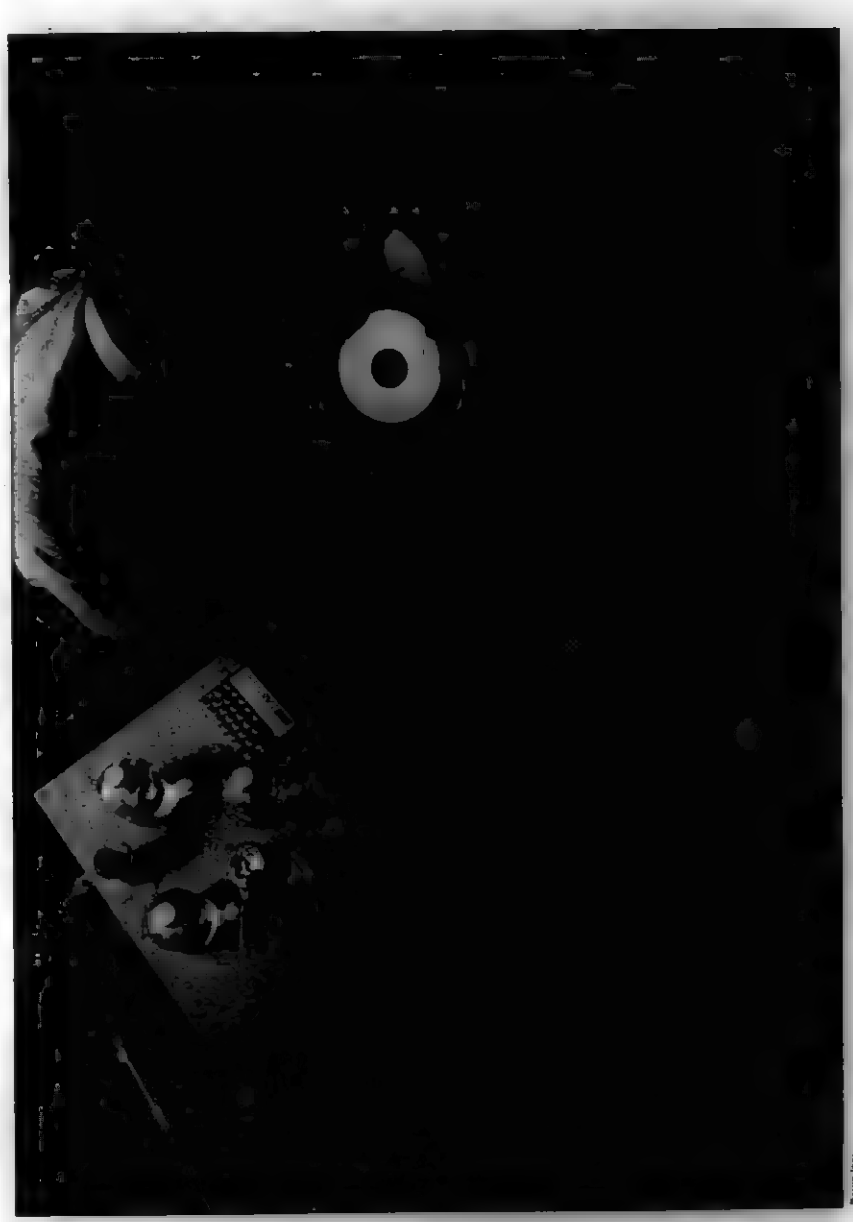
The lure of outsmarting the competition and exploring new technology tempts many firms to beta-test unproven products. But it's a big leap from cracking the seal on newfangled hardware and software to running rings around your rivals by using new systems. Beta tests are expensive, time-consuming and can be a drag on the information systems staff, participants say.

Yet an estimated 50% to 60% of Fortune 1,000 firms have beta-tested products at one point or another, with about 20% regularly involved, according to analysts. Common reasons for putting themselves through the hard work include free staff training and unprecedented access to vendors, according to several large beta sites.

But the No. 1 reason companies test products is the opportunity to turn new technology into a way to beat competitors.

"Anything we can do to make [us]

On trial, *page 112*



Davis Jost

Bill Reiher, vice president of central systems at Baxter International, *says a three-month beta test of SmartStream ran up $100,000 in personnel costs*

On trial

CONTINUED FROM PAGE 111

more attractive is going to have an impact on business," says David Cochran, technical coordinator for architecture at Delta Air Lines in Atlanta.

To that end, Delta has been testing Sybase, Inc.'s next-generation database and related products to see how they fit into its vision of the "airport of the future."

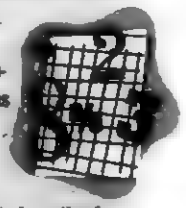
Delta plans to modernize basic airport operations, such as baggage handling, passenger check-in and gate agent information at airports in all of the 217 cities and 34 countries the airline services. Delta hopes the Sybase products will help it achieve its goal of synchronizing constantly changing flight data, which is currently scattered across Delta's far-flung locations.

In the works is a scaled-down prototype of a companywide application that uses Sybase's Replication Server and Navigation Server products, which were designed to copy, collate and distribute information, in real time, between databases.

BETA FACTS

MICROSOFT churned out nearly **75,000** alpha, beta and other preproduction copies of Windows NT to about **300** users involved in testing the operating system. That's quite different from the abbreviated beta cycle that DOS 4.0 went through, says Aberdeen Group's Peter Kastner. "DOS 4.0 ended up having a lot of bugs because of that, and the release has a bad reputation to this day," Kastner says.

AT LEAST ONE-THIRD of the products that vendors put into beta every year never see the light of day, says Howard Anderson at The Yankee Group, adding that products are canceled when market conditions change, user demand shifts or vendors hit rough financial times.



FINANCIAL services, retail, transportation and telecommunications firms are most likely to beta-test products, analysts say.

POTENTIAL DISCOUNTS are thin incentive for doing beta tests. Vendors will often let beta sites keep a copy of the most current version of the product when it starts general shipping. Even so, users then must pay for maintenance and support on that product.

Gaining an edge

Companies that beta-test products "can get several months or even a year ahead of the general public on figuring out how a new technology may or may not fit into their operations," says Peter Kastner, an analyst at the Aberdeen Group in Boston.

Lawton Llewellyn, chief systems officer at American General Life Insurance Co. of New York, agrees. A preview of products coming down the pike — and the opportunity to influence that technology — can be turned into IS initiatives that put beta sites ahead of the competition, he says.

Llewellyn is working with Tricord Systems, Inc. superservers. The Syracuse, N.Y.-based firm is moving 100 years of insurance policy records from 25-year-old mainframes and minicomputers to two Tricord ES/5000 machines tested early last year.

With superservers and networking gear, he says, insurance salespeople should gain faster access to American General's 15G bytes of data, cutting processing speed from five or more minutes to a few seconds, Llewellyn says.

These companies are hot to beta, despite the drag on staff and hefty price tags associated with being a test site.

Howard Anderson, an analyst at The Yankee Group in Boston, pegs the amount at $100,000 to $150,000 per project.

Expenses accrue in tangible areas such as buying new hardware to accommodate upgrade requirements for the new software.

For example, Westinghouse Savannah River Co. upgraded several Digital Equipment Corp. VAX 3100 machines to VAX 4000 models to handle the testing of Oracle Corp.'s Oracle 7 database," says Garrett Suhm, group leader of manufacturing support systems.

Suhm declined to specify how much the hardware cost, saying only that "it was significant."

Less concrete are the people costs associated with taking one or two — sometimes more — IS workers off daily operations duties, at least for part of each day.

Would-be sites for Informix Software, Inc., for instance, must take staff time to design detailed project plans showing how the test product will be used in conjunction with other technologies.

Users are also expected to attend two- or three-day training classes at Informix facilities in either Kansas or California. Once the project is underway, users must allot time for weekly conference calls with Informix engineers to talk about that week's scheduled experiments.

At Baxter International, Inc., staff members spent two days mapping out how it would put Dun & Bradstreet Software's untested SmartStream financial package through its paces, says Bill Reiher, vice president of central systems.

In the course of an initial three-month project to test Smart-

On trial, *page 116*

CITICORP MORTGAGE, INC.

WHAT'S IN BETA?

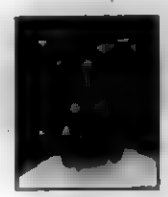
- Informix-OnLine database, Hyperscript, Viewpoint, other development tools
- Microsoft DOS 6.2
- Microsoft Windows 4.0

BUG WATCH

Citicorp Mortgage discovered "a handful" of bugs in DOS 6.2, "but only one of them would be a 'gotcha,' " says senior applications analyst Stephen Skinner, declining to elaborate.

Beta tests spur brainstorming sessions in Citicorp Mortgage's IS department.

"You get a key new product in and the possibilities pop out at you," says Stephen Skinner, senior applications analyst. It "gives you ideas about where to take IS," he says.



Skinner

Citicorp Mortgage initiated a beta test of Informix's OnLine database six months ago and is studying beta and early versions of new massively parallel processing (MPP) features in databases from Oracle and Sybase.

Those experiments have convinced Citicorp Mortgage to delve into MPP.

The St. Louis division of Citicorp NA plans to port mission-critical mortgage lending applications from Pick Systems' Pick operating system to an MPP version of Unix, according to Skinner. The company hasn't made a final decision on hardware, but Informix will be the database, he says.

What's more, Skinner wants to redesign key applications for client/server computing. Hence, beta tests of Microsoft Corp.'s DOS 6.2 and Windows 4.0.

Mind meld

Insight into vendor thinking is the best part of beta testing, Skinner says. "Engineers and other people at the companies are more forthcoming about plans because they see you're a serious customer," he says. "You can get information you wouldn't otherwise receive."

Also valuable are informal support groups that have erupted among users beta-testing the same products.

Help from the user community keeps Skinner and colleagues sane as they delve in and explore uncharted technologies.

"It's the biggest confirmation that you're not crazy," Skinner says.

—Kim S. Nash

CHEVRON CANADA LTD.

WHAT'S IN BETA?

- Microsoft Windows NT and SQL Server for NT database
- Microsoft Access
- Microsoft LAN Server

BUG WATCH

An early version of SQL Server for NT was slow at checking the consistency of the database, but Microsoft was quick to fix the bug.

Beta testing is on the rise at Chevron Canada as the firm digs further into client/server computing.

Understanding how to navigate the new terrain is tough, but almost six months of beta-testing Windows NT and SQL Server for NT databases has given Chevron's 23-member IS team a sense of the future. "Beta projects give us [client/server] knowledge, something to get our arms around," says Bill Soper, manager of information services.

Soper

The only way to get hold of some of the newer, fancier functions touted in emerging products is to become a beta site, says Dan Chorney, lead database administrator.

Vancouver, B.C.-based Chevron currently uses the IBM OS/2 edition of Microsoft Corp.'s SQL Server database but wants to swap that out for NT products. "If NT is the key strategic direction for Microsoft, I'm not sure how much energy they'll put into keeping OS/2 stuff going," Soper says. Therefore, Chevron wanted to try NT products right away to create blueprints and budgets for client/server projects.

To outfit itself for the beta project, Chevron had to buy several 486-based servers and workstations at about $15,000 a pop. Microsoft handed Chevron a 120-day CompuServe ID and a special technical support phone number through which to report bugs.

Beta tests have become part of everyday life at Chevron for most IS staffers. Those who participate spend an average of an hour or two per day beta testing, according to Soper.

"If it's part of your job to help the company make decisions about the future," Chorney adds, "making time [for beta work] is a necessity."

—Kim S. Nash

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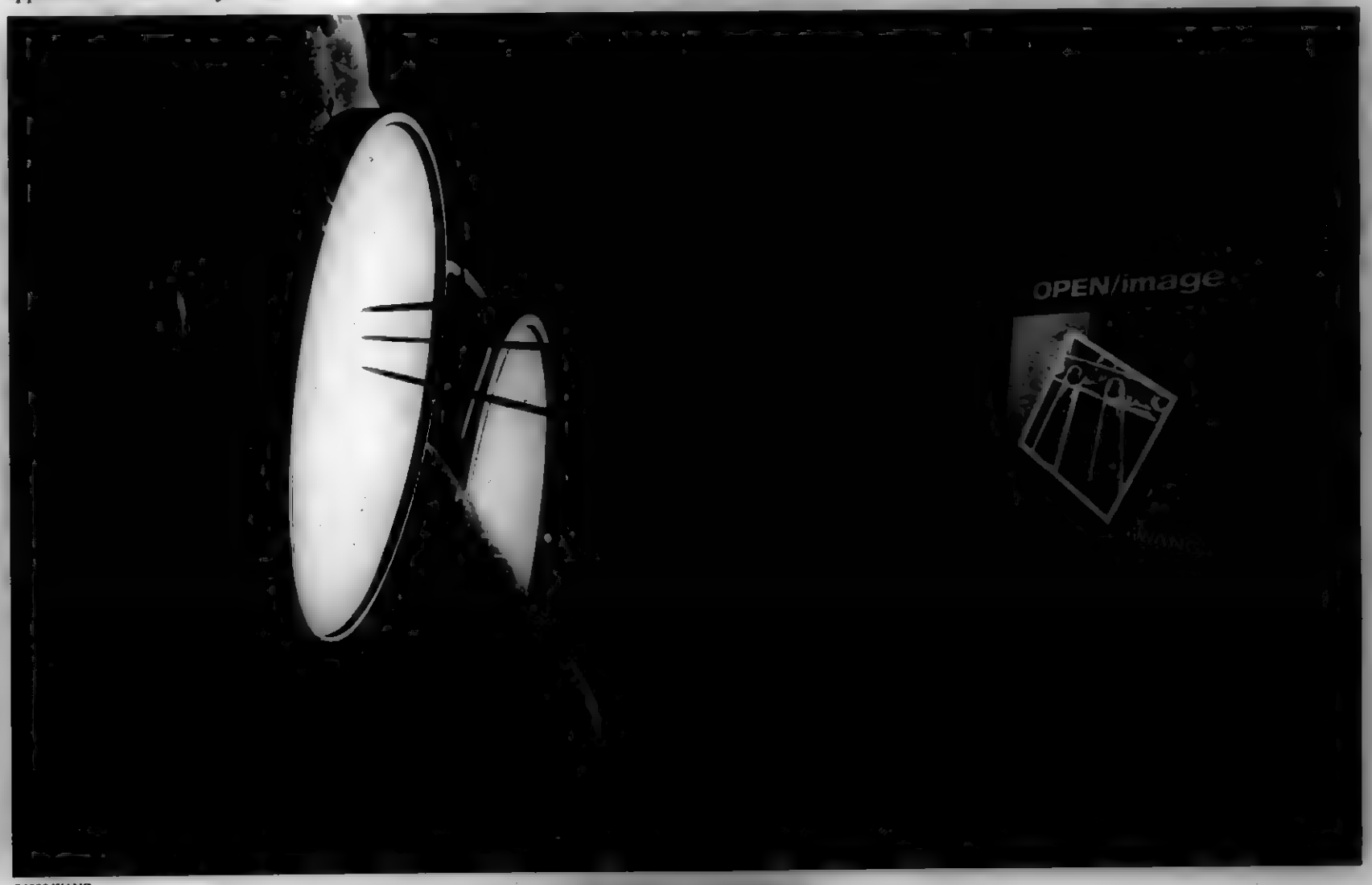

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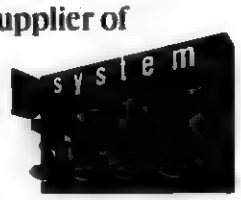

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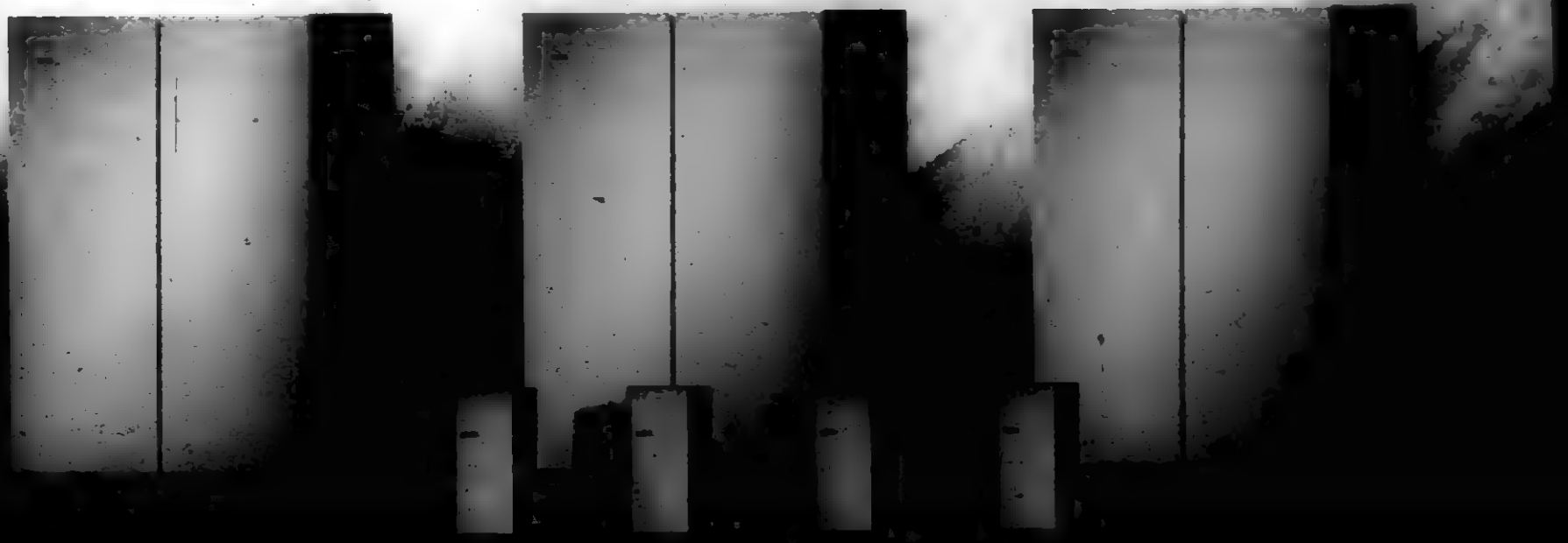

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On trial

CONTINUED FROM PAGE 112

Stream. Baxter spent about $100,000 in personnel costs, Reiher says. The Deerfield, Ill., company has continued to dabble with SmartStream for the past two years but is in no hurry to implement the project.

Only one shop interviewed, King County Medical Blue Shield, is in the process of putting in place a dedicated beta staff. About 10 people out of a 500-member IS staff at the Seattle-based health maintenance organization participate in beta testing (see story at right).

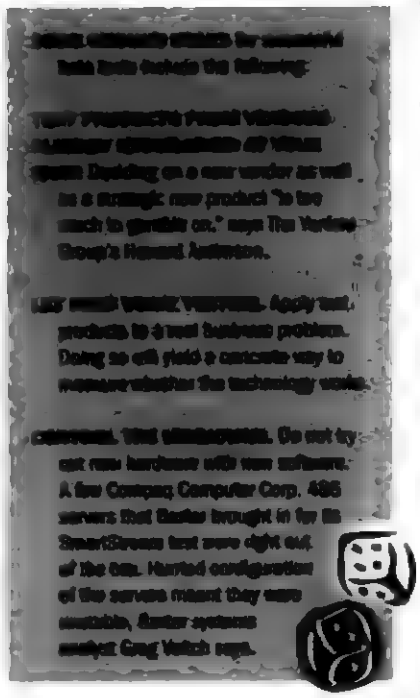
King County Medical may be on to something. Some people in the trenches say the schizophrenic nature of handling everyday IS duties as well as beta testing can take a toll. "I felt a little stressed about my priorities at times," says Greg Veitch, systems analyst at Baxter.

Sometimes the beta experience is like a Pandora's box. "We saw all the fancy things [Sybase's new products] could do and wanted to try them all out," says one database analyst at a bank. Soon, what had been a limited four-week trial with one staffer swelled to a two-person, nine-week disorganized effort that raised as many questions for the company as it answered, the analyst says.

The rule of thumb in beta projects is to run them no longer than two or three months, Anderson says. "If you can't tell what a new product is going to buy you in that length of time, then something's wrong," he explains.

Being a seasoned tester can have a drawback of a nontechnical kind — popularity. Sean Dittmore, beta manager at King County Medical, which is currently testing more than $500,000 worth of software, says his shop became a target for every software company on the planet with a product to test.

"About a year ago, we were getting calls and packages from several companies per day," Dittmore says. "We've had to say 'no' a lot."



GROUND RULES

One benefit that can offset any drawbacks, however, is the virtually free training IS staffers get.

Late last year, two programmers at Westinghouse Savannah River got two weeks of instruction from Oracle in the intricacies of the Oracle 7 database. "We're way ahead of other Oracle users now," Suhm says. "We have experienced staff ready to install client/server systems."

Vendors will often send engineers on site to larger beta projects, giving IS workers instant access to product experts. Such hands-on guidance saves time and money that would have been spent on training when the beta product goes live, Kastner says.

Beta testing also helps users double-check vendor-supplied information, says Ken Doolan, president of Everest Technologies, Inc., a Houston consulting firm. "If Sybase says it's putting in X or Y capability into its next release, I can check up on them," Doolan says. A former programmer at BP Exploration, Doolan beta-tests Sybase tools for the nearby oil company.

The direct access to vendor engineers that beta sites gain often yields information about what is realistic to expect from specific versions of products. "Sales types want you to think that everything you've ever wanted is in the new product," says Stephen Skinner, senior applications analyst at Citicorp Mortgage, Inc. "But technicians tell you want you need to know." (See story page 112.)

Plus, doing a beta one year may help IS managers hone next year's budgets. Managers can know ahead of time whether a product due out next year is worth buying, says Bill Soper, manager of information services at Chevron Canada Ltd. in Vancouver, British Columbia. "It's a way of adding a little more certainty to an uncertain future," Soper says. ■

Nash is a *Computerworld* West Coast correspondent.

THE FOLLOWING is a real ad soliciting beta sites. It appeared in the second-quarter 1993 edition of "Oracle Tech," a newsletter of the International Oracle User Group (IOUG).

THE IOUG AND ORACLE SUPPORT DIVISION ARE WORKING TOGETHER TO FIND QUALIFIED BETA TEST SITES FOR NEW ORACLE PRODUCTS. ALL BETA SITES SHOULD BE PREPARED TO:

- Provide weekly status reports of their testing activities and file bug reports on the products they test.
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KING COUNTY MEDICAL

WHAT'S IN BETA?

- Microsoft Windows NT and SQL Server for NT database
- Must Software International's Nomad Systems management tools
- Integral, Inc.'s client/server human resource and payroll applications
- KnowledgeWare's ObjectView and Microsoft Access development tools

BUG WATCH

Most tests run two or three months, but some products don't make it beyond a few weeks. Early releases of InfoDesigner, a database designer from Asymetrix Corp., had too many bugs so King County had to put it aside. King County says it plans to reopen the beta when Asymetrix sends a more coherent version of the product.

More than $500,000 worth of software resides in the beta-test shop at King County Medical Blue Shield in Seattle.

Microsoft Corp. is the most favored software supplier at the Seattle health maintenance organization, but client/server development and management tools from several other vendors are also being beta tested (see list above).

Once an informal process for anyone willing to put in the extra hours, beta testing at King County Medical is becoming more organized. Formalizing the process helps document projects, as well as keep track of the length of testing. The company has begun assigning specific staffers to lead tests of individual products, according to Sean Dittmore, beta manager at the organization.

Dittmore is currently handling dry runs of Windows NT products and looking into side-by-side comparisons of client/server development tools from Microsoft and KnowledgeWare, Inc.

BETA MANAGER SEAN DITTMORE AND ABOUT 10 OTHER PEOPLE SPEND A COUPLE OF HOURS EACH DAY TRYING OUT NEW TECHNOLOGIES. THEY HAVE ERECTED SEPARATE NETWORKS, DATABASES AND APPLICATIONS JUST FOR TESTING SOFTWARE.

Survival of the fittest

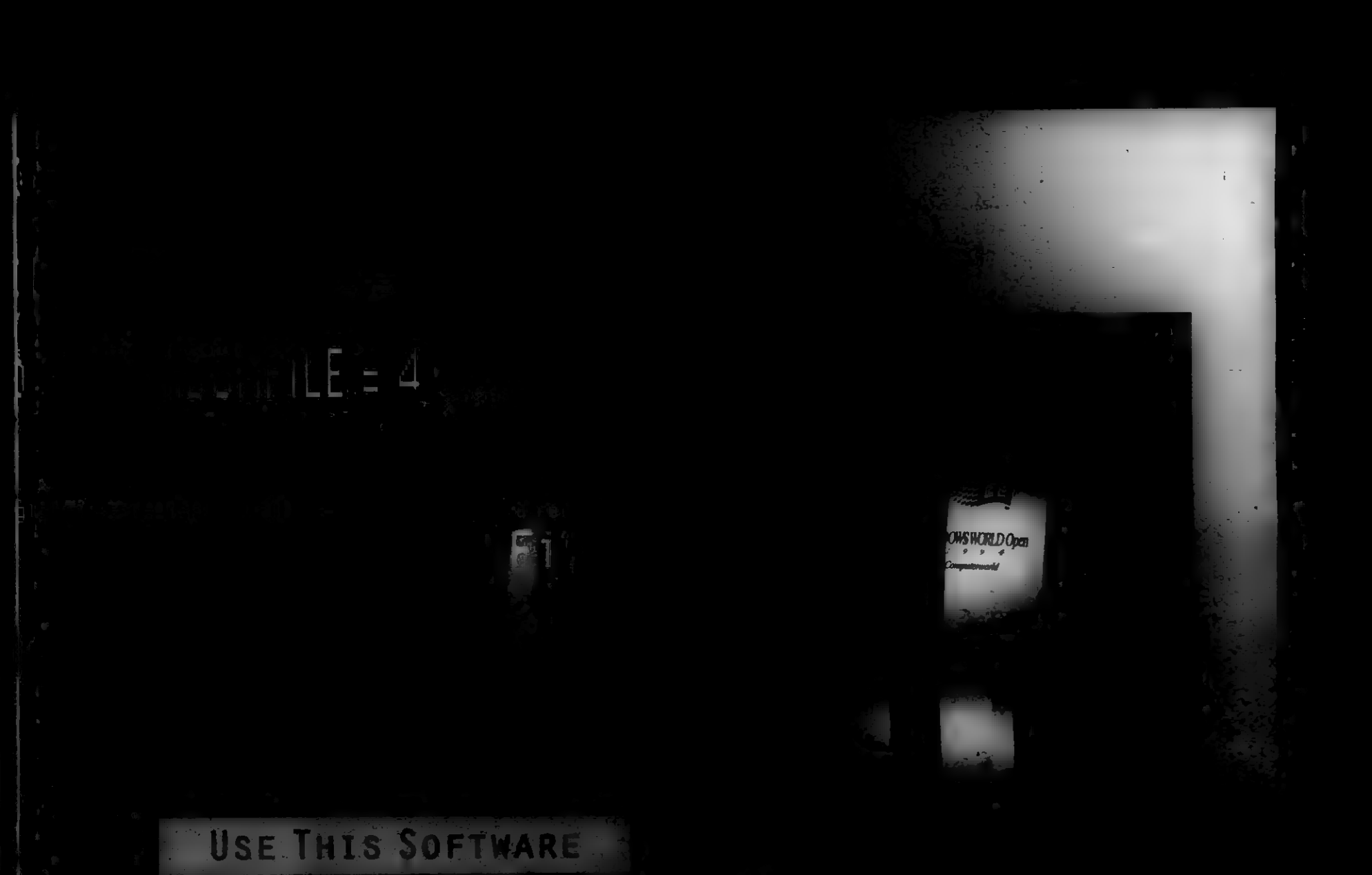
Dabbling in several kinds of preproduction offerings and pitting similar products against one another has helped King County Medical choose the best tools for the job, he says. For example, tests of various Open Database Connectivity drivers from both IBM and Microsoft proved that Microsoft drivers work more quickly and efficiently with Microsoft's Access and Visual Basic, Dittmore says.

The business side of the house approves of all this beta work "as long as we don't put anything critical on a beta product," Dittmore explains. He and about 10 other IS people spend a couple of hours each day trying out new technologies and have erected separate networks, databases and applications just for testing software.

Overall, Dittmore says he likes the idea of helping to shape a preproduction product for the commercial world.

"If my work makes the thing better for my company, it's worth it."

—Kim S. Nash



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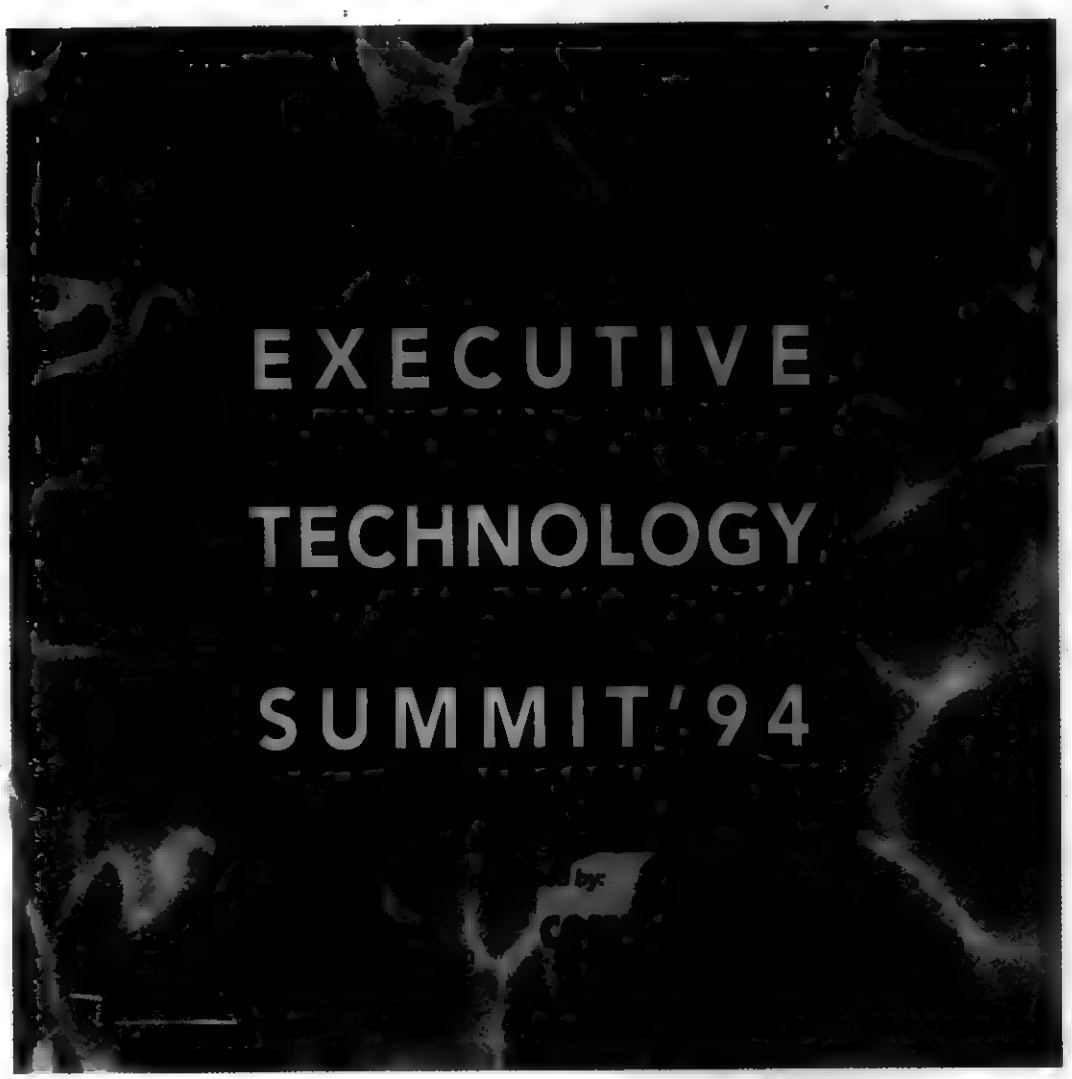

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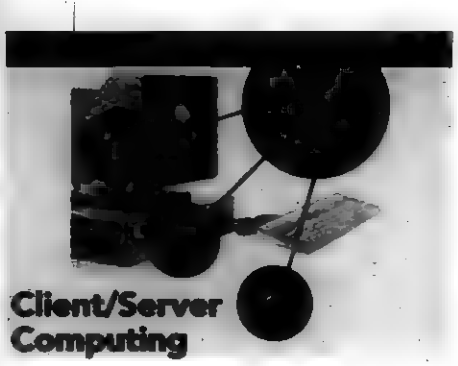

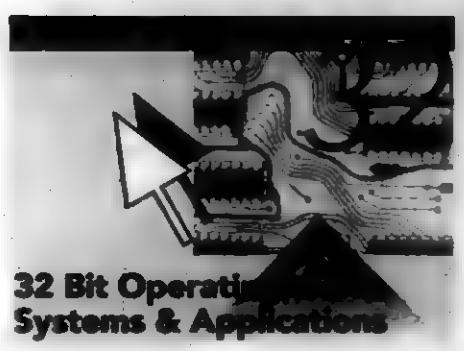

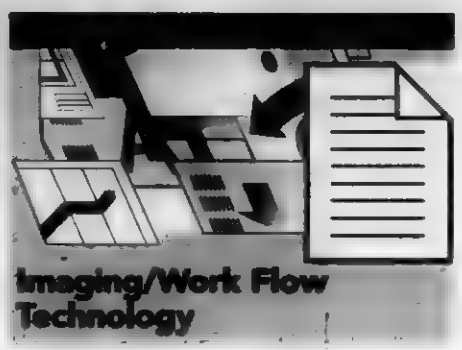

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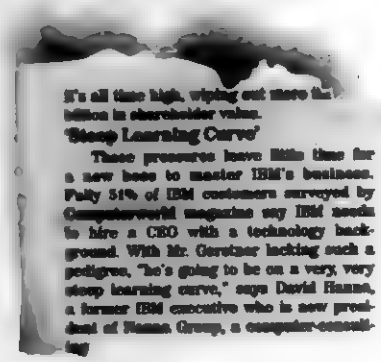

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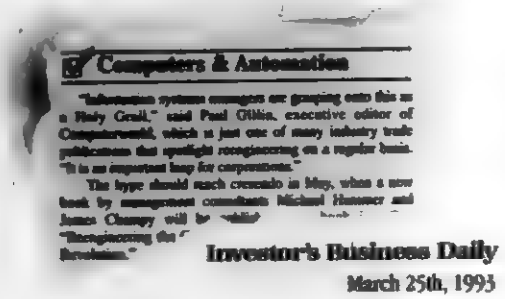
'Steep Learning Curve'

Those pressures leave little time for a new boss to master IBM's business. Fully 51% of IBM customers surveyed by Computerworld magazine say IBM needs to hire a CEO with a technology background. With Mr. Gerstner lacking such a pedigree, "he's going to be on a very, very steep learning curve," says David Hanna, a former IBM executive who is now president of Hanna Group, a computer-consulting

THE WALL STREET JOURNAL
March 25th, 1993

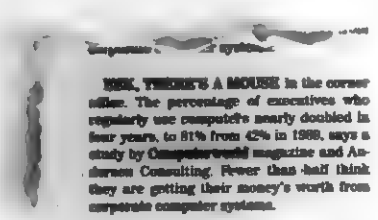


Computers & Automation

"Information systems managers are grasping onto this as a Holy Grail," said Paul Gillin, executive editor of Computerworld, which is just one of many industry trade publications that spotlight reengineering on a regular basis. "It is an important leap for corporations."

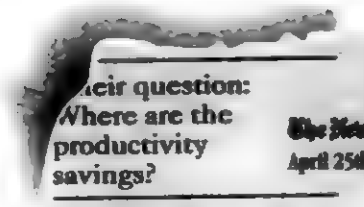
The hype should reach crescendo in May, when a new book by management consultants Michael Hammer and James Champy will be [illegible] "Reengineering the [illegible] Revolution."

Investor's Business Daily
March 25th, 1993



WEB, THERE'S A MOUSE in the corner office. The percentage of executives who regularly use computers nearly doubled in four years, to 81% from 42% in 1988, says a study by Computerworld magazine and Andersen Consulting. Fewer than half think they are getting their money's worth from corporate computer systems.

THE WALL STREET JOURNAL
April 20th, 1993



...eir question: Where are the productivity savings?

The New York Times
April 25th, 1993

CORPORATE executives appear to be more knowledgeable about computer technolgy than ever before, but they have also become more demanding and less forgiving, a new survey has found. While they believe information technologies are the key to competitive advantage, they also say that they have not been getting their money's worth.

The survey, conducted by the computer industry newspaper, Computerworld and Andersen Consulting, also found that 81 percent of top executives are personally using computers in their daily jobs, nearly double the percentage reported when the survey was first taken four years ago.

More than 200 chief executives, chief operating officers, and chief financial officers, representing a broad range of businesses, participated in the study, the results of which were published in **Computerworld** last week. Annual company sales ranged from $250 million to $20 billion.

The New York Times
March 25th, 1993

... CUSTOMERS HAVE THEIR SAY TOO

■ IBM directors should forget about hiring another salesguy to replace John Akers as CEO. And whoever he is, Akers's successor should fire a whole lot more people. So says a *Computerworld* survey of executives at 100 companies that spend at least half their computer budgets on IBM products. The participants, who work at the likes of **Kmart** and **Parker Hannifin**, a maker of pneumatic and hydraulic components, also said IBM's reorganization into smaller business units should go further.

Computerworld, in addition, interviewed various computer industry luminaries, including Steve Jobs. The Next CEO marveled that none of IBM's machines from mainframes to PC's uses the same software. Says Jobs: "IBM's troubles stem from the fact that they approach everything from a hardware strategy, and the Nineties is a software decade."

Not everybody agreed that breaking up is the way for IBM to go. Said Larry Ellison, CEO and co-founder of **Oracle**, a software company: "This is the

...and his ...ther, Richard is a retired I.B.M. vice president.

A survey of some 100 of I.B.M.'s largest customers by **Computerworld** magazine found that 51 percent preferred someone with a technical background to be the computer giant's new chief executive, while 36 percent said technical expertise was not essential and 13 percent had no opinion.

But some industry experts say technology knowledge is [illegible]

...93 **FORTUNE** 11

FORTUNE
April 5th, 1993

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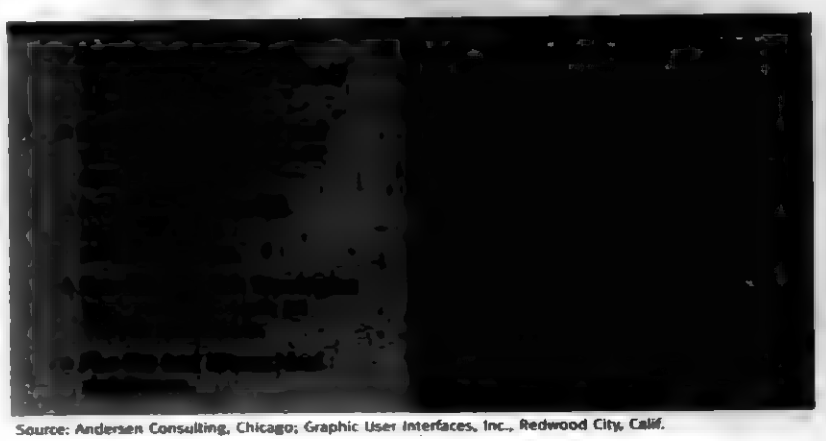
MIXING OLD AND NEW

In large-scale client/server systems development, hiring managers look for a balance of new development tools with a working knowledge of old standby languages



Source: Andersen Consulting, Chicago; Graphic User Interfaces, Inc., Redwood City, Calif.

By David Baum

Application development vendors have been quick to present solutions that make building client/server applications look like child's play. But once programmers attempt to create complex, heterogeneous, enterprisewide applications, they find that broad skill sets, both old and new, are needed to complete the job.

Many programmers, for instance, have picked up one of the rapid application builder products such as Powersoft Corp.'s PowerBuilder or Gupta Corp.'s SQLWindows. Great for quickly pulling together tactical, client-centric applications, these products can quickly enhance a programmer's knowledge — and career options.

However, a programming team may run into obstacles when creating complex, heterogeneous applications.

Client/server changes

Part of the difficulty, explains Nick Wybolt, director of technical architecture at Andersen Consulting's Foundation division in Chicago, comes with the architectural changes brought on by client/server. With host-based systems, data communication consists of sending data from the mainframe to a 3270 terminal; network administrators handle the rest. With client/server, however, network communication becomes an essential part of the development process, often involving low-level communication coding based on protocols such as Named Pipes, NetBIOS and TCP/IP, as well as familiarity with many different platforms.

"The danger some programmers face is that they become so enamored with the new operating systems that they forget the rest of the world," Wybolt says. "To me, the ideal client/server programming candidate is someone who can work with the new windowing environments but also brings other systems experience."

For instance, a heterogeneous client/server application might be based on a three-tiered architecture, where Windows clients access relational data from Unix servers on a LAN and also interface with a corporate database on a mainframe running a CICS transaction monitor. Creating such a system requires knowledge of all the platforms and operating systems involved, Wybolt says, as well as experience with application partitioning.

To ease the burden of interapplication communication, some companies rely on middleware, a software layer that sits between the network and the application. Middleware shields developers from low-level networking complexities by enabling them to write applications based on a common, system-level application programming interface.

Time-saver

Alex Bakman, a senior systems consultant at Unum Life Insurance in Portland, Maine, says middleware saves corporate programmers a lot of time with low-level communication coding, making it an essential tool for client/server developers.

Some high-end development tools have middleware integrated with the overall environment, such as Andersen Consulting's Foundation for Cooperative Processing. Programmers can also turn to one of the stand-alone products such as Peer Logic, Inc.'s Pipes or TransAccess from Netwise, Inc. in Boulder, Colo.

Whatever the mix of old and new, it is a mistake to base your career on expertise in one particular language or tool. "It's the guy with a true systems-level view that companies are paying a lot of money for," says Bill Jacobs, marketing vice president at Netwise. "Step back and try to understand technologies that are not only on your block but maybe one block over."

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.

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Exploring some avenues to 'real code'

Writing batch files, XBase provides foundation for place in development project

KEEPING UP

BY DAVID MICHAEL BERNARD

Bernard is a technology management consultant at Omicron Consulting, an international consulting and services firm that provides analysis, development and implementation of business information systems.

Q. I am a PC support technician at a large company. I have experience writing batch files and know a bit of dBase, but I want to sink my teeth into real code. A new development project has created several openings. Do I have a chance?

A. There are many ways you can fit into a development team, and you have a small foundation to work from right now. For instance, writing batch files and XBase code is programming experience. Designing dBase databases will also help you work in a database analyst capacity.

Start by determining the project's nature and decide how you want to fit into it. If possible, get a copy of the tools and familiarize yourself by building your own applications.

If only advanced programming positions are available, prepare by getting hands-on experience writing real code. In addition, try using the traditional methods such as classroom training and reading books.

Q. I am an information systems manager in a midsize company and have been charged with converting our office from a largely DOS-based environment to Windows. What issues should I focus on?

A. The steps I've successfully used in a Windows rollout include the following:

- Define the application suite.
- Identify DOS-only requirements. Certain communications packages must be run within DOS. If packages require significant conventional memory, a third-party memory manager may be required, which will add to your total cost.
- Assess hardware inventory. Test the new application suite on current hardware for acceptable performance.
- Upgrade or purchase hardware when necessary.
- Divide the hardware domain into types and create standard configurations. Different makes, models and configurations may require different setups. Grouping hardware by type will ease installation and maintenance.
- If implementing on a LAN, determine how Windows and the applications will be installed. Server installations ease maintenance but slow the network. Client installations perform better but are difficult to maintain.
- Consider training and support the most important issue. Even with an ingenious design, projects will fail if training is not begun well in advance.

Q. As a corporate developer, I feel I am not growing technically. What should I focus on to keep current?

A. Developers should focus on Windows and client/server architecture. As far as programming tools go, C, C++, Visual Basic and Visual C++ are hot. If you do not have experience using one of these tools, buy one today, and be sure to start writing object-oriented code.

Client/server development experience is harder to obtain outside the workplace. Ideally, a developer's skill set should include at least one high-level client/server development tool, such as Powersoft Corp.'s PowerBuilder or Gupta Corp.'s SQLWindows. These tools, however, are priced beyond a programmer's disposable income.

You can take advantage of Microsoft Corp.'s Access, which provides a similar environment to PowerBuilder at a fraction of the cost.

Q. I recently assumed responsibility for our software library. What should my main concerns be?

A. Address three basic issues: inventory, upgrades and licensing. As new disks come in, print out their directory and number them along with the disk before filing for easy access. To keep on top of software updates, regularly canvas software vendors because they won't always come to you.

Lastly, ensure that the company follows software license agreements to the letter by securing software and manual storage. Additionally, be sure to work with the network manager to monitor usage.

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SURVEY CONDUCTED BETWEEN SEPTEMBER AND NOVEMBER '93 ASKED FOR HEAD COUNT CHANGES DURING THE PAST YEAR

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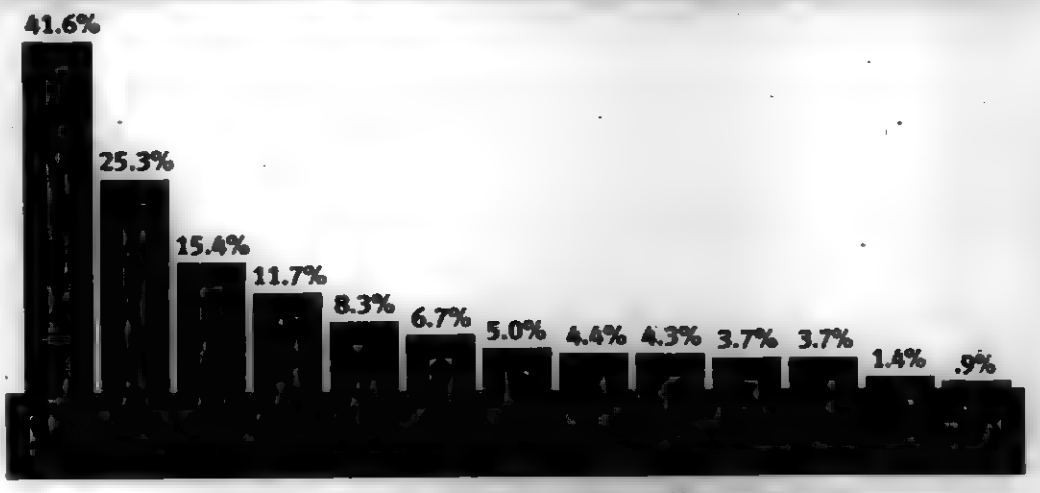
REGIONAL GROWTH ANALYSIS



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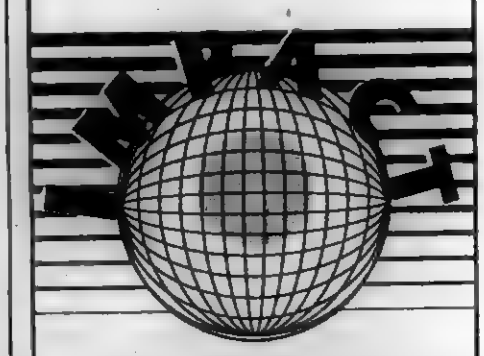

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In this important sales position you will be in charge of your own sales territory, where you will develop and close new business. To help get you started, we have many, active sales leads that were developed this past year. The ideal candidate should have 3 or more years of successful software selling experience, with a proven track record of quota achievement, plus excellent communication skills. This position requires 50% travel, spent meeting with various prospects and presenting and demonstrating the *ROCHADE* product line. We're looking for progressive self-starters. A competent technical background is highly desired.

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These technical specialists will provide a "hot line" function, stationed at our regional field offices in Lexington, MA and Walnut Creek, CA. The ideal candidate will possess strong analytical and customer support skills with a preference given to those candidates who posses a solid background in the use of multiple hardware/software operating environments. Excellent telephone manner, and 25% travel is required.

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GREAT FINDS

Time saving tools

By Alice Bredin

Hundreds of utilities on the market help shave a few minutes off the work day or make certain tasks a little easier. While some of these tools are household names, others are not. In a search for some of the more helpful ones, we asked a few information systems pros to nominate the tools they couldn't live without.

Bredin is a free-lance writer in New York.

Amidiag is an advanced diagnostics program for PCs.

Benefits Jeffrey Jull, senior technical services representative at Jurisoft Corp. in Cambridge, Mass., says Amidiag has found system memory problems that other packages have not. "If I'm having trouble with the software or with anything on the network, I can verify if it's a PC memory problem or something else."

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Benefits "This information cuts programming time by about 25% per project by reducing the time spent researching what's on the network," says Irving Lesser, IS manager at Data First, Inc., in Weare, N.H. "We can also print out the entire network and have it in front of us in minutes."

Benefits

Michael Sharpe at Midlands Technical College in Columbia, S.C., says the Norton Disk Doctor is the most comprehensive diagnostic package he has used.

Benefits "It diagnoses a problem in your boot sector and allows you to boot from a floppy so it can fix it for you. Other diagnostic packages don't tell you much."

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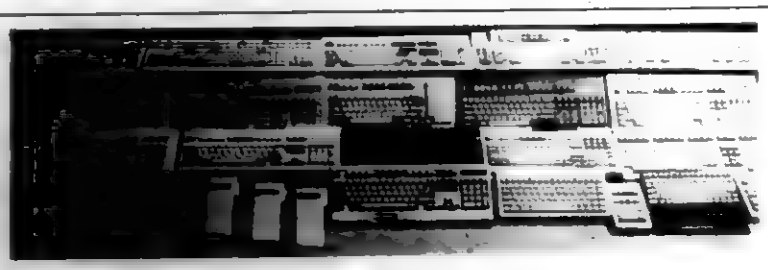

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PS/2 Model 70-A21	$675
PS/2 Model 55SX	$650
ThinkPad 700C	$2,850
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Percent

Centigram Communications	28.2	Group I Software	-14.3
Micron Technology	12.5	Cabletron Corp.	-14.3
Parametric Technology	9.4	CrossComm	-10.3
SMC Systemhouse	9.3	Compuserve Labs Inc.	-10.2
DGS Systems Inc.	9.0	4th Dimension	-9.1
Computer Corp.	8.8	Sequoia Systems Inc.	-8.7
Xylan	8.3	Zilog Inc.	-8.5
Sybase Inc.	7.7	Kendall Square Research	-8.5

Dollar

Centigram Communications	5.50	Matsushita Electronics	-6.25
Micron Technology	4.88	CrossComm	-3.00
Texas Instruments	4.38	Microsoft Corp.	-2.88
Parametric Technology	3.25	Zilog Inc.	-2.50
Cabletron Systems	3.13	4th Dimension	-2.00
Xylan	3.13	Paychex	-2.00
Sybase Inc.	2.63	DSC Communications	-1.75
DGS Systems Inc.	2.25	Computer Sciences	-1.75

Communications stocks not for the fainthearted

For the past month DSC Communications Corp. (DIGI) has been bouncing up and down like a yo-yo. The stock has been on one side or the other of the top gainers and losers chart for five weeks running. And Newbridge Networks Corp. (NNXCF) has oscillated right alongside it.

Analysts pointed to a variety of factors for the volatility of stocks in broadband communications, including momentum investors, industry announcements and profit taking.

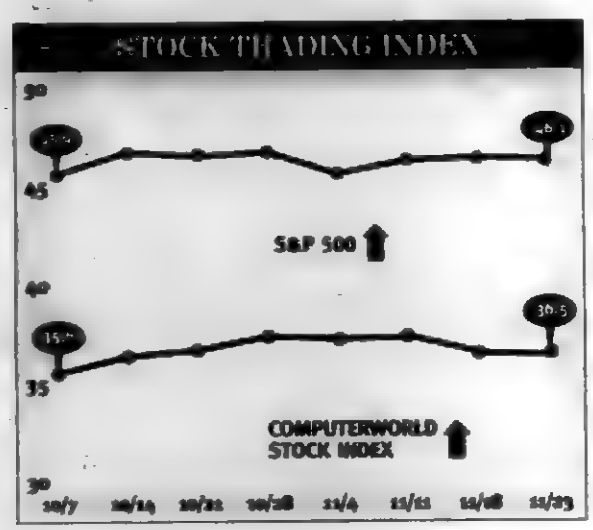
"They are victims of their own past success," said Bob Kim, analyst at S.G. Warburg & Co. "After having exceeded everyone's expectations for several quarters, Newbridge has only met expectations [in the most recent quarter]. So all of a sudden momentum players get out of the stock," Kim said.

"DSC's stock has run up substantially in the past 12 months. People had such good profits, they just took them," selling the stock and pushing the share price down, said James Hartke, director of research at Laidlaw Holdings.

Analysts agreed that while the stocks may not settle down immediately, these companies enjoy good long-term possibilities. "Everybody's results were strong, and the next quarter looks promising as well," said James Kedersha, Cowen & Co. vice president.

"I expect them to rise even in the short term — if you measure short term as anything longer than a week," Hartke said.

—Derek Slater



Each	52-Week Range			Nov. 24 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						UP 0.9%
OTC	40.00	19.63	3 COM Corp.	35.50	2.25	6.8
NYS	91.13	66.50	American Info Techs Corp.	77.13	0.38	0.5
NYS	65.00	46.75	AT&T	55.88	-0.38	-0.7
OTC	4.44	0.94	Artel Communication Corp.	3.25	0.00	0.0
OTC	24.50	12.50	Bantan Systems Inc.	22.00	-0.25	-1.1
NYS	69.13	46.75	Bell Atlantic Corp	58.13	-1.00	-1.7
NYS	63.88	48.13	BellSouth Corp	55.25	0.50	0.9
NYS	14.75	4.25	Bolt, Beranek & Newman	11.25	0.38	3.2
OTC	18.50	9.50	Brooktrout Technology	13.00	-0.75	-5.5
NYS	119.00	70.75	Cabletron Systems	97.88	3.13	3.3
OTC	36.50	11.25	Centigram Communications	32.75	5.50	20.2
OTC	55.50	22.88	Chipcom Corp.	46.75	1.00	2.2
OTC	59.25	34.38	Cisco Systems Inc.	56.75	0.75	1.3
OTC	18.38	8.00	Compression Labs Inc	13.25	-1.50	-10.2
OTC	36.00	21.75	CrossComm	26.25	-3.00	-10.3
OTC	4.63	1.75	Data Switch Corp	2.00	0.13	6.7
NYS	19.88	12.38	Digital Comm. Assoc.	18.75	0.00	0.0
OTC	17.00	3.50	Digital Systems Int'l Inc.	3.63	-0.13	-3.3
OTC	73.13	17.75	DSC Communications	57.13	-1.75	-3.0
OTC	9.50	4.75	Fibronix Int'l Inc.	5.75	0.13	2.2
OTC	23.75	8.75	Frenet Corp.	18.00	0.00	0.0
OTC	4.38	1.63	Gandalf Technologies Inc	2.88	0.00	0.0
OTC	2.06	0.69	Gateway Communications	1.03	0.06	6.4
NYS	15.75	4.63	General Datacomm Inds.	10.00	-0.13	1.2
ASE	3.63	2.00	Go Video	2.44	0.00	0.0
NYS	39.88	33.13	GTE Corp.	36.75	0.25	0.7
NYS	94.75	69.00	ITT Corp.	91.88	-1.13	-1.2
OTC	29.88	18.44	MCI Communications Corp.	25.00	-0.63	-2.4
OTC	6.50	1.50	Microcom Inc.	3.88	0.25	6.9
OTC	24.25	3.50	Netrix Corp.	6.50	0.38	6.1
OTC	19.00	6.50	Network Computing Devices	7.25	0.25	3.3
NYS	11.50	5.38	Network Equipment Tech.	9.88	-0.13	-1.3
OTC	20.13	8.00	Network General	13.50	0.25	1.9
OTC	15.00	6.88	Network Systems Corp.	8.25	0.25	3.1
OTC	73.88	14.75	Newbridge Networks Corp.	54.88	-0.88	-1.6
NYS	46.00	21.38	Northern Telecom Ltd.	29.38	-0.25	-0.8
OTC	35.25	17.00	Novell Inc.	23.25	0.13	0.5
NYS	48.88	30.31	Nynex Corp.	42.13	0.88	2.1
OTC	30.00	19.00	Octel Communications Corp.	25.25	-0.75	-2.9
OTC	6.13	3.75	Penril Data Comm Networks	5.13	-0.25	-4.7
OTC	30.50	14.50	Picturetel Corp.	20.13	-0.50	-2.4
OTC	11.50	3.63	Proteon Inc.	6.69	-0.44	6.1
NYS	38.88	17.75	Scientific Atlanta Inc.	31.75	0.63	2.0
NYS	47.00	34.19	Southwestern Bell Corp	40.00	-1.00	-2.4
NYS	40.25	24.38	Sprint Corp.	33.25	-0.38	-1.1
OTC	27.00	12.50	Standard Microsystems Corp.	21.88	-1.25	-5.4
OTC	19.75	10.00	Stratacom Inc.	17.25	0.25	1.5
OTC	42.75	20.00	Synoptics Communications	27.88	1.13	4.2
OTC	9.88	2.88	Telebit Corp.	6.88	0.00	0.0
OTC	17.88	5.13	Telematics Int'l Inc.	14.38	-0.63	-4.2
OTC	35.25	17.00	US Robotics	25.38	0.88	3.6
NYS	50.75	37.00	US West Inc.	45.88	-0.63	-1.3
OTC	58.25	29.50	Wellfleet Communications	57.25	2.00	3.6
OTC	19.50	7.25	Xircom	14.75	-0.75	-4.8
PCs and Workstations						OFF 3.7%
OTC	5.56	2.50	Advanced Logic Research	3.50	0.00	0.0
OTC	65.25	22.00	Apple Computer Inc.	33.00	-0.25	-0.8
OTC	24.25	12.75	AST Research Inc.	22.25	-0.25	-1.3
NYS	9.25	2.50	Commodore Int'l	3.88	0.00	0.0
NYS	70.00	40.63	Compaq Computer Corp.	68.25	1.75	2.6
OTC	49.88	13.50	Dell Computer Corp.	24.00	0.25	1.1
NYS	89.25	62.88	Hewlett Packard Co.	71.50	-1.38	-1.9
NYS	46.75	23.50	Silicon Graphics	42.00	-1.13	-2.6
OTC	41.00	21.13	Sun Microsystems Inc.	26.13	-0.38	-1.4
NYS	48.00	24.63	Tandy Corp. (H)	45.88	0.00	0.0
OTC	7.00	2.50	Zeos International Ltd.	4.00	0.00	0.0
Large Systems						OFF 1.5%
ASE	8.50	4.38	Amdahl Corp.	4.94	0.06	1.3
NYS	8.75	3.63	Convex Computer	5.25	-0.25	-4.5
OTC	5.38	2.25	Cray Computer	2.75	0.00	0.0
NYS	30.88	20.38	Cray Research Inc.	26.75	0.25	0.9
NYS	13.88	7.75	Data General Corp.	9.75	0.38	4.0
NYS	49.25	30.38	Digital Equipment Corp.	36.00	0.38	1.0
NYS	47.38	32.50	Harris Corp.	45.25	0.25	0.6
NYS	68.88	40.63	IBM	53.13	1.25	2.4
OTC	25.75	10.25	Kendall Square Research	10.75	-1.00	-8.5
NYS	141.50	87.00	Matsushita Electronics	128.00	-6.75	-4.7
OTC	23.75	12.75	NetFrame	16.00	0.00	0.0
OTC	26.00	9.25	Parallan Computer	15.75	-0.75	-4.5
OTC	23.25	8.50	Pyramid Technology	14.88	0.63	4.4
OTC	24.00	11.25	Sequent Computer Sys.	16.50	-0.38	-2.2
OTC	6.00	1.38	Sequoia Systems Inc.	4.56	-0.44	-8.7
NYS	41.25	20.25	Stratus Computer Inc.	27.38	-1.00	-3.5
NYS	16.88	8.50	Tandem Computers Inc.	10.38	-0.63	-5.7
OTC	27.50	10.63	TriCord Systems	24.25	0.25	1.0
NYS	13.88	8.50	Unisys Corp.	11.50	-0.13	-1.1
Software						UP 1.2%
OTC	37.00	14.50	Adobe Systems Inc.	22.13	1.38	6.6
OTC	25.25	11.75	Aldus Corp.	21.25	0.75	3.7
OTC	9.25	5.50	American Software Inc.	6.25	-0.38	-5.7
OTC	28.13	9.50	Ask Computer Systems	14.00	0.38	2.8
OTC	56.75	17.00	Autodesk Inc.	42.75	-0.63	-1.4
OTC	7.25	2.38	Bachman Info. Systems	2.75	0.00	0.0
OTC	42.00	24.00	BGS Systems Inc.	27.25	2.25	9.0
OTC	84.13	38.75	BMC Software Inc.	47.75	-1.00	-2.1
OTC	28.25	20.38	Boole & Babbage	26.13	-0.38	-1.4
OTC	27.25	12.75	Borland Int'l Inc.	16.63	0.75	4.7
OTC	4.63	2.75	CE Software	3.13	-0.13	-3.8
ASE	40.25	16.61	Cheyenne Software Inc.	30.50	2.13	7.5
OTC	19.50	8.25	ChipSoft	17.00	0.50	2.9
OTC	10.50	5.63	Cognos Inc.	9.88	0.13	1.4
NYS	44.25	17.63	Computer Associates (H)	40.00	-1.13	-2.7
NYS	6.50	2.13	Computervision Corp.	3.13	-0.13	-3.8
OTC	34.25	19.25	Compuware Corp.	26.25	2.13	8.8
OTC	14.75	5.75	Comshare Inc.	9.25	0.00	0.0
OTC	37.00	10.75	Copel Corp.	30.25	-1.25	-4.0
OTC	15.25	4.00	Easel Corp.	4.00	-0.25	-5.9
OTC	25.25	13.75	4th Dimension	19.88	-2.00	-9.1
OTC	19.25	5.75	Frame Technology	9.63	-0.13	-1.3
OTC	17.50	8.00	Group I Software	9.00	-1.50	14.3
OTC	35.25	14.00	Gupta	14.88	-0.38	-2.5
OTC	12.00	4.88	Hogan Systems Inc.	10.25	0.00	0.0
OTC	27.75	11.25	IMRS	23.50	-0.50	-2.1
OTC	44.75	27.00	Information Resources	34.38	-1.63	-4.5
OTC	27.25	13.38	Informix Corp	18.25	0.75	4.3
OTC	14.00	8.50	Intergraph Corp.	10.00	0.38	3.9

Each	52-Week Range			Nov. 24 3 PM	Wk Net Change	Wk Pct Change
OTC	13.63	4.88	Interleaf Inc.	7.25	0.00	0.0
OTC	15.25	4.75	Intersolv Inc.	9.25	0.50	5.7
OTC	18.25	7.75	Knowledgeware Inc.	15.25	0.00	0.0
OTC	54.75	15.50	Legent Corp.	24.00	0.50	2.1
OTC	50.75	18.75	Lotus Development	46.13	-0.63	-1.3
OTC	23.00	4.25	MathSoft	6.13	-0.50	-7.5
OTC	21.25	4.50	McAfee Associates	6.25	0.00	0.0
OTC	11.63	3.38	Meca Software	6.38	-0.25	3.8
OTC	13.75	7.63	Mentor Graphics	13.38	-0.13	-0.9
OTC	46.00	19.50	Micro Focus (L)	20.13	-0.13	-0.6
OTC	13.25	4.38	Micrografx Inc.	7.50	-0.13	-1.6
OTC	98.00	70.38	Microsoft Corp.	77.38	-2.88	-3.6
OTC	33.00	9.44	Oracle Corp. (H)	31.50	1.00	3.3
OTC	44.75	22.50	Parametric Technology	38.00	3.25	9.4
OTC	40.50	23.50	Peoplesoft	28.13	-0.75	-2.6
OTC	7.13	3.50	Phoenix Technologies	4.00	-0.31	-7.3
OTC	40.00	22.00	Powersoft	33.50	1.00	3.1
OTC	39.75	13.50	Platinum Software	24.25	0.88	3.7
OTC	25.00	7.25	Platinum Technology	9.50	-0.25	-2.6
OTC	61.50	32.25	Progress Software Corp.	49.75	0.50	1.0
OTC	6.63	1.94	Quarterdeck Office Sys.	2.25	-0.06	-2.7
OTC	32.00	16.00	Rainbow Technologies Inc.	20.50	1.00	4.7
OTC	11.38	4.25	Rasterops	7.25	-0.25	-3.3
OTC	15.25	6.50	Ross Systems	7.63	-0.63	-7.6
OTC	28.75	17.25	Sapiens Intl. Corp. N.V.	22.25	1.13	5.3
OTC	14.50	5.50	Software Publishing Corp.	6.13	-0.13	-2.0
OTC	17.25	5.25	Software Toolworks Inc.	12.88	-0.25	-1.9
OTC	7.88	0.75	Spinnaker Software	2.41	0.16	6.9
OTC	13.75	6.50	State of the Art	8.25	-0.50	-5.7
NYS	33.63	17.63	Sterling Software Inc.	27.00	-1.50	-5.3
OTC	21.63	9.63	Struct. Dynamics Research	17.75	-0.13	-0.7
OTC	38.75	19.13	Sybase Inc.	36.75	2.63	7.7
OTC	20.50	9.25	Symantec Corp.	16.88	-0.75	-4.3
OTC	25.50	10.00	System Software Assoc.	14.00	-0.75	-5.1
OTC	6.50	2.75	Trinzic Corp.	5.38	-0.25	-4.4
OTC	26.50	13.50	ViewLogic Systems	21.00	-1.13	-5.1
OTC	22.50	5.50	Walker Interactive Systems	8.75	-0.25	-2.8
OTC	1.19	0.84	Wordstar	1.28	0.03	2.5
Semiconductors						UP 1.0%
NYS	32.88	14.25	Advanced Micro Devices	18.50	-0.13	-0.7
NYS	26.00	13.25	Analog Devices Inc.	22.50	0.38	1.7
OTC	38.63	14.75	Atmel Corp.	24.75	-0.38	-1.5
OTC	6.63	2.75	Chips and Technologies	6.50	0.00	0.0
OTC	39.75	13.00	Cirrus Logic	33.13	-0.25	-0.7
NYS	16.75	8.63	Cypress Semiconductor Corp.	13.25	0.63	5.0
NYS	19.00	11.75	Dallas Semiconductor	14.13	-0.38	-2.6
OTC	74.50	35.50	Intel Corp.	58.88	0.38	0.6
NYS	19.25	8.88	LSI Logic Corp.	14.63	0.13	0.9
OTC	26.75	12.25	Lattice Semiconductor (L)	13.50	0.75	5.9
NYS	63.63	36.25	Micron Technology	43.75	4.88	12.5
NYS	107.50	48.75	Motorola Inc.	95.88	-0.38	-0.4
NYS	21.75	10.13	National Semiconductor	17.00	1.13	7.1
OTC	15.75	6.50	Sierra Semiconductor	8.25	0.13	1.5
OTC	52.75	25.75	SynOptys	46.63	1.75	3.9
NYS	84.25	45.13	Texas Instruments	64.00	4.38	7.3
OTC	18.88	6.50	VLSI Technology	14.00	0.63	4.7
OTC	14.38	4.25	Weitek	9.38	0.00	0.0
ASE	10.25	3.63	Western Digital Corp.	9.25	-0.50	-5.1
OTC	54.50	20.25	Xilinx	40.63	3.13	8.3
OTC	40.75	19.00	Zilog Inc.	26.75	-2.50	-8.5
Peripherals and Subsystems						OFF 1.5%
OTC	24.75	10.50	American Power Conversion	19.00	0.50	2.7
OTC	22.75	15.50	Banctec Inc.	20.63	-0.38	-1.8
OTC	17.50	3.50	Cambex Corp	4.50	-0.75	-14.3
ASE	18.38	3.88	Cognitronics Corp.	4.63	0.13	2.8
NYS	25.50	9.00	Conner Peripherals	13.25	-0.50	-3.6
OTC	38.50	17.25	Creative Technologies Inc.	24.50	0.00	0.0
OTC	30.75	6.50	Data Race Inc.	10.50	0.00	0.0
ASE	12.50	7.50	Databar Corp.	9.25	-0.38	-3.9
NYS	39.00	9.25	EMC Corp.	31.13	0.00	0.0
OTC	10.50	5.25	Emulex Corp.	6.13	0.00	0.0
OTC	20.00	14.00	Evans & Sutherland	17.25	-0.38	-2.1
OTC	20.50	7.50	Exabyte	15.50	-0.25	-1.6
OTC	34.00	12.25	Intelligent Info. Systems	29.75	0.13	0.5
OTC	8.25	2.50	Iomega Corp.	3.00	-0.25	-7.7
OTC	14.25	5.75	IPL Systems Inc.	7.25	-0.25	-3.3
OTC	24.00	13.75	Komag Inc.	15.63	-0.88	-5.3
OTC	19.63	4.38	Maxtor Corp.	6.63	-0.13	-1.9
OTC	10.00	5.75	Micropolis Corp.	7.25	-0.13	-1.7
NYS	117.00	97.25	3M Corp	109.00	0.38	0.3
OTC	8.00	4.00	Printronix Inc.	7.25	0.00	0.0
NYS	17.25	7.50	QMS Inc.	10.25	-0.13	-1.2
OTC	17.88	9.38	Quantum Corp.	13.75	-0.25	-1.8
OTC	8.00	3.13	Radius Inc. (H)	8.00	0.25	3.2
NYS	17.75	11.75	Recognition Equipment	16.13	0.13	0.8
OTC	13.25	3.63	Reson Inc.	4.13	0.00	0.0
OTC	25.13	13.13	Seagate Technology	23.63	-0.25	-1.0
NYS	65.00	18.00	Storage Technology	28.50	0.00	0.0
NYS	27.88	17.63	Tektronix Inc.	21.75	-0.63	-2.8
NYS	88.88	69.88	Xerox Corp.	80.63	-1.13	-1.4
Services						OFF 0.6%
NYS	4.38	1.63	Allegion Inc	3.25	0.00	0.0
OTC	23.75	14.88	American Mgmt. Systems	20.25	0.38	1.9
NYS	4.75	2.38	Amacomp Inc.	1.75	-0.13	-3.7
OTC	23.84	14.16	Analysts Int'l	17.75	0.38	2.2
NYS	56.50	46.88	Auto Data Processing (H)	54.00	0.38	0.7
NYS	19.88	13.88	Ceridian Corp.	19.00	0.38	2.0
NYS	21.00	13.13	Condisco Inc.	18.63	0.13	0.7
OTC	13.38	5.16	Computer Horizons	11.88	0.75	5.9
NYS	100.25	70.00	Computer Sciences (H)	96.25	1.75	1.8
NYS	9.00	6.00	Computer Task Group	6.75	0.13	1.9
NYS	37.00	19.00	CompUSA Inc	25.63	-0.63	-2.4
OTC	14.13	8.00	Control Data Systmes Inc.	9.00	-0.13	-1.4
OTC	16.00	7.00	Corporate Software (H)	15.00	-0.63	4.0
OTC	11.75	6.63	Egghead Discount Software	8.50	0.13	1.5
NYS	35.88	26.00	General Motors E (EDS)	28.50	0.13	0.4
OTC	25.50	13.50	Imacom Corp.	16.75	-0.25	-1.5
OTC	24.38	8.75	Intelligent Electronics	24.38	1.25	5.4
OTC	17.00	9.63	Meisel	14.75	0.13	0.9
OTC	37.00	7.00	Microage Inc. (H)	31.50	1.50	4.5
OTC	17.75	13.50	Paychex	12.25	2.00	5.8
NYS	87.25	21.63	Policy Management Sys.	26.38	0.38	1.4
NYS	43.63	24.13	Reynolds and Reynolds	41.25	-0.25	-0.6
OTC	24.00	13.38	SEI Corp.	23.00	0.25	1.1
OTC	26.00	17.50	Shared Medical Systems	22.13	-0.13	-0.6
OTC	12.63	5.75	SMI Systemhouse	7.38	0.63	9.3
OTC	30.75	20.00	Software Spectrum Inc.	20.75	-0.50	-2.4
OTC	42.75	26.25	Sungard Data Systems	35.25	-1.50	-4.1

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

SSA results rise

System Software Associates, Inc. last week posted fourth-quarter net earnings of $9.5 million, a 17% increase from the same period last year. Revenue in the period ended Oct. 31 rose 16% to $83.2 million, the Chicago developer said. Though earnings sank 12% to $23.4 million in fiscal 1993, revenue jumped 15% to $263.4 million. The year-to-year comparison was skewed by accounting changes made to fiscal 1992 results, the company noted.

Share offering

KnowledgeWare, Inc. has agreed to sell 1 million shares at $14.75 a share to several investors, including **Mitch Hutchins Asset Management**, well-known financier Irwin Jacobs and others. It intends to use the proceeds to bolster working capital and pay off obligations related to recent acquisitions. Prior to the transaction, the Atlanta software company had 13.3 million outstanding shares.

AST delays

AST Research, Inc. in Irvine, Calif., has postponed a proposed offering from February to March of zero coupon-convertible subordinated notes due in 2013. The offering, which is being underwritten by Merrill Lynch & Co., is expected to raise $100 million for the PC maker. Proceeds will be used for working capital, retirement of bank debt and new product development.

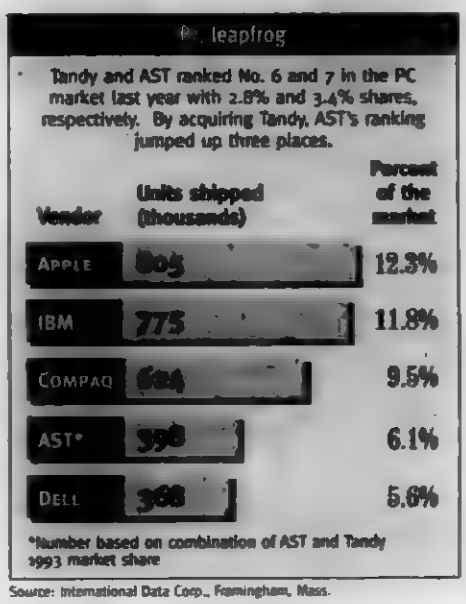
SHORT TAKES **Sungard Recovery Services, Inc.** in Wayne, Pa., has completed its acquisition of **Computer Recovery Services Corp.**, the disaster recovery unit of **United Computer Services Corp.** in Scottsdale, Ariz. .... SNA software developer **Apertus Technologies, Inc.** has agreed to acquire Systems Strategies, Inc., a New York Unix software house, from **Nynex Corp.**'s AGS Computers, Inc.

PC market share

AST purchase staves off backlog

By Stephen P. Klett Jr.

AST Research, Inc.'s purchase of Tandy Corp.'s PC manufacturing facilities has not only catapulted it from a seventh- to fourth-place ranking among top PC makers, but it could also be all that stands between AST and the backlog woes affecting the Top 3 companies (see chart).



Source: International Data Corp., Framingham, Mass.

Revenue

So far, fiscal 1994 has been more than kind to the Irvine, Calif., clone maker. AST posted record revenue totaling $514.4 million — an increase of 80% over the comparable period last year and 26% over the preceding quarter. Net income was $8.2 million vs. $7.6 million for the same period last year. The company also shipped a record 332,000 units worldwide during the first quarter — an 111% increase over fourth-quarter 1993.

In addition, the recently completed $111 million deal with Tandy netted four manufacturing plants and the Grid and Vector product lines [CW, May 31], which, when combined with AST's existing assets, have almost doubled the company's clout.

"The Tandy acquisition was a big plus for AST. All of a sudden, they're No. 4," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "From a volume standpoint, it's a huge success; now they have to focus on image," he added. Giusto said he did not foresee this being a significant problem because AST's "brand name is strong."

Moreover, the additional manufacturing capacity could not have come at a better time, according to Howard Elias, vice president of worldwide marketing at AST. He said AST has sold out all of its product line for the fourth calendar quarter and faces backlogs across nearly all its lines as well. "We think this integration goes a long way toward solving this problem," Elias said.

Resellers contacted said that while they faced minimal backlogs on various AST product lines, they had not experienced significant supply problems.

"We have experienced some supply problems but not any worse than those with IBM and Compaq equipment, not even close," said one reseller, who requested anonymity.

Manufacturing moves

Quick to react, AST has drawn up worldwide integration plans for Tandy's manufacturing business, including the following:

- Establish two manufacturing centers for mobile computers in Fountain Valley, Calif., and Taiwan. Establish Fort Worth, Texas, as the center for worldwide production of processors. Move desktop and server production for the Americas from Fountain Valley to Fort Worth.
- Consolidate all distribution and repair from East Kilbride, Scotland, to Limerick, Ireland; shift desktop production from Taiwan to Ireland and Vector and Grid brand production from Scotland to Ireland.

AST expects the restructuring to result in a 40% increase in worldwide manufacturing and to be completed by next June, according to Elias.

To cover these restructuring costs, AST took a onetime charge of $125 million in the fourth quarter last year and will lay off about 1,050 workers. Nearly half of these cuts — 450 — will be desktop and server manufacturing positions in Fountain Valley.

However, 850 new jobs are expected to be created in Fort Worth and Limerick.

Maverick will push IBM open

By Ed Scannell

LAS VEGAS

Labeling himself a "maverick" in IBM's relatively conservative corporate culture, James Cannavino said he hopes to be the catalyst who pushes IBM into an era of open standards.

"I think [IBM Chief Executive Officer Louis V. Gerstner] wants me to shake things up a little," said Cannavino, fresh from his appointment as IBM's senior vice president of strategy and development.

Perhaps with that in mind, he admitted in a Comdex/Fall '93 interview that the time-honored concept of account control at IBM is dead. Even so, Cannavino predicted that IBM's mainframe hardware business, long symbolic of the company's proprietary bent, will be profitable for at least another five years.

"It is folly to believe you can make customers move to something [when] they don't want to. When you do business with a customer you want to add value, not lock them up with something proprietary," Cannavino said, in what would have amounted to heresy at the old Big Blue.

In that vein, he said the end game of IBM's energized commitment to true open standards is eliminating the need for its largest corporate customers to "place bets" on which de facto standards to back.

Taking the risk

"We want to take the risk of betting away from customers who should not be in the gambling business," Cannavino said.

One such example, he said, is that IBM's PowerPC-based systems can run RISC- and complex instruction set computing-compatible operating systems, and the Workplace OS operating system can support multiple personalities — or the look and feel of several graphical environments. So users now have more freedom to tailor an open strategy that goes hand in glove with their computing needs.

James Cannavino, *senior VP of strategy and development, hopes to shake things up*

But he said he clearly realizes that just saying IBM will do something can no longer hold large corporate accounts in the company's sway. "IBM is going to have to demonstrate it is capable of delivering solutions to real-world problems," Cannavino said.

Many corporate managers said they believe Cannavino is moving along the right track, but still, they wonder if IBM will move fast enough to provide those solutions given a school of voracious competitors.

INDUSTRY PULSE: Computer industry

PC hardware

	Second-quarter 1993	Second-quarter 1992	12 months	12 months
Apple Computer, Inc.	$1,740.2	$1,862.0	13.4%	-2.5%
Compaq Computer Corp.	$827.0	$1,632.3	73.6%	+5.4%
IBM	$1,523.8	$1,539.0	-8.6%	-4.4%
Dell Computer Corp.	$467.5	$700.6	91.5%	+2.7%
Gateway 2000, Inc.	$248.6	$441.8	71.3%	+1.2%
Digital Equipment Corp.	$286.7	$415.7	48.5%	+8.7%
AST Research, Inc.	$266.3	$409.2	48.6%	+8.7%
Hewlett-Packard Co.	$301.3	$358.5	14.8%	-8.3%
Unisys Corp.	$176.7	$163.8	-4.5%	-8.8%
Zeos International Ltd.	$48.8	$52.7	-4.6%	-8.2%

Source: Gartner Group Yankelich, Stamford, Conn.

Average U.S. desktop/tower street prices*

Processor/speed	1993	1994	1995	1996
386SX, 33 MHz	$920	$890	$850	$810
486SX, 33 MHz	$1,610	$1,550	$1,520	$1,460
486DX2, 50 MHz	$2,150	$2,050	$1,950	$1,820
486DX2, 66 MHz	$2,400	$2,300	$2,250	$2,000
Pentium, 60 MHz	$5,420	$5,130	$4,950	$4,530
Pentium, 66 MHz	$6,510	$6,120	$5,820	$5,250

*Projections
Based on average configurations for each time frame; prices do not include monitors

Source: International Data Corp., Framingham, Mass.

The 5th Wave *by* Rich Tennant

Inside Lines

When yoga's not enough

To put some substance behind Notes as an application development platform, Lotus will announce next week at Lotusphere that Informix Software, Powersoft, the ASK Group's Ingres Division and Revelation Technologies will deliver Notes support in the first half of 1994, according to sources close to Lotus. Information Builders has also jumped on the bandwagon (see story page 29). Discussions with Oracle, meanwhile, are ongoing. All of these vendors will join Gupta as Notes tools partners [CW, Oct. 25]. Lotus will also disclose a deal with CompuServe to enable Notes users to replicate databases through the CompuServe public network beginning in 1994. Ascom Corp. will announce delivery of an X.400 router for Notes, which will provide a more robust wide-area network (WAN) for Notes traffic than existing X.25 WANs.

Set out the Novocain

Remember that FBI proposal to make digital networks more suitable for wiretaps [CW, June 8]? FBI chieftains said the reason for the controversial scheme — code-named Operation Root Canal — is that digital traffic is hard to tap, but G-men in the field are not reporting any problems with electronic surveillance. Documents obtained under the Freedom of Information Act by Computer Professionals for Social Responsibility show that FBI efforts to elicit horror stories from field offices came up with a big zero.

Reigniting the flame

Candle Corp. President Merritt Lutz suddenly turned up missing from the privately held $180 million software firm. His departure two weeks ago was followed by a brief memo from founder, Chairman and CEO Aubrey Chernick, who is now also president, company sources said. The company gave no explanation for the management change, but some said Chernick wants to personally drive the strategy beyond its base in the data center and into distributed computing. Lutz arrived three years ago from PDI, a Los Angeles consultancy.

Money changes everything

As part of an effort to cozy up to resellers, Digital plans to throw some money at them. Digital, which wants to increase its relatively small indirect channels presence, has a lot of history to overcome. It plans to announce this week that virtually all resellers meeting the minimum sales levels in their contracts will now be able to get marketing funds from the company. Only a small subset of resellers qualified before, and Ed Kamins, vice president of U.S. channels, conceded that Digital has "been behind other vendors in this regard." Digital also plans to provide more extensive training to resellers.

Uniface takes bite of Apple

Uniface plans this week to disclose that it has ported its client/server application development tools to the Macintosh, a source close to Uniface said. The deal is being touted as a way to integrate Macintoshes into corporate computing. In theory, Macintosh users could build applications for that platform but quickly port the software to Unix and vice versa. Powersoft and Gupta, Uniface's major client/server tools rivals, do not support the Macintosh. The product is expected to ship early next year, the source said.

CSC Index's latest indications publication ought to get an award for "virtual" abuse — it talks about virtual teams, virtual structures and virtual decentralization, complete with definitions for each. Gimme a virtual break. Meanwhile, Robert Eccles, a former Harvard B-school prof who now heads an "advisory capital" firm, brought back a new word from a recent trip to England: "rightsizing." It's what you do with the people who lose their jobs after you've rightsized your organization, he told attendees at a recent SIM chapter meeting in Boston. Right. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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COMPUTERWORLD

Security woes dull OLE luster

Object embedding opens hacker door

By Michael Vizard

■ Information systems shops may soon find themselves exposed to security shortcomings as they move to adopt the coming generation of object technology in their networked PC applications.

Objects are intended to provide dramatically improved integration between applications. But deploying technologies such as Microsoft Corp.'s Object Linking and Embedding interface may inadvertently create a back door through which malicious individuals can enter to embed destructive commands, viruses and worms in any number of applications that are distributed via electronic mail or network protocols.

"IS managers should be forewarned that this can be done, but only one in 10,000 users is conversational enough in OLE and electronic mail or networks to accomplish it," said Joel Diamond, technology director at the Windows User Group Network in Media, Pa.

However, the potential damage

OLE, *page 8*

Novell to fill directory gaps

Planned additions said to bring NDS up to par with Banyan's StreetTalk

By Elisabeth Horwitt

Novell, Inc. plans next spring to fill in many of the more prominent missing pieces in its NetWare Directory Services, a core piece of NetWare 4.01 that forms the foundation for Novell's enterprise networking services strategy.

Planned introductions include utilities for administering legacy NetWare v3.11 directories from NDS and tools to facilitate altering NDS directory structures. Also in the works is initial integration of the NDS directory with Novell's electronic-mail and third-party SQL database services, a Novell spokesman said last week.

"Novell is finally doing something to help people migrate between 3.11 and 4.01," said David Strom, president of David Strom, Inc., a Port Washington, N.Y., consultancy.

Ready to use

Network administrators who have balked at the complexity of NDS will make good use of the promised "tools for manipulating, combining and reshaping [NDS] directories," Strom said.

Several customers have cited those missing capabilities, most notably the lack of NetWare v3.11 support, as their reasons for holding off on NetWare 4.01 implementation [CW, July 26].

"It is also essential that Novell continue to extend NDS across" all of its major network services so that the global directory "becomes the center of the [NetWare] universe, just like StreetTalk is for Vines," Strom said.

However, while Banyan Systems, Inc. archi-

Novell, *page 12*

Chip powers up PowerPC

By James Daly and Ed Scannell

PowerPC-based systems *may be more attractive with the addition of the Malibu chip*

Kaleida Labs, Inc., Motorola, Inc. and Scientific-Atlanta, Inc. last week announced a powerful graphics controller designed to provide splashy multimedia services for the home. And if Kaleida has its way, business use won't be far behind.

Officials from the three companies positioned the Malibu chip for use with embedded PowerPC-based TV-top boxes. But Motorola and Kaleida also plan to aggressively pursue deals with manufacturers of PowerPC systems — including IBM — geared toward the corporate world, sources close to both companies said.

Karen A. Ashbaugh, manager of

Chip, *page 16*

STELLA JOHNSON

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CIOs, such as former Unum Insurance chief John Alexander, stand by their use of foreign contractors, citing high-quality code and up to 50% cost savings. **See story page 123.**

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Amex extending credit for parallel processing plans

By Gary H. Anthes

Saying that parallel processing will give it a competitive advantage, American Express Co. is increasingly turning to high-performance parallel computing for information processing and decision support.

However, the company said the technology must mature considerably before it moves mission-critical, on-line transaction processing applications off its mainframes. In fact, an Amex official said he expects such key applications will remain on conventional mainframes for at least five years.

Meanwhile, Amex is pushing forward with the spadework necessary to make enterprisewide adoption of parallel processing a reality.

"Parallel processing technology promises to dramatically improve

Amex, *page 14*

IS budget: **$1.1B**

IS budget as percentage of revenue: **4%**

Processor market value: **$800M**

Total PCs and terminals: **115,000**

Source: 1993 *Computerworld* Premier 100

SPECIAL REPORT

THE STATE OF OPEN SYSTEMS '93

If vendors can't provide better interoperability than they have so far, users may opt for semi-open systems such as Windows NT. For exclusive results of X/Open's latest worldwide survey, see the special *State of Open Systems* supplement that begins on page 87.

THE SHIFT IS ON

Corporations around the world say they plan to nearly double spending on open systems hardware and software over the next three years

(PERCENT OF IS BUDGET)

1993: 28%
1995: 50%

SOURCE: X/OPEN CO.'S SURVEY OF 700 IS MANAGERS

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STELLA JOHNSON

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Executive Briefing

Parallel processing — the new frontier. The race is on in the financial services field to claim the competitive edge that this technology yields.

American Express is aggressively experimenting with massively parallel processing but worries that it may already have fallen behind competitors such as **Citicorp, AT&T and Banc One.** An internal Amex report on the technology highlights its ability to offer targeted products and services to customers in near-real time and talks about its potential to "open up many marketing opportunities that are now unthinkable." **Boulders on the path:** Lack of software development and systems management tools; inadequate reliability for commercial transaction processing; and a drastic shortage of people who understand parallel processing technology. *Page 1*

Mixing and matching. It takes a combination of several tool sets to manage a distributed system, according to Jim White, vice president of technical planning at **Charles Schwab.** That's especially true since the company is moving toward a nationwide network of distributed computing resources based on **OSF's DCE**, for which key pieces are still missing. Schwab has opted for **Sun's operating system** in place of OSF/1 and **Tivoli Systems' Time Management Environment** in place of the OSF's DME framework. *Page 28*

"We decided to pay and just get the hell out."

Jim Masey at Reynolds Metals Co. on how to end a bad consultant relationship. More war stories, page 79.

War stories. Scratch an IS executive and you'll find a person itching to tell you about a horrific experience with a consultant. What's particularly scary is that the **consultants who figure as villains** in these tales are not usually fly-by-nights. Jim Masey *(at right)* ran into trouble with a division of a firm he'd worked with successfully in the past. **Michael Simmons**, who spoke with us just before his departure from Bank of Boston, offered the harshest assessment of experts-for-hire. "My definition of 'expert?' " he said. " 'X' is an unknown quantity and 'spurt' is a drip under pressure." *Page 79*

Gold you can manufacture: Consultant and research analyst **Carma McClure** estimates that 40% to 60% of new application code could potentially come from libraries of reusable components. And the **Penatagon** figures it could save $300 million if it could just increase its current level of software reuse by 1%. Interested? Well, here's a tip. Be systematic and **develop software with reuse in mind.** Experts say the most common mistake organizations make is to think about reuse only when they're in the middle of a project. *Page 73*

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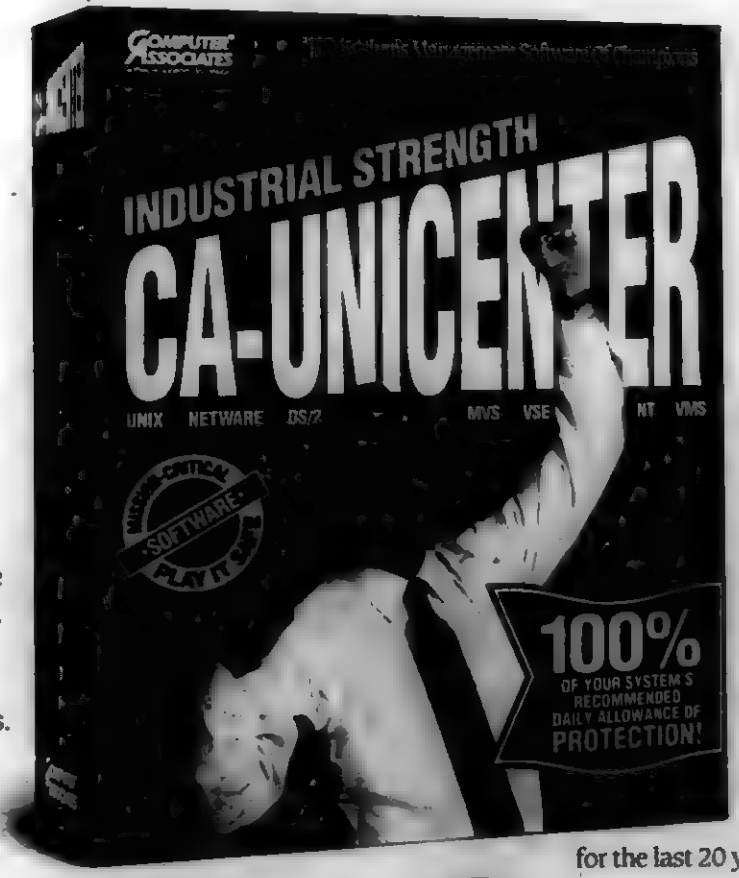

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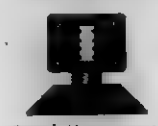
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Network management

SunNet Manager gets distributed

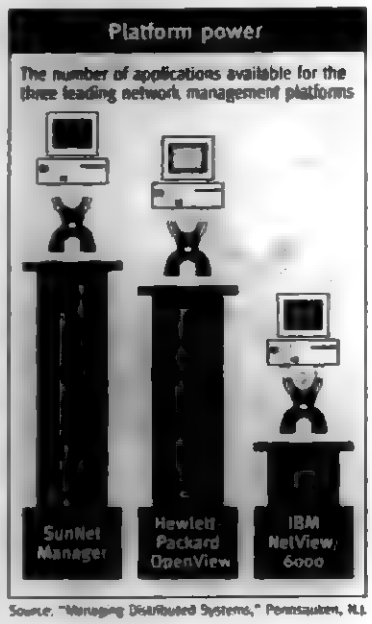
By Lynda Radosevich

Network managers should see the first distributed object-oriented network management platform from a leading vendor by the middle of next year.

SunConnect, a division of Sun Microsystems, Inc. in Mountain View, Calif., will announce this week that it is licensing distributed object-oriented technology from NetLabs, Inc. to be included in the next version of SunNet Manager, according to analysts briefed by both companies.

The distributed technology is structured to address large network management issues such as traffic overload at central consoles, duplicate and unsynchronized databases and users' inability to manage from any point on the network. The object-oriented aspect should help hide the complexity of underlying network structures from corporate or third-party developers.

"Distributed management will be good, but I have to see the real thing before I can get excited about it," said John Dubiel, manager of planning and technology at Boston Edison Co. and a SunNet Manager user.



Source: "Managing Distributed Systems," Pennsauken, N.J.

SunConnect will obtain the technology from NetLabs' Dimons 3G network management platform (formerly called OverLord) and the related application programming interfaces, neither of which will ship this year. A NetLabs spokesman said a Dimons 3G development kit for corporate and third-party developers will ship this month, and the software itself will ship in the first quarter of next year.

NetLabs is roughly nine months ahead of other vendors in the development of distributed object-oriented network management, according to James Herman, president of Northeast Consulting Resources, Inc. in Boston. The deal, therefore, would allow SunConnect to vault over its main rivals, Hewlett-Packard Co. and IBM, Herman said.

Today, IBM is expected to restate its distributed object-oriented network management plans. Analysts said they anticipate IBM will say it has elements in place and speculated that it would offer a piecemeal solution.

Playing catch-up

While the deal would enable SunConnect to address the widely held perception that its technology is falling behind HP and IBM, it is not clear whether the NetLabs version of the distributed technology is robust enough and easy enough to use. That is because NetLabs is not following the same path as the Open Software Foundation (OSF), an industry group that first identified the need for distributed object-oriented network management.

The OSF chose to use the Open Management Group's Common Object Request Broker Architecture specifications, which are general object guidelines. NetLabs is instead using the International Standards Organization's object guidelines, which are specific to network management.

"That means that when you come into the [SunNet Manager/NetLabs] environment as an expert object programmer, you won't know how to program in it," Herman said.

While analysts and users generally applaud Sun's move to object-oriented distributed network management, the technology is not without its downside.

"Instead of having one central management center and a few people with keys, the information is scattered around, so how do you securely delegate tasks?" asked Jill Huntington-Lee, principal at Brandywine Network Associates in Cinnaminson, N.J.

Also key to the success of the new SunConnect/NetLabs platform is the support of third-party developers, which has not yet been established, said Charles Robbins, a director at Aberdeen Group in Boston.

However, Tony Helies, president of Concord Communications in Marlboro, Mass., said SunConnect's upcoming object-oriented system should make it more efficient for his company to write its network monitoring applications to that platform. His firm will develop its products for the upcoming object-oriented SunNet Manager, as well as for whatever system HP and IBM develop, be said.

Howdy, partner

NetLabs' technology has garnered at least one other partner. In April, NCR Corp. picked NetLabs' technology for use in its StarSentry network management line. StarSentry is used by some large companies but lacks the third-party support needed to make it a main player in the market, according to an NCR spokesman.

HP's plan for 'post-RISC' raises migration concerns

By Mark Halper

Hewlett-Packard Co., which pioneered the move to commercial RISC in the mid-1980s, last week startled the industry by sketching out plans for a next-generation, "post-RISC" architecture that promises quantum performance leaps — but also raises compatibility questions.

No sooner had Joel Birnbaum, senior vice president and head of research, outlined HP's plans for a 64-bit billion instructions per second chip that uses Very Long Instruction Word (VLIW) technology than users and analysts raised migration concerns.

"Is there a compatibility issue going forward? Is there a price advantage?" asked Craig Sultan, an analyst at Montgomery Securities in San Francisco.

"I think they need to make some sort of public statement that would reassure not only their customers, but their partners as well, about the compatibility question," said Sam Ellis, associate vice president of information services at Portland Community College in Portland, Ore. "They shouldn't leave any lingering doubt about what 'post-RISC' means."

Anticipating such concerns, Birnbaum, who provided a glimpse of VLIW during a corporate year-end meeting with analysts, told his audience that the technology will provide an easy migration path from HP's current superscalar, 32-bit Precision Architecture-RISC.

"We can provide a seamless migration from PA-RISC and perhaps other architectures," Birnbaum said, according to the text of his prepared remarks obtained by *Computerworld*.

Birnbaum did not provide a time frame for VLIW, but users and analysts said they expect HP to make it available within two years.

Learning from the past

Users and analysts pointed out that HP probably learned a few lessons from its rocky migration in the late 1980s, when it moved users from its "classic" architecture to PA-RISC, then code-named Spectrum. The transition was marred by software incompatibilities as users moved from the classic machines to the PA-RISC models, Ellis said.

Ellis said HP outlined a next-generation architecture at a seminar in France last summer that would move from PA-RISC's CMOS fabric to a Bi-CMOS fabric and portended a huge order-of-magnitude performance improvement.

"It's clear they are making some significant changes in their microprocessor architecture and that they have something that's very significant," Ellis said.

Double the performance

Birnbaum could not be reached to elaborate, but in his prepared remarks he stated that VLIW would permit between 4 and 20 instructions per cycle. "We expect performance to be as significant of an improvement over the current generation as RISC was over its predecessor," he stated. He said raw performance ratings could hit "several billions of instructions per second."

Birnbaum also explained in his text that while superscalar and VLIW both permit more than one execution per CPU cycle, VLIW permits software to schedule these executions in parallel. Superscalar designs schedule multiple executions in hardware, "which increases the complexity and which will in the next few years reach the point of diminishing returns," his statement said.

Eric Fisher, principal at Fisher Systems Consulting in Groton, Mass., pointed out that the key to compatibility between PA-RISC and VLIW will be the development of compilers to allow software written for PA-RISC to take full advantage of VLIW.

He also noted that HP's VLIW will probably exploit microkernel operating system design and will permit HP to build one machine that would accommodate both its Unix and its MPE operating systems — and perhaps others.

David Wu, an analyst at S. G. Warburg & Co. in New York, observed, "Whether it's called CISC or RISC or VLIW, I don't care. All I want to know is, how fast does it run my applications, and how much does it cost me?"

Corrections

An item on page 101 of the Open Systems Supplement says the Open Systems' Foundation and Unix International, Inc. are expected to soon merge. After deadline, it was learned that Unix International plans to close its doors by year's end (see item page 8).

A chart concerning availability of modules offered by different data center automation vendors in The CW Guide to Mainframes in the Nov. 29 issue could be misinterpreted. Computer Associates International, Inc. does indeed offer a report distribution module. Information was not available on whether Candle Corp. offers a data balancing module.

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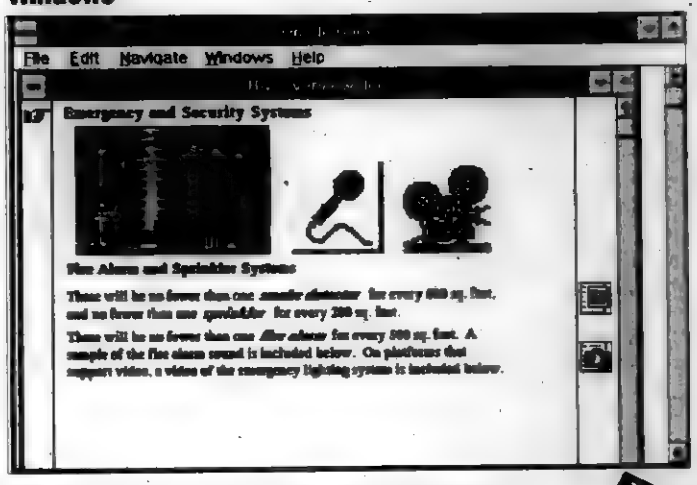

This application was designed in Windows, then deployed on Windows, Motif, Macintosh, and even Character terminals without any programming.

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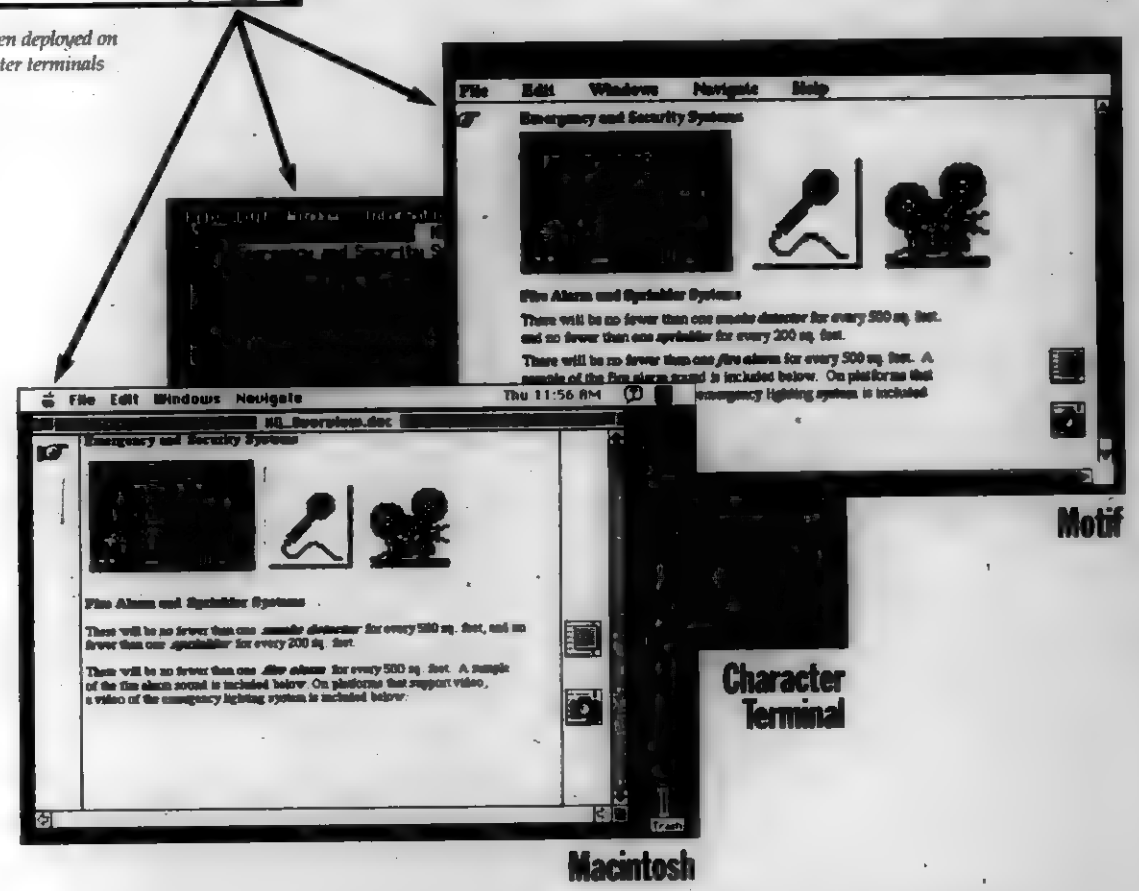

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Objective: Have it both ways

The linkup of Sun Microsystems and Next Computer is the latest demonstration of how computing is attempting to move in two seemingly contradictory directions simultaneously.

On the one hand, computer users aspire to employ more complex data in more sophisticated systems to better reflect their business tasks. On the other hand, they want to work with systems that are easier to maintain and easier to use.

This demand for greater simplicity sitting atop higher and higher levels of abstraction is the major competitive force driving the industry today, and companies as divergent as IBM, Sun, Microsoft, Apple and Hewlett-Packard are scrambling to meet it.

To do so, Sun officials have been forced to set aside old differences with what they once viewed as a presumptious and preposterous competitor and link up with Steve Jobs' outfit. Next's hardware proved to be no threat, but it did field a first-class object-oriented development environment in NextStep. From an early date, Next tended to compare NextStep with Sun's object-oriented offerings, to Next's advantage.

But these differences are no longer relevant in a rapidly changing climate. Sun is not as competitive as it used to be on the hardware front, and it faces additional challenges in software. Sun offers a good assortment of tools for traditional software development, but delivering complicated systems under an easy-to-use veneer is a big challenge. With NextStep, it can give its customer base a way to move quickly into next-generation systems.

Sun's agreement with Next is indicative of the growing demand for sophistication wrapped in simplicity.

Charles Babcock

By agreeing to invest $10 million in Next, Sun will get to incorporate NextStep's object-oriented capabilities into its Solaris operating system. In particular Sun will be able to offer the extensive object class libraries of the NextStep system, something that would take Sun years and millions of dollars to develop on its own.

Moving toward object-oriented systems is a genuinely different way of doing things — so different that we have few business examples of successful implementations. The object-oriented approach is one of the few ways to deal with different kinds of complex data — not only voice, video and image but also complicated entities and their relationships — building business models that come closer to reflecting the rules and practices of the business.

NextStep is not the only means of moving toward systems based on objects. Microsoft has moved rapidly to put object capabilities into the hands of its users through the release of Object Linking and Embedding Version 2.0. The Taligent project from Apple/IBM is likely to match or improve on NextStep.

In addition to modeling greater complexity, the use of objects also contributes to delivering ease of use. Without objects, there would be no graphical user interface on the Macintosh or MS-DOS PC. The use of objects is likely to help advance the user interface on other fronts, including touch, voice recognition, gestures, etc.

IBM already offers a PC-based voice recognition system for less than $1,000 that can be trained to recognize a user's voice. An underlying system digitizes the speech pattern and examines it two or three words at a time (bigrams and trigrams), using word relationships to resolve ambiguities.

The Personal Dictation System can allegedly deliver 90% to 95% accuracy, with the rate improving as the user types in corrections in speech transcription.

The Personal Dictation System is only one small example of the way in which the contradictory drive toward greater complexity — manipulated through a simpler interface — is going to yield results in the near future. The Sun/Next collaboration is likely to produce the next fruits.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 375-2737.

Object-oriented systems

Microsoft OLE pushes on

By Melinda-Carol Ballou and Michael Vizard

Microsoft Corp. last week took another step in its race with IBM and others toward establishing its next-generation object-oriented operating system.

As part of a technology demonstration with Digital Equipment Corp., Microsoft for the first time showed a distributed version of its Object Linking and Embedding (OLE) interface running on mutiple platforms. OLE is the key technology Microsoft will use to build Cairo, its forthcoming object-oriented operating system.

For Microsoft, the demonstration answers criticisms from rivals that OLE works only within a single Windows system, meaning users cannot share objects across a network.

But while Microsoft plans to ship a developer's kit this month for distributed OLE, the company does not plan to make that technology generally available until it has the other major elements of Cairo in place in 1995, said Mark Ryland, Microsoft senior programming manager.

In contrast, members of the OpenDoc consortium — the Component Integration Laboratories (CIL) — are expected to offer a developer's kit in the first quarter. OpenDoc is a set of object-oriented specifications based on technology from IBM and Apple Computer, Inc. that has been endorsed by Novell, Inc., WordPerfect Corp., Oracle Corp, Taligent, Inc. and Xerox Corp.

Strength in ubiquity

Because it is based largely on the Distributed System Object Model (SOM) created by IBM, OpenDoc is considered to be a more robust object environment that already supports distributed computing.

However, developers have yet to see any actual OpenDoc code, while Microsoft has already lined up hundreds of developers behind OLE 2.0 running on top of Windows 3.1 and Windows NT.

"Microsoft has got the channels and the [independent software vendors] locked up," said John Rymer, an industry analyst at the Patricia Seybold Group in Boston.

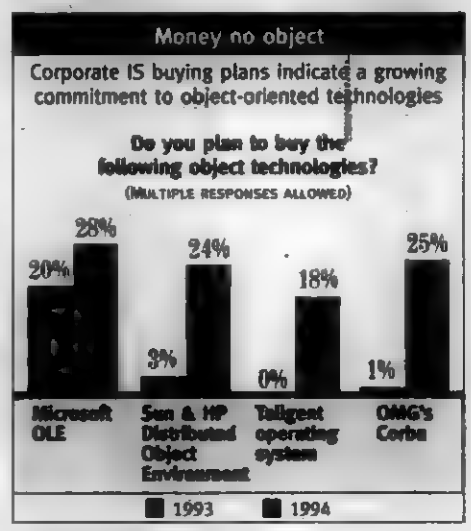
And even the members of CIL have deferred to Microsoft's dominance.

"The tremendous strength of Microsoft's OLE is in how widespread it is. It may not be elegant, but it is out there being used. So SOM will have to talk to OLE," said Cliff Reeves, IBM's program director of object technology products. To accomplish this, WordPerfect is developing technology that will allow OpenDoc applications to exchange objects with OLE applications.

Moving forward

But in the meantime, CIL members said they will push ahead with OpenDoc because they claim OLE is a proprietary technology. "All they have now is a distributed proprietary object solution. And publishing a spec is not the same thing as making source code available," said Scott Handy, program manager for market strategies at IBM's Personal Software Products group.

For the time being, information systems organizations are generally adopting a wait-and-see attitude.



Source: X/Open Co. survey of 780 IS managers

"We have our finger on the pulse and are checking out" Taligent, Cairo and Sun Microsystems, Inc.'s deal with Next Computer, Inc., said Jeffrey Oakes, a systems consultant at International Telegram & Telegraph Hartford. "Strategically, [object request brokers and object-oriented operating systems] are a critical direction for us. But I don't see a clear winner at this point."

Software reuse offers paybacks. See story page 73.

COMmon interest

Microsoft and Digital last week unveiled plans to develop an object specification that will allow OLE 2.0-based applications to be distributed across multiple platforms and interoperate with Common Object Request Broker Architecture (Corba)-compliant objects from Digital.

The specification will ensure that applications written to it can work with Digital's ObjectBroker.

Through ObjectBroker, data from OLE applications can be shared with applications running on any platform that supports Digital's implementation of the Object Management Group's (OMG) Corba standard.

The specification, called Common Object Model (COM), will include relevant portions of OLE's Component Object Model, interfaces and a communications protocol based on the Open Software Foundation's Distributed Computing Environment/Remote Procedure Call.

Digital and Microsoft will be shipping an early developer's release of the COM specifications during the first quarter of 1994. A version of the distributed OLE developer's kit will ship this month.

— Melinda-Carol Ballou

Lingering identity crisis stalks DEC

Users hope for a clearly detailed, long-term strategy at DECUS conference

By Craig Stedman

Attendees at this week's Digital Equipment Computer Users Society (DECUS) conference in San Francisco are expected to press Digital Equipment Corp. to lay out a more coherent long-term strategy and to provide some evidence that its client/server message is starting to filter down to the company's sales force.

Digital tried to paint itself in the colors of open client/server computing at a mid-October product introduction meant to be a defining moment. But users and analysts interviewed last week said the company still suffers from a lack of focus compared with rivals such as Hewlett-Packard Co.

Scott Bowes, chief financial officer at Phoenixville Medical Associates Ltd. in Phoenixville, Pa., said his rating of Digital has improved during the last two years. But Bowes, who is planning a new system purchase for late next year, said he would like the company to "come out of its fog a bit and explain itself better."

"It's a fair criticism to say that they're going through an identity crisis," said Bill Stella, senior vice president of information services at Arkwright Mutual Insurance Co. in Waltham, Mass. "Their public strategy appears to be headed in the right direction, but we'll see."

Conflicting messages

"From sales office to sales office, we get a different message," noted Irv Shapiro, president of Metamor Technologies Ltd., a consulting and systems integration firm in Chicago. "They're not predictable and focused, and that makes them a higher risk in an MIS organization."

Steven Tihor, an assistant research scientist at New York University, agreed that getting approvals for VAX or Alpha AXP purchases remains a hard sell because of Digital's directional uncertainties and continued higher pricing.

Management at the university "is more interested in generic Unix," and Digital's DEC OSF/1 operating system still is not fleshed out enough to compete with more established Unix vendors, Tihor said.

A Digital spokesman said the company's strategy is centered around client/server technology and Alpha, but he acknowledged that "it takes time for things to spread" throughout the organization. Edward Lucente, vice president of worldwide sales and marketing, is scheduled to expand on the client/server plans at the DECUS conference, the spokesman added.

Even users who think Digital has become more customer-focused and is making progress toward righting itself are critical of the company for not giving them a better idea of what technologies beyond Alpha hardware are central to its strategy.

"They're saying they're everything; well, nobody can be everything," said Mark Livings, manager of distributed computing services at Quaker Oats Co. in Chicago. If Microsoft Corp.'s "Windows NT is their direction, then we'd like to start preparing to move from VMS to NT." But thus far, Digital has not been willing to detail its plans to that level, he added.

Lynn Berg, a Gartner Group, Inc. analyst in Stamford, Conn., said Digital's framework-oriented software strategy is particularly unclear. It could take most of 1994 to get everyone at the company on the same page, she said. "The further away you get from corporate headquarters, the more confusing this is."

Digital can probably muddle along until then without losing too many customers, but it will be hard for the company to reach out beyond its installed base, which it must do to grow revenue again, Berg noted. "People who have been sort of not thinking about Digital are still not thinking about Digital," she said. "There's just not enough visibility."

Digital's LinkWorks to get key missing link. See story page 51.

News Shorts

Unix International to close

Unix International (UI) will announce today that it will shut down on Dec. 31, Chief Executive Officer Peter Cunningham said late last week. UI's five-year mission to evolve Unix System V standards and combat the competing **Open Software Foundation** changed when **Unix System Laboratories, Inc.** was sold to Novell, Inc. in July, Cunningham said. The March start-up of the Common Open Systems Environment consortium hastened UI's demise, he added. "A lot of the work UI did can be passed on to **X/Open Co.**," which has become the Unix standard bearer, he said. Some UI vendor members will form a UnixWare Technology Group to give vendor feedback to Novell.

Microsoft starts second Chicago alpha

Microsoft Corp. late last week shipped the first copies of its second alpha version of Windows 4.0, codenamed Chicago. The alpha has 32-bit networking connections — the first version had 16-bit implementations. It will be more widely distributed at a developer's conference in Anaheim, Calif., next week.

U.S. Weather Service downsizes system

Hoping to respond more rapidly to next spring's flood season, the **National Weather Service Office of Hydrology** is installing a client/server river forecasting system at its offices along the Mississippi River. The service is replacing a mainframe-based system with IBM RS/6000 and Hewlett-Packard Co. Series 750 workstations in Kansas City, Mo., and Minneapolis.

Novell announces NetWare Video 1.0

Novell, Inc. showed its NetWare Video 1.0 last week as expected [CW, Nov. 29]. The initial version, slated for January release, allows a NetWare server to deliver multimedia files across a LAN for replay by a Windows workstation running Microsoft's Video for Windows. The package is priced at $1,100 for a five-user version. The next phase of Novell's multimedia strategy is to release software that allows a NetWare server to broadcast real-time video presentations across a high-speed LAN to multiple desktop clients.

IBM PC Co. drops PS/2 server prices

IBM PC Co. last week cut prices of its PS/2 Server 85 and 95 models by as much as 19%. Pricing on a PS/2 Server 85 based on Intel Corp.'s 33-MHz 1486SX chip is now $4,000, down from $4,835, while a 25-MHz/50-MHz DX2-based Model 95 is now $5,335, down from $6,195. The PC Co. also said it would ship more PS/2 servers in the fourth quarter of 1993 than in all of 1992, ending its backlog for that family.

SHORT TAKES Supercomputer maker **Kendall Square Research Corp.** continues to struggle with an accounting problem it first revealed in October. Last week co-founder Henry Burhardt was stripped of the chief executive title, although he remains president, after the company said its loss for 1992 will be about $17.2 million, some $4.5 million more than previously expected.... **General Electric Co.**'s Industrial Power Systems Division has outsourced its PC procurement, configuration, support and service to **Entex Information Services, Inc.**.... **Intel Corp.** and **Microsoft** announced Version 1.1 of their Advanced Power Management Interface Specification. It is also supported by the Plug and Play BIOS specification.... **Nynex Corp.** is developing a broad array of networking services to be delivered over a broadband, fiber-optic network that it will build. Services will include video entertainment and information services and interconnections to specialized network service providers.

More news shorts, *page 16*

Work-flow upgrade

Education lender invests in imaging

By Ellis Booker

Sallie Mae, the nation's top holder of insured education loans, last week announced a five-year, $55 million multivendor contract award to develop and deploy an imaging and work-flow system to streamline loan processing.

But the project, which will commence early next year and be fully implemented in 1996, also includes major upgrades to Sallie Mae's desktop and network infrastructure and represents a major commitment by Sallie Mae to client/server computing, observers said.

Starting a revolution

"This technology will revolutionize our entire loan-servicing operation to the benefit of our borrowers, their schools and lenders and, ultimately, our shareholders," said Robert D. Freidhoff, executive vice president of servicing.

The Price Waterhouse office in Columbia, Md., will act as systems integrator on the project. Recognition International, Inc. will provide the imaging and work-flow software. The Dallas firm said the deal represents one of its largest corporate software licenses to date.

The imaging deployment calls for replacing some 3,000 IBM 3270-class dumb terminals with approximately 3,000 486-class 66-MHz PCs at seven regional centers. Each loan center will have a Fiber Distributed Data Interface Token Ring backbone network and an Ethernet LAN for local access to the images. Each servicing center will also have a high-speed document-capture system for inputting new documents and converting microfilm to digital images.

The centers will link back over a Sallie Mae private wide-area network (WAN) to a central electronic document repository at Sallie Mae's Corporate Asset Repository in Herndon, Va. This center, which will be backed by a redundant site in Pennsylvania, will use SPARCstation 2000s from Sun Microsystems, Inc. to store more than 54 million documents per year.

The seven regional loan processing centers are currently connected to mainframe resources in Herndon over T1 lines, but Sallie Mae is evaluating upgrading the WAN to frame-relay technology.

Donald J. Coleman, vice president of Sallie Mae's Servicing Division, said he expected a "three- to five-year payback," depending on the loan volume. Savings, he added, would also come from the ability to add volume without increasing capacity.

"We've been rated far above our competitors in service levels, and [imaging/work flow] will enable us to raise the bar," Coleman said.

Sallie Mae will rely on Price Waterhouse and its own in-house training to ease the migration from 3270 terminals to the high-powered workstations. "We're putting in walk-up workstations in the centers to get people used to dealing with a mouse and Windows ... and a tutorial to take the rep through the technology."

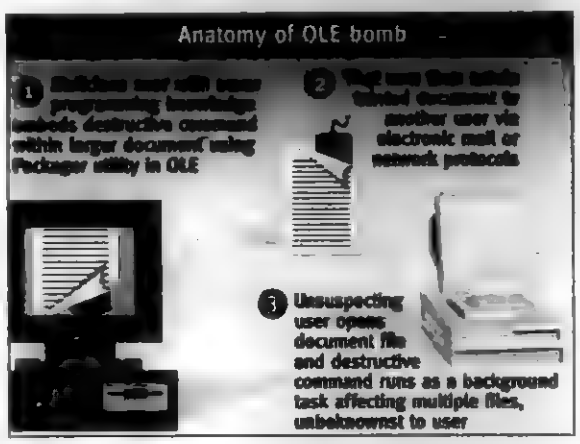
OLE

CONTINUED FROM PAGE 1

that a single individual can accomplish is staggering. And it may only take someone with a rudimentary knowledge of Windows to send by E-mail something that would decimate a PC population at a given site, according to Ralph Trickey, a consultant at Cap Gemini America, Inc. in Middletown, Ohio.

User beware

According to Trickey, the fundamental problem is that when an object is posted, the user invoking that object has no idea whether it contains a simple document or a document that has been embedded with a destructive command such as delete *.*.



And as users begin to adopt offerings such as Microsoft's Office 4.0, it will not be long before OLE is widely used and some of the more intrepid users become familiar with its intricacies.

In general, the additional security issues brought on by the adoption of object technology are endemic to any local operating system that does not include built-in security features. As such, Windows 3.11 and Windows 4.0 will be more susceptible to abuse than high-end offerings that include built-in security and journaling features such as Microsoft's Windows NT. However, administration of offerings such as NT typically require too much memory and technical knowledge to be deployed on a large-scale basis on end-user desktops.

While OS/2, Unix and Novell, Inc.'s NetWare offer higher levels of security than Windows 3.1, the security features in OS/2 are only marginally better than those in Windows because OS/2 includes a backup and restore facility, and many sites do not take advantage of the security features in Unix and NetWare, said Bob Bales, executive director at the National Computer Security Association in Carlisle, Pa.

To combat this threat within Windows, IS managers may want to disable some OLE features on user desktops, such as the Packager utility for embedding objects, said Mark Ryland, Microsoft senior programming manager. But at the same time, a determined individual could easily write an equivalent Packager utility, he said.

Security forthcoming

In the meantime, Ryland said, Microsoft is studying the issue and may write some utilities to address OLE security in the future. But again, he noted that just about any utility can be overcome on a local operating system that does not include built-in security.

Ryland noted that knowledgeable users can already accomplish many of the same security breaches using OLE 1.0, but as yet Microsoft has not seen OLE 1.0 abused.

However, OLE 1.0 has not yet been widely implemented by users. And Bales noted that OLE is not the only new technology open to abuse.

And many sites will be evaluating a wider range of technologies in 1994 that are also open to abuse, ranging from the OpenDoc specification from IBM, Apple Computer, Inc. and Novell to new multimedia and networking protocols.

Making A Purchase Based On Price Alone Can Lead To Serious Headaches Later

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Client/server

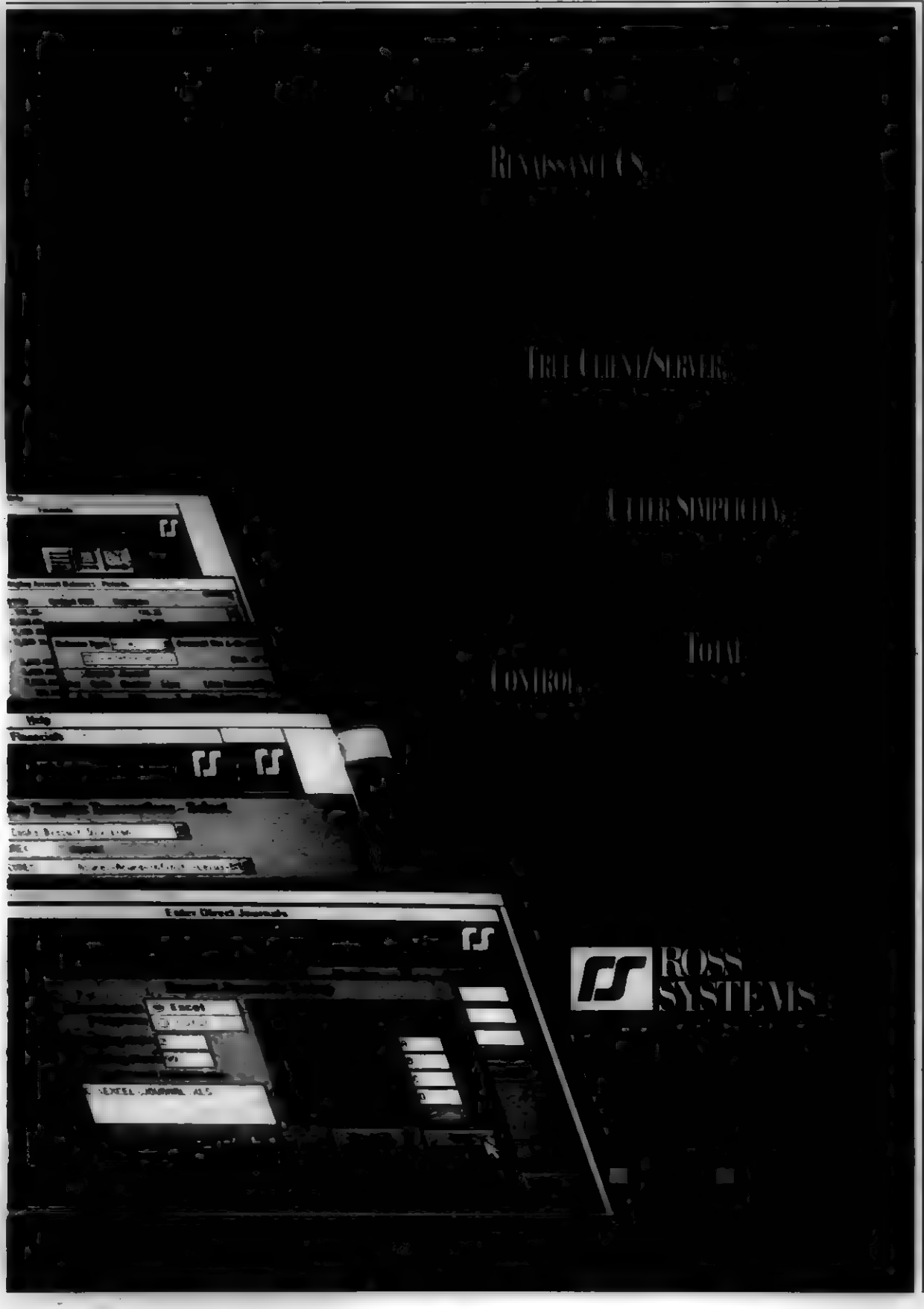
IBM division at a crawl during first year

By Johanna Ambrosio and Ed Scannell

IBM's dedicated client/server business marked its first anniversary Nov. 23, having made only limited progress signing up customers and relaying its message.

Part of the problem, observers said, is of IBM's own making: It had not — until very recently — articulated a coherent strategy in the client/server arena [CW, Nov. 29]. Another almost equal burden is one that virtually every vendor faces: trying to make sense of a confused market in which customers themselves do not always know what they want.

"Saying 'client/server' is like saying 'the planet Earth,'" said John Chapman, president of the IBM user group Share. Even in his company, he said, "There are different views of what client/server is and how it should be used."



IBM's Worldwide Client/Server Computing group is now meeting with large customers to find out what users' needs are, "and IBM is struggling as hard as the users are" to figure it out, he added.

The client/server group, announced with great fanfare a year ago [CW, Nov. 30, 1992] and reorganized in September, combines product development with marketing. It works with all of IBM's other businesses as well as with third-party vendors to develop new products and combine existing ones into client/server solutions.

The group also works with the IBM Consulting group and IBM's Integrated Systems Solutions Corp. to provide outsourcing, programming and other services.

Worldwide Client/Server Computing is making some progress, said Peter Tarrant, director of IBM client/server marketing. The group claims some 100 U.S. customers, including such name accounts as U.S. Air, Ford Motor Co., Prudential Securities, Inc. and Barnett Bank. However, according to Tarrant, IBM counts as a client/server customer any user to which it has sold hardware, software or services.

Still, he said, "We're not as well understood as I'd like us to be. There is definitely confusion" about IBM's client/server message. At least part of that is due to "image" problems, he said. "The outside world thinks of a mainframe company in the client/server world as an oxymoron, and so we have this baggage."

In addition to articulating a strategy — which IBM's announcement of its Open Distributed Computing System blueprint next year will help — it recently completed a 12-city road show on client/server.

Wayne Pattison, director of data center operations at Kansas City Southern Railway Co., attended the seminar in Kansas City, Mo. "I didn't learn a whole lot, but I did learn that IBM is headed toward client/server. I believe them, and I think they're like me: being dragged kicking and screaming."

Users who have looked to IBM for client/server help offered mixed reviews.

Blue Cross/Blue Shield of Minnesota in Eagen worked with IBM's client/server unit about a year ago to develop a PC-based system for tracking and paying pharmacy drug claims. The 300-workstation application, based on an Oracle Corp. database with IBM OS/2 servers and workstations, was designed and developed by IBM.

"They were extremely responsive," said Jack Yarbrough, chief operating officer at Pharmacy Gold, Inc., a Blue Cross/Blue Shield division. "At one point we had a printer problem, and they took printers off their own employees' desks and brought them out."

But another client/server customer who requested anonymity said that although his company bought its equipment from IBM, he opted for programming services from another vendor. "IBM just charges too much," he said.

"We were told it was impossible to develop a client/server application without extensive retraining. Then we talked to Micro Focus."

Larry Lowder, Systems Architect, Questar Service Corporation

Mountain Fuel Supply®, a division of Questar®, is a utility company supplying natural gas to 750,000 customers across Utah, Wyoming, Idaho and Colorado. The company's success is largely driven by its implicit belief that the customer is number one.

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When Larry Lowder, one of Questar's Systems Architects, set out to build the client/server architecture for Mountain Fuel Supply, he needed solutions, not skepticism. For the first project, a cashiering system, he needed to link workstations with OS/2® to the DB2® database on the host, running CICS.

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GSA Contract Number GS00K93AGS6403.

DCE integration: Anemic, but available

By Elisabeth Horwitt

■ The good news is that the major network operating system vendors are already beginning to provide software that allows their client systems to access resources on the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) servers. The bad news is that these early products provide only limited support for the OSF standard.

And while the quartet of IBM, Novell, Inc., Banyan Systems, Inc. and Microsoft Corp. are each promising more robust integration between their own global services and those of DCE, users will not be able to get their hands on these offerings any time soon, since time frames for commercial introductions are at least a year away or nonexistent.

If and when the vendors follow through with their plans for full DCE support, however, their products potentially would fulfill the corporate user's ideal of being able to access and administer a hodgepodge of Unix-, network operating system- and host-based resources through a single, coordinated directory system.

DCE comprises a set of security, naming, directory and authentication services that were designed to ensure reliable resource sharing and communications across heterogeneous distributed systems. Also included is the Remote Procedure Call (RPC), which defines how a query is sent from one system to another over a transport-independent network.

Extent unclear

The OSF standard has gained broad support in the Unix and mainframe communities; however, the major network operating system vendors have been maddeningly difficult to pin down about whether, and to what extent, they will adopt the protocol as a standard.

These vendors will certainly provide gateways between their own servers and DCE, as a way for their clients to gain access to Unix-based resources, said Bob Gill, a vice president at Gartner Group, Inc., a Stamford, Conn., research firm. Less clear is whether the vendors will actually integrate DCE fully into their own global services so that customers can essentially implement one set of services across their heterogeneous environments, Gill said.

The University of Michigan has officially chosen DCE as the basis for a "Future Computing Environment" that will provide the full set of services on the mainframe, including security, directory, authentication, mail and remote dial-in, across an extremely heterogeneous client/server environment, said Larry Gauthier, manager of the technology assessment group in the university's information technology division.

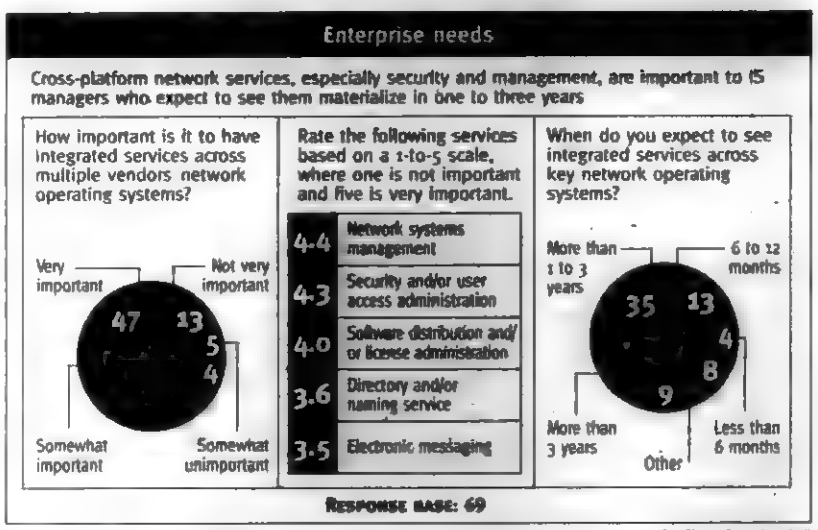
Similar solution

However, because DCE currently does not run across the full gamut of the university's client/server systems, it will probably do what others in similar circumstances are doing: create a "lower-case distributed computing environment" that mixes DCE standards with proprietary networking products, Gauthier said.

Other network administrators, particularly those outside the Unix world, had doubts about DCE's ultimate effectiveness as a standard. "DCE might provide more universal client access, but things are up in the air until the major players reach a truce" on how their systems can talk to each other, said Bruce Evans, network administrator at the National Immunization Program in Atlanta.

Currently, IBM is the only vendor to have publicly committed to implementing the full DCE architecture across its major platforms and to adopting DCE services as the glue for connecting its client/server systems globally. It has been rolling out DCE across OS/2 and AIX.

Banyan plans to implement DCE compliance in its StreetTalk directory, said Bill Johnson, vice president of corporate business development. The vendor plans next year to roll out that compliance in phases, including DCE's security system, X.500-compliant directory and RPC, he added.



Source: *Computerworld* Database Division

CW Chart: Dave Marshall

Share and share alike

IBM and Digital are perhaps the most notable large systems vendors looking to share their proprietary skins, partly through DCE support. Digital is in the process of rolling out the OSF standard across its OSF/1, Windows NT and OpenVMS hosts. IBM, meanwhile, has already made core DCE services available on AIX and OS/2 and plans early-availability versions of DCE on AS/400 and MVS hosts next year, IBM director Art Olbert said.

Meanwhile, Novell and IBM are working to implement software that will integrate DCE directory services with NetWare v3.11's bindery-based directory, a Novell spokesman said.

Novell and Microsoft are both working on gateways that will enable their client systems to log on to a DCE-based host and, conversely, to allow a DCE client to log on to a NetWare or Windows NT server, company spokesmen said.

However, gateway-based interoperability is a poor substitute for "true integration" between DCE and various vendors' proprietary service environments, Gauthier said.

Microsoft's Windows NT and Windows clients can already access DCE through a client version of the DCE RPC, said Erin Contorer, lead program manager of Windows NT Systems. Digital Equipment Corp. will ship a full DCE client for NT this spring, he said. Microsoft has no plans for a full Windows DCE client, mostly because DCE takes up too much RAM.

RPC-based access leaves too much low-level programming to users before their clients can get at DCE services, Johnson said. Banyan hopes to provide a subset of DCE application programming interfaces to enable popular desktop environments to fully access DCE-based services, he added.

Novell directories

CONTINUED FROM PAGE 1

tected its network services around the StreetTalk global directory from the word go. Novell is stuck trying to tie NDS to "a millstone of an installed base of old [applications and services] that are not directory-aware," Strom said.

However, Novell will still be ahead of archrival Microsoft Corp., which plans to provide an object-oriented global directory service on Windows NT Advanced Server with Cairo in 1995.

Announced last March with NetWare 4.0, NDS laid the foundation for a single directory service that would allow client applications and users to transparently access resources across the enterprise on NetWare servers — eventually reaching UnixWare servers as well.

We want to "administer NetWare 3.11 and 4.01 servers from one workstation, using NDS, instead of having to go to each 3.11 server manually to change or delete users," said Sheryl Grossman, senior technical analyst at Transamerica Financial Services in Los Angeles.

Novell will deliver those capabilities around the time of its Brainshare developer's conference in March with the announcement of NetSync and NetWare Administrator, said Richard King, executive vice president and general manager of NetWare Systems Group.

NetSync allows the user to view and manage 3.X servers from "one vantage point" via a NetWare 4.X server, he added. The software will work in concert with NetWare Administrator, which allows the administrator to make changes to an existing 4.X directory.

Several users said the above introductions are exactly what they were waiting for. The integration of NDS with 3.11 bindery directories "sounds super," and the ability to move branches of the global directory around "would also be helpful to us," said Chuck Rush, a systems project manager at McDonald's Corp.

Staying single

The other big area where NDS has yet to fulfill its promise is in providing a single global directory across major NetWare Loadable Module-based enterprise services, such as Novell's Global Message Handling Service (MHS) and third-party SQL database servers, said Lorie Mouklas, project leader at Hoechst Celanese Corp. Until that happens, in addition to NDS, companies must maintain "four or five directories that don't work together," each controlling user access to a different type of service.

NDS will eventually provide resource naming and user authentication across the full range of NetWare-based services, including E-mail, fax, database and host gateways, King said. Instead of keying in a password or identification first on NDS and then again for the individual service, the user will be able to say, " 'Show me fax servers,' and he only sees the ones he can access," King said.

For this to happen, however, third-party NetWare service providers need to write to an application programming interface that hooks their software to a public key and naming service within NDS, King said.

On the E-mail front, Novell plans to introduce this spring a version of Global MHS "architected for NDS." Changes made on the MHS directory will automatically propagate to the NDS directory, King said. An auxiliary directory will be used to tie into legacy MHS systems whose directories are based on the NetWare 3.11 bindery. As a result, users can go through NDS to gain access to any MHS-compatible E-mail service, King said. Banyan's StreetTalk is a consistent directory for E-mail and other services.

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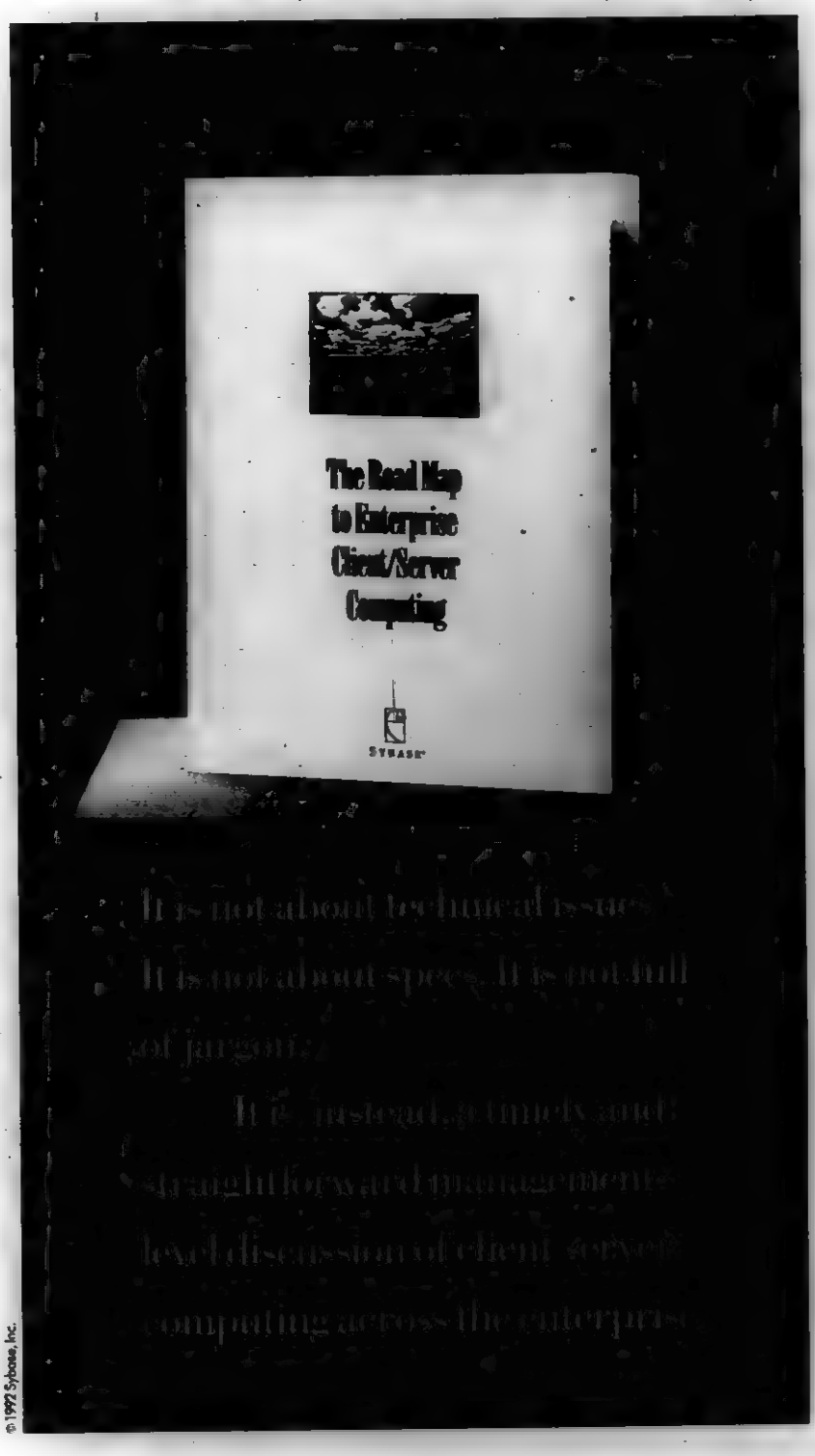

call 1-800-8-SYBASE.

Amex extends parallel plan

CONTINUED FROM PAGE 1

data processing price/performance while providing a level of performance unachievable by conventional computer systems," the $27 billion financial services company said in an internal report obtained by *Computerworld*. "The scope of the technology is broad: It can be applied to all American Express businesses."

Mystery machine faster

Amex recently benchmarked six applications on six platforms representing four basic approaches to parallel processing (see chart). One application creates a file of preapproved potential credit-card members from credit bureau tapes and other sources.

The Prospect Credit system ran 100 times faster on an unidentified massively parallel computer than on a single IBM ES/9000 processor, the company report stated. That benchmark led to a pilot project that will result in a production system early next year. Company officials declined to provide specifics.

However, despite the bullish assessment and plans to roll out some parallel processing applications next year, the technology will not eliminate the glass house any time soon.

"The plans we have are not 'full speed ahead,'" said Bob Mercurio, director of advanced technology at American Express Travel Related Services Technologies. "There are issues with systems management, software development, reliability, security and integration with existing environments."

Advanced languages and development tools are also lacking in the parallel arena, Mercurio said. And of reliability, he said, "Ninety-percent uptime doesn't cut it in the commercial world."

Vendors of these systems tout their favorable price/performance ratios, but Mercurio said he would gladly pay higher prices for added uptime.

Amex is not alone in this assessment (see chart). "Definitely, there's a wariness about using this [technology] for mission- or business-critical functions," said David Frankel, director of technology at Gary Smaby, Inc., a research consultancy in Minneapolis. "The management software is still relatively immature if you're running a 7-by-24 operation."

Training the right people

Developing expertise is a tough issue as well. "I'm still trying to find people," Mercurio said. "I ask [parallel processing systems vendors] where they find people, and nobody has given me a good answer yet."

Despite these obstacles, the company said parallel processing — based on so-called "massively parallel" systems or clusters of more conventional computers — will enable Amex to mine competitive gold from terabytes of data in ways not economically feasible with traditional mainframes.

For example, the ability to quickly process huge amounts of credit-card data would enable Amex to target products and services to card holders in near-real time.

"We can mail restaurant or service coupons as soon as travel reservations are made," the company said in its report. "And we can identify products and services available in one region that are hard to find in another."

Amex added that because it has both the consumer and provider side of each transaction, it can "offer card members products and services based on their spending patterns, and we can offer service establishments profiles of their customer base.

"The information needed to create . . . business opportunities lies buried in our databases," the report continued. "Right now, even nightly batch processing is beyond our hardware capacity. But parallel processing will open up many marketing opportunities that are currently unthinkable."

Sifting through massive amounts of data is conceptually possible with mainframes, but it is so demanding that multiple mainframes would be needed. Thus, mainframes are not economically viable for such tasks, analysts said.

Conversely, the scalability of massively parallel processor (MPP) architectures makes them attractive for database mining, Frankel said. "You may start with a small MPP, and if the database grows, the system can grow with it."

On the edge

Amex has already deployed parallel processing in at least two areas (see story bottom left).

"American Express is very much a leading-edge user of technology," said Howard Richmond, director of high-performance computing at Gartner Group, Inc. in Stamford, Conn. "They are very visionary in their grasp of technology."

But Amex is not resting on this reputation. In fact, the company worries that competitors may have an edge in parallel processing.

For example, Citicorp uses nine parallel processing systems from Teradata Corp. to merge data about checking and savings accounts, credit cards and mortgages to provide a complete financial picture of each customer.

Borrowing experience

Amex also cited bank-holding companies and more recent competitors for the credit-card market, such as AT&T, GTE Corp. and automobile companies, which are already strong in parallel computing.

For example, AT&T owns Bell Laboratories and NCR Corp., which owns Teradata. General Motors Corp. owns Electronic Data Systems Corp. and has years of experience in the use of parallel systems.

The Amex report pointed out that Banc One Corp., a leading bank-holding company, has embarked on a $100 million re-engineering effort that will lead to the capture of 12,000 pieces of information on each customer. "As we consider the possibilities, our competitors are acting on them," Amex concluded.

Chicago bureau chief Ellis Booker also contributed to this report.

Parallel efforts

Parallel processing systems benchmarked by American Express

Vendor	System	Type
Hewlett-Packard Co.	890	SMP
	890	FDDI workstation cluster
Kendall Square Research Corp.	KSR-1	Shared memory, MPP
Maspar Computer Corp.	MP-1 & 2	Distributed memory, MPP
NCR Corp.	3558	SMP
Sequent Computer Systems, Inc.	750	SMP
Thinking Machines Corp.	CM-5	Distributed memory, MPP

Applications tested included mortgage arbitrage, credit-card spending, monthly reporting on spending and preapproval of credit-card prospects.

Source: American Express Travel Related Services Co.

By leaps . . .

Today, the market for massively parallel computers is 95% scientific and 5% commercial. By 1997, the commercial sector will account for 70% of MPP sales. Meanwhile, the MPP market will have grown from $500 million to $5 billion, according to Gartner Group.

. . . and bounds

Parallel processing technology will double in capability every 12 months for the rest of the decade, yielding a 250-fold performance improvement, according to the Advanced Technology Group at American Express Travel Related Services Co.

Putting MPP into action

American Express has done more than write research reports about the feasibility of massively parallel processing (MPP) to support its essential business operations. The company has already deployed at least two MPP applications.

The first was with Amex subsidiary Lehman Brothers, Inc., which invested $2 million in a mortgage arbitrage application running on an MPP platform. It has generated $15 million annually in revenue, according to Amex.

A larger and more ambitous application, called Quantum, is now being tested by American Express Travel Related Services Co. It is scheduled to go into production in the first quarter of next year.

Quantum will be applied against Travel Related Services' huge marketing database, compressing a week-long batch process to a day. Specifically, it will handle a 300G-byte database that receives thousands of queries per week, according to John Peterson, vice president of marketing information technology.

"We knew what we had didn't work, but we didn't know what would work or if the problem was solvable," noted Peterson, who said parallel computing "was generally seen as an obvious solution."

The application — five years in the making — was developed by Amex subsidiary Epsilon Data Management, Inc. in Burlington, Mass. Epsilon used a 64-processor CM-5 computer from Thinking Machines Corp. in Cambridge, Mass., to act as a number-crunching client to an IBM MVS mainframe acting as a data server via an UltraNetwork Technologies, Inc. 100M byte/sec. link.

A 128-processor CM-5 is now being tested at Travel Related Services' global computer processing facility in Phoenix. The application now runs a custom database. Peterson said the kind of database is a secondary concern at the moment. "Getting it to run at all is what's really important now," he said.

—Ellis Booker and Gary H. Anthes

Parallel pros and cons

Do you perceive the following benefits and drawbacks in your use of parallel processing?

(Percentage of 49 respondents)

	Benefits
86%	Better price/performance
81%	Better service to internal users
65%	Ability to run applications
62%	Competitive advantage
36%	Better customer service

	Drawbacks
52%	Immaturity of tools, utilities, databases
52%	Difficulty of software development
43%	Difficulty of migrating legacy applications
42%	Training
32%	Concerns about vendor staying power
25%	Reliability

Source: *Computerworld* Database Division

In the beginning, Genesis promised much

Years later, project finally yields benefits at Amex

By James Connolly
ATLANTA

Call it a strategic application or a "big-bang" project, American Express Co.'s Genesis Project was intended as a total replacement of the company's core information systems when it was initiated in 1987 under a cloak of corporate secrecy.

Today, after years of work and questions about the project's merits, a greatly scaled-down Genesis is yielding benefits for American Express' Travel Related Services Co.

Last week, Albert B. Crawford Jr., executive vice president of strategic business systems, outlined some of those benefits at the Retooling '93 conference.

Amex assets

Crawford said examples of the reusable assets already developed under Genesis — which American Express plans to complete by the end of 1994 at a revised cost of $120 million — include an enterprise data model, a re-engineering test facility and a user training database.

He said new applications now allow Travel Related Services to accomplish tasks overnight, such as a repricing project in France. In the past, that would have taken months.

However, Genesis did hit potholes along the way. American Express originally froze its legacy systems while planning to rewrite all applications using Texas Instruments, Inc.'s Information Engineering Facility (IEF) computer-aided software engineering tools.

That resulted in the "waste" of 18 months' work because American Express failed to define an information architecture before beginning system design and, in part, because IEF was too "immature" for Genesis' needs, Crawford said.

Another key element, IBM's DB2 database management system, "broke" under the weight of Genesis' design, Crawford noted.

He said some elements of Genesis just failed to pass cost-efficiency tests, citing the example of a client/server-based card member support application originally budgeted at $70 million.

Computer clusters may be answer

American Express last week declined to give details of the parallel processor benchmark results but said no one architecture is right for all applications (see story at left).

However, American Express programmer/analyst Ian Simpson said he was bullish on the promise of clusters of workstations and/or symmetrical multiprocessors.

"Given pending developments in high-speed communications, the gap between clustered systems and custom-built, massively parallel systems will narrow dramatically," he said.

Simpson said computer clusters may emerge as the parallel solution of choice for all but the most demanding applications. He said the approach is attractive to those familiar with networking and client/server technology, standards are further along, and much more software exists than for the massively parallel options.

"An interesting concept developing now is not massively parallel processors per se, but workstation farms," said Omri Serlin, editor of "The Serlin Report on Parallel Processing" in Los Altos, Calif.

"It is possible that rather than have these clever massively parallel architectures, a much simpler approach may emerge for high-performance computing."

— Gary H. Anthes

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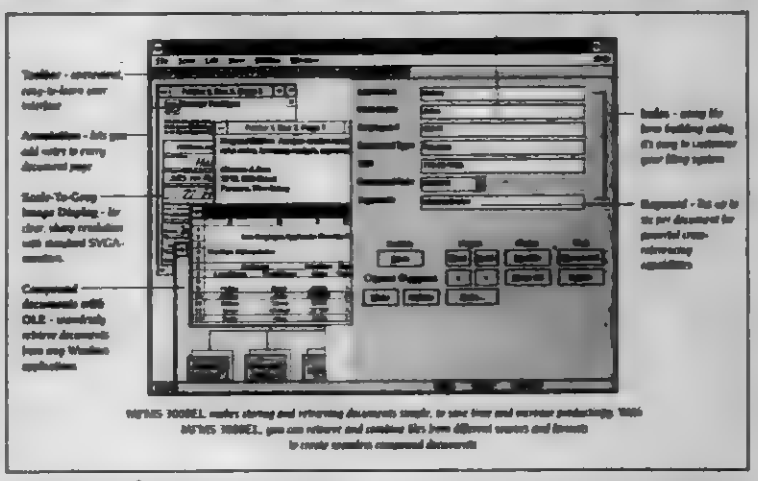

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News Shorts

Cable show offers multimedia previews

The Western Cable Show in Anaheim, Calif., last week was the place to be to catch a ride on the information superhighway (see story at right). **Zenith Electronics Corp., General Instruments Corp.** and **Intel Corp.** showed modems they claimed will enable PCs to access cable lines to retrieve data up to 1,000 times faster than is possible via telephone lines. **Comcast Corp., Continental Cablevision, Inc., Cox Cable Communications, Tele-Communications, Inc.** and **Time Warner Entertainment**, meanwhile, said they will team up to provide telecommunications services using digital video, fiber-optic and wireless technologies.

Bachman plots turnaround

Bachman Information Systems, Inc. President and Chief Executive Officer Peter Boni said last week the firm has a series of client/server products slated for 1994. These include a new version of application development tools for Windows and OS/2 from Bachman acquisition **Cooperative Solutions, Inc.** In addition to Bachman's traditional modeling tools, the company will target the database design and re-engineering, performance analysis and professional services arenas with new client/server Windows products.

NCR exec resigns after harassment suit

John R. Poole, a senior vice president in charge of **NCR Corp.**'s computer business in the Americas, has stepped down from his position at the company amid sexual harassment charges filed by a former female employee. J. Meg Olsen, a 13-year veteran of NCR's sales force, filed a lawsuit against Poole and three other male supervisors, charging them with "blatant sexual harassment and discrimination." Poole, a 33-year NCR veteran, claimed the charges are "unfounded."

Macintosh development from Uniface

Uniface Corp. will unveil this week an industrial-strength application development environment for the Macintosh that is portable across platforms, including DOS- and Windows-based PCs. The Uniface Macintosh development environment will be available in the first quarter, with a single Macintosh development license selling for $4,400.

Better taxing through technology

The **Internal Revenue Service** announced a reorganization enabled in part by its $7 billion tax systems modernization program. The IRS said 16,000 employees freed up by new systems — and by accompanying business process re-engineering — will be assigned to jobs that improve public service and increase tax compliance from 82% to 90% by 2001. Each 1% brings in $7 billion more in tax revenue, the IRS said.

Ask not for whom the toll bells

The Illinois Tollway, the most heavily traveled toll road in the U.S., last week became the first to use an electronic collection system. The I-Pass system is deployed at nine of 17 sites on a highway near Chicago. A commuter can mount a transponder in his car that communicates with an antenna in the toll lane. Fares are deducted from a prepaid account. The system was designed by **AT/Comm, Inc.** in Marblehead, Mass.

SHORT TAKES The **U.S. Department of Justice** has given its approval for a merger between **Intuit, Inc.** and **Chipsoft, Inc.** . . . **The ASK Group, Inc., NCR Corp.** and **Radius Retail Ltd.** plan to build a set of retail management and analysis applications based on ASK's Ingres database and Windows fourth-generation language application development tool kit.

Interactive multimedia

Businesses test-drive info highway

By Stephen P. Klett Jr.

A new pay-per-view option may be on its way to a cable service near you, and no, it is not "The Best of Beavis and Butthead" or the latest Madonna concert. It is an interactive multimedia network that beta users expect will vastly improve their business processes.

The network, unveiled last week at the Western Cable Show in Anaheim, Calif., is based on bridging technology from Digital Equipment Corp. and LANcity Corp. [CW, May 17]. Arizona State University and Times Mirror Cable TV also contributed to its development (see chart).

In its initial implementation, the network is aimed at connecting large manufacturing companies to their suppliers and subcontractors. McDonnell Douglas Helicopter Co., Modern Industries, Inc. and Tempe Precision Aircraft began beta-testing the network this month in Phoenix.

"If it performs like they say it will, I think businesses will be standing in line to get into it," said Ron Boes, vice president of operations at Tempe Precision in Tempe, Ariz., a McDonnell Douglas parts supplier.

Called ECnet, for Electronic Commerce Network, the network allows cable operators to use their existing fiber cabling to provide Ethernet-based multimedia networks for metropolitan areas.

Able to support digital video data transmission at Ethernet's full 10M bit/sec. transmission speeds, the cable TV infrastructure will enable users to videoconference with one another while sharing applications and database resources. Digital said its Ethernet-to-cable bridge supports communications distances of up to 70 miles over standard cable TV wiring.

ECnet will enable engineers at McDonnell Douglas to interact on-line with engineers at Tempe Precision during the development of the company's first commercial helicopter.

Cable connection

Each member of the ECnet consortium supplies a vital piece of the network

Organization	Contribution
Times Mirror Cable TV	7,000-mile fiber/coaxial cable network in Phoenix
Digital	Bridge to connect Ethernet with cable infrastructure; network consulting and management services
Arizona State University	GUI to resources connected to cable network; development of future manufacturing applications

Solves problems in minutes

Boes said the ability for engineers at different sites to simultaneously access and manipulate the same three-dimensional drawing will solve design problems in a matter of minutes rather than days. This could cut a new part's development cycle from eight months to six weeks, he said.

"We've been trying to develop these interactive video capabilities on our own for some time and haven't been able to do it, so this consortium is a very welcome sight," said John Harper, research and engineering specialist at McDonnell Douglas.

Boes estimated it will cost Tempe Precision $20,000 in hardware to connect its team of three engineers to ECnet, followed by a monthly user fee of roughly $250, which he expects will drop over time.

Both Harper and Boes said that while using a cable supplier to support the mission-critical needs of their businesses raises some reliability concerns, they believe cable technology is mature enough to depend on. The bigger issues of affordability, security and cultural acceptance remain to be resolved, they said.

"We see this as the first step toward developing a national data highway for manufacturing or anyone involved in intensive imaging applications," said Jay Campbell, a consultant for Digital.

Chip

CONTINUED FROM PAGE 1

multimedia solutions at IBM's Large Systems group, noted that business applications are going to be the dark horse of interactive TV.

"Home-oriented entertainment is just a vehicle for developing the infrastructure," she said, adding that information systems management will help define the role of multimedia in corporate America.

When deployed in under-$3,000 desktop systems such as the ones IBM's Power Personal Systems division expects to deliver next year, the one-two punch of the PowerPC and Malibu chips could rival the performance of a $50,000 to $75,000 Silicon Graphics, Inc. workstation, said a source familiar with the chip's design.

As such, systems using the PowerPC/Malibu tandem would put that much more price/performance pressure on Intel Corp. and its Pentium-based multimedia strategies in both the home and business markets, analysts said.

Kaleida President Michael Braun downplayed those implications, saying Malibu is tightly focused on powering the TV-top boxes that provide a variety of interactive home programming and entertainment.

Designed to complement

Braun said Malibu, which Kaleida designed, is meant to complement the embedded PowerPC that will be in the set-top box.

"We didn't want to duplicate the processing power of the PowerPC," Braun said. "Instead, we designed a graphics accelerator chip that would make our applications scream."

But that may be shortchanging the chip, which insiders said would be a natural for providing added juice for power-hungry graphics applications on PCs and workstations.

The Malibu chip is part of Kaleida's Project Skywalker, a TV-top device designed to be a key component of interactive TV. Applications crafted using ScriptX, Kaleida's multimedia development language, can be run in the set-top box, according to Braun. He said the device will make its way into homes by the end of next year or early 1995.

Internally, Kaleida has been torn over whether to focus on the consumer or business markets, sources said. If Kaleida initially leans toward the business end, the company risks watching Japanese companies beat it to the punch in the consumer market.

"If you want to do all this multimedia, super data highway stuff, and you do not cover the home market well, you are going to get shut out of selling some pretty exciting technology," said a source close to Kaleida.

"All the money is in the consumer markets now. But [the technology] has significant implications for business markets."

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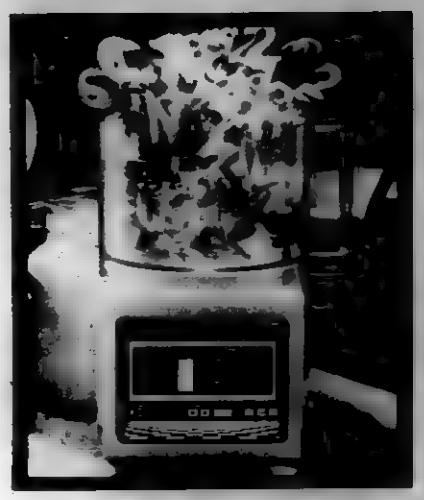

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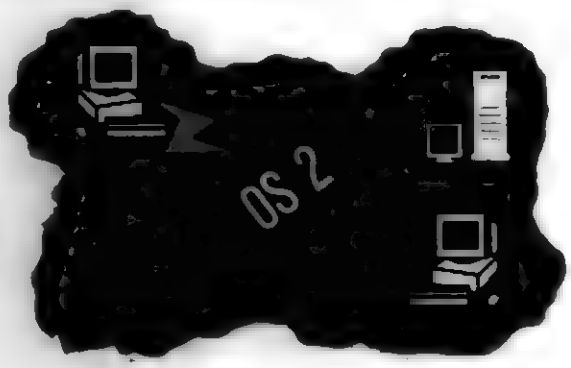

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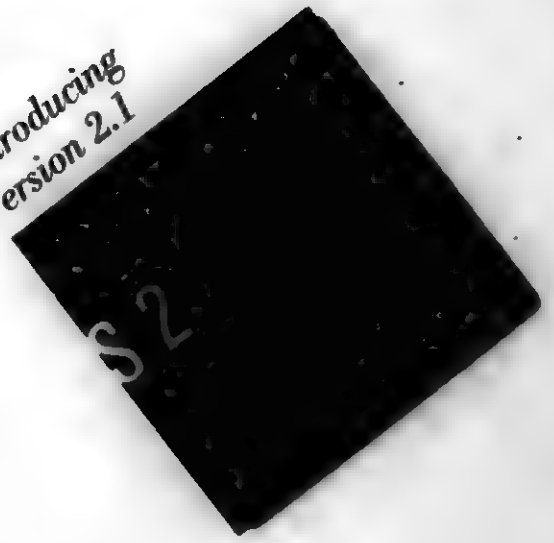

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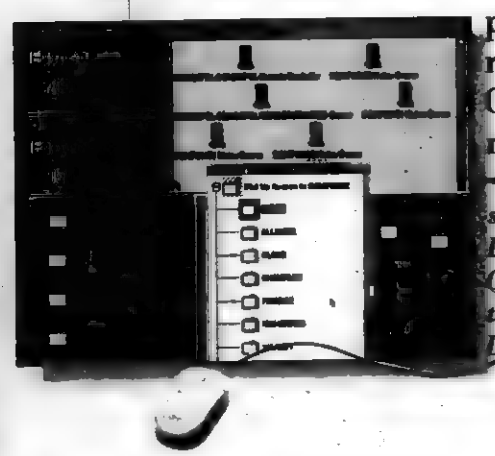

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Lotus' SmartSuite gains momentum

By Michael Vizard

Microsoft Corp. may have a two-year head start in PC application suites, but Lotus Development Corp. appears to be making up for some lost ground.

Lotus' SmartSuite accounted for 34% of $240.1 million in total sales in the third quarter ended Sept. 30. In that same period a year ago, SmartSuite accounted for less than 10% of $207 million in total sales. In contrast, Microsoft claimed that suite sales account for more than 50% of the PC software units it sells.

Lotus had been unable to effectively compete in the suite space until a substantially improved version of 1-2-3 for Windows became available last summer. Since then, however, the suite market has become one of the fastest-growing segments of Lotus' product line and a key battleground with Microsoft.

"Suites are one of the most important trends in the PC application market, and SmartSuite 2.0 is a very solid offering," said Chuck Stegman, an industry analyst at Dataquest, Inc. "Both Lotus and Microsoft have done very good jobs educating people about the benefits of suites, and it's paying off for both."

In fact, Stegman noted that Microsoft has been able to keep its suite momentum moving although it has yet to ship all of the components for Microsoft Office 4.0, which was announced last fall. Microsoft has delivered Word 6.0, but Excel 5.0 and PowerPoint 4.0 are not scheduled to ship until this month (see story below).

Instead, purchasers of Office 4.0 are receiving coupons for free upgrades to the next versions of Excel and PowerPoint. "This hasn't seemed to affect Microsoft sales of Office," Stegman said.

Meanwhile, Lotus successfully pitched SmartSuite to McKesson Corp. in San Francisco and the SSM Health Care System in St. Louis.

Out of a potential base of 2,000 users at McKesson, more than 550 SmartSuite packages have been deployed since April 1, said Bill Vanderlind, senior microcomputer and network specialist there.

McKesson chose SmartSuite over three other options — including Office — because SmartSuite is cheaper and its applications share a common look and feel and run on multiple platforms.

Vanderlind said McKesson also looked at a best-of-breed recommendation made by a consulting firm and considered replacing the word processor component of a suite with WordPerfect Corp.'s namesake program.

But in the end, Vanderlind said, the integration between the 1-2-3 spreadsheet, Ami Pro word processor, Freelance Graphics presentation graphics software, CC:Mail and Organizer personal information manager made the full SmartSuite package more attractive.

Meanwhile, SSM Health Care, which manages 17 hospitals, clinics and nursing homes, is beginning to overhaul its office automation applications. The company expects to support as many as 3,000 users with SmartSuite packages in the next two to three years, application specialist Kelly Hible said.

Excel 5.0 delayed

The delivery schedule for Excel 5.0 has begun to slide. Microsoft plans to ship the spreadsheet, originally slated to ship last month, before year's end, a spokeswoman said.

Microsoft attributed the minor delay to additional testing. Beta users said providing support for two macro languages in Excel 5.0, which now supports Visual Basic as a macro language, requires Microsoft to go through an expanded testing procedure.

"You have to test Visual Basic side by side with the older XLM macro language to ensure that everything is backward-compatible. It's a monumental project," said Don Baarns, president of Baarns Consulting Group in Sylmar, Calif.

—Michael Vizard

WordPerfect Office next to go wireless

By Lynda Radosevich

WordPerfect Corp. will be the latest vendor to offer wireless messaging when it announces a partnership this week with Intel Corp. and RAM Mobile Data to wirelessly enable its WordPerfect Office software.

The partnership mirrors a similar arrangement that Lotus Development Corp. and Microsoft Corp. have with Intel and RAM Mobile Data whereby Intel sells a wireless modem that includes drivers to run electronic mail over the RAM Mobile Data network.

While not the first wireless E-mail offering, Office includes wireless calendaring and scheduling and task management capabilities that Lotus and Microsoft do not offer, according to a WordPerfect spokesman.

Also, Office is different from Lotus' CC:Mail in that users have only one mailbox, even if they use different computers while working at the office or on the road.

"Before, you had to have two log-ins if you used [an Apple Computer, Inc.] PowerBook and a DOS computer. Now it doesn't matter where you are or what you are on, you only have one mailbox," said Julie Watson, manager of office automation at Iomega, Inc., a wireless Office beta site in Roy, Utah. When users read their messages while on the road, the messages are marked "read" when they return to the office, she explained.

Wireless capabilities for Office Remote for DOS are now available. A Windows remote product for dial-in and wireless connections will ship by year's end, and a Macintosh version will ship in the first quarter of next year, according to WordPerfect. A five-user client pack lists for $495.

Limited offer

RAM Mobile Data said it will offer four months of unlimited messaging for $75 to people who purchase the Intel wireless modem to work with wireless WordPerfect Office. RAM Mobile Data's regular charge is $135 per month.

For Read Gilgan, a director of learning support services at the University of Wisconsin in Madison, the Macintosh version means that PowerBook users can dial in directly for their messages rather than manually work through a "Mickey Mouse" arrangement of computing systems, he said.

CDPD plans

Additionally, WordPerfect is talking with wireless Cellular Digital Packet Data (CDPD) providers, such as McCaw Cellular Communications, Inc., but would not provide availability dates. Watson said she is beta-testing Office's CDPD services to supplement RAM Mobile Data's wireless coverage.

Last month, Lotus endorsed McCaw's CDPD technology — which operates over the existing cellular telephone channels — but also has not provided delivery dates for wireless CC:Mail and Notes.

Microsoft has not made any CDPD announcements, but McCaw demonstrated Microsoft Mail operating over a CDPD network at Comdex/Fall '93 last month.

Iomega users will most likely want both types of wireless capabilities because the salespeople already have preferences, Watson said.

Separately, WordPerfect said by the second quarter of next year, small company and remote office users will be able to use a WordPerfect hub installed at MCI Communications Corp.

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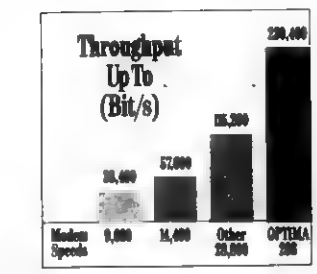

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Gun law mandates criminal database in 5 years

By Mitch Betts
WASHINGTON

When President Clinton signed the Brady Handgun Violence Protection Act last week, he set the clock ticking on a five-year deadline to build a national information system for conducting background checks of would-be gun buyers.

The biggest expected hurdle for building this criminal database is finding enough money for cash-strapped states to automate paper criminal records. The Brady bill authorizes $200 million a year in grants to help states do that, but it remains to be seen whether Congress will appropriate those funds.

Can the 50 states make the deadline?

"Five years will get us most of the way there, if Congress appropriates the money," said Gary R. Cooper, executive director at Search, Inc., a Sacramento, Calif., group of state information systems managers in charge of criminal records.

The new law requires a five-day waiting period for the purchase of handguns, but that provision will expire in five years and will be replaced by an "instant check" system. Gun dealers must use the system to see if a customer is disqualified because of a felony conviction.

Dealers who fail to use the federal system can be fined up to $5,000 and lose their gun-selling license.

The national system is likely to resemble Virginia's system, in which merchants telephone the state police agency, which in turn checks state and interstate computer records while the buyer waits at the counter for a decision. Virginia is experimenting with placing dumb terminals at high-volume gun stores for direct access to the system.

The U.S. Department of Justice will choose the IS architecture of the interstate database within six months. The Search consortium and an influential legislator, U.S. Rep. Charles E. Schumer (D-N.Y.), said the system should piggyback on an existing but unfinished federal database called the Interstate Identification Index, which is a master index of the criminal names stored in state databases.

No sale
Since 1989, background check systems in California, Florida, Virginia and Maryland have blocked more than 47,000 attempted firearm purchases, according to a survey by *The Washington Post.*

That master index, run by the Federal Bureau of Investigation, can be turned into the Brady system by "flagging" the names of convicted felons. But the index is incomplete because many states are unable to feed it data.

Time to automate

Search's latest survey found that only 25 states participate in the interstate index and only 15 states have fully automated their criminal files and name index. Four states — Maine, New Mexico, Vermont and West Virginia — have no automated criminal history files.

Moreover, states will have to get thousands of courts to transmit information on the disposition of their cases, as well as standardize data elements and formats. "The Brady bill assumes a greater degree of [data] compatibility and communication than really exists," said Raymond Foucault, president of OCS Technologies, Inc., a Pleasanton, Calif., software vendor specializing in criminal justice systems.

On the other hand, 16 states already have some system for presale background checks of gun buyers, so they are not far from complying with the new law. Existing state programs are not preempted if they are at least as strong as the federal law.

The statute also requires the Justice Department to write regulations governing the privacy and security of the national information system.

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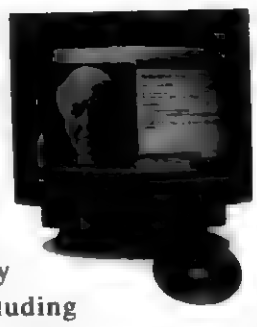

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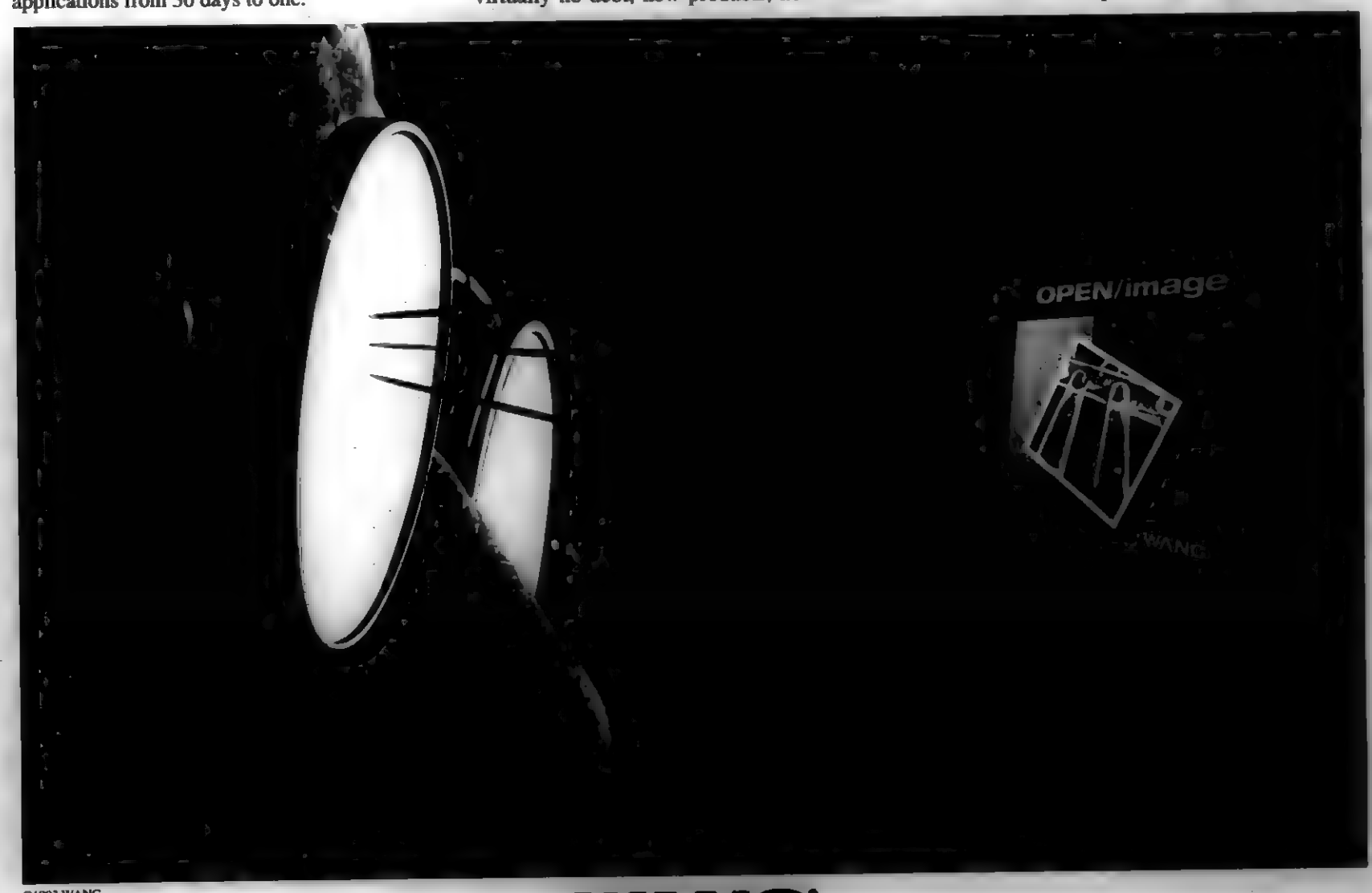

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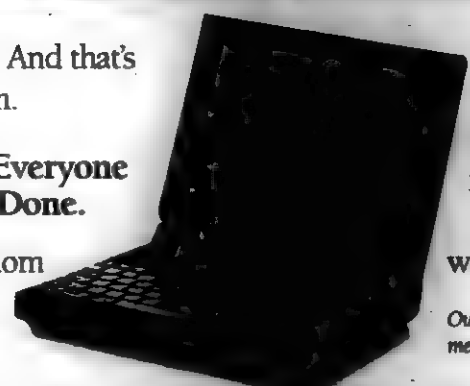

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Users upbeat on RISC-based Mac

New Windows-capable Quadra sets the stage until PowerPC debuts

By James Daly

When Apple Computer, Inc. starts shipping Macintosh PCs running the speedy PowerPC chip early next year, it may find an unusual source of enthusiasm — Windows users.

Apple set the bait last month when it introduced the Quadra 610 DOS Compatible, which runs Macintosh, DOS and Windows applications by means of an unusual pairing: a Motorola, Inc. 68040 chip and an Intel Corp. I486SX chip on separate cards.

The Windows applications will still tap into the 486 chip, and Apple is somewhat hazy about whether Windows applications will have to be tweaked to run on the RISC chip. However, Apple claims that since the basic operating system and any Macintosh applications will be run on RISC, the advantage accrued by the Windows user is more CPU cycles for the Windows applications — particularly during number-crunching tasks and with graphics applications.

Welcome aboard

When PowerPC upgrade boards become available next year, users will have a RISC machine that can run Windows, according to Apple. Until then, the box may especially appeal to users looking for a bilingual machine.

The 68040 serves as the springboard to the RISC-based PowerPC, with Apple and third-party developers expected to provide upgrade boards shortly after the PowerPC Macintoshes ship this spring. Pop in the new board and — voila — the Quadra 610 is a RISC machine that can run Windows. A RISC-based Sun Microsystems, Inc. SPARCstation can run Windows, but it is reportedly very slow.

Windows users say the added computational muscle of a RISC chip may be just the thing they need to carve through the power-hungry Windows environment.

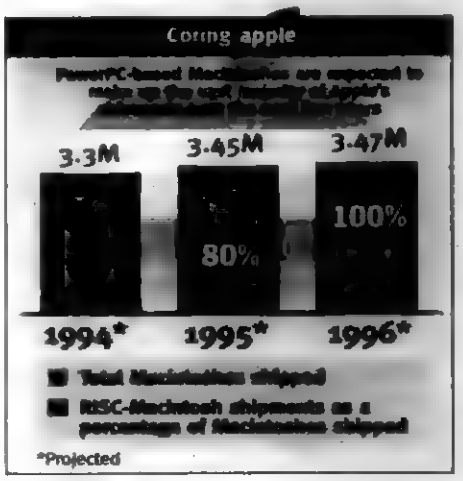
Windows bashing

"You can never be too rich, too thin or have too many CPU cycles," said Greg Feeler, who runs a network of Windows, DOS and Unix machines as an information systems manager at Employers Resource, Inc., an employee management firm in Boise, Idaho. "Windows is a dog. It's fundamentally very pathetic. Very slow."

If the Quadra 610 DOS Compatible "does everything they say it can do, I'd love to get my hands on it," said William Gibson, who runs a network of IBM PC clones as national support engineer at General Electric Medical Systems in Milwaukee. "I'm not a Mac fan, and I don't want to buy a Mac because everything I've got is DOS and Windows. But a RISC chip is a very potent lure."

But not everyone sees a benefit in a RISC-based Macintosh for Windows. "If they did it two years ago, we would have been interested," said Charlie Russell, system administrator at New United Motors Manufacturing, Inc. in Fremont, Calif. "But right now there's nothing that I can do on a Mac that I can't do on a PC. Wabi is a more likely alternative. I think you'll see a lot more Windows applications than [those] running on a Mac."

Pricing for the Quadra 610 DOS Compatible is expected to be less than $2,000 in the various outlets now carrying the Macintosh line. A 486 PC clone is priced in the $1,500 to $1,800 range. A PowerPC upgrade card is expected to cost $1,000 to $1,500, depending on its power. Thus, a PowerPC-equipped Quadra 610 could be bought for as little as $3,000, significantly less than the $5,000 price tag of many RISC workstations.



Source: "The Hartsook Letter"

IBM's recently unveiled PowerStation 250 workstation can also run Windows, but its $5,445 base price is high for most PC fans. Early next year, IBM will also roll out a PowerStation based on the PowerPC 601 chip that IBM officials said will be able to run DOS or Windows applications as fast as a 66-MHz 486-based PC. That will be accomplished through Intel x86 emulation technology developed by IBM and bolted onto Sun's Wabi Windows emulator.

Name your price

Although IBM has not established an entry-level price point for its PowerPC system, it is expected to be comparable to the Macintosh PowerPCs — in the $2,500 to $4,000 range. Doug Kass, an analyst at The Viewpoint Group, said an entry-level Macintosh could possibly cost as little as $2,000 (with monitor and keyboard included) if Apple really wants to drive the Macintosh PowerPC market fast in its early stages.

A cheaper RISC-based machine capable of running Windows could also be a very strong weapon in Apple's self-avowed war with Intel. "PowerPC could be a very serious competitor to Intel in the long run," Kass said. He explained that the price and performance of the PowerPC, when compared with the typical $5,000 price tag of a RISC workstation, should make it a very competitive alternative to a 486- or Intel Pentium-based PC.

However, Apple will also find itself competing against other purveyors of PowerPC systems. Kass suggested that Apple's edge may lie in underpricing its PowerPC competitors, but it remains unclear how Apple plans to differentiate itself in that sector.

Brokerage deploys distributed management

By Jean S. Bozman
SAN FRANCISCO

Charles Schwab & Co. is moving ahead with its pioneering distributed computing architecture, pairing software from Tivoli Systems, Inc. and Hewlett-Packard Co. to handle systems management and network management, respectively.

Schwab is among the first corporations to put the Open Software Foundation's (OSF) Distributed Computing Environment (DCE) into production, the OSF said. On Nov. 8, Schwab started up its first DCE "cell," a portion of a future nationwide network of distributed computing resources that can be tapped from any workstation.

The first cell has some 50 Sun Microsystems, Inc. workstations and several Sun SPARC 10 servers in Schwab's Phoenix office [CW, Nov. 15]. Schwab's DCE applications will then expand to seven sites nationwide, serving thousands of users.

Tivoli's Time Management Environment (TME) is being used as an "umbrella" for systems management applications at the Phoenix offices, said Michael Negatu, Schwab's director of systems integration. Tivoli last week said it had reached a two-year, $2.3 million agreement to provide the $750 million brokerage firm with systems management products and consulting services.

Schwab's first DCE site hosts a stock quotation application. On-line TME applications send network-wide registration data for user identifications and workstations to Unix file servers and distribute software programs throughout the DCE system, Negatu said.

Tool set immaturity

HP's OpenView, meanwhile, is being used to monitor all the workstations and Unix servers on the network. "They play together," said Jim White, Schwab's vice president of technical planning. He explained that a combination of several tool sets is needed to manage a distributed system, creating a patchwork far less mature than data center tool sets.

Management of the DCE depends on timely coordination of network resources and is built on several software layers. "You enter information in one place [in TME], and it's disseminated to the other products," Negatu explained. "As we move forward, users in a given cell will have their own profile available for quick log-on at any place" in the network.

That means that Schwab brokers could fly across the country, sit down at any local office and access their applications and data, just as if they were sitting in their home office.

Original plans called for Schwab to use the OSF/1 operating system, OSF's DCE and Posix-compliant Unix products [CW, April 20, 1992]. The OSF failed to deliver the Distributed Management Environment (DME) framework, which is being rebuilt, and failed to ship all of the promised DME functions, such as print services.

Replacement parts

So, while Schwab uses some DCE products, it uses Sun's operating system instead of OSF/1 and Tivoli's TME instead of the DME framework. It decided to use the Andrew File System software developed at Carnegie Mellon University in Pittsburgh instead of DCE's Distributed File System, and it uses Atrium Technologies, Inc.'s Dazel for distributed print services.

Tivoli was an early developer of the OSF's DME framework, although industry analysts said they believe OSF may never ship its framework [CW, Nov. 15]. Tivoli is now consulting with Schwab to forge links to other vendors' systems management applications.

New applications built by Schwab programmers may also need to reach into legacy systems to access mainframe data.

"There's some customization we're doing here," Negatu said. "There will be some bridging that needs to happen."

Networking to Go U.S.

Schwab's nationwide rollout of its DCE applications goes as planned, they will be used in seven regions nationwide by 1995. Among the key cities: San Francisco, Denver, Indianapolis and New York. Until now, Schwab's 5,000 end users have accessed data from a Hitachi Data Systems Corp. six-processor mainframe in Phoenix via IBM 3270 terminal emulation.

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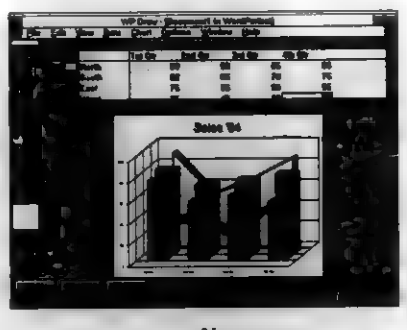

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In a pickle

Last week, the Russian who is responsible for preserving Lenin's body in rather remarkable condition, despite its being dead for 70 years, revealed his secrets.

It seems the Russian may have been motivated by the Kremlin's cutting of the preservation funding. Now he's willing to market his services to anyone who'll spend $250,000 to pickle the deceased.

I suggest he contract with the information technology industry to perform his magic on open systems computing.

Maybe it is a slight exaggeration to say that open systems is dead, or maybe reports of its death are premature. But if you read through our special report on the state of open systems (beginning on page 87) — a report based on our exclusive analysis of X/Open's worldwide open systems survey — you will conclude at the very least that open systems is, in the purist sense, dead.

Sick and tired of vendors' squabbles and the glacial movement of consortia-based standards efforts, users are redefining just what "open" really means. Guess what? Included in that definition are some curious features such as SNA, mainframes and Windows NT — technologies and products that would make open systems purists shudder.

How can this be? The Yankee Group's Howard Anderson summed up the situation thusly: "While users are entranced with the idea of standards, when all is said and done, they go back to what works." And what still works best for many of them is heavy reliance on things that look and feel quite proprietary.

This is not such a bad state of affairs. After several years of some of the most torrid marketing blitzes ever witnessed, during which users were fed a steady stream of PC-wanderlust, a much more pragmatic customer has emerged. They know mainframes are here for the long haul and, no, mainframe is not a dirty word. They know that 30 years of large systems development and all the attendant network management and security built into that environment is not going to be replicated in the open systems and client/server worlds anytime soon. For heaven's sake, vendors can't even deliver something as simple as E-mail systems that can talk to other vendors' E-mail systems.

Maybe one day there will be a greater sense of unity and interoperability among the 25 versions of Unix floating around. Perhaps one day the vendor consortium called COSE will bring some order to the 1,170 API-related "standards" out there. Possibly Godot will finally show up.

In the intervening years, customers will continue to redefine what is open in order to suit their needs, because they and their organizations can't wait. This pragmaticism is destined to drive corporate computing for years to come.

Bill Laberis

Bill Laberis, *Editor in chief*

Software cure not worth the pain

Steve Epstein's "Taming wild software country" [CW, Oct. 11] brought to light many interesting points and not a few misconceptions on software quality.

He speaks against a subjective answer to the question, "How safe is this piece of code?" What is Mr. Epstein's magic number that he will use to judge that software is indeed safe? Mr. Epstein compared the lack of standards to the mostly well-defined standards in civil engineering.

His implication is that we can expect a similar type of standard to evolve for software engineering as it becomes more mature. But are civil engineering and software engineering fundamentally similar? Ensuring safety in a digital domain is inherently much more difficult. If a bridge can be deflected to the right a few degrees, suffering no damage, the civil engineer would reasonably expect it to behave safely when deflected similarly to the left. In digital systems there is no guarantee of symmetry like this. It is as though the software "bridge" is constructed of explosive bricks. The failure of one brick can detonate the entire bridge.

Mr. Epstein says, "The answer is to begin by implementing techniques from the disciplines of software reliability, software system safety and software risk analysis. ..." But no proof or rationalization is presented that these methods will actually improve software quality.

Much of the effort in software quality assurance goes into producing more documentation and to testing. But does more documentation really equal more quality?

Mr. Epstein suggests that "licensing of software engineers may also be part of the answer." Although blunders by individual programmers are often made, the really spectacular failures come from failures in management. Licensed or not, a team of engineers working 60 to 80 hours every week will eventually make mistakes.

I do agree with Mr. Epstein that the state of software quality needs improvement and is a serious matter of concern. Let's make sure the cure doesn't make the problem worse.

Robin Rowe
President
Rowe Technology
Redmond, Wash.

Not mad for RAD

Regarding "Leave analysis behind" [CW, Oct. 18], David Baum's contention that rapid application development (RAD) renders the need for regimented methodologies obsolete is ridiculous.

RAD may be fine for developing some small throwaway programs but fails miserably for building major enterprisewide information systems. RAD sacrifices system integration for development speed, pacifying the business problem for the moment but creating long-term headaches when the application has to be redesigned to work with other programs.

But instead of RAD, we call it "QAD" for "quick and dirty."

Tim Bryce
M. Bryce & Associates, Inc.
Palm Harbor, Fla.

Wanted: "Big picture" skills

Regarding "Think big picture for client/server" [CW, Oct. 25]: For every classified ad that uses terms such as "overall client/server architecture and methodology" or "technology planning" or "integrated business and technical skills," there are literally thousands that are looking for product- and vendor-specific skills.

Where are the jobs that require "big picture" and "conversationally fluent" skills?

Either they are all filled, since no one is advertising for them, or the need is not recognized.

I tend to think it is the latter. Unless we learn to put the cart where it belongs, the problem won't be fixed.

Carolynn Rantlo
Independent consultant
River Vale, N.J.

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The meaning of certification

Eli E. Hertz

Ideally, certification protects consumers. Certifications such as the UL seal on an electrical plug indicate a meaningful and acceptable standard of performance that is monitored on an ongoing basis. But sometimes certifications can be misleading and provide a false sense of security. That is the case with certification labels created by Novell.

Novell's certification programs have gained quick acceptance in the marketplace. People now perceive Certified NetWare Engineer (CNE) status as a qualifier for network specialists. Similarly, the Novell Independent Manufacturer Support Program (IMSP) product compatibility certificate supposedly ensures a smooth-running network. Few question the meaning or value of these certificates.

Employers and consumers don't always get what they expect when they hire or buy on the basis of a Novell certification.

The CNE designation has become the computer equivalent of an MBA. Most people have one; therefore, those who don't are at a disadvantage. Businesses even specify "CNE a must" in their ads because they feel this will attract the appropriate applicants.

There is a widespread impression that certificate holders can handle all network problems and all forms of maintenance. In fact, CNE certification addresses only one aspect of network support — the operating system software — and does not require a demonstration of hands-on skills. Candidates must pass only a series of on-screen tests to qualify.

Increasingly, employers are discovering that many CNE holders lack the skills needed to work with network hardware, cabling systems and applications software.

Novell has no incentive to publicize the limitations of its CNE program. Its CNE business is booming. The demand for courses pressured Novell to contract the training to Novell Authorized Education Centers and to expand the program by introducing three new certifications: Enterprise Certified NetWare Engineer, Certified NetWare Administrator and Certified NetWare Instructor.

Similar opportunities exist for Novell through its IMSP product certification program. Novell says it wants to encourage OEMs to integrate their products with NetWare. The cost of this encouragement can be exorbitant, however, averaging approximately $7,000 per computer system.

Getting less

Microsoft and IBM provide to OEMs, for free, preconfigured diskettes with which to conduct compatibility tests. Do you get more for your money with Novell? Actually, you get less.

A Novell sticker on a computer system means only the exact and specific configuration tested is certified. Any change in that computer system, such as revision to the system board, a different add-on board or a small update to software drivers or BIOS, voids the certification. The pace of change in the industry may render a specific configuration obsolete during the eight to 12 weeks it takes to receive a Novell certificate.

Just as employers expect CNEs to apply for network-related jobs, many purchasing managers require the Novell sticker on hardware they buy. People believe this guarantees compatibility. It's time to read the fine print on the certificate.

Hertz is founder of Hertz Computer Corp., maker of workstations and file servers, and the author of a number of industry-related books. His latest, *Now that I Have OS/2 2.0 on My Computer, What Do I Do Next?*, was published by Van Nostrand Reinhold.

Enterprisewide LAN E-mail still a dream

Patricia B. Seybold

Do you dream of growing your LAN E-mail systems to handle robust applications across your entire enterprise? Dream on. Are you planning to build E-mail bridges and applications that reach out to customers and suppliers? Don't count your blessings yet.

The good news is that LAN-based E-mail is growing up. The leading packages now run across multiple platforms and support international and de facto messaging standards. They also come with gateways that let you connect relatively seamlessly to host-based E-mail systems and external E-mail services.

Even the skirmishes among the leading players over which firm controls the messaging application programming interfaces for LAN E-mail have subsided so that, within a couple of years, you should be able to write corporate applications for project management, scheduling and work flow that will run across various LAN E-mail products.

The bad news is LAN E-mail products often are not robust enough to support the many thousands of users in large organizations. Important features are lacking — such as reliable end-to-end delivery in a global network, message tracking, certification of delivery and rock-solid security.

The use of multiple gateways also makes it problematic to send files and rich text without fear of corruption. And it is almost impossible to synchronize E-mail directories across an enterprise, particularly if you have products from more than one vendor.

LAN E-mail products are a long way from being able to support the large-scale applications you're daydreaming about.

It will take a couple of years before LAN E-mail products are up to the enterprise challenge.

In the meantime, assumptions can be dangerous. It's a mistake to assume, for example, that your LAN E-mail package will serve as an adequate "backbone" for all your LAN E-mail systems.

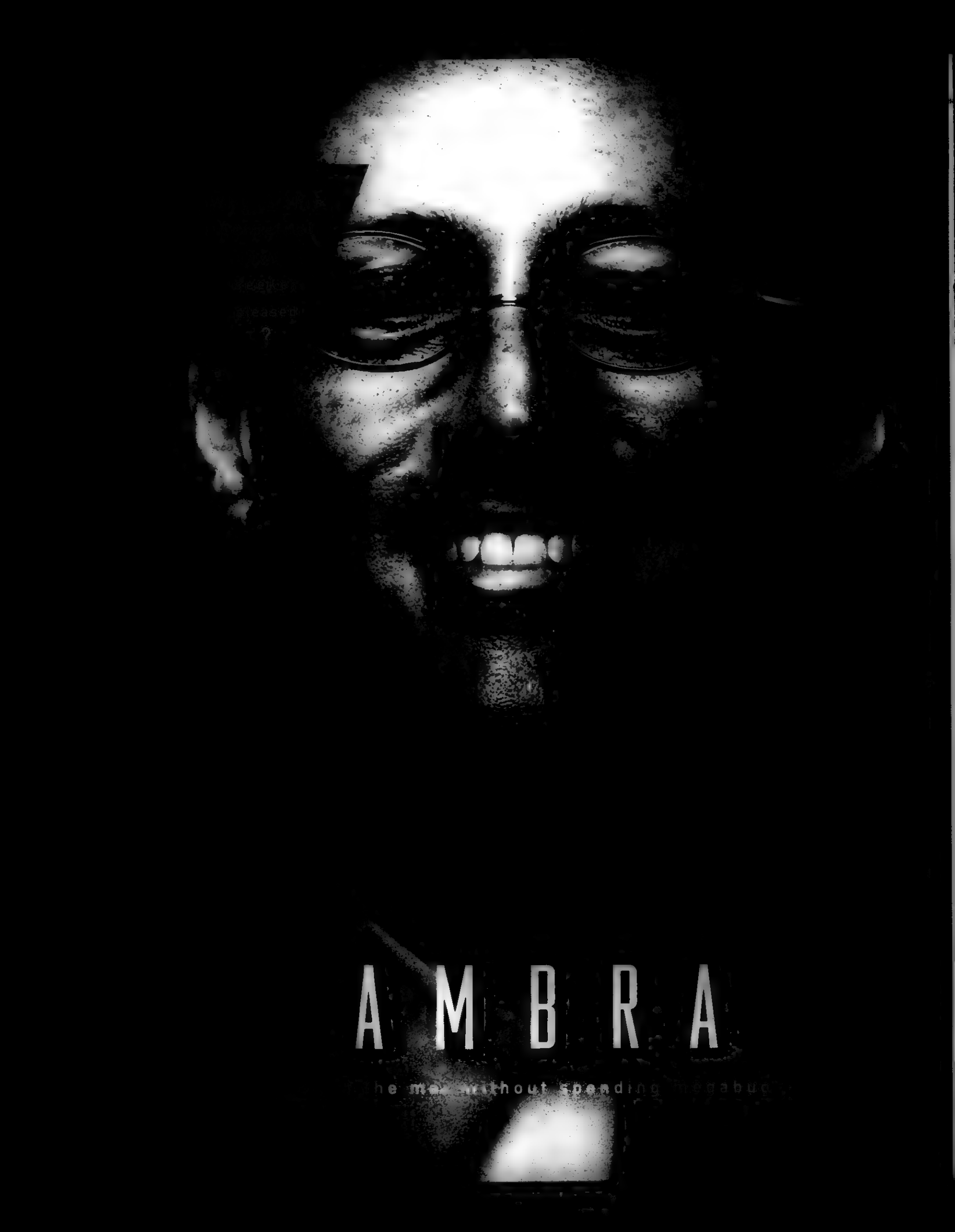
You'll also need directory services, and this is the area where I see most corporate E-mail task forces punting. There's good reason.

Many of the commercial directory services offerings are immature. Also, it is difficult to establish a single corporate LAN E-mail standard. And even if you do, chances are the directory services available from your vendor won't be up to the challenge of keeping those hordes of users in sync as they relocate, spawn new LANs, join and leave project teams and travel the world. Needless to say, it gets worse if you want to include customers and trading partners in your global directory system.

Be wary of promises of directory synchronization across mixed systems. This is the single most difficult problem in the industry. To solve it will require distributed database standards — something we're not likely to see soon.

NOTE: In my last column about how the Commonwealth of Massachusetts is using rapid, iterative development, a paragraph was omitted, which I feel was necessary to convey the accomplishments and professionalism of Comptroller Bill Kilmartin and his staff. The omitted text read: "How can a well-intentioned executive, no matter how visionary he is, make a dent in this tar baby of 20 years of fossilized practices? It helps if you have a good track record, as Bill does, in delivering return on investment on your projects. It also helps if you have put together a hot management team that is eager and willing to tackle the insurmountable."

Seybold is president of the Patricia Seybold Group in Boston. Her Notes address is Patricia Seybold @ PSOCG. Her Internet address is PSeybold @ MCImail.com.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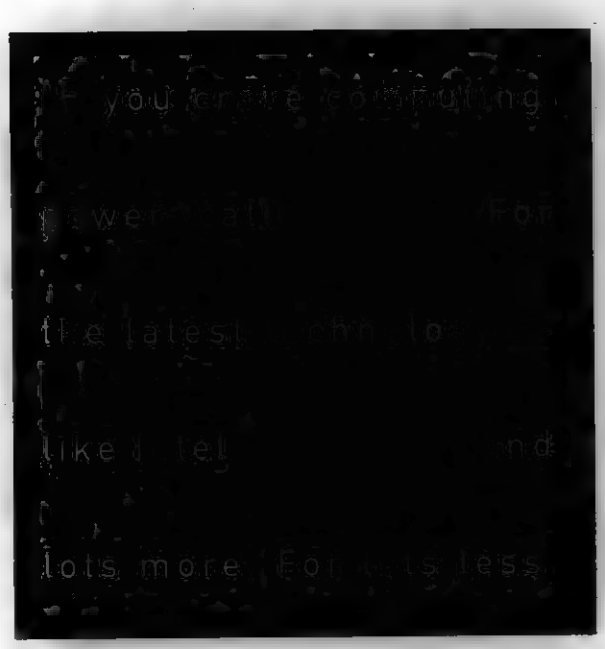

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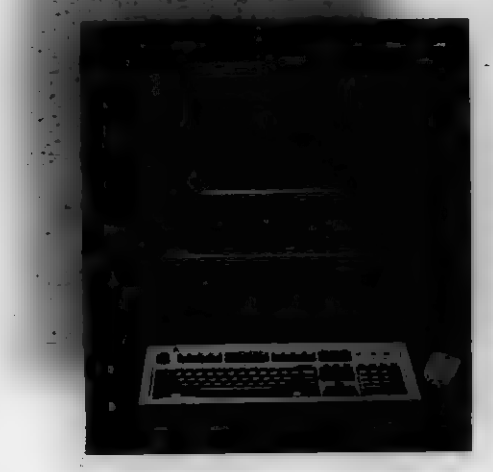

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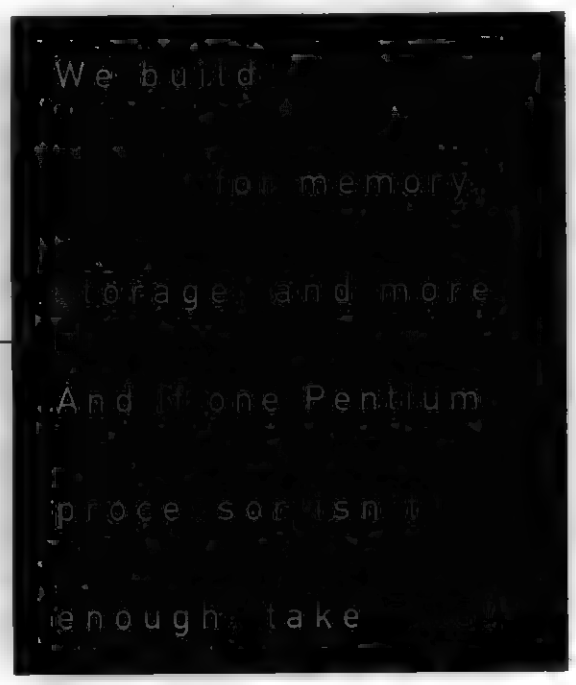

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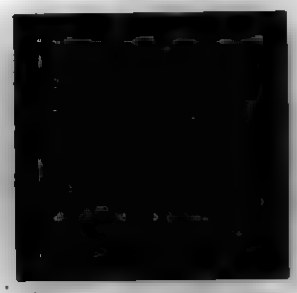

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intel inside

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Accounting software tallied up for NT

Microsoft takes little notice of Great Plains Software's latest contribution

By Ed Scannell

Accounting software is usually afforded the same level of respect an 8-year-old child gives brussels sprouts. You know it is necessary and probably even good for you, but it just is not very exciting.

Since the start of the PC revolution in corporate America, accounting software has not been able to get good public relations. The press and analysts have always found the spreadsheet, word processing and operating systems ware infinitely more interesting. Accounting software was something that, well, other people wrote about and analyzed.

That feeling appears to be alive and well as the industry enters the age of client/server computing.

Recently, Great Plains Software, Inc. released what it says is the first 32-bit accounting software application to support Microsoft Corp.'s Windows NT and Windows NT Advanced Server.

Typically, Microsoft's marketing machine would be quick to take note of such an event and aggressively promote the product at shows and in its literature. But Great Plains' software introduction of Dynamics C/S+ went relatively unnoticed by the boys and girls in Redmond, Wash.

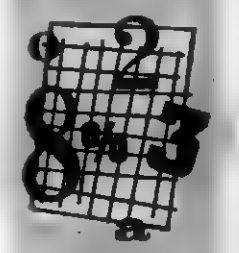
This, despite the fact that Great Plains developed Microsoft Profit, an entry-level, integrated accounting package that Microsoft exclusively markets and Great Plains supports, almost a year ago.

"Yes, we were somewhat disappointed when Microsoft was promoting some of the 32-bit applications available for NT in other categories but did not mention ours," said Raymond August, a vice president at Great Plains.

Doing it alone

While August and other company officials said Microsoft will come around in due time, they are not counting on it any time soon. Being based in the high-tech wilderness of Fargo, N.D., the company has developed a certain pioneer independence and sense of self-reliance.

Great Plains has built a $35 million to $40 million business, putting the privately held company among the Top 25 microcomputer software makers, according to "The SoftLetter," an industry newsletter in Cambridge, Mass.



Ordering mainframes

In a 1992 survey conducted by International Data Corp., 71% of the respondents at U.S. mainframe sites said client/server architecture is now or will be important to their accounting systems.

But as Great Plains enters the client/server market, it might not hurt to have Microsoft say a few nice things about its product. In this new arena, the company expects to go up against some experienced players such as market leader Oracle Corp., Dun & Bradstreet Software, PeopleSoft, Inc., Ross Systems, Inc. and newcomer The Dodge Group, that have established reputations at the high end.

But with prices on powerful hardware systems dropping, experience in developing Windows applications and the growing acceptance of client/server solutions, Great Plains officials said they believe the market is rolling their way.

"The accounting software needs of businesses of all sizes are changing with these market shifts. And I think we have adjusted our strategy to best address users' needs in this emerging market," said Doug Burgum, Great Plains president and chief executive officer.

Some observers agree, pointing to the company's network of some 3,000 value-added resellers (VAR), many of which are veterans at creating sophisticated client/server applications.

Almost all of the high-end competitors to Great Plains have sold their products directly to end users and only now are turning to VARs and systems integrators to help build an industry around their respective products, analysts explained.

Serious challenge

"They must be taken seriously by their competition just because of their resellers and customer developers. Most of them have already been doing real client/server stuff and most are really hot for this new product [Dynamics C/S+]," said Jeff Tarter, editor of "The SoftLetter."

Great Plains is pinning most of its hopes for success in the client/server market on its recently shipped Dynamics C/S+. The company is targeting the package primarily at midrange companies with revenue of roughly $25 million to $100 million a year.

Accounting, *page 42*

Smart-card technology used in lifesaving work

By Mitch Betts

When the ambulance crew arrives, the patient may be unconscious or incoherent and most family members too distraught to provide vital information about medical conditions, allergies and prescription drugs.

So the ambulance service in Midwest City, Okla., and six area hospitals have teamed up to deploy smart-card technology so emergency personnel have accurate patient data in an instant.

MediCard *gives emergency personnel accurate patient data in an instant*

The MediCard system was developed and installed by Advantage Data Systems, a smart-card systems vendor in Oklahoma City. Besides the plastic cards that store patient data on an embedded computer chip, the system involves Hewlett-Packard Co. 95LX palmtop computers, which have smart-card readers set in the PCMCIA slot, as well as desktop PCs with smart-card readers attached to the serial port.

The palmtop devices are installed in six ambulances, and the desktop readers are installed in six hospital emergency rooms and eight local pharmacies, explained Bob Riley, director of ambulance services at Midwest City Regional Hospital. At the scene of a medical emergency, responders insert the smart card into the palmtop readers to obtain data critical to split-second treatment decisions, he said.

The card-reading devices are made by Gemplus Card International Corp. in Gaithersburg, Md. Participants can update their med-

Smart card, *page 42*

Comdex/Fall '93

RISC PCs gain notoriety

By Michael Fitzgerald

LAS VEGAS

Apple Computer, Inc. Chief Executive Officer Michael Spindler used his Comdex/Fall '93 keynote address to declare that RISC is "the new desktop paradigm" [CW, Nov. 22]. That remains to be seen, but certainly RISC PCs were plentiful at the show.

Backers of the PowerPC, spearheaded by Apple, IBM and Motorola, Inc., were joined by proponents of Digital Equipment Corp.'s Alpha architecture and Mips Technologies, Inc.'s R4000 architecture to form a three-headed threat to Intel Corp. at the show. Related activities included the following:

- Spindler demonstrated a PowerPC Macintosh outperforming a Pentium-based system on high-level graphics software. Also, IBM showed sleek prototypes of its PowerPC hardware, including a PowerPC notebook.
- NEC Technologies, Inc. introduced its Image RISCstation and Express RISCserver. Based on the R4400, with 16M bytes of RAM and a variety of integrated features, the system is expected to sell for $3,749 when it ships in December.

The Express server, due out in February, will sell for less than $10,000, according to NEC officials. NEC, which also manufactures the Mips chip, announced lower-than-expected pricing of $80 per chip. It also announced a joint marketing and development agreement with start-up Netpower, Inc.

- Carrera Computer, Inc. introduced its Pantera Series I and II computers, with a 166-MHz and 200-MHz Alpha processor inside. Shipping "soon," Carrera, in Laguna Hills, Calif., will charge a base price of $3,995. Eight other vendors demonstrated Alpha machines at Comdex.
- DeskStation Technology, Inc. in Lenexa, Kan., demonstrated a sub-$3,000 NT PC, called the Tyne Series. It uses the R4600-Orion, a souped-up version of the R4400 made by Integrated Device Technology, Inc.

Officials outlined a plan to build two families each of notebooks and desktops around the Mips architecture. The Tyne series joins DeskStation's R4400-based Evolution line of RISC PCs, which start at $5,495.

- A Santa Clara, Calif., start-up called ShaBtamm Computer announced its support for the Mips R4000 family, in both a family of Mips-based PCs and workstations and on its NITro-VLB accelerator cards, which use the R4400 and the R-4600-Orion 100-MHz and 133-MHz chips.

imagine a desktop printer designed to keep everyone on track.

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PUTTING IMAGINATION TO WORK
digital

Accounting

CONTINUED FROM PAGE 39

Dynamics C/S+ is complemented on the high end by the company's Corporate Dynamics, an enterprisewide product capable of supporting all of the dominant SQL relational databases. On the low end is Dynamics, a LAN-capable graphical system with shipping versions for both Windows and Macintosh desktop systems.

A real billion

Sales of client/server accounting systems are expected to reach $1 billion in 1997, up from $70 million in 1992, according to International Data Corp.

Last month, Great Plains announced it would deliver Dynamics Release 2 by the middle of next year, which will target companies with 100 employees or fewer. This version will support Novell, Inc.'s Btrieve 6.1 NetWare Loadable Module and improved cross-module consistency.

Smart card

CONTINUED FROM PAGE 39

ical information at the pharmacies, whose desktop systems have read/write capability.

Riley said there are some side benefits to the technology for the ambulance service and emergency rooms. Information from the smart cards can be fed directly into clinical and billing systems to reduce data entry, data errors and paperwork, he said.

Of course, the system depends on people actually carrying their smart cards at all times. Local residents obtain their smart cards from participating pharmacies and hospitals and pay a $30 fee for three-year membership in the program. Riley said the hardware is installed and the membership drive will start soon.

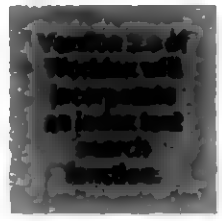
The ambulance service serves more than 100,000 residents in the eastern suburbs of Oklahoma City, Riley said, and he hopes to distribute 20,000 cards to people who are likely users, such as the elderly.

Document management

Start-up company adds text-retrieval engine

By Michael Vizard

World Software Corp., a start-up supplier of document management system software in Ridgewood, N.J., plans this month to ship Version 2.0 of its Worldox offering, which will incorporate an index text search function supplied by Odyssey Development, Inc. in Denver.



The addition of the index text search engine will give Worldox text-retrieval capabilities similar to those of rival products from vendors such as SoftSolutions Technology Corp. in Orem, Utah, and PC Docs, Inc. in Tallahassee, Fla.

However, World Software seeks to differentiate itself from its rivals by providing a document management system that does not take over all the applications attached to it, according to company President Tom Burke.

For example, while Worldox replaces the File Open and Save As dialogs in an application, it still allows users to upgrade their applications without having to wait for an upgrade to the Worldox product.

For this reason, the Federal Labor Relations Authority in Washington has adopted Worldox in three offices to supplement users of WordPerfect Corp.'s namesake word processor.

"These offices tend to use a lot of documents, and WordPerfect only supports eight-character file names. So with Worldox, we can have expanded file names across a library of documents," said Harold Kessler, director of information resources and research services.

"Price was a backdrop consideration. We wanted something that didn't take over our DOS directories," he said.

However, Kessler added that a lack of support staff at the authority is making it difficult for him to deploy Worldox further. "We only have four people supporting 240 people in multiple regions, so we're keeping the rollout limited. But we expect more offices to become interested in it over time," he said.

Worldox, which includes an application programming interface and viewers that allow users to preview documents before calling them, is priced at $229.95.

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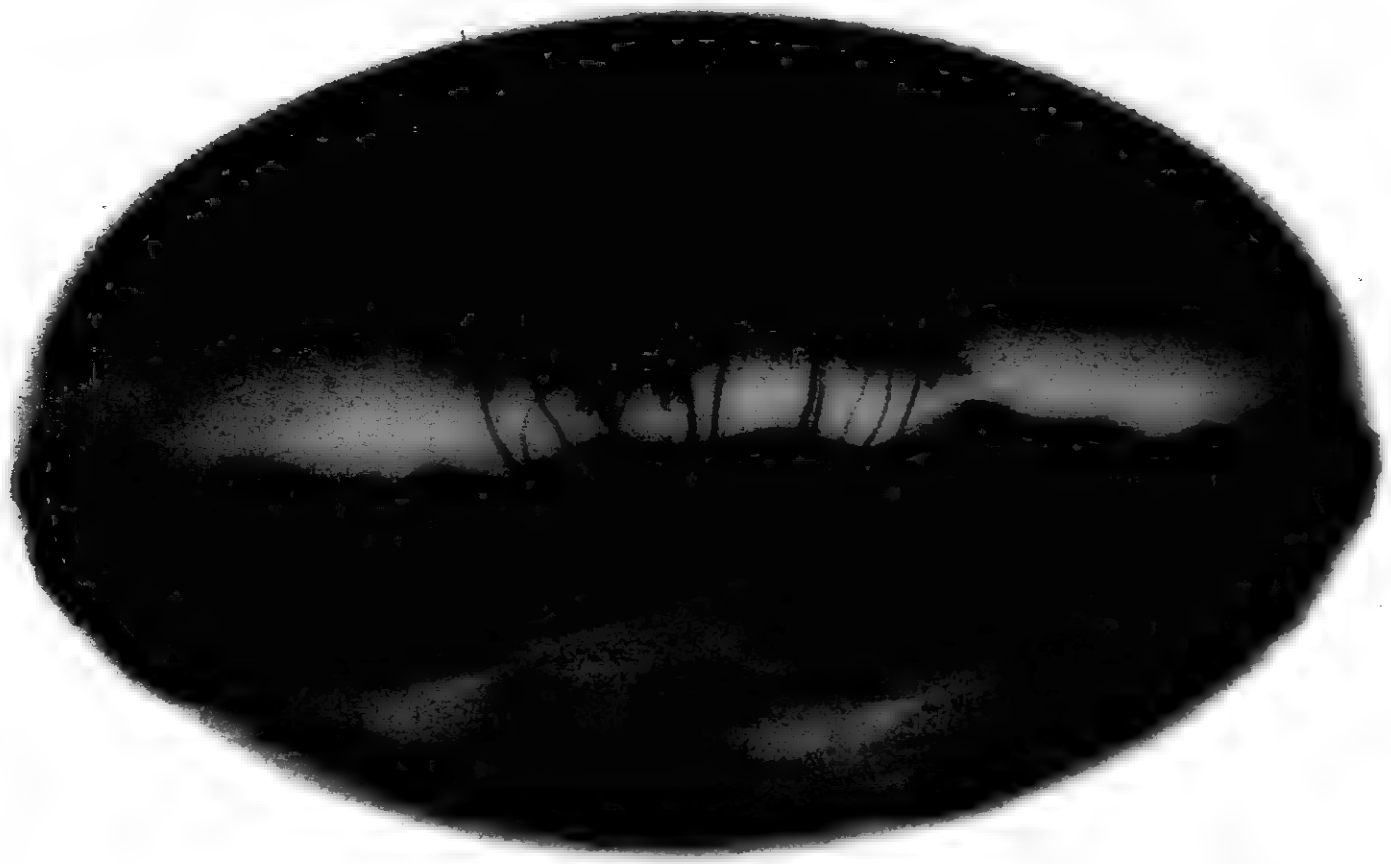


YOU KNOW HOW SOME THINGS ALWAYS LOOK GOOD FROM A DISTANCE?

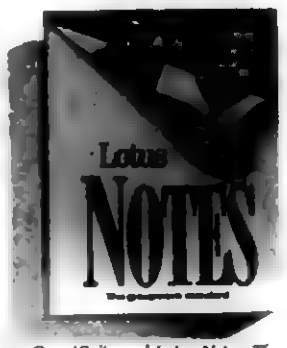
As anyone who's ever been in the desert can tell you, things aren't always as they appear. Whether it's an oasis in the sand. Or a suite of application software in the office.

Unless you look very closely, for example, you'd swear Microsoft® Office was a revolutionary new way to use, manipulate and share business data through integrated software. When, in reality, Lotus® SmartSuite® achieved that distinction over a year ago.

LOTUS SMARTSUITE 2.1 VS. MICROSOFT OFFICE PRO	
APPLICATIONS	
1-2-3® RELEASE 4	COUPON FOR EXCEL 5.0
AMI PRO® 3.01	WORD 6.0
FREELANCE GRAPHICS® 2.01	COUPON FOR POWERPOINT® 4.0
APPROACH® 2.1	ACCESS™
ORGANIZER™ 2.1	COUPON FOR 1 SEAT OF MICROSOFT MAIL
INTEGRATION	
LOTUS APPLICATION MANAGER	MICROSOFT OFFICE MANAGER
COLLECT & COPY	
DDE, OLE	DDE, OLE (2.0 IN WORD)
CONSISTENT USER INTERFACE	SEMI-CONSISTENT USER INTERFACE
WORKGROUP	
ALL APPS MAIL-ENABLED	ALL APPS MAIL-ENABLED
VERSION MANAGER™	SCENARIO MANAGER
INTEGRATED WITH NOTES® THRU NOTES/FX™	
VALUE	
$299 COMPETITIVE UPGRADE	$349 COMPETITIVE UPGRADE

A closer inspection will also demonstrate that not all of Microsoft Office's five applications are designed for general business users. And some new versions aren't yet available at all. Lotus SmartSuite, on the other hand, has five of the leading, award-winning, most usable applications. All of which truly complete the desktop of every Windows™ user.

And while Microsoft claims Office is going to fully maximize cross-product integration and consistency, Lotus is already way down the road to achieving precisely that across all five applications. Sharing the same user interface. With common menus. And SmartIcons.® To say nothing of task-oriented functions that cross applications. Collect and Copy for instance. With a single click, it lets users gather data from 1-2-3® and Freelance Graphics® and combine it into an Ami Pro® word processing document.



SmartSuite and Lotus Notes. The secret to integrating workgroups instead of just applications.

Of course, you might be just as easily deluded into believing that Microsoft Office is work-

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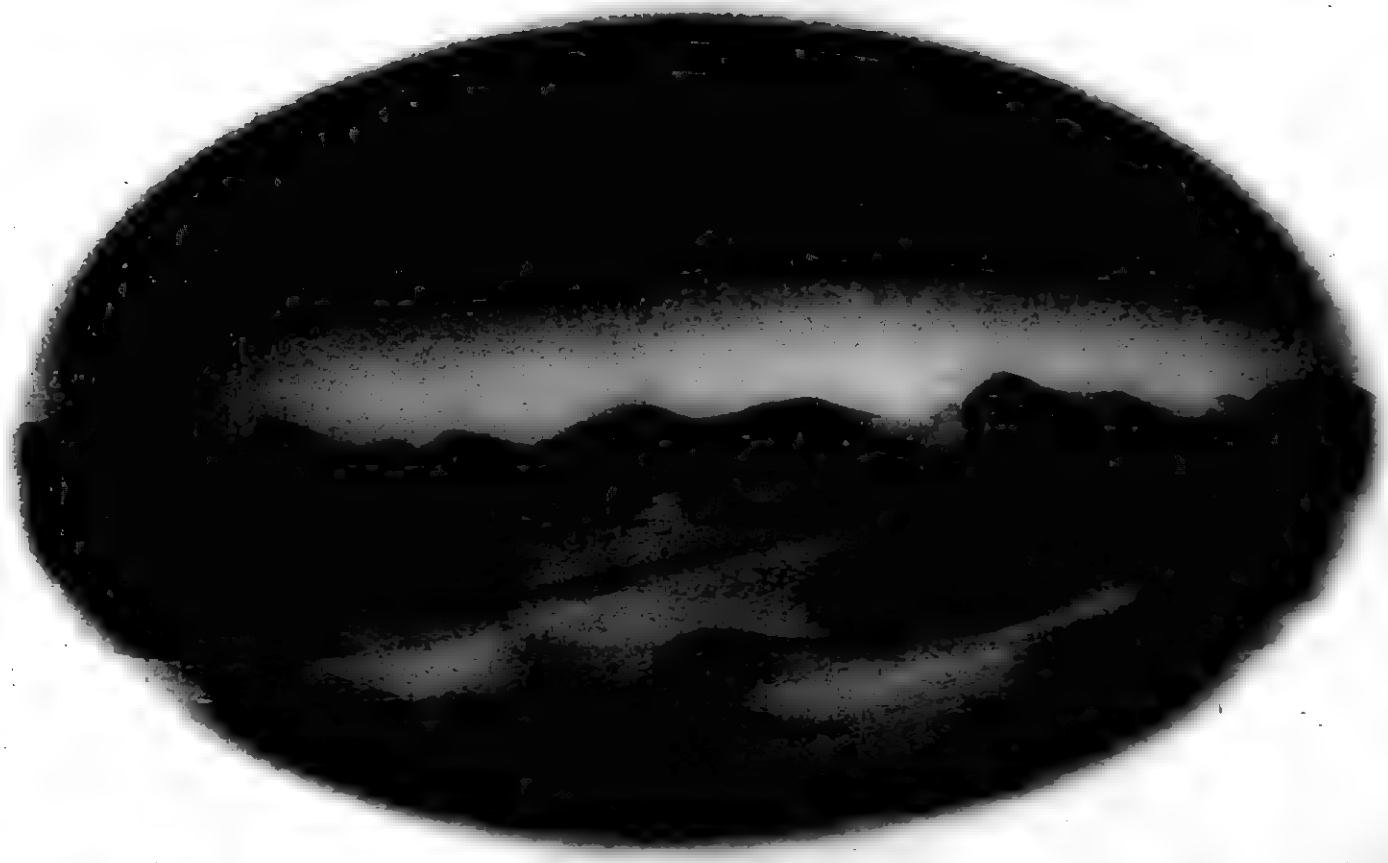

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group enabled. When, in fact, Office can only integrate applications. SmartSuite can actually integrate entire groups of people. With Lotus Notes® groupware, SmartSuite users can access, share, track and manage business data like never before. Not only can it be routed, it can be revised, stored and accessed concurrently by multiple users working in collaboration.

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Software

Intex Solutions, Inc. has introduced Forecast for Lotus Development Corp.'s 1-2-3 Release 4, a product that can be used for applications such as forecasting sales and expenses.

According to the Needham, Mass., company, the product was created specifically for 1-2-3 Release 4 for Windows users and includes pull-down menus, full mouse support and dialog boxes in a 1-2-3 environment.

Forecast for 1-2-3 Release 4 converts a user spreadsheet into a forecasting system, offering features that include time series analysis, statistical analysis, multiple regression analysis, seasonal adjustments, smoothing, filtering and other advanced forecasting techniques.

Forecast costs $165.

▶ *Intex Solutions*
(617) 449-6222

IntelligenceWare has announced Corporate Vision, a product designed for multidimensional data analysis.

According to the Los Angeles company, the product runs on Windows and implements a HyperInformation Graphic User Interface, providing instantaneous, intuitive and graphic access to vital information required to monitor and control a business.

Features include fully customizable windows and dialogs, support for a large number of fields and dimensions and hypergraphs and hyperdata.

Corporate Vision costs $800 per copy.

▶ *IntelligenceWare*
(310) 216-6177

GST Software has announced DesignWorks 2 for Windows, drawing and illustration software.

According to the Falls Church, Va., company, DesignWorks 2 is a Windows-based technology that offers enhanced flexibility, speed and control.

Features such as custom shape tools, color features, text features, snapshot utility, keypad/foot utility, clip art and photo CD browser are included. Object Linking and Embedding support is also provided.

DesignWorks 2 costs $199.95

▶ *GST Software*
(703) 560-2354

Financial Decision Systems, Inc. has introduced MasterAgenda, a Windows-based system for corporate tax and financial filing, tracking and analysis.

According to the Agoura Hills, Calif., company, MasterAgenda can track, manage and analyze target dates pertaining to filings or events in the treasurer's office and legal departments.

MasterAgenda offers a Windows-based graphical user interface for ease of use. A query module provides instant access to all filings and related activities, enabling users to view, define and analyze data from a variety of perspectives.

A single-user version of MasterAgenda costs $795. The networked version is priced at $1,295.

▶ *Financial Decision Systems*
(818) 706-2000

Octel Communications Corp. has introduced DecisionPro, a Windows-based voice processing reporting tool that combines a Windows graphical user interface with an industry standard relational database and a report writer.

According to the Milpitas, Calif., company, the product provides users with system information and report customization capabilities.

User profiles and event statistics can be downloaded from an Octel voice processing system and stored in a standard database on the user's desktop PC.

DecisionPro costs $1,000 per client.

▶ *Octel Communications*
(408) 942-6500

PenWare, Inc. and **Sharp Electronics Corp.** have introduced the PenCell spreadsheet software card designed for the Sharp line of pen-based Wizard electronics organizers.

According to Palo Alto, Calif.-based PenWare, the card enables users to access, update and utilize spreadsheet information on their pen-based Wizards.

By touching on-screen icons, users can enter data, run spreadsheet scenarios and do simple budgets and forecasts.

Other PenCell features include manipulation of data through pen gestures, multiple levels of Undo and Redo operations, drag-and-drop functions for copying and moving cell data and a shortcut entry method for common formulas.

The PenCell IC card costs $229.99.

▶ *PenWare*
(415) 858-4920

Scitor Corp. has announced Project Scheduler 6 for Windows, a project management system.

According to the Foster City, Calif., company, the product supports all aspects of project planning, tracking, reporting and analysis.

Project Scheduler 6 employs object-oriented programming technology and offers an interface designed to streamline project planning with user-configurable spreadsheets, an unlimited Undo/Redo option, graphical Gantt chart dependencies and tool bars for quick access to functions and views frequently used by project managers.

Project Scheduler 6 costs $695.

▶ *Scitor*
(415) 570-7700

Computervision Corp. has announced the Revision 6.0 DOS-Extended version of Personal Designer, its two-dimensional/three-dimensional PC computer-aided design software.

According to the Bedford, Mass., company, this version offers more than 100 customer-requested productivity enhancements.

Features include a graphical user interface that allows intuitive interaction via raised buttons, pop-up menus, context-sensitive assist text, relocatable dialog boxes and an expanded Non-Uniform Rational B-Spline.

Personal Designer is compatible with MS-DOS Versions 5.0 and 6.0.

The product costs $3,995.

▶ *Computervision*
(617) 275-1800

Jensen-Jones, Inc. has introduced Commence Start-Up, an entry-level version of Commence 2.0, personal information management software that operates under Windows.

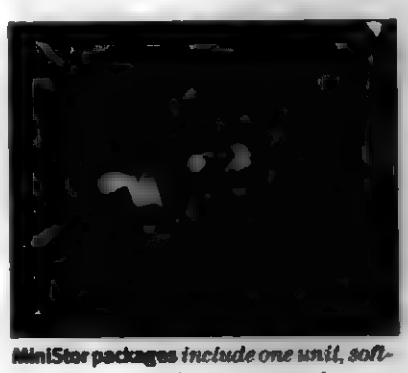
According to the Red Bank, N.J., company, Commence 2.0 offers users an easy way to view, organize, store and share information in workgroups.

Commence Start-Up is a stand-alone version of Commence 2.0. Users can organize contacts, manage and automate tasks and projects, dial telephone numbers through a PC, create customized views of information and maintain a calendar with a drag-and-drop scheduler.

Commence Start-Up costs $49.95.

▶ *Jensen-Jones*
(908) 530-4666

Hardware



MiniStor packages *include one unit, software drivers and a user manual*

MiniStor Peripherals Corp. has announced a 128M-byte, 1.8-in. hard drive and DockIt Socket, a product that adds a PCMCIA slot to existing desktop PCs.

According to the San Jose, Calif., company, the two-platter drive uses glass media and can be used as a high-capacity removable storage device or a built-in drive for primary storage in portables.

The product holds up to 15,000 pages of text, graphics, multimedia presentations, spreadsheets and other data.

The drive features 16 millisecond average seek times, data transfer rates of between 11M and 22M bit/sec., 6.67 average latency and 250,000 hour mean time between failures.

DockIt Socket lets users transfer files from portables to desktop systems without a cable link or docking station.

The 42M-byte PCMCIA drive costs $499, the 85M-byte drive is $549, and the 128M-byte drive is priced at $699. DockIt Socket's suggested retail price is $249.

▶ *MiniStor Peripherals*
(408) 943-0165

S3, Inc. has introduced S3 Vision, a family of multimedia-enabled, 64-bit graphics accelerators, a companion video accelerator and a peripheral chip.

According to the Santa Clara, Calif., company, the products provide users with more than double the power of their predecessors and offer more color depth and the ability to incorporate video.

The 64-bit Vision family includes two multimedia-enabled single-chip graphics accelerators, a companion accelerator called the S3 Vision/VA, the dynamic random access memory-based S3 Vision864 and Video RAM-based S3 Vision964.

The single-chip, S3 Vision/VA video accelerator operates with Vision964-based systems. The S3 SDAC peripheral chips support high resolutions.

The S3 Vision864 costs $45 per 1,000 parts, and the S3 Vision964 is priced at $75 per 1,000 parts. S3 Vision/VA costs $75 per 1,000 parts, and the S3 SDAC, 110 MHz and S3 SDAC, 135 MHz are priced at $5.81 and $10.56 per 1,000 parts.

▶ *S3*
(408) 980-5400

Hewlett-Packard Co. has introduced the HP DeskJet 310 printer for notebook PCs and the HP DeskWriter 310 printer for Macintosh PowerBooks.

According to the Palo Alto, Calif., company, the printers offer 300 dot-per-inch resolution for black or color, text and graphics. The printers can be powered by a battery or an AC adapter, and they use HP-developed thermal ink-jet technology.

Each printer weighs approximately 4 pounds and costs $379.

▶ *Hewlett-Packard*
(415) 857-1501

Olivetti North America, Inc. has introduced Quaderno 33, a high-powered version of its Quaderno subnotebook.

According to the Spokane, Wash., company, the product is an ultralight PC designed for users who need a portable computer with the power and capabilities of a desktop system.

Quaderno 33 comes equipped with 4M bytes of memory (expandable to 12M bytes) and a 60M-byte drive with an optional 120M bytes.

Preinstalled software includes Windows 3.1, MS-DOS, Microsoft Corp.'s Works for Windows and Lotus Development Corp.'s Organizer.

A Quaderno 33 package costs $1,899.

▶ *Olivetti North America*
(509) 927-5600

Lexmark International, Inc. has introduced six desktop printers.

The IBM ExecJet II 4076 printer features optional advanced flash memory scalable fonts and 600-by-300 dot-per-inch printing.

The IBM 4037 5E page printer employs Lexmark's electrophotographic print engine and offers graphics at up to five pages per minute.

The IBM 2300 Plus Series of nine- and 24-wire dot matrix printers consists of four models that were designed for customers who require extra reliability in printing multipart forms and labels.

According to the Lexington, Ky., company, the printers comply with the Energy Star Printers program.

Prices range from $349 to $799.

▶ *Lexmark International*
(606) 232-2000

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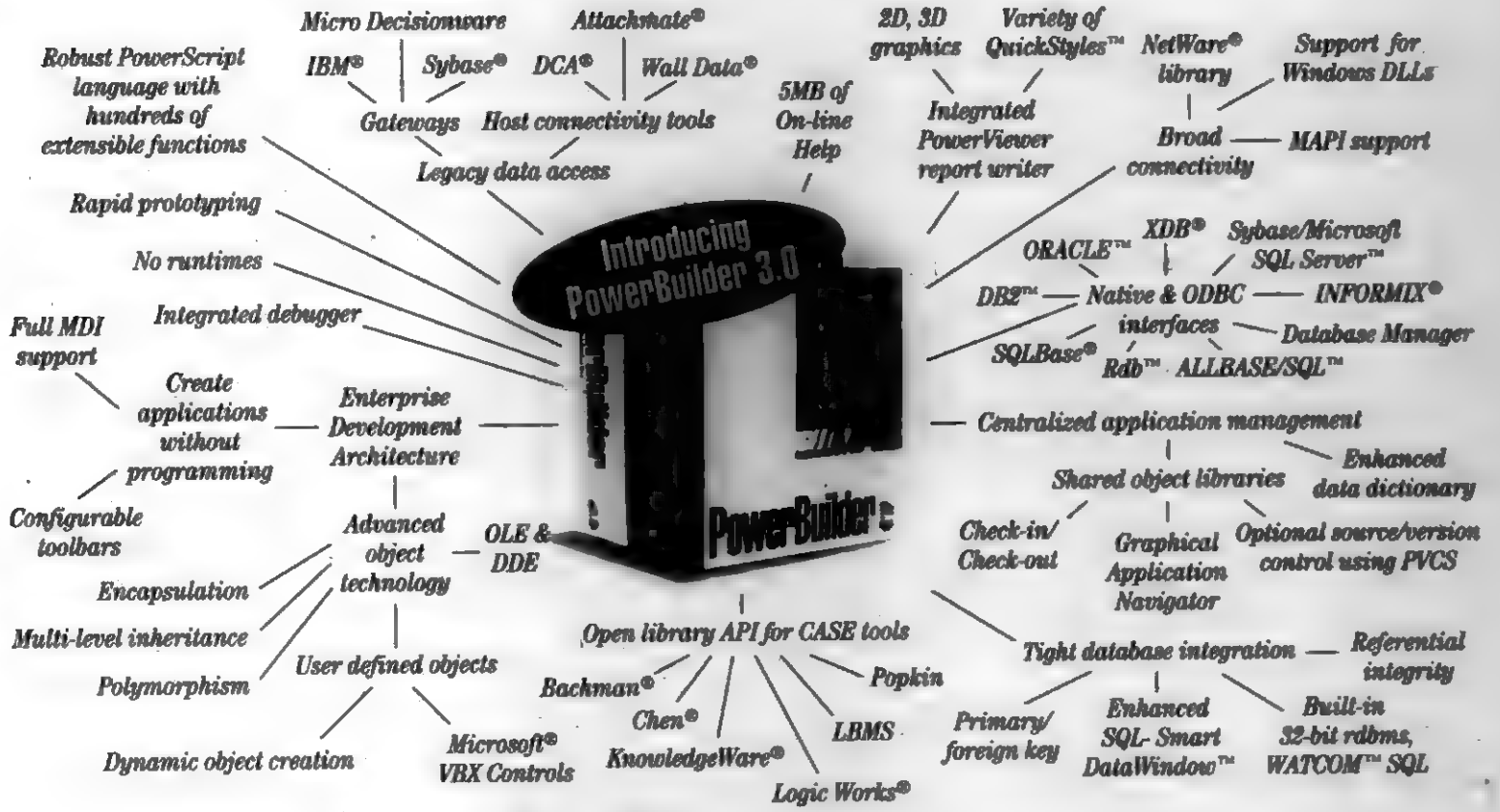

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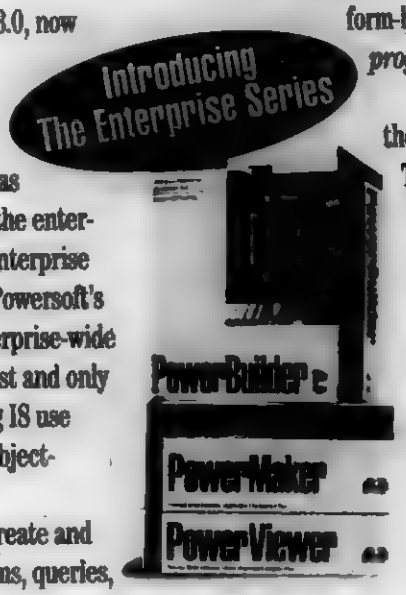

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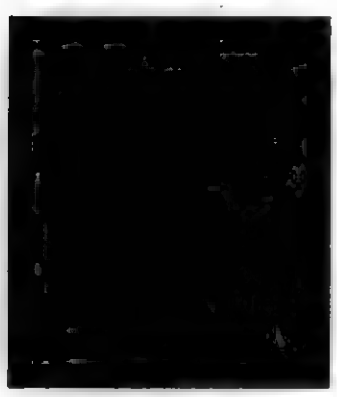

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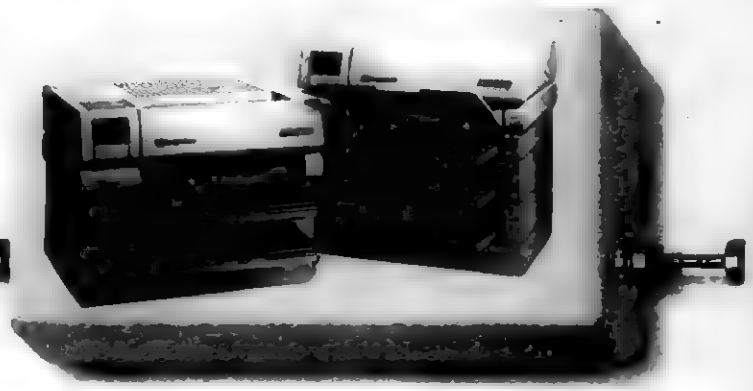

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New tools create an open Notes

By Michael Vizard

Lotus Development Corp. will move this week to shatter the image of its Notes environment as a closed system when it announces a set of alliances with leading providers of application development tools at its Lotusphere conference in Orlando, Fla.

Among those vendors will be Information Builders, Inc., Informix Software, Inc., Powersoft Corp., the Ingres Products Division of The ASK Group, Inc. and Revelation Technologies, Inc. All are expected to deliver Notes support in the first half of 1994. Meanwhile, discussions with Oracle Corp. are ongoing.

"A lot of corporations have the perception that Notes is a closed proprietary environment. Having these tools will go a long way to changing that perception," said Randal Zahora, president of Workgroup Productivity Corp., a consulting firm in Oak Brook, Ill.

Better tools for linking

In general, these agreements will shore up the Notes application development environment, which is hampered by a lack of graphical client/server tools, and give developers better tools for linking Notes with SQL databases.

"We'd expect to see a much cleaner two-way data flow. Right now there are batch products, but for real-time exchange you have to go with the Notes API, which is not as strong as we

Notes tools, *page 56*

E-mail integration

LinkWorks lacks key link

By Craig Stedman

Digital Equipment Corp. plans next year to add front-end support to its LinkWorks workgroup integration software so it can work with leading PC mail packages. That key capability is missing from the first LinkWorks release, scheduled to ship this month.

Ronni Marshak, editor in chief of the "Workgroup Computing Report" published by Patricia Seybold Group in Boston, described the absence of direct support for Microsoft Corp.'s Microsoft Mail and Lotus Development Corp.'s CC:Mail as LinkWorks' main flaw.

"I'm not sure how useful it is without mail integrated into it," Marshak said. "If people are already using CC:Mail or Microsoft Mail, they're not going to be willing to go backward on functionality." LinkWorks will be "much more attractive" once it can work with those packages, she added.

Users looking for more

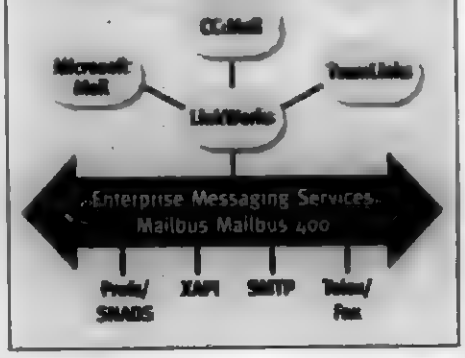
"The closer it looks to the things that people are using, the better it will be," agreed Michael Frow, vice president of credit at Bank of Montreal's U.S. operations in Chicago. The bank is implementing LinkWorks in its corporate banking department, where Microsoft Mail is the dominant mail package.

Dilip Phadke, LinkWorks group marketing manager at Digital, said the next release of the workgroup product will tie directly to both Microsoft Mail and CC:Mail. Digital's own TeamLinks mail software will also be supported in that release, which should be ready by "approximately summer," Phadke said.

Initially, LinkWorks has to go across Digital's Mailbus or Mailbus 400 messaging backbones and pass through gateways to hook up with the PC mail packages. It relies on a native X.400 mail client for now, although support is also included for Digital's VMSmail product and the Unix-oriented Simple Mail Transfer Protocol (SMTP).

Mail call

Under Digital's plan, LinkWorks will tie PC mail clients to wide-area messaging environments that are connected to its messaging backbones



Not fully rounded

Phadke insisted that the mail capability "is not as limited as some people think it is." However, other analysts agreed with Marshak that LinkWorks will not be a fully rounded product until Microsoft Mail and CC:Mail can be accommodated in a more seamless fashion.

"If mail is not one of the things you can link up to easily at first, it would be a knock" against LinkWorks, said David Yockelson, a research analyst at Meta Group, Inc. in Westport, Conn. "You want to play in whatever environment you're need to," he added.

Native X.400 is much more complicated than packaged

LinkWorks, *page 53*

Oracle, Novell pact aids DBMS on networks

Software bundle seeks to simplify administration of Oracle 7 on NetWare

By Kim S. Nash

The bundling of Oracle Corp.'s database with Novell, Inc.'s NetWare and UnixWare operating systems is more of a marketing pact than a technological advancement, observers said. But the packaging is expected to offer some advantages in terms of deploying Oracle 7 databases over networks.

As NetWare gains ground in client/server settings, critics have charged that products from Oracle and other relational database makers are difficult to monitor and maintain over a LAN. OracleWare seeks to change that. Packaging the database with NetWare — and UnixWare later in 1994 — is a stab at simplifying the tasks of installing and administering Oracle 7 on a LAN.

Meanwhile, Sybase, Inc., Informix Software, Inc. and The ASK Group, Inc. have all announced that NetWare Loadable Modules (NLM) supporting NetWare 3.12 and NetWare 4.0 will be available for their latest databases during the same time frame.

"There isn't much difference between an NLM and OracleWare, except the single-point support," said Wayne Kernochan, an analyst at Aberdeen Group in Boston. "It remains to be seen whether OracleWare will truly be easier to support over Novell because of this bundling."

Shipping this week

Novell and Oracle have promised to ship the first iteration of OracleWare, a database and network operating system bundle, this week to NetWare resellers. Users should be able to get hold of the product two weeks from now, the firms said.

Users will also be able to install Oracle 7 and accompanying tools directly from existing NetWare consoles. That means the database will be easier to administer and maintain because users monitor it from the network operating system level with a single view.

OracleWare is aimed at department-level client/server setups. Some observers see OracleWare as a thrust to Microsoft Corp.'s parry of a low-priced SQL Server database for Windows NT sold through resellers.

Microsoft's $1,495 price tag for a low-end SQL Server for NT setup "should be a big concern for Oracle and other database companies," said Michael Corey, president of the International Oracle Users Group.

Indeed, database pricing has to give way next year as NT installations grow, said Bill Shattuck, an analyst at Montgomery Securities in San Francisco.

OracleWare — sold indirectly and aimed at smaller users — partly addresses Microsoft's advances, according to Shattuck.

However, observers noted that a factor in OracleWare's favor is that users rely on Oracle for primary technical support — even for NetWare or, eventually, UnixWare questions.

Meanwhile, Novell resellers are learning the ins and outs of Oracle products so that they can answer some base-level database questions.

NLM questioned

Announced in June, various OracleWare bundles are slated for staged release, with a NetWare 3.12 edition due out in two weeks. A UnixWare edition is expected by first-quarter 1994, to be followed by a NetWare 4.0 version by midyear, the companies said.

Some users maintain that LANs lack the power and reliability of a host-based system for large applications, and therefore they are uninterested in either NLMs or OracleWare.

"You'll never get an NLM to perform as well as a database on a host," said Ira Kirschner, director of technology services at J. J. Kenny Co. The New York financial firm intends to switch most of its NLM applications over to a multiprocessing machine from Sequent Computer Systems, Inc., he said.

Tools bundled

Oracle Office, an office automation suite, and Oracle Glue, a tool to connect the Oracle database with various front-end query and development products, are also part of the various OracleWare bundles.

The price is ...

OracleWare for NetWare 3.12 is priced at $3,095 for a five-user version.

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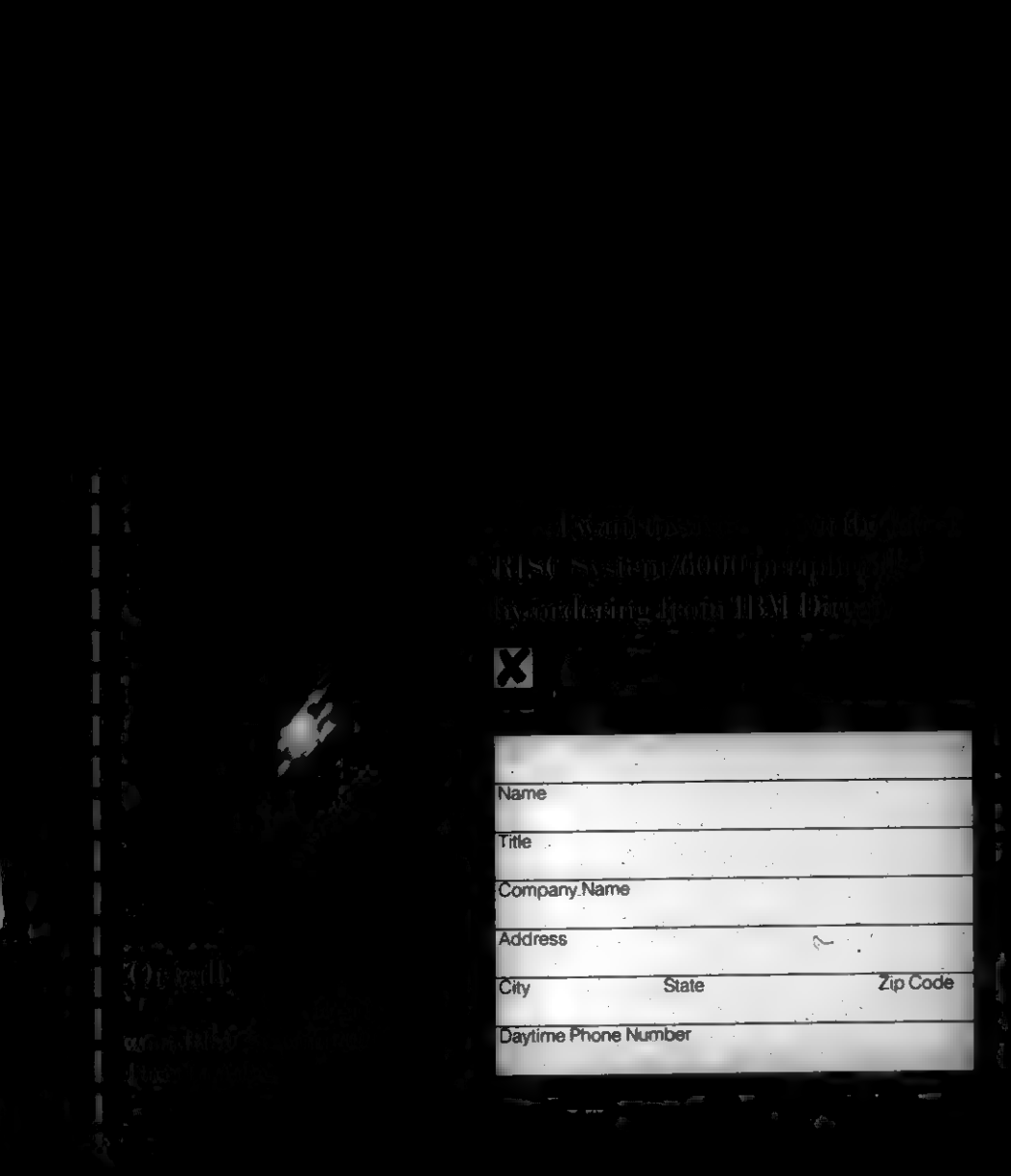
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Digital's LinkWorks: Missing key link

CONTINUED FROM PAGE 51

mail products, Marshak noted. "X.400 is a horrible environment for users," she said. "It has all sorts of codes that don't mean anything to anybody except a mail guru. You need a mail front end to hide all that stuff."

About 150 of Bank of Montreal's 1,150 corporate banking employees are using the X.400 mail client as part of the bank's LinkWorks installation, Frow said. X.400 provides "lots of flexibility and very powerful capabilities," such as conditional routing of messages, he added. "But the price you pay for power is complexity, obviously."

Users like functionality

While Microsoft Mail is not as robust as native X.400, employees "are very comfortable and happy with its functionality," Frow said.

As a result, Bank of Montreal is interested in using it as a front end into the X.400 mail engine in LinkWorks. "A hybrid is definitely what's required," he said.

Conrad Wiser, data center manager at Martin Marietta Corp. in King of Prussia, Pa., said mail "is always a concern" for his users.

"The better coordinated everything is from the start, the easier it would be to integrate into our environment," added Wiser, who looked at LinkWorks but has not yet committed to using it.

Beyond the initial mail shortcomings, analysts have a generally positive view of LinkWorks.

"Digital is a lot clearer about the whole workgroup market than it used to be," Marshak said. "I would not go out and buy LinkWorks yet, but the product has potential."

Can users cope with little to no control?

A thorny issue that Digital and potential customers face with LinkWorks is how much control individual users should have over their desktop environments.

The balance of power is weighted toward systems administrators for now, but analysts said that goes against the workgroup grain.

"There's typically a demand for freedom in workgroup settings, and [LinkWorks] doesn't allow for that," said Roxni Marshak, an analyst at Patricia Seybold Group in Boston.

"Desktop users have absolutely no power to configure anything or decide anything," Marshak said.

"It's kind of at the opposite end of the Lotus Notes spectrum, where everyone can collaborate freely," added David Yockelson, a research analyst at Meta Group. He noted, however, that the top-down approach may be the right one for clerical-oriented applications such as claims processing.

Dilip Phadke, LinkWorks group marketing manager, said LinkWorks has built-in flexibility for allowing users to have some say over their setups, but the power to provide access to those features resides with the systems administrator.

"It's really the choice of the customer," Phadke said.

User manipulation of LinkWorks "is a tough issue to deal with," acknowledged Michael Frow, vice president of credit at Bank of Montreal's U.S. operations in Chicago.

According to Frow, "There's always this paradox between central control and empowerment."

Giving too much control to individuals could make it hard for users to log on to their desktops from other PCs, which is one of the bank's key goals with LinkWorks, Frow said.

The bank, therefore, has a standard environment, but it provides some flexibility and does not shut off access to the Windows program manager, he added.

On the other hand, the States of Guernsey police department in the UK expects to "take a pretty strict approach," said Inspector Mike Burrows.

"One of the nice things about LinkWorks is the ability to do that," Burrows continued. "The system administration capabilities are pretty powerful."

— Craig Stedman

Briefs

New backup software

IBM's Storage Systems Division said its new versions of software to back up and recover files on the RS/6000 and OS/2 platforms, will extend its Adstar Distributed Storage Manager (ADSM) server software to both RS/6000 and OS/2 machines. The original versions ran on IBM's VM and MVS mainframes. Now, ADSM can automate backup and recovery of geographically distributed data files. Among the clients supported are a variety of Unix workstations, OS/2 and DOS PCs and Macintoshes. The OS/2 server software is priced from $1,500 for 10G bytes of managed data, and the RS/6000 version is priced from $3,750 for 25G bytes of managed data.

Testbed chooses Earth

Hewlett-Packard Co. said the National Information Infrastructure Testbed has chosen the Earth Data System environmental research software, co-developed by HP and Ellery Systems, Inc., for transparent access to heterogeneous servers and real-time application on HP workstations.

Go with the flow

FileNet Corp. in Costa Mesa, Calif., will market its document imaging and WorkFlo software to IBM RS/6000 users as an AIX application. FileNet said users can license the software from FileNet or IBM.

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Database query tools

Dimensional bolsters tools with report writer

By Michael Vizard

■ Dimensional Insight, Inc. in Burlington, Mass., has enhanced its CrossTarget database query tools with a customizable report writer, called the Reporter, and a set of interfaces, called the Selector, that link its tools with SQL databases.

Aimed primarily at giving professionals access to data that has been moved from a mainframe database to a smaller engine supporting multidimensional analysis, the CrossTarget tools also include a facility called Diver, which allows users to do drill-down data analysis. Another capability, called the Data Integrator, allows users to link queries across dissimilar databases.

Taken together, the Dimensional Insight tools let information systems managers download production data to a separate server engine, precluding end-user queries from slowing the performance of the transaction processing system with ad hoc queries, the vendor said.

No slowing down now

For example, Vetrotex Certained Corp., a fiberglass manufacturer in Wichita Falls, Texas, has deployed CrossTarget on a Macintosh server that is linked to an IBM mainframe.

Every morning, the company downloads data from the mainframe, against which 20 to 30 engineers and other personnel run queries.

"Improving performance as part of a downsizing project was a huge issue for us," said MIS manager Alan Brinkley.

"The performance is excellent. Anything that takes more than a second means we have a network problem. And we're running queries against over 10,000 records," he said.

According to Dimensional Insight President Fredrick Powers, the company is looking to combine the multidimensional database functionality of an executive information system, which traditionally has supported only canned queries, with that of a decision-support system featuring ad hoc queries.

More flexible

As part of that effort, Dimensional Insight has created a server engine that can either be deployed on the same system as the company's primary database or on a separate server.

Powers argued that his company's approach is more flexible than deploying multidimensional databases that have larger amounts of overhead and require more systems management to create preprocessed queries.

CrossTarget engines and tools run on Macintosh and Digital Equipment Corp. OpenVMS systems. A Windows version will ship this quarter, and a Unix version will be available in early 1994.

Pricing averages about $1,200 per client, depending on configuration.

Notes tools

CONTINUED FROM PAGE 51

would like it to be," Zahora said.

"Our world has been expanding from Notes to the corporate databases for a long time now. It's very clear Notes won't stand by itself," added Ron Beck, senior director of technical services at Synetics Corp., a consulting firm in Wakefield, Mass.

Earlier this year, Lotus addressed these same issues through a pact with Gupta Corp., which announced it will deliver Notes support for its tools in the third quarter of 1994 [CW, Oct. 25].

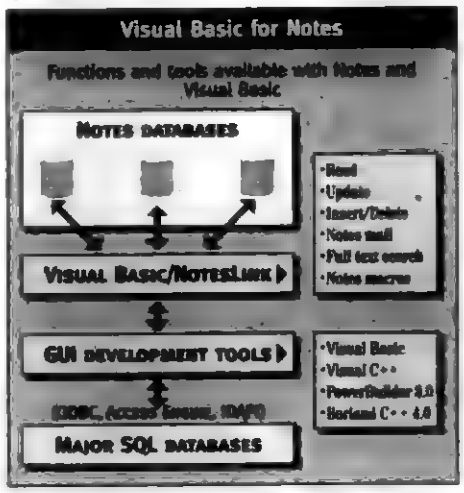
Brainstorm takes lead

Since then, Brainstorm Technologies, Inc. in Framingham, Mass., has announced it will deliver next week an interface that allows applications written with Visual Basic to run on top of Notes [CW, Nov. 1]. Lotus plans to deliver its own application development environment, called Notebook, in 1994. Based on Lotus' forthcoming LotusScript derivative of Visual Basic, the Notebook offering is intended to give Lotus a rival offering to Microsoft Corp.'s Visual Basic.

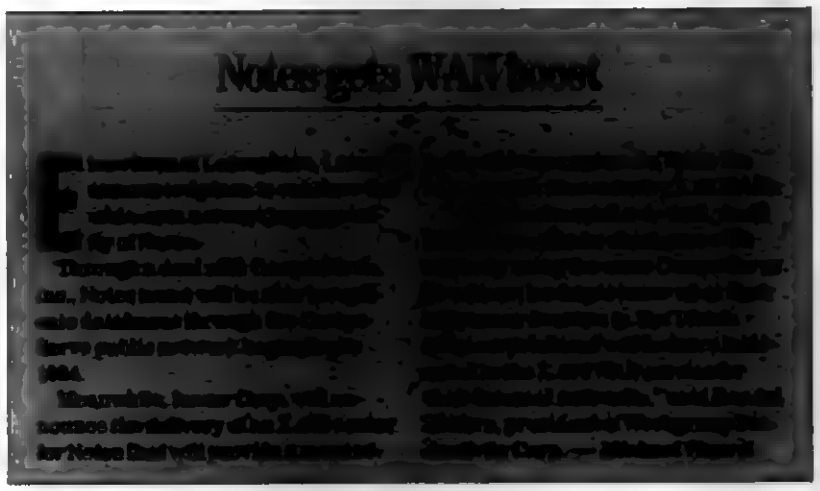
But early adopters of Brainstorm's VB/Link report they can no longer wait for Lotus to deliver Notebook, which Lotus began promoting earlier this year.

"We'll have to wait and see about Notebook. So far, it's vaporware, and we've given up hope on it," said Greg Burnett, a project manager at Waste Management of North America in Oak Brook, Ill.

Instead, Burnett said he plans to use VB/Link to build electronic forms in Visual Basic that can read and write to a Notes database.



"Visual Basic will allow us to simplify the user interface for Notes and allow us to build some types of forms that we can't build now. We won't replace all our Notes applications with Visual Basic ones, but for some types of applications Visual Basic makes more sense," Burnett said.



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Cambex Corp. has introduced the Cambex Certainty 6500-28, a 128M-byte memory card.

According to the Waltham, Mass., company, the product allows users to double the capacity and extend the life of every IBM RS/6000 computer that uses IBM's HD-1 memory technology, and it is fully compatible with all RS/6000 computers that use IBM HD-1 memory technology.

The Cambex Certainty 6500-28 can be swapped card-for-card for the IBM technology.

The product is priced at $19,500 in single quantities.

▶ *Cambex*
(617) 890-6000

Wyse Technology, Inc. has announced the WX series, a family of high-performance RISC-based color and monochrome X terminals.

According to the San Jose, Calif., firm, the WX series, which is based on the Mips Technologies, Inc. R3000 processor, offers 1,280- by 1,024-pixel display resolution and 64M bytes of display memory.

The WX series consists of three color models available in 15-, 17- and 19-in. displays and two monochrome models with 17- and 19-in. displays.

All of the systems are equipped with Ethernet interfaces supporting standard Ethernet protocols, including TCP/IP and Digital Equipment Corp.'s DECnet.

Prices range from $2,095 to $3,995.

▶ *Wyse Technology*
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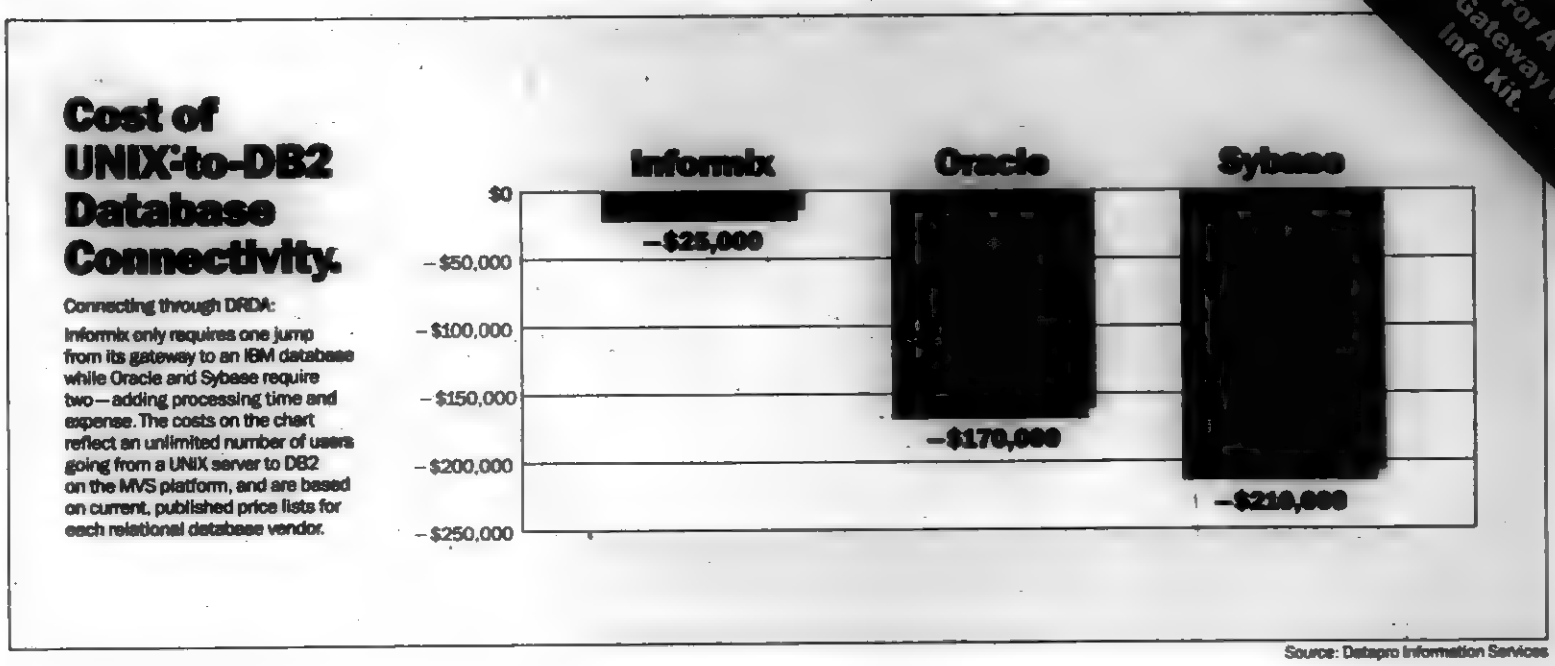

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UNIX-to-DB2 Connectivity

	Cost	Complexity	Products Required on Mainframe	Communication Protocol
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Oracle	$170,000	Three Products: SQL Connect, SQL Net, Protocol Driver	Yes	Proprietary
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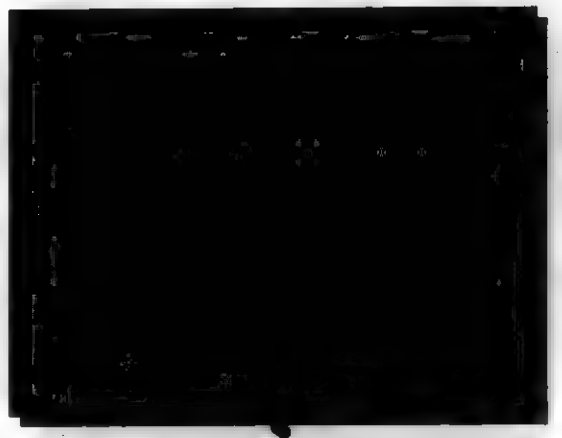

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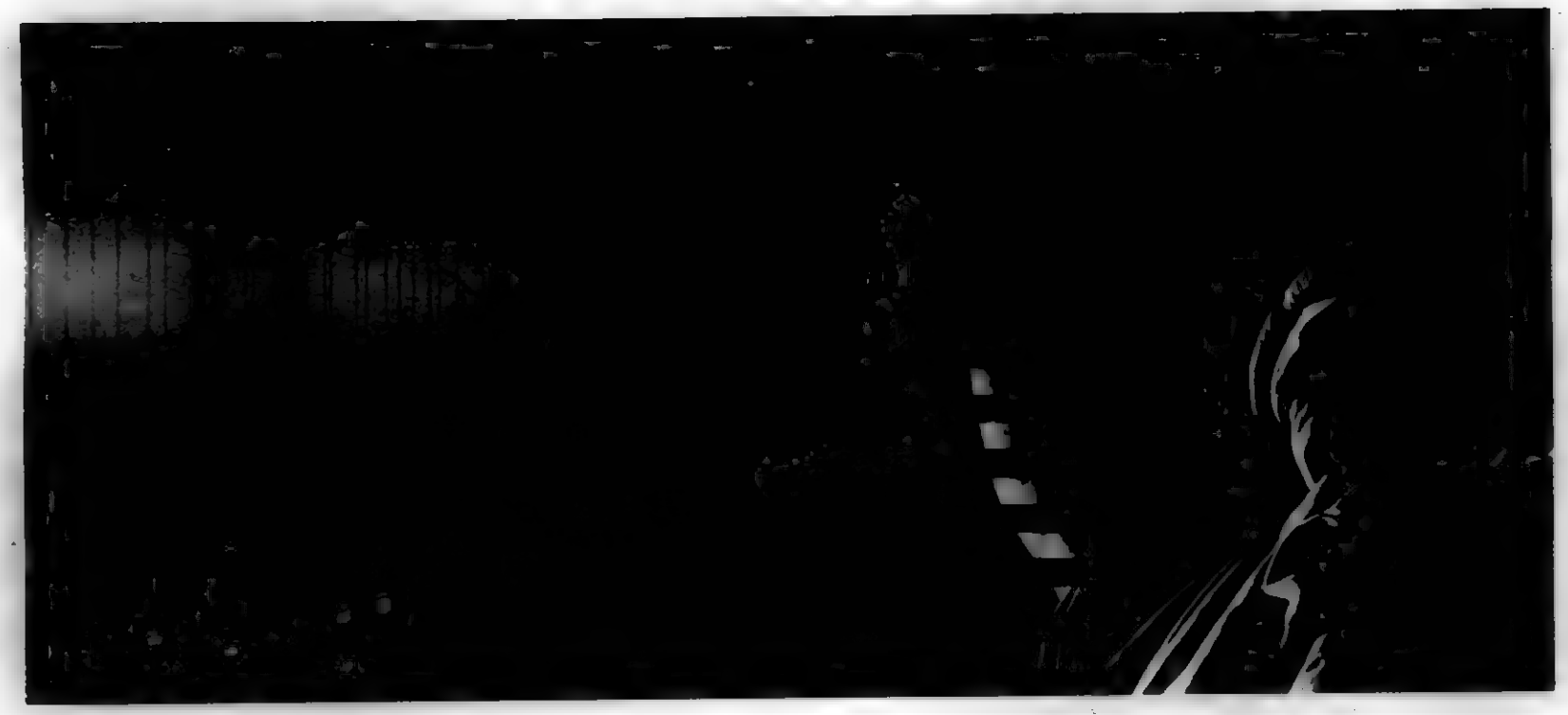

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TECHNOLOGY

Sun Life walks down/upsizing line

By Joanie M. Wexler and Stephen P. Klett Jr.
WELLESLEY, MASS.

Early this year, networking officials at Sun Life Assurance Co. of Canada's U.S. headquarters realized they needed to rein in a proliferating mass of LANs. The LANs were springing up willy-nilly and creating slow network response times, an unmanageable tangle of wires and a generally nonscalable network environment.

So the $31 billion insurer embarked on a $1 million, 12-month project to revamp its network infrastructure, which is now being challenged to support an influx of client/server applications.

The old unstructured cabling setup "wouldn't allow the network to be redesigned. There were no records as to what [wires] went where," explained John A. Kruk, telecommunications and network services officer.

Three-tiered effort

The thrust of the overhaul has been to better manage resources in three ways: balance processes appropriately between LANs and the corporate mainframe, implement smart switching hubs that allow information systems to reconfigure LANs on the fly and pare communications protocols and equipment (see story page 63).

Previously, by allowing users to link to servers as they saw fit, the firm was trying to run "a Minuteman army with West Point precision," Kruk said. "What we got was a ball of yarn all tangled up."

To untangle the network, Sun Life replaced dumb IBM Token Ring wiring concentrators with 17 Bytex Corp. Series 7700 smart hubs. The hubs provide Sun Life with sophisticated LAN bandwidth management capabilities so users can be reassigned to new servers through software commands rather than manual recabling.

Previously, Sun Life users had to go through multiple servers located on a backbone ring to access a variety of applications, which cluttered up the network and drained the servers of processing power, according to Kruk.

For internetworking, Sun Life has gone the route of the collapsed backbone, where a high-end Wellfleet Communications, Inc. Backbone Concentrator Node sits in the data center, allowing buildingwide LANs to interconnect through the one centrally managed box rather than requiring routers on every floor.

Wellfleet's technology relationship with Bytex means the two devices can be managed together, said John Scanlon, senior network analyst at Sun Life. However, he said he has concerns about what router vendor Network Systems Corp.'s recent purchase of Bytex [CW, Oct. 4] will mean for that relationship.

Wellfleet and Bytex "are not really going to be able to innovate together because Wellfleet and [Network Systems] are direct competitors," Scanlon said. He said he had no inkling of the buyout when Sun Life chose Bytex as its hub vendor last summer.

Meanwhile, despite doomsday predictions about the fate of IBM Networking Systems' cash cow, the 3745 front-end processor, Sun Life spent

Sun Life, page 63

Sun Life's John A. Kruk: *The old network was like trying to run a 'Minuteman army with West Point precision'*

ON SITE

Sun Life of Canada
Wellesley, Mass.

Challenge: To strike a cost-effective and manageable balance of downsized and upsized applications and create the underlying network infrastructure to support it.

Building blocks: Bytex smart wiring hubs, Wellfleet multiprotocol routers, a new IBM 3745 front-end processor, Novell NetWare.

Payback: Ability to handle 50% of staff moving or changing each year through software; to reap client/server cost benefits while maintaining mainframe advantages where applicable.

Novell one step closer to NetWare distributed manager

By Elisabeth Horwitt

Several users are treating NetWare Management System (NMS) 2.0, which Novell, Inc. began shipping this fall, as a useful intermediate step to the fully distributed, scalable NetWare Distributed Management Services (NDMS) that Novell should start rolling out sometime next year.

Indeed, NMS 2.0 paves the way to NDMS by providing distributed NetWare Loadable Module (NLM) versions of key management services, such as the Remote Network Monitoring (Rmon)-compliant LANalyzer, which monitors and diagnoses LAN traffic, said Steve Dauber, network management product line manager at Novell.

Novell formerly provided LANalyzer only as a stand-alone system that needed to be installed at each LAN it monitored. That approach was both expensive and troublesome, users reported. In contrast, NMS 2.0 provides LAN packet diagnostics in the form of Rmon agents that sit on a NetWare server on each LAN, collect statistics and report back to the central NMS console.

United Parcel Service, Inc. is in the process of deploying NMS 2.0 and is finding the LANalyzer service "a phenomenal tool [that allows the administrator] to click on the server, collect statistics, packet rates and figure out the problem," said Ralph Perez, section manager of LAN systems programming at UPS.

However, Perez expressed concern whether real-time collection and analysis of LAN traffic would overload his servers: "Novell, I think, calls it full-impact mode when it is acting as a LANalyzer." UPS is still evaluating impact.

Multiple management

The current NMS architecture requires that a single centralized Windows-based system collect all management information and initiate all management functions. The ability to distribute management functions across multiple NetWare servers, which NDMS will provide, is essential if the platform is to cope with a broad

Novell, page 63

Third-party support

Novell's NMS 2.0 has picked up strong support from third-party vendors. SynOptics Communications, Inc., for example, recently announced an NMS 2.0 version of its Optivity hub-based management system.

Optivity for NMS 2.0 includes an AutoTopology feature that automatically discovers hubs, bridges, switches and end-user devices such as PCs and plots their dynamic relationships, said SynOptics product line manager Tom Dyal.

Also included are NodalViews applications that "take a logical slice through the network and show all users part of the network what traffic is being generated, error conditions and who or what is eating up bandwidth" in a graphical fashion, Dyal said.

The above applications can report into the NMS database, giving network administrators views all the way to the user level, "so they can search for a NetWare user name and show what hub, bridge, port and slot the user's PC is connected to" on a topological map, Dyal said.

The AutoTopology and NodalViews on Optivity "are very nice," said Brian Gunnell, second vice president of data processing at Conseco Co., who saw the product demonstrated.

"All of my LAN administrators are in data processing; none [are in] in the user community," Gunnell said. "It's very exciting to be able to enter a user or node ID in the management station, find the user's port and look at the information relating" to the user.

Editorial Calendar (January-June, 1994)

Issue Dates	Ad Closings Color*	Ad Closings B&W	Editorial Features	Show Distribution	Ad Readership Study Issue	Response Card Deck
Dec. 27 & Jan. 3	Dec. 10	Dec. 17	**Special Edition:** Annual Forecast Issue			
Jan. 10	Dec. 24	Dec. 31	**Closer Look:** Object Database Management Systems		Starch	Mails: Jan. 12 Close: Dec. 11
Jan. 17	Dec. 31	Jan. 7	**CW Guide To: Spreadsheets and Spreadsheet Utilities** The New Capabilities *Buyers' Satisfaction Scorecard:* Windows Packages from Borland, Lotus, Microsoft, etc. *Firing Line:* Latest Windows Offering			
Jan. 24	Jan. 7	Jan. 14	**Closer Look:** ATM	**ComNet** Washington D.C., 1/25 - 1/27		
Jan. 31	Jan. 14	Jan. 21	**CW Guide To: Departmental Servers and Superservers** Matching a System to Departmental Needs (including Alpha, Tricord, Netframe, Sun, RS/6000, NCR, Sequent, Wyse, Compaq) *Buyers' Satisfaction Scorecard:* Leading RISC Servers *Firing Line:* Latest Server Product	**Executive Technology Summit** Tarpon Springs, Florida 2/2 - 2/4		
February		Dec. 27	CLIENT/SERVER JOURNAL	All Shows Feb. - April	Harvey	
Feb. 7	Jan. 21	Jan. 28	**Special Quarterly Report:** Re-engineering the Workplace		Starch	Mails: Feb. 9 Close: Jan. 3
Feb. 14	Jan. 28	Feb. 4	**CW Guide To: Management Tools for Large Networks** What Works When Systems are Distributed *Buyers' Satisfaction Scorecard:* Multivendor Network Management Software from DEC, HP, IBM,Sun, etc. *Firing Line:* Latest Management Package	**Networks Expo** Boston, 2/15 - 2/17		
Feb. 21	Feb. 4	Feb. 11	**Closer Look:** Windows and OS/2 Imaging Software			
Feb. 28	Feb. 11	Feb. 18	**CW Guide To: Work Flow Software** The Reality Behind the Promises *Buyers' Satisfaction Scorecard:* Leading Work Flow Software Systems *Firing Line:* Latest Work Flow Managers	**Groupware '94** Boston, 2/28 - 3/3		
Mar. 7	Feb. 18	Feb. 25	**Closer Look:** Desktop Laser Printers		Starch	Mails: Mar. 9 Close: Jan. 31
Mar. 14	Feb. 25	Mar. 4	**CW Guide To: RAID** Choosing Among the Various Levels of Disk Array Technology *Buyers' Satisfaction Scorecard:* Leading Server-based RAID Systems *Firing Line:* Latest Mainframe RAID Subsystem			
Mar. 21	Mar. 4	Mar. 11	**Closer Look:** Unix Workstations	**UniForum** San Francisco, 3/23 - 3/25		
Mar. 28	Mar. 11	Mar. 18	**CW Guide To: Wireless Networks The** Spectrum of Technologies, Including LANs, WANs and Radio Frequency *Buyers' Satisfaction Scorecard:* Leading Wireless LANs *Firing Line:* Wireless Services Product			
Apr. 4	Mar. 18	Mar. 25	**Closer Look:** Personal Productivity Software			
Apr. 11	Mar. 25	Apr. 1	**CW Guide To: NT vs. OS/2 vs. Unix** Desktop and Server Choices *Buyers' Satisfaction Scorecard:* Leading Server Operating Systems from IBM, Microsoft , Sun, etc. *Firing Line:* Latest Desktop Operating Systems from a Leading Vendor		Starch	Mails: April 13 Close: Mar. 17
Apr. 18	Apr. 1	Apr. 8	**Management Special:** IS Architecture in Times of Change	**AIIM** New York 4/18 - 4/21 **SIM Conference** Florida, 4/20 - 4/22		
Apr. 25	Apr. 8	Apr. 15	**CW Guide To: Data Access Tools** New Tools for Quick Access to Data Buried in Older Flat-file and Hierarchical Databases *Buyers' Satisfaction Scorecard:* Leading SQL-based Data Access Tools *Firing Line:* Latest Data Access Tool from a Leading Vendor			
May		Mar. 30	CLIENT/SERVER JOURNAL	All Shows May - July	Harvey	
May 2	Apr. 15	Apr. 22	**Closer Look:** Distributed Computing Environment	**Interop+Networld** Las Vegas, 5/2 - 5/6		
May 9	Apr. 22	Apr. 29	**CW Guide To: Mobile Computing** From Notebooks to PDAs *Buyers' Satisfaction Scorecard:* Leading Notebook Computers *Firing Line:* Latest Sub-notebook Product from a Leading Vendor	**International DB2 Users Group** San Diego, 5/8 - 5/12		Mails: May 11 Close: April 14
May 16	Apr. 29	May 6	**Special Quarterly Report:** Re-engineering the Workplace		Starch	
May 23	May 6	May 13	**Windows World Open Supplement** **CW Guide To: The Impact of OLE 2.0** What OLE can do for IS and How to Make Sure Your Favorite Desktop Software Vendor is Up to Speed *Buyers' Satisfaction Scorecard:* Leading OLE Applications *Firing Line:* Latest OLE Development Tool	**Windows World Comdex Spring** Atlanta, 5/23 - 5/26 **DB Expo** San Francisco, 5/24 - 5/27		
May 30	May 13	May 20	**Annual Job Satisfaction Survey** How IS Professionals and Managers Really Feel About Their Jobs and Careers			
June 6	May 20	May 27	**CW Guide To: Distributed DBMS** Selecting the Right Engine for a Distributed Database Architecture *Buyers' Satisfaction Scorecard:* Leading Relational DBMS *Firing Line:* Latest Relational DBMS Product	**Computerworld Smithsonian Awards** Washington, DC		Mails: June 8 Close: May 2
June 13	May 27	June 3	**Closer Look:** AS/400		Starch	
June 20	June 3	June 10	**CW Guide To: Mainframes** How Big Iron Vendors are Answering the Challenges of the Mainframe's Changing Role *Buyers' Satisfaction Scorecard:* Leading Mainframes from Amdahl, HDS, IBM, etc. *Firing Line:* Latest Mainframe Model			
June 27	June 10	June 17	**Closer Look:** PCMCIA Cards	**PC Expo** New York, NY, 6/28 - 6/30		

Editorial contacts (508) 879-0700 CW Guide: The Guide includes a package of articles on the stated topic, in addition to Buyers' Scorecard and Firing Line
Feature Editor: Joanne Kelleher, *Management Features:* Allan Alter, *Closer Look:* James Connolly, *CW Guide Articles:* Mary Brandel & Derek Slater, *Buyers' Satisfaction Scorecard:* Michael Sullivan-Trainor, *Firing Line:* Garry Ray

***Color close also applies to ads within Special Editorial Features and Premium Positions.**

Mary J. Cronin

Internet shortcuts

It would make sense to index the resources on the Internet in a consistent, easy-to-use format, but so far that hasn't happened. Users must still contend with imprecise navigational tools and haphazard subject descriptions. However, some shortcuts can make on-line excursions less frustrating and more profitable. Here are a few of them:

▶Demographic and marketing data for every state, city and metropolitan area in the U.S., including disposable personal income per capita, can be found in the 1990 Census Summary tables. These are available for searching at many university Internet sites, including the University of Southern California (Telnet to cwis.usc.edu) and the University of Pennsylvania (Telnet to penninfo.upenn.edu).

The Economics and Business directory at USC also provides access to Asia and Pacific business and marketing resources, Central European business information and world statistics from the United Nations.

▶If tracking recent federal legislation is a priority, the Library of Congress (Telnet to marvel.loc.gov) maintains a current legislative database, searchable by subject as well as by sponsor and bill number. The same connection provides an Internet gateway to the White House, the Food and Drug Administration, the Department of Commerce and the Department of Energy.

▶Everywhere you turn on the Internet are stores of government information. The National Technical Information Service offers free information on patents, technical research and regulations available through Fedworld (Telnet to fedworld.doc.gov).

The Commerce Department plans to charge an annual subscription fee for the data it posts daily on the Economic Bulletin Board — economic indicators, treasury rates and international trade opportunities — but new users can browse for free (Telnet to ebb.stat-usa.gov and log in as trial). You can't download the files, but you can read them on-line.

▶Trade and export resources on the Internet range from documents such as the Export Guide from the National Trade Data Bank and the text of the North American Free Trade Agreement, accessible at the University of Missouri at St. Louis (Telnet to umslvma.umsl.edu), to discussion lists where deals are often made between vendor and customer. Terry Brainard Chadwick, president of InfoQuest, used the Eastern European Business Network list to match a U.S. manufacturer of food dehydrators to entrepreneurs and government clients in Hungary. She describes this list as one of the "hidden assets" of the Internet. (To subscribe, send E-mail to listserv@ncsuvm.cc.ncsu.edu.)

▶Many corporations use the Internet to deliver late-breaking news to corporate desktops. AT&T, for example, provides daily international and domestic news updates to corporate staff through ClariNet, an Internet-distributed newswire service.

For an annual fee, ClariNet organizes thousands of stories from United Press International and other agencies into customized "electronic newspapers" with intensive coverage of desired topics.

▶For a sample of what's news in any area, there's also the Electronic Newsstand, which offers tables of contents and selected articles from publications such as *The Economist*, *Financial World*, *Technology Review* and *Computerworld* over the Internet (Telnet to gopher.netsys.com and log in as news). More full text is a possibility down the road, but right now, this is more an appetizer than a complete meal.

Cronin is the author of *Doing Business on the Internet: How the Electronic Highway is Transforming American Business* (Van Nostrand Reinhold). She can be reached on the Internet at cronin@bcvms.bc.edu.

Novell takes distributed step

CONTINUED FROM PAGE 61

range of management services and manage the hundreds or thousands of client and server systems that reside at many corporations, Dauber said.

The migration of LANalyzer to NetWare servers is one of the first steps Novell has taken to move users from NMS' centralized architecture to NDMS' distributed platform that sets up NetWare servers as domain managers for local client/server networks, Dauber said.

Another management service that has already been distributed as an NLM is NetExplorer, an NMS discovery service that automatically determines what resides on the network.

During the next six to 12 months, Novell will migrate other services to NLMs, including inventory management, software distribution, real-time monitoring and analysis of network traffic and user administration, Dauber said.

> NDMS "is so far in the future, Novell isn't saying much to end users except, 'Trust me.'"
>
> *— Brian Gunnell, Conseco Co.*

Migration fears

Users did express some fears about the difficulty of migrating from a centralized to a distributed system. "Migration is a concern, especially as we get more dependent on NMS," said Brian Gunnell, second vice president of data processing at Conseco Co., a Carmel, Ind., manufacturer. "If you change the architecture or if it's converted to another environment, it's a concern, but [NDMS] is so far in the future, Novell isn't saying much to end users except, 'Trust me.'"

Novell is smoothing the way for users to migrate from NMS to NDMS by preserving user and application interfaces between the two platforms, Dauber said. However, he said that users may run into some challenges migrating their management databases off one or more Windows systems to a single database structure on a NetWare server. The NetWare database, which acts as common ground for applications to share data, is a linchpin for NDMS' distributed architecture.

Tim Clark, network support supervisor at Ciba Vision, said he was concerned about how much more it would cost to set up separate domain managers under NDMS.

NDMS should actually help customers keep costs down by allowing them to implement management services on existing NetWare servers, Dauber said. Then if they add more users, network devices or services, they can simply add more servers to share the load.

Sun Life

CONTINUED FROM PAGE 61

$250,000 on a new 3745 to improve performance over its 3725, which Kruk said was too small electronically and too big physically to meet Sun Life's needs. These include some backup of the mainframe in Sun Life's Toronto headquarters.

"Every time the power fluctuated, [the 3725] went down," plus it didn't support 16M bit/sec. Token Ring and frame relay, Kruk said.

The 3745 is indicative of the fact that Sun Life's mainframe still plays an active role in the company. While the insurance provider is counting on client/server for its flexibility and cheaper MIPS, it has decided to "upsize" certain appropriate functions, including data storage and electronic mail, according to Kruk.

The insurer discovered that having each user's logon, applications and files stored on 21 servers spread across Sun Life's three-building campus — combined with the fact that users weren't cleaning out their files — made managing LAN-based storage a nightmare, Kruk said.

Back to mainframe

Then came the cost of providing separate uninterruptible power supplies and archival backup and storage — functions that in the mainframe world come as a package deal. These factors, plus Kruk's perception that current LAN-based mass storage products lack sophistication and reliability, led the insurer to move storage management back to the mainframe.

In addition, when the firm's pricing policy for 1994 changed to allow unbundled fees for mainframe services, Sun Life realized it could not beat the mainframe charge of $20 per month per user for E-mail by running it on a LAN.

Thus, Sun Life's custom E-mail package once again resides on the mainframe.

Whittling away

The recent company trend of paring down diverse equipment and communications protocols to ease management headaches is evident on several fronts at Sun Life.

On the LAN software side, the insurer is easing off its Banyan Systems, Inc. Vines internetwork in favor of Novell, Inc.'s NetWare. The insurer wants to run fewer network protocols and opted for NetWare largely because "mainframe applications port better to NetWare than to Vines," said John Kruk, telecommunications and network services officer.

Meanwhile, the company has standardized on Compaq Computer Corp. SystemPros for servers and has stopped purchasing Banyan CNB servers and IBM PS/2 Model 95s.

To boost power at the desktop, Sun Life is transitioning its nearly 800 Intel Corp. 80386 and 80286-based PCs, mostly of IBM origin, to 1486-based systems, also from IBM. However, Kruk said he is concerned that this may be only a Band-Aid fix with the advent of Intel's Pentium and the Motorola, Inc./IBM/Apple Computer, Inc. PowerPC-based systems.

"The 1486 machines will probably be obsolete for the application they were originally purchased for within six months," Kruk said.

— Stephen P. Kistt Jr. and Joanie M. Wexler

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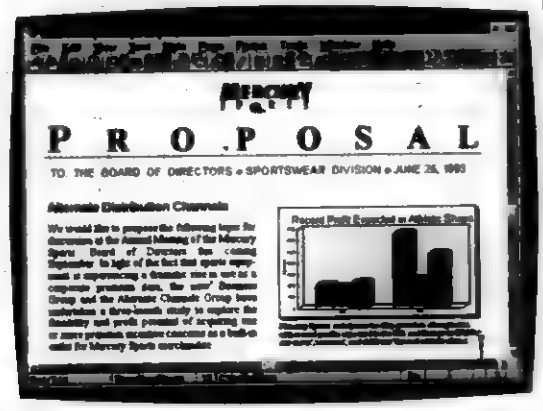

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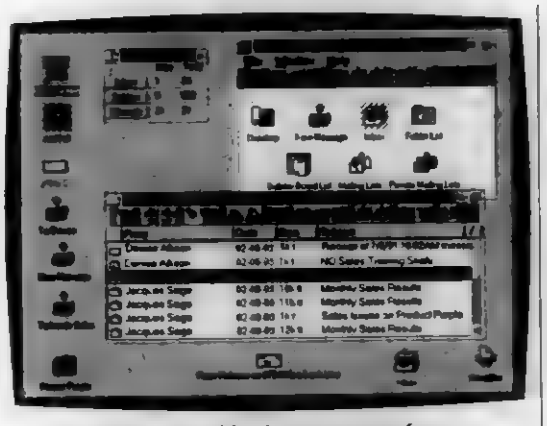

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Pacer Software, Inc. has announced upgraded versions of its PacerShare and PacerPrint file and print servers for Unix systems.

According to the La Jolla, Calif., company, these releases offer Macintosh-based administration and management, enhanced integration with other Unix-based file server products and improved performance.

PacerShare is an Apple Computer, Inc. AppleTalk Filing Protocol 2.1-compliant implementation for Unix host platforms. With PacerShare, Unix volumes and directories can be mounted and used as if they were Macintosh disks.

The products are available for Sun Microsystems, Inc.'s SPARC platforms, Hewlett-Packard Co.'s 9000 700/800 and Digital Equipment Corp.'s RISC Ultrix systems. Pricing is based on the number of simultaneously connected users, starting at $3,000 for a 20-user license.

▶ *Pacer Software*
(619) 454-0565

NetManage, Inc. has introduced NetManage X products, a suite of products that allow Windows PC users to integrate X Window System and Windows in the same environment.

According to the Cupertino, Calif., company, NetManage X products consist of Xsession, Chameleon/X and ChameleonNFS/X.

Xsession offers both a PC X server and a TCP/IP protocol stack. Chameleon/X includes the functionality of Xsession and Chameleon TCP/IP for Windows applications. ChameleonNFS/X includes Xsession, Chameleon/X and Network File System client/server implementations for Windows.

All of the products include an X server and the NetManage TCP/IP protocol.

Xsession, Chameleon/X and ChameleonNFS/X cost $445, $695 and $790, respectively.

▶ *NetManage*
(408) 973-7171

Source-Comm Corp. has announced its ANS/1010 Server product and Client 3270/5250 software, which together offer remote access for notebook, laptop and desktop PCs to IBM mainframe and midrange hosts.

According to the Valencia, Calif., company, the ANS/1010 Server includes eight asynchronous ports for dedicated or dial-up connection from PCs at up to 19.2K bit/sec., in addition to two synchronous ports for local or remote connection to hosts at up to 64K bit/sec. each.

The Client software offers emulation of both IBM 5250 and 3270 systems and runs on the attached PCs.

The ANS/1010 Server is priced at $3,995, plus $495 for the Client 3270/5250 software with an eight-user license.

▶ *Source-Comm*
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Product shorts

Delrina Corp. has announced the Delrina Fax Broadcast Server, which allows PC users to broadcast fax messages using any industry-standard modem. Delrina software and MCI Communications Corp.'s Fax Broadcast Service. Cost: $69 for WinFax Lite users and users with competitive products. Delrina, San Jose, Calif. (408) 363-2345. . . . **Locus Computing Corp.** has announced PC-Interface for Macintosh, a product that allows users to share Macintosh files, applications and Adobe Systems, Inc.'s PostScript printers on a networkwide basis using IBM's RS/6000 as a nondedicated server. The product provides Apple Computer, Inc. AppleShare protocols on the AIX system when installed on the RS/6000. Cost starts at $720 for a two-user license. Locus Computing, Inglewood, Calif. (310) 670-6500.

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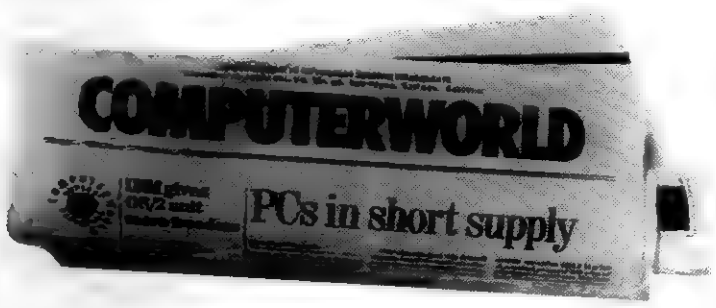

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Amdahl users eye open systems strategy

Firm to rely on other vendors' Unix hardware

By Jean S. Bozman

Amdahl Corp. is trying to bridge the widening gap between legacy mainframe systems and open systems, even as many of its 2,000-plus sites worldwide move to Unix systems and client/server computing.

Some of the $2 billion mainframe maker's largest users said they like the new strategy, but many have already launched their move to open systems with the help of other vendors.

Amdahl will continue to sell IBM-compatible mainframes and will build next-generation mainframes with more off-the-shelf components to reduce costs. At the same time, Amdahl said it will resell Sun Microsystems, Inc. Unix servers [CW, Sept. 27] and work with Sun to transfer mainframe functionality into Sun's Solaris operating system. To pull enterprise client systems together, Amdahl will provide re-engineering services through its Antares Alliance Group venture with Electronic Data Systems Corp.

As Amdahl downsizes its work force to 5,800, it will do less in-house engineering and may eventually drop its 11-year-old UTS Unix mainframe product, said Jim Cassel, vice president and director of Gartner Group, Inc.'s Large Computer Strategies Group in Stamford, Conn. Amdahl, which has had three rounds of layoffs and has restructured twice in 12 months, was unprofitable for most of 1992 and 1993.

Holding the line

Despite Amdahl's downturn, many sites are keeping their mainframes online. Frank Stromboe, information services director for the city of San Antonio, plans to upgrade the city's Amdahl 5995 mainframe for at least four more years. He is moving quickly to Unix, having recently tested Amdahl's UTS as a Unix server on the mainframe, and is working with Software AG of North America, Inc. to develop client/server applications for midrange Unix servers. The advantage of migration is cost: A police dispatching system that uses 20% of mainframe cycles is moving to two NCR Corp. 3450 Unix servers.

While pleased with Amdahl's service and support, Stromboe said he senses Amdahl's dilemma as it tries to please traditional IBM-compatible sites and become an open systems integrator. "It sounds like they need to change direction, but the direction is between a rock and a hard place," Stromboe said.

San Antonio has been using Amdahl mainframes for more than 12 years. "They've constantly followed IBM's direction, and the question [now] is, are they going to be a leader or continue to be a follower?" Stromboe asked.

"Clearly, we've had to refocus the company and be very, very efficient in the use of our resources," Chief Executive Officer Joseph Zemke acknowledged. Future Amdahl mainframes will use low-cost CMOS chips to squeeze profits from low-margin CPUs, he said. But consulting and re-engineering services will be equally important. "We have always provided an alternative source of supply, ideas and strategy," Zemke said. "We did that within the IBM architecture, and we're going to continue to do that in this new generation of machines.

For some users, the future means leaving mainframes behind. The Marshfield Clinic in Marshfield, Wis., has two Amdahl mainframes but is migrating to open systems servers with Amhahl's UTS and its consulting help.

Amdahl, *page 70*

Harold Lorin

IBM buys time

At this time, IBM is tied to the tracks at a major juncture with trains approaching from all sides. Its best hope for slipping the ropes is to use the CMOS-390 as a delay tactic while the SP-Commercial, based on memory-shared PowerPC arrays, is readied for the market.

The importance of the CMOS-390, from IBM's perspective, is that it provides a growth option that does not break MVS culture. It gives IBM and its mainframe loyalists breathing space to prepare for the transition to the PowerPC running AIX or Microsoft's Windows NT Advanced Server. If this strategy is executed in an orderly way, IBM will be able to convert its installed bipolar-based legacy systems into a major (as much as 60%) share of the enterprise server and superserver markets.

Water-cooled mainframes are not going out at the rate the New Age press suggests. IBMers say there are Hewlett-Packard "hit teams" coming into VSE accounts and staying until they win the business or are arrested, but there is much less movement in the large MVS machine sector. Customers contemplate the costs of client/server migration, worry about the uncertainties of putting mission-critical applications on the network and hesitate to take major new directions.

Familiar ways

The CMOS-390 gives these customers a welcome reprieve from the necessity of making drastic decisions. It addresses their key problem — the cost of mainframe hardware — by providing growth at CMOS costs. As an off-load engine rather than a server, the machine splits functions in a way that's familiar to mainframe culture. It leaves the MVS/DB2 mind-set intact. And, most important, it provides a tactical growth path.

Customers taking the CMOS-390 can prepare for future moves to the PowerPC by writing applications using DCE, Posix or XPG4 that will run on MVS/Open Edition or ADX. Long term, everything will migrate (with guidance and sup-

Lorin, *page 70*

Prudential builds new data center for consolidation

By Johanna Ambrosio

■ Christmas came a few months early at Prudential Securities, Inc. where Mohammed Mosaad says he got to build "the 21st-century data center of my dreams."

The data center, which features brand-new equipment as well as fiber optics and backup facilities, replaces a circa-1970 building.

"You don't get a chance to do this very often," said Mosaad, senior vice president of information systems and telecommunications services at the New York securities firm.

The new center was cut over on Oct. 25; the old one has been shut down.

Moving day

In the next year, some 4,500 Prudential employees will move into the new building, one floor of which is the data center, on the tip of downtown Manhattan. The trading floors, brokers, operational facilities — all of the technology-driven departments — will join the data center staff. The new building will serve as Prudential's headquarters for capital markets and investment banking. The company's other headquarters remains near the South Street Seaport, also in Manhattan, and will continue to house some 1,500 employees in the retail and mutual fund areas.

Prudential decided to make the move as a way of consolidating eight buildings into two. The leases on the eight buildings will expire at the end of next year, and the company wanted to centralize its staff now scattered around Manhattan. In addition, the company was able to negotiate a much lower per-square-foot rate than it is currently paying, according to Rodger Parker, senior vice president and director of administrative services.

He would not provide financial specifics but did acknowledge that the overall cost will still be higher because of the new data center.

"We are making the operational departments much more functional," Parker said. "The programmers are now on two floors, where they used to be in four separate buildings." Similarly, the control center, which includes data center support, network control and console control, is now in one area. Before, they were all separate.

"That will improve the communications among all the areas," Mosaad said. An outside consulting firm, Infra-Structures, Inc. in Brent-

Prudential, *page 71*

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Optic avenues opened for brokers

By Thomas Hoffman

A recent ruling permitting brokerages to expand their options for data storage to optical disc storage will prove to be a boon for economic reasons. Until recently, brokerages were forced to store volumes of financial transactions on cumbersome paper-, microfilm- and microfiche-based mediums.

"The optical technology is much more economical than fiche and paper," said Samuel A. Malek, manager of technology at Salomon Brothers, Inc.

Salomon Brothers, which has been piloting ablative write-once, read-many (WORM) and magneto-optic technologies for the past six months, is hoping to retire 80% of its microfiche-based storage records by year's end, Malek said.

Rule change

Last June, the Securities and Exchange Commission (SEC) amended the Securities Exchange Act of 1934, Rules 17A/3 and 17A/4, which in effect permits brokerages to store financial data on optical discs. The "no-action" ruling, which followed three years of intense lobbying by members of the Securities Industry Association (SIA), allows securities firms to deploy nonerasable and nonrewritable magneto-optical and WORM technologies.

But it is still unclear when the SEC rules will go into effect permanently, said Douglas G. Preston, associate general counsel at the SIA in New York and SIA staff adviser to an SIA ad hoc subcommittee that is pushing for the change.

Brenda Sanders

Salomon Brothers' Samuel A. Malek: *"The optical technology is much more economical"*

Preston said the SIA has been lobbying the SEC to expand the amendment even further to include other forthcoming technologies, such as optical tape, so that brokerages can adopt them as they mature.

In May 1991, the SIA subcommittee submitted a rule-making petition to the SEC to open the amendment to other technologies, as long as they adhere to SEC safeguards requiring security, compatibility and readability, according to Preston.

Meanwhile, firms such as Kidder, Peabody & Co. have jumped headlong into the optical disc fray. Kidder, Peabody has been using Filetek, Inc. imaging software, Hitachi America Ltd. disk drives and a FileNet Corp. optical disc jukebox to store 1.2 million pages of customer financial statements each month since July.

The system has reduced the hours it took to locate and print a customer's financial statement from a microfiche system to 10 seconds using optical images viewed over IBM 3270 terminals, said Larry Caminiti, Kidder's manager of data resource management. "The response I've been hearing from users has been very positive, and with users telling their peers about it, we can't get it out there to them fast enough," Caminiti said.

Lorin: IBM buys time

CONTINUED FROM PAGE 67

port from IBM) to SP-Commercial, and the "390" will go the way of the once-beloved RISC-like 7094.

If the CMOS-390 is late, however, or its integration into MVS environments is clumsy, customers will desert MVS for AT&T/NCR, HP, Sequent and other Unix- or NT-based superservers that can deliver seriously improved price/performance. IBM's AIX will not gain enough market share to help IBM survive this. That may sound overly dramatic, but this potentially cataclysmic reduction in revenue will hit at a time when the AS/400 is undergoing redefinition and new revenue streams are just being built.

If the strategy fails, it will be a failure of will and culture. There are still those at IBM who believe the Japanese computer manufacturers are a threat and the Sysplex technology on which the strategy depends has struggled badly. The 390 microprocessor is not rooted in the Hudson Valley.

Early signs give reason for concern. In initial customer presentations, there have been glitches in what can be elegantly off-loaded. The first delay in availability has been announced, and the clock is ticking loudly. With SP-Commercial coming on, superserver NT and Unix clusters getting more powerful and client/server development tools flooding into the market, the moment of opportunity may pass before IBM can seize it. And if that happens, the company will lose any chance for control of the transition from the 390.

When we reach a point where the costs associated with a jump to client/server Unix or Windows NT are less than the costs of sticking with MVS, the world will belong to superserver vendors. The end of the 390 chapter could be orderly or it could be bloody. IBM can decide.

Lorin consults on information technology strategy with organizations in Europe and the U.S. and is senior adjunct professor at Hofstra University. He was previously the ranking faculty member at the IBM Systems Research Institute.

IBM partners with users to develop unifying application

By Michael L. Sullivan-Trainor

■ If you were to name the fiercest rivalries in the past decade, high on the list would be IBM vs. Xerox Corp. in the arena of high-performance printers and Bell & Howell Co. vs. Pitney Bowes, Inc. in computerized mailroom processing.

Yet the need to get products out quickly and match them to user applications is causing even these competitors to cooperate. Witness Xerox's reselling of a high-speed printer engine to IBM in a deal announced last month at the Xplor International document management conference.

"It's like [Yasser] Arafat and [Yitzhak] Rabin shaking hands," said Edward W. Pullen, service director at Computer Intelligence/InfoCorp in Santa Clara, Calif.

IBM added a twist to this trend — partnering with users to develop an application combining the technologies of multiple vendors.

Six user companies — Advantis, Aetna Life and Casualty Co., BellSouth Corp., Electronic Data Systems Corp., Merrill Lynch & Co. and Pacific Bell — are working with eight vendors — Bell & Howell Phillipsburg, Beste Bunch, Inc., Cope, Inc., IBM's Pennant Systems, Johnson & Quin, Inc., Pitney Bowes, Roll Systems, Inc. and Wallace Computer Services, Inc. — to develop a ground-breaking application unifying mainframe databases with mailroom/billing output and processes.

Work-flow software key

The key technology in the application is IBM's work-flow manager software, an as-yet unnamed product that will provide a central data gathering point with a common graphical interface to monitor, control and troubleshoot the processing of millions of bills and mailing packets generated from data residing on the mainframe.

After more than a year of planning, the application was demonstrated for the first time at the Xplor conference last month. Advantis, which is beta-testing the system, will be the first to implement a production version of the application in the first half of 1994.

"We volunteered because we saw a need for [us] to have a better management application," said Tom D'Apice, manager at the Advantis Dallas Data Center. "We run into roadblocks because we don't have all the links between vendors' systems. We spend a lot on overhead in writing code to control the systems locally. Right now it's a maintenance nightmare."

The partnership is shifting the issue of linking systems through a central management application from the users onto the vendors, D'Apice said.

Advantis information systems executives said they expect to achieve the following benefits: control of individual pieces of mail, reduced document rework, more flexibility in mixing different inserts into the mail package and easier application maintenance.

"Several of the vendors didn't understand the process from our point of view. It took a while for them to stop thinking only about their individual pieces. Then a light went on and they saw why we have the requirements we do," said Larry Stenson, director of the data center.

Amdahl to diversify

CONTINUED FROM PAGE 67

Peter Bauer, director of information systems, said the clinic's Amdahl 5995A, purchased used, will probably be upgraded. "This will last us for several years, and we'll probably be in the new world of the RISC boxes," he said.

Given users' moves to downsize applications and the heavy discounting in IBM-compatible mainframes, critics said Amdahl should have moved more quickly.

"They have not taken aggressive action until the last six months or so when the pressure grew significantly," said Bob Djurdjevic, president of Annex Research in Phoenix. "It's somewhat similar to the IBM story in that they kept refusing to accept the reality of the situation — that their margins weren't going back up to 40% or 50%."

Not an easy sell

Some longtime Amdahl users are not buying the strategy, saying they want traditional mainframes. "I couldn't care less about Unix," said George Sekeley, president of CSX Technologies, Inc. in Jacksonville, Fla., which uses a seven-processor Amdahl 5995M mainframe and client/server systems running on IBM's OS/2 machines. "I wish them good luck. I think it's tremendously important that they stay in business to give [users] a choice in mainframe suppliers."

Amdahl's strongest suit may be its technical support, consulting and educational services — high on the lists of the vendor's longtime users. Amdahl consultants helped migrate mainframe work loads from CSX's Port Elizabeth, N.J., data center to the Jacksonville data center, Sekeley said.

But Amdahl will have to bank on its services because the same users still expect it to compete in three-way bids for mainframe hardware business. "If they win on price," one West Coast user said, "they'll win."

Prudential builds new data center

CONTINUED FROM PAGE 67

wood, N.Y., helped Prudential design the new command center. "We told them what we wanted, and they executed it nicely," he said.

"There are a lot of efficiencies to having everyone in one building," he added. Some of these benefits are related to personnel and others are driven by technology. "It's easier and more cost-effective to deliver fiber to everyone in one building. You don't have to build bridges across buildings." Similarly, providing multimedia information to traders will be easier to do in one facility, he added.

Inventory list

Every workstation will be tied to the data center through a LAN, and "that will provide immediate response time to data and much better access to information," Mosaad said. Prudential is using twisted-pair cabling on each floor and a fiber-optic backbone among the floors. In the data center are two IBM ES/9000 Model 962s; 1.6T bytes of disk storage — primarily IBM 3390 Model 3s and some Model 2s; eight Storage Technology Corp. silos; some front-end controllers; and a private branch exchange. All of the data center gear is tied to the mainframes via Escon fiber-optic cables.

In addition, a backup power generator and facilities for the data center, communications and trading floors will ensure no costly outages. Previously, the company had to rent a generator whenever there were power problems. "It's very costly to build multiple facilities for different buildings," Mosaad said.

The move itself took place over a weekend. Although the company did not move much gear because it purchased all new equipment, the largest chunk of time was consumed by building the communications infrastructure. "That was a major undertaking," Parker said. "It took us about six weeks to install the network and then we had to test to make sure every connection works."

Another tricky area was getting the 1.6T bytes of data into the new data center. Prudential opted to do this electronically with programs written in-house. "We took advantage of the computer to help ourselves move and test," Mosaad said. After the data was over, the data center staff selected 500 files and compared them byte by byte to make sure everything transmitted.

All told, the move occurred without a hitch. In fact, Parker said that end users paid them the ultimate compliment: They did not notice that the data center had moved. "A lot of people called once they heard and said they never would have known," Mosaad said.

Brief

Candle supports DB2

Candle Corp. announced support for IBM's DB2 Version 3.0, which will be available when the IBM relational database management system ships Dec. 17. The support was announced at the Guide meeting for IBM users, along with an enhanced version of the Omegamon II for CICS performance monitor that tracks transactions over an enterprise network. Candle's new Transplex Navigation feature, slated to be available by year's end, will support IBM's Common User Access interface, said Janice Roberts, senior marketing manager for Candle's Performance product line.

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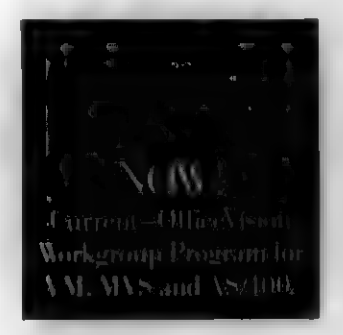

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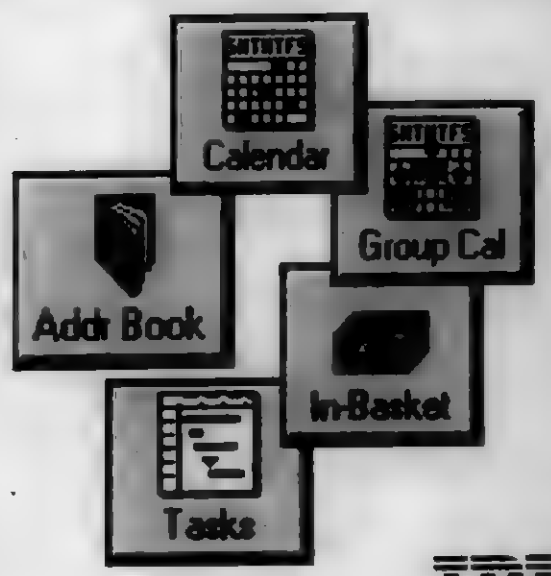

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[redacted]

Cross Access Corp. has introduced the CrossAccess Data Delivery System, a software product designed for enterprisewide information access in heterogeneous client/server environments.

According to the Oak Brook, Ill., company, features include a single relational update capability and support for a relational approach to data access in IBM CICS on-line transaction processing environments.

Version 1.8 also includes catalog support, expanded support for multiple versions of TCP/IP, enhanced use of Computer Associates International, Inc.'s IDMS Integrated Data Dictionary and restart capabilities.

CrossAccess Version 1.8 prices start at $100,000 for typical IBM mainframe configurations.

▶ *Cross Access*
(708) 684-2345

IDEAssociates, Inc. has introduced the IDEAcomm Midrange Client communications software.

According to the Billerica, Mass., company, the software was designed for its IDEAcomm product line, which addresses the networking needs of Windows-based PCs in an IBM midrange client/server environment.

The product was created for PC users attached to host systems at central sites and branch offices where remote users need host connectivity.

IDEAcomm Midrange Client can also be used for IBM AS/400 sites that are replacing terminals with Windows-based PCs linked to Novell, Inc. Token Ring and Ethernet LANs. Features include auto font sizing, Dynamic Data Exchange and a cursor ruler function.

The product supports Ethernet, Token Ring, Synchronous Data Link Control and X.25.

IDEAcomm Midrange Client is available at $395 for a single client, $2,950 for a 10-user site license, $6,875 for a 25-user site license and $12,750 for a 50-user site license.

▶ *IDEAssociates*
(508) 663-6878

Appintec Corp. has announced Windows- and Macintosh-compatible graphical user interfaces (GUI) for its TeleMagic/400 Contact and Activity Management software.

According to the Emeryville, Calif., company, the TeleMagic/400 GUI is an expandable graphical framework that organizations can use to further link marketing, manufacturing, shipping, customer service and other operations.

Version 5.0 features activity plans, To Do lists, activity panels and campaign management.

TeleMagic/400 GUI costs $199 per workstation.

▶ *Appintec*
(510) 450-1550

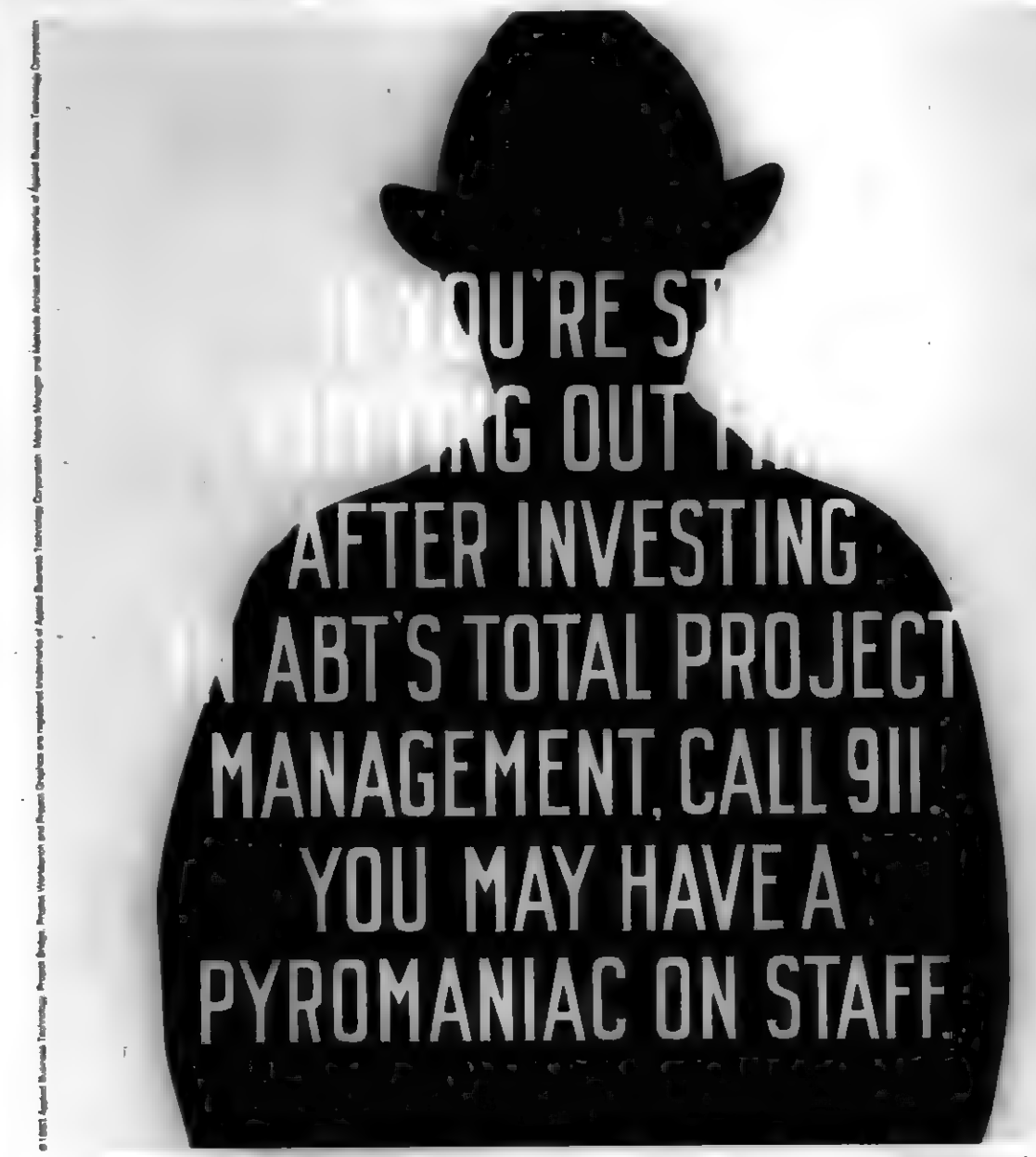
Generic Software, Inc. has announced the Business Management Series, a group of fully integrated and flexible financial applications for IBM's AS/400.

According to the Madison, Miss., company, the series modules include GL 400, a general ledger/financial reporting and budget system; AP 400, an accounts payable system; AR 400, an accounts receivable/credit and collection system; and FA 400, a fixed assets system. The general ledger module provides its own report writer for designing custom financial statements.

The modules support up to 99 companies and divisions. Each can run as a stand-alone system for users who do not need all four applications.

Prices for GL 400 and AR 400 begin at $995. AP 400 starts at $795 and FA 400 begins at $295.

▶ *Generic Software*
(601) 853-1189



With the demands on IS departments today, project management tools that just schedule and track aren't enough. That's why ABT has introduced the first Total Project Management System that delivers an integrated process: methods and estimating on the front end, scheduling and tracking in the middle, and quality and productivity metrics on the back end. And implementation programs to get you up and running in six weeks. To ensure that your projects are on-time and on-budget, give ABT a call at 1-800-4-PROJEC. After all, why play with fire?

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Software reuse plans bring paybacks

closer look: Reusable software

By Gary H. Anthes

Talk about payoff: The Pentagon reckons it could save $300 million annually if it increased software reuse by just 1%.

The U.S. Department of Defense sees software reuse as a necessity in these days of the incredible shrinking budget. Corporations, aided by new technologies, are also turning with fresh interest to the age-old concept.

Software reuse dates to 1944, when a Defense Department programmer wrote a routine to compute the sine of an angle, a useful thing to do when plotting missile trajectories.

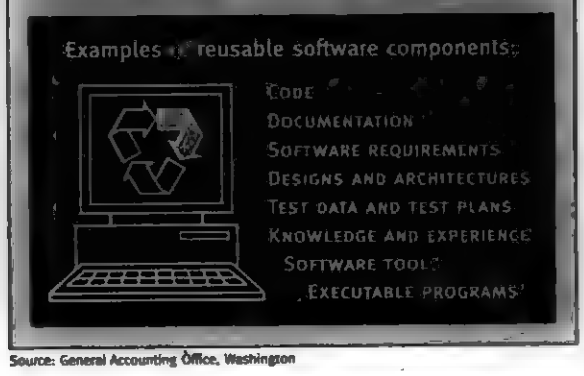
Now it has expanded in scope from completing specialized mathematical functions to using libraries of routines written by user organizations, programming with reusable objects and building applications with reusable templates.

Information systems managers might eye their software development backlogs with more enthusiasm if they realized that half of the required code — not to mention designs, test plans and documentation — had already been written. According to Carma L. McClure, research vice president at Extended Intelligence, Inc. in Chicago, 40% to 60% of all new code could potentially come from libraries of reusable components.

"Software reuse is one of the best-kept secrets in the computer business today," said McClure, who gives seminars on the subject.

However, she said she has seen interest in reuse rise sharply in the past 18 months. She noted that companies are beginning to establish internal organizations devoted specifically to improving quality through software reuse.

RECYCLABLES



Source: General Accounting Office, Washington

Reuse programs

McClure said companies with aggressive reuse programs have seen handsome payoffs:

- GTE Data Services, Inc. in Tampa, Fla., has gained a 20% to 30% productivity increase from its repository of 960,000 lines of Cobol, C, assembler and PC spreadsheet code. Each year, GTE Data's chief information officer raises the target percentage for reused software.
- Canadian National Railway wrote 10,600 lines of new code for a freight-car optimization system, but it used 137,600 lines from its application software library and brought up the complex application with just eight person-months of effort.
- Canadian Airlines International Ltd. bought a frequent-flier application "template" from Trans World Airlines, Inc. and knocked 50% off the time required to code a system from scratch. "More important, it taught them the frequent-flier business," McClure said.

Opportunistic way

According to the U.S. General Accounting Office, users often pursue reuse in an ad hoc or opportunistic way — they get into a development project and then look around for code that can be "salvaged" from some other application.

A better approach, counsels the GAO and others, is to put in a systematic, long-

DOD, *page 76*

Application-specific templates

There are two types of software reuse. "Horizontal" reuse spans applications and includes generic functions such as sorting algorithms or user-interface mechanisms.

"Vertical" reuse looks for functions common to a class of applications, such as a gross-pay-to-net-pay routine in accounting systems.

Software vendors with application-specific "templates" — high-level designs tied in with computer-aided software engineering tools — can help users with vertical reuse. For example, Texas Instruments, Inc. offers templates for generating general ledger systems and other applications; Andersen Consulting has them for functions such as life insurance and policy administration; and Oracle Corp. recently announced seven industry-specific templates that use business models to help generate applications for pharmaceutical, oil and gas, utilities and other companies.

Other vendors offer products geared more to horizontal reuse. For example, American Management Systems, Inc. in Arlington, Va., offers a collection of reusable software modules for foundation functions such as database interaction, user interfaces and error correction. Software AG of North America, Inc. in Reston, Va., offers a code generator that includes a library of 65 software models for generic functions such as data entry, online browsing and menu selection.

At a lower level of granularity lie specialized pieces of reusable code. For example, the Open Software Foundation offers the OSF/Motif widget set, a library of objects for constructing graphical user interfaces. The objects define functions such as push buttons, text fields, labels and pull-down menus.

— Gary H. Anthes

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CA readies Windows-based tool

By Thomas Hoffman

Computer Associates International, Inc. is readying a Windows-based query and reporting tool designed to access data from as many as 20 popular database environments.

CA-Visual Express 1.0, in beta testing and scheduled for delivery early next year, is a combination of several software tools, including CA-Visual Easytrieve and CA-Visual Ramis query languages for host-based processing.

Because of its simplified point-and-click capabilities, CA-Visual Express does not require end users to have any programming expertise, according to Marc Sokol, CA's director of product strategy. "You can join data from a VSAM file and an IMS database together with no knowledge of how those intricacies operate," Sokol said.

Early beta testers of CA-Visual Express 1.0 have lauded the package for its enhanced reporting functionality, compared with its QbyX predecessor.

CA-Visual Express beta testers also said they were impressed with the integration of CA's Report Engine Technology, or CA-RET 2.0, a function that CA has integrated with QbyX, a query-by-example tool for CA's IDMS and Datacom host database products.

"Query tools aren't known for their reporting capabilities, so CA-RET is a nice addition there," said James Cone, a database manager at Fel-Pro, Inc., a Skokie, Ill., automotive parts manufacturer that has been testing the package for the past month.

CA-Visual Express is compliant with Microsoft Corp.'s Open Database Connectivity (ODBC) capabilities, allowing users to access local and host-based SQL databases such as CA-Datacom, CA-IDMS, IBM's DB2 and Borland International, Inc.'s dBase. CA-Visual Express also utilizes Watcom International Corp.'s Watcom SQL Database Server as a choice for local personal database storage and retrieval, a feature that pleases James Bradshaw, a CA-Visual Express beta tester and director of database administration at Clemson University.

"The Watcom database allows us to store data locally in a PC database of our own choosing, which our end users in the field have responded favorably to," Bradshaw said of users at the Clemson, S.C., institution. Bradshaw added that Clemson is planning to exploit the ODBC connectivity in CA-Visual Express in order to transfer data from its Hitachi Data Systems Corp. AS/EX 80 mainframe to PC users via TCP/IP.

Shaku Atre, president of Atre, Inc., a Rye, N.Y., consultancy, said CA-Visual Express stacks up well against competitive products such as Gupta Technologies, Inc.'s Quest and Powersoft Corp.'s PowerBuilder. "PowerBuilder doesn't have as many reporting capabilities as CA-Visual Express, and PowerBuilder's CA-IDMS and CA-Datacom connections are not that seamless or robust," Atre said.

QbyX customers will be eligible to receive free upgrades to CA-Visual Express when the package becomes available in the first quarter of 1994, Sokol said. CA-Visual Express will be priced at $495 per ODBC client. CA-Visual Easytrieve and CA-Visual Ramis will be priced at $25,000 for users needing access to mainframe data that is not ODBC-compliant.

SQL tools

Only 10% of corporate data in the U.S. resides in relational database management systems, while the other 90% exists in nondatabase and nonrelational environments, according to Shaku Atre, president of Atre, Inc., a Rye, N.Y., consultancy. As such, SQL-only query and reporting tools can access just 10% of corporate data that resides in relational database environments, according to Atre.

Digitalk, Inc. has announced a 32-bit version of its object-oriented Smalltalk/V development environment for Microsoft Corp.'s Win32.

According to the Santa Ana, Calif., company, developers can deliver Smalltalk/V applications on Windows 3.1 and Microsoft's Windows NT that run up to 100% faster than the 16-bit version.

Features include a portable architecture, object library support and exception handling.

Smalltalk/V Version 2.0 for Win32 costs $995.

▶ *Digitalk*
(714) 513-3000

Micro Focus has announced its Software Development Kit (SDK) program for 32-bit OS/2 and Microsoft Corp.'s Windows NT operating systems.

According to the Palo Alto, Calif., company, the Micro Focus 32-bit SDK provides a powerful environment for creating 32-bit Cobol applications and for migrating existing 16-bit applications to a 32-bit execution environment.

The SDK costs $2,500.

▶ *Micro Focus*
(415) 856-4161

DOD software reuse

CONTINUED FROM PAGE 73

term, enterprisewide reuse program, one that develops software with the forward view that it will be reused.

The problem is that it costs significantly more up front to prepare software for reuse because it must be generalized for different uses, certified for reuse and more thoroughly tested and documented. A project manager facing a tight schedule or a division head under pressure to meet a quarterly budget may not care that code written today may be useful again years later.

"Corporate culture and organizational infrastructure must be changed to reward reuse and overcome disincentives," McClure says.

Repositories may include not only code but also application-specific knowledge, designs, algorithms, test plans, test data and documentation. Some experts argue that reusing code — which is dependent on language, hardware and implementation approach — is not where the greatest leverage lies.

For example, KnowledgeWare, Inc.'s Philip Kiviat, vice president of federal programs in McLean, Va., says, "You should reuse designs, not code. Code is perishable. Reuse components that are further upstream."

Another advantage of centering a reuse strategy around higher-level elements is that those elements may be able to automatically create lower-level components.

Nevertheless, proponents of object-oriented languages point out that big productivity gains are available through the use of reusable objects, with or without reusable designs. "Shared 'black-box' objects of prewritten and pretested software code ... can be used again and again in subsequent generations of an application," said San Francisco-based Montgomery Securities in a recent report on business re-engineering.

Domain analysis

A successful reuse program requires careful "domain analysis," in which one studies a domain such as payroll and determines which components are most suitable for reuse. The analysis is vital, experts say, to avoid a costly and unmanageable approach that seeks to put everything in a reuse library.

Failure to do systematic and rigorous domain analysis accounts for the failure of many corporate reuse programs, according to Arthur Pyster, chief technology officer at the Software Productivity Consortium in Herndon, Va.

"Five or six years ago there was this naive view you could just assemble lots of parts and the world would be better," he says. "People tried to use those libraries, and they couldn't find what they needed and they couldn't understand what they got."

Using techniques akin to those used in business process re-engineering, IS organizations should do domain analysis to derive reusable architectures — high-level designs — that are far more valuable than reusable code, Pyster says.

It is sometimes possible to extract reusable logic and data designs from existing code by reverse-engineering. Microelectronics and Computer Technology Corp. in Austin, Texas, has tools for "harvesting" reusable software designs from existing applications.

Other tools have recently emerged that can help get more mileage out of old code. For example, Texas Instruments, Inc. and KnowledgeWare just introduced tools that analyze legacy Cobol programs and propagate chunks of reusable code into computer-aided software engineering tools for use in new client/server applications.

Raytheon reuse program

Raytheon Co. in Lexington, Mass., has had a disciplined reuse program in place since 1976 and said it has perfected the program to the point where the company gets 80% to 90% of new business applications from reusable components.

Raytheon originally wrote eight basic shells, or "logic structures," for the major processing parts found in business applications. The shells consist of a high-level design and some code. Raytheon's library now contains 143 program shells in combinations such as sort/select/edit/update/report.

In addition, over the years Raytheon has built a library of nearly 2,000 "functional modules" — chunks of reusable code for data definitions, edit rules, business algorithms, database calls and the like.

According to Robert Lanergan, corporate information systems manager, 40% to 60% of a new Cobol application can be generated interactively from one of the shells. An additional 30% to 40% can be obtained from inserting various functional modules.

Code can not only be developed much faster with this scheme but is also far easier to maintain because it is standardized and therefore widely understood, he said.

Lanergan said implementing the reuse program was "a tough sell," especially to veteran programmers who feared it would strip the creativity and independence from their jobs. His advice to companies considering such a program: "Hire programmers right out of college; they are not set in their ways."

— Gary H. Anthes

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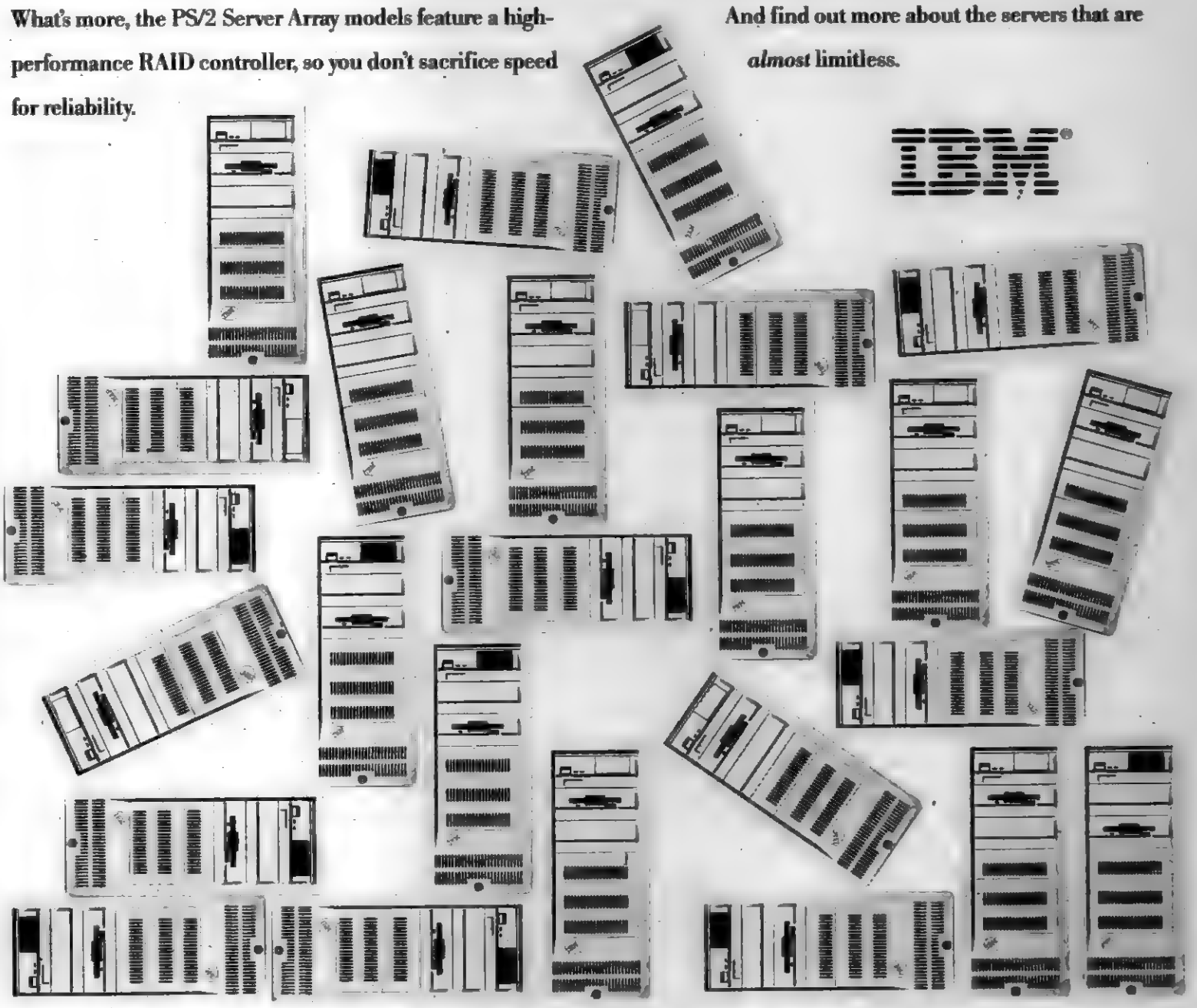

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NextStep 3.2 gets DOS, Windows support

By James Daly

Next Computer, Inc. has spruced up its NextStep system software for Intel Corp. processors by adding support for DOS and the Windows environment.

Both the single-user and the developer's version of NextStep Release 3.2 will gain DOS and Windows compatibility via Insignia Solutions, Inc.'s SoftPC for NextStep. A version of SoftPC containing both Windows 3.1 and DOS 5.0 will come with each copy of NextStep and work for 30 days after initial boot-up. If NextStep users decide after a month that they want the added DOS and Windows compatibility, they can call Insignia to receive a license number that will unlock an unlimited working version. A single-user license costs $249.

Release 3.2 also includes additional driver support, which increases the number of hardware configurations NextStep can address. New to Release 3.2 is DriverKit, an object-oriented framework that enables developers to write device drivers in less time and with less code than traditional methods of writing Unix drivers, Next officials said.

The updated NextStep also includes application programming interfaces that allow sound, graphics and LAN devices to be supported by dynamically loadable drivers. Also added is support for a variety of new graphics adapters and — for the first time — full support for 32-bit color graphics.

Developer's version

The developer's version of NextStep 3.2 contains a new FileMerge feature. FileMerge is used to compare two directories and show which files have been added, deleted or modified. For a pair of lines that are different, the applications will show them side by side and highlight the differences.

The developer can choose to create a third file and selectively merge the files. Using this tool, a developer is able to quickly merge changes from different source branches with only a few mouse clicks.

The developer's release also includes support for Portable Distributed Objects (PDO) — high-level objects that can be transported over a network. With PDO, developers create custom objects that can be deployed in heterogeneous server environments and shared throughout the networks.

Pricing for NextStep for Intel processors and NextStep Developer is $795 and $1,995, respectively. Pricing for upgrades is $195 and $495, respectively.

Customers who purchased the full version of NextStep Release 3.1 and returned the registration card before Oct. 31 will receive Release 3.2, which is shipping now, for free.

Big market seen for objects

Object-oriented programming will be one of the biggest advancements in software development in the 1990s. The market is expected to grow 67% annually to become a $4 billion market by the end of 1997, according to a report released by Datapro Information Services Group, a research house.

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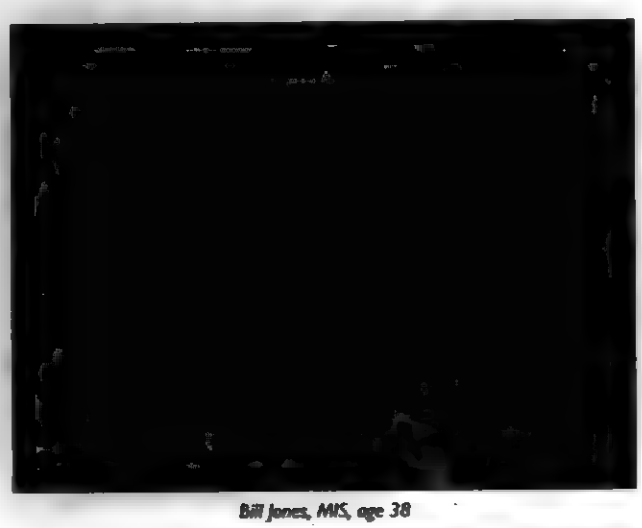

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"HI! I'm your consultant from HELL"

BY MELANIE MENAGH

Peter Johnson has a lot to say about his experiences with consultants: "We have plenty of horror stories."

Johnson, who is vice president of information systems at the Dartmouth/Hitchcock Medical Center in Lebanon, N.H., recalls a particularly devilish experience:

"We hired people to help us analyze what other academic medical centers in the Northeast were doing. We run our equipment in a clinical setting; we're a life-and-death operation. That's why we wanted the consultants to come work with us here, but these guys were not particularly sympathetic to that. They felt since they were doing an analytical piece, they didn't have to perform on-site. So they took the work back to Baltimore."

Unfortunately, "they didn't know our procedures. They didn't follow our protocols," Johnson says. The medical center had fail-safe procedures built into its system to prevent major blowouts to databases. Anyone working on software development is authorized to work only on test environments.

"Our consultants should have been working on a test environment, but the programmers thought, 'We'll just dial into the system.' They crossed over to a production environment — on their own reconnaissance. Our practices weren't considered.

"They made changes to software that caused

Consultants, *page 80*

Consultants

CONTINUED FROM PAGE 79

us to lose data, which in turn caused the system to crash," Johnson says.

As a result, the pharmacy department was unable to access data on patient medications for several hours. Fortunately, the crash didn't prove fatal to the databases (or the patients), but clearing up the wreckage required more time and money.

"We have a certain awe for 'experts,' and perhaps they have a bit of awe for themselves because they took it upon themselves to tap into the system without asking questions first," Johnson says.

Sid Diamond, Diamond & Associates, Stevenson, Md.

Recurring nightmare

This scary episode is hardly an isolated case. Although IS managers say that experts hired to help them usually do so in a reasonable time at a reasonable price, consultants' activities often produce precisely the opposite results.

Bad advice, shoddy work and revolving-door personnel all contribute to overruns of time and money. Managers admit that sometimes they deserve part of the blame. But all too often, even when they follow the conventional advice about managing consultants — defining projects carefully, setting up tight time limits and cost controls, insisting on qualified firms and periodic reviews — the results have been disastrous.

Professional advice caused another frightful mess at Reynolds Metals Co. in Richmond, Va. The company was looking for point-of-entry inventory systems to track incoming items for proper distribution. What it got instead was "a nightmare," says Jim Matsey, corporate director for IS.

Matsey called in consultants who said they could do the job in less time for less money than Reynolds could in-house, so Matsey decided to go with them. He even hired a division of a firm that he had worked with successfully for years. They hammered out a good contract, with cost caps and periodic reviews. But trouble was brewing.

The project became a classic case of corporate IS procedure ignored, circumvented or gone awry at every turn.

"Things weren't right up front. They were incompetent," Matsey says. "We could see things weren't headed in the right direction, and we held meetings with them saying, 'You can't get to it that way.'"

This advice was to no avail. "They weren't honest with us," Matsey says.

"Originally, they told us we could run this on X-size of machine. When we did, the response time was really bad. Then they admitted that, 'No, you really have to put it on a bigger machine, and since we tier-price our work, you're going to have to pay us more to put it on the other machine.'"

Small bills started trickling in, but when the project dragged on, a couple of whoppers arrived.

"I said, 'Wait, we have a cap. You can't overrun without my signature,'" Matsey recalls. "They insisted that the mere fact we challenged the bills meant we acknowledged their validity."

Matsey wanted to cut his losses and run but had to stay in the arrangement because the consultants withheld software that Reynolds needed. The project ended up costing twice what was agreed on and put the entire program a year-and-a-half behind schedule.

By the end, Matsey says, "I was in Atlanta with our lawyer and their lawyer back and forth with innuendos and accusations."

And as it turned out, Reynolds' troubles were not unique.

"We found out that another company working with this firm at the same time ended up suing them," Matsey says. "We decided just to pay and get the hell out."

No guarantees

Paying top dollar for a top banana does not always ensure success. When VF Corp. in Wyomissing, Pa., the maker of Lee jeans, needed new software, it brought in a big-name firm "because the people presenting had significant product knowledge and good suggestions of where to go for solutions," says H. Lynn Hazlett, vice president of business systems at VF Corp.

However the working relationship "went downhill from there," Hazlett says. "They changed consultants during the process to accommodate other customers — it was like musical chairs. There was constant disruption, constant retraining of their people and ours."

Not surprisingly, the end product was a total washout.

Managers complain that the experts make only superficial attempts to understand the client's business.

"We brought in people to look at the possibility of outsourcing our IT environment," says James Miller, vice president for information technology at Hallmark Cards, Inc. in Kansas City, Mo. "They said, 'Well, you're sort of a paper company, and we kind of did this with another company before.'

"Ninety-eight percent of their slides in their presentation were used the day before with another client; they tried to give us a boilerplate solution for our problems. When we confronted them, they basically responded with smoke and mirrors. Instead of working toward a common goal, they were just trying to cover their ass."

Games people play

The consultants' ploys didn't stop there.

"They infiltrated the company and made suggestions to other parts of the organization. While IT was looking at outsourcing one way, they were busy soliciting another department to outsource in a way that created cross-functional conflicts with ours. There was a total lack of integrity. I wouldn't use them again if they were the last vendor on the planet," Miller says.

"My definition of 'expert?'" says Michael Simmons, former executive vice president of technology and operations at the Bank of Boston: "X is an unknown quantity, and spurt is a drip under pressure."

Other IS executives offer stronger epithets — some not suitable for print.

Miller says of his experience hiring consultants: "I'd probably split it 80/20 — 80 were marginal or negative."

Managers who have been to hell and back have come away with a more pragmatic, realistic attitude.

"A consultant's mission is to bill you as much as possible for as long as possible," Simmons says. "If you don't realize that going in, you're in for trouble.

"You have to match expectations with reality," Matsey says. "There's a disconnect between the sizzle people expect and the substance of what a consultant can actually accomplish."

Going into each relationship understanding the possible dangers and with a firm grip on the reality of what the experts can do for you — and to you — will make hiring a consultant a smart move instead of a pact with a devil. ■

Menagh is a free-lance writer in Summit, N.J.

BEYOND THE BASICS

How to avoid infernal consultants

While fail-safe procedures are well-known — and were followed by all the people whose experiences are quoted herein — they are often not enough to guard against consultants from hell.

What else can be done when standard precautions are not enough? Consider the following advice:

After "price and function," says David Morgan, director of IS for the city of Dallas, "we look for quality people. We hired a firm that gave us a good program, but it wasn't user-friendly because they forgot to figure in the average city clerk working on the system. They should have considered all our users and trained them better."

Feedback is essential throughout the process, says Sid Diamond, president of Diamond & Associates, a consulting firm in Stevenson, Md. Diamond formerly managed IS for Purolator Products Co., Bristol-Myers Squibb Co. and Black & Decker Corp.

"Now that I'm on the other side, it's surprising how many clients don't ask me questions they should. Often a feedback channel is set up but never used properly. Feedback needs to come from all sources, from the consultant, but also informal feedback from within your organization.

"Find out the relevant experience of the person who's going to be on the job, not the account rep," Diamond says. "They may have 10,000 people, but not all are going to be that great. The company is less important than the person working for you. Protect yourself in the contract with right of refusal of anyone working on the account."

Insist that consultants work on-site. Even if it costs a little more, it can save time, money and frayed nerves in the long run, says Peter Johnson, vice president of IS at the Dartmouth/Hitchcock Medical Center.

"If they are here, they ask questions. They have to check with more people," Johnson says. "They're less likely to make huge errors in protocol."

If the consultants can't do all the work on-site, they should at least spend enough time there "to build a rapport with your people, to get under the covers and understand the details of your business," says James Miller, vice president of information technology at Hallmark Cards in Kansas City, Mo.

"It's not enough to have them pull personnel out and interview them in another place, completely out of context," Miller says.

When using a large firm, keep close tabs on personnel. "Always establish a relationship with someone high up — a senior partner — to be sure your interests are properly looked after," says H. Lynn Hazlett, vice president of business systems at VF Corp.

— Melanie Menagh

Executive Track

William C. Donovan has been named vice president of information technology and a member of the senior management committee at **Sea-Land Service, Inc.** in Liberty Corner, N.J. Donovan, who has jointly led this function since 1992, assumes full responsibility for the firm's global information technology group. Prior to rejoining Sea-Land in 1992, Donovan worked at RJR Nabisco, serving in six senior positions in information technology.

Thomas D. Murphy, Sea-Land's former vice president of information technology systems and co-head of the group, is moving to Kroger Co. in Cincinnati as vice president and chief information officer. Murphy joined Sea-Land in 1990 and has co-managed the information technology group with Donovan since 1992.

Amtrak, the national railroad passenger corporation in Washington, has announced the appointment of **Donald G. Gentry** as vice president of information systems. He replaces Norris W. Overton, who was promoted to chief financial officer. Gentry was formerly assistant vice president of systems development.

James T. Pollard has been appointed senior vice president and chief information officer at **Tech Data Corp.** in Clearwater, Fla. In this newly created position, he will report to President and Chief Operating Officer A. Timothy Godwin. Pollard was previously director of information systems at Florida Power Corp. in St. Petersburg, Fla.

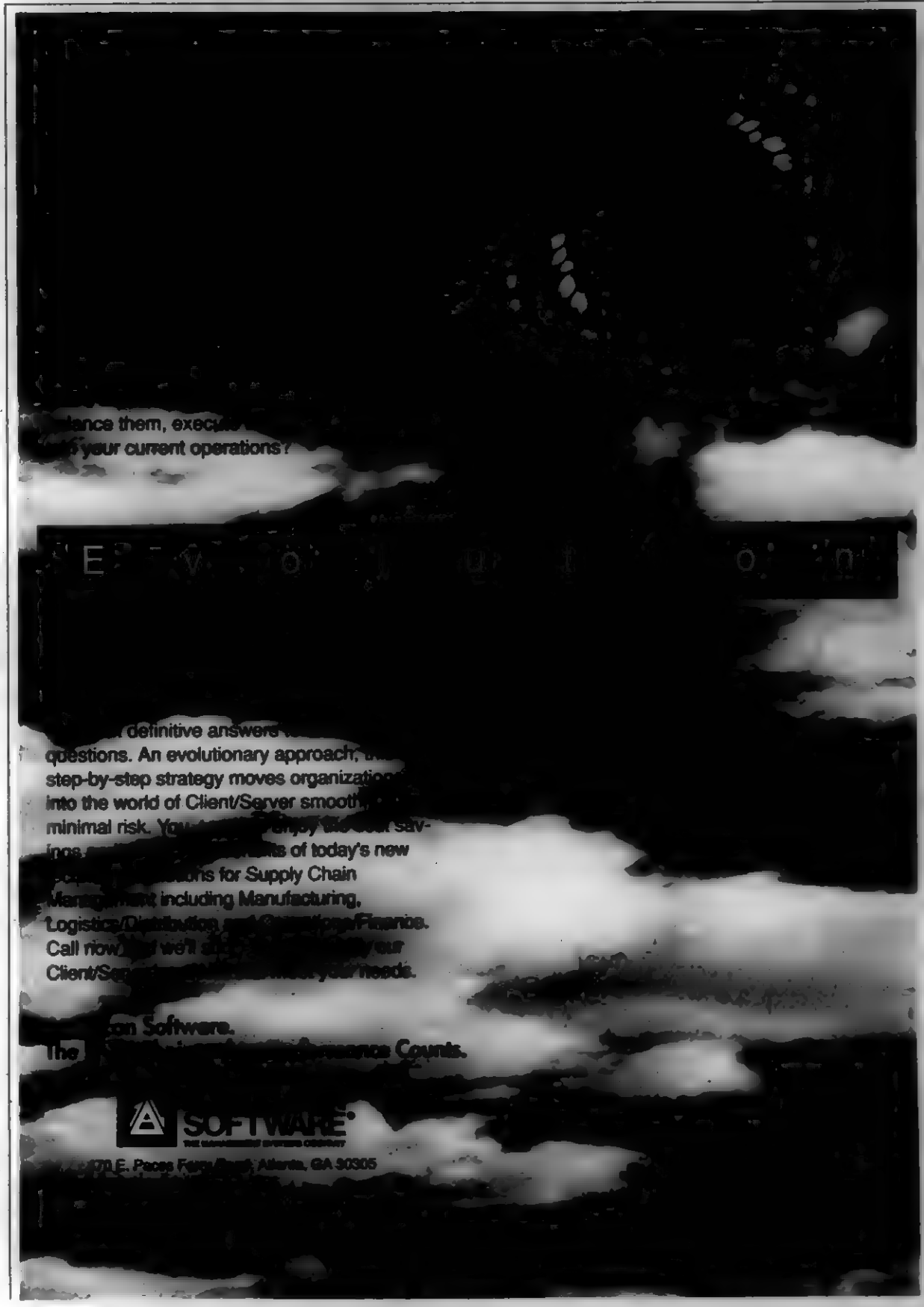
Nancy Miracle has been named vice president of operations at **NewWorth, Inc.** in Irving, Texas. She was previously director of operations and MIS at Fujitsu Personal Systems in California.

Visa International has announced the appointment of **William L. Chenevich** as group vice president of VisaNet service development, a department that represents one-third of the corporation's delivery systems organization. Chenevich will be based in San Francisco and will report to Roger Pierce, executive vice president of international delivery systems. He will oversee development of credit, debit and risk control systems. Chenevich was previously executive vice president and director of information systems at Home Savings of America.

The National Association of State Information Resource Executives in Lexington, Ky., has announced several recent appointments and member changes. **George Beard**, former manager of planning and policy in the Information Systems Division in Oregon, has taken a position in the private sector; **Bev Schuft** has been named acting director of the Information Policy Office in Minnesota, replacing Steve Gammon; and **Pat Urban** has been named director of communications and information technology in Vermont. The association also elected **Bradley S. Dugger** president for 1993-94. Dugger is chief of information systems at the Department of Finance and Administration in Tennessee.

Marcia Lissak has joined **Richard A. Eisner & Co.**, a New York-based accounting firm, as director of its apparel consulting practice. Lissak had been director of information services at Donna Karen in New York.

NPRI, Inc., a call center systems vendor in Alexandria, Va., has announced that **Louis A. Venezia** has been appointed vice president of business operations. As part of NPRI's companywide reorganization, internal MIS functions and other functions will report to Venezia.



Intelligence files

Banner week at CSC

While Computer Sciences Corp. (CSC) emerged as the finalist in the British Aerospace PLC outsourcing sweepstakes in mid-November, it also reported a couple other cork poppers. The El Segundo, Calif.-based services company said it entered a five-year, $90 million outsourcing contract with RAET, a $377 million Dutch information technology services company.

The deals add people and data centers to CSC's wherewithal, giving it sudden leverage in Europe. The same week, CSC said it won a $10 million contract from the U.S. Department of Defense (DOD) to help move the DOD to open systems.

Source: Computer Sciences Corp.

New York Times recruiting

The New York Times Co. is offering an interactive system for employers to advertise jobs and candidates to send in resumes.

Information Kinetics, Inc. in Chicago developed and will administer the service, called New York Times FasTrak. An Information Kinetics spokesman said the system is the company's first in operation for a newspaper, although the company said it signed a preliminary agreement with the *Chicago Tribune* in June.

FasTrak, which began last month, lets job seekers register their resumes in a database at the newspaper for a $40 fee. For six months, they can answer recruitment ads in the newspaper using a phone to send their resumes into a database. Advertisers will periodically receive updated disks containing the resumes. Companies will also be able to place candidate requests through the system.

Source: *The New York Times*

The virtually real hotel stay

The Hyatt Corp. hotel chain is experimenting with a "hotel of the future" in Schaumburg, Ill., that could redefine the "quick check-in" concept to "no check-in." According to *Fortune* magazine, part of the futuristic vision for the hotel is a wireless technology that allows hotel employees to perform tasks from any location, including checking in guests who prefer not to do so themselves.

The hotel industry is also looking into virtual reality marketing techniques such as helmets with built-in screens that allow prospective customers to see the rooms and facilities of a variety of hotels and resorts in their destination area.

Source: *Fortune* magazine, Oct. 4, 1993

Profitable companies

Businesses that have seen their profits increase in the last 24 months are more likely to understand and quantify the business benefits of information technology, according to a survey recently released by the Keystone Group, a management consulting firm in Evanston, Ill., that specializes in the strategic use of information technology.

The survey targeted chief executive officers who head either "profit-up" companies (profits rose in the past 24 months) or "profit-down" companies (profits decreased in the past 24 months). It addressed the questions of why some companies realize a greater return on their information technology investments and whether there is a correlation between technology return on investment and overall profitability.

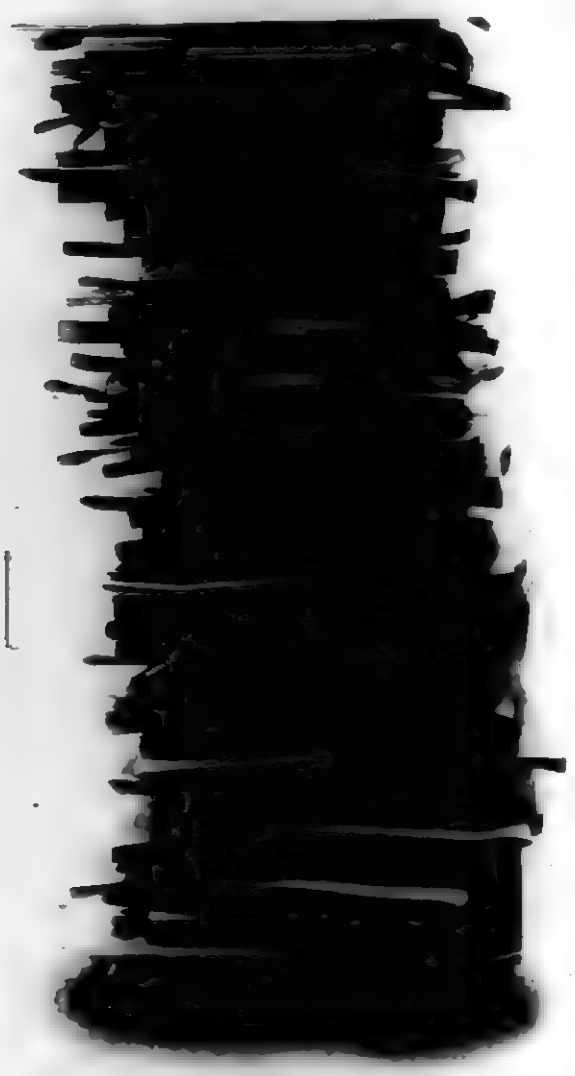
Among the survey's other findings were that 70% of CEOs at profit-up companies said information technology affects business processes vs. 20% of profit-down company CEOs, and 80% of profit-up company CEOs said they will manage cultural change in future implementations vs. no CEOs from profit-down companies.

Source: The Keystone Group

Technology buy-in

Retailers are buying into the improvements that information technology can bring to their service and cost-reduction efforts. According to a study conducted by Computer Sciences Corp., senior business and information systems executives feel the worst of the recession is over. They also see information technology as a critical part of their efforts to streamline their businesses.

Source: CSC Consulting, Waltham, Mass.



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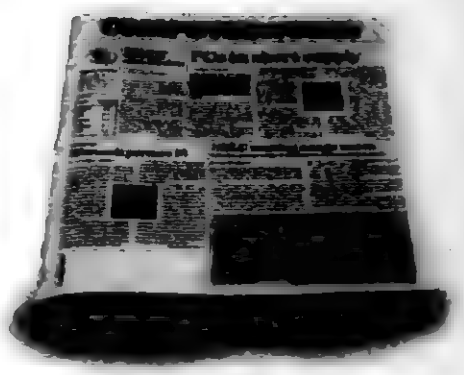

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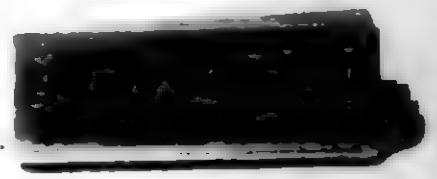

The Newspaper of IS

Calendar

JAN. 2-JAN. 9

Third Annual ShowBiz Expo. New York, Jan. 6-8 — Contact: ShowBiz Expo, Los Angeles, Calif. (213) 668-1811.

1994 International Winter Consumer Electronics Show. Las Vegas, Jan. 6-9 — Contact: Electronic Industries Association, Washington, D.C. (202) 457-8728.

JAN. 9-JAN. 15

ObjectWorld. Boston, Jan. 10-13 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JAN. 16-JAN. 22

Client/Server Conference & Exposition. San Jose, Calif., Jan. 18-21 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-7460.

Re-engineering: The Implementation Perspective. Boston, Jan. 19-21, also to be offered Feb. 9-11 — Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

Storage & Interfaces '94 International Technology Conference. Santa Clara, Calif., Jan. 19-27 — Nine separate but related forums and seminars will be offered during these dates. Contact: Technology Forums, St. Peter, Minn., (507) 931-0967.

Nomda/Landa Emerging Technologies Expo '94. Orlando, Fla., Jan. 20-22 — Contact: Nomda/Landa, Kansas City, Mo. (816) 941-3100.

JAN. 23-JAN. 29

Demo '94. Palm Springs, Calif., Jan. 23-26 — Contact: InfoWorld Editorial Events, San Mateo, Calif. (415) 312-0545.

ComNet '94. Washington, Jan. 24-27 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Fourth Annual "Achieving Quality Software" Tutorial and Conference. San Diego, Jan. 26-28 — Speakers include Barry Boehm, University of Southern California, and Ron Radice, director of the Software Process Program. Contact: Vince Heald, Beck-Ellman Agency, La Mesa, Calif. (619) 469-3500.

15th International Conference on Engineering Information Systems: Product Data Management & Alternatives. Dallas, Jan. 26-28 — Contact: Management Roundtable, Boston, Mass. (617) 232-9080.

JAN. 30-FEB. 5

14th Annual Florida Educational Technology Conference. Tampa, Fla., Jan. 31-Feb. 4 — Contact: Bureau of Educational Technology/ Florida Education Center, Tallahassee, Fla. (904) 488-0980.

Executive Technology Summit '94. Sponsored by The Society for Information Management and *Computerworld*. Tarpon Springs, Fla., Feb. 2-4 — Contact: ATI Travel Management, Chicago, Ill. (312) 644-6842.

FEB. 13-FEB. 19

Sigda: Workshop on Field Programming Gate Arrays. Berkeley, Calif., Feb. 14-15 — Contact: Association for Computing Machinery, New York, N.Y. (212) 944-1318.

Conference on software quality calls for papers

A call for papers has been issued for the 12th Annual Pacific Northwest Software Quality Conference, which will be held Oct. 17-19, 1994, at the Oregon Convention Center in Portland.

Abstracts on any topic relevant to software quality are invited and should be sent to Sue Bartlett, Tektronix, Inc. MS 63-356, P.O. Box 1000, 26600 SW Parkway, Wilsonville, Ore. 97070-1000. Deadline for submission is March 7, 1994. For more information, contact Terri Moore at (503) 223-8633.

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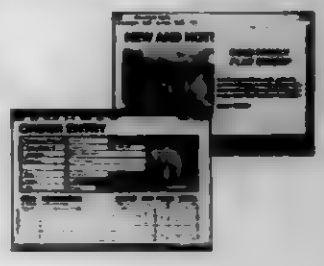

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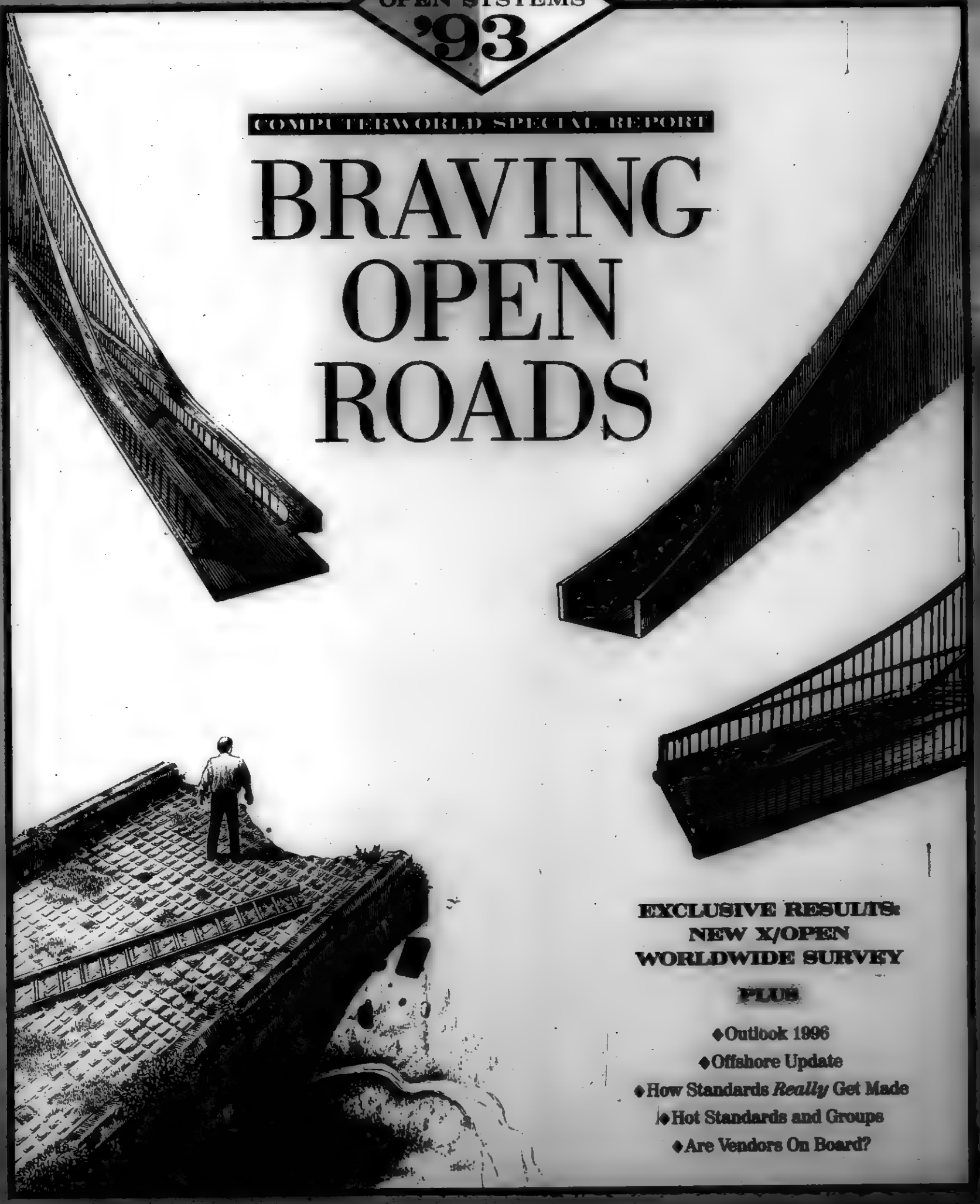

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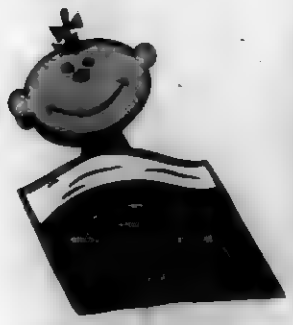

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EDITOR'S NOTE

SIGNPOSTS ALONG THE ROAD

You've got the whole wide open world in your hands — literally.

This special *Computerworld* X/Open supplement presents results of the largest and most ambitious global survey on open systems ever done: five continents, 56 user groups and 780 top information systems managers and professionals.

You'll notice a couple of important things about this special report. First, our stories go way beyond reporting survey findings. In the pages that follow, IS chiefs from leading firms tell where they're headed, why and how. No vapor. Top experts in the field contribute haze-cutting analysis in four incisive "Perspective" columns.

Second, we've tried to be hard-headed and critical in the best sense of the words. The last thing the industry needs today is more open systems smog.

Finally, our coverage has a distinct U.S. focus. Although globalism is a major strength of the Xtra study, we've opted to tell the story mostly through the eyes and experiences of our own readers. With a topic so complex, exciting and fast-changing, it's the only realistic thing to do. (Full worldwide survey results will be presented at X/Open's annual meeting in Rome later this month.)

Regardless of location, the study shows clearly that the bumpy road to open systems continues to swell with hopeful travelers. Some are fast-laners. Others putt along more cautiously. Most are simply trying to keep pointed in a new direction, adding parts as they go. Ultimately, all seek lower costs and higher performance via the best path they can find.

As you read the following pages, you'll be struck by the sheer determination of companies. The next couple of years will tell whether these journeyers (and you) will make it to more open roads. And whether computer industry vendors will ride in the front seat, backseat or under the wheels.

While we can't tell you exactly how to get there from here, we can give you some valuable signposts for the trip.

Keep on driving.

Joseph Maglitta
Senior editor, corporate strategies

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119 IS BEING HALF OPEN LIKE BEING HALF PREGNANT? Vendors swear fidelity to open systems. Users and consultants say "show me." ♦*By Michael Vizard*

120 Users rank major Unix variants.

122 PERSPECTIVE: Bill Laberis on "Chart your own course."

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THE STATE OF OPEN SYSTEMS '93

MAKING IT WORK

FRUSTRATION YIELDS TO PRAGMATISM AS USERS MAKE DO

OPEN ENOUGH

BY FRANK HAYES

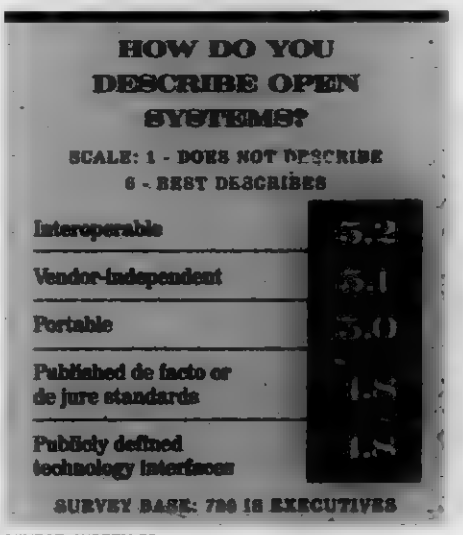
David M. Sherr is the very model of a modern open systems champion. But you have to look hard to tell. True, as a vice president for investment banking technology at Lehman Brothers, Inc., Sherr is responsible for making certain programmers write to standard interfaces, heterogeneous hardware works together in harmony and his users can choose whatever information systems they need.

But what exactly constitutes Lehman Brothers' idea of an open systems environment? "Our 'open systems' have Novell SAA servers on [IBM] Token Rings that go into VM," Sherr says. Beyond that, Novell, Inc. networks and Unix servers link with huge networks of PCs and Unix systems. "Our mainframe people here talk about downsizing," Sherr says. "But they're still planning to quadruple the capacity of the data center."

Welcome to the world of today's open systems, where mainframes and proprietary networks share equal billing with hardware and software that was designed to meet officially accepted formal standard specifications. It's a place where pragmatism, frustration and confusion have replaced philosophical certainty about what "open" means.

But it's also where users are getting more real work done using open systems than ever before — in part because they're reshaping their definitions as well as their information systems.

"People have moved away from a purist's view," says Burt Rubenstein, a vice president at Cambridge Technology Partners, Inc. in Cambridge, Mass. "They're just being practical about what's really out there."



SOURCE: X/OPEN CO.

Vendors draw heat

The X/Open Co.'s new Xtra global survey of 780 high-level IS executives clearly illustrates the frustration that is causing more and more companies to take their open systems fates into their own hands.

Respondents blamed vendors and standards-making organizations alike for being stumbling blocks along the open road: vendors for failing to provide compatible, standards-based products and standards groups for producing too many overly complicated specifications (see story page 101).

"If your information technology group was trying to hold the line, waiting for implementations of well-defined open systems, they would

OPEN ENOUGH, PAGE 92

ALAN LEVENSON

♦ *Rockwell International's James F. Sutter: While waiting for well-defined open systems standards, 'frustration sets in and pragmatism follows'*

OPEN ENOUGH

CONTINUED FROM PAGE 91

be overrun by events. Then frustration sets in and pragmatism follows," says James F. Sutter, vice president of IS at Rockwell International Corp. in Seal Beach, Calif.

Organizational pressures are another big factor. "Our business people are learning to move ever quicker, and the information technology people have to be out in front to enable them to move more quickly than they ever have before," says Jim White, vice president of technical planning at Charles Schwab & Co. "We want more, faster — we need that just to stay up."

As a result, many IS executives are rethinking the usefulness of both open systems and standards.

"If you say, 'I can't write my message-handling system until X.500 is a reality,' you're never going to write it," Sherr says. "All the standards can do is reduce the amount of work you have to do. They're not going to do the work for you."

No longer willing to wait for standards organizations to fill in the holes in the open systems framework, users are creating their own architectures and populating them with existing proprietary systems and popular de facto standards, along with products based on formal standards.

Ken Rohan, vice president of IS at Nerco, Inc., an oil, gas and mining company in Portland, Ore., says, "Bottom line, sooner or later you need to choose what are going to be your own internal standards."

Incompatible products

That's a far cry from the open systems ideas of just a few years ago. Back then, standards came from standards committees, and by insisting that vendors conform, customers could choose among many interchangeable, competing products for each part of their IS architecture — in theory.

But in practice, "standardized" products often remain incompatible. "The international standards bodies have created a framework for open systems, and it's very appealing," Sutter says. "But if you simply say, 'Well, let's adopt that framework, let's implement those standards' — that's very frustrating."

Making matters worse is continued confusion about what "open" really means. Most respondents equate the concept with portability and vendor independence (see chart previous page). But even that definition is far from universal.

"X/Open wants you to think open means developing an API that is going to be easily portable across multiple hardware platforms," says Tom Kucharvy, president of Summit Strategies, Inc., a Boston-based consulting firm. "In the PC environment, there's a totally different definition of standards: one API from one vendor that provides total hardware flexibility. I'm not sure which is a better definition of open. It's now in the eyes of the customers."

Even when standards exist, many don't stand up well when turned into products. "People buy a SQL-based database so they think they have industry-standard SQL that will run on any platform. Wrong!" says Judith Hurwitz, editor of the "Client/Server ToolWatch," a newsletter based in Watertown, Mass.

"People went into this whole open systems era believing standards were magic and that it was easy," Hurwitz says. "But there's nothing that's '1-2-3, you're saved.' You can build according to standards, but it's a lot more complex."

Lack of interest isn't the problem: Worldwide sales of Unix operating systems hit $1.2 billion last year, according to International Data Corp. And respondents to the X/Open survey said they plan to nearly double their spending on open systems by 1996 (see chart at right).

Even so, uncertainty plagues many users.

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USERS ARE

getting more real work done — in part because they're reshaping their definitions as well as their information systems.

EXCLUSIVE RESULTS of a major new X/Open survey of 780 information systems managers on five continents reveal that a major global shift to open systems is in full swing. But user attitudes are decidedly pragmatic: If open systems are the best way to drive key business goals, fine. If not, the next three years will tell whether open systems benefits outweigh barriers.

ABOUT THE RESPONDENTS

TITLE

♦ IS director/manager, 51%; technical support staff, 7%; CIO or other executive officer, 10%; technical/operations/applications manager, 13%; chairman/CEO/managing director, 5%; engineering manager, 4%; consultant/adviser, 4%; other senior executive, 3%; other, 2%; other non-IS manager, 1%.

RESPONSIBILITY

♦ Entire company/organization, 55%; one department, 16%; one subsidiary, 9%; multiple divisions or subsidiaries, 7%; multiple departments, 7%; workgroup or department, 6%.

INDUSTRY

♦ Other, 12%; manufacturing (discrete), 11%; manufacturing (process), 11%; professional services, 10%; education, 9%; government, 8%; communication, 7%; finance, 7%; other services, 6%; utilities, 4%; transportation, 3%; insurance, 3%; agriculture/construction/mining, 3%; health care, 2%; wholesale trade, 2%; retail, 2%.

REGION

♦ Respondents included users from the U.S., Canada, Europe, Middle East, Japan, Asia, Africa and South America. Final results were weighted by Gross Domestic Product to reflect the concentration of information systems usage in various regions.

ANNUAL COMPANY REVENUE (U.S. DOLLARS)

♦ Less than $5 million, 12%; $5 million to $9.9 million, 5%; $10 million to $24.9 million, 7%; $25 million to $49.9 million, 8%; $50 million to $99.9 million, 6%; $100 million to $249.9 million, 10%; $250 million to $499.9 million, 8%; $500 million to $999.9 million, 9%; $1 billion to $10 billion, 22%; over $10 billion, 13%.

ANNUAL IS BUDGET

♦ Less than $500,000, 19%; $500,000 to $999,999.9, 11%; $1 million to $4.9 million, 20%; $5 million to 9.9 million, 7%; $10 million to 24.9 million, 12%; $25 million to $99.9 million, 17%; $100 million to $1 billion, 12%; over $1 billion, 2%.

ANTICIPATED ANNUAL IS BUDGET GROWTH (1993-1996)

♦ Negative by more than 10%, 6%; negative by less than 10%, 10%; flat or no change, 32%; positive by less than 10%, 38%; positive by more than 10%, 14%.

TOP 3 BUSINESS GOALS (1993-1996)

♦ Improve customer focus and service, 32.3%; improve operational efficiency, 29.4%; improve innovation and development, 25.1%.

TOP KEY SYSTEMS (1993-1996)

♦ Design and development, 32.1%; sales and marketing, 29.7%; administrative, 18.3%; manufacturing, 14.6%.

MAIL SURVEY CONDUCTED BY DATAQUEST, INC. BETWEEN JUNE AND SEPTEMBER 1993

OPEN OR BUST

OPEN SYSTEMS SHIFT

WHAT IS THE PROJECTED SHIFT TO OPEN SYSTEMS OVER THE NEXT THREE YEARS?

PERCENT OF IS BUDGET

PAYOFFS . . .

HOW MUCH DO YOU CONSIDER EACH TO BE A BENEFIT THAT OPEN SYSTEMS BRINGS TO YOUR ORGANIZATION?

SPECIFIED TOP CHOICES IN DESCENDING ORDER

1. Easy access to applications anywhere on the network.
2. Interoperability.
3. Software and data portability.
4. Availability of many applications.
5. Cost savings in hardware and software.

. . . AND PAINS

HOW MUCH DO YOU CONSIDER EACH TO BE A BARRIER TO THE ADOPTION OF OPEN SYSTEMS IN YOUR ORGANIZATION?

SPECIFIED TOP CHOICES IN DESCENDING ORDER

1. Vendors that provide proprietary/ incompatible versions of open systems.
2. Cost of conversion from existing proprietary systems.
3. Too many competing standards.
4. Difficulty of conversion from existing proprietary systems.
5. Published standards too complicated or confusing.

BIGGEST WINNERS FOR 1996

BASED ON BUYING PLANS

1. Microsoft's Windows NT
2. Object-oriented databases
3. OSF's DCE
4. OSI
5. Sun/HP's DOE

BIGGEST LOSERS FOR 1996

BASED ON BUYING PLANS

1. MS-DOS
2. Windows
3. Hierarchical databases
4. Macintosh
5. TCP/IP

OSI OBSTRUCTIONS

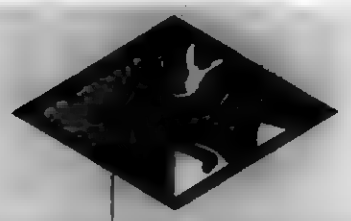
WHAT ARE THE OBSTACLES TO YOUR ORGANIZATION'S ADOPTION OF OSI?

SPECIFIED TOP CHOICES IN DESCENDING ORDER

Benefits of OSI not apparent to organization	47%
Installed base of other networks	42%
Products not available	36%
Lack of awareness of OSI in organization	29%
Available products not proved	29%

PERCENT OF RESPONDENTS MULTIPLE RESPONSES ALLOWED

OFFSHORE UPDATE



EUROPE

AS IN U.S., PRODUCTS LAG USER DEMAND

PERCENTAGE OF COMPANIES THAT MANDATE PURCHASE OF OPEN PRODUCTS COMPLYING WITH INTERNATIONAL STANDARDS:

23%

European information systems managers want open systems to help overcome differences in technical culture. But user concerns about a lack of mature products and applications as well as tight budgets pose major obstacles to adoption.

Too bad, because unlike U.S. firms, European organizations are willing to forego short-term paybacks in favor of strategic benefits, says Alain Pastre, director of European operations at the Open Software Foundation in Brussels.

"Open systems is a good way to build an integrated computer architecture from different proprietary systems," says Christophe Binot, information technology architect at Elf Aquitane, a French oil and gas group with 780 companies worldwide.

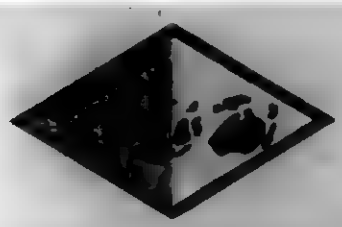
Elf hopes to gain economies of scale from negotiating companywide contracts. Moreover, a standards-based information architecture would give branch operations the autonomy to choose among a range of products that conform to standards, Binot adds.

While major multinationals in Europe are committed to open systems strategies, it's the public sector that is on the bleeding edge. Great Britain's National Health Service (NHS), for example, is considered one of the continent's most savvy user organizations.

The need to communicate among 14 regional health authorities with incompatible systems drove the NHS to an Open Systems Interconnect (OSI)-based architecture, says Seth Mason, senior information technology consultant. "The NHS grasped the nettle, and we're now two years into implementation of a strategy to have a nationwide OSI network for the health service."

The relative immaturity of vendors' OSI products has driven the NHS to set up its own interoperability testing lab. "I don't think we've implemented anything that we haven't had problems with interoperability and conformance to standards," Mason says, adding that vendors aren't testing their products properly. "When we find problems, they are usually fixable, but I'm a user and I shouldn't have to do that."

Written by Elizabeth Heichler, London-based European correspondent at the IDG News Service.



PACIFIC RIM

JAPAN SLOW, BUT UNIX GAINS FOOTHOLD IN REST OF REGION

PERCENTAGE OF COMPANIES THAT MANDATE PURCHASE OF OPEN PRODUCTS COMPLYING WITH INTERNATIONAL STANDARDS:

42%

Japan

In the largest Asian market of all, open systems are only beginning to take root.

Japanese computer users have been less inclined to look at open alternatives, thanks to the dominance of proprietary big-iron companies such as Fujitsu Ltd., Hitachi Ltd. and NEC Corp.

Another factor: a paucity of LANs. IDC Japan estimates the penetration of PC-based LANs in Japan at only 8% in 1992.

"Only 15% to 20% of our office computer [proprietary minicomputer] users are considering Unix," says Yukio Ono, general manager of open systems marketing at Fujitsu.

"While there are very few cases of customers replacing current proprietary systems with Unix," says Yoichi Kataoka, general manager at NEC's Workstation Marketing Promotion Division, "many are replacing current proprietary systems with Unix systems because it is more cost-effective than adding new mainframe capacity."

JDC Corp., a large-scale construction company and longtime NEC mainframe user, recently built a sales support system with Oracle Corp. and Informix Corp. databases running on an NEC Unix server. "We chose Unix because the start-up and maintenance costs are lower" than a host-based system, explains JDC's director of system development, Masatoshi Tomimatsu.

The predominant view in Japan of Unix as simply a cost-effective solution for implementing new applications differs from the U.S. view.

"In Japan, most companies tend to buy from a single vendor, so there is very little impetus to move to open systems from a multivendor standpoint," explains Takahiko Umeyama, senior analyst at IDC Japan.

Kiyoshi Ohta, an industry analyst at Nomura Research Institute, predicts that open systems will not take off in Japan until 1996 or 1997.

Pacific Rim

Unix and standards-based client/server systems are gaining a strong foothold in major Pacific Rim information technology markets.

Despite "a general shyness about bringing Unix into mission-critical and on-line transaction processing areas," notes Davis Blair, vice president at IDC Asia Pacific, "the advancement of open systems in Asia is definitely progressing." In many places, the spread of Unix is aided by strong government support.

Another boost: Client/server and Unix are well-suited to the small and medium-size operations in the region. Poor telecommunications presents a big stumbling block in some areas, however.

Australia

Industry experts say Unix acceptance is greater here than in the U.S.

IDC Australia predicts that sales of large-scale, multiuser Unix systems will increase at a compound annual growth rate of 24% during the next five years, compared to a 7% annual drop for similar-scale proprietary systems.

Popular support appears strong. John Everitt, MIS manager at upmarket retailer David Jones Ltd., explains: "Unix will save us money on software development because we can buy more packages off the shelf."

Taiwan

The government, eager to position itself as a major future exporter to mainland China, is developing a standard Chinese language specification that should result in greater cross-platform compatibility among Unix vendors.

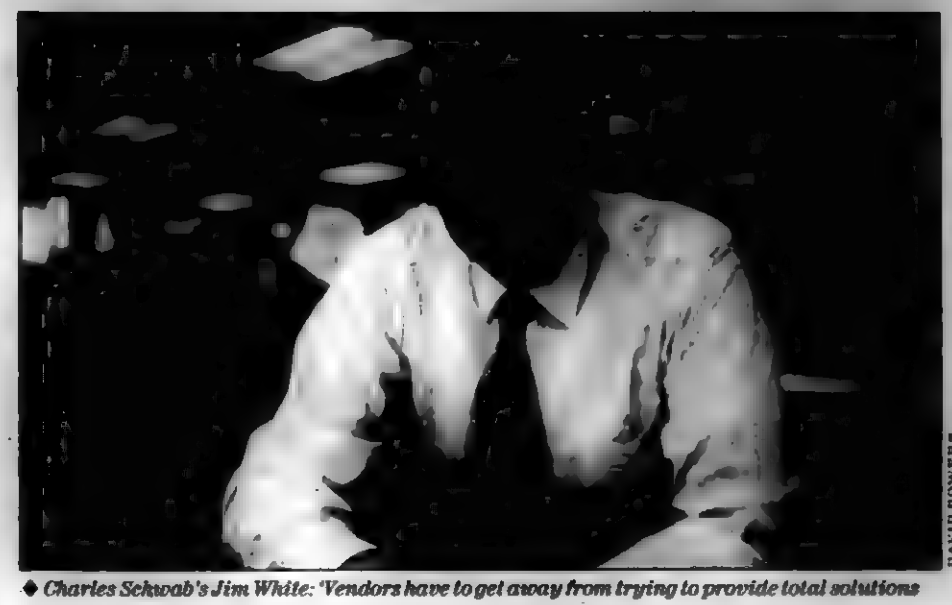
Hong Kong

The island's role as a major financial center requiring centralized processing has slowed Unix acceptance. However, English-speaking buyers have more freedom to pick and choose among products and brands.

South Korea

A government-backed consortium has established a Unix specification. "Ticom" addresses local language issues and serves as a standard for government procurements.

Written by David Kellar, Tokyo correspondent at the IDG News Service. *Computerworld Australia*, *Computerworld Hong Kong*, IDG Communications Taiwan and *Computerworld New Zealand* contributed to this report.



DAVID POWERS

◆ *Charles Schwab's Jim White: 'Vendors have to get away from trying to provide total solutions rather than a core product that would fit open environments'*

OPEN ENOUGH

CONTINUED FROM PAGE 92

"If what you know is the world of IBM, today's world has got to be frustrating from a lot of points of view," says Nicholas Rudd, chief information officer and senior vice president at Young & Rubicam, a New York advertising agency. "You've got lower cost, but you're not sure if it's going to work with everything else you've got."

Signs of progress

Some users even understand their vendors' fears of turning their products into generic commodities and no longer accuse vendors of dragging their feet when it comes to incorporating standards in their products.

"That was the case even with proprietary systems," acknowledges Lehman Brothers' Sherr. "When I was on an IBM or DEC platform, they told me how much I was going to get, when I was going to get it and how much it was going to cost."

But for all their newfound pragmatism about open systems, many users still have a bone to pick: They wish vendors would stop fighting over minor issues and instead focus on doing what they do best.

"Vendors who have good products in one space are trying to provide total solutions rather than a core product that would fit in an open environment. This is what we've got to get away from," White says.

Fortunately, there are signs that vendors are beginning to get that message. Recent announcements such as the Common Open Software Environment, proposed by IBM, Hewlett-Packard Co., Sun Microsystems, Inc. and Novell, and the "Posix 1170" collection of application programming interfaces suggest that suppliers have begun to eliminate some of the low-level inconsistencies among otherwise similar products (see story page 119).

Still, users complain that their most pervasive problem with vendors remains the lack of standards-based products in certain key areas, including system and network management and security.

Trade-offs inevitable

Ironically, one key role of standards is reducing choice. But the hardest choice many IS executives face today isn't which vendors or products but how products will be used. Even standards-based products include extra bells, whistles and other features to make them more attractive and easier to use.

Should you take advantage of those features and risk becoming locked into a single vendor's product? Or should you forego them and risk losing the competitive edge they may give your competitors who use them?

Your choice is getting the most either from the product or from the standards it's based on. That's a trade-off — a compromise. But today, the road to open systems is paved with compromises. ◆

Hayes is a Portland, Ore.-based free-lance writer who specializes in Unix and open systems. His Internet address is frankhayes@bix.com.

"HOW DO YOU DEFINE OPEN?"

"Ultimately, [open systems] simply and importantly boils down into having more choices."

EUGENE LUKAC, Vice President of Information Services, U.S. Bancorp, Portland, Ore.

"Open systems creates an opportunity to provide a more flexible technology solution to our clients."

MIKE BELAC, Director of Data Management, PHH Fleet American, Hunt Valley, Md.

"Open systems means the ability to pick the best of breed in hardware and software, whether it be spreadsheets, programming tools, databases or any other element. . . . In the past, IS executives could pick the wrong tool or vendor, and the consequences might have been disastrous."

ED ALTMAN, Executive Director of MIS, Paramount Pictures Corp., Hollywood, Calif.

PERSPECTIVE

IT'S TIME TO GET TOGETHER

PETER KEEN

"True progress will be sped up when logicians and pragmatists join forces."

Unix is proprietary. SNA is open. Your response to that statement — "yeah" or "@!!*&" — says which of the two standards camps you belong in: logicians or pragmatists.

Logicians drive the formal standards-setting process. They tend to be optimists: academics and technical specialists.

Logicians are the true believers who forgot that Open Systems Interconnect was a "reference model," who saw ISDN as a long-term unifying blueprint for the world's public networks, who are the founders of forums such as the Committee for Open Systems and who are vendors with grand schemes, most obviously IBM with Systems Application Architecture.

Pragmatists don't have a scheme. They are opportunists who go with what works. In doing so, they often determine what works: PC users and software developers who turned proprietary DOS into a very open standard, telecommunications specialists who solved the Unix-to-SNA problem with TCP/IP and IS managers who decided that despite its usability, the nonstandard Macintosh did not fit into their architecture.

Pragmatists must be opportunists. To them, an open standard is meaningful only in terms of products. The latest X/Open Co. survey illustrates their main problem: Many of the open standards products they need — integrated network and systems management tools, client/server applications and distributed environment tools — are unlikely to arrive smoothly.

Perhaps disciplined pragmatism is the key to making smooth and consistent progress. Logicians get results slowly: X.25 took 15 years to implement in proven products. X.400 took eight years. ISDN was obsolescent before its rollout. In contrast, multimedia and wireless are here before there are standards. The same is true for Fiber Distributed Data Interface.

True progress will be sped up when logicians and pragmatists join forces. The former can help define standards and publish interfaces. Users can then push vendors to publish standards and make sure no one player controls changes. And perhaps most critically, users must create enough mass to guarantee rapid growth of products and services.

SNA fits this definition, which is why it is clearly an open standard. Multimedia and wireless will be non-open for a long time unless users create a market leader. And judging by these criteria, Unix is a semiopen, semiproprietary standard — unstable and not fully defined.

The faster technology moves, the more pragmatists will determine open standards. To shift from being opportunistic and reactive, they need to tell logicians what they are betting on. Logicians and pragmatists can formalize the standard they each embody and ensure better end-to-end integration across the enterprise.

Keen is executive director of the International Center for Information Technologies.

Trapped In The Body Of This Tiny Ser

This is a story about a small computer engineered to be so dependable, you won't think twice about trusting it with your mission-critical applications. And to be this without filling a closet, much less a room. If you haven't thought of Compaq as an enterprise-critical platform before, we invite you to grab your bifocals and begin. (We'll be cramming a lot of information into this ad, which, given how much we managed to fit into our new servers, only makes sense.)

If there's one thing we've learned working with our customers, it's that you're running more and more mission-critical applications on your network. And if your network goes down, your business goes down. All of which makes the introduction of the new Compaq ProLiant Server even more timely.

The ProLiant is a new family of affordable, high-performance, easy-to-manage servers engineered specifically to provide the high availability you need for mission-critical networks. We've designed ProLiant in three different models, ranging from a single-processor configuration to a four-Pentium processor model.

Now, how can you be sure our server is truly a miracle and not a mirage? To begin with, there's Full Spectrum Fault Management, provided by Compaq Insight Manager technology and software that continually monitors over 800 aspects of the server's operating status. (For example, Drive Parameter Tracking checks 15 hard-drive parameters.) All of this information is constantly gathered, analyzed and then used to prevent, tolerate or recover from system problems.

If the performance of a monitored component drops below a specified level, our unique Pre-Failure Warranty kicks in. We'll actually replace a Compaq warranted drive or memory system free. Before it stops working. No downtime. Ringing cash registers. Happy boss.*

Still, no network's perfect. In the unlikely event problems occur, our server exhibits remarkable tolerance. Every ProLiant includes Compaq-designed hot-pluggable drives. ProLiant Models 2000 and 4000 come standard with advanced error-correcting memory and off-line backup processor features (whereby the server reboots automatically to a second processor). And, most notably, the Compaq Smart SCSI Array Controller together with the ProLiant Storage System ensures mission-critical data integrity. Should a network problem bring the server down, the Rapid Recovery Systems of the ProLiant are designed to bring it back up.

VER IS A MAINFRAME WITH AN ATTITUDE.

For example, Automatic Server Recovery 2 uses a historical record of server status and performance to perform an astonishing array of tasks. Like intelligently restarting the server, automatically correcting a variety of problems, and accessing a telephone pager to contact network administrators.

By now you'd expect us to have rethought server setup, configuration and OS installation, but you might be surprised by the results. Introducing SmartStart, a CD-ROM system that takes the headache out of getting your server up and running. ProLiant includes a CD-ROM drive and bundled CDs of optimized Netware and other major operating systems. To get hooked up to your network operating system, simply call your dealer for an access code, enter it, answer a few questions, and leave. Minutes later—say, after you've enjoyed a cup of coffee and a jelly donut—you'll return to find an integrated OS fully installed and optimized for increased performance and improved management. And we'll keep you updated via CD when new operating system versions appear.

*And finally, to accompany our new line of mission-critical servers, we're introducing mission-critical support. With ProLiant, we now offer extensive analysis, installation and service through our CompaqCare System Partners, a select group of highly trained systems experts backed by Compaq engineers. You can now choose 4-hour on-site warranty response upgrade** direct from Compaq. Again, there's our unique Pre-Failure Warranty. And, of course, all Compaq servers come with a 3-year on-site† warranty, and 7-day-a-week, 24-hour-a-day technical support.*

All in a surprisingly small box for not a whole lot of money. In fact, a DX2/66 Compaq ProLiant 1000 starts at about $6000‡.

Which may help to explain the look your boss gives you when he hears how much money you've saved: stunned admiration. But you'll get used to that. It goes with the territory. For more information on the new Compaq ProLiant servers, or for the location of an authorized Compaq reseller near you, just call us at 1-800-345-1518. If you'd like to receive model, feature and specification information immediately via fax, select the PaqFax option. Or, if you'd like that information even sooner, just turn the page.

COMPAQ

The New Compaq ProLiant Mission-Critical Servers

	ProLiant 1000	ProLiant 2000	ProLiant 4000
High Performance Network Servers			
Processor	DX2/66 or Pentium 60MHz	DX2/66 or Pentium 66MHz	DX2/66 or Pentium 66MHz
Architecture	TriFlex/PC One Processor	TriFlex with up to two symmetric processors	TriFlex with up to four symmetric processors
Network Interface	Up to 12 High-Speed Channels; NetFlex 2 with Packet Blaster Technology Standard		
Standard Disk Controller	Integrated Fast SCSI-2 and Smart SCSI Array Controller (selected models)		
Storage Capacity	550MB–112GB Internal/external	1050MB–140GB Internal/external	1050MB–140GB Internal/external
Typical Usage	Departmental network services—primarily NetWare	Departmental network application services—NetWare, NT and Unix	Application services for preemptive downsizing—NT and Unix
Transaction Rating	50–150 TPS	200–300 TPS	300–400 TPS
Estimated Starting Street Price‡	$6,000	$8,900	$13,900
Server Dependability and Availability			
Management	Second-generation Compaq Insight Manager (standard) combines with innovative hardware design to constantly monitor, assess and report server health and performance		
Fault Prevention	Insight Manager alerts you to server status changes in over 800 component parameters, allowing proactive server management backed by 3-Year Pre-Failure Warranty		
Fault Tolerance	Standard support for RAID levels 1,4,5; hot-pluggable drives; on-line spare drive; off-line backup processor§; advanced ECC RAM§		
Fault Recovery	Standard rapid recovery services automatically return server to full operational status even in the event of a critical subsystem failure		
Simplicity, Ease of Ownership and Support			
SmartStart	Standard CD-based intelligent hardware configuration and system software installation, providing simplified server configuration for NetWare, NT or Unix. (CD-ROM drive standard)		
System Warranty	Free Three-Year, On-Site Limited Warranty		
Pre-Failure Warranty	Three-Year, On-Site Warranty replacement of designated components that fall below preestablished thresholds		
4-Hour Warranty Response Upgrade	Optional Three-Year On-Site Warranty upgrade to 4-hour response		
Technical Support	Toll-free, 7 x 24 technical phone support from Compaq engineers		
CompaqCare System Partners	Highly trained, dedicated, third-party professionals who provide systems maintenance and comprehensive technical support		
QuickFind/PaqFax	Proactive notification and delivery of new technical information/7 x 24 fax response for updated specification, configuration and settings data		

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THE STATE OF OPEN SYSTEMS '93

NONSTANDARD STANDARDS

JAMIE HOGAN

DESPITE GRAND PLANS AND INTERNATIONAL GUIDELINES, STANDARDS ARE WHAT SELLS. STILL, IS HEDGES BETS FOR THE FUTURE.

DE FACTO IS DE STANDARD

BY AMY BERMAR

Dean Trilling once thought the Open Software Foundation would provide Cleveland-based American Greeting Corp. with its first open architecture. But after three years of planning long-term strategy to guide the $1.8 billion greeting card company through the next decade, dreams of open systems became a closed book.

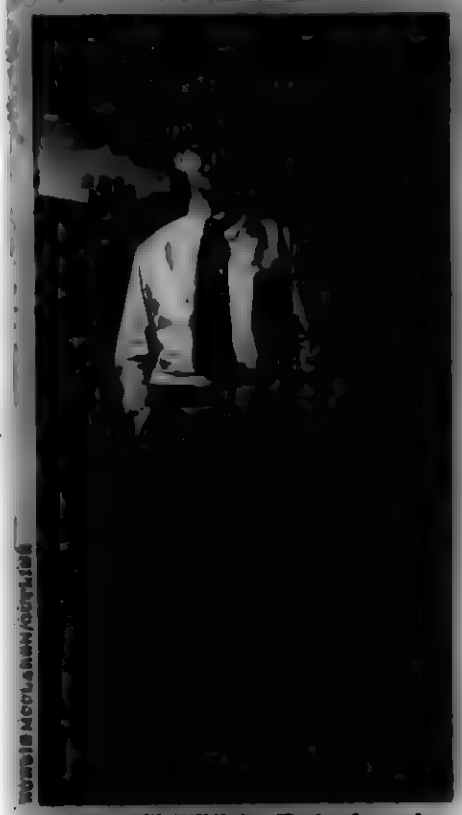
DE FACTO, PAGE 100

THE BUYERS HAVE SPOKEN: MARKET LEADERS

1992 U.S. INSTALLED BASE IN MILLIONS

DOS	51M
Windows	12.8M
Unix	1M
NetWare	1.2M

SOURCE: BIS STRATEGIC DECISIONS, NORWELL, MASS.



ROBERTO MCCLARAN/CIRRUS

◆ *Microsoft's Bill Gates: Hoping for a winning plan with OLE 2.0 and Cairo*

Object wars

IT'S WINNER TAKE ALL STAKES FOR THREE COMPETING GROUPS IN THE OBJECT-ORIENTED BATTLE

By Garry Ray

Hashing out open systems standards may seem like genteel deliberation. But pull back the curtain and you'll find furious politicking rarely seen outside of Washington. Consider the ongoing jockeying for leadership in object-oriented technology.

The three-way battle pits Microsoft Corp., the Object Management Group (OMG) in Framingham, Mass., and an alliance that includes IBM, Apple Computer, Inc., Novell, Inc. and other vendors against one another.

The outcome probably won't be seen for some time, but the stakes are high. The winner will dictate object-oriented programming interfaces for years to come.

Each party is a formidable foe. Formed in 1989, the OMG, which boasts 100 software vendors, has cobbled together a series of specifications for object-oriented technology. The most important is the Common Object Request Broker Architecture (Corba).

Microsoft is pushing its Object Linking and Embedding 2.0 and Cairo extensions to Windows. The Apple/IBM alliance, which began with Taligent, Inc., is slated to deliver an object-oriented operating system in 1995.

Will the three pull together or pull apart?

Observers say Microsoft clearly intends to call its own shots. But lately, the Redmond, Wash., company has expressed more interest in the OMG amid Microsoft's rumored partnership with Digital Equipment Corp. and a third-party database vendor.

Microsoft expresses no regret about sidestepping the OMG in the past. "We have to move fast, and the OMG is taking much too long," says Dave Seres, OLE product manager. He adds that he views Corba as "technically useless."

Even so, Microsoft appears eager to gather object specifications from other alliances. For example, the company has been chasing Apple's OpenDoc specification since its announcement, according to Seres, but has thus far been ignored. Apple has made no comment on the issue.

The likely result of such wrangling? "Paralyzed interoperability" among open vendors, predicts Steve McClure, manager of object technology at International Data Corp. in Framingham, Mass.

Still, hope, like politicking, springs eternal. "It would be great," says Judy Mintz, the OMG's director of marketing programs, "if everybody was playing in the same sandbox."

Ray is *Computerworld*'s senior editor, Firing Line.

DE FACTO

CONTINUED FROM PAGE 99

"We have to run our business," says Trilling, vice president of information service responsible for a worldwide enterprise of IBM mainframes, minicomputers and workstations, Macintoshes and 3,000 PCs. "So whoever is perceived as having the best solution ends up as the de facto standard."

That's why Trilling and many colleagues are increasingly betting on market-made standards, whether it's Novell, Inc.'s NetWare, IBM's NetView, Windows and DOS, Intel Corp. processors or database management systems from Oracle Corp. and Sybase, Inc.

Analysts and information systems executives say demand for working products is usurping the relevance and role of "pure" open systems, even those based on official, international standards.

"It doesn't matter whether you call it open, proprietary, international or de facto," says Mark LaRow, a principal at Ernst & Young's Technology Service Group in Fairfax, Va. "There's no such thing as a real standard. What matters is market share."

With several hundred "standards" vying for primacy, users question which will endure. Some, including electronic data interchange (EDI), X.400, X.500 and TCP/IP, are generally considered survivors. Others, including Manufacturing Automation Protocol and Open Systems Interconnect, have fared worse than expected.

And the kitchen sink nature of most standards groups means that standards, when available, often perform far worse than proprietary solutions.

Buying what works

"While users are entranced with the idea of standards, when all is said and done, they go back to what works," notes Howard Anderson, president of The Yankee Group, a Boston consulting firm.

"We know we're paying a premium by going with a proprietary approach," says Chip Cyr, vice president of information technology at Beckton, Dickenson & Co., a medical supplies manufacturer and a large IBM AS/400 site headquartered in Franklin Lakes, N.J. "But rather than waiting for nirvana, we're in the game now."

If there's a bright spot, Cyr and others note, it's that interim activity can hasten the standards-setting process. "Committees see what works in the real world. And even though you may be using a proprietary platform, the vendor is influenced by the principles of what you're trying to do."

True, says John Morris, director of liaisons at the Open Software Foundation in Cambridge, Mass. "The standards world is coming to grips with the market realities and marketing battles," he says. "There is an overall consensus that end users are able to describe what they need, and this gives vendors and standards organizations the ability to fill the gaps."

George Shaffner, chief operating officer at X/Open Co., a standards body comprising 130 vendors and users, agrees that unofficial and de jure standards can work in concert.

"De facto standards don't displace formal standards," Shaffner says. De facto standards have become more important, he says, as the industry moves to standardize new technologies such as client/server, object-oriented programming and DBMS applications.

Risks for users, vendors

What's the long-term impact of relying on unofficial standards? The biggest drawback for users: The de facto standard may be based on an inferior solution that can require rework to conform when a de jure standard comes along.

Moreover, vendors are hesitant to relinquish even small features believed to provide competitive differentiation.

Finally, many observers say proprietary products still deliver the biggest payoff. "Official standards, by definition, are trailing-edge technology," says Rikki Kirzner, an analyst at Dataquest, Inc., a San Jose, Calif.-based market researcher. "By the time something gets incorporated as a standard, the technology has moved on."

Procter & Gamble Co.'s senior standards-setting strategist could not disagree more. Four years ago, Frank Caccamo, vice president at the Cincinnati-based company's management systems division, bet that X.400 and X.500 would someday let him bridge the company's 15 mail packages. Procter & Gamble also relies on EDI and TCP/IP for internetwork communications.

"The standards we've tried to make within [Procter & Gamble] are those we'll try to hang on to," says Caccamo, who says he hopes to eventually reduce the mail load

WE SEE

consortiums because a consortium of vendors has a better chance of establishing a standard than any one vendor. This is actually a simplifying process, although everyone tends to groan that things have gotten more complicated, notes Charles Babcock, Computerworld technology editor.

BUYING: 1993

Purchasing plans for the next three years show a marked shift away from proprietary products

DATABASES
Sharp drop in hierarchical and SQL as object-oriented takes off.

FRAMEWORKS
X/Open's XPG4 and Posix new top runners. SAA dives.

GUIs
Windows edges out Motif.

OBJECT TECHNOLOGIES
C++ slips but still dominates. OLE and Corba are fast risers.

NETWORKING
Sharp drop in SNA, corresponding rise in OSI and DCE. Novell's NetWare will lose ground but stay in Top 4. Biggest winner: TCP/IP.

OPERATING SYSTEMS
Microsoft's Windows NT rises to top at the expense of Unix. All others lose ground, especially DOS and Windows.

SOURCE: X/OPEN CO. GLOBAL SURVEY OF 780 IS MANAGERS

to four applications. "Heaven help us if the real thing comes along and it's different."

To increase its chances of being heard by the right people, Procter & Gamble employees sit on several standards-setting committees. The firm also continually assesses the viability of pending standards.

Buyers face another catch-22: In tight times vendors tend to invest precious development funds into proven products. "[No vendor] wants to spend the money or invest in the staff to research something new," says Robert Tucker, general manager of information resources and technology operations at KeyCorp., a financial services holding company in Albany, N.Y.

KeyCorp spent much of the past eight years acquiring other financial services organizations, and open systems would have helped in the resulting integration. But Tucker says he hasn't modified his stance on open systems.

"We're continuing to operate with the same vendors we've dealt with for years," he says, including Digital Equipment Corp., IBM and Tandem Computers, Inc. "Nobody's been able to demonstrate anything for open systems. They have good stories to tell, but they don't have enough installed base."

American Greeting changed LAN vendors this past year, based on the shifting market. "We didn't go to Novell right away because we were unsure of its prospects," explains Trilling, who previously used IBM's LAN Manager. Now, he says, NetWare has the benefits of clear market leadership, as well as new features.

De facto may be best

As user investment in de facto standards increases, the de jure standards are under pressure to match the evolving features of market-leading products. But this takes time.

As a result, notes Tom Kucharvy, president of Summit Strategies, Inc., a Boston consultancy, de facto standards may be the best available solution for users trying to balance the most competitive technology with some level of interoperability.

> "WHILE *users are entranced with the idea of standards, when all is said and done they go back to what works.*"
>
> HOWARD ANDERSON, YANKEE GROUP

In many respects, de facto standards are better than open systems, Kucharvy argues. "They let you consolidate development and give you all the advantages of economy of scale without locking you into something that is inherently less than the most advanced technology available."

Anderson adds that users who grumble about the dearth of more interoperable solutions have only themselves to blame. "Users talk out of both sides of their mouth," Anderson says. "They say they want a standard, but they don't vote with their pocketbook." ◆

Bermar al Corporate Ink in Newton, Mass., writes about the computer industry.

CAN'T TELL THE GROUPS WITHOUT A SCORECARD

A fast, opinionated guide to stalwarts and fast risers in the standards world

♦UNIX INTERNATIONAL, PARSIPPANY, N.J.
Formed in 1988 to promote Unix System V as the industry standard, this once-promising group is a shadow of its former self. One industry consultant describes it as "a hollow organization with about 25 people, including support staff, and a huge production copier that can turn out thick books in a few seconds." On paper, the group has 300 members. A surprisingly active white paper and conference program supports its role as a Unix cheerleader. A merger with the OSF is a safe bet in the coming months.

♦OPEN SOFTWARE FOUNDATION, CAMBRIDGE, MASS.
Software think tank and development organization formed in 1988. Founders IBM, Digital and others wanted to promote industrywide standards for open systems. Today, the OSF boasts 167 corporate and 145 individual members. Only real successes: creation of the Motif graphical user interface and Distributed Computing Environment middleware. Influence appears to be waning rapidly with the rise of the COSE alliance. Active, fairly powerful End User Steering Committee.

♦X/OPEN CO., MENLO PARK, CALIF.
An international melange (headquarters are in the UK) trying to shake its clubby, vendor-dominated past. Arguably the most happening standards-making group in the open systems arena. Now consists of 16 vendors, 54 users, 27 independent software vendors. Its branding approach is gaining momentum and already encompasses a portfolio of more than 800 X/Open-branded products. Recently inherited ownership of OSF/Motif and the Unix brand name.

♦USENIX ASSOCIATION, BERKELEY, CALIF.
The pioneering (18 years old) group boasts 4,500 individual members and 450 on the corporate side. Heavy techie feel. Sponsors various seminars, workshops, symposia. Beards and ponytails still required, dude.

♦OPEN USERS RECOMMENDED SOLUTIONS, STAMFORD, CONN.
Headed up by superstar CIO Elaine Bond, this 2-year-old group and its 34 corporate members try to "improve multivendor computer networks."

Nonstandard procedures

WHY IS IT SO DARNED HARD TO MAKE GOOD STANDARDS QUICKLY?

By Ted Krum

A few years ago, open standards groups and professional bodies promised to lead eager users down smoother, wider and cheaper computing paths. Today, many information systems organizations are wondering if the guides are lost in the bramble.

X/Open Co.'s latest survey shows that the slow, fragmented and political process of creating open systems standards has left many IS chiefs disappointed, bitter and skeptical (see chart).

SOURCE: X/OPEN CO.

"As soon as customers show interest in something new, vendors jump on it and fight within the standards-setting bodies," laments Eric Firdman, director of strategic IS at Pacific Bell. "By the time standards are approved, they are already obsolete."

He is not alone: Many wonder whether existing mechanisms for devising open systems standards really work or if they matter.

Critics complain that poor user involvement and the sheer number of standards have hindered the spread of open systems, resulting in lost opportunities for users and vendors alike.

Electronic mail is a good example, says Dean Allen, vice president of information and administrative services at Lockheed Corp.

"The X.500 E-mail standard is still up in the air, so we had to develop our own interoperable E-mail capability," Allen says. "Open standards are important to us, but we can't afford to wait for them."

Little wonder, users say, that ad hoc industry groups, proprietary products and make-do solutions have rushed in to fill the vacuum, threatening to make "official" standards irrelevant.

"We don't care about open systems," says George Brenner, vice president of Universal Studios and director of corporate information services at MCA Worldwide. "Real standards would be nice, but the lack of standards hasn't really hurt us."

Brenner says he can accomplish all the interoperability his company needs by using hardware that runs on Token Ring or Novell, Inc.'s NetWare.

Such comments beg the question "What's wrong with the way standards get made?" Most agree on the following problems:

- **Too many groups.** The biggest obstacle is the decentralized nature of standards making. Hundreds of other large, lesser-known groups are now trying to establish open systems standards. This lack of centralized power, coupled with rapid technological innovation and lack of government regulation, makes discussions of reform difficult if not impossible.
- **Differing agendas and styles.** Priorities for standards makers and users often vary sharply. The former, for example, do not face the same time-to-market pressures as corporate

PROCEDURE, PAGE 106

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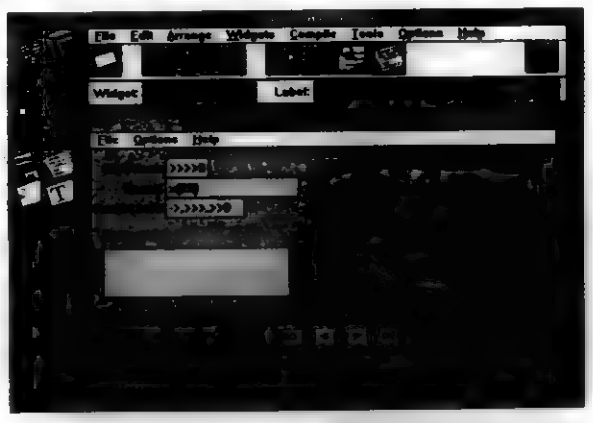

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HOT ALPHABET SOUP

A GUIDE TO THE MOST IMPORTANT AND FASTEST-RISING OPEN SYSTEMS STANDARDS

UNDOUBTEDLY, one of the worst things about open systems is that there are too many damned acronyms! Even the most fervent open zealots get goo-goo-eyed at the sheer number and complexity of standards, real and otherwise. To help you sort things out, here's an opinionated guide to the hottest, most important standards and suites.

COMPILED BY JONATHAN EUNICE AT ILLUMINATA, A HOLLIS, N.H., CONSULTING FIRM.

NAME	DESCRIPTION	KEY BACKERS	STATUS	STRENGTHS	WEAKNESSES
OPERATING SYSTEM AND SYSTEM SERVICES					
POSIX	Suite of standards describing Unix-like system behavior.	IEEE, all Unix vendors, some proprietary vendors.	Individual standards for core system calls, command interface and utilities ratified and available; many areas (security, GUI, testing, etc.) still under development.	Broad-based effort to specify and improve Unix.	Has taken a long time to deliver results; process continues.
SAA	Common systems environment for selected IBM systems (MVS, VM, VSE, AS/400 and OS/2).	IBM.	Now almost a decade old. IBM products implement parts of SAA, though certainly not all. SAA plans appear less important than in years past.	Attempt to give a common application environment across important, diverse platforms.	Very slow state of development has significantly reduced user attention and confidence; other standards and approaches have superseded SAA's designs.
SPEC 1170	Set of approximately 1,170 system and library calls defining Unix behavior.	Leading Unix vendors, X/Open.	Development recently initiated; being passed to X/Open.	Cooperative attempt to further nail down just what Unix is and should be.	Adds yet another standard, which overlaps with already developed standards such as Posix and XPGN.
Win32	Description of APIs for writing Microsoft environment programs, especially those for Windows and Windows NT.	Microsoft, IBM (via OS/2), Sun (via Wabi).	Products implementing Win32, Win32s and other variants are now available (e.g., Windows NT, Windows 3.1), with more on the way.	Single-vendor definition allows quicker, surer definition with less compromise and confusion. Huge potential market makes Win32 and its variants very compelling target for software developers.	Single-vendor definition makes it closed and proprietary and also limits what could be valuable outside review.
XPG	X/Open Portability Guide. Suite of standards describing Unix-like system behavior.	X/Open, most Unix vendors, some proprietary vendors.	XPG2 obsolete; XPG3 current and widely implemented on Unix, with parts on some proprietaries; XPG4 new and implemented by a few vendors (e.g., HP).	Comprehensiveness relative to other open systems standards. Attempts to define a whole application environment, not just a few system calls and utilities (contrary to Posix, Spec 1170). Conformance is tested and compliant products branded in conformance (i.e., vendor claims independently checked).	X/Open has been just one of many bodies attempting to standardize and has not had particular moral authority.
GRAPHICS AND USER INTERFACES					
COSE	Common Open Software Environment, Common Desktop Environment for Unix and other open systems.	HP, IBM, Sun, SCO, Novell, X/Open.	Now under development. Functional specification released June 1993, with final definition by late 1993 and products in 1994.	Spurred by the threat of Microsoft's Windows NT, Unix vendors finally cooperate on interoperable desktop environment, ending years of bickering that did nothing to help users.	COSE attempts to unify, often without making hard choices between one approach or another. Merged products will do both ways, making them more complex and expensive to develop and use.
OSF/Motif	Look and feel for X Window environments.	OSF, most Unix vendors.	Broadly implemented on Unix and some proprietary systems.	Portable, network-aware user interface system.	Defines only a part of the GUI behavior; needs more. Leaves many holes, which causes incompatible and dissimilar implementations.
X11R5	Distributed, windowed, GUI environment.	MIT, virtually all Unix vendors.	Broadly implemented and supported, especially X11R5 version.	Portable, network-aware user interface system. Has led to whole new classes of device, X terminals, with benefits of both workstations and terminals. May be good evolution for traditional terminal vendors.	Design does not optimize efficiency or functionality. Interoperability promises often at least partially subverted by subtle differences in configurations and font availability of different products.

NONSTANDARD STANDARDS

NAME	DESCRIPTION	KEY BACKERS	STATUS	STRENGTHS	WEAKNESSES
INTERCONNECTIONS (COMMUNICATIONS, NETWORKING, ETC.)					
Asynchronous Transfer Mode.	High-speed link interface suitable for creating network backbones (either private or public).	Telcos, networking vendors, systems vendors.	Products beginning to ship now (4Q '93).	Suits needs of backbones and multimedia applications; good fit with telco equipment will enable good service offerings.	None apparent.
Fiber Channel Standard.	Point-to-point high-speed links, primarily over fiber: Type 1 (raw channel) for cluster links; Type 2 (reliable, packetized) for disk links.	Systems and peripheral vendors.	Products beginning to ship now (4Q '93).	High-speed links suitable for shared disk, system clusters and high-availability links; high-end, longer-distance alternative to SCSI.	None apparent.
Low-level definitions of the most important network media, including Ethernet, Token Ring and fiber.		IEEE, ANSI, virtually all network products vendors.	Definitions of Ethernet, Token Ring, FDDI and supporting layers ratified and widely available; definitions of incremental improvements and new network kinds (e.g., 802.6 MAN) in progress.	Networking critically depends on common, interoperable definitions of those networks.	None per se.
Open Systems Interconnect.	ISO suite of communications and networking standards.	ISO, at least lip-service paid by many systems and networking vendors.	Implementations available for many open and proprietary platforms; not used as much as available.	Highly general, flexible, forward-looking definitions.	Extraordinarily complex; takes longer to implement and often more expensive to use. Despite more than a decade of development, not nearly as mature or proved as competitors TCP/IP and SNA; often treated as a check-off item, not a real must-implement requirement.
Internet suite of networking protocols.		All Unix vendors, virtually all network products vendors.	Broadly implemented in both Unix and proprietary systems.	Mature and proved in innumerable implementations; practical inter-environment connections; steady, incremental evolution.	Relatively low function; impending shortage of IP addresses; confusing standards evolution process.
Interface for connecting systems to public data networks.		CCITT, telcos, virtually all network products vendors.	Widely implemented in products and services worldwide.	Supports many WAN and inter-WAN connections.	Obsolescence approaching; designed for much slower connections. Designed for virtual circuit, long-haul connections in world that is increasingly packet-switched.
Extended addressing and directory standards designed for worldwide electronic mail and messaging.		CCITT, many network services and software vendors (at least to some degree).	X.400 broadly but usually partially implemented; X.500 beginning to be implemented; no full implementations yet.	Flexible, future-looking.	Very complicated; slowing development limiting practical use.
DISTRIBUTED COMPUTING					
Customer Information Control System.	IBM environment for OLTP applications.	IBM, others indirectly.	Very widely implemented in the commercial computing world; now emerging in the Unix world.	Very efficient transaction processing possible; huge body of CICS applications.	Historical design.
Common Object Request Broker Architecture.	Common framework and definitions for accessing, interacting with and managing object databases.	Object Management Group (OMG), most vendors that follow OMG.	Corba 1.1 definitions available and products being built on this base; specs remain somewhat immature, and development continues with Corba 2.0.	Interoperability in the world of objects (which is already too complex to admit the complexity of N competing approaches).	Corba development behind products; continued development required to make Corba sufficient.
Distributed Computing Environment.	OSF's tool kit for developing distributed and client/server applications.	OSF, most Unix vendors, many proprietary systems vendors.	First versions just now reaching users and developers; few applications use DCE yet.	High-function, distributed computing support components; broad acceptance promotes compatibility.	Long development cycle has caused many developers to look elsewhere for client/server support tools; performance and other productization issues weak.
Network File System.	Sun-developed file sharing mechanism.	Sun, virtually all Unix vendors, many proprietary systems vendors.	Widely implemented and used on Unix and proprietary systems.	Ultrabroad use makes it a very practical solution.	Performance, security and robustness over long-haul networks very weak; DCE DFS component, not NFS, seen as future of open file sharing.
SYSTEMS AND NETWORK MANAGEMENT					
Distributed Management Environment.	OSF environment for distributed systems and network management.	OSF, HP, IBM, CA, many others.	First components delivered to vendors late 1993 and to users in 1994 or early 1995. Full DME not to users until 1996 or 1997.	Attempts to address full difficulty of systems management problem; core services such as event notification, software distribution and license management inarguably required.	Full difficulty of systems management problem may be unsolvable in intermediate term; limited completeness and productization throws doubt on value of the enterprise.
Simple Network Management Protocol.	Internet protocol for managing network elements.	Virtually all networking vendors.	SNMP widely implemented and used. SNMP Version 2.0 now accepted and moving into implementation.	Lightweight design and broad implementation makes SNMP a very practical tool.	Lightweight design may not be fully scalable and limits functionality; security not good until SNMP Version 2.0 widely used.

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Editor, Client Server Journal

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The Newspaper of IS

PROCEDURE

CONTINUED FROM PAGE 101

customers and are inherently bureaucratic.

"Success" for standards groups, says Mary Lynne Nielsen, senior project editor for Posix standards at IEEE in Dun Ellen, N.J., means achieving broad consensus, coordinating with other standards bodies and creating specifications that don't need much future revision.

"If the standards committees are guilty of anything," adds Lorraine Kevra, a co-chair of an ISO advisory group on open systems and manager at AT&T, "it's wanting the standards to be perfect before they let them go." Unfortunately, that's a serious impediment to customers in fast-moving industries.

• **Lack of resources.** Nielsen notes that IEEE standards makers are largely volunteer bodies. A 35-person staff coordinates the work of volunteer committees for the group's activities, including some 600 standards publications.

No miracles

Unfortunately, the reforms users say they want most — faster progress and more user input — are at odds. Even so, Jim Johnson, chairman of The Standish Group, a South Yarmouth, Mass., consultancy, says greater user involvement is a must. "Only users can separate the standards process from vendor politics," he says.

Because companies let vendors spend the time and money, Johnson continues, "the pace and results benefit vendors, not users."

There are precedents for users driving standards, including the pivotal roles played by General Motors Corp. and The Boeing Co. in helping standardize Ethernet and Token Ring.

Allen adds, "Only the biggest, most valuable customers can have real influence." Lockheed, Allen notes, is working through the Aerospace Industry Association's Technology Committee to gain additional leverage.

More user involvement is fine with George Shaffner, chief operating officer at X/Open, an international standards certifying group. "Customers always tell me they vote when they buy products. But by then it's too late."

Even critics of today's standards processes recognize their looming future importance.

"We can't handle all of this activity with point solutions. Sooner or later, the industry will need to lay the pipe for truly seamless connectivity." ◆

HOW COULD THE PROCESS BE IMPROVED?

THREE CHOICES PERMITTED

1. Faster adoption and implementation.
2. Fewer competing standards.
3. All vendors should be forced to conform to the same set of standards; fewer standards organizations.
4. Users should have more input into the standards process.
5. Standards should be implemented further into the development cycle.

Krum, based in Stamford, Conn., conducts independent research, consulting and free-lance writing.

ALAN LEVENSON

◆ *Lockheed's Dean Allen: 'Open standards are important to us, but we can't afford to wait for them'*

PERSPECTIVE

AN OPEN PROPOSAL

MICHAEL GOULDE

"A new charter would enable X/Open to be free to move into some of the more advanced areas of technology."

When it comes to defining and implementing a structure and methodology to achieve industrywide open systems, intelligent and rational professionals go on vacation and the Keystone Kops take over.

Users complain that there are too many competing standards coming from too many standards bodies.

No kidding.

The list of industry associations, consortia, accrediting agencies, task forces and ad hoc committees working on standards throughout the world is mind-boggling. There is no one organization with overarching authority to coordinate all of the standards efforts and ensure that they are not duplicative or incompatible.

This is a serious problem.

Some argue that X/Open plays the role of standards integrator and coordinator. However, the X/Open process is to integrate rather than prescribe. It combines existing standards into profiles and creates conformance tests to qualify products for the X/Open brand that users value.

The organization was not intended to look for new areas of standardization or to provide coordination of other standards efforts. It was designed to respond, not initiate.

Maybe the charter of X/Open needs to change. X/Open should become the overarching coordinating body that ensures that the efforts of the informal standards groups, such as the various consortia, workgroups and other industry forums, fit into a cohesive architectural and strategic plan.

X/Open could also coordinate the work of informal groups with the efforts of formal standards bodies such as the IEEE. There is no other organization as well-positioned as X/Open to assume this role.

And we certainly don't want a new consortium.

A coordinating body could squelch duplicative efforts and initiate work in areas where it was lacking. A new charter would enable X/Open to be free to move into some of the more advanced areas of technology, such as distributed object computing, and help set standards there so the industry can move ahead more quickly.

It is critical that X/Open remain permanently insulated from proprietary interests. User support is a critical component in ensuring neutrality. Funding is a critical issue. Branding fees are important, but there may also need to be an X/Open fee built-in and assessed as part of the purchase of branded products — a kind of open systems tax.

The X/Open User Council was given control of the X/Open requirements process in 1992. If users are going to have control and achieve the benefits of open systems, then maybe the users need to pay something to help reduce X/Open's dependency on vendor fees.

Goulde is editor in chief of "Open Information Systems," a newsletter published by the Patricia Seybold Group in Boston.

HOW STANDARDS (REALLY) GET MADE

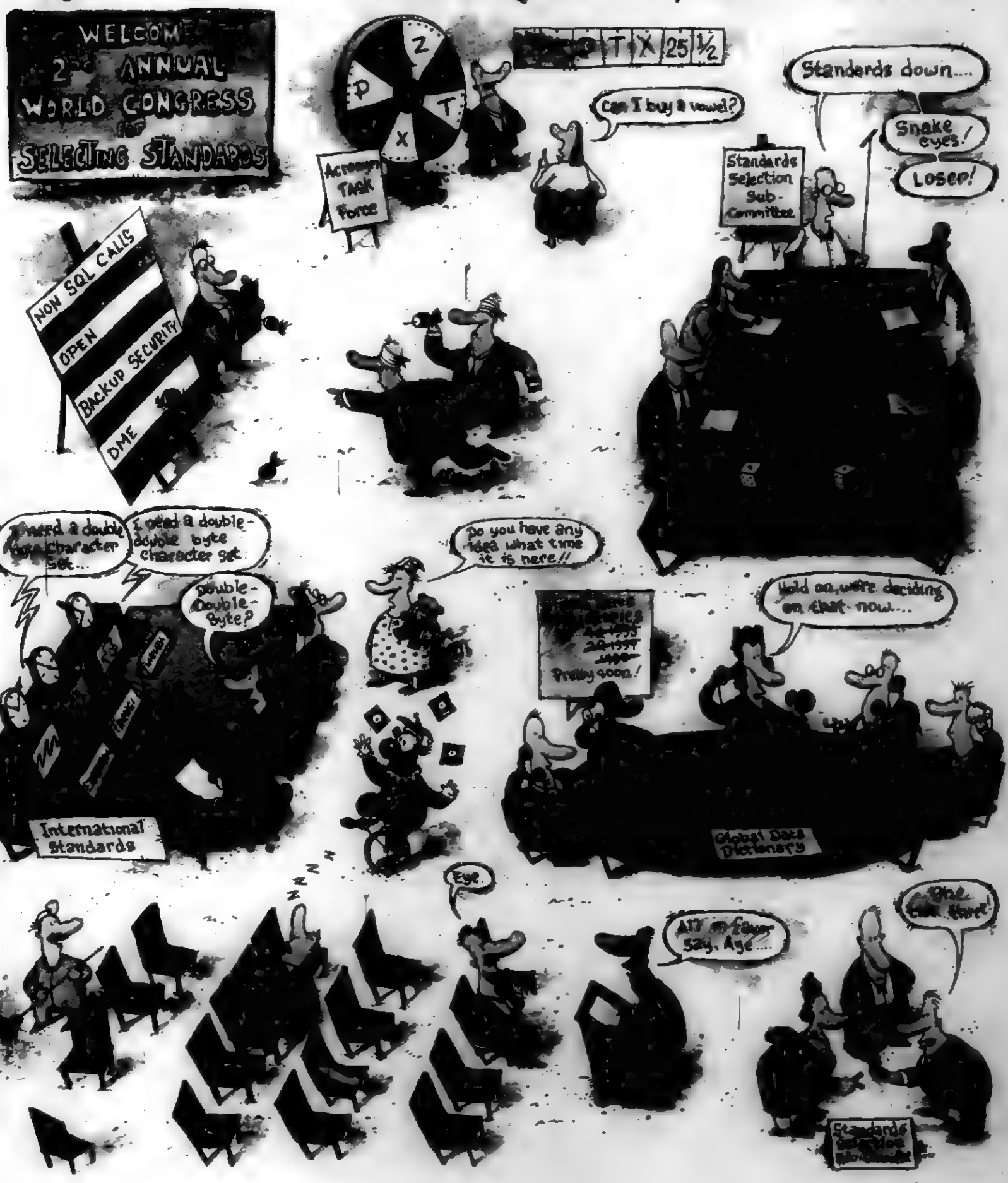
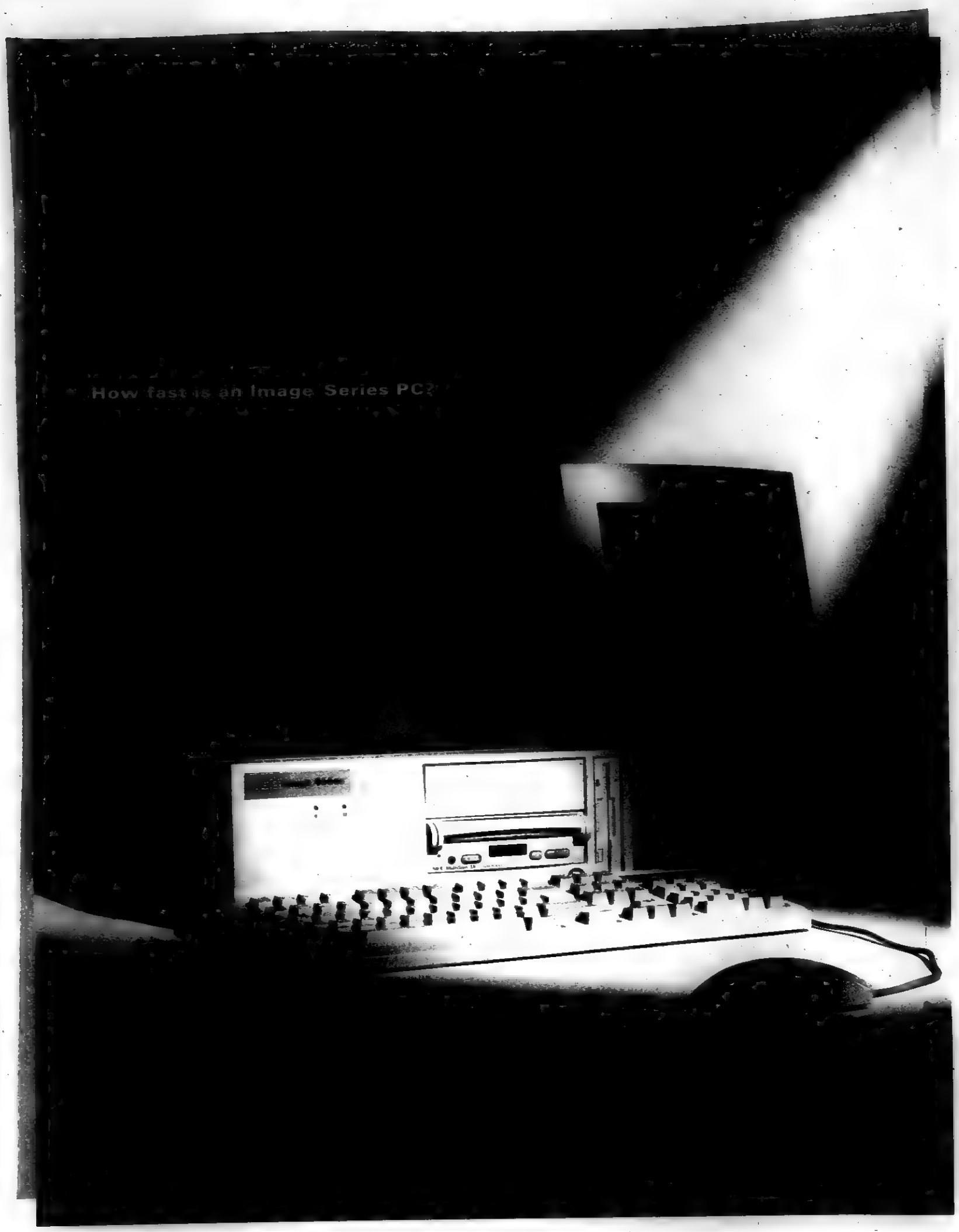
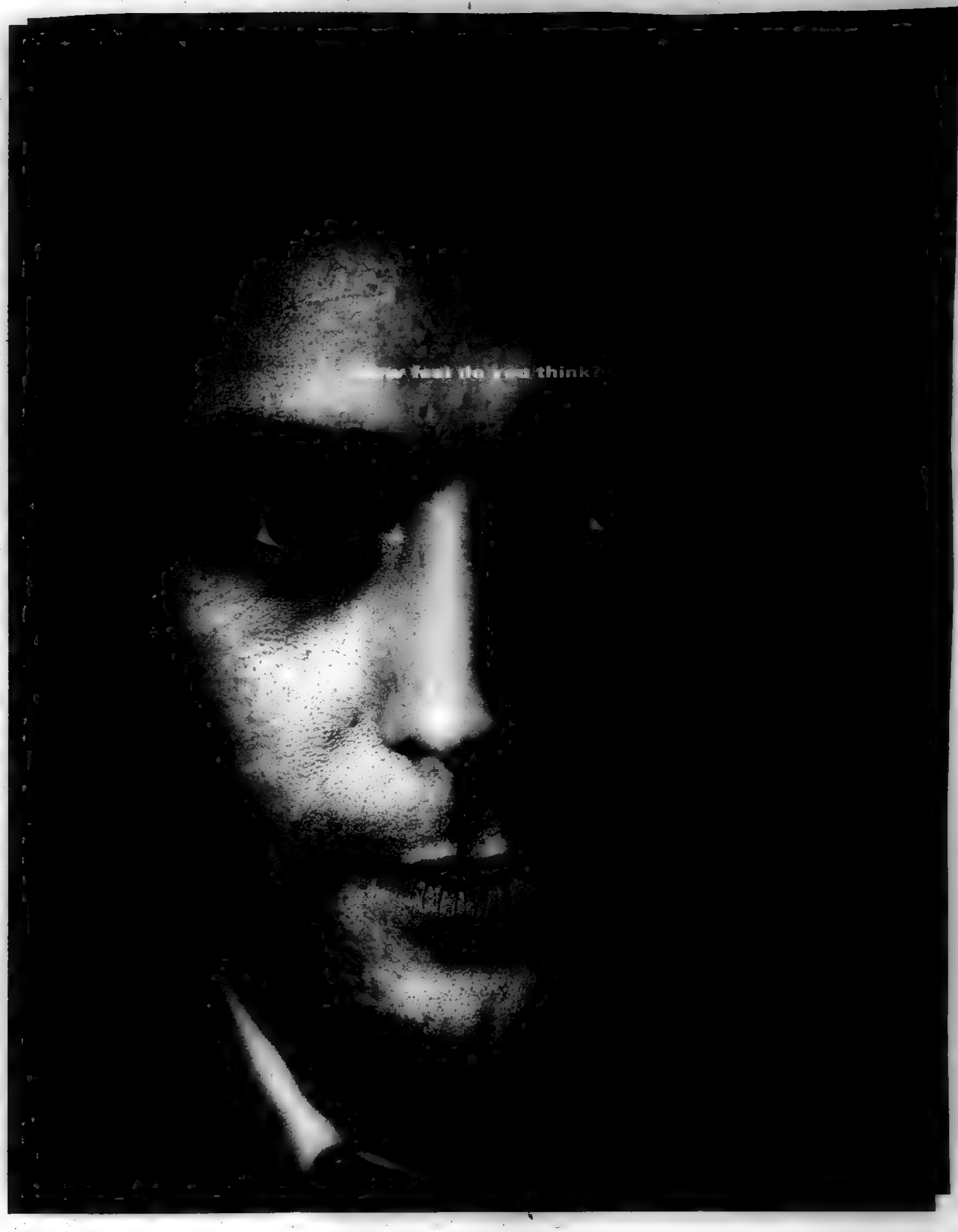


ILLUSTRATION BY DAVID CLARK; CONCEPT AND TEXT BY MICHAEL COHN

How fast is an Image Series PC?





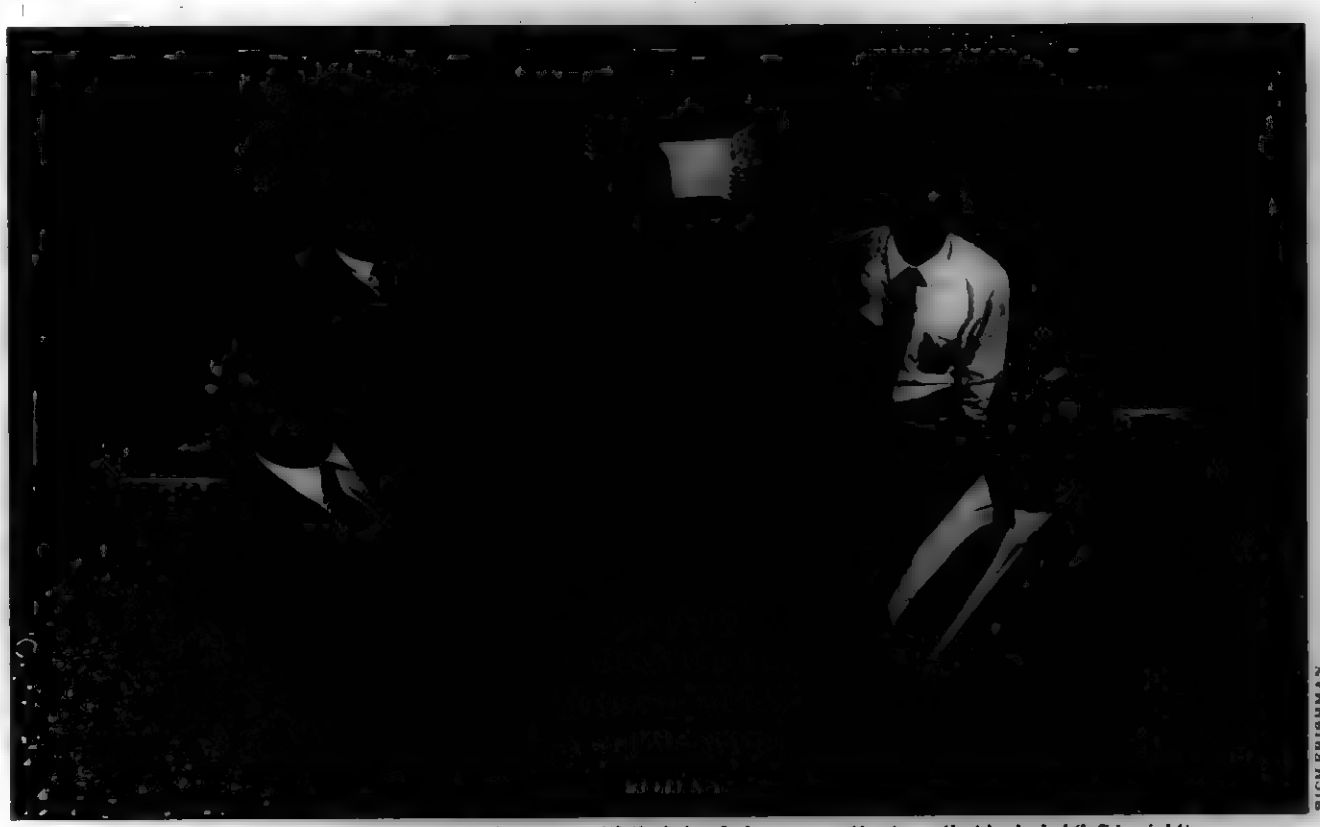
Some more information to bring you up to speed.

intel inside

NEC

THE STATE OF OPEN SYSTEMS '93

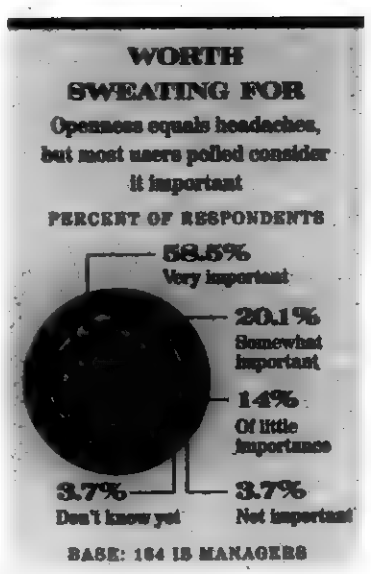
TALES FROM THE ROAD



RICH PRIBHMAN

♦ *Associated Grocers took the open systems plunge last year with the help of a large executive team that included (left to right): David Okimura, Bob Nehira, Dragan Jagnjic, Boey Peng Mun and Dick Lester*

WORK AROUND



BY JEAN S. BOZMAN

Like pioneers who settled the open plains, open systems adventurers learn to work around hardship and eventually get where they are going. But not without detours, bumps, bruises and an occasional serious injury.

"I've stepped on so many land mines, I've got pegs for legs," quips David Pensak, a consultant who advises users on open systems and networks at Du Pont Co.'s research division in Wilmington, Del.

Among typical trials: Disk drives that crash in the wee hours of the morning, overnight database backups that stop halfway through, software vendors that disappear into thin air and development tools that won't fit together.

While users have been learning lessons for sidestepping such hazards since the 1980s, other complex problems persist, slowing the shift of mainframe applications to distributed servers and networks.

Information systems managers frequently complain, for example, that open systems consoles and management tools are far less evolved than those for proprietary mainframe environments. Security and integration are also big problems, along with support (see story page 117).

WORK, PAGE 114

Crossover schemes

TOP IS EXECS WHO HAVE TAKEN THE PLUNGE GIVE SOME FRONT-LINE ADVICE

TIP ONE

BEWARE THE MARKETING HYPE

Jumping to a new technology merely because of marketing hype or because it is the "in" thing won't necessarily boost your career or help your firm.

"We look at Unix as a technology, and it must prove its business value for our shareholders before we will embrace it," says Stuart Gaiber, director of MIS at the Avery Division of Avery Dennison in Diamond Bar, Calif.

Indeed, IS executives should take a deep breath and calmly look at the real trade-offs in a Unix-based environment.

A problem for Unix is the need to support an on-line transaction processing (OLTP) environment. "Though progress has been made in OLTP support, the bulletproof transaction processing business demands is not yet all there," says Larry Panatera, director of information technology at PepsiCola of North America in Purchase, N.Y.

TIP TWO

DO GOOD BEFORE YOU DO HARM

Because of the many installation problems, code rewrites and new system designs, any attempt to ramrod Unix into a commercial environment will alienate staffers and users. It also could cause hiccups that might lose precious corporate data.

Instead, a graduated approach can lead to less harm and greater good. "Start with pilot projects," urges Hugh Naughton, group manager of MIS at Gas Research Institute in Chicago, "and do a lot of prototyping."

TIP THREE

IF YOU'RE GOING TO BUILD A FIRE, FIRST BUILD FIRE-FIGHTING SKILLS

Programmers and analysts used to a standard mainframe environment are not likely to know what to do in a distributed Unix-based graphical user interface (GUI) setting. Apart from the confusion that shifting to a whole different operating system generates, IS executives can inadvertently make their in-house staffers feel like they are back in kindergarten.

John Nomura, director of global information technology at Mitsubishi Electronics of America in Cypress, Calif., offers this rule of thumb: "There must be at least 20% to 30% of Unix-experienced personnel in your project teams." Once trained, he adds, these staffers can take on a trainer role and further train or retrain others.

TIP FOUR

DON'T TURN USERS INTO UNIX GURUS

Unix can make life easier or much harder for your users. If you require users to learn arcane Unix commands, they are bound to become critics.

"Users should never need to know that they are running on Unix," says John Stevenson, vice president of MIS at Dr Pepper Co./The Seven-Up Co. in Dallas. "The emphasis of a Unix transition should be on simultaneously embracing GUI capabilities and making system access for users easier than ever."

Bottom line: Users need to get their jobs done and won't appreciate any requirements that force them to wear propeller-head hats.

Before putting Unix and Unix-based applications into the hands of users, conduct exhaustive testing, Panatera adds.

TIP FIVE

PUBLICIZE YOUR COMMITMENTS

If you've decided to use Unix, take a stand and make it work. Wishy-washy decisions will leave your staff confused.

Switching to Unix is "definitely not for the faint of heart," warns Denny Steele, vice president of IS at Bergen Brunswig Corp. in Orange, Calif.

Decisions to use one contemporary Unix version must be followed by a clear direction shared by all. It's a tough job, but that's the only scheme that will really work.

Written by Lance Eliot, president of Eliot & Associates and an internationally recognized computer industry consultant, writer, speaker and analyst.

WORK

CONTINUED FROM PAGE 113

Morever, users complain that still-evolving standards and products further complicate things. "It would be nice to have a crystal ball that you can rub and hope for divine guidance," Pensak says. "But if you wait until you're absolutely sure, your competition has probably beaten you."

Below, experienced hands that worked around the problems with early forays into open systems share their trials and triumphs in hopes of smoothing your path.

Dunkin Donuts

Dunkin Donuts, Inc., based in Randolph, Mass., migrated from Wang Laboratories, Inc. minicomputers to an open systems network of Sun Microsystems, Inc. servers in the late 1980s. But the donut chain soon ran into compatibility problems with TCP/IP in the corporate network.

The difficulty, explains Dave Bennett, vice president of information services, involved third-party TCP/IP support for Banyan Systems, Inc. Vines LAN servers and Sun TCP/IP support for its Unix servers. "Even though there were standards," Bennett recalls, the two products "didn't talk."

Sun engineers eventually solved the problem, he says, but finger-pointing and delays "blew us out of the water for two months or so" during development.

Another showstopper soon cropped up but was mercifully short-lived. In 1991, a corrupted Oracle Corp. Oracle 6 database brought operations to a halt for hours, according to Bennett. While Dunkin Donuts stores could still sell donuts, financial results could not be updated on the central-site system, he says, causing lost productivity.

"When something like that happens, it knocks you down, and people are sitting around not able to work. It's a huge opportunity cost," he says.

Despite these early bumps, the rest of the company's shift to open systems came as a result of standardizing on the Oracle database, which runs on both Wang and Sun platforms. Applications were rewritten for Sun machines and transferred off the Wang servers.

What lessons did Dunkin Donuts learn? The biggest one, according to Bennett, was also the toughest: Moving to open systems does not automatically slash costs.

"We are spending the same amount of money we would have if we'd perpetuated the legacy systems," Bennett says.

But, he adds, quicker, easier access to the centralized corporate database and a "much simplified" data environment have yielded big qualitative payoffs.

Bennett says he would like to be able to access other databases to widen his options. He claims that his only regret is standardizing on a single relational database management system.

While past problems seem small, he says, the sense of insecurity they cause can be profound. "You're never really sure if anybody is going to step up and solve the problem."

First Boston

First Boston Corp. views its move to distributed computing as a competitive advantage that gives its traders faster access to data feeds and powerful desktop analysis capabilities.

TWO YEARS *ago, according to Forrester Research, Inc., a consultancy in Cambridge, Mass., client/server systems cost 15% to 20% more to build than a traditional minicomputer-based solution. However, plummeting hardware prices and better development tools have brought the build-from-scratch price of both systems to about $2 million.*

But migrating applications from IBM mainframes to 1,000 Sun workstations and servers also swelled the cost of each workstation seat from $4,000 to $15,000, says Jim Swanson, a vice president of IS at First Boston's Fixed Income Trading Technologies Group.

To make the move work, programmers had to build custom code in C and C++ to fill gaps in the open systems middleware. One custom-crafted, transaction-based utility, for example, lets mainframes pass data to Unix systems, ensuring safe arrival.

However, even with carefully planned coding and systems deployment, First Boston didn't bank on the day-to-day management headaches.

For example, handling backup of hundreds of gigabytes of data from more than 20 Sun servers poses a major administrative headache, Swanson notes. "We have so many workstations and there's so much installation and engineering going on that it's taking up a lot of manpower."

The firm is now considering a centralized backup with a large archival tape system.

Big gaps in systems management software — really a collec-

tion of separate packages — is another problem. Swanson is eagerly awaiting the arrival in 1994 of several "framework" products that would unite network and systems management tasks.

Associated Grocers

Like First Boston, Associated Grocers, Inc. in Seattle did not wait for open systems to mature before taking the plunge last year. The $1.2 billion grocery cooperative installed a network of a dozen Unix servers to manage mission-critical warehouse inventory and distribution systems.

The goal was to base efforts on the Open Software Foundation's Distributed Computing Environment (DCE) standard, explains Richard Lester, vice president of IS. That meant a three-layered software approach in which user interface, database and application software are handled separately. DCE acts as the "glue" that links clients to servers.

The firm took a staff of Cobol programmers and retrained them to work in C, C++, Microsoft Corp.'s Visual Basic and Informix Software, Inc.'s Informix 4GL database application builder.

"I've leaned toward hiring a few key people with Unix and open systems backgrounds who are going to seed that knowledge into my organization," Lester says. "I'm still committed to retaining as many of the existing staff as possible and helping them to become technically proficient in this new world."

To reduce programming burdens, Associated Grocers bought Unix accounting packages as well.

An avid supporter of open systems, Lester says he still sees a few holes in his strategy: He, too, has not saved as much money as he would have liked — and the systems management tools are few and far between. For example, Associated Grocers had planned to cut its IS budget in half, down to just 0.5% of sales.

But the higher "soft" costs of architectures for client/server and open systems plus extra training, development and implementation costs have kept spending steady.

RIGUNA VASILENKA

♦ *First Boston's Jim Swanson eagerly awaits the 1994 arrival of 'framework' products to unite network and systems management tasks*

There were other disappointments: Lester says IBM RS/6000s running AIX installed in the early 1990s did not perform as well as Hewlett-Packard Co. HP 9000s in his environment. Since then, he has stopped buying the IBM workstations and begun buying HP servers.

"We were one of the very first users of RS/6000s," he explains. "When we put the order-entry system on it, we had to make an investment in duplicate hardware and backup systems."

A second setback arose from the need to carry out backup and restore operations on distributed Unix servers. Associated Grocers cleverly simplified the task by regrouping the warehouse servers in its central data center.

RIGHT NOW

the vendors have 25% of what you need and 75% promises."

RICHARD LESTER, ASSOCIATED GROCERS

"Because of the immaturity of system tools, it's most convenient to run your core machine functions in a centralized place because of the operators there," Lester advises.

In the end, migrating to open systems has meant reassembling pieces of the fragmenting mainframe data center, but with a new set of building blocks.

"Right now, the vendors have 25% of what you need and 75% promises," Lester says. "Somebody has to go out there with 50% and we'll jump at it."

Myke Miller, a client/server manager at Andersen Consulting in Minneapolis, advises IS groups to sidestep conflicting standards by implementing their own application-specific interfaces. "You need to insulate yourself with a very thin layer of architecture," which can help prevent chaos, he says.

Gene Friedman, vice president of applied technology at The Chase Manhattan Bank NA, agrees that attention to architecture makes sense. Friedman advises picking a standard tool set and a vendor-independent framework. ♦

Bozman is a *Computerworld* senior West Coast editor.

Upcoming shows

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Boston, Jan. 10-13
(508) 879-6700

♦ **CLIENT/SERVER CONFERENCE & EXPOSITION**
San Jose, Calif., Jan. 18-21
(516) 562-7460

♦ **COMNET '94**
Washington, Jan. 24-27
(508) 879-6700

♦ **SIM/COMPUTERWORLD EXECUTIVE TECHNOLOGY SUMMIT '94**
Tarpon Springs, Fla., Feb. 2-4
(312) 644-6642

♦ **BUILDING ENTERPRISE ARCHITECTURES**
Washington, Feb. 8-10
(310) 394-8305

♦ **UNIFORUM '94**
San Francisco, March 21-25
(800) 225-4698

♦ **NETWORKS EXPO**
San Francisco, April 19-21
(201) 346-1400

♦ **DISTRIBUTED COMPUTING WORLD**
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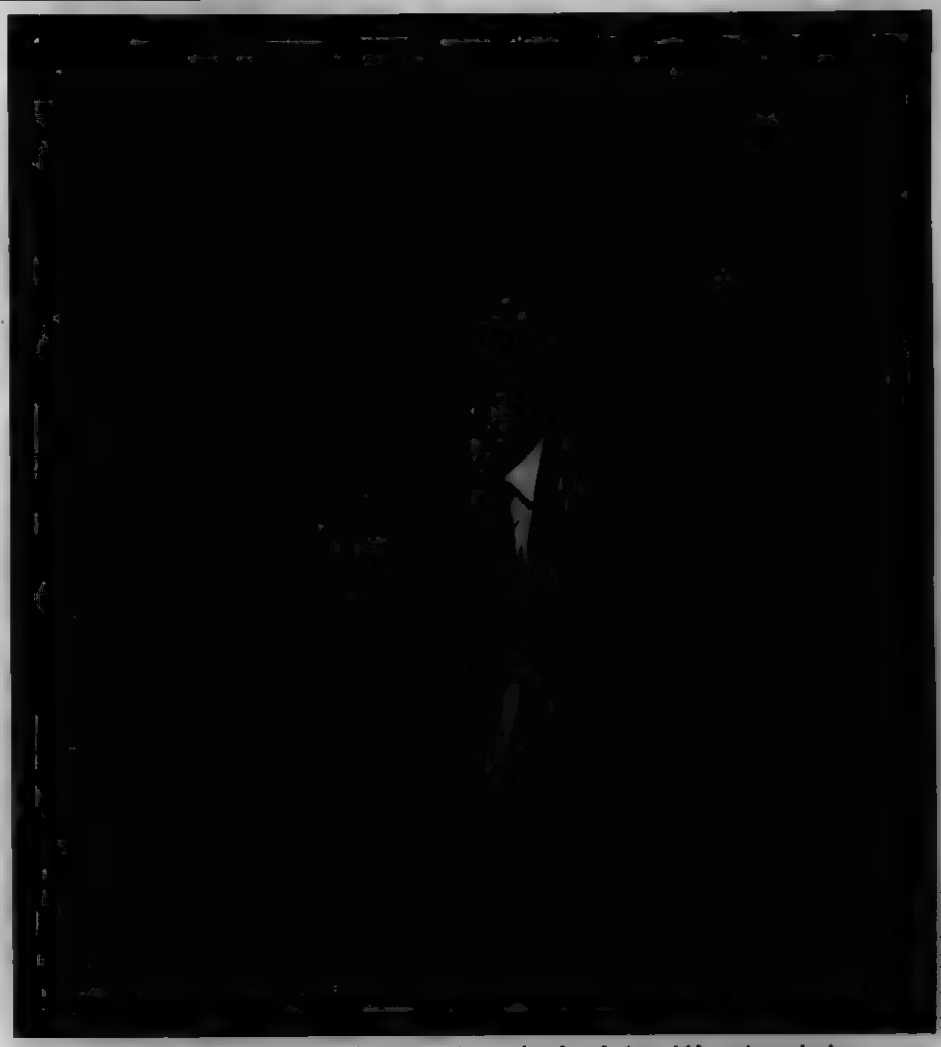


ALAN LEVENSON

♦ *Jenny Craig's Lee Rizio: Outsourcing support eases burdens but avoid long-term deals*

BY ALAN RADDING

Sky-high support demands nearly deflated Spalding Sports Worldwide's open systems game plan. When the Chicopee, Mass., manufacturer of sporting goods equipment began a migration from a proprietary Hewlett-Packard Co. 992/200 host to PC networks and HP Unix servers, it expected its data center staff to pick up support for the systems.

But the 60-person centralized group lacked the right skills and tools for the 9000 Series 800 and HP/UX environment, says Chief Information Officer Bard White. "We were naive at the beginning," White acknowledges. "We saw the cost savings of open systems, but we didn't understand networking and Unix."

Indeed, consultants say many firms focus so intensely on the design and development that support problems catch them off guard.

"Most companies assume that service and support will be absorbed within their existing setup — that the help desk will pick up the load and central IS will manage everything," says Robert Walsh, principal at Practice Corp., an open systems consulting firm in Mansfield, Mass. "But it doesn't work out that way."

For many, it's an expensive surprise. A recent study of support costs by Forrester Research, Inc. in Cambridge, Mass., found that the average cost for running a 5,000-user LAN internetwork was nearly three times higher than that of a comparable SNA network — $6.3 million.

"The sheer breadth of products borders on chaos," says Carter J. Lusher, program director at Gartner Group, Inc. in Stamford, Conn. The diversity of the open systems environment, he says, makes support more difficult.

Supporting multiple protocols without robust mainframe administration tools requires new skills and tools, adds Chip Steinmetz, chief technology officer at CS First Boston, Inc.

Others complain about staffing strains. "We have 650 stores, each fully automated, running critical applications but without anybody with computer experience," says Lee Rizio, vice president of information services at Jenny Craig, Inc., a Del Mar, Calif.-based chain of weight-loss clinics.

At Au Bon Pain, a Boston-based chain of 150 bakery/coffee bars, MIS director Mark Factor faces a similar dilemma. "Essentially, we support 150 data centers that don't have any skilled technicians. There is no central place to go for support."

Clever planning

The strain of retraining staff to maintain complex new open systems comes when the information systems group is under cost-cutting pressure. Still, such pressures have forced companies to develop innovative strategies.

Jenny Craig, for example, still maintains a centralized IS help desk. But many calls are forwarded to Computerland Corp., a Pleasanton, Calif., computer reseller chain.

But Rizio warns that outsourcing field support has limitations: For starters, the outsourcer doesn't know the company's business.

THE COST *of managing and maintaining a 140-user client/server system with custom software totals $859,000 over four years, says Forrester Research, Inc.*

At Au Bon Pain, Factor combines outsourcing from NCR Corp. in Dayton, Ohio, with tools that allow his central IS support group to control the remote system and resolve the problem. The chain also standardizes on products with the biggest market share because more third-party support is available.

Spalding, too, outsourced its PC help desk because it lacked in-house expertise. But to ensure that the contractors understood Spalding's business, White insisted the vendor dedicate the equivalent of three full-time staffers to work inside his IS group.

"We will bring service and support back inside once we get our staff trained," he adds.

If there's an upside, it's that IS managers say now is a good time to ink open systems support deals with outside vendors. A broad range of outsourcing suppliers are slashing prices to capture market share.

In November, for example, Bell Atlantic Business Systems Services, GE Capital Computer Leasing and Sungard Recovery Services, Inc. announced they will bundle their respective service specialties: equipment service, leasing and disaster recovery.

Bottom line: IS managers say it's wise to avoid piecing together a last-minute open systems support strategy.

"View support as important as system engineering," Steinmetz advises, "and make sure that support is appropriately staffed before you deploy the new system."

Rizio's advice: Get multiple bids and avoid long-term contracts. ♦

OPEN SUPPORT: GULP!

Architectural diversity can make open systems support a nightmare. Consider the mathematics of this worst-case scenario:

4 PLATFORMS X 3 GUIs X 4 DBMSs X 4 COMM PROVIDERS X 3 PRODUCTIVITY ENVIRONMENTS X 4 UNIX VERSIONS X 3 OLTP SYSTEMS =

6,912 COMBINATIONS

SOURCE: ANDERSEN CONSULTING, CHICAGO

Radding is a free-lance writer in Newton, Mass.

PERSPECTIVE

Open and shut

RICH MALONE

Malone is general partner of data processing at Edward D. Jones & Co., a St. Louis investment firm with more than 2,400 U.S. offices.

JIM STIKELEATHER

Stikeleather is director of systems development at Kash n' Karry Food Stores, Inc., a $1.2 billion supermarket chain with 115 stores.

The open vs. proprietary debate, as any information systems manager awake for the last decade knows, is hardly black and white. Free-lance writer Alice LaPlante asked top IS executives Rich Malone at Edward D. Jones & Co. and Jim Stikeleather at Kash n' Karry Food Stores, Inc. about the pros and cons of each approach.

Both in business and technology, Edward D. Jones marches to the beat of a different, conservative drummer. When financial services companies dove into Unix, open systems and client/server computing in the late 1980s, Edward D. Jones held to its centralized strategy.

Malone says the $500 million firm, which specializes in serving individual investors, will eventually include distributed components in its IBM mainframe-based architecture — but only slowly and cautiously.

Edward D. Jones recently announced that it would replace six IBM Series/1 minicomputers handling front-end communications controllers with two IBM RS/6000 PowerServers. The company plans to have 10,000 North American offices by the year 2000.

Kash n' Karry Food Stores has grown at a 6.2% annual rate since 1988. In early 1991, the Tampa, Fla.-based chain decided to move to the forefront of retail grocering by implementing an open, distributed architecture.

Today, the company boasts both development and production networks containing a mixture of Sun Microsystems, Inc. SPARCstation and IBM RS/6000 servers alongside several Intel Corp.-based systems connected via Fiber Distributed Data Interface and a parallel 10Base-T network.

The chain is currently working to replace proprietary point-of-sale store systems with Unix processors and is using standards-based electronic data interchange.

Remarks from Malone and Stikeleather, combined from separate interviews, follow.

TWO VIEWS ON WHY OPEN IS THE SMARTEST CHOICE... OR NOT

Q What is the main drawback of staying with a proprietary architecture?

MALONE: Without an independent steering body, such as exists in the open systems world, your proprietary vendor can determine what, when and how changes to the system are to be implemented and rolled out. Pricing is determined by the vendor alone, not the market. If your vendor doesn't provide a solution, you might be forced to implement a costly, unintegrated or inefficient workaround.

And information about the underlying architecture and internal workings of a product is often a closely guarded secret, making customization and integration beyond that anticipated by the vendor impossible.

STIKELEATHER: I can't honestly say there was an objection to proprietary systems as much as there was an attraction to open systems.

We were concerned that proprietary vendors wouldn't be able to maintain the quantity, quality and availability of technical support and remain competitive with what was happening in the marketplace.

There were also the issues of depth, breadth and variety of hardware and software technologies available in both the commercial and public domain.

Finally, we wanted to control our own destiny. We used to joke about the annual visit of our [proprietary] vendor rep to tell us what our budget for the next year was going to be.

Q What do you believe are the major drawbacks to open systems?

MALONE: Open systems vendors often don't implement more than core functionality. If a database vendor tells you it can communicate with Sybase and Oracle, usually that means the bare minimum. You might not be able to get remote procedure calls or other critical functions. When you get down to what you want to do, you have a lot of customization ahead of you. And that usually requires a detailed knowledge of underlying standards.

We often have to go out and find people who know one particular thing in the open systems world — Distributed Computing Environment, for example — and there is no one place to go for information on how that works. You just don't call a single vendor.

In addition, the need to maintain open application programming interfaces can mean extra code is included in the software, as it tries to be all things to all people. Rather than just having to talk to a single platform architecture, you have to talk to the whole universe of possible architectures. That's a lot of extraneous code that takes up memory and disk space.

STIKELEATHER: Open systems is no bed of roses. If anything, it's more work than a proprietary approach. With open systems, you are your own systems integrator, or you spend money on consultants to perform systems integration for you.

Secondly, if you're doing it right, there are a lot of up-front costs and time spent building an open systems architecture infrastructure. With so many more options to choose from, most decisions require more evaluation and thought than you'd require with a proprietary approach.

Third, you can't rely on your vendors the way you used to with proprietary environments. You literally control your own destiny.

Finally, the transition is very difficult. You have to keep the legacy functioning while building your new architecture.

Frankly, you need a higher quality of staff. You can't just look in the manual or call a vendor for a solution. Open systems has a short-term negative impact on turnover, productivity and morale. A highly paid professional does not want to become a "trainee" again.

Q Do you find there are cost advantages to be found with open systems?

MALONE: You're basically just shifting your costs from one place to another. If you want to move to distributed, open computing, it should be because your long-term business vision requires it.

STIKELEATHER: With an open systems-based distributed network, we have a finer granularity of resource addition. We can add another machine, upgrade a machine or spread upgrades around the network.

This, coupled with the competition among vendors in the open systems world, gave us better incremental cost control than a proprietary approach could offer.

Q What would be the worst-case scenario for your firm, given the technology route you've taken?

MALONE: The worst-case scenario would be to invest a considerable amount of money and time in transitioning our proprietary environment to a distributed architecture, with no appreciable payback. There'd be a loss of credibility with our users.

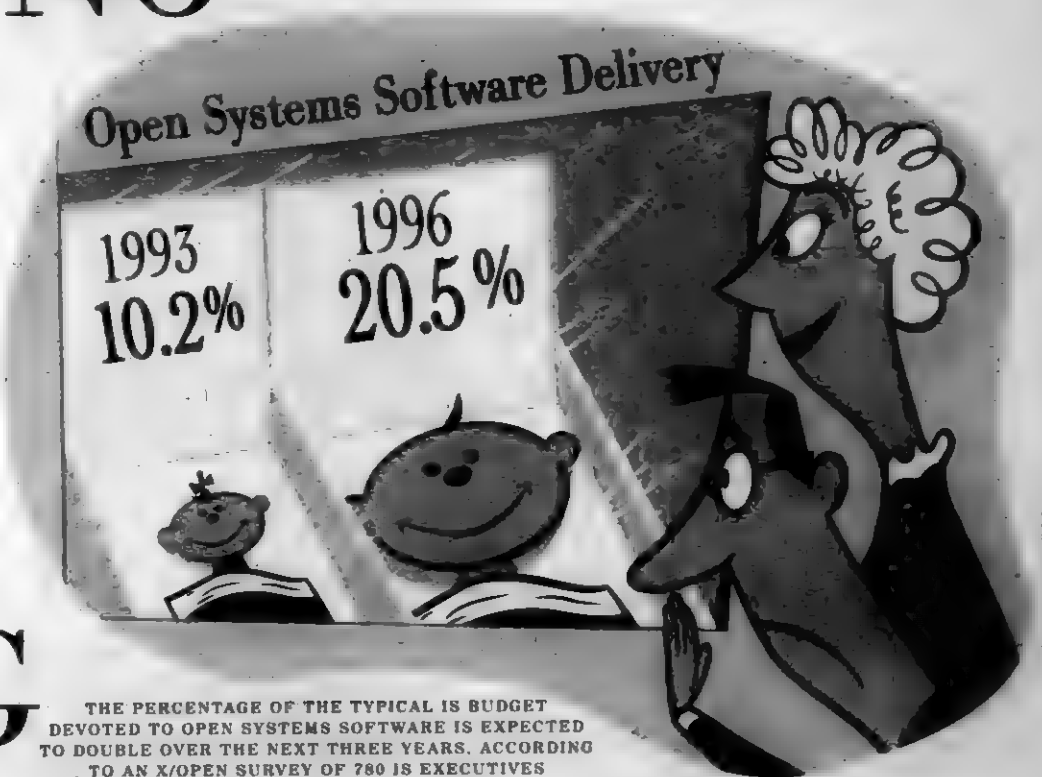
STIKELEATHER: The inability to attract and keep the staff we need. Open systems really pushes your staff. There's a shortage of qualified people. [But] the issue facing an IS executive is not whether but when to switch over. ◆

THE STATE OF OPEN SYSTEMS '93

HOW OPEN IS OPEN?

VENDORS SWEAR FIDELITY TO OPENNESS. USERS AND ANALYSTS SAY 'SHOW ME.'

IS BEING HALF OPEN LIKE BEING HALF PREGNANT?



THE PERCENTAGE OF THE TYPICAL IS BUDGET DEVOTED TO OPEN SYSTEMS SOFTWARE IS EXPECTED TO DOUBLE OVER THE NEXT THREE YEARS, ACCORDING TO AN X/OPEN SURVEY OF 780 IS EXECUTIVES

BY MICHAEL VIZARD

It's time, users say, for racy talk about open systems to end and labor pains to begin. Pressured by impatient customers and a swelling threat from Microsoft Corp., leading computer industry suppliers have set out to

give birth to the Common Open Software Environment (COSE), their latest open systems wonder child.

But heard-it-all-before users and analysts are reserving their oohs and aahs until gestation progresses a bit. They say vendors must deliver more mature open systems products that offer true interoperability and portability.

"[One] of the biggest problems we have is running the same software on different platforms," says Glenn Smith, a vice president at J. P. Morgan Investment Services in New York. "It's doable, but it's difficult."

While major suppliers such as IBM, Digital Equipment Corp., Oracle Corp. and many others have for years sworn their support of "open" products and computing, many buyers remain skeptical of seller commitment.

The latest evidence: Respondents in X/Open Co.'s latest global survey cited "vendors provide proprietary/incompatible versions of open systems" as the single biggest barrier to open systems adoption.

Also cited as a major stumbling block was a widespread belief that vendors place their own interests above the interests of users in the standards-making process.

HALF, PAGE 122

UNIX UNITS

Sun Microsystems' SunSoft unit dominates the fragmented billion-dollar worldwide market for Unix operating systems

1992 MARKET SHARE BY SHIPMENTS

Solaris 1, 2	21%
SCO Unix (multiple versions)	18%
HP/UX	10%
AIX	7%
Ultrix	5%
Interactive	3%
NextStep	3%
Irix	3%
System V Release 4 (Intel)	2%
Others	27%

TOTAL SHIPMENTS: 1.01 MILLION

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

MAJOR UNIX VERSIONS COMPARED

WHO'S MOST OPEN?

NOT ALL 'OPEN' OPERATING SYSTEMS ARE CREATED EQUAL. AN EXCLUSIVE *COMPUTERWORLD* USER COMPARISON SHOWS BIG DIFFERENCES IN FEATURES AND SUPPORT.

SCALE: 1 = NOT OPEN AT ALL, 6 = VERY OPEN

DIGITAL'S OPENVMS

USER OPENNESS RATING

3.3

"OpenVMS is a proprietary operating system. You can't mount an NFS file on it, and that is just one of a million things that is proprietary about [OpenVMS]. OpenVMS is really not open, but using the name 'open' probably helps DEC sell another 5% of products."

MICHAEL HIGGINS

"DEC doesn't care what the end user thinks. They are more interested in selling hardware and not about what the end users need."

JOHN ALLEN

"We are very happy with OpenVMS. We like it better than Unix, but the world is going to Unix. For the average user working with OpenVMS, it is very hard to move from English commands to the cryptic commands found in Unix. In interoperability, Unix is better than OpenVMS. When we try to port over to VMS, we have to rewrite the application."

TOM GUNN

NOTES: *Digital's growing push into open systems also includes OSF/1, AXP 1.2 and Ultrix 4.3 as main thrusts.*

HP/UX

USER OPENNESS RATING

3.7

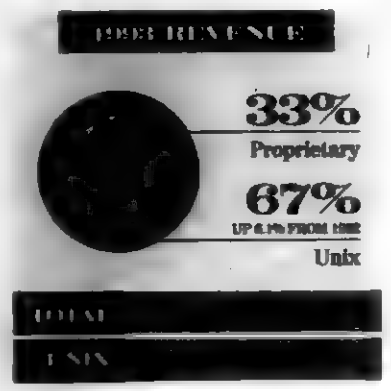
"HP/UX is not as mature as the MVS XA scheduling, tape management and debugging tools we use in our company."

RUSS QUARTARARO

"[HP/UX] has a lot of good utilities included in the operating system, such as scripts that make life easier for the user. More specifically, a script called SAM provides good basic administration capabilities. Another strength of HP/UX is that HP is providing the Posix shell in its operating system. . . . Most applications written for OpenLook don't quite work on Motif. . . . HP is more in compliance with the rest of the industry, in terms of standards, but I think Sun is realizing that and is trying to change."

SAM SOBHANI

NOTES: *Based on Unix System V Release 3 and Unix 4.3 technology. Strong in distributed management.*



IBM'S MVS/POSIX/AIX

USER OPENNESS RATING

2.4

"We have found that all of the [app] vendors have been willing to port to either SCO or AIX. . . . The toughest problem was getting the Token Ring connected from the mainframe to AIX and to get it to run at a respectable speed. We found answers very difficult to get out of IBM. . . . We hope we do not have to go to MVS for two major reasons: the cost and the other is that our staff is trained on VM and VSE."

DON DAVIS

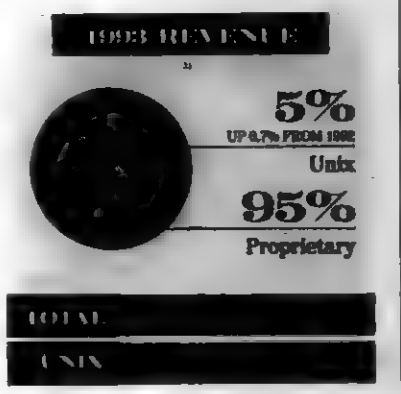
"IBM's AIX is a step behind in networking features. . . . We will welcome [MVS/Posix] tools since we are running Hitachi mainframes that are compatible with IBM. We have Posix-compliant tools on other systems."

JOHN ALLEN

"Every time we have upgrades, terminal interface problems occur [with AIX on an RS/6000]. We couldn't drive the printers at all [after installing the last upgrade] and ended up with the incorrect baud rate on our machines."

TOM GUNN

NOTES: *AIX is IBM's version of OSF/1. Predictably strong on RS/6000 workstations and servers.*



MICROSOFT'S NT

USER OPENNESS RATING

3.6

"I don't think we would move to Microsoft Windows NT to do our mission-critical applications. We may use NT as we use Windows on the desktop for office automation."

RUSS QUARTARARO

"In some sense, Windows NT is about as proprietary as you can get: There are no standards committees. From another standpoint, it is pretty open because of all of the applications and things that will run on it. Strictly speaking, Windows NT is not open, just as DOS is not open, but both have all of the efficiencies as if they were open."

DAVID CARLSON

"I'm not anxious to move toward NT at all. As NT matures and as applications . . . become available, we will certainly be open to incorporating them into an open computing environment."

MIKE PRINCE

"Microsoft lacks a true spirit of openness. It is open wallet, not open systems."

JOHN ALLEN

NOTES: *Not truly open, but it may not matter.*

SOURCES FOR THE CHARTS ON THESE TWO PAGES ARE COMPUTER INTELLIGENCE/INFOCORP AND COMPANY REPORTS

ABOUT THE RATINGS

In a separate survey conducted by the *Computerworld* Database Division in late October, 164 information systems managers were asked to rate the relative openness of several major "open" operating systems they were familiar with.

Respondents were asked to judge on the basis of several criteria, including the following: compatibility with standard interfaces; application portability across different hardware platforms; support for open communications standards; interoperable support for heterogeneous environments, independent of a given vendor's strategy; more than one supplier of the primary technology; third-party support and applications readily available; publicly defined technology interfaces; and a published set of public or de facto standards, scalable across different-size hardware platforms.

Compiled by Lee Bruno, a free-lance writer in San Francisco.

COMMENTATORS

JOHN ALLEN is system integrator at Standard Insurance Co. in Portland, Ore.
DAVID CARLSON is senior vice president at Kmart Corp. in Troy, Mich.
DON DAVIS is director of MIS at Payless Drug Stores in Wilsonville, Ore.
MIKE PRINCE is director of information services at Burlington Coat Factory Warehouse Corp. in Burlington, N.J.
JACK HANCOCK is MIS vice president at Pacific Bell in San Francisco.
MICHAEL HOBBS is technical support manager at Byer California in San Francisco.
TOM GUNN is systems administrator for the city of Oswego, N.Y.
RUDY QUARTARARO is manager of applications development at Union Camp Corp. in Wayne, N.J.
SAM SOBHANI is technical specialist at Syntex Corp. in Palo Alto, Calif.
RICHARD HENRY is IS manager at Food for the Hungry, Inc. in Scottsdale, Ariz.
RICHARD PRUETT is network architect at Metro Seattle in Seattle.

NOVELL'S UNIXWARE

USER OPENNESS RATING

3.3

"Because UnixWare came from USL and Novell, it has the utilities to make a great centralized server. It is a vanilla type of Unix, and that is really what users are looking for. We need to work with the vanilla-type operating system to cut down on production and training costs."

JOHN ALLEN

"We wanted to access the Unix systems through Windows but didn't want to go to another protocol. UnixWare gave us this capability. The ability it gives us to look down the Unix pipe at NetWare file systems really helps us in relating our databases. We have, however, had a lot of problems trying to get some of UnixWare's basic functions to work. I still cannot print properly and LP doesn't do what it is supposed to do. And we can't get adequate support. We are hoping Novell acknowledges there is a problem with LP and fixes it in the next version."

RICHARD HENRY

NOTES: *Legal descendant of original AT&T Bell Laboratories' Unix. Marketed as Unix System V Release 4.2 by new Univel unit.*

OSF'S UNIX

USER OPENNESS RATING

4.3

"OSF was truly the beginning of openness. So much water has passed over the dam that its importance has passed."

JACK HANCOCK

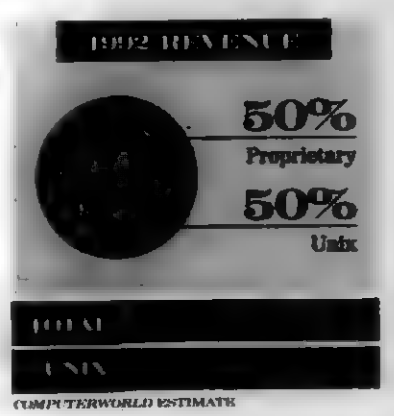
"The ideas behind OSF are good, clean and simple, and that is smart. The problem is that it doesn't exist anywhere. It has the right idea, but it isn't available."

JOHN ALLEN

"We ended up debating whether to purchase OSF/1 or OpenVMS. As it turned out, because of the applications we are planning to buy for a GIS, we will be getting one of each [operating system]. The GIS software ran on OSF/1 and the Oracle financials we are planning to buy run on OpenVMS. So we are buying two DEC Alpha boxes and two different operating systems."

RICHARD PRUETT

NOTES: *Released three years ago as OSF/1. OSF Release 1.2 began shipping in January. Next version will be microkernel-based.*



COMPUTERWORLD ESTIMATE

SCO'S UNIX

USER OPENNESS RATING

3.7

"There is only one SCO out there, and you have to do what they say. Because there is just one SCO, you can't jump ship if you need to.... We have found that the best open systems support comes from the people who also see the hardware."

JOHN ALLEN

"Part of the reason Payless went with SCO is that SCO can run on any hardware box. It doesn't have to run on just one."

DON DAVIS

"In our experience, SCO Unix has been faultless and has done everything it was promised to do."

TOM GUNN

NOTES: *Leader in the Intel Corp.-based Unix market. Lite and Server versions of Open Desktop unveiled this year.*

SUN'S SOLARIS

USER OPENNESS RATING

3.7

"Sun had to go out and be different. They really, truly have their own operating system. And that does make it less open. It is the application vendors that get shut down by the incompatibilities among operating systems and then that shuts down the end user because the applications take longer to be ported."

JOHN ALLEN

"Sun is somewhat open, although the philosophy is to create [Solaris] as the target open system, which means that everyone writes to it."

JACK HANCOCK

"Sun is probably the premier company when it comes to compatibility with standard interfaces, applications portability, open communications standards. I'm not married to Sun's Solaris. I can switch vendors of operating systems or at least the versions of Unix without a major disruption."

MIKE PRINCE

NOTES: *Strong in SPARC environment, headed for Intel marketplace.*

HALF

CONTINUED FROM PAGE 119

"Open systems is somewhat of a marketing hoax," says David Soll, vice president of advanced technology at Omicron Co., a systems integrator based in Philadelphia. "Its one purpose is to make users independent from any one vendor, but it doesn't exactly work."

One big obstacle is that 25 Unix variants are now in use.

"On the surface, everything is open and salespeople have found open systems to be the word of the minute to use, but it's a catch-22," adds Daniel Grant, president of Tangent International Computer Consultants, Inc. "That's why there's this push now for the area of middleware. It's the glue that holds these semiopen architectures together."

Baby step forward

Industry observers say vendors must make COSE succeed to provide a much-needed toddling step ahead for open systems progress. Some analysts even predict that open systems growth between now and 1996 depends mainly on how large suppliers embrace this latest standards initiative.

"I think vendors are serious this time," says Jim Brennan, an industry analyst at WorkGroup Technologies, Inc. in Nashua, N.H. "They've made too much about these standards and would lose face with customers if they don't come through with them."

Backers, including IBM, Hewlett-Packard Co., SunSoft, Inc. and Novell, Inc.'s Unix Systems Group, say COSE will improve portability and interoperability.

COSE adoption, they say, will create a unified Unix platform by complying with a more narrowly defined set of industry standards than the 1,170 that have been floating around for the past five or 10 years. Backers hope to receive brand certification from X/Open.

Ultimately, the goal is to shield developers and users from many of the vagaries of Unix systems that have harmed past vendor claims of offering "open systems."

"The wars are over," declares Dave Taber, director of commercial product marketing at SunSoft, a unit of Sun Microsystems, Inc. "There's going to be a high level of commonality, which perhaps we're not getting enough credit for yet."

A big driver behind this unity is the specter of Microsoft. The Redmond, Wash., vendor is pushing to deliver a Win32 application programming interface, which will allow users to run the same applications across NT and a future 32-bit implementation of Windows.

"There are a lot of people who hate Microsoft," says Curt Monash, president of Monash Information Services, Inc. in New York, "so anything that is being seen as anti-Microsoft is going to draw a lot of support."

But even with an offering like NT, users are not assured of improved openness. For starters, NT doesn't claim to be wholly open and isn't. Plus, NT is prone to suffer from most of the implementation vagaries that affect Unix. Multiple vendors such as Digital, Acer America, Inc. and Sequent Computer Systems, Inc. are already implementing Windows NT on different hardware platforms.

For its part, COSE could eliminate some interoperability hurdles with other standards, such as the Open Software Foundation's (OSF) Distributed Computing Environment and Distributed Management Environment.

A delicate balance

But even that would not change a more fundamental problem: the need for vendors to strike a balance between maximizing profits and providing differentiated products vs. growing user demand for an environment that is plug-and-play compatible.

"The truly portable server operating system environment is a pipe dream," Monash says. The temptation for vendors is to sacrifice portability for features, he notes.

Bottom line: Vendors are making progress, but information systems managers shouldn't count on a truly open environment soon.

In fact, by the time vendors implement COSE, it's likely that new technologies such as object-oriented will create a whole slew of compatibility issues.

Even so, COSE backers remain optimistic. Their ideal scenario: In 12 to 18 months, the standard is adopted by makers of products based on Unix System V and the OSF/1 versions, then by Digital, HP and others.

Some, including Noah Ross, chief information officer at Cap Gemini America, Inc. in New York, wonder whether vendors will be truly able to lay politics aside.

"For a while, it looked like everyone was going to follow Novell's lead and set aside their differences," Ross says. "But they're still arguing because IBM wants to have a certain set of features and Sun wants another set for what they see as being important for their technological vision of Unix. It would be nice to have an implementation that covered all these services." ♦

Vizard is *Computerworld*'s senior editor, personal computing.

OPEN OPPORTUNISTS

The Unix systems market hosts a wide range of companies using Unix-based platforms

- **SECOND-TIER SYSTEMS COMPANIES** using Unix as a survival and growth strategy (Data General, Unisys, Groupe Bull and Wang).
- **WORKSTATION COMPANIES** attempting to leverage technical strengths in commercial markets (Sun and Silicon Graphics).
- **PC COMPANIES** using Unix to scale upward into multiuser/server positions (Compaq, AST and Dell).
- **FIRST-TIER MIDRANGE COMPANIES** expanding into new growth areas and attempting to capitalize on "open systems" buying (IBM and Hewlett-Packard).
- **THIRD-PARTY OPERATING SYSTEMS SUPPLIERS** trying to disintegrate the computer systems business and play leading roles in servers and the advanced desktop market (The Santa Cruz Operation, SunSoft, Univel and Next).

PERSPECTIVE

CHART YOUR OWN COURSE

BILL LABERIS

"The worst thing would be for the [open systems] movement to be deeded to vendors."

For Columbus, it was a shortcut to India. For Lewis and Clark, it was the Northwest Passage. And for Monty Python, it was the Holy Grail.

The thread, of course, is people in search of some thing or place that doesn't exist but where the quest itself is what matters. Sort of like the quest for open systems: Reality and illusion in one epic package.

Go and ask any vendor if it is "open," or at least "totally committed" to open systems. The answer will be an unequivocal, unanimous "yes!"

The vendor is not lying.

Vendors really believe they are committed. It's just that the very definition of open systems is hazy at best.

That's what allows IBM to call the AS/400 a "relatively" open system or Microsoft to claim NT will be very open. True and untrue, reality and illusion.

In users' minds, open systems is a real place, a paradise where hybrid systems interoperate, scalability is a built-in feature, programmers write to common interfaces and major development languages are universally supported.

Sounds a lot like the reincarnation of the bygone IBM mainframe world or Digital in its All-In-1 heyday, doesn't it? The difference is that today, nobody has it all.

No wonder users have doubts about the open intentions of industry vendors. The leader, Microsoft, in some ways looks as much like the next great proprietary seller as anything else.

And that is why the true course to open systems must be set by users.

The worst thing would be for the movement to be deeded to vendors. The reason is simple: No computer company acting in its best interests is going to embrace a strategy that will produce less differentiation for its products.

So, to sit back and let companions with that kind of orientation steer the open systems movement is like leaving yourself at the mercy of the winds, the tides and a navigator who isn't sailing in the same direction you are.

Don't do it.

Laberis is *Computerworld*'s editor in chief. His MCI Mail address is 509-6827.

#?!

SURPRISING NUMBERS

UNIX RELATIONAL DATABASE MARKET

♦ *Grew an unprecedented 51% from 1991 to 1992, reaching $1.13 billion. All regions enjoyed strong growth; Europe was especially strong. Sales of database development tools climbed twice as fast as database engine/server software.*

OBJECT-ORIENTED PROGRAMMING

♦ *Most likely candidates: Large sites with mainframes and Digital VAXs, heavy office automation or technical/scientific processors, open systems strategies and those in education, transportation, communications, utilities, insurance and financial services.*

UNIX INTEGRATED OFFICE SYSTEMS

♦ *Global sales rose 25% to $164 million last year, slower but still healthy. Reasons: Shifting demand for client/server and peer-to-peer products, emergence of Windows NT, more vendors. U.S. lags behind world badly: Sales here grew only 1%.*

SOURCE: INTERNATIONAL DATA GROUP, FRAMINGHAM, MASS.

NOT Made in the U.S.A.

Despite cries of 'political incorrectness,' IS chiefs stand by their use of foreign programmers, citing quality and low costs

BY GARY H. ANTHES

It is one of those things they don't teach in Software Development 101.

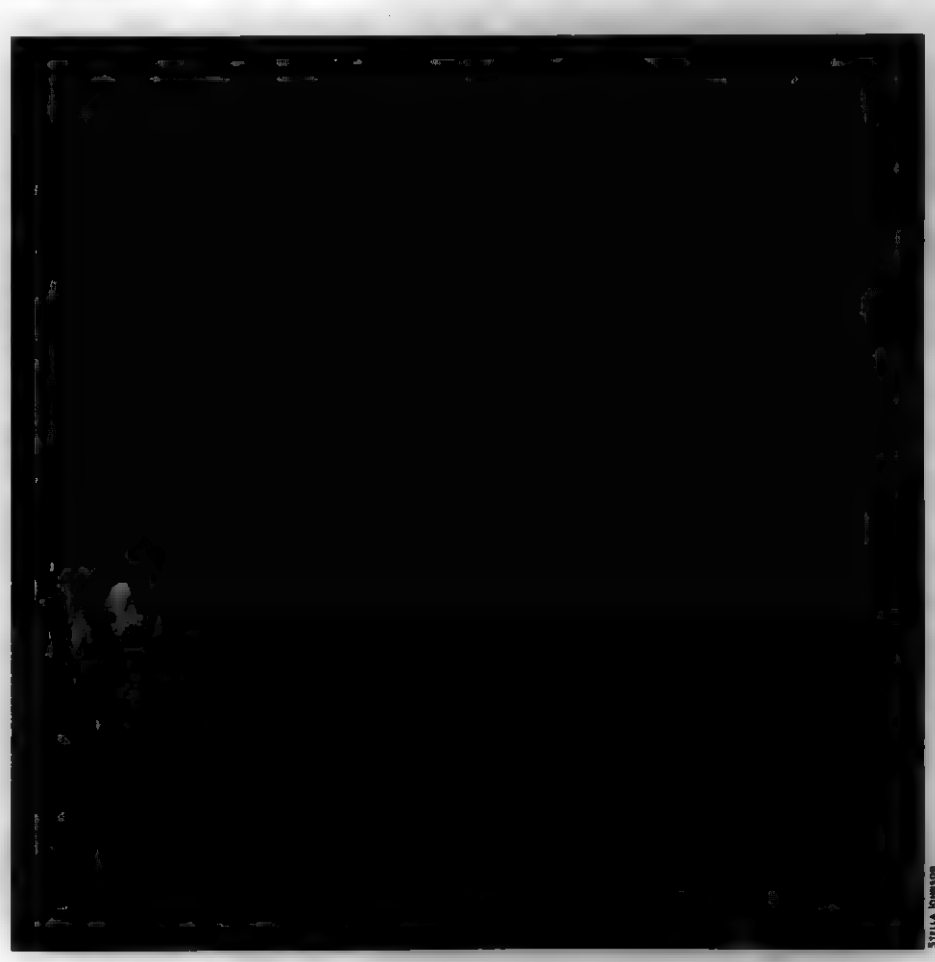
At a critical point in an application development project at Unum Life Insurance Co., a key foreign programmer — part of a team brought to the U.S. from India just for the job — went home for a lengthy religious observance. The project was several weeks late as a result.

"People really got bent out of shape," says John Alexander, who was Unum's chief information officer at the time. But the project was ultimately a success, and Alexander dismisses such cultural challenges as a manageable hazard of offshore software development.

Interest in the use of non-American programmers — whether brought to the U.S. temporarily or based abroad — is increasing among U.S. companies looking for ways to trim development costs and reduce programming backlogs. Companies claim cost savings of up to 50%, and they insist that code written by Indian, Irish or Filipino programmers is every bit as good as that turned out by their U.S. counterparts.

One major U.S. retail chain, for instance, faced with a requirement to get a major new system up in less than a year, gave the job to Information Management Resources, Inc. (IMR), which offers development services from centers in India. The $500,000 Cobol/CICS/DB2 warehouse application would have cost $1 million to develop in-house and $1.5 million if done by a software contractor using U.S. labor, says Jeff Forsythe,

Not made in the U.S., *page 124*



STELLA JOHNSON

◀ **Former Unum CIO John Alexander:** *"The right thing [for one Unum development group] was to employ Americans and keep the work local."*

Not made in the U.S.

CONTINUED FROM PAGE 123

director of logistics systems at the retailer at the time and now a senior vice president at IMR.

"The U.S. — and, in fact, all of the more developed nations — are increasingly turning to offshore companies to get work done," says Janet J. Palmer, an associate professor at the City University of New York and a specialist in offshore outsourcing. "It's a strong trend — globalization of the information services industry."

Meta Group, Inc. in Westport, Conn., estimates that the market for overseas programming on behalf of U.S. companies is growing at 50% annually and should top $500 million this year.

Unum undertook two experiments in the use of non-American programmers, one executed at company headquarters in Portland, Maine, and the other by a team based in India. Both were contracted out to IMR in Clearwater, Fla.

The projects, which cost between $50,000 and $100,000, demonstrated that offshore outsourcing is workable and can be economically attractive, Alexander says.

A key part of the economic attraction is the cost of labor. Indian programmers are available at an hourly rate of $15 to $25 compared with $35 to $50 in Ireland and $50 to $75 in the U.S., according to International Data Corp. (IDC), which last year completed a study of offshore software development funded by the World Bank.

"You can get a Ph.D. in India for the same price as an undergraduate college student in the U.S.," says Kurt Johnson, a senior analyst at IDC in Framingham, Mass.

Unum's job in India was particularly cost-effective because developers were able, via a network, to use Unum's production mainframe in the U.S. during off-peak hours.

More legwork

However, Unum found that the advantages of offshore development were offset by disadvantages. "It requires more formality," Alexander says. "You have to do more work up front, and it requires more rigorous testing and evaluation at the end to ensure that what you said and what the other guy heard matched what you really meant."

That added layer of formality just about wiped out cost savings on Unum's test projects, but Alexander says offshore development in larger projects of the right type would probably yield between 15% and 30% in savings.

Unum concluded that the ideal development job to be sent offshore would cost more than $250,000 (large enough to recoup fixed costs involved in setting it up) and straightforward in scope — for example, porting a legacy mainframe application to a client/server environment without re-engineering the underlying business practices.

"It would also be helpful if the customer is really rigorous in defining requirements and is willing to hold the world still between requirements definition and solution delivery," Alexander says.

Forsythe agrees, saying that change control has to be rigorous when contracting from thousands of miles away. "You have to be disciplined in evaluating whether a system change is worth the risk of introducing late in the game."

Control was the watchword at Turner Broadcasting System, Inc. in Atlanta when it turned to offshore software house Data Conversion, Inc. in Cambridge, Mass., to develop a financial system. Turner designed the application and handed very detailed specifications — including test data — to the foreign programmers. To help Turner monitor the project, the programmers did all coding and testing on Turner's computer in Atlanta via satellite hookup.

Turner received 35 bids to develop the financial system, four from overseas firms. According to Don O'Brien, manager of application development, the U.S. bids ranged from two to five times the quote received from winning bidder Data Conversions. Offshore workers put in 17,500 hours of programming in six months, and the quality of code in the 240 programs delivered was "excellent," O'Brien says.

He says Turner's own development people objected at first to sending the work overseas but came around to the idea when they saw that the quality was good and that they would not lose their jobs. In fact, O'Brien says, there was a silver lining for Turner's 35 programmers: They were able to move from low-level coding and maintenance tasks to analytical work.

Palmer, who recently visited Ireland and the Philippines, says there is a strong quality ethic at work in most overseas programming shops. "Every place I went really stressed quality, not low

Not made in the U.S., *page 128*

The user interaction factor

While the use of offshore outsourcing seems to be on the rise, some forces are working against the practice, a number of observers say.

"As companies move toward client/server, the proximity between [IS staffers and end users] is going to be increasingly important," says John Alexander, president of Business Technology Consulting, Inc. and former CIO at Unum Life Insurance, which used offshore programmers on two projects.

"You can generate a [graphical user interface] screen overnight, and you really want the client to touch it and feel it and give you instant feedback."

The close ties between users and developers in some cases means that users become a part of the IS workgroup, he adds. "Doing that from overseas raises a whole set of issues that don't seem to be offset simply by the labor cost differentials."

Martin Garvey, senior research analyst at Meta Group in Westport, Conn., agrees. "For certain applications, offshore is OK," he says. "But there are more and more applications where you need interaction with users day by day, and that's very difficult to do when your programming takes place thousands of miles away."

From the users' mouths

Computerworld phoned 12 companies that are currently using offshore programmers to find out what their experience has been like. Here is what they told us:

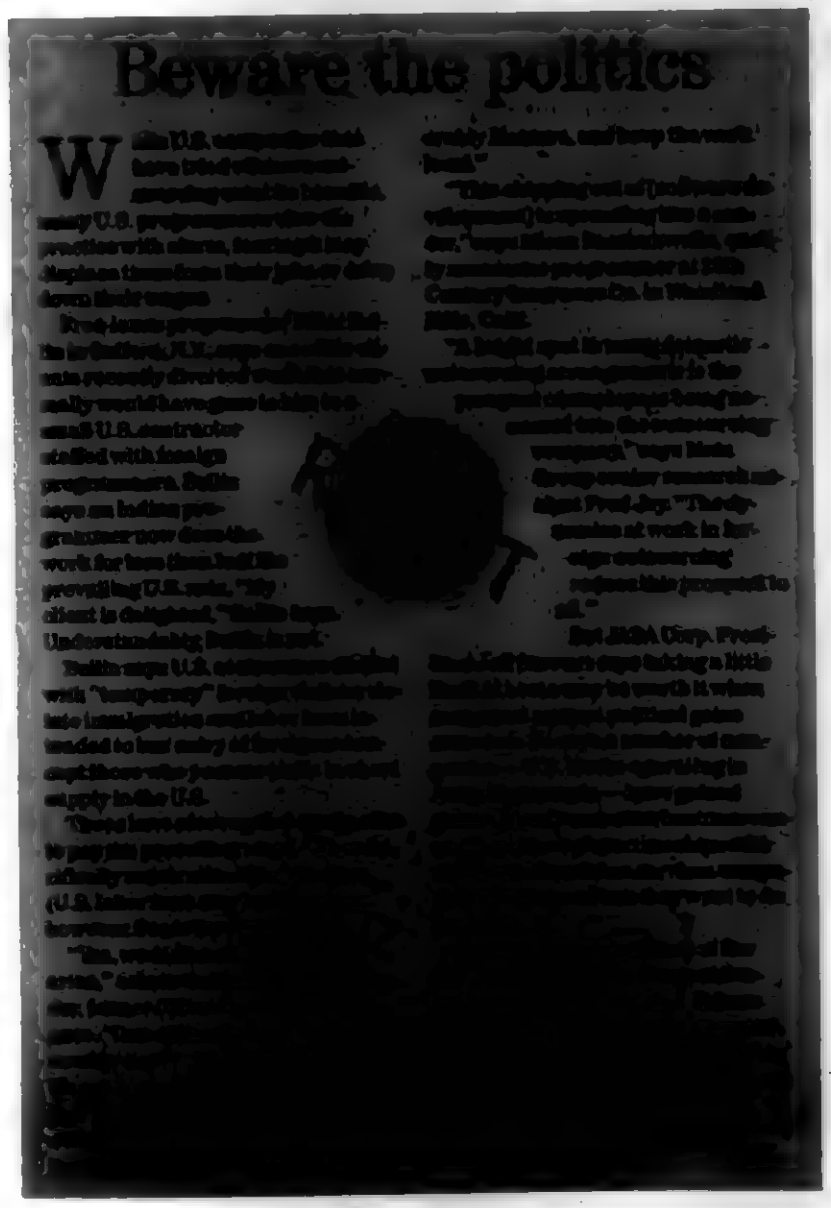
42% said using foreign workers was a cost-based decision.

67% said they've experienced no problems communicating because of a language barrier or distance.

50% said they use offshore programmers for either pure coding or application development, but a majority said they use these coders to handle less than 10% of their development work.

75% said they would rate the overall quality of work done by offshore programmers as "excellent" or "good."

Source: First Market Research Corp., Austin, Texas



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Give Your New Product the Launch It Deserves

By Entering the ComNet '94 New Product Achievement Award Competition

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That's right. If you're introducing a new product, product enhancement and/or product upgrade at the ComNet '94 show, you can give its debut an added boost. Enter the ComNet '94 New Product Achievement Award Competition and give your launch special pre-show, on-site and post-show exposure.

Award Categories

Awards will be presented in eight categories representing the communications and networking market:

- Best New Transport Technology Product
- Best New Networking Management Product
- Best New Carrier Service
- Best New LAN and Internetworking Product
- Best New Customer Premises Equipment (CPE)
- Best New Infrastructure Product
- Best New Multimedia and Desktop Application
- Best New Wireless Product

Plus, a grand winner will be chosen as the ComNet '94 Most Innovative New Product or Service.

Judging

A panel of judges will select three finalists in each category prior to ComNet '94, with finalist selection announced on January 10. ComNet show attendees will then view finalists' entries in a special showcase in the main lobby of the Washington, D.C. Convention Center and make the final selection by voting electronically for one winner per category, plus the grand winner. The nine winners will be announced at a special awards ceremony on Wednesday evening, January 26.

Eligibility

All contracted exhibitors introducing a new product, product enhancement and/or product upgrade for the first time at ComNet '94 are eligible.

A new product that has been announced within six weeks preceding ComNet '94, (but not introduced or exhibited in the same form at previous tradeshows) is also eligible.

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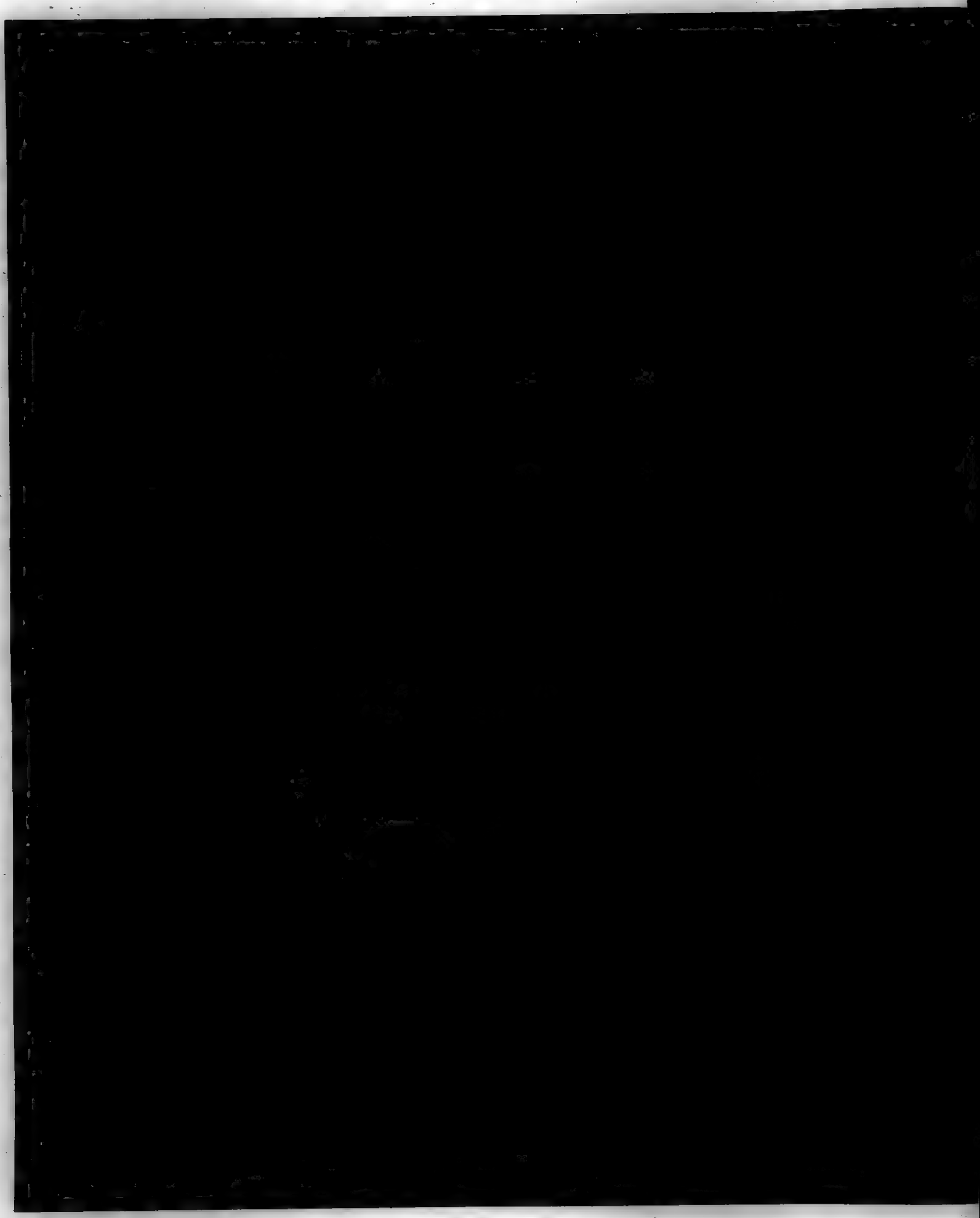

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CONTINUED FROM PAGE 124

price," she says. "These companies take great pains to train their people to understand the applications."

Palmer's views were substantiated by *Computerworld* phone interviews with about a dozen U.S. companies using offshore workers. Three-fourths of those information systems shops rated the quality of foreign workers as "excellent" or "good." (For other results of those phone interviews, see page 124.)

And foreign programmers are continually trying to improve. Bolstered by government programs and incentives, Indian developers, for instance, are moving into areas such as relational databases, database integration, C++ programming, Unix and client/server technology, according to IDC.

Julian Coolidge, vice president of IS operations at The Travelers Corp., says he feels "very strongly" that the quality of offshore work is just as good as in the U.S. and "in many cases better." Travelers in Hartford, Conn., set up a software development office in Ireland in 1987 and now has 27 application developers there. Coolidge says the company saves 12% on its offshore development work.

Nevertheless, there are drawbacks, he says. Echoing a complaint common to a number of companies that have gone offshore, he says, "There is difficulty in getting your traditional IS manager to use remote activities. It's a culture shock knowing your people aren't sitting down the aisle where you can go talk to them."

That remoteness is both a blessing and a curse, says former Unum CIO Alexander. At Unum, "we tended to put the programmers and analysts as close as we could to the businesspeople, so we tended to minimize the formal handoffs to maximize fast response to customer needs."

While the formal handoffs from Unum to its Indian team forced a discipline that was useful at times, it also led to misunderstandings, Alexander says.

"The strengths that Unum gains by having that close proximity [between IS staff and users] is that everyone tends to develop a shorthand way of working. Things are understood but not said. If you try to translate that through 20,000 miles of communications network, it loses something." ■

Legally speaking

Two changes in federal law may make things tougher for foreign programmers trying to work for U.S. companies:

1. Possible revamp of the Labor Conditions Applications.

The Labor Department is taking a close look at the Labor Condition Applications that employers must file when they petition for visas for foreign professionals.

Some of the proposed changes to regulations include the following:

- The government could initiate investigations. Previously, only "aggrieved parties or organizations" could file complaints. In this way, government agencies would be able to initiate investigations even in the absence of a complaint.
- Employers would be required to state how they determined the prevailing wage rate for the foreign worker.

2. Tighter restrictions on foreign visas for temporary workers.

The State Department is looking at tightening visa restrictions in the area called "B-1 visitor for business."

Some of the proposed rule changes include the following:

- The foreign worker's salary or other remuneration can come only from the foreign employer, not directly or indirectly from a U.S. company.
- The foreign firm maintains ultimate control over the alien's employment, including hours worked.
- The alien's "proprietary work product" belongs either to the alien or the foreign firm, not to a U.S. firm.
- The foreign firm handles all personnel matters, such as promotions and terminations.

Wake up, U.S. programmers!

BY ED YOURDON

WHEN YOU INHERIT A WAN

By Julie Hart

When you thought your job couldn't get any harder, you suddenly inherit a wide-area network. Your first inclination is to run. Your second is to sign up for primal scream therapy. After the panic subsides, you realize what you already knew: You can't escape.

"Being a LAN technician is becoming somewhat like being an electrician because the technology is pretty close to plug-and-play," says Chris Finn, a senior analyst at TeleChoice in Verona, N.J. When you work with a WAN, however, no two networks are the same. "This is where you get into using art and science to pull everything together."

But where do you begin? First, if you don't know much about WANs, expect to feel a bit uncomfortable for about the first six months, according to analysts. And after that, it still isn't easy.

"You may inherit a WAN as well as a bunch of unmet needs," Finn says. That's why it's important to get to know your user community before launching into day-to-day WAN management.

"Find out how well the wide-area network is serving their needs," advises Bob Harrold, manager of strategic programs at ARI Network Services in Milwaukee. "And if you inherited a staff, talk to them about the network's current and potential use." This background information will come in handy.

"The biggest ongoing learning curve is sorting through the onslaught of technology," says Phil Evans, director of telecommunications at Perot Systems Corp. in Dallas.

Get your feet wet

Adding to the confusion is a growing mass of telecommunications options, from asynchronous transfer mode to synchronous optical network. In addition, data carrier solutions constantly change. Your best defense, Evans says, is to keep up with the players, especially their vision for the future.

Cpac, Inc. in Leicester, N.Y., is in the process of moving from individual PC and Macintosh LANs to a WAN. "Before, I just plugged in AppleTalk and it worked," says James Mullin, data processing coordinator. "Packets and TCP/IP and other terminology didn't matter to me. Most everything I needed was shrink-wrapped and ready to go. Now I find myself reading everything I can get my hands on."

One of the best ways for newcomers to get their feet wet fast is to surround themselves with peers. "Become active in an association," Evans says. Not only will you meet peers in other companies willing to share information, but the exposure to WAN issues and terminology will also eventually start to make sense.

A big concern is how to deal with multiple vendors. "With a WAN, you're not at all guaranteed that everything will run smoothly," Evans says. And when things go wrong, it's difficult to trace problems back to a particular vendor.

To minimize this difficulty, analysts suggest building strong vendor relationships before making long-term commitments.

"Vendors are willing to give advice," says Rob Rich, an analyst at Dataquest Worldwide Services Group in Framingham, Mass. "Just be sure to talk with them thoughtfully before coming to any conclusions."

In addition, be prepared for things to move more slowly in the large-scale WAN world than in the LAN environment. Although the technology is advancing rapidly, Finn says, companies are swallowing it at a leisurely pace to control costs.

If you plan to succeed in your new role, don't expect to simply keep the network running. "Give it a fresh look — that's what you're there for," Rich says. "Whoever set up the WAN in the first place may not have done it right, or the company's business goals may have changed."

Once you have some knowledge under your belt, take a close look at the WAN topology to determine whether changes are needed. A variety of ways exist to optimize a WAN.

Either way, your job is to ensure that the WAN you've inherited serves the needs of the user community. "It's not an easy job," Finn says, "but it's where the action is."

Hart is a free-lance writer in San Jose, Calif.

10 STEPS FOR FIRST-TIME WAN ADMINISTRATORS

1. Identify company's business goals.
2. Get to know user community's needs.
3. Create a WAN diagram, including [illegible] services.
4. Hit trade shows to preview technologies.
5. Meet with service providers to compare costs and services.
6. Meet with vendors to discuss technology.
7. List how the current WAN environment meets user's needs.
8. Recommend/make adjustments to current WAN as needed.
9. Look for opportunities to consolidate options.
10. Repeat process.

RESOURCES

- Canadian Business Telecommunications Alliance, Ontario, Canada (416) [illegible]
- Communications Managers Association, Morristown, N.J. (201) 425-1700
- International Communications Association, Dallas, Texas (214) 233-2600
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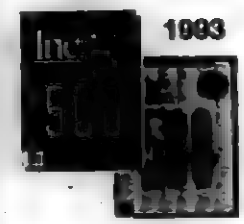

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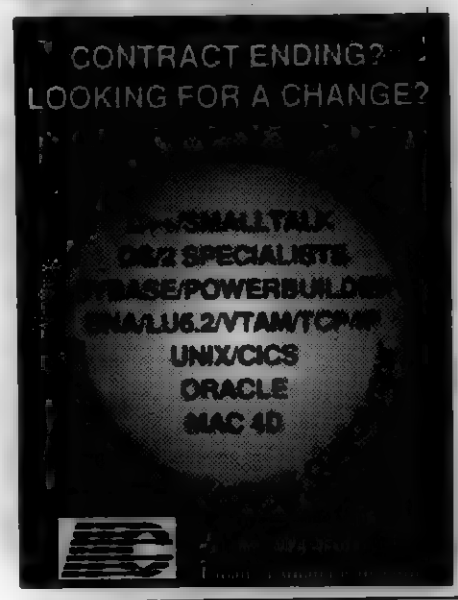

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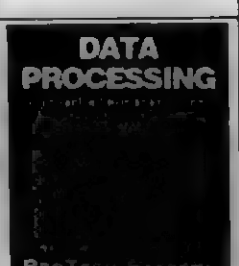

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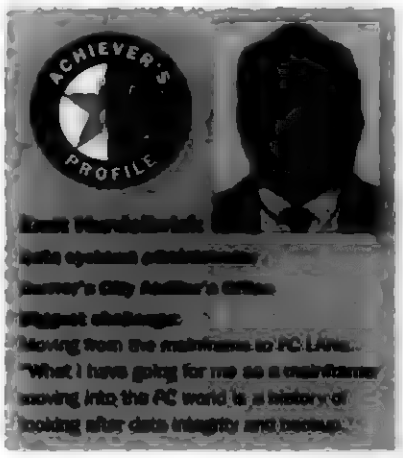
All skills reap benefits

By Joe Panepinto

Even though Emit Hurdelbrink and John Johnston have made the journey from mainframe systems operator to today's multiplatform world, they have marched to the tunes of wildly different drummers.

The 42-year-old Hurdlebrink started out in 1970 as a mainframe operator working in an Army mobile data center — two IBM System/360s in a 40-foot trailer in Frankfurt. From there, he took a job as a mainframe operator at Denver's city auditor's office and pursued his interest in programming by taking Cobol and assembler classes at night.



In 1976, he left to become a mainframe programmer at another company, where he wrote financial, accounting and other mainframe software for an IBM CICS system. Even though he was a self-proclaimed VSE bigot, Hurdelbrink picked up MVS skills from IBM manuals and wrote software primarily for that operating system.

He also did contract work but eventually returned to Denver's auditor's office as a mainframe application programmer, vowing to earn a college degree. Taking classes part-time earned Hurdelbrink a joint degree in business administration and information systems in 1990.

On the mainframe side, he picked up skills with VM and SQL. On the PC end, the city auditor's office had a mandate to install PCs and chose to go with 20 diskless workstations attached to a server via a 3Com Corp. Ethernet LAN. Vendor classes on systems administration were conducted at night, and soon Hurdelbrink and his colleagues were left to manage the network on their own.

"There was a lot of going in and playing with the problems as they came up," he said. "The processing concepts are really not that different from mainframes. It's just the administration was different."

They have since moved to Novell, Inc.'s NetWare.

Hurdelbrink says he believes IS people trained in a mainframe environment bring valuable skills to the PC world. "I'm used to being flexible. If I have a mainframe problem, a two-hour response time is terrible. We tend to put more emphasis on being up 100% of the time and so look at redundancy and backups, which were crucial to mainframe shops."

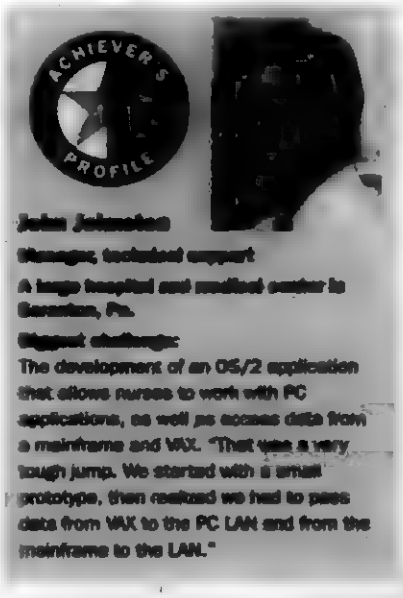
Downtime learning

Like Hurdelbrink, Johnston didn't have a college degree when he started his career in IS. In 1977, one year after graduating from high school, Johnston joined The Prudential Insurance Co. of America in Houston as a stock clerk and rapidly moved up to a position as third-shift operator at the firm's IBM mainframe shop. Johnston took advantage of downtime on the third shift and learned some Fortran programming.

When Prudential consolidated its mainframes, Johnston joined Baker Oil in Houston, where he became the only systems programmer on an IBM 4331. Johnston also began to interview regularly with companies, whether he was looking for a job or not. "Since then, I have always done one or two interviews per year, just to keep abreast of the skills people are looking for and to make new contacts," he said.

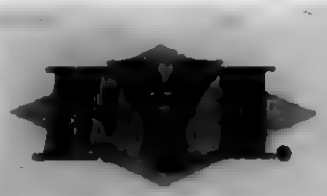
This practice resulted in a systems programming position at The Coca-Cola Co., and within 18 months he was supervising technical support for an IBM 3033. Eventually, he moved to his current job as a systems programmer at a large hospital and medical center in Scranton, Pa., and jumped on the PC bandwagon. When the medical center rumbled about downsizing, for instance, Johnston bought a PC and learned DOS, OS/2 and assembler on his own. When it began installing LANs, he volunteered for that project as well.

After less than four years, Johnston was in tune with the emerging heterogeneous environment. When the hospital wanted to build a prototype application that would pass data among Windows PCs, OS/2 workstations and CICS applications on the mainframe and the Digital Equipment Corp. VAX, only Johnston could build the application.



Although Johnston never earned a college degree, he says he never really missed it. "I would recommend young people learn NetWare first, and there's a lot there to learn," Johnston says. "Then I'd tell them to learn the interconnectivity parts of OS/2 and Windows. But most importantly, I'd tell them to jump on every opportunity they have to get more skills."

Panepinto is a free-lance writer in Amherst, Mass.



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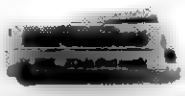

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CONSULTANT (Ref. #86193) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: enhancing & customizing the UWIN, (Universal Windows Credit Card Services Sys) incl redesign, development of its modules & integrated sys testing. Duties require using Sun4 Sparc Workstation, UNIX, ANSI C, C, DEVGUIDE & DBXTOOL. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, Consultant or S/ware Specialist. Will accept 3 yrs of college ed plus 3 years of exp in the related occupation in lieu of the required ed & exp. REL EXP: must include in whole or in part, s/ware development using SUN/UNIX Operating Sys & the following languages and/or s/ware: ANSI C, C, DEVGUIDE, & DBXTOOL. $47,000/yr. 40 hr/wk.

SYSTEMS ANALYST (Ref. #86983) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: analysis, design, development & maintenance of a defined contribution record keeping & reimbursement sys for benefit plans. The responsibilities incl process flow & data flow design, integration of various modules, troubleshooting, tech support & meeting with business analyst & users to gather reqs. Tech support will be for design of apps using LINC II on Unisys A series using the following hrware, s/ware & languages: Unisys A12/A17, COMS, DMS II, LINC II Level 14 & upwards, COBOL & WFL. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, Tech Consultant or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the job offered or in the related occupation in lieu of the req ed & exp. REL EXP: must include in whole or in part, app. s/ware development; designing program & data flow; troubleshooting & tech support, & using UNISYS A series, LINC II 14 version, COBOL, COMS, & DMS II. $46,500/yr. 40 hr/wk.

SENIOR SYSTEMS ANALYST (Ref. #86093) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: lead team of programmers in analysis, design, code, test & implementation stages of application sys development. The duties require the use of UNIX C, INFORMIX & 4GL-ROBMIS. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the required ed & exp. REL EXP: must include in whole or in part, s/ware development using UNIX, C & INFORMIX. $37,810/yr. 40 hr/wk.

SYSTEMS ANALYST (Ref. #74403) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: analysis & enhancement of telephone billing sys. Integration, regression test of modules. Database administration, service order maintenance over data network with AIN (Advanced Intelligent Network); AP, BOSS for CRIS & BPP bills. Responsibilities incl Project tracking, tech support using IBM 3090, MVS/ESA, VM/XA/OV, SNA/VTAM, JCL, QMF, SOL, CICS 3.1, C, DB2 2.3, PL/I 2.3, VS COBOL II, IBM ASSEMBLER & MSWINDOWS' EXCEL on Ethernet & NCP/Netview environment. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: must include, in whole or in part, network design; sys admin., & using IBM 3090, MVS/ESA, VM/XA, SNA/VTAM, CICS, Ethernet, DB2, IBM Assembler & PL/I. $33,154/yr. 40 hr/wk.

SENIOR SOFTWARE CONSULTANT (Ref. #84863) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: managing multiple large s/ware projects & ensuring the completion of the projects with very high quality, on schedule & within budget; proposal preparation; s/ware estimation, client presentations, planning; arriving at development methodology & milestone; defining deliverables for different milestones, arriving at payment schedules; work allocation; monitoring; tracking quality & costs; reliability modeling; managing changes; client liaison & expectation management of clients; motivating a team of highly skilled professionals; & interacting with multiple vendors at different sites at the same time. Duties require using IBM mainframes & DB2, CICS, COBOL II, TSO, REXX, SRPI & IMS DB/DC. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the job offered or in the related occupation in lieu of the req ed & exp. REL EXP: must include, in whole or in part, involvement in all stages of s/ware development cycle, project management for quality; schedules & cost; preparing proposals; defining programming objectives; conducting client presentations; maintaining client liaison; interacting with vendors; & using IBM mainframes, DB2, CICS, TSO & IMS DB/DC. $52,000/yr. 40 hr/wk.

SENIOR SOFTWARE CONSULTANT (Ref. #84783) to consult with clients to ascertain & define their business reqs or problem areas & utilize tech expertise to provide solutions to clients' needs, incl analyzing, designing, developing & implementing comp s/ware for clients' EDP sys. Duties incl: managing large APP S/ware Development projects. Responsibilities incl effort estimation, project planning, scheduling, management & provision of tech support to the development team, development & implementation of tech standards, guidelines, tools & procedures, reviewing tech design, carrying out performance anal & tuning, quality assurance, monitoring & control of project progress & reporting to corporate management. The development environment is an IBM mainframe with the following hrware & s/ware: IBM 3090, MVS/ESA, COBOL II, DB2, CICS, EASYTRIEVE, CASE TOOL FOUNDATION, (METHOD I, DESIGN I, INSTALL I) & MICROSOFT PROJECT. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg, Consultant or Project Manager. Will accept 3 yrs of college ed plus 3 yrs of exp in the job offered or in the related occupation in lieu of the req ed & exp. Related exp must have incl in whole or in part, design & management of large s/ware app. development projects, project planning & scheduling, quality assurance; providing tech guidance; developing project estimates, evaluating design for tech feasibility; & using IBM 3090, MVS, DB2, CICS, COBOL II, Microsoft Project & METHOD I. $60,000/yr. 40 hr/wk.

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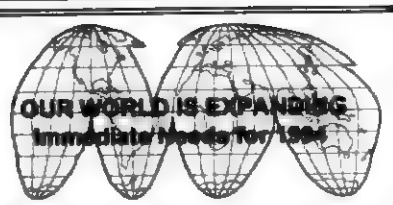

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Field Report: Docking Stations

By David Baum

The concept is great: A portable computer that goes anywhere and upon return to the office, slips into a docking station with your favorite desktop peripherals and network connections already attached. No need to maintain two computers or worry about files and programs being in synch.

Typically, the goal of most users who seek docking stations is to integrate a portable computer into a cohesive desktop system, not just to provide a bigger monitor and keyboard, says Matt Ghourdjian, national director of technology at the law firm of Howrey & Simon.

Apple Computer, Inc., NEC Corp., Compaq Computer Corp. and a host of third-party vendors offer docking stations that work with portables from these three vendors. After testing PC and Macintosh-compatible systems, the 750-person law firm standardized on Apple PowerBook Duo portable computers and a variety of docking stations from Apple and third-party vendors.

"The attorneys like the Duos because they are lightweight," Ghourdjian says. He insists that Apple's PowerBook Duo line and accompanying docking stations offer the best integration between hardware and software.

"The PC vendors don't do this as well," he says. "There is no synergy between the operating system and the docking hardware. For instance, [with a PC] if you hit the eject key, you can lose whatever document you were working on. Also, there are no automount features like you have with the Apple" docking stations.

Makes traveling easy

Docking stations have caught on at sites where users are on the move such as Houston Community College in Texas, where the faculty travels among 46 different locations at six different colleges.

"Our faculty teaches at multiple sites on the same day," says Willie Pritchard, assistant vice chancellor for instructional computing. "We've established teaching bunkers in the main lecture halls with built-in docking stations. Teachers can walk in with a computer, slip it into the dock and power up a full multimedia system for presentations."

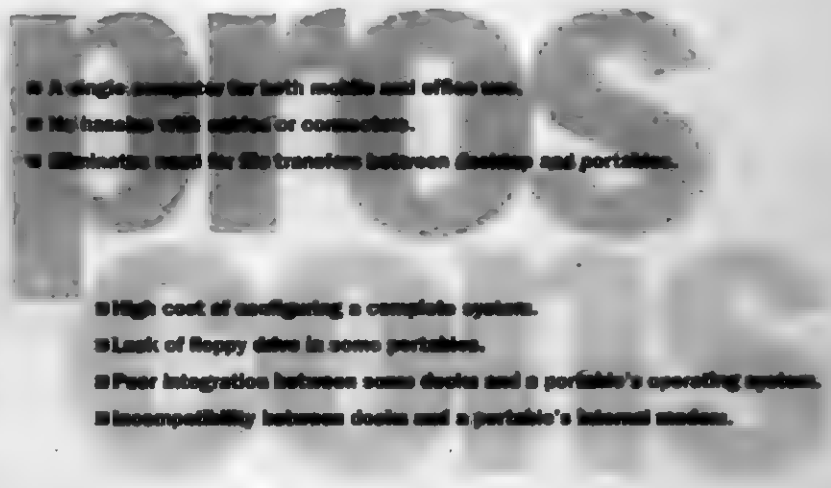
Ghourdjian says his favorite Duo-compatible dock is Etherdock from E-Machines, Inc. in Sunnyvale, Calif., because it is Ethernet-ready. However, it does not support an internal PowerBook modem or a dock-resident hard drive.

Lingering complaints

Despite the convenience, the price for a complete system is steep. After spending $1,500 to $2,000 for a portable computer, spending another $500 to $1,000 for the docking station may be hard to swallow. Some users say many docking station-compatible notebooks that favor light weight over functionality are flawed by the lack of an internal floppy drive.

Ghourdjian disagrees. "If you utilize the networking and communication tools, you'll almost never need a floppy," he says. "For us, the extra weight isn't worth it." Yet users warn that not having a floppy drive onboard can be disastrous if a critical program crashes when away from the dock. With no way to insert floppies, you cannot reboot the system.

Baum is a free-lance writer in Santa Barbara, Calif., who specializes in emerging technologies.



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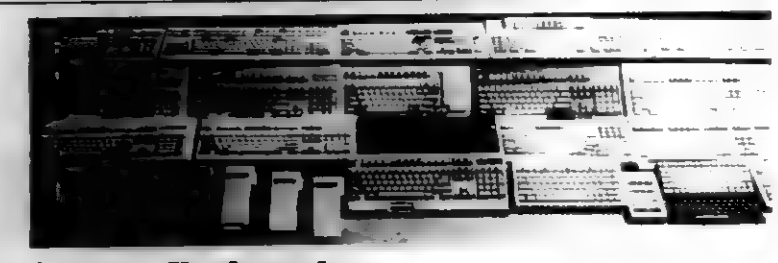

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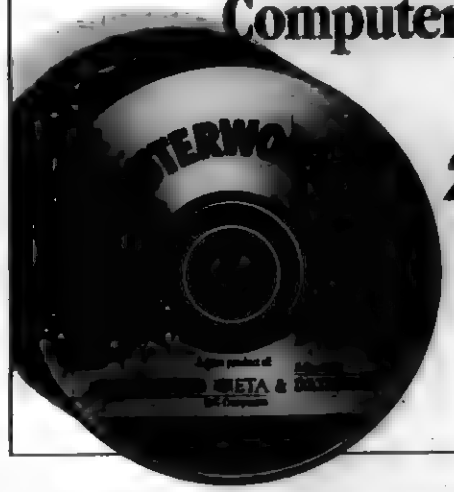

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Percent

Microcom Inc.	39.5	Kendall Square Research(L)	-52.2
Software Publishing Corp.	32.7	VLSI Technology	-27.2
Cabot Corp.	27.6	Micro Focus(L)	-22.3
GO Video	23.1	Wordstar	-14.3
Penril Data Comm Networks	21.4	Spinnaker Software	-13.1
Cipher Data	19.8	Ramtron Technologies Inc.	-12.9
3 Com Corp.	17.8	Policy Management Sys.	-12.4
CE Software	16.0	Zoom Intl Materials Ltd.	-12.1

Dollar

Cabletron Systems	13.25	Kendall Square Research(L)	-5.88
Matsushita Electronics	9.00	Micro Focus(L)	-4.38
Microsoft Corp.	6.50	VLSI Technology	-3.88
3 Com Corp.	6.50	Policy Management Sys.	-3.25
Wellfleet Communications(H)	5.25	ITT Corp.	-3.00
Sybase Inc.(H)	5.00	IBM	-2.63
Cipher Data	5.00	Ramtron Technologies Inc.	-2.63
DSC Communications	4.38	National Semiconductor	-1.88

Kendall Square Research continued its remarkable free fall after announcing drastic revenue restatements (see page 6).

Wall Street divided on EDS

The granddaddy of outsourcing firms, Electronic Data Systems Corp. (GME), owns more than one-third of the market. Recent events have divided analysts on the company's near-term stock performance, however.

James Kissane, an analyst at Salomon Brothers, Inc., said EDS is fundamentally solid and that its revenue will likely continue to grow. But he recently downgraded EDS shares from Buy to Hold, citing uncertainty created by the decision of EDS parent General Motors Corp. to contribute its GME shares to its U.S. Hourly Pension plan.

Also, EDS has had mixed results in recent jousts for big contracts. EDS lost the bidding in November for a 10-year, $1.3 billion contract with British Aerospace PLC. Computer Sciences Corp. (CSC) got the business instead. At the end of the month, though, EDS scored a 10-year, $2 billion contract with Inland Revenue, the UK's tax agency.

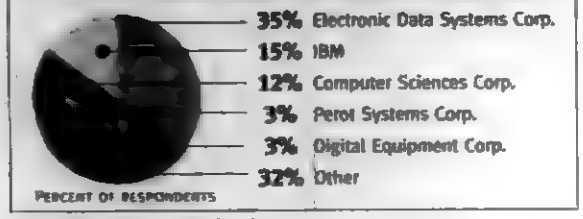
EDS received a Moderately Attractive rating in a Nov. 19 report from Donaldson, Lufkin & Jenrette Securities Corp. Analyst Mark Wolfenberger said EDS' fundamentals are more important than the pension plan and the British Aerospace contract loss. EDS has cut costs and should see revenue growth in the coming year, he said.

With the British Aerospace deal under its belt, EDS competitor CSC seems to enjoy good prospects. Equities firm Raymond James & Associates, Inc. recently gave CSC shares a Buy rating, estimating that the British Aerospace contract alone could buoy CSC's earnings per share by 20 cents annually. Raymond James analyst Jeffrey Newman said CSC should post a 19% rise in revenue in 1994.

— Derek Slater

Outsourcing giants

The 1993 outsourcing market is valued at $9.5 billion. EDS is still king of the hill, though competitors are gaining ground.



Source: Gartner Group, Inc., Stamford, Conn.

Exch	52-Week High	52-Week Low		Dec. 3 1993	Wk Net Change	Wk Pct Change
Communications and Network Services						Up 1.53%
OTC	63.00	19.63	3 Com Corp.	43.00	6.50	17.8
NYS	91.13	67.50	American Info Techs Corp.	77.63	0.38	0.5
NYS	65.00	47.13	AT&T	54.38	-1.50	-2.7
OTC	4.44	0.94	Aytel Communication Corp.	3.25	0.00	0.0
OTC	24.50	12.50	Banyan Systems Inc.	24.50	2.00	8.9
NYS	69.13	47.38	Bell Atlantic Corp.	61.00	2.00	3.4
NYS	63.88	49.00	BellSouth Corp.	57.50	0.63	1.1
NYS	14.75	4.25	Bolt, Beranek & Newman	13.25	1.38	11.6
OTC	18.50	9.50	Brooktrout Technology	13.00	-0.75	-5.5
NYS	119.00	70.75	Cabletron Systems	113.75	13.25	13.2
OTC	36.50	11.25	Centigram Communications	34.25	1.50	4.6
OTC	55.50	22.88	Chipcom Corp.	50.00	3.63	7.8
OTC	60.50	34.38	Cisco Systems Inc.	60.50	3.13	5.4
OTC	18.38	8.00	Compression Labs Inc.	14.13	1.00	7.6
OTC	36.00	21.75	CrossComm	30.25	5.00	19.8
OTC	4.63	1.75	Data Switch Corp	1.75	-0.13	-6.7
NYS	19.88	12.38	Digital Comm. Assoc.	18.75	0.00	0.0
OTC	11.75	3.50	Digital Systems Int'l Inc.	3.63	-0.13	-3.3
OTC	73.13	17.75	DSC Communications	62.13	4.38	7.6
OTC	9.50	4.75	Fibronix Int'l Inc.	5.50	-0.25	-4.3
OTC	23.00	8.75	Fibronix Int'l Inc.	20.25	2.75	15.7
OTC	4.38	1.69	Gandalf Technologies Inc.	3.00	0.13	4.3
OTC	2.06	0.69	Gateway Communications	0.94	-0.06	-6.2
NYS	15.75	4.75	General Datacomm Inds.	10.13	0.13	1.3
ASE	3.63	2.00	Go Video	3.00	0.56	23.1
NYS	39.88	33.13	GTE Corp.	36.88	-0.50	-1.3
NYS	94.75	69.00	ITT Corp.	88.00	-3.00	-3.3
OTC	29.88	18.63	MCI Communications Corp.	24.88	-0.25	-1.0
OTC	6.50	1.50	Microcom Inc.	5.25	1.38	35.5
OTC	24.25	3.50	Netrix Corp.	6.13	0.00	0.0
OTC	19.00	6.50	Network Computing Devices	6.75	-0.75	-10.0
NYS	11.50	5.38	Network Equipment Tech.	9.88	0.00	0.0
OTC	20.13	8.00	Network General	14.75	1.50	11.3
OTC	14.00	6.88	Network Systems Corp.	9.38	1.00	11.9
OTC	73.88	15.63	Newbridge Networks Corp.	57.38	3.38	6.3
NYS	46.00	21.38	Northern Telecom Ltd.	28.38	-1.25	-4.7
OTC	35.25	17.00	Novell Inc.	24.88	1.63	7.0
NYS	48.88	40.31	Nynex Corp.	42.00	-1.00	-2.3
OTC	30.00	19.00	Octel Communications Corp.	26.75	0.88	3.4
OTC	6.38	3.75	Penril Data Comm Networks	6.38	1.13	21.4
OTC	30.50	14.50	Picturetel Corp.	20.75	1.00	5.1
OTC	11.50	3.63	Proteon Inc.	7.25	0.38	5.5
NYS	38.88	17.75	Scientific Atlanta Inc.	33.63	1.75	5.5
NYS	47.00	34.19	Southwestern Bell Corp.	42.75	1.13	2.7
NYS	40.25	24.38	Sprint Corp.	32.88	-1.50	-4.4
OTC	27.00	12.50	Standard Microsystems Corp.	24.75	1.25	5.3
OTC	19.75	10.00	Stratacom Inc.	17.63	0.63	3.7
OTC	42.75	20.00	Synoptics Communications	26.75	-0.63	-2.3
OTC	9.88	2.88	Telebit Corp.	7.63	0.88	13.0
OTC	17.88	5.13	Telematics Int'l Inc.	15.63	0.25	1.6
OTC	35.25	17.00	US Robotics	26.00	-1.25	-4.6
NYS	50.75	37.75	US West Inc.	40.88	0.50	1.1
OTC	64.00	29.50	Wellfleet Communications (H)	64.00	5.25	8.9
OTC	19.50	7.25	Xircom	15.63	0.63	4.2
PCs and Workstations						Up 0.62%
OTC	5.56	2.50	Advanced Logic Research	3.50	0.00	0.0
OTC	65.25	22.00	Apple Computer Inc.	31.50	-1.13	-3.4
OTC	25.50	12.75	AST Research Inc. (H)	24.50	0.63	2.6
NYS	8.63	2.50	Commodore Int'l	3.38	-0.38	-10.0
NYS	73.63	41.75	Compaq Computer Corp. (H)	73.63	3.50	5.0
OTC	49.88	13.50	Dell Computer Corp.	28.00	3.63	14.9
NYS	89.25	63.38	Hewlett Packard Co.	76.63	2.38	3.2
NYS	46.75	23.50	Silicon Graphics	44.75	1.38	3.2
OTC	41.00	21.13	Sun Microsystems Inc.	27.75	0.88	3.3
NYS	48.00	24.63	Tandy Corp.	46.50	0.13	0.3
OTC	7.00	2.50	Zeos International Ltd.	3.63	-0.50	-12.1
Large Systems						Off 2.42%
ASE	8.50	4.38	Amdahl Corp.	5.50	-0.13	-2.2
NYS	8.75	3.63	Convex Computer	5.50	0.00	0.0
OTC	5.13	2.25	Cray Computer	2.50	-0.13	-4.8
NYS	30.88	20.38	Cray Research Inc.	27.00	0.63	2.4
NYS	13.88	7.75	Data General Corp.	9.75	0.13	1.3
NYS	49.25	30.38	Digital Equipment Corp.	36.25	-1.00	-2.7
NYS	47.38	32.50	Harris Corp.	46.25	1.38	3.1
NYS	67.38	40.63	IBM	53.38	-2.63	-4.7
OTC	25.75	5.38	Kendall Square Research (L)	5.38	-5.88	-52.2
NYS	141.50	87.00	Matsushita Electronics	132.00	9.00	7.3
OTC	23.75	12.75	NetFrame	16.13	-0.13	-0.8
OTC	26.00	9.25	Pacallan Computer	14.75	-0.38	-2.5
OTC	23.25	8.50	Pyramid Technology	14.50	-1.00	-6.5
OTC	24.00	11.25	Sequent Computer Sys.	16.50	0.25	1.5
OTC	6.00	1.38	Sequoia Systems Inc.	4.44	-0.19	-4.0
NYS	41.25	20.25	Stratus Computer Inc.	27.75	0.38	1.4
NYS	16.88	8.50	Tandem Computers Inc.	10.38	-0.13	-1.2
OTC	27.50	10.63	TriCord Systems	27.50	3.25	13.4
NYS	13.88	9.63	Unisys Corp	11.88	0.38	3.3
Software						Up 2.89%
OTC	37.00	14.50	Adobe Systems Inc.	24.38	1.00	4.3
OTC	25.25	11.75	Aldus Corp.	24.75	1.75	7.6
OTC	9.25	5.50	American Software Inc.	6.38	0.25	4.1
OTC	28.13	9.50	Asa Computer Systems	15.00	1.00	7.1
OTC	56.75	37.00	Autodesk Inc	45.25	1.50	3.4
OTC	6.75	2.38	Bachman Info. Systems	2.75	0.00	0.0
OTC	62.00	24.00	BGS Systems Inc.	27.00	0.00	0.0
OTC	84.13	38.75	BMC Software Inc.	50.25	2.50	5.2
OTC	28.25	20.38	Boole & Babbage	26.00	0.00	0.0
OTC	27.25	12.75	Borland Int'l Inc.	16.13	0.00	0.0
OTC	6.63	2.75	CE Software	3.63	0.50	16.0
ASE	40.25	16.41	Cheyenne Software Inc.	33.50	2.13	6.8
OTC	19.50	8.25	ChipSoft	17.75	0.75	4.4
OTC	10.50	5.63	Cognos Inc.	8.50	-0.50	-5.6
NYS	44.25	17.63	Computer Associates	41.38	-0.13	-0.3
NYS	6.50	2.13	Computervision Corp.	3.13	0.13	4.2
OTC	34.25	19.25	Compuware Corp.	25.00	-0.25	-1.0
OTC	14.25	5.75	Comshare Inc.	9.50	0.00	0.0
OTC	19.75	5.38	Corel Corp.	19.75	4.25	27.4
OTC	15.25	3.63	Easel Corp. (L)	4.25	0.25	6.3
OTC	25.25	15.75	4th Dimension	20.13	-0.13	-0.6
OTC	19.25	5.25	Frame Technology	10.00	0.25	2.6
OTC	17.50	8.00	Group I Software	8.75	-0.25	-2.8
OTC	35.25	13.50	Gupta (L)	15.00	0.00	0.0
OTC	12.00	4.88	Hogan Systems Inc	10.63	0.50	4.9
OTC	27.75	11.25	IMRS	22.50	0.00	0.0
OTC	44.75	27.00	Information Resources	17.13	1.13	3.4
OTC	27.25	13.38	Informix Corp.	19.13	1.50	8.5
OTC	14.00	8.50	Intergraph Corp.	10.13	0.38	3.8

Exch	52-Week High	52-Week Low		Dec. 3 1993	Wk Net Change	Wk Pct Change
OTC	13.63	4.88	Interleaf Inc.	7.25	-0.25	-3.3
OTC	15.25	4.75	Intersolv Inc.	10.25	1.00	10.8
OTC	18.25	7.75	Knowledgeware Inc.	17.25	1.75	11.3
OTC	54.75	15.50	Lotus Development	50.25	3.00	6.3
OTC	23.00	4.25	MathSoft	6.50	0.13	2.0
OTC	20.50	4.50	McAfee Associates	6.25	-0.38	-5.7
OTC	11.63	3.75	Meca Software	6.38	0.00	0.0
OTC	14.75	7.63	Mentor Graphics (H)	14.75	1.25	9.3
OTC	46.00	15.25	Micro Focus (L)	15.25	-4.38	-22.3
OTC	13.25	4.38	Micrograf Inc.	7.88	0.50	6.8
OTC	98.00	70.38	Microsoft Corp.	85.50	6.50	8.2
OTC	34.63	9.44	Oracle Corp.	34.63	2.75	8.6
OTC	64.75	22.50	Parametric Technology	40.25	0.63	1.6
OTC	60.50	23.50	PeopleSoft	31.00	1.75	6.0
OTC	7.13	3.50	Phoenix Technologies	4.00	0.00	0.0
OTC	40.00	22.00	PowerSoft	38.88	3.38	9.5
OTC	39.75	13.50	Platinum Software	22.75	-1.00	-4.2
OTC	25.00	7.25	Platinum Technology	10.00	0.13	1.3
OTC	61.50	32.25	Progress Software Corp.	49.50	1.00	2.1
OTC	6.63	1.94	Quarterdeck Office Sys.	2.19	-0.06	-2.8
OTC	32.00	16.00	Rainbow Technologies Inc.	18.38	-2.63	-12.5
OTC	11.38	4.25	Rasterops	8.00	0.38	4.9
OTC	15.25	6.50	Ross Systems	8.00	-0.25	-3.0
OTC	28.75	17.25	Sapiens Intl. Corp. N.V.	21.75	-0.50	-2.2
OTC	14.50	5.50	Software Publishing Corp.	8.13	2.00	32.7
OTC	17.25	5.25	Software Toolworks Inc.	11.88	-0.75	-5.9
OTC	2.88	0.75	Spinnaker Software	2.06	-0.31	-13.1
OTC	13.75	6.75	State of the Art	7.75	0.00	0.0
NYS	33.63	17.63	Sterling Software Inc.	28.88	2.00	7.4
OTC	21.63	9.63	Struct. Dynamics Research	19.50	1.75	9.9
OTC	41.75	20.88	Sybase Inc. (H)	41.75	5.00	13.6
OTC	20.50	9.25	Symantec Corp.	17.88	1.38	8.3
OTC	25.50	10.00	System Software Assoc.	15.25	0.50	3.4
OTC	6.50	2.75	Timeic Corp.	5.38	0.25	4.9
OTC	26.50	13.50	Viewlogic Systems	21.25	1.50	6.5
OTC	27.50	6.50	Walker Interactive Systems	9.75	1.00	11.4
OTC	3.19	0.84	Wordstar	1.13	-0.19	-14.3
Semiconductors						Off 2.45%
NYS	32.88	15.88	Advanced Micro Devices	18.63	-0.50	-2.6
NYS	28.00	14.38	Analog Devices Inc.	23.50	-0.13	-0.5
OTC	38.63	14.75	Atmel Corp.	27.25	1.75	6.9
OTC	6.88	2.75	Chips and Technologies (H)	6.25	-0.38	-5.7
OTC	39.75	13.00	Cirrus Logic	36.00	1.38	4.0
NYS	16.75	8.63	Cypress Semiconductor Corp.	12.63	-0.63	-4.7
NYS	19.00	11.75	Dallas Semiconductor	13.63	-0.38	-2.7
OTC	74.50	38.25	Intel Corp.	63.25	3.00	5.0
NYS	19.25	10.00	LSI Logic Corp.	13.88	-1.38	-9.0
OTC	26.75	12.25	Lattice Semiconductor	14.25	0.13	0.9
NYS	63.63	16.25	Micron Technology	48.25	2.25	4.9
NYS	107.50	48.75	Motorola Inc.	96.38	0.25	0.3
NYS	21.75	10.13	National Semiconductor	19.38	-1.88	-10.9
OTC	15.50	6.50	Sierra Semiconductor	8.38	-0.13	-1.5
OTC	52.75	25.75	SynOptics	46.13	-1.00	-2.1
NYS	84.25	45.13	Texas Instruments	63.63	-0.75	-1.2
OTC	18.88	6.50	VLSI Technology	10.38	-3.88	-27.2
OTC	14.38	6.88	Weitek	8.88	-0.75	-7.8
ASE	10.25	3.63	Western Digital Corp.	9.88	0.38	3.9
OTC	54.50	28.75	Xilinx	42.50	0.50	1.2
OTC	40.75	19.00	Zilog Inc.	28.00	-0.75	-2.6
Peripherals and Systems						Up 1.22%
OTC	24.75	10.50	American Power Conversion	19.00	0.00	0.0
OTC	22.75	15.50	Banctec Inc.	22.63	1.63	7.7
OTC	17.00	3.50	Cambex Corp.	4.75	-0.25	-5.0
ASE	18.38	3.88	Cognitronics Corp.	5.13	0.31	6.5
NYS	25.50	9.00	Conner Peripherals	14.38	1.00	7.5
OTC	38.50	17.50	Creative Technologies Inc.	27.75	1.25	4.8
OTC	30.75	6.50	Data Race Inc.	9.75	-0.25	-2.5
ASE	12.50	7.50	Datagram Corp.	9.50	0.00	0.0
NYS	39.00	9.25	EMC Corp	34.50	2.13	6.6
OTC	10.50	5.25	Emulex Corp.	6.25	0.13	2.0
OTC	20.00	14.00	Evans & Sutherland	17.50	0.25	1.4
OTC	20.00	7.50	Exabyte	17.63	1.75	11.0
OTC	34.00	12.38	Intelligent Info. Systems	25.00	-1.75	-6.5
OTC	8.25	2.50	Iomega Corp.	3.25	-0.13	-3.7
OTC	13.50	5.75	IPL Systems Inc.	7.75	0.50	6.9
OTC	24.00	13.75	Komag Inc.	16.00	0.50	3.2
OTC	19.50	4.38	Maxtor Corp.	6.25	0.00	0.0
OTC	10.00	5.25	Micropolis Corp.	8.00	0.75	10.3
NYS	117.00	97.25	3M Corp	108.38	0.50	0.5
OTC	8.00	4.00	Printronix Inc.	7.25	0.00	0.0
NYS	17.25	7.50	QMS Inc.	10.38	0.00	0.0
OTC	17.88	9.38	Quantum Corp.	14.75	0.88	6.3
OTC	9.00	3.13	Radius Inc. (H)	9.00	0.88	10.8
NYS	17.75	11.75	Recognition Equipment	16.38	0.00	0.0
OTC	12.75	3.63	Reton Inc.	4.38	0.38	9.4
OTC	25.13	13.13	Seagate Technology	24.13	0.63	2.7
NYS	45.00	18.00	Storage Technology	37.00	3.50	12.3
NYS	27.88	17.63	Tektronix Inc.	21.88	0.38	1.7
NYS	88.88	69.88	Xerox Corp.	82.13	-0.50	-0.6
Services						Up 1.92%
NYS	4.38	1.63	Allegron Inc.	3.88	0.50	14.8
OTC	23.75	14.88	American Mgmt. Systems	20.00	-0.25	-1.2
NYS	4.75	2.38	Analytics Inc.	3.75	0.00	0.0
OTC	23.84	14.84	Analysts Int'l	18.38	1.25	7.3
NYS	56.50	46.88	Auto Data Processing	55.13	-0.25	-0.5
NYS	29.88	13.00	Ceridian Corp.	18.25	0.00	0.0
NYS	21.00	13.13	Comdisco Inc.	19.50	0.75	4.0
OTC	13.38	6.00	Computer Horizons	12.13	-0.13	-1.0
NYS	100.25	70.00	Computer Sciences	97.50	0.88	0.9
NYS	9.00	6.00	Computer Task Group	6.88	0.25	3.8
NYS	37.00	19.00	CompUSA Inc.	27.00	0.63	2.4
OTC	14.13	8.25	Control Data Systmes Inc.	10.13	0.88	9.5
OTC	16.00	7.00	Corporate Software	14.88	0.00	0.0
OTC	11.75	6.63	Egghead Discount Software	9.00	0.50	5.9
NYS	35.88	26.00	General Motors E (EDS)	28.38	-0.50	-1.7
OTC	25.50	13.75	Inacom Corp.	17.00	0.00	0.0
OTC	27.63	10.75	Intelligent Electronics (H)	26.00	-0.50	-1.9
OTC	17.00	9.63	Mercisel	14.63	0.25	1.7
OTC	37.00	7.00	Microtage Inc.	35.75	1.50	4.4
OTC	37.75	21.50	Paychex	32.75	-0.13	-0.4
NYS	87.25	21.63	Policy Management Sys.	23.00	-3.25	-12.4
NYS	44.25	24.13	Reynolds and Reynolds	44.25	2.50	6.0
OTC	24.75	13.38	SEI Corp (H)	24.50	1.75	7.7
OTC	26.00	17.50	Shared Medical Systems	22.50	0.13	0.6
OTC	12.63	5.75	Shl Systemhouse	6.63	-0.50	-7.0
OTC	30.75	20.00	Software Spectrum Inc.	23.00	2.25	10.8
OTC	42.75	27.75	Sungard Data Systems	35.13	-0.63	-1.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

Legent looking to buy

Legent Corp. plans to buy **TeamOne Systems, Inc.** in Sunnyvale, Calif., a developer of configuration management software for Unix workstations. The purchase will be a pooling of interests. Legent expects to finalize the transaction in early 1994.

TeamOne's technology will be blended into Legent's Endevor change management product line and will also be used to provide a key deliverable for Legent's recently announced XPE client/server initiative.

MAI exits Chapter 11

MAI Systems Corp. in Irvine, Calif., said it has emerged from Chapter 11 proceedings with a "positive cash flow, a minimum debt load and strong earnings potential." The reorganized company will provide unsecured creditors with stock. MAI's net income for the third quarter, ended Sept. 30, was $2.3 million compared with a loss of $169.6 million in the same period last year.

Total revenue for the quarter just ended was $18.9 million, a decline of 72% from the comparable period in 1992. This drop was mostly attributed to the elimination of MAI's European subsidiaries.

HP closes PC plants

Hewlett-Packard Co. told analysts last week it has shuttered seven of its 10 PC manufacturing plants in the last 18 months, including all of its U.S. sites. HP said it retained a "high percentage" of the employees from those plants.

SHORT TAKES **Memorex Telex N.V.** said its three major creditor groups are supporting its Chapter 11 restructuring plan. . . . **Darrell Miller**, Novell's executive vice president, corporate marketing and strategy, said he will officially retire Dec. 9, and plans to consult with venture capitalists.

Dour Dell seeks portable panacea

By Michael Fitzgerald

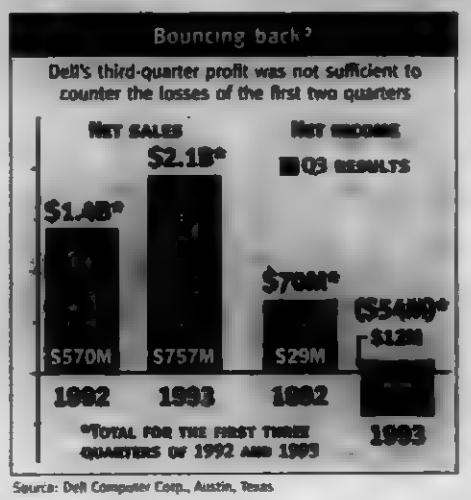
Despite a return to profitability, Dell Computer Corp.'s normally effusive executives ate humble pie last week, forecasting a fourth quarter that will not match last year's.

At the same time, Dell is gearing up for renewed growth in 1994, in part through a rebirth in the notebook market.

Dell posted a $12 million profit on record revenue of $757 million in its fiscal third quarter, up from $570 million a year ago and a solid 8% increase over its second-quarter revenue.

While profits fell to less than half of the $28 million posted in last year's third quarter, the stock market reacted positively, bumping Dell's stock up three points. The PC maker had been expected to break even at best.

However, Dell followed up by issuing a dour forecast, cautioning analysts that fourth-quarter profits will likely fall short of last year's $30 million, though sales should rise from last year's fourth-quarter total of $615 million. Dell also said it will not hit its goal of $3 billion in sales for the fiscal year. Its sales totaled just over $2 billion in the last fiscal year.



Source: Dell Computer Corp., Austin, Texas

Lack of a portable hurts

Dell surprised analysts with solid unit growth in the desktop market, but its lack of notebooks hurt its third-quarter sales performance and is blamed for the projected slip.

Still, analysts said they were impressed with the company's ability to grow revenue 8% despite its absence from the portable sector.

In a recent interview, Joel Kocher, Dell's president of sales, promised "a fairly broad range of products" for 1994.

Sources confirmed a published report that Dell will relabel AST Research, Inc.'s Bravo notebook line in a deal expected to be announced in the first quarter of 1994. The company also expects to add at least one upcoming Motorola, Inc. wireless handheld to its product catalog. And, in mid-1994, Dell-designed notebooks — the company's first 486s — are expected to appear.

Industry sources said Dell is discussing a wide range of features for its notebook line, including a built-in answering machine, extensive multimedia features, local-bus video and built-in global positioning software, among other things. Analysts said Dell's experience with build-to-order systems could be an advantage in pushing sophisticated portables.

While the AST OEM deal is a stopgap measure until Dell's own products appear, Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass., said, "They'll be coming from behind the curve, but if they can come out with something innovative," the notebook market will be open to them. Stephen said the rumored Dell notebook direction is innovative, but depends on when the company delivers the products.

Michael Stonecipher, office systems manager at United Missouri Bank in Kansas City, said, "The opportunity for Dell is that [notebook] form factors keep changing so quickly, so by default they'll get an evaluation if they're in the market for the next generation."

Stephen Ades, director of information systems at States Nitewear, Inc. in New Bedford, Mass., said that while he is "not thrilled" with the AST box, he is "glad" to see Dell coming back into the market.

Kocher also said the Austin, Texas, PC maker has fixed the infrastructure and systems problems that caused it to lose track of inventory. He pointed to Dell's year-long focus on beefing up its systems staff, including the hiring of a chief information officer and several people who will focus on better integrating Dell's business and systems.

Moreover, analysts said Dell appears to have contained its cost of goods sold, suggesting it has addressed its structural issues.

Kocher said Dell, currently among the Top 5 PC makers in the U.S., is poised to grow rapidly in 1994. "The Top 5 only own 35% of the market — 700 no-names own the rest of it," Kocher said. "The big will get bigger" next year.

Sybase finds an Oasis

By Kim S. Nash

Sybase, Inc. last week said it plans to acquire Oasis Group PLC, a $16 million business process re-engineering firm based in the UK.

The deal, valued at $21 million, would add consulting services aimed at nontechnical senior managers to Sybase's collection of technical trainers, systems integration partners and other client/server advice-givers, the Emeryville, Calif., database vendor said.

As client/server computing becomes mainstream, users will need to plan for it on a corporate level, rather than project by project, analysts said. "Sybase needs to strengthen its consulting side to go beyond solving individual technology problems," said Dan Richards, an analyst at Database Associates in Morgan Hill, Calif.

Oasis provides Sybase with an entree into business process re-engineering with the Oasis Methodology, according to David Peterschmidt, vice president and general manager of worldwide field operations at Sybase.

The Oasis way

Oasis Methodology is a set of guidelines for analyzing and revamping core business tasks such as billing, customer service and order-filling. About 70% of Oasis Methodology can be applied to any industry, while the other 30% must be customized for specific users, said David Stanley, Oasis cofounder.

By happenstance, Exxon Corp.'s Chemical Polymers Europe division and BP Exploration, Inc., are among several joint Sybase and Oasis customers. For the next year, Sybase plans to gradually introduce Oasis consulting to existing Sybase users interested in rebuilding business processes.

Rival Oracle Corp. beefed up its consulting arm by introducing Oracle Industries five months ago [CW, July 19]. The vertical market-oriented service provides consulting and prefabricated application templates based on the Oracle database.

Sybase officials claimed that Oasis goes beyond Oracle's offering by reaching out to senior executive suites at user sites. "We deal in high-level discussions of how business works and doesn't work, without touching on specific technical issues until much further down the line," Stanley said.

The acquisition is expected to be approved by shareholders and government agencies next month.

Oasis Group PLC
Maidenhead, England

Founded: 1986.
Focus: Pure consulting firm for business re-engineering; sells no software or hardware of its own.
1993 sales: $16 million.
Employees: 100.
Customers: Multinational firms, primarily based in the UK, including S. G. Warburg & Co., BP Exploration, British Coal Corp., Eli Lilly & Co.
Sybase gains: High-level consulting services.

Wysiwyg

It's only NATURAL

Dallas-based software maker Intellection has a family of intelligent planning and scheduling software it calls **Rhythm**. (We're guessing it's a big family.)

Dear Mr. President

Computer Museum visitors in Boston can send an electronic message directly to the White House via the Internet. Computer animation simulates the message as it bounces from the museum to a gateway in Boston to Washington and finally to the White House. President Clinton says he hopes to answer the messages within a year.

GREAT NAMES

Col. Gary Case
Program director for the Pentagon's $400 million integrated computer-aided software engineering (I-CASE) contract to the U.S. Air Force.

HACKER LINGO

Bagbiter *n.*: Something, such as a program or computer, that fails to work or works in a remarkably clumsy manner. Example: This text editor won't let me make a file with a line longer than 80 characters. What a bagbiter!

BAGBITER

LOBIX

Glork *interj.*: Term of mild surprise, usually tinged with outrage, as when one attempts to save the results of two hours of editing and finds the system has just crashed.

Source: The New Hacker's Dictionary (MIT Press)

ASCII ART

What would be your idea of a dream merger between vendors and why? Contact Lory Zottola Dix at 1 (800) 343-6474; LDIX (MCI Mail); or 76537,2413 (CompuServe).
If we use your suggestion, we'll send you a gift.

The 5th Wave *by* Rich Tennant

Inside Lines

Unstacking the code

Microsoft late last week informed DOS 6.2 users via CompuServe that they may need a patch from Stac Electronics if they intend to use the operating system with the latest version of Stacker. Microsoft claims that Stac slipstreamed some changes into Stacker 3.11 that have caused various "incompatibilities" between the two products. Users need to run the patch, which can be found in Stac's forum, before installing MS-DOS 6.2. If Version 6.2 has already been installed, users must uninstall it, run the patch and then reinstall DOS. The vendors are involved in litigation.

Scaling, scaling over the DBMS sea

This week Microsoft is expected to show attendees at Database World in Chicago a version of its SQL Server for Windows NT database running on Digital's Alpha, according to sources close to both firms. The product will ship by month's end, the sources said. A 64-bit Alpha release of SQL Server will help prove that the database is scalable and portable, according to Dennis Schneider, president of OnPoint Marketing, a Nashua, N.H., consulting firm.

Getting a handle on Unix

Novell is preparing to roll out the services that will allow its UnixWare systems to be managed along with NetWare via its NetWare Management System (NMS), according to product line manager Steve Dauber. The services to be rolled out to UnixWare in the "fairly near term" include inventory management and software distribution, Dauber said. The recently shipped NMS 2.0 already monitors traffic generated by UnixWare systems through its LANalyzer NetWare Loadable Module, which can analyze TCP/IP packets, he added.

Ties that bind

When it comes to integrating Banyan's Enterprise Network Services (ENS) with Microsoft's Windows NT, the question is not whether but how, according to Banyan Vice President Bill Johnson. Definitely in the works is an NT redirector that will put NT clients on an ENS server. Less clear is whether Banyan will implement its global services on an NT platform, as it is doing for various Unix systems; or integrate ENS services with Microsoft's LAN Manager, as it did with NetWare; or even support Microsoft's future global services, a la Cairo. Stay tuned, Johnson says.

Avoiding LAN mines

Tandem Computers and its Ungermann-Bass subsidiary are expected this week to disclose that they will ship a set of fault-tolerant LAN products in the first quarter of next year. The NonStop Access for Networking series was designed to nearly double the uptime of LANs running DOS, Windows and OS/2 PCs through the use of dual-port LAN adapters and dual hub controller cards. The MasterLAN FT dual-port Ethernet adapter card, priced at $190, can be added to LANs of any brand. A complete system, including hub controller cards and host-based LAN controllers, costs $650 per workstation.

Even Digital employees seem a bit uncertain over when it's OK to use the now-discredited DEC acronym. Last week's press release on Digital's object technology agreement with Microsoft made reference to the Digital OSF/1 operating system (see story page 6). But a spokesman for the company's Unix operations said that at least for now, the name is still DEC OSF/1; he surmised that the press release reflected an overly zealous reading of the corporate campaign to sweep the DECs clean. Digital does eventually want to change the name of DEC OSF/1 to include the word "Unix," provided licensing terms from new keeper-of-the-Unix brand X/Open Co. are not onerous; but the spokesman said a switch to a new moniker is not imminent. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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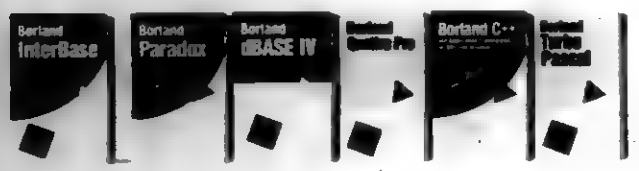

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COMPUTERWORLD

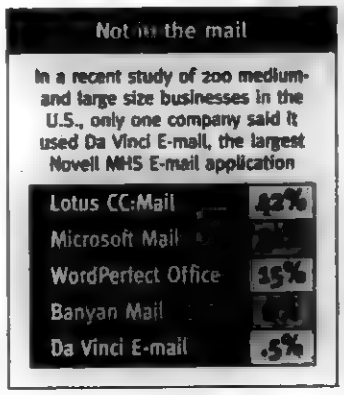
Novell eyes way to boost E-mail

Taps Da Vinci to shore up front end

By Lynda Radosevich

Novell, Inc. is rushing to bolster its weak enterprise messaging presence with partnerships before Lotus Development Corp. and Microsoft Corp. come out with their enhanced messaging lines next year. But users and analysts said the company may be doing too little too late to sway the corporate messaging market.

In its latest arrangement, Novell last week disclosed that it has authorized Da Vinci Systems Corp. in Raleigh, N.C., to sell its electronic-mail client software in Novell's signature red box. Also, Novell has authorized resellers to bundle Da Vinci's E-mail with NetWare and the NetWare Message Handling Service subsystem.



Source: Dataquest, Inc., San Jose, Calif.

Novell and Retix unveiled a similar partnership last June for X.400 messaging services, and more partnerships are under discussion, according to Novell.

Novell's strategy is to provide MHS as a core messaging service in the NetWare Version 3.12 and 4.x operating systems and let users pick from a variety of third-party front-

Novell, *page 15*

Notes goes mainstream

NLM version, improved interface may help large sites boost ROI

By Michael Vizard
ORLANDO, FLA.

■ Seeking to make Notes more attractive to deploy, Lotus Development Corp. is working on several initiatives that should make it easier for corporate sites to more quickly recoup their investment in the groupware package.

Lotus last week revealed plans to ship in February a version of its groupware that runs seamlessly with Novell, Inc.'s NetWare. Moreover, the company plans to deliver a more user-friendly interface in a major upgrade due within a year. The company made both announcements at its user conference here.

The Notes NetWare Loadable Module could help reduce the time it takes for most companies to gain a return on their investment in Notes. That is because many sites will no longer have to purchase a separate OS/2-based server to run Notes. Additionally, the improved user interface should reduce training costs, analysts said.

Also contributing to reduced training costs will be a new set of applications being developed using graphical tools from companies such as Powersoft Corp. [CW, Jan. 6]. Meanwhile, users are getting around the Notes interface by employing standard PC applications as a front end to the Notes environment (see story page 14).

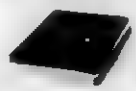
Waiting for return

But most Notes sites have yet to fully see their investment in Notes pay dividends, according to a study to be released next month by International Data Corp. in Framingham, Mass. (see chart page 14). That research indicates that the larger the Notes installation, the more difficult it is to recoup the investment. Previously, Lotus ex-

Notes, *page 14*

HP edges toward NT support

By Mark Halper and Jean S. Bozman


While Digital's Alpha is little endian, IBM's PowerPC and Mips are bi-endian.

Hewlett-Packard Co., the leading Unix vendor, is taking a large step toward supporting Microsoft Corp.'s Windows NT operating system on its workstations and minicomputers by altering the processor that powers those boxes.

The company last week said it is adding an Intel Corp.-type "little endian" byte-ordering scheme, in which bits are arranged in ascending order, to HP's descending "big endian" PA-RISC processor. As a result, the chip will become bi-endian.

While HP stopped short of saying it is porting NT to PA-RISC, the little endian addition eases the porting task by properly aligning the chip with the data structure in NT, according to Peter Rosenbladt, group research and development manager of HP's minicomputer and workstation business. By comparison, HP's PA-RISC port of NetWare, another Intel-oriented operating system, was tedious.

In the past, HP expressed only a lukewarm

HP, *page 12*

MAKING THE
MEXICAN CONNECTION
WHAT NAFTA DOESN'T SAY

Mexico is open, but that doesn't mean it's accessible. Restaurants, for example, have cellular phones so executives can bypass the regular phone system, which is poor in many areas.

Can you build a reasonable information technology infrastructure in Mexico? Yes, you can — but don't expect to solve problems the way you did here.

See Management, page 91.

NAFTA

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Utility sparks IS revamp to plug credibility gap

By Mitch Betts

■ The Tennessee Valley Authority last week reorganized an information systems department in deep trouble.

The radical restructuring is TVA's latest effort to turn around an IS department plagued by procurement scandals and viewed by the business units as a slow, unresponsive bureaucracy that is best avoided.

In fact, the IS department at the huge quasi-public electric utility has been losing business to "shadow IS groups" and outside contractors, TVA executives acknowledged. TVA's finance department, for example, turned to Coopers & Lybrand and Oracle Corp. for development of a major financial system because it lacked confidence in the IS department's ability to build the client/server system in a timely fashion.

Putting customer first

The overhaul is intended to make IS more responsive to the business units, restore that lost confidence and compete for business with outsiders, said William F. Malec, who oversees the IS department as TVA's executive vice president and chief financial officer.

Internal clients, such as the finance department, were dissatisfied that IS projects "were taking way the hell too long," Malec said. "I won't be authorizing any IS project that takes longer than nine

TVA, *page 16*

AT A GLANCE

TENNESSEE VALLEY AUTHORITY

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IS BUDGET:
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Now Imagine Letting NT Fly On Alpha AXP.

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December 13, 1993

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■ Today, more than 200 products and services can be categorized as "groupware." Despite all the hubbub around this technology, few organizations are using any type of groupware in production mode. *Page 101*

■ Before groupware, there was project management. Users closely rate Microsoft's Project for Windows and Symantec's Time Line. *Page 110*

■ Futurus Corp.'s Futurus Team Combo gets high marks for value, low marks for tech support. *Page 112*

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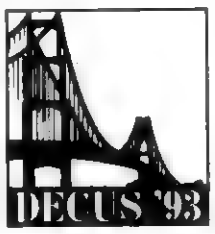

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■ The **backup storage industry** is becoming more open. *Page 49*

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■ Digital's **DECnet/OSI for OpenVMS** is available, but some analysts and users see limited demand for OSI. *Page 55*

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IN DEPTH

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■ Adjusting to support of **distributed systems** can be tough. Sometimes you'll find you're only a few steps ahead of the users. *Page 119*

MARKETPLACE

■ Don't judge **E-mail packages** just on current capabilities. Make sure you know the vendor's plans. *Page 128*

COMMENTARY

■ Opening up System 7 is a great idea but one that is probably too late to do much good, **Charles Babcock** writes. *Page 6*

■ Anyone who tries to sell a future without legacy systems is either dumb or dishonest, **Paul Gillin** writes. *Page 32*

■ Interactivity isn't just about media convergence, **Esther Dyson** says. It's about giving people the means to share information in new ways. *Page 33*

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Executive Briefing

Think hard about the way you divvy IS chores. Old organizational models may not work, particularly as you move to more distributed systems environments.

Division of IS personnel along business lines resulted in redundant and incompatible systems at the **Tennessee Valley Authority**. So as part of a general reform effort, the TVA is restructuring the IS organization into technical experts and "strategic consultants." The consultants will interact with business units to identify system opportunities but have a higher level and more unified view than is typical for IS personnel assigned to a specific unit. *Cover 1* Old functional divisions based on system expertise can also create problems these days, according to senior networking editor **Elisabeth Horwitt**. Trying to build new client/server systems with teams of specialists is counterproductive, she says. *Page 33*

Return on investment: It helps to know what you are trying to do. According to **Seth Pinsky**, IS manager at Sandoz Pharmaceutical and a committed user of **Notes**, a key reason why many Notes sites don't get the payback they expect is they treat the product as an E-mail extension in search of an application rather than as a set of distributed databases that require management. *Cover 1*

Smoke and mirrors? Healthy skepticism has grown up in the market of late. Many users and observers are taking an "I'll-believe-it-when-I-see-it" attitude toward the **Plug and Play Initiative**, endorsed by many top tier vendors as a way to make it easier for users to install and automatically configure a range of hardware and software products. Consultant **Mike Drips** expressed the mood in comments about a preview of **Microsoft**'s Chicago: "A lot of the plug-and-play stuff is still smoke. . . . Microsoft will try to sell everyone on it and hope they buy into it quickly." *Page 2*

Wireless developments: Data exchange with the office using cellular-based wireless data services is about to get easier as service providers **join hands around the modem pool**, swearing that they will all provide subscribers with access in the same way. This means users won't have to change scripts to send data to and from different regions. *Page 4* **Bell Atlantic** has announced that five cells and one switch in its Washington/Baltimore cellular network are now equipped with **Cellular Digital Packet Data (CDPD) service**. *Page 4* And the technology has gained an important convert. **Price Waterhouse CIO Sheldon Laube**, long a critic of wireless data transfer technology, has now committed to outfitting all the company's portable computer users with CDPD-capable systems. It's not the real answer, he says, "but it's the best we have for the next five years." *Page 4*

Startling statistics: According to software productivity expert Capers Jones, **cancelled software projects** accounted for a total dollar waste of $14.3 billion in 1993. *Page 116*

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Developers head for Chicago

Upcoming Windows 4.0 plug-and-play capabilities draw interest

By Ed Scannell

■ The starting gun on development for Microsoft Corp.'s much-anticipated Chicago — also known as Windows 4.0 — will be fired this week at the company's largest developers conference ever.

More than 5,000 developers will likely receive a high level of technical detail on Chicago and will hear about Windows NT Version 1.1 (see story at right) and Cairo, the company's object-oriented follow-up to Windows NT. Microsoft will have 200 hands-on systems for developers, with 70% of the machines running Chicago, to show off the 32-bit environment's power and ease of use.

Of particular interest to many developers and information systems managers are Chicago's plug-and-play aspects. They promise to make computer installation a much simpler task than it is today. But many users remain unclear about the immediate advantages for existing systems and the investment needed to take full advantage of the concept.

The plug-and-play initiative, backed by most of the industry's top-tier companies, is a specification that makes it easier for users to install and automatically configure a wide range of hardware and software products.

"A lot of the plug-and-play stuff is still smoke at this point. Until you start getting cards that have the plug-and-play ROM BIOS interface on it, there isn't much you can do," said Mike Drips, a consultant and Windows beta-tester in Tampa, Fla. "Microsoft will try to sell everyone on it and hope they buy into it quickly."

Drips and other users said the lack of hardware and applications, and/or their added expense, could force some users to hold off on buying Chicago.

At the same time, however, many observers said enough vendors will sign on to plug and play to put a large number of products on the market even before Chicago arrives in the fall.

Added features

Chicago's plug-and-play capabilities will not offer much help for IS managers with thousands of old-style products, but Microsoft said it will help them to at least diagnose many problems faster. Company officials also said the operating system's added speed and features, compared with 16-bit Windows 3.1, will sell it while plug-and-play compatible products dribble out to market.

"We are working closely with a lot of partners to create a 'no excuses standard,' which means making systems easy to modify through plug and play," said Brad Silverberg, vice president of Microsoft's Personal Systems group.

Not much more than NT

Besides having all 32-bit networking code, the second Chicago alpha, which was delivered to some beta users last week, has a few features that Windows NT does not have.

These include support for Microsoft's Telephone Applications Programming Interface and the company's color management scheme, which Silverberg describes as TrueType for colors. With it, users will be able to more accurately print out complex color schemes as they appear on-screen.

Despite this, Windows NT will remain a superset of Chicago, with these and other features added into a version of NT that will come out shortly after Chicago.

While the alpha version does not have the new document-centric interface Microsoft has been touting, developers can begin doing useful program development with it, according to Silverberg.

Focus on Win32

At this week's conference, the company will once again advise developers to focus on one application programming interface, namely Win32, to create applications that work with both Chicago and Windows NT [CW, Oct. 25].

While Microsoft will not kick off serious beta testing of the product until February or March, company officials still say they can deliver the 32-bit operating system by the fall of 1994.

Given its delivery record with Windows NT and the aggressive beta program that could include as many as 20,000 or more sites, Microsoft will have to struggle to meet its fall deadline.

"If a large-scale beta doesn't begin until February or March, it's difficult to see the product in retail stores by the end of 1994. I think the end of first-quarter 1995 is more real," said another beta user.

Oracle to aim small with planned low-end database

By Kim S. Nash

Oracle Corp. plans to disclose next month a slimmed-down version of the Oracle 7 relational database designed to cater to small workgroups of 10 or fewer users.

Oracle's Larry Ellison *said the LAN Server will be 'a one-button install'*

The product, dubbed Oracle LAN Server, is part of Oracle's effort to elbow into the low-end client/server market, said Chief Executive Officer Larry Ellison. Oracle LAN Server will require several megabytes less memory than Oracle 7, partly because it lacks heavy-duty features such as parallel query. The product will be shrink-wrapped and sold through Novell, Inc. resellers, Ellison said.

Oracle LAN Server, due to ship in the first quarter of next year, will be "a one-button install . . . that needs no database administrator," he said.

While Oracle LAN Server is bigger and more functional than a single-user database such as Microsoft Corp.'s Access or Borland International, Inc.'s Paradox, it is smaller and expected to be less expensive than OracleWare, Ellison said. The first incarnation of OracleWare — Oracle 7 bundled with NetWare 3.12 — is priced at $3,095 for a five-user version.

Filling a gap

Oracle LAN Server will be aimed at smaller and simpler departmental client/server setups than OracleWare.

Oracle LAN Server could fill a glaring gap in Oracle's line.

"They've needed to get into the small network or desktop area for quite a while," said Paul Cubbage, an analyst at Dataquest, Inc. in San Jose, Calif.

"It's all well and good to talk about massively parallel systems, but that's a small, small portion of the market," Cubbage said, referring to Ellison's goal of providing massively parallel databases to movie, phone and cable companies for use in information highway applications.

Operating systems

Microsoft outlines memory, speed upgrades for latest NT

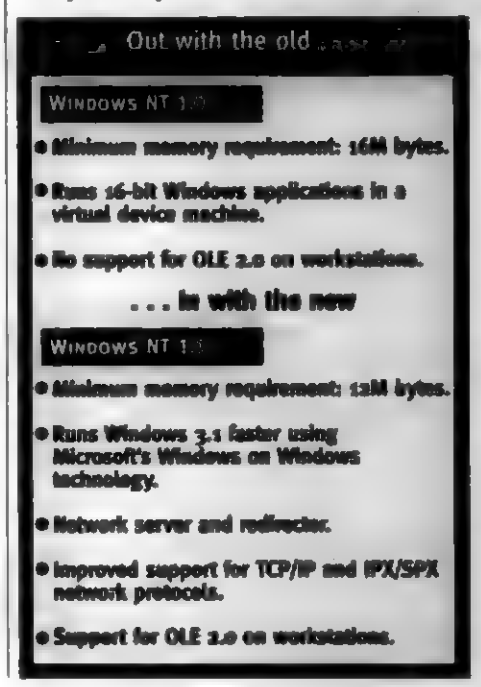
By Ed Scannell

SAN FRANCISCO

Microsoft Corp. will fix some of the deficiencies users have cited in Windows NT with an improved version that is speedier and requires less memory.

Code-named Daytona, Windows NT 1.1 lets users generally run their current hardware/software configurations with about 4M bytes less memory than what Release 1.0 requires.

"So if you need 20M bytes to run NT now, you'll need only 16. If you need 16 now, you'll only need 12 and so on," said Brad Silverberg, vice president of Microsoft's Personal Systems group, during an interview here.



Twice as fast

The new release, expected to enter beta testing next month, will be about twice as fast as the current version when running on a server, Silverberg said. He added that the company does not yet have definitive results for the improvements.

Other improvements include the ability to preemptively multitask 16-bit Windows applications in a virtual device machine, which quickens desktop processing. In the first version, Microsoft used its own technique, called Windows on Windows, which technically was not true preemptive multitasking.

Redirector addition

The new version will also have a Novell, Inc. NetWare redirector that allows a Windows NT Server to act as a gateway to NetWare to service multiple clients. That eliminates the need to have a NetWare redirector in each client.

The company has also added better TCP/IP support that essentially gives information systems departments more flexibility in either choosing the TCP/IP support already built into Windows NT or substituting another vendor's implementation.

A company spokesman said Microsoft expects to ship Version 1.1 in the first half of next year. Pricing has not been established.

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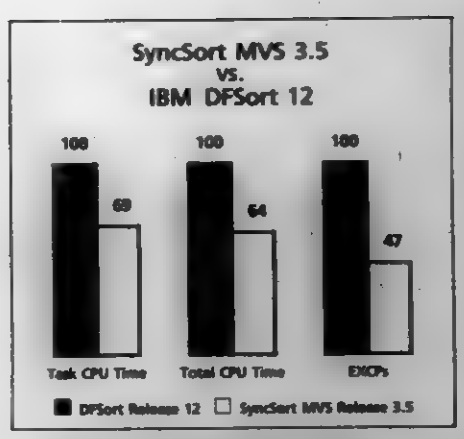

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AT&T launches Sonet links

By Joanie M. Wexler

AT&T last week filled in a big chunk of the nation's information superhighway when it served up the first interexchange Synchronous Optical Network (Sonet) service in the U.S.

The service will allow users to create dedicated links running at 155M bit/sec speeds among sites in about 200 U.S. cities. Early applications will likely include disaster recovery, supercomputer communications and state-sponsored distance learning programs, said Hemant Vaidya, AT&T's product line manager for Accunet High-Speed Services.

Sonet is a very high-speed international standard for a fiber-based transmission infrastructure. Imminent business applications that mix voice, data, video, graphics and images will soon require a Sonet foundation to carry Asynchronous Transfer Mode (ATM), frame relay and other high-speed network services that can transport this bandwidth-intensive traffic.

"The merging of voice, data and image into a single network has become a general business requirement," said Larry Gessini, president of the International Communications Association (ICA) user group and director of telecommunications at Agway, Inc., an agricultural cooperative in Syracuse, N.Y.

"Any major network effort that could support major applications and faster movement of information — hopefully at a lower cost — would be looked on very favorably" by the ICA, he said.

Meanwhile, corporations that offer network-based services are already eyeing AT&T's Sonet service. Comdisco Disaster Recovery Services, based in Rosemont, Ill., for example, just completed a trial of the AT&T dedicated-line service, called Accunet T155, among facilities in Illinois and New Jersey and will probably install the Sonet links, said John Sandberg, vice president of networking products and services.

Sandberg said Comdisco needs Sonet for two main reasons: to support the new high-speed network services its customers are migrating to (such as ATM) and to streamline its own operational efficiencies.

"This is the first technology with built-in interoperability among different vendors' equipment and using the same management structures" across heterogeneous devices, he explained.

Currently, in Comdisco's backup operations center the company must duplicate each customer's transmission switch of choice. With Sonet, Comdisco could whittle down the number of switches it supports because Sonet compatibility would allow the company to logically and physically partition a given device among several customers, Sandberg said.

The availability of long-distance Sonet links also moves the country a notch closer to Vice President Al Gore's vision of solving social and environmental problems and fostering economic growth through the use of information technology, said Ken McGee, vice president at Gartner Group, Inc.

Making music

Interexchange carriers Sprint Corp. and MCI Communications Co. have deployed some Sonet segments in their own backbones for aggregating customer traffic, and the seven regional Bell operating companies are in various stages of building Sonet "on-ramps" into the superhighway.

Future vision

"This is the first three-lane highway" in achieving those visions, McGee said. The Sonet service represents "the next generation of transmission hierarchy in America — the migration from the asynchrononous structure we've had for 30 years," he said.

Most companies will not need nationwide Sonet right away, though, as evidenced by the meager acceptance of T3 (45M bit/sec.) services, whose tariffs have remained too high to become mainstream. Vaidya said the Accunet T155 service will initially be tariffed on a customer-by-customer basis, and said he expects per-bit prices to be 10% to 15% higher than T3, provided customers use up the bandwidth.

Price Waterhouse to give CDPD a chance

By Michael Fitzgerald

Price Waterhouse has signed up to test Cellular Digital Packet Data (CDPD) early next year despite initial misgivings about the nascent wireless data transfer protocol. The Big 6 firm will begin tests of the technology via McCaw Cellular Communications, Inc.'s network in January or February next year, according to Sheldon Laube, Price Waterhouse's national director of information and technology.

Sheldon Laube: *CDPD is 'best we have'*

Price Waterhouse joins such companies as United Parcel Service, Inc. and American Airlines, Inc. in preparing CDPD pilots [CW, Nov. 22].

Depending on pricing, Price Waterhouse intends to outfit all of its portable computer users with CDPD-capable systems, in part by leveraging software expected from a recent McCaw/Lotus Development Corp. agreement to bring CDPD to Lotus' Notes [CW, Nov. 15].

"We intend to be there at the beginning" of CDPD use, Laube said.

Price Waterhouse's move to support CDPD is somewhat surprising since Laube has been harshly critical of wireless this year, saying it provides poor support for large data files [CW, June 28].

Apparently Laube has softened his attitude to some degree. CDPD "is not the real answer, but it's the best we have for the next five years," he said last week. Portable technology is particularly important to Price Waterhouse because the company's revenue comes from having its employees in the offices of other firms. Price Waterhouse is one of the most aggressive adopters of notebook computers — some 90% of its PC purchases are notebooks.

Where to plug in

Laube said wireless connectivity was a must for his users. "If [my people] are in your office and you have a Rolm or any other digital phone network, how can they plug in their modem? The benefit here is that I don't have to have a phone line to connect the computer," he said.

Laube said Price Waterhouse expects combination land-line/CDPD-capable modems to hit the market in 1994. The company will buy only this sort of modem as soon as it is feasible, Laube said. Currently, no CDPD modems are available, but several have been announced for availability in January.

Cellular modems pick up support

By Stephen P. Klett Jr.

WASHINGTON

Bell Atlantic Mobile last week said it will use Primary Access Corp.'s WireAccess cellular modem pooling software in its AirBridge Gateway service to provide cellular/land-line protocol conversion between remote data devices and host computers over its cellular networks.

"The gateway service will enable users to walk into any computer store, buy a cellular modem for their portable, and they're in business — without worrying about their land-line connection," said Benjamin L. Scott, executive vice president and chief operating officer at Bell Atlantic Mobile, the cellular subsidiary of Bell Atlantic Corp. in Bedminster, N.J.

Available now in Baltimore, Philadelphia and Washington, AirBridge Gateway will be offered in all Bell Atlantic markets by the end of next year, Scott said.

The announcement was made at Wireless Datacomm '93 here.

Cellular carriers Ameritech Cellular Services, Inc., GTE Mobilnet and Nynex Mobile Communications, Inc. have announced similar services using WireAccess.

"We've all agreed we're going to be compatible and will provide subscribers with access to the modem pool in the same way, which means users won't have to change scripts to send data from region to region," said Greg Oslan, director of wireless data at Ameritech in Chicago.

Analysts said the modem pool would help cellular technology move forward because it preserves users' investments by not requiring them to change the host computer's modem.

Bell Atlantic also announced that it has provided the first five cells and one switch in its Washington/Baltimore cellular network with Cellular Digital Packet Data service, using technology from AT&T. Called AirBridge Packet, it is also slated to be available to all Bell Atlantic markets by the end of next year.

Motorola moves

Wireless vendors' reaction to Motorola, Inc.'s recent announcement that it would charge license fees to companies deploying Cellular Digital Packet Data (CDPD) was low-key. Motorola has claimed some of its patents cover technology inherent in the CDPD spec, which became final in August.

A Motorola spokesman said the company raised the possibility of patent issues to the CDPD consortium in April, when the direction of the CDPD specification began to gel.

"I agree, essentially, with what Motorola is doing, and my sense is that it has no desire to slow down CDPD implementation," said Benjamin L. Scott, executive vice president and chief operating officer at Bell Atlantic Mobile. "The patent claims will not be a major factor in our CDPD plans."

Jeffrey Brown, vice president of sales and marketing at McCaw's Wireless Data division, said, "Motorola has said it will be reasonable with terms and besides, look at who their biggest customers are: the group of carriers that form the CDPD consortium. I don't think they'd want to upset us."

It is unclear at this time, however, what the cost of CDPD licensing will be to equipment vendors and their customers. Motorola is striking individual licensing deals with each supplier, rather than charging a fixed percentage of the equipment cost, a Motorola spokesman said. — *CW staff*

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Apple already missed its best 'open' shot

Apple has decided to open up its Macintosh operating system as a way of broadening its appeal and generating a larger community of third-party developers. This is a good move but about a decade too late.

If Apple had responded quickly to the implications of the IBM PC's success, it would have fielded the Macintosh as a volume contender for the business desktops when the market was burgeoning. But Apple's roots, its individualistic culture and its persistent interest in high margins didn't allow it to do that.

Now it's raising its hand from the back of the room to say, "Me, too," on the open systems front. It's too little too late, although there's a smidgen of hope that Apple will get a second chance, compliments of the PowerPC microprocessor.

Instead of learning its lessons from the IBM PC, Apple has until now seemed to follow the example of Digital, another company so dominated by its founder that events nearly passed it by before it could respond.

Opening up the Macintosh operating system is a good idea, but one that came much too late.

Charles Babcock

For many years, Digital sold computers that were progressively more open. Its software developers paid keen attention to industry standards, and each generation of hardware was more programmable in the language of the user's choice. The process ended in Alpha, a crowning achievement in open hardware design.

But the decisive step may have come too late. For much of its history, Digital was an open systems vendor only insofar as it was more open than IBM. Digital zigzagged toward an open systems strategy, but it fell short of committing to one. Indeed, it became increasingly hard for Digital's leadership to accept Unix as an "open system."

Then one day it woke up to find an upstart, Sun Microsystems, using Unix to do to Digital what it had been doing to IBM — posing as the more open vendor. (At one time, Sun sold 75% of its workstations to Digital customers, according to brokerage house Sanford Bernstein & Co.'s analysis.)

Now it is Apple's turn to belatedly lurch toward an open systems strategy. Its AppleSoft Division will make System 7 available to other PowerPC vendors to produce clones.

But instead of producing a vibrant community of Compaqs or Dells delivering Macintosh look-alikes, it is more likely to yield an asthmatic set of knockoffs, coughing and wheezing their way into a few protected niches.

The best way to create a vibrant clone community is for the originating vendor and cloners to compete on near-equal footing, trying to outdo one another in coming up with customer choices. The sooner the clones make their entry, the better. This proliferation occurred with the IBM PC because no single vendor controlled all the parts, and Microsoft was willing to sell MS-DOS to all comers.

A variety of hardware suppliers sprang up, the number of application developers multiplied, and Microsoft, to its credit, recognized them as resources that could be cultivated to expand the market.

Expecting the same thing to happen with System 7 at this late date is problematic. Apple may want it to happen, but much of the fertile ground that might foster it has been closed off. The Apple customer has been trained for 16 years to think that only Apple can deliver the hardware, and customer loyalty at this point will test the staying power of clone start-ups. Apple has also been rapidly lowering the price of the Macintosh, leaving less room for newcomers to maneuver on price/performance appeal.

The possibility that intrigues me is that of Apple and IBM teaming up to offer System 7 and something else — Taligent? AIX? OS/2? — on a single PowerPC platform, increasing the stakes by creating a more open system than any single PC that has gone before it.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

IBM, Novell team up on CICS

By Elisabeth Horwitt

Continuing efforts to promote its CICS transaction processing environment in the client/server arena, IBM last week said it is codeveloping with Novell, Inc. software that will enable NetWare clients to access and update remote CICS hosts.

Novell and IBM plan to ship by the second half of next year a CICS client implementation on the NetWare requestor.

This will permit users to develop applications that are automatically sent out over the NetWare client-to-server link and across the NetWare for SAA gateway to access resources and applications on a CICS Enterprise Systems Architecture or MVS host, said Olwyn Spencer, an IBM Transaction Systems business area manager.

Managers at two companies said such a product might well halt, or at least slow, their migration off CICS hosts and onto client/server platforms.

What such a product should provide is a front end to make it easy to access mainframe resources and integrate them with existing client/server applications, said Donald Sternfield, director of information systems at Morgan, Lewis & Bockius, a Philadelphia law firm. "If we had that, why not stay on the mainframe? It's the most reliable equipment I've got."

"We are moving very rapidly toward client/server solutions and away from CICS because of our limited ability to use CICS in a client/server environment," agreed Gary Robinson, technology consultant at Saif Insurance Co. in Salem, Ore.

One-stop shopping

A key advantage of the IBM/Novell project is that users will be able to use a single client requestor and protocol stack to access both NetWare and IBM hosts, said David Passmore, a principal at Gartner Group, Inc. in Stamford, Conn.

Indeed, IBM plans to provide NetWare client access to its available CICS OS/2 implementation as well as to the AS/400, VSE and AIX versions of CICS scheduled to roll out next year, Spencer said.

Pricing for the CICS NetWare client was not available.

Networking

IBM explains product direction

By Joanie M. Wexler

NEW YORK

Members of the recently reorganized IBM Networking Systems group donned their new hats last week and disclosed additional deployment and pricing details about IBM product plans with Asynchronous Transfer Mode (ATM), wireless, internetworking and other offerings.

•**ATM:** IBM's 100M bit/sec. server adapter slated to roll out in the first quarter of next year [CW, July 19] will cost roughly $3,000. IBM's 25M bit/sec. workstation adapters, due in mid-1994, will be priced at about $1,000, dropping to "less than $500 over time, but not in 1994," said Don Haile, general manager of IBM's newly formed Networking Software Division.

Adapters running the 155M bit/sec. ATM speeds should ship in 1995, he said.

The ship date of IBM's Transport Network Node (TNN) wide-area ATM switch has moved up from late 1994 to mid-1994. The TNN, now in beta-testing at IBM and Sears, Roebuck and Co.'s jointly owned Advantis value-added network, is expected to cost about $500 per port.

•**Network management:** On the ATM side, a NetView/6000-based application will show with one set of user commands an integrated topology view of the TNN, Network Equipment Technologies, Inc. IDNX T1 multiplexers, which IBM resells, wiring hubs and routers, said William E. Warner, vice president of enterprise management.

The company also plans next year to get into NetView Distribution Manager/6000-based software distribution on non-IBM platforms, such as Novell, Inc.'s NetWare, he said. Warner predicted NetWare support by midyear.

IBM's strategy for getting its network management applications onto other vendors' Unix-based management platforms is to make its SNA-oriented NetView enterprise management system available for those platforms, then run NetView applications there, as opposed to porting applications directly to those platforms, Warner explained.

While some analysts questioned whether this might be a shortsighted tactic because users might be turned off by possible dual investments, others called it a smart strategy.

"They are being smart about the development investment," said Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif. "They'll just build a gateway for the platform" and the applications will automatically port over. But the approach means the user will have to buy a NetView gateway or the vendor will have to buy it and bundle it with its product.

•**LANs:** IBM is working with an unnamed partner on a Token Ring switch — which dedicates a Token Ring LAN's full 16M bit/sec. bandwidth to one or a few resources — slated to ship next year, Haile said. IBM executives, however, did not specify how they would advise customers on choosing among high-speed LAN alternatives such as the dedicated Token Ring, ATM and 100M bit/sec. Ethernet/Token Ring LANs under construction in the standards bodies.

IBM also said it will provide NDIS3 driver support on its adapters for Microsoft Corp.'s Windows NT compatibility next year. "We are looking at whether our key software, such as DB2, should run on NT," Haile said.

•**Wireless:** IBM intends to ship in March or April LAN adapters for portables that interface both to Cellular Digital Packet Data and Ardis wireless networks, said Jim Boyle, vice president of wide-area networking.

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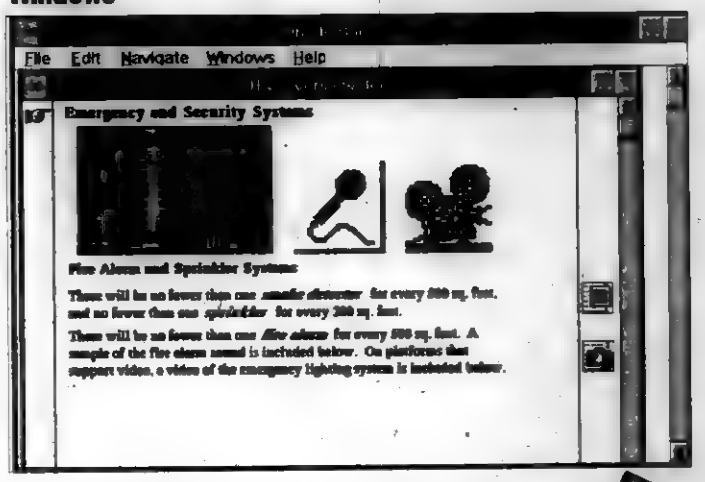
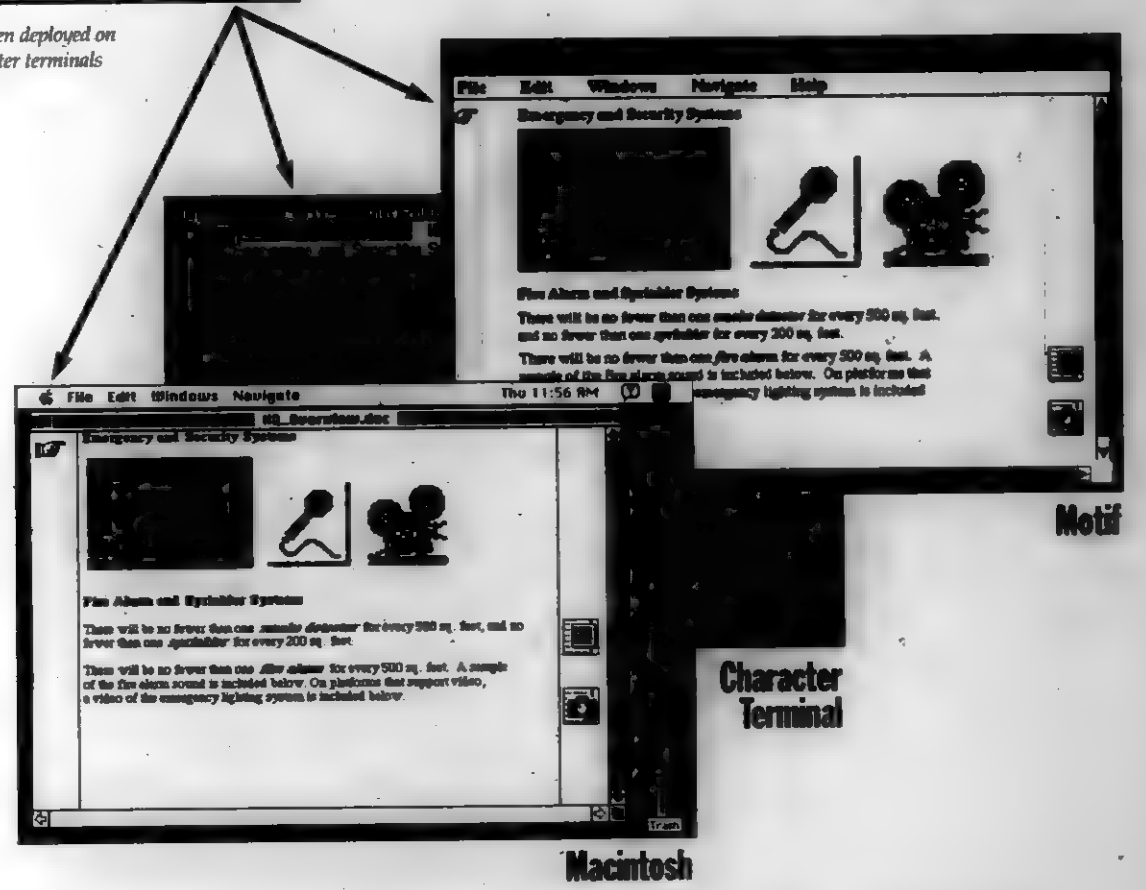
Windows

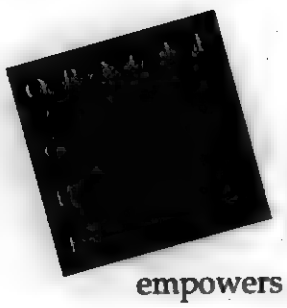


This application was designed in Windows, then deployed on Windows, Motif, Macintosh, and even Character terminals without any programming.

"CDE's portability has been a great advantage to us, having developed the original system on UNIX we were able to port with no additional code to Microsoft Windows. It also allows us to offer the system to a much wider user base than if it had been available for only one of these environments."

Chris Nicholls
Manager IS Dev.
British Telecom, UK





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News Shorts

Word for NT to be showcased

At its Win32 Professional Developer's Conference this week, **Microsoft Corp.** will preview a 32-bit version of Word 6.0 for Windows NT that takes advantage of the client/server operating system's features. The new version allows multiple users logging on separately to a Windows NT network server to be granted access automatically to those documents based on their user names and designated privileges. Version 6.0 for NT also accommodates long files names intended to make documents easier to manage.

Acer plans server intro

Acer America Corp. in San Jose, Calif., consolidated its AcerFrame and AcerAltos server lines, which will now be sold solely under the AcerAltos name. Acer will unveil today the first additions to the AcerAltos family: the entry-level 700, the midrange 7000 and the quad-Pentium 17000.

Network General agrees to buy ProTools

LAN analysis tool vendor **Network General Corp.** in Menlo Park, Calif., last week signed an agreement to purchase privately held **ProTools, Inc.** in Beaverton, Ore. The purchase, scheduled to be finalized by the end of January, is intended to enable Network General to meet long-standing customer demands for lower-cost distributed LAN management capabilities and integration of Network General's Sniffer products with leading network management platforms.

Data at greater risk

Is corporate data more secure than it used to be? Not according to a survey released last week at the **Computer Security Institute Conference**. Approximately 80 of the 100 computer security managers surveyed said they believe corporate America faces a greater security risk today than a year ago, with the greatest threats being hackers and disgruntled ex-employees. Sixty managers said their information security budget is inadequate to meet the challenges of the next 12 months.

Legent offers data movers

Legent Corp. in Herndon, Va., last week introduced Legacy Data Mover, a family of software products for moving large volumes of mainframe-based data to a server through a four-step process of data extraction, data conversion, data transport and data application. The products will be available in the first quarter of next year.

The Hartford trims staff

ITT Hartford Life Cos. eliminated the six-person corporate information systems staff reporting to Chief Information Officer Leo Heile when it laid off 1,000 employees in October. The staff helped Heile run IS councils, negotiate contracts with vendors and coordinate major information technology projects among The Hartford's companies, which include Sheraton Hotels and Hartford Insurance. Besides Heile, a 26-person local support staff is the only IS staff in the company's New York headquarters.

SHORT TAKES **Hewlett-Packard Co.** endorsed **Novell, Inc.**'s UnixWare as a platform to enable computers based on **Intel Corp.** architectures to be clients of HP/UX PA-RISC servers. . . . Novell has reduced the cost of upgrading NetWare v3.11 to a same-user-count NetWare 3.12 by as much as 50%. . . . **Southland Corp.** signed agreements with **NCR Corp.**, **Electronic Data Systems Corp.** and **Cassmax Retail Systems, Inc.** to implement a comprehensive retail automation system for 5,600 7-Eleven convenience stores.

Digital plans customer service fixes

Targets contract administration and telephone support

By Craig Stedman
SAN FRANCISCO

Digital Equipment Corp.'s customer service unit last week laid out a plan to improve its telephone support and handling of contract administration, two areas that have drawn user criticism. However, the company said the full effect of the changes will not be felt until 1995.

The promised service changes are part of a wider overhaul of Digital's business practices and internal information systems that senior management approved late last month. The re-engineering will also touch on areas such as order processing and billing, company executives indicated.

While Digital said there is hope that some improvements will become evident by next summer, the key part of the service plan — integration of separate databases for contract administration, call handling and service dispatch — is not scheduled to be implemented until April 1995 at the earliest.

At your service?

Digital is trying to resolve contract administration problems. Some examples include the following:

Problems
Slow response on contract renewals and changes.
Inaccurate information on contracts.
Users routed to multiple offices for approvals.
Slow updating of service call information.

Planned actions
Eliminate need to enter invoices in multiple databases.
Implement one 360-person staff for handling contracts.
Simplify and reduce size of contracts and invoices.
Link local office and telephone support center databases.
Offer continuous service and payments to reduce renewal process.
Eliminate need to enter data more than once for multilocation customers.
Integrate key functional databases.

"This is not a quick-change process," said Phil Pietrowski, Digital's business operations manager for multivendor customer services. Especially in the area of contract administration, Pietrowski added, the firm is trying to fix a situation "that we understand is broken."

No choice but change

Attendees of the Digital Equipment Computer Users Society (DECUS) conference here made it clear that changes are necessary. Robert Koskovich, information services manager at EDM Supplies, Inc. in Downey, Calif., said the mechanics of renewing and altering Digital service contracts "have been a nightmare."

"Digital is finally waking up and smelling the coffee," added Steven Tihor, assistant research scientist at New York University. He said it can take up to five months to renew the school's annual maintenance contract because of Digital's inability to quickly reconcile information from its various databases.

A system manager for a government operation in Colorado, who asked not to be identified, said his 1993 service contract was just recently finalized. "And it's still only close to what it should be," he said. "There are some things that we don't have anymore that we're paying for service on and vice versa."

"It's a classic legacy systems problem," said Bill Mayhew, president of the Village Systems Workshop, Inc. in Natick, Mass., and chairman of DECUS' business practices service group. Digital's need to manually load information from one database to another is also labor-intensive, leading to higher costs, he noted.

Dave Beresford, U.S. customer administration manager at Digital, acknowledged that systems shortcomings contribute to poor responsiveness, inaccurate contracts and late updates to service delivery information.

Digital has already integrated some of its overseas service databases, but Beresford said the April 1995 date for completing the U.S. project is only a target at this point and might have to be extended.

At the same time it is joining its databases, Digital plans to migrate its customer administration operations from terminal-based VAX systems to Alpha AXP machines running in client/server mode, Beresford said. Order processing and manufacturing scheduling will also be revamped then.

In the short term, Digital plans a series of lower-level contract administration changes to provide users with some relief by next July or so. Included will be smaller contracts; an offer of continuous service and payments to cut out the renewal process; and the elimination of the need for duplicate data entry for large multisite customers.

Users said the 1995 date for completing the IS overhaul would not likely be a major problem, as long as Digital can make some intermediate improvements. "1995 is a long time to wait, but it's a big octopus they're wrestling with," Koskovich said.

The company also indicated that it now plans to measure the performance of phone workers based more on customer satisfaction than on the number of calls closed. This shift is supposed to be phased in over the next few months, along with an increase in the number of high-level service engineers available to take calls, Digital executives said.

The previous approach led some users to complain that they were being rushed to make the call quota, according to Mayhew.

All shook up

The DECUS board last week stepped up the pace of the U.S. chapter's reorganization, approving a plan that cuts funding from all local user and special interest groups and shifts more business responsibilities to the unit's professional staff.

While the reorganization of the 32-year-old user group has been in the works since February, the board accelerated its implementation in the face of a deficit that DECUS sources said could approach $800,000 for the first half of the chapter's fiscal year, which ends this month. "We didn't want to slip into a position of cash-flow difficulties," said Margaret Knox, U.S. chapter president.

A "token" membership fee, yet to be finalized, is also being added. And local user groups are being moved "to more of a peer relationship" with DECUS, in which they would be responsible for their own activities and finances, Knox noted.

—Craig Stedman

A picture is worth a ~~thousand~~ 25,000 lines of code.

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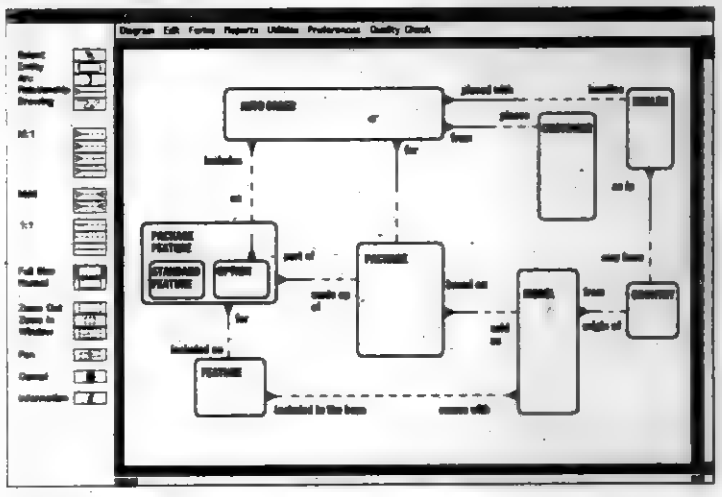

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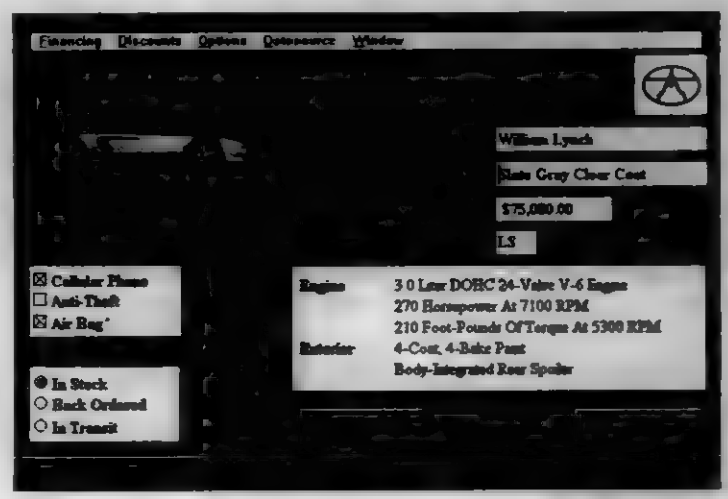

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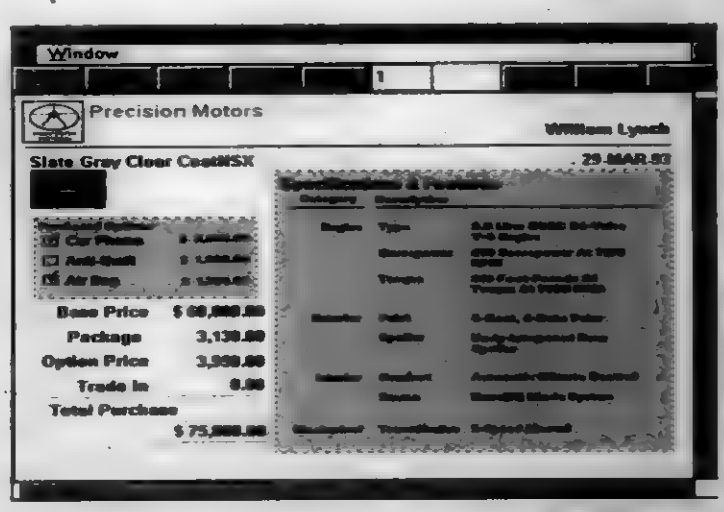

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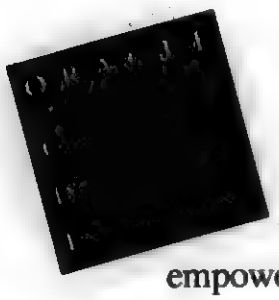

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Former Kodak IS director to head global plastics company

By Joseph Maglitta

Katherine M. Hudson, a former information systems director who became Eastman Kodak Co.'s top female business executive, has been named president and chief executive of a $243 million international plastics manufacturing company.

Hudson, 46, is ending a 24-year career at the Rochester, N.Y., giant to head up W. H. Brady, a diversified Milwaukee-based maker of coated film and industrial products, effective Jan. 1.

Hudson said she hopes to leverage her IS experience into global expansion and value-creating growth at Brady, an 80-year-old company that manufactures 20,000 different products.

Hudson said she is "very impressed" with Brady's centralized, AS/400-based operation and expects that a number of pilot re-engineering programs will be expanded. She declined to be more specific.

"Brady has used a good selection of external packages that are keeping [software] development costs and staff down," she said. "They are a decentralized company providing a source of standard technology that can then be used by the divisions. [That] was something I was working on forever when I was at Kodak."

Katherine M. Hudson *will head $243 million plastics firm*

Joyce Rave

As for how involved she plans to be in the firm's technology planning, Hudson said, "In general, I'm a hands-off type of manager."

However, she added that she expects Administrative Vice President Tom Turner, who now oversees IS, to play an important role in corporate decision-making. "Anybody who has lived through an IS position knows that, clearly, the IS function should have a role at the strategy development table," Hudson said.

Ideal background

Hudson said she views her new post as evidence that IS is a good background for corporate advancement.

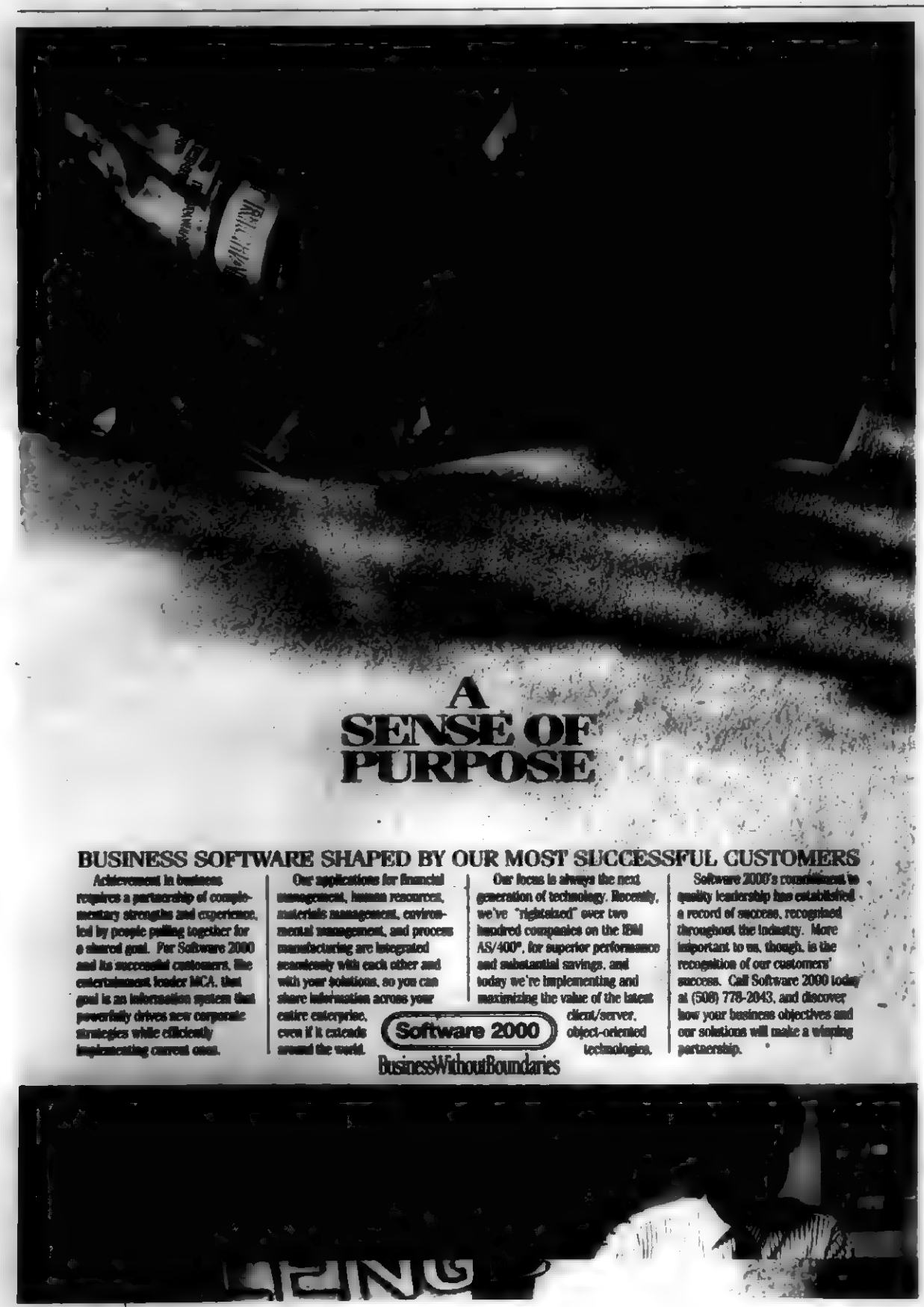
"CEOs of the future are going to have a significant amount of multifunctional, cross-functional background," she said. "That's something that you learn in IS because systems supports the whole enterprise."

But don't get too excited, cautioned Nancy Wendt, an IS consultant in Greensboro, N.C. Chief information officers "are at a tough juncture," Wendt said. "They're at the survival point. It's not the time to worry about where to go after IS."

Hudson gained international attention for arranging the 1989 landmark outsourcing deals between Kodak and IBM, Digital Equipment Corp. and Businessland, Inc. Most recently, Hudson served as vice president and general manager at Kodak's professional printing and publishing imaging division. She worked in finance, legal, public affairs, investor relations and general management before being named head of a new corporate IS group in 1987. In that role, Hudson oversaw 3,000 employees and a $500 million annual budget.

Albert F. Turner, an analyst who follows Kodak for Duff & Phelps in Chicago, said that although Hudson played a large role, her departure was unlikely to disrupt business too greatly.

"Eastman Kodak has a lot of soldiers ready to fill the ranks," he noted. "They are not going to have any difficulty in filling this position."



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Apple tries to fire up Newton developers

By James Daly
SANTA CLARA, CALIF.

Four months after Apple Computer, Inc. launched the Newton personal digital assistant, the company last week gathered more than 1,000 developers interested in crafting applications for the product line and bluntly said the machine's success or failure rests squarely on their shoulders.

"This industry is based on content," President Michael Spindler said at the Newton Platform Development Conference. "We need your applications to foster the communication that Newton is all about."

Spindler acknowledged that the Newton MessagePad, the line's first product, has been hit with critical barbs since its introduction at this summer's Macworld Exposition.

He compared its rocky reception to the early days of television, when the technology was awkward and incomplete and gave no hint of the immense societal changes to come.

To make Newton appealing to corporate America, analysts said, Apple needs to fill critical gaps, including a software developer's kit that is still in beta testing and the lack of two-way paging capabilities.

"It's hard for companies to commit when the pieces aren't all in place," said Pieter Hartsook, editor of "The Hartsook Letter," a Macintosh-specific newsletter in Alameda, Calif.

Source: "The Hartsook Letter," Alameda, Calif.

That discrepancy is going to make the Newton a tough early sell to the "business professional," whom Gaston Bastiaens, vice president of Apple's Personal Interactive Electronics Division, said represents the Newton's target market.

Hartsook said he expects most of the key components — including full delivery of connectivity components — to be available within six months.

Until those pieces are in place, some Macintosh fans will look on the Newton as a fascinating piece of technology but not a critical business tool.

"If they start improving their digital and cellular communications capabilities, then they may have something really appealing and we'll give it a harder look," said Dr. Warren Young, director of neuropharmacology computing at the Scripps Research Institute in La Jolla, Calif. Young has considered outfitting nurses and doctors with the Newton.

Budget constraints

The MessagePad's success will hinge on Apple's ability to convince users that they cannot live without its "anytime, anywhere" capabilities. That could be a tough sell in a land where corporate information systems budgets have tightened considerably in the past two years.

"I'm more interested in putting full-fledged workstations on desks than getting the Newton in the hands of users," said Dr. Steven Erde, director of academic computing at Cornell University Medical College in New York.

The upcoming enhancements are great, some users said, but Apple still needs to work on some of the basics.

"It's still agonizingly slow," said Bruce Gordon, a designer at Walt Disney Imagineering in Glendale, Calif. Gordon then spent two minutes trying to beam his business card from his Newton to another Newton user about 2 feet away. After several unsuccesful attempts, some shrugs and a smirk that hinted he has done this before, he reached into his wallet and pulled out a traditional paper business card.

Follow the script

Also still troubling is the lack of a final software developer's kit. The Newton operating system, called Newton Intelligence, demands that independent software vendors develop applications from scratch using the Newton Toolkit. The Toolkit has its own object-oriented programming language, called NewtonScript, that enables developers to program functionality as a series of reusable objects.

Developers said the beta developer's kit works fine for developing applications, but the lack of a final version could cause corporate users to hesitate. The delay in making a kit available represents the classic conundrum when attempting to establish a new operating system platform: Users will buy it only if a wide range of applications are available, but software vendors will develop applications only if there is a large installed base of users.

While only about 10 applications are now for sale for the Newton, 30 others are nearing release. Apple officials said about 2,000 developers are active in Newton development. That is an impressive number for a device with an estimated installed base of less than 100,000.

"It took Hewlett-Packard two years and 325,000 palmtops to interest that many developers," said Jeffrey Henning, a senior industry analyst at BIS Strategic Decisions in Norwell, Mass.

Spindler said the company had shipped 50,000 Newtons by the end of the September, but he said he would not release recent sales figures until after the first of the year. "We're pretty satisfied with sales," he noted.

Consultants say Microsoft may one-up Apple in POAs. See column page 46.

Next Newton

Apple analysts said they expect to see several additions to the Newton product line next year, including the following:

- **The NotePhone from Rolm Corp., which is a standard analog phone with a docking station for a MessagePad. Expected price: $900 to $1,000. Shipment: June.**
- **A larger and heavier model (9 by 10 in. and weighing about 3 pounds) geared toward vertical applications such as data collection tasks within a company. Expected price: $800 to $1,000. Shipment: June.**
- **A slim MessagePad powered by four AA batteries. Price: $500 to $600. Shipment: first half of 1994.**

—James Daly

HP support for NT

CONTINUED FROM COVER 1

NT commitment above the PC level. The company now appears to be hedging its bets, positioning itself in the event that NT catches on in the workstation and minicomputer markets, analysts said. Interest in NT by PA-RISC licensees is also forcing HP's hand.

"We cannot ignore the existence of NT or its gradual evolution, nor can our partners," Rosenbladt said.

"NT has a strong history with the Intel environment and therefore requires this [little endian] type of architecture," he continued. "Today, it is prudent to develop microprocessors that can do both" byte-ordering schemes.

Rosenbladt noted, however, that Microsoft is not working with HP on the byte-ordering project.

HP's forthcoming "bi-endian" design will continue to support software written for PA-RISC machines while easing support for software written for NT and other Intel-associated operating systems.

Industry analysts agreed that HP anticipates a shift in the workstation market once rivals Sun Microsystems, Inc. and IBM field workstations that run NT next year. Digital Equipment Corp. and workstation start-up Netpower, Inc. already sell NT RISC machines; they were designed around Alpha and Mips Technologies, Inc. RISC chips, respectively.

Live demonstration

Linley Gwennap, editor of the "Microprocessor Report" in Sebastopol, Calif., said HP gave a back-room demonstration last month at Comdex/Fall '93 of a workstation running NT software using a bi-endian, trimmed-down version of PA-RISC, called PA-RISC 7100LC.

But the LC, or "low-cost," version will not appear in HP's multiuser systems because it runs at a maximum of 75 MHz, well below the 90-MHz speeds HP uses widely today in its minicomputers, HP said.

On the plus performance side, however, HP will use a 48-bit design on the LC chip, compared with the 32-bit design on today's PA-RISC, the company said.

"The LC is suited to desktop systems but not really designed for larger systems," Gwennap said. "It has a smaller cache and doesn't have the same performance as the high-end chips. But the implication is in the future, they could put it on a PA-RISC server."

Users and analysts noted that the bi-endian development gives HP a nearly ready-to-go entree into the NT market with its workstations and minicomputers and that HP will complete a port when NT takes hold in those markets.

"NT is not taking the workstation market by storm," said Bill Bluestein, director of Computing Strategy Research at Forrester Research, Inc. in Cambridge, Mass. "NT will probably build up a core of application support in that area, but it's certainly not the case now. I think HP wants to be ready."

Analysts further noted that the 7100LC chip should gain HP entrance into the low-end workstation market, where it does not have a sub-$5,000 offering to compete against boxes from Digital, IBM, Silicon Graphics, Inc. and Sun.

On the workstation and minicomputer levels, "HP is probably hedging their bets," said Sam Ellis, associate vice president of information services at Portland Community College in Portland, Ore. "But they're not going to bet their corporate farm on it."

Ellis, whose HP equipment includes a large Unix version of HP's mainframe alternative Corporate Business System, said NT is a long way from his own multiuser plans.

"This is a bid for market share by HP, but they're not turning their back on their current user base," said Eric Fisher, principal at Fisher Systems Consulting in Groton, Mass.

Fisher further pointed out that the bi-endian design opens the way for supporting other Intel-associated operating systems. "That includes OS/2, Chicago, Cairo — all of those things," Fisher said. "And if you really want to hold your nose, it includes DOS."

Users are both concerned and excited about HP's post-RISC era. See story page 72.

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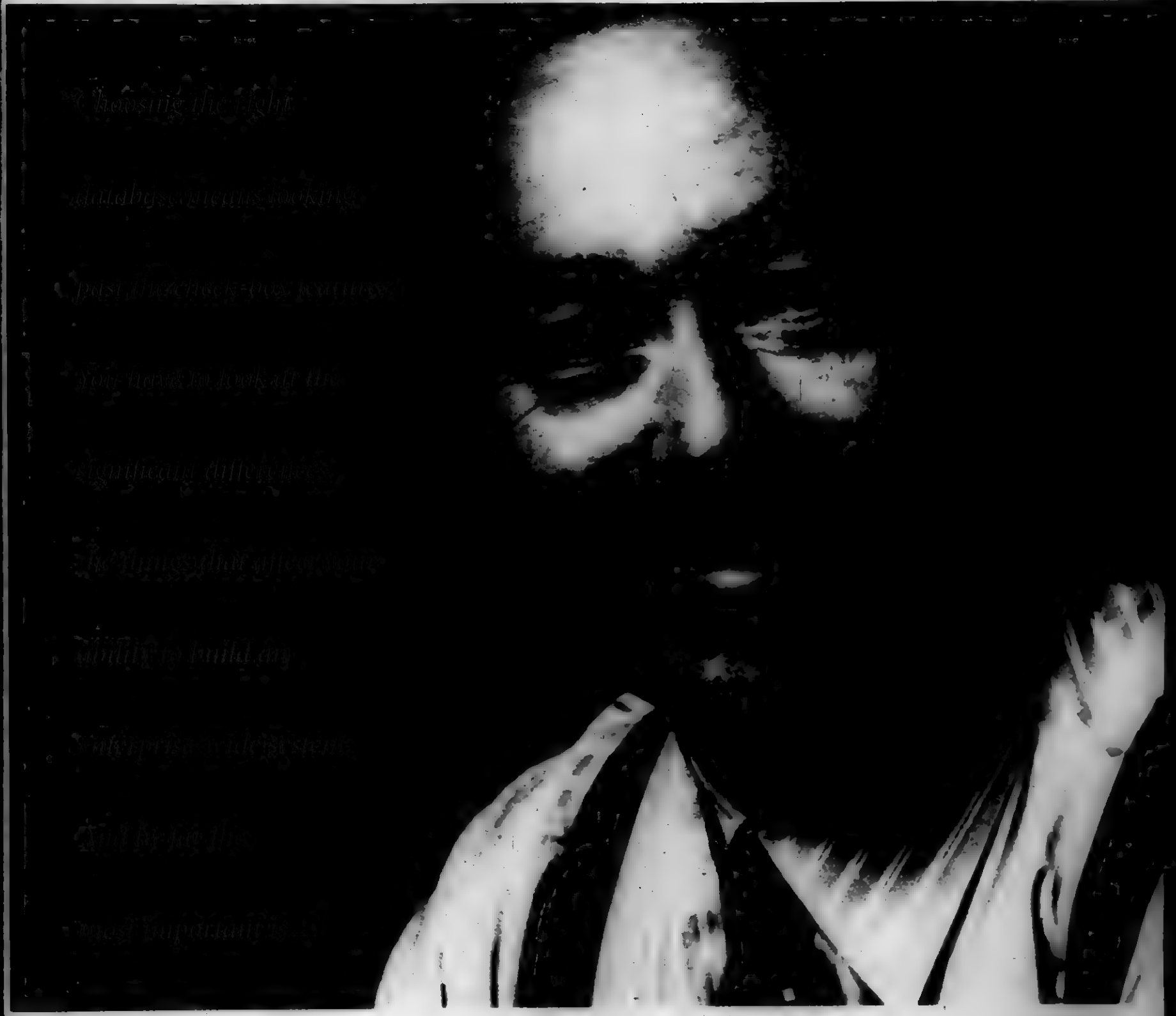

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SmartSuite to get Notes

Competition with Microsoft's Office 4.0 cited in Lotus decision

By Michael Vizard

After much in-house debate, Lotus Development Corp. is preparing to deliver in the first half of next year a shrink-wrapped edition of SmartSuite that includes Notes, according to Lotus Executive Vice President Bob Weiler.

Lotus' decision to include Notes as part of the suite is being driven by its need to provide a highly integrated suite of applications to compete with Microsoft Corp.'s Office 4.0. Microsoft is expected to deliver all the major elements of Office 4.0, which supports Version 2.0 of its Object Linking and Embedding (OLE) interface, by the end of the year.

"We standardized on Microsoft Office before we got Notes. But given the direction of Notes and SmartSuite, we're starting to wonder if we made the right decision or not," said Bill Woods, an information systems manager at Smithkline Beecham Corp. in Philadelphia.

Previously, Lotus bundled Notes with SmartSuite only to selected high-end IS shops. Some Lotus marketing executives said as recently as three weeks ago that bundling distributed database technology within a PC application suite would not make sense.

But Lotus is now looking to broaden its edge in the area of collaborative computing by pushing Notes through higher-volume reseller channels.

Weiler said IS shops should not expect Lotus to deliver a massive price break for sites opting to purchase a SmartSuite edition that includes Notes.

According to Weiler, Lotus does not feel compelled to lower Notes pricing to generate higher volumes because it believes its rivals do not have comparable offerings. Lotus positions Notes as an environment in which users will live as they access documents created in word processors, spreadsheets, presentation graphics packages and other applications.

Notes resellers have been lobbying Lotus to adopt a client/server pricing model that mirrors the one most SQL database companies employ. That model would price Notes clients lower than Notes servers, thereby boosting volume. Currently, a Notes license costs $495 and can be used as either a client or a server.

Weiler maintained that current volumes do not seem to support that model in terms of guaranteeing a profit for Lotus.

Messaging groupware

Meanwhile, Microsoft is working to deliver a groupware offering around its forthcoming Electronic Messaging Server (EMS) running on top of SQL Server on Windows NT. But that offering will serve only to extend Microsoft's electronic-mail capabilities, as opposed to competing with the Notes multiplatform distributed database services, said Mark Tebbe, president of Lante Corp., a reseller of Notes and Microsoft products based in Chicago. And Lotus is working to counter EMS with a client/server edition of CC:Mail.

However, some resellers said changing technology may force Lotus to ultimately concede the Notes pricing issue. As applications that use distributed technologies such as OLE 2.0 come to market in 1995, PC applications should be able to directly access Notes servers without requiring a local Notes client, said Robert Davis, a director at New Information Paradigms Ltd. in the UK.

Reporter's Notebook

Although Lotusphere attracted a veritable Who's Who of attendees from Fortune 1,000 companies, even Lotus' best efforts couldn't keep a Notes forum up and running smoothly for four days.

The Notes server used by attendees at the show crashed for an extended period at least once, had to be rebooted several times, was subject to sluggish performance and at one point fell victim to a virus sent over electronic mail that crashed every Notes session on the network.

One of the reasons Lotus has had trouble maintaining a consistent level of Notes support may actually lie in the prices it charges for consulting. Because Lotus consultants typically get paid about $100 per hour, the more knowledgeable ones discover they can venture out on their own and charge considerably less than Lotus.

Two of the larger vendors to join the Notes bandwagon last week were Wang Laboratories and, as expected, Powersoft. Close to three quarters of Powersoft's installed base has Notes installed, said Bill Critch, Powersoft director of business alliances.

Edge Research, a start-up founded by Mark Klein in Portsmouth, N.H., who also founded Channel Computing, has developed a highly polished alternative application programming interface for Notes. The company's first offering is a tool for linking Visual Basic applications to Notes, which Edge Research will give away to customers. However, Edge Research will charge for support calls.

Notes

CONTINUED FROM COVER 1

ecutives had claimed that the return on investment (ROI) for Notes was as high as 400%, based on results from eight companies that installed Notes for one year.

"The big bang for the buck in terms of ROI comes from companies with relatively small investments. The return tends to moderate at the larger companies," said Scott McCready, an industry analyst at IDC.

Despite the long lead time to recoup the investment, however, corporate buyers are still lining up to buy Notes. "Purchase plans still exceed hundreds of thousands of copies," McCready said.

Process re-engineering

In fact, many information systems executives said traditional ROI models do not really apply to Notes. "Notes requires a three- to five-year commitment, and the only measure that really matters is changing the business," said Seth Pinsky, an IS manager at Sandoz Pharmaceutical in East Hanover, N.J. "You need to focus your efforts on one or two applications that will change the business cycle."

Pinsky said many Notes installations fail to achieve specific ROI targets for Notes because their implementation goals are too vague for what is essentially a set of 1G-byte distributed databases. Instead, many sites approach Notes like an extension to their electronic-mail system that is deployed in search of an application, as opposed to an environment that has to be managed like any other database, he said.

"Notes becomes a different type of animal at the enterprise level, and it grows everywhere. You have to make sure the technology doesn't outpace your ability to support it," said George Goldsmith, president of the Human Interface Group in Wethersfield, Conn.

Despite these caveats, large IS organizations are still plowing ahead with Notes deployment.

"Notes is a required technology platform for everybody. You can apply an ROI to specific tasks, but ROIs don't take into account the investment in technology people are making for future applications," said John Faig, an industry analyst at Meta Group, Inc.

For example, Boston Chicken is deploying 2,000 copies of Notes to link its restaurants with its corporate IS headquarters in Chicago.

At the same time, the telecommunications division of The Travelers Corp. in Hartford, Conn., plans to deploy up to 210 Notes copies in the first quarter, said IS manager John T. Murphy. "We'll have one Notes server and treat it like a glass house," Murphy said. Overall, the firm has 1,000 Notes users accessing five servers.

Duly noted

A survey of 70 companies that have worked with Notes for one to three years found most sites still waiting for their investment to pay off

Return on investment	Companies
100% or more	10%
80% to 100%	20%
60% to 80%	40%
40% to 60%	20%
30% to 40%	5%
Less than 30%	5%

Source: International Data Corp., Framingham, Mass.

And the Canadian National Railway system is using Notes to track its efforts to re-engineer the railroad using technology acquired from the Sante Fe Railroad Co., according to systems manager Glenn Chafe. The railroad is using Notes as the primary vehicle for keeping track of the specific jobs on the $150 million, four-year project.

Cooperative cartel

Meanwhile, Lotus chief executive officer Jim Manzi said Notes will be one of the technologies that fosters the creation of "electronic *keiretsus*" among companies. *Keiretsu* is a Japanese term for a cartel of suppliers and customers who work cooperatively together.

Partly with that goal in mind, QCS Development Co. in Valbonne, France, plans to use Notes as part of a clearinghouse for buyers and manufacturers that will allow retail stores to order goods from suppliers in the Far East, said IS manager Steve Roessingh.

Version 3.1 of Notes will ship about 30 days after Lotus delivers Notes on Solaris 1.1 from Sun Microsystems, Inc. in January. Lotus' first Unix implementation was originally due in this quarter but has been delayed slightly due to testing.

Take Notes

Upcoming upgrades:

Notes 3.1
- NLM support
- TCP/IP
- SPX-2 for Windows
- CD-ROM install
- ScreenCam audio files
- Packaged vertical applications

Notes 4.0
- Redesigned user interface
- CC:Mail integration
- OLE 2.0
- Simpler replication procedures
- Agents for automating tasks
- LotusScript development language
- Improved scalable performance

Guide to groupware begins on page 101. Corporate Software ties Microsoft apps to Notes. Page 49.

Novell messaging

CONTINUED FROM COVER 1

end clients and wide-area services [CW, Sept. 13].

The Da Vinci pact is meant to assure customers of a high degree of integration between front- and back-end messaging pieces and provide a single point of support, like they receive in single-vendor solutions, a Novell official said.

However, while Da Vinci is a third-place player in most LAN surveys, its strength is mainly in small businesses, not in the corporate market.

Furthermore, "displacing the leading players will be very difficult because most big companies already have set their LAN E-mail standards, and they aren't MHS-based," said Chuck Stegman, a principal analyst at Dataquest, Inc.

In a recent study of 200 medium- to large-size companies, 71% said they had standards in place, but only 2% mentioned having any MHS-based products, Stegman said.

"What's hurt Novell is its lack of marketing and inability to build demand in the NetWare marketplace," said Terrence McCarthy, managing director of Neoteric, Inc., a systems integrator in New York.

Additionally, the messaging landscape very likely will change next year when Microsoft saturates the messaging market by bundling E-mail clients for free in its next version of Windows.

"If Microsoft only gets 25% of Windows users to upgrade, that's 20 million copies of Microsoft Mail out there. Even though the back end will be open, that would entice a large user to consider a Microsoft back end for support reasons," said Jim Lisiak, a software engineer at Chevron Information Technology Co. in San Ramon, Calif.

Although tight network operating system and messaging integration would be a bonus, it is not enough to draw the city of San Carlos, Calif., which recently standardized on Lotus' CC:Mail, said Brian Moura, an assistant city manager. "The key is most E-mail packages can read the NetWare bindery. In CC:Mail, that process is not as smooth as it can be, but it's easy enough."

Ultimately, the lack of strength in enterprise messaging could hurt Novell's network operating system sales.

"They can do well for a while without an interesting strategy because they have a huge LAN market share, but it'll hurt them when Microsoft comes out with a stronger back-end operating system," said Sara Radicati, president of the Radicati Group, a consulting company in Palo Alto, Calif.

But McCarthy said that although Novell's marketing is weak, its MHS products are strong. In fact, several large customers have standardized on MHS and either Da Vinci E-mail or Beyond, Inc. E-mail clients, including Guiness North America and Revlon, Inc., he said.

X.500 or not?

Although Novell's Global MHS messaging directory will tightly integrate with the NetWare Directory Services (NDS) in NetWare Version 4.01, for users the question is how easily the information will integrate with other systems' directories.

Novell claims NDS and Global MHS are based on the X.500 directory standard. NDS and MHS architecture is like X.500, but Novell built the directories on its IPX and SPX stacks so they are no longer protocol-compliant with X.500, which lives on top of an Open Systems Interconnect or TCP/IP stack.

"The point is that because of the way Novell has done it on the wire, if you can capture their packet, it's not compliant and understandable by an X.500 implementation," said Sara Radicato, president of the Radicati Group and a principal designer of the X.500 standard.

However, Novell has assigned an application programming interface to its directory that is very similar to the X.500 API, so it would be easy to write software that goes between the two, Radicati said.

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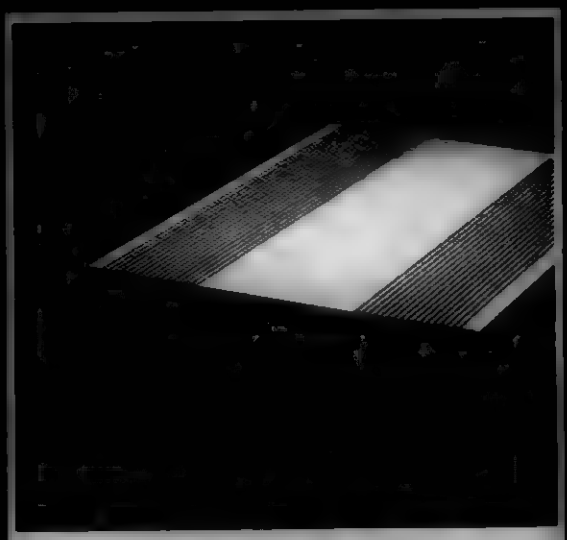

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News Shorts

WordPerfect names new CEO

Alan Ashton, **WordPerfect Corp.**'s co-founder and chief executive officer, is moving up to co-chairman on Jan. 1 and will be replaced by Adrian Rietveld, who had been senior sales and marketing vice president. Ashton said WordPerfect needs a more aggressive CEO as it restructures operations next year.

CA ships OS/2 project package

Computer Associates International, Inc. last week began shipping CA-SuperProject for OS/2, a native 32-bit project management application designed to exploit OS/2 strengths such as the WorkPlace Shell, preemptive multitasking and enhanced memory management. The package provides binary compatibility of SuperProject files across four platforms: OS/2, Windows, DOS and Digital Equipment Corp. VAX/VMS.

New notebooks from NEC

NEC Technologies, Inc. introduced the Versa E notebook series, which features faster processors, accelerated local-bus video and three- to five-hour battery life on its thin-film transistor, active-matrix color model. NEC has also built in an integrated trackball for its latest-generation notebook. NEC is the second major vendor after **Toshiba America Information Systems, Inc.** to use **Intel Corp.**'s SL-enhanced 20/40-MHz DX2 and 25/50-MHz DX2 in a notebook line.

Tate leaves MMA

Priscilla Tate has left her position as executive director of the **Microcomputer Managers Association** (MMA) in Warren, N.J., to concentrate on independent consulting. Alex Kask, a founder of the MMA and former president, became interim director.

France Telecom, Bundespost team

France Telecom and Germany's **Deutsche Bundespost Telekom** last week said they have signed an agreement to cooperatively provide X.25, frame relay, Internet Protocol, virtual private network, very small-aperture terminal and other services throughout the European Community bonded by a common network management system. The single-backbone venture, slated to be operational by 1995, falls short of rumored expectations last month that the two European telecommunications giants would pull **AT&T** into the fold.

Stikeleather to consult

Jim Stikeleather, director of systems development at **Kash n' Karry Food Stores, Inc.** in Tampa, Fla., resigned to join Tampa consulting firm **Technical Resource Connection, Inc.** Stikeleather was the force behind Kash n' Karry's leading-edge development with object technology and public domain tools.

SHORTTAKES **Viasoft, Inc.** and **Seec, Inc.** announced a joint technology and marketing agreement that will integrate Seec's Windows-based Cobol products with Viasoft's Existing Systems Workbench for maintenance and redevelopment of existing Cobol systems. ... **KnowledgeWare, Inc.** will next week begin shipping its NorthStar re-engineering tool, which allows developers to capture business logic from existing programs for analysis and migration to KnowledgeWare's Application Development Workbench. ... **Intel Corp.** and **SynOptics Communications, Inc.** said they will announce an agreement to jointly develop and market 10M/100M bit/sec. Ethernet products. ... **Eo, Inc.** bought **Peasoft Corp.**, which makes an application that runs on the AT&T EO Personal Communicator. ... This month marks the final shipment of AT&T 3B2 minicomputers, which totaled more than 70,000 units in 10 years.

TVA overhaul

CONTINUED FROM COVER 1

months," he added.

Malec said the overhauled IS department must help TVA respond to the "sea change" of deregulation, which is introducing competition in the electric utility industry. The end of monopoly status requires electric utilities to slash costs, radically re-engineer business processes and replace old information systems with ones that support the new way of doing business, said George M. Hill, the Phoenix-based head of Andersen Consulting's utilities practice.

Prior to last week's reorganization, the IS department was divided along business lines, such as power generation and marketing. That meant the IS groups at the Knoxville-based utility were building redundant and incompatible systems, such as those for personnel, for each of the business lines, according to Jack Flack, who has the new title of information technology architect.

New roles

The new-wave organizational chart clarifies the roles of IS professionals by allowing technical experts to focus on technology and creating a separate group of "strategic consultants" to build better relationships with the business units.

The consultants will have the full-time job of "interacting with the key opinion leaders [in the business units] to identify strategic IS opportunities we're missing now," said Robert L. Yates, TVA's vice president for information services and head of the 925-employee IS department.

Previously, that sort of strategic thinking was supposed to be done by line managers, Yates said, "but you can't expect them to do it in their spare time because there is no spare time."

By separating the roles of technologists and business consultants, the consultants can recommend IS applications without any bias about what technology — such as mainframes or PC networks — to use, Yates explained. Otherwise, it is human nature for technologists to recommend their pet platform without regard to business needs, he said.

The restructuring is just the latest in a series of efforts to reform the IS department. TVA's previous IS executive centralized the then-scattered IS department, but that offended the business units, Flack said.

The previous chief also started to drag the IS department away from IBM mainframes and into client/server computing on smaller platforms. He signed a $16 million contract with Oracle for software licenses, Flack said, which alienated the mainframers, who felt management was "shoving Oracle down their throats."

TVA's inspector general is investigating the Oracle contract due to allegations of collusion and kickbacks, TVA sources said. In addition, the inspector general is probing allegations of improper procurement of a PeopleSoft, Inc. payroll system [CW, June 21].

Still pending

Jim Reed, manager of financial investigations in the inspector general's office, declined to provide details but said investigations of the PeopleSoft and Oracle contracts will be resolved soon. Flack said the IS department was cleared of wrongdoing in the original Oracle contract, but certain revisions to the contract are still under investigation.

In August 1992, Malec brought in Yates, who had been corporate treasurer, to "clean up the mess" in the IS department, according to sources. Yates said he found a department with "a lot of turf battles, no clear-cut domains and built-in conflicts of interest," which is why he forged ahead with the reorganization.

Yates said he expects the new organization to be stabilized — and produce tangible results such as better client satisfaction — in three to six months. The next big step will be billing the business units for IS services so they recognize IS is not a free resource, IS officials said.

TVA closely followed a blueprint developed by IS management consulting firm N. Dean Meyer and Associates, Inc. in Ridgefield, Conn. However, Yates said he opened the process to employee input rather than keep it secret until the announcement. Employees in TVA's IS organization are represented by three unions, so Yates said it was crucial to get union buy-in for the restructuring.

West Coast correspondent Kim S. Nash contributed to this report.

Power conversion

TVA's IS unit was broken up into the following four groups:

- **"Service bureaus" that handle the data center, network operations, PC-user support and IS administrative functions.**
- **A pool of "technologists," including database administrators, systems programmers, applications specialists and technical experts in fields such as security, artificial intelligence and computer-aided software engineering tools.**
- **A "consultancy" of about 30 people to help business units with IS needs assessment and financial analysis, as well as market the IS department's capabilities.**
- **A small office of IS "architects" to facilitate the development of corporate technology standards, which are sorely lacking at TVA.**

Sun sets on technical users?

By Jean S. Bozman
SAN JOSE, CALIF.

Technical users at last week's Sun User Group said they feel their vendor has shifted its focus to commercial sites and is leaving them behind.

Sun Microsystems, Inc. appears to be more interested in commercial users than in its original cadre of scientific and technical installations, some of the 200-plus attendees said.

"Sun is selling a lot of Classics and LXs to people who don't know about Unix," said Gene Rackow, a systems manager at Argonne National Laboratories in Argonne, Ill., and a user group board member.

Some users are toying with the idea of moving to other Unix computers when their Sun hardware wears out. "Why do I buy a Sun when I'm changing my environment [to Solaris 2.3] and my users have to learn again?" asked Michael Pearlman, a systems manager at Rice University in Houston.

Other users said they see machines from Hewlett-Packard Co., IBM and Silicon Graphics, Inc. making headway. "Now we're beginning to see [end users buy] many other workstations," said S. Lee Henry, a Johns Hopkins University systems administrator.

"We are 95% SunOS and 5% Solaris 2.x," said Govind Desale, a network systems manager at National Semiconductor Corp. in Santa Clara, Calif. "Because we have SPARC compilers and packaged applications, the cost to convert would be small."

A Sun spokesman said the firm is taking a balanced approach. He cited graphics enhancements and new higher speed SPARC-based systems that should appeal to both technical and commercial users.

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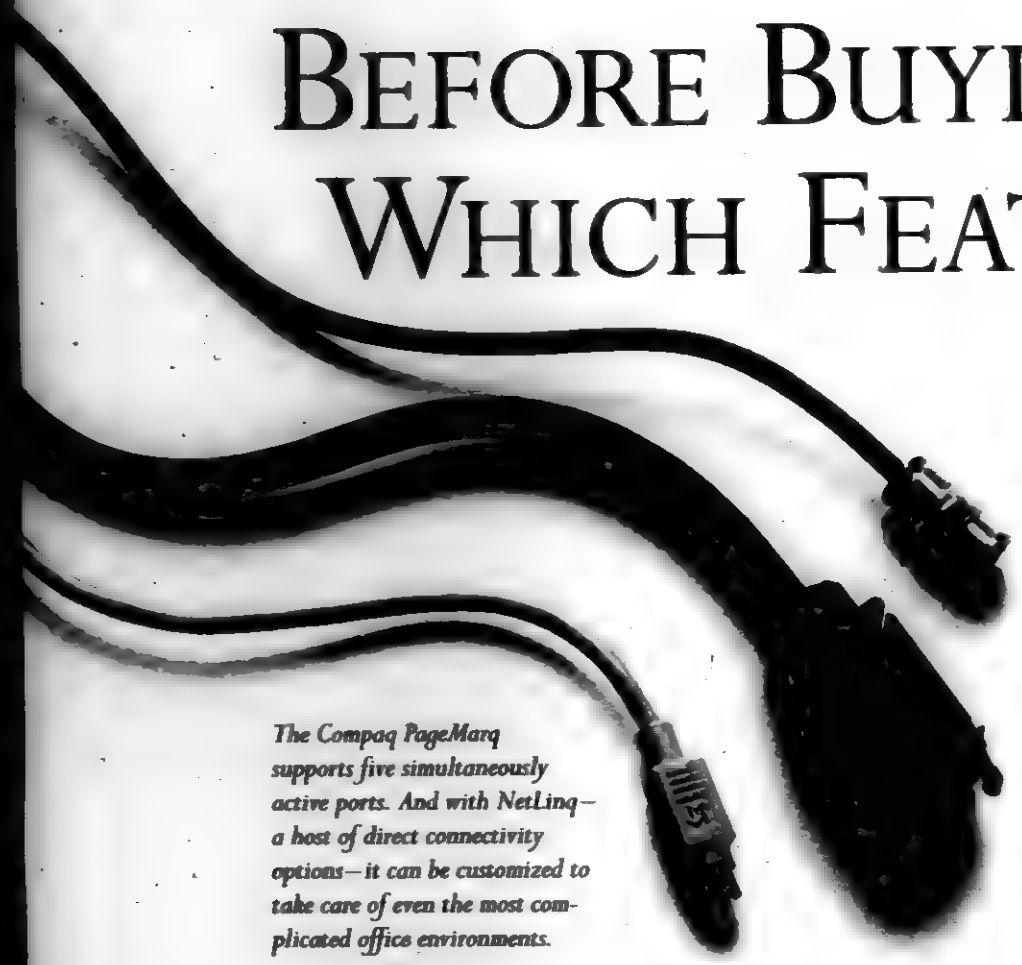

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Tandem tries to make nets more dependable

By Jean S. Bozman
CUPERTINO, CALIF.

Tandem Computers, Inc. and its Ungermann-Bass, Inc. subsidiary last week launched a fault-tolerant networking system for PC LAN applications, the first in a series of products that the firms said would make client/server computing more reliable.

The two firms plan to extend Tandem's fault-tolerant hardware features, which were built to run on its proprietary NonStop operating system, to network wiring hubs and PC LANs made by other vendors. Users installing the products could reduce client/server application outages by up to 80% [CW, Dec. 6], according to Tandem, which said it gauged the reliability boost using a self-developed 1,000-user LAN model.

"We need to get to a point where we get client/server dial tone," said Gary Sabo, Tandem's director of product marketing for open access systems.

The NonStop Access for Networking line is a set of products, intended to work in concert, that extend the redundant LAN connections available in Tandem servers to the desktop. Dual-port Ethernet adapter cards for client PCs link concurrently to a pair of Ethernet wiring hubs. Should a path or a hub go down, the adapter automatically switches to the alternate path or mirrored hub, preserving the PC's session with the server, the vendors said.

Users can buy the $199 MasterLAN FT Ethernet cards for any brand of PC LAN. The firms said they may later license to other vendors the software algorithms embedded in the Ethernet cards and hub controllers.

Looking ahead

One longtime Tandem and UB site, the Coffee, Sugar & Cocoa Exchange in New York, plans to use the products for LAN applications slated to go into production early next year, said Phat Leung, the exchange's director of systems and planning.

Tandem built many elements of client/server technology early, analysts said, but has not capitalized on these strengths — or on its ownership of UB.

"Tandem is trying to make waves in the marketplace to show they're very much in the [client/server] mainstream," said George Weiss, a vice president at Gartner Group, Inc.'s Mid-Range Computing Strategies group. "They need to supplement the hardware for fault-tolerant hubs with software."

All in favor

Ungermann-Bass Chief Executive Officer Roel Pieper, on the job for three months, said last week he was reorganizing the Tandem subsidiary into three units: one for systems integration and network services, one for network management services and one for building networking gear such as switches and hubs.

Rival approach

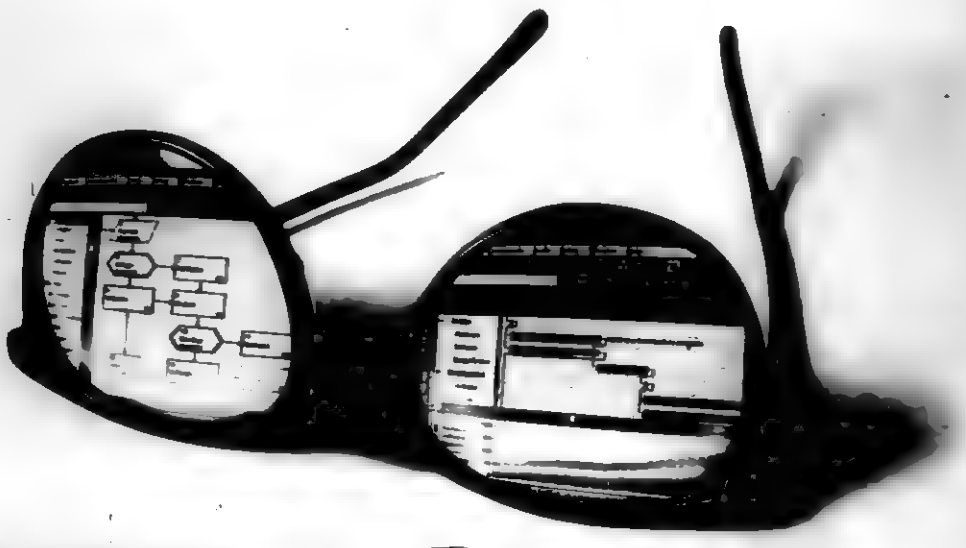
Tandem rival Stratus Computer, Inc. in Marlboro, Mass., has taken a software-oriented approach to building fault tolerance into Novell, Inc. NetWare LANs. The company is beta-testing NetWare for Unix software, which would enable Stratus machines to bring fault tolerance to NetWare servers [CW, Aug. 2].

Separately, Ethernet switching pioneer Kalpana, Inc. last week introduced a two-tiered approach to bullet-proofing its EtherSwitches, internetworking devices that allow users to dedicate an Ethernet's worth of bandwidth to one or a few resources to boost network throughput.

Users can purchase a $7,500 to $9,500 device consisting of completely redundant EtherSwitch components, all operating in parallel.

The second option is to pay an extra $1,000 over the cost of a standard $2,000 EtherSwitch chassis for dual-power supplies only.

Senior Editor Joanie M. Wexler contributed to this report.



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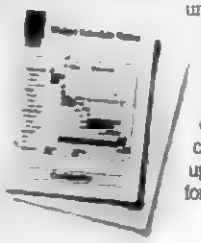

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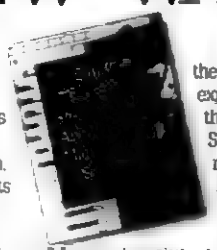

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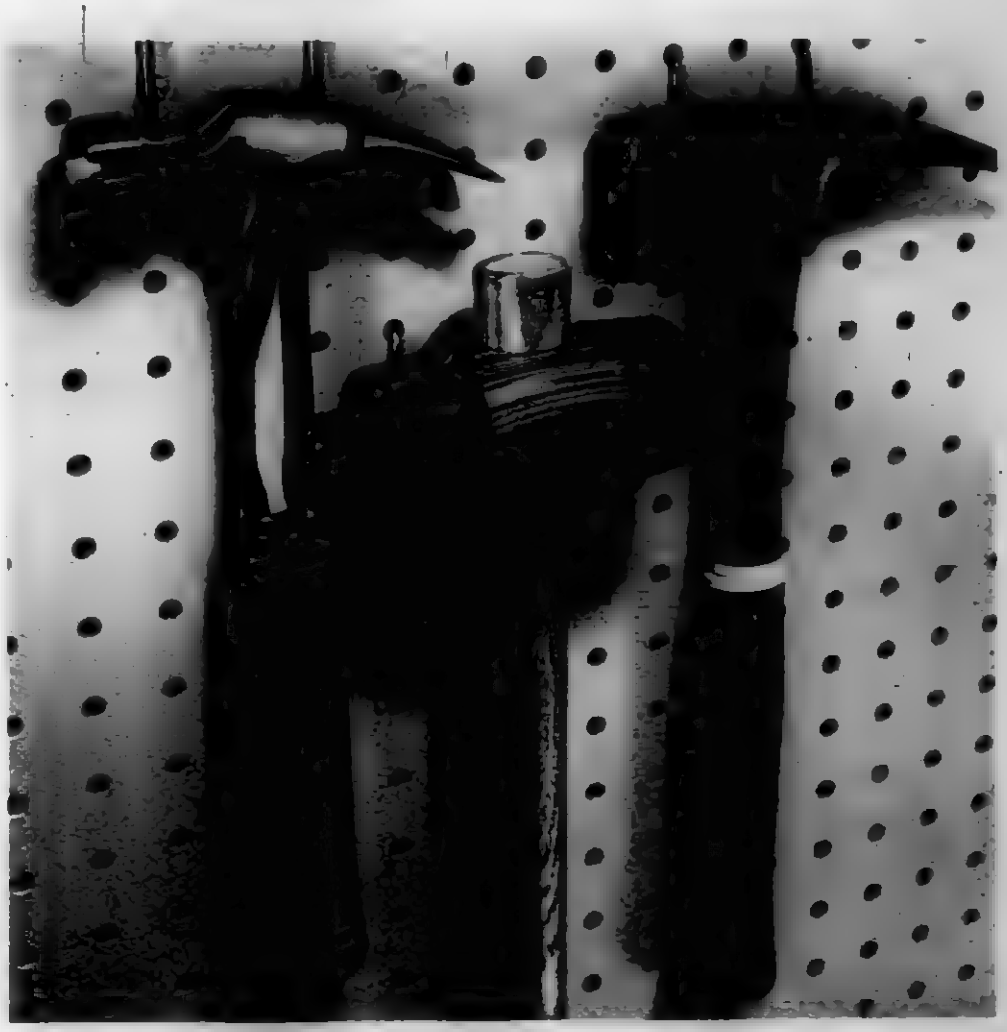

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Middleware brings host data to PC apps

By Johanna Ambrosio

Middleware unveiled last week by Early, Cloud & Co. promises to give mainframe applications a kinder, gentler means of achieving client/server nirvana.

With Message Driven Processor (MDP), users will be able to tap into virtually any host-based application that supports IBM's CICS and bring the data into almost any PC-based application, according to officials from the Newport, R.I., company.

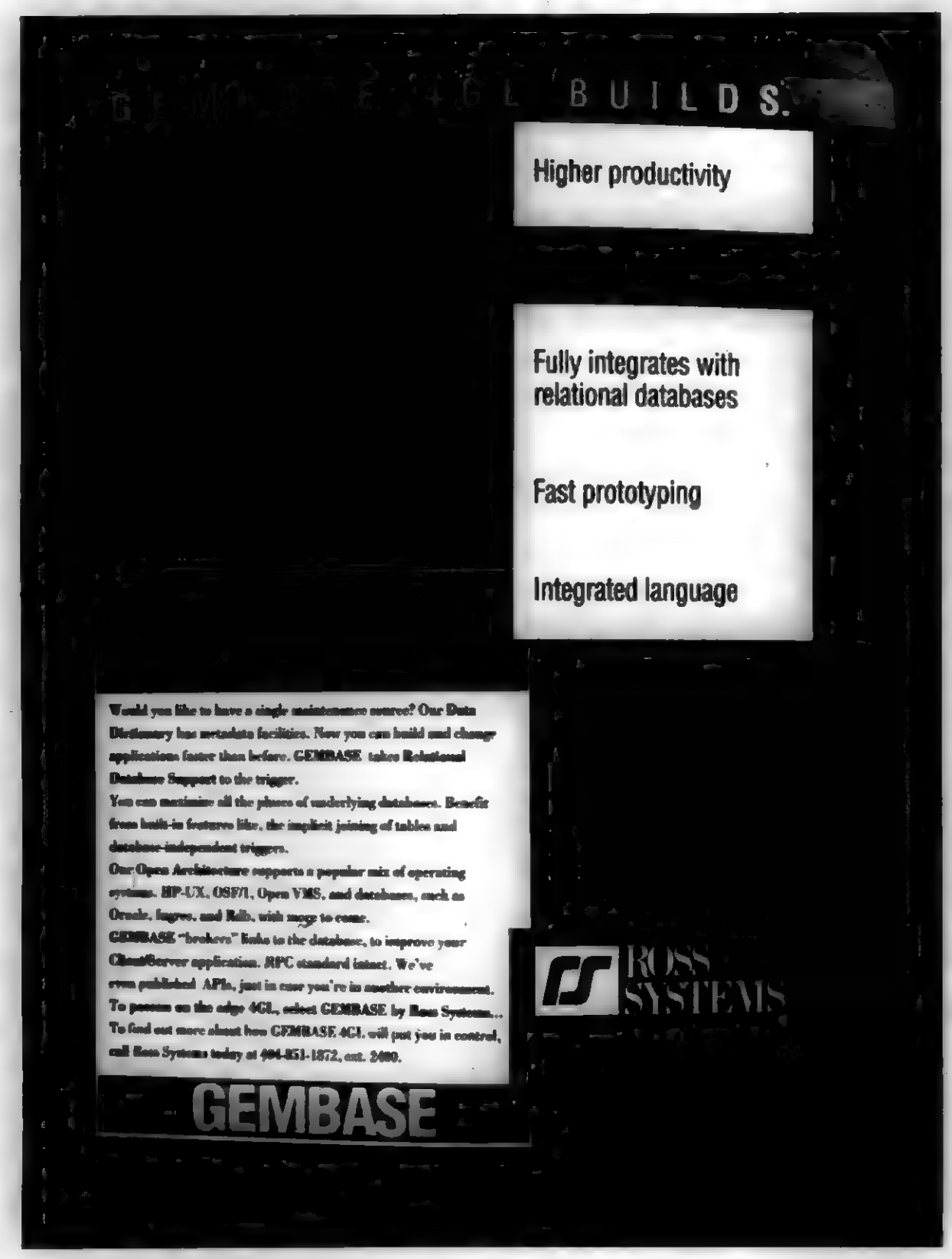
Available immediately for a limited number of customers, MDP sells for a minimum of $40,000 because services are bundled with the very complex package, which includes 250 programs and some 400,000 lines of code.

The software message-oriented middleware simplifies the data-gathering process from both an end user's and programmer's perspective, officials said.

"When a client machine makes a request, MDP takes the message, opens up the envelope, defines the tasks needed to answer the question, taps the back-end systems and puts the answer back into the envelope, and sends it to the client machine," said Gary Krueger, vice president of sales and marketing. With workflow automation part of MDP, all of this happens behind the scenes, he added.

The approach MDP takes differs from that of remote procedure calls (RPC), Krueger said. While RPCs require clients to wait for the reply before they can proceed to other processing, MDP does not, he said.

"With MDP, the client can go on and do other things while waiting for the answer," Krueger said.



Early interest

At least four large banks are beta-testing MDP, which is based in part on a previous Early, Cloud package that automates the customer service function, Krueger said.

First Bank Systems in Minneapolis is not yet using MDP but is "very interested" in it, said Bernard McGarrigle, vice president of emerging technologies at the bank, a longtime user of Early, Cloud telemarketing software.

"Right now our applications are terminal-based, and we want a workstation-based environment," he said; MDP will likely "expedite that process for us."

Similarly, Norfolk Southern Corp. in Atlanta has been using Early, Cloud's telemarketing software in its customer service center, said Allen Childress, assistant vice president at the transportation concern.

Onward and upward

Founded in 1981 as primarily a services firm, Early, Cloud has some 110 customers and 170 employees worldwide. The private company, in which IBM has a 20% to 30% equity stake, expects to make around $20 million in revenue this year, up from $7 million in 1990.

To help answer customers' questions about the status of their shipments, "we are extrapolating data from several applications and bringing them down to an intelligent workstation with a graphical user interface." MDP, or something like it, would help with that effort, he said.

MDP, available now for any MVS-based mainframe that also runs CICS, will be delivered next year for other CICS platforms, including OS/2 and AIX. Others will follow.

Satisfying the client

On the client side, MDP supports development tools, including Microsoft Corp.'s Visual Basic, Easel Corp.'s Workbench and Powersoft Corp.'s PowerBuilder.

The basic MDP set includes an application development environment with a work-flow management tool set, a runtime environment, technical support and maintenance.

The major component of the development environment is a script builder that contains executable objects that fulfill the client's request.

Scripts are created in the development environment and executed in the runtime environment.

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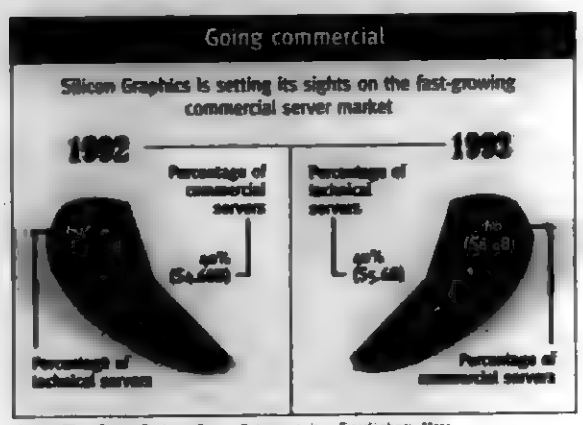
SGI takes Challenge to commercial mart

By Joan S. Bozman

Seeking to further diversify its scientific/technical roots, Silicon Graphics, Inc. (SGI) plans early next year to make a splashy push into the commercial database server market.

The move could signal an aggressive stance by $1 billion SGI against $4.3 billion Sun Microsystems, Inc., which sells many high-end machines to commercial sites as database servers, said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

SGI will elevate its commercial presence by getting systems integrators to pitch its Challenge server as a high-speed, high-capacity database engine aimed at a variety of computationally intensive applications, including multimedia. SGI began diversifying its business last summer when it formed its Information Products Division (see story at right).



Source: Client/Server Systems Group, Dataquest, Inc., Framingham, Mass.

Feedback for fine-tuning

SGI is already working with systems integrators to test its database server strategy, which combines Challenge machines with multiple gigabytes of data, major relational databases and redundant arrays of inexpensive disks storage devices for high-availability. SGI needs the feedback it gets from systems integrators to fine-tune its database strategy, said Ihab Abu-Hakima, the Information Products Division's marketing director.

Multimedia applications that apply three-dimensional graphics to the task of analyzing large databases with up to one terabyte of data are being tested by some integrators, said Terry Trent, a vice president at SAIC in La Jolla, Calif. Visualization of patterns stored in user databases using Oracle Corp. and Sybase, Inc. database engines, is also being tried.

Visualizing is key

"You can fly through your corporation," said Jim Presley, regional operations manager at Electronic Data Systems Corp.'s High-Tech Industry Division in Pleasanton, Calif. Visualizing a business model, he said, "can show a corporation what they need to do to get their financial systems in tune, or what type of information their sales organization should be providing to them and how often."

Early users said the SGI machine's high performance and big database capacity outweigh concerns about the price tag, which ranges from $69,000 to more than $790,000 for a 36-processor Challenge machine. In contrast, Sun's SPARCcenter 2000 ranges from $95,000 to $197,600.

Both SGI and Sun are trying to shake their images as technical workstation vendors. But SGI may try to leverage its high I/O specifications and high-resolution 3-D graphics into database pluses, analysts said. "They definitely have an edge," Iams said. "SGI [machines] have buses with enormous bandwidths to push pixels around." A SPARCcenter 2000, which is a symmetrical multiprocessor with about 500M byte/sec. of I/O bandwidth, would be outpaced by a high-end SGI Challenge and its 1.2G-byte/sec. aggregate bandwidth, Iams said.

SGI plans to bank on benchmarks to show that Challenge machines provide better overall price/performance than the less costly symmetrical multiprocessor servers from Sun and other Unix vendors. "The key to their success is going to be that the cost of their transactions per second will be way down compared to others," said Donald Feinberg, a program director at Gartner Group, Inc.'s Software Management Strategies Group in Santa Clara, Calif.

Some users said they are considering the plan. One information systems planner at a large petrochemical company said SGI recently stopped by to present its database plans. "That new machine they've got has a high-bandwidth backplane," the planner said, referring to the Challenge machine, "but whether it works as well as they think it does remains to be seen."

SGI machines have been used at commercial sites for years. United Airlines in Elk Grove Village, Ill., has been using two SGI Iris machines to run flat-file databases since 1991. United downsized a crew-scheduling application from an IBM 3090 mainframe host to run on IBM RS/6000 and SGI workstations, users said.

SGI's Challenge

- **CPU:** 150-MHz, 64-bit MIPS R4400 RISC processor.
- **Operating system:** IRIX, a version of Unix System Version 4.
- **Power range:** 2 to 36 processors; up to 16G bytes of main memory and up to 3.5T bytes of data storage.
- **Price range:** $69,000 to $790,000.

Partners plan

SGI has already lined up several large integrators, including Electronic Data Systems Corp., Computer Sciences Corp. and SAIC, to take it into the commercial space.

Ross Bott, general manager of SGI's new Information Products Division, said systems integrators would provide better software and database support to users, leaving only hardware and technical support to SGI.

"These systems integrators see us as a neutral technology provider," said Ihab Abu-Hakima, the division's marketing director. "They know we're not going to go in and compete with them on consulting services." — *Joan S. Bozman*

Going for the record

One benchmark showed SGI's Challenge had 1,786 TPC-B transactions running the Oracle 7 database on a 28-CPU machine. In contrast, a high TPC-B benchmark for an Oracle 7 database running on an 8-CPU Sun server was 400.47. SGI intends to run more TPC benchmarks in 1994, the firm said, in an attempt to set new on-line transaction processor records.

Object orientation

Sun extends net management

By Lynda Radosevich

SunConnect last week unveiled a distributed, object-oriented network management platform, in addition to filling in strategy details and introducing enhancements to its existing SunNet Manager platform.

The Mountain View, Calif., division of Sun Microsystems, Inc. said it will take a three-tiered approach to network management.

At the high end, SunConnect will offer a product called Encompass that will be aimed at users who need a fully distributed enterprise network management platform. The low end will be a continuation of the current SunNet Manager line and a midrange strategy will include software that allows SunNet Manager's server to synchronize data.

SunConnect said it will ship Encompass, which is based on distributed, object-oriented technology licensed from NetLabs, Inc., to customers by the fourth quarter of next year [CW, Dec. 6]. A developer's release will ship in the second quarter. Encompass is based on a shared object-oriented data respository. It will enable application integration and security levels for multiple managers, according to SunConnect.

Help with integration

William Gray, a systems programmer at the Univerity of Tennessee, a SunNet Manager site in Knoxville, said he hopes the new release will help him integrate divided network management sections into a global view. "Currently, if we want to look at a particular section of the Novell network, we have to put up a monitor in that area," he said. Encompass will allow administrators to manage dispersed network functions from one screen and to call up that screen from various points on the network.

Intelligence added

Additionally, Encompass will include "nerve center" technology from NetLabs that can add some intelligence to network management. For example, the nerve center can be programmed to take action on specific alarms, according to Brian Biles, a SunNet product line manager.

One concern users may have is that existing applications written for SunNet Manager Versions 2.0 and 2.1 will not run on the Encompass platform. Instead, users will have to rewrite applications or use Version 2.2 as a bridge to send information from earlier releases to Encompass, Biles said.

At the lower end, for managers of discrete network segments, SunConnect will ship in the first quarter of next year an updated version of SunNet Manager that runs on Intel Corp. 1486- and Pentium-based machines. Also, the management platform will be available for the Solaris 1 operating system — used by 50% of Solaris users, Biles said.

To link multiple SunNet Manager segments, SunConnect will also ship in the first quarter two platform extensions that provide a common repository and reporting mechanism for information sent by multiple SunNet Manager systems.

Leader of the pack

SunNet Manager is the leading Unix-based network management platform, with 33% of the 1992 market share, according to International Data Corp. However, some analysts say IBM's NetView/6000, which only had 6% of the 1992 market, is picking up momentum because of IBM's close relationship with Digital Equipment Corp. and Microsoft Corp.

Why is this traveling
troubleshooter
so tranquil?

He just
took off
with
a purple
color
notebook
from

Lotus Organizer - [Untitled]
File Edit Section Page Tools Options Help
Planner
M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T
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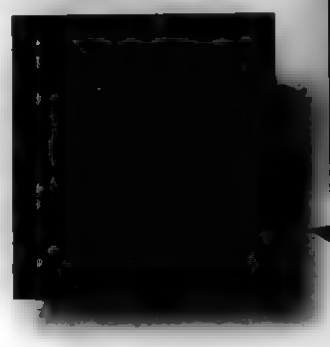

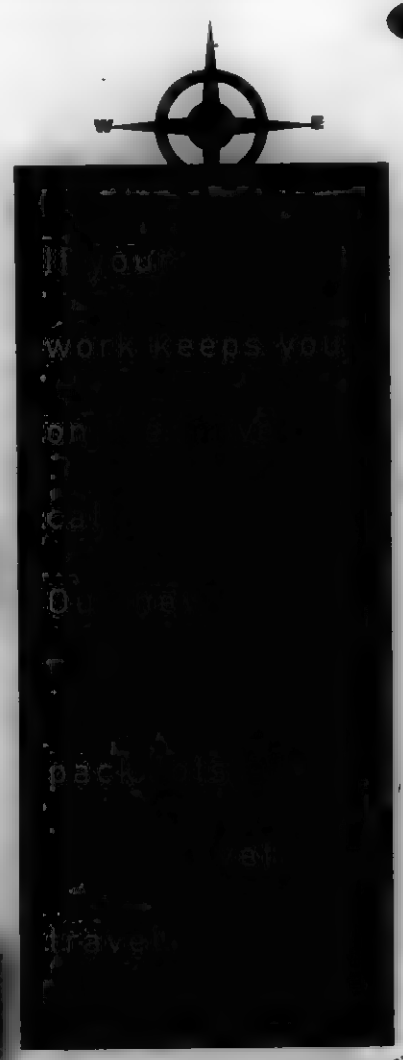

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1 keyboard port
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1 parallel port
1 video port
1 keyboard port
$249

SN-Series Port Replicator
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1 parallel port
1 video port
1 keyboard port
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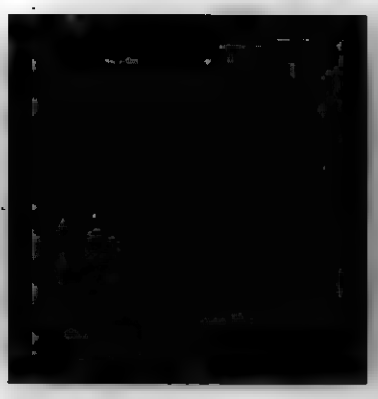

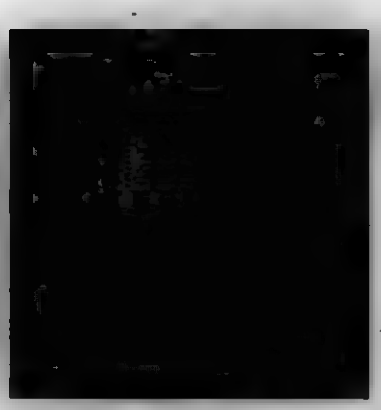

LIGHTWEIGHT NOTEBOOKS

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N450T

- 486DX2, 50 MHz
- 8MB RAM, max: 12MB
- 3.5" 1.44MB diskette drive
- 200MB hard disk
- 9.5" TFT active matrix color screen
- 1 PCMCIA slot, Type III
- Integrated 16mm trackball
- Suspend/Resume
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- 6.6 lbs, including battery

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- 3.5" 1.44MB diskette drive
- 200MB hard disk
- 9.5" STN dual-scan color screen
- 1 PCMCIA slot, Type III
- Integrated 16mm trackball
- Suspend/Resume
- MS-DOS, Windows 3.1
- Carrying case
- 6.6 lbs, including battery

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N433C

- 486SX, 33 MHz
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- 3.5" 1.44MB diskette drive
- 120MB hard disk
- 9.5" STN dual-scan color screen
- 1 PCMCIA slot, Type III
- Integrated 16mm trackball
- Suspend/Resume
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- Carrying case
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SN425C

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- 170MB removable hard disk
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- 1 PCMCIA slot, Type II
- Integrated 16mm trackball
- Suspend/Resume
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(With external 3.5" 1.44MB diskette drive, add $99.)

SN425

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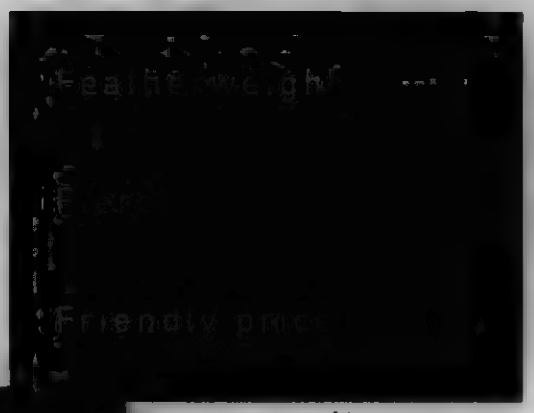
- 80MB removable hard disk
- 8.2" monochrome LCD
- 1 PCMCIA slot, Type II
- Integrated 16mm trackball
- Suspend/Resume
- MS-DOS, Windows 3.1
- Slip case
- 4 lbs, including battery

$1,399

(With 170MB hard drive, add $150. With external 3.5" 1.44MB diskette drive, add $99.)

intel inside



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[1] Ron White, "In Search of the Ultimate Notebook," *PC Computing*, July 1993. [2] Please call for details regarding AMBRA's money-back guarantee, limited warranty and Executive warranty. Return shipping and insurance charges are the responsibility of the customer. [3] Offerings may differ in Canada.

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Hubble trouble

Watching the Endeavor astronauts in space working on the Hubble telescope for about 30 hours last week made me wonder: Is there anything they *didn't* fix up there? I mean, did NASA launch a '78 Chevy by mistake and now they're trying to replace it piece by piece?

Actually, the Hubble experience may strike a familiar chord with many IS managers because what NASA is doing 350 miles above the Earth is coping with a bad legacy system. Imagine Hubble was instead an old accounting application. Launched years ago, the system is no longer able to accommodate its users' needs. The company's got too much invested in it to throw it out and there's no guarantee a replacement will work any better. So the owners just keep patching it up.

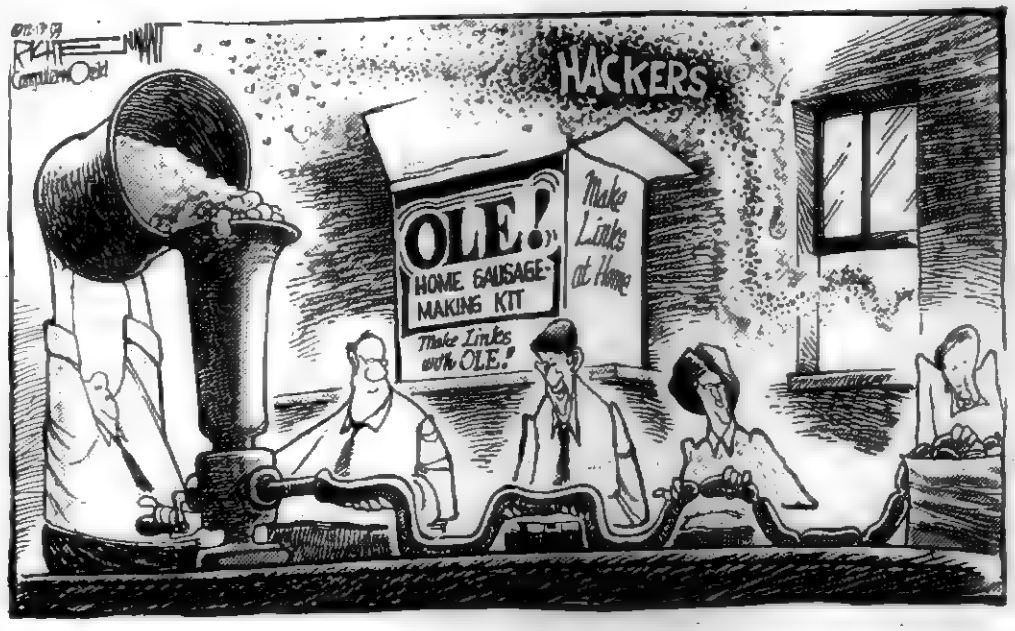
Chances are there's a system like that in your organization. IBM software restructuring guru Eric Bush says he's seen applications in some IS sites that are 90% constructed of 90% dead code. That's program logic that doesn't do anything other than take up memory space but is so poorly documented that everyone is scared to get rid of it.

Like it or not, the legacy is here to stay and the smart providers of software and services are going to be those who recognize that. "The future of computing is in applications that span platforms," wrote Humana's Joe Vincent in a defense of the mainframe that appeared in *Computerworld* last month.

Many vendors still don't understand that legacy systems will be one of those platforms. Remember application downsizing? A couple of years ago a lot of vendors were saying you should move mainframe applications down to client/server platforms. But just about no one could do it. Even if the applications worked on the network, performance suffered and user training and support problems overwhelmed the hardware savings. Now the buzzword is "rightsizing," which can mean whatever you want it to mean.

The technologies that get press are the ones that push the leading edge. But the ones that get the attention of IS management are those that leverage existing investment. A legacy systems is a lot more than an application. It's the skill sets of the programming staff, the technical experience of the network managers and the business knowledge of the whole organization. Any vendor that tells you that that stuff isn't important — that mainframes are dead, Cobol is a dinosaur and SNA is a has-been — is brain-dead. Some of the most successful software and service companies in the industry — Computer Associates, Legent, Electronic Data Systems, IBM, Computer Sciences and others — are those that understand how to leverage the resources users already have. There's a lot of value in those old systems, even if they don't work so well anymore. Just ask NASA.

Paul Gillin, *Editor*



Commodore Amiga overlooked, again

I must express concern over a glaring misstatement in your report on Michael Spindler's keynote speech at Comdex/Fall '93 ["Apple declares micro war," CW, Nov. 22].

Your report states, "Apple will be the only PC company with a machine that can run DOS, OS/2, Windows, Windows NT, Unix and Macintosh software." You owe it to your readers to point out that a suitably equipped Commodore Amiga already has the ability to run "... DOS, OS/2, Windows, Windows NT, Unix and Macintosh software" (not to mention AmigaDOS software). Why this has escaped the mainstream press for so long has been the subject of endless speculation and accusation.

The Amiga's 32-bit preemptive multitasking operating system, its object-oriented graphical user interface, its 1,280 by 1,128, 262,000-plus color screen mode, its 30 frames per second full-screen animation, its robust, interprocess communication, its Auto-Config hardware specification and other features are considered cutting-edge only now that the heavy hitters are targeting them.

All of this, combined with support for multiple (simultaneous) operating systems, should earn the Amiga at least an acknowledgement, if not full-scale coverage in the mainstream computer press.

Michael R. Hartigan
President
MCM Associates
Carol Stream, Ill.

The complexity of software contracts

In the article "Software contracts" [CW, Nov. 8], put simply, there is some bad advice.

It is suggested that "an adequate warranty is one that provides for a total refund at the customer's option. ..."

A computer user's damages for a system that fails to perform in accordance with specifications often can lead to that user's bankruptcy or, at the very least, damages far in excess of the price of the system.

Computer contracts involve complex legal issues. Your readers should be cautioned not to forget that.

Dennis S. Deutsch
Adjunct professor of computer law
Fordham University
Hackensack, N.J.

Regarding "Software contracts," the writers' suggestions are a typical knee-jerk reaction to a few common software contract provisions that software users will inevitably encounter.

Notwithstanding the boilerplate that is lumped into so many software contracts, there are no clauses or provisions that should be automatically inserted into any contract.

Each software contract uniquely defines a relationship between a vendor and a user, and that relationship must be the paramount element in any negotiation of contract terms.

If you build your contracts solely out of the boilerplate that will give you the best initial advantage in litigation, you will neglect the core purpose of the contract.

John A. Franczyk
Chicago

Waxing antithetical

Regarding your editorial, "Friends, Romans..." about John Sculley [CW, Oct. 25], why did you decide to use a word such as antithetical? It is not in my 1980 Oxford American Dictionary (paperback edition) and my spell checker just laughed.

I realize as a writer, you want to stretch your readers' minds, but I'll bet you lost most of them on that one.

Of course, it is easy to guess the meaning of the word from the context.

Dale Jamus
Warren, Ohio

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Forget the old distinctions

Elisabeth Horwitt

You know how it is when the gods seem intent on hammering something into your thick head? This happened to me recently, and it seems I am far from alone.

It happened this way: I was at a client/server conference, and a guy from a major investment company was telling a horror story about what happened when a group of old-guard IS managers were turned loose on their first mission-critical client/server implementation.

Client/server demands not just new tools and new skills, but a different — more unified — view of the world.

The company had provided training to reorient the IS managers' mainframe skills to analogous PC-based products — DB2 to dBase II and so on. However, three months into the project, the group was already six months behind. Where they got stuck, my source said, was in trying to find the ideal combination of LAN, client, PC software and server products. The hardware and software people kept switching out products that didn't work, and they were getting into drawn-out debates with the database designers about which pieces of data would stay on the host and which would go on the LAN server.

The group finally figured out that they couldn't get away with the old data center organizational model, with separate cliques of database, network and hardware experts occasionally exchanging E-mail. Successful client/server implementations require a single project team of people who have at least a basic working knowledge of all disciplines, so the different disciplines can have meaningful dialogue, he said.

Right, I said. That makes sense.

A week later I got another tap from the hammer. An extremely savvy technical support manager told me that when he was just a network administrator, he assumed all he had to do was deliver network services to users' desktops and they'd start using them. He got a real awakening when he started working closely with users on the desktop. He learned that many found network services hard to use via DOS commands — and so were using them as little as possible.

Crossing that line between the network and the desktop gave this man some real insight into how to help users make the most of the company's client/server systems. His organization switched the user interface to the services from DOS to Windows, and users who had barely touched the network became enthusiasts.

The third hammer stroke is falling now — not just on me, but on this publication.

As our readers move more and more into client/server, we're beginning to realize we cannot afford to keep the old separations between reporters' beats.

A lot more cross-fertilization is taking place across reporters' areas of specialization — between the desktop operating system reporters and the networking people, for example. And we are all beginning to bone up on technologies that used to seem totally irrelevant to our jobs.

This is enabling us to better understand (and also sympathize with) what our right-sizing readers are going through. But boy, have we all got a lot to learn!

Horwitt is a *Computerworld* senior editor, networking.

Interactivity means 'active' participation

Esther Dyson

Go to any industry conference these days and you're sure to hear about interactivity and convergence — almost as if they were synonyms. But, to look at interactivity only in this context misses most of its value.

Convergence, of course, is the melding of television, publishing, telecommunications and computer firms (mostly through fierce financial battles). Interactivity, in that particular framework, is the ability to select from a wide array of merchandise displayed on one of 500 or so channels. You may even be able to get further information about a particular item by pushing a button on the remote that controls the set-top device — the seat of all that "interactivity."

But that's not what I'd call interactivity. That's filtering.

In my book, interactivity happens when there's genuine activity at *both* ends of the wire, fiber or radio link. As the rise of the Internet (a notoriously unfriendly, mostly text medium) shows, interactivity isn't about the medium; it's about communicating with other people — giving and getting attention and feedback from friends and colleagues, customers and suppliers. Computers are no longer a calculating device or a display device but a communication device.

For computer vendors, that raises the interesting question of how to enhance "interactivity." People want to remove the barriers to communication, not embellish them with complexity. Faster, simpler and cheaper is about it.

But there are things vendors can do. They can provide better access methods, as well as better ways of finding people and leaving messages. They can also develop better ways of compressing, organizing, presenting and sharing information created interactively.

For commercial computer customers, interactivity may apply not just internally but to interactions with their customers. That doesn't just mean multimedia videos and presentations, but interactive support where a customer can answer questions for himself (talking to an expert system or knowledge base and then getting on-line with a human expert as necessary).

If you think interactivity is all about home shopping, you're missing the most important implications.

Within an organization, employees need to work and learn individually, but they also need to work together and interact as a "learning" organization. Beyond the desktop, there's a group and a whole organization. Interactive communications means they can share information with each other.

The real win in interactivity won't be multimedia videos, on-line shopping or even the ability to obtain information on demand but tools that let people create their own forms of communication. Just as the 1-2-3 spreadsheet replaced financial planning languages used by experts and let a whole new generation of people create their own business plans and models (for better or worse), interactivity could give people the means by which they can develop communications, such as videos and voice-overs for a shared document, to suit their own purposes.

Suppliers can add value, but customers want a role in the process, too, and need easy-to-use tools to let users edit voice and video and use existing information management tools in new and different ways for real-time give and take.

Then, more than anything, true exploitation of interactivity is up to the users, not to the suppliers. Above all, interactivity requires user participation. No more desk potatoes!

Dyson is editor of "Release 1.0" and "Rel-East," newsletters on new technology and new computer markets in Eastern Europe.

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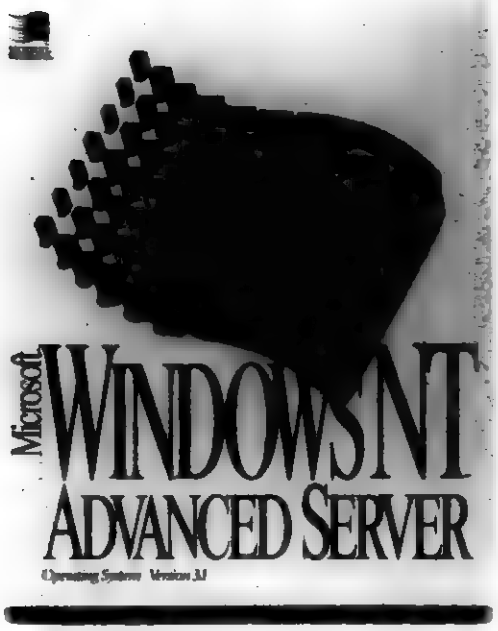

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Microsoft to offer FoxPro for Macintosh

By James Daly

Microsoft Corp. is likely to make a splash at next month's Macworld Exposition in San Francisco when it delivers its first database for the Apple Computer, Inc. Macintosh.

FoxPro 2.5 for the Macintosh, which will be announced this week, not only fills a hole in Microsoft's Macintosh product line, but its $99 introductory price is expected to set off a pricing donnybrook among established competing products, such as Claris Corp.'s FileMaker Pro and Acius, Inc.'s 4th Dimension, both of which sell for hundreds of dollars more.

Microsoft will also emphasize FoxPro 2.5's cross-platform compatibility, which offers support for both Windows and DOS. In addition, FoxPro for The Santa Cruz Operation's Unix and Xenix will be available by June, Microsoft officials said.

One standard

FoxPro for Macintosh-based applications can be run, unchanged, in FoxPro for Windows, FoxPro for DOS, and Unix and Xenix, said product manager Bob Fortner. Likewise, FoxPro for Windows and DOS applications can be run without modification in FoxPro for Macintosh.

For developers, this means building an application once and running it on four platforms. For corporations, it means supporting only one database management system standard. Support, training and maintenance can be consolidated into one product for users of all levels on multiple operating systems, Fortner said.

That simplicity of support is hitting a nerve with users. "It provides an extra measure of choice in painlessly migrating an application, and that's very important to us," said beta user Mike Silberger, an associate at J. P. Morgan & Co. Financial Services in New York, who has been running a beta copy of the application for three months.

Standing alone

Microsoft will also offer a professional edition of FoxPro for Macintosh that allows developers to distribute stand-alone applications royalty-free and write libraries in C or C++ that can be called from FoxPro. The Professional Editor is scheduled to be upgraded to allow development of client/server applications via Open Database Connectivity in the first quarter.

The professional edition will also provide a comprehensive set of tools for developers and power users to create applications that take advantage of the Macintosh-style user interface. The application's screen builder, for instance, supports more than 16 different screen objects such as buttons, picture controls, check boxes, pop-up lists and radio buttons.

Microsoft FoxPro 2.5 will be available for the introductory price of $99 through June. Then it will jump to $495, Microsoft officials said.

Object technology: Ready to fly?

Long-term promise in PC applications tempered by current IS realities

By Michael Vizard

For months now, PC developers have enticed users with the promise of applications that will include object technology to simplify data integration across applications.

But achieving the promised benefits of object-oriented technology in the corporate world is going to require users to do a lot more than simply wait for the next major upgrade of their favorite off-the-shelf software package. In fact, information systems managers can expect to reevaluate just about every piece of software they have as they move, in phases, to the next generation of object-oriented applications.

"Objects will provide important incremental benefits. But people already have a lot of applications written in different tools, so they are going to have to see what the actual business benefits will be when they move to a universal object-oriented development model," said Brent Williams, an industry analyst at International Data Corp.

"Most people will probably look to embellish their existing applications before moving completely to an object environment," said Tim Harmon, an industry analyst at Meta Group, Inc.

OLE vs. the rest

Driving the move toward object technology on the desktop and the industry at large is Microsoft Corp.'s decision to add object-oriented technology to Windows using its Object Linking and Embedding (OLE) 2.0 interface. Meanwhile, IBM, Apple Computer, Inc. and several other vendors are pursuing the rival OpenDoc standard, which purports to provide similar capabilities on other operating systems.

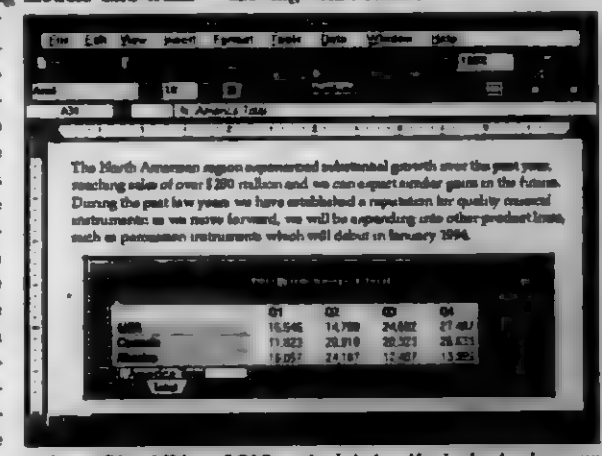
But OLE and OpenDoc are more than just another set of programming interfaces. OLE 2.0, for example, actually consists of more than 400 object-oriented interfaces that make up the first step in Microsoft's drive to turn its desktop operating system into a truly object-oriented environment.

IS managers are looking at adopting new programming models and training users on how to take advantage of highly integrated applications. They also must provide support in a world where the source of a particular glitch in one user's file may actually be in an application that was originally created on another user's system. Once these object standards are deployed, IS managers will find themselves confronting a host of object interoperability issues that vendors are just beginning to address (CW, Dec. 6).

"OLE 2.0 is the beginning of object desktops. IS is going to have to look at OLE as a new class of applications that has to be considered as part of a long-term object strategy. Overlaying OLE 2.0 on top of existing applications isn't going to provide a lot of benefits," said David Coursey, editor of the "P.C. Letter" newsletter.

However, because OLE 2.0 represents such a massive undertaking, a preponderance of the IS community is only now beginning to experiment with the limited number of applications that support OLE 2.0.

Even Nordstrom, Inc., a leading-edge user of Microsoft technology, is moving with caution.



Microsoft's addition of OLE 2.0 *is driving the industry's move toward object technology*

"We've done some limited beta testing of OLE 2.0 with Excel 5.0 and Word 6.0. But we don't have any immediate plans to make use of OLE 2.0 until early to middle of next year," said Pete Claar, a developer at the Seattle retailer.

Taking their time

Other shops will be slower still to tackle OLE 2.0.

"We won't move to it anytime in the near future and probably won't begin to evaluate initial OLE 2.0 applications until late 1994," said Gary Falk, a PC application specialist at Nixon, Hargrave, Devans and Doyle, a law firm in Rochester, N.Y., with more than 700 PCs.

"OLE 2.0 is like getting a Lego set. But it's going to require a complete retraining of users, and they are resistant to change. And there will be so many things that probably won't work that I don't see it providing anything other than headaches," he added.

A large part of this protracted roll-out of OLE 2.0 applications is due to the fact that for OLE 2.0 to be truly effective, most of the applications in the or-

Object technology, page 42

Interface intricacies

Technologies such as OLE promise to ease the exchange of data across applications by encapsulating data into objects that can be more easily manipulated by other applications across live links.

That is because the applications only have to be aware of the interface, known as the "handle," that surrounds the data they are looking to access.

In a PC application, OLE 2.0 technology will translate into support for a true drag-and-drop protocol that allows users to exchange data across applications simply by dragging an icon that represents that data across the screen and clicking on another application.

In addition, users will be able to launch an application, such as electronic mail or a spreadsheet, from within a word processor and actually edit data in that spreadsheet using the standard commands associated with that application. This latter capability is referred to as in-place editing.

Beyond that, IS shops will benefit from being able to address common interfaces in the same application with a common macro language. Using this capability, developers can create macros for multiple applications or write applications that incorporate off-the-shelf spreadsheets or word processors in their custom applications. — *Michael Vizard*

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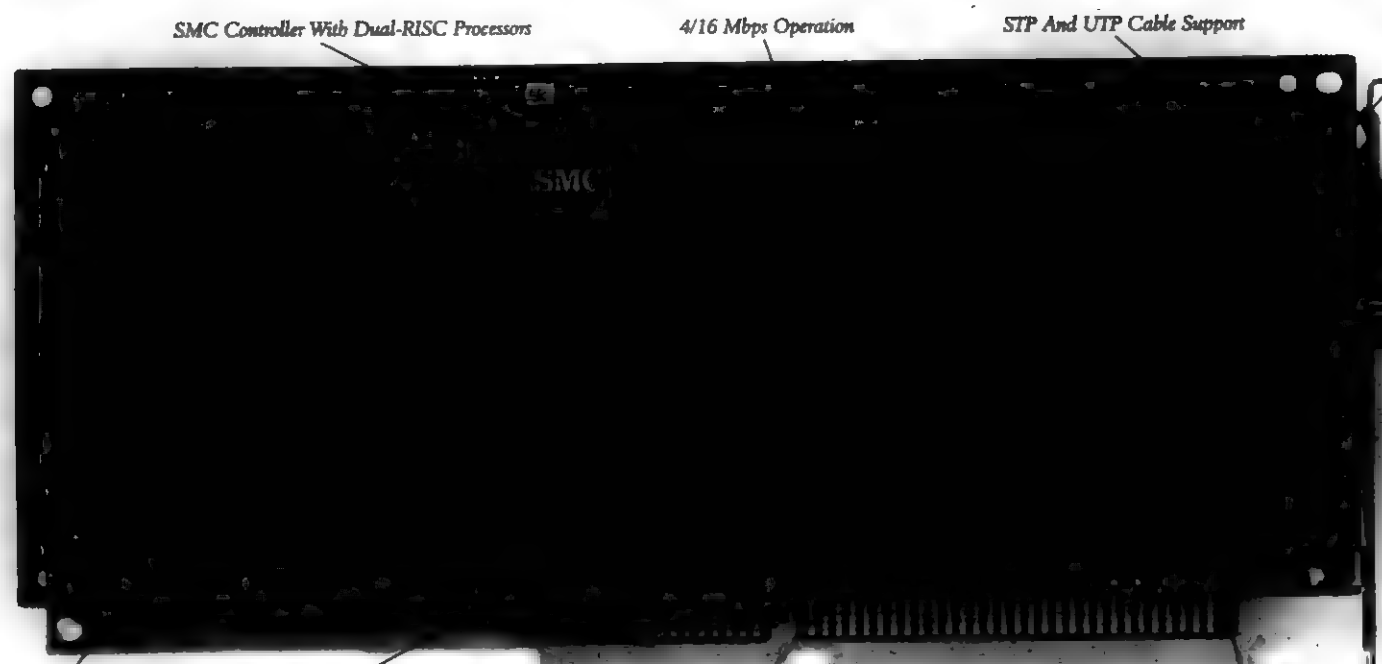

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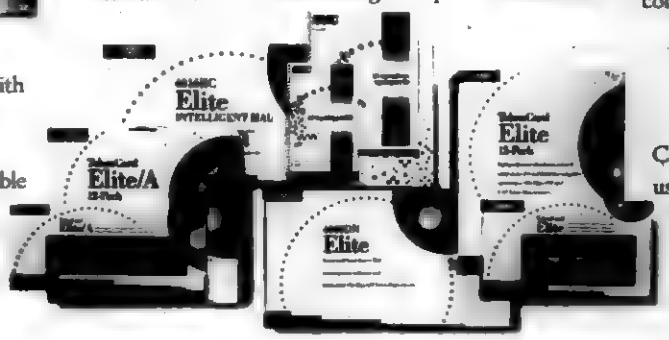

In fact, according to independent network testing laboratory LANQuest Labs, EZStart is "head and shoulders above the others."

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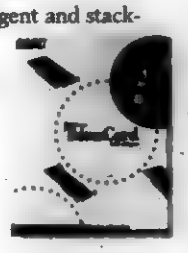

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'Bars' smooth data access

By Michael Vizard

Looking to give users an easy-to-use tool for analyzing data drawn from databases, Computer Concepts, Inc. in Bohemia, N.Y., has released a proprietary database that presents users with a bar chart metaphor.

Called D.B. Express 1.0 for Windows, the database uses dual indexing algorithms to sort through data that has been downloaded from SQL or PC databases. One indexing algorithm keeps track of data stored in D.B. Express, while the second links that data to the appropriate bar chart display.

Attracted by D.B. Express' ability to give end users a tool for quickly doing drill-down analysis of data, Mellon Financial Services in Ridgefield Park, N.J., adopted the product as a component of its Executive Inquiry System.

At Mellon Financial, data from a flat-file system running on an IBM mainframe is downloaded into a Clipper database from Computer Associates International, Inc.; that is then transferred to users running D.B. Express.

"We spent some time up front to set up the interfaces that link D.B. Express and the databases," said Vincent Scilla, Mellon senior vice president of information technology.

Using standard Windows mouse commands, users can navigate through D.B. Express to create bar chart representations of queries. Scilla said he envisions users employing D.B. Express as part of their interactive presentations.

"Whenever you go into a presentation with presorted data, somebody always has a question. Now you'll be able to answer that question by running a query against D.B. Express at the presentation," Scilla said.

Pricing for D.B. Express is $595.

Desktop enhancements

AST adds multimedia to Premmia, Bravo

By Michael Fitzgerald

AST Research, Inc. last week became the latest major PC vendor to add multimedia capabilities to its business-focused PCs, building CD-ROM drives, sound and full-motion video support into its Premmia and Bravo desktop lines.

AST already has such features in its consumer line, where accoutrements such as CD-ROM drives are becoming checklist items. AST joins other PC bigwigs such as IBM PC Co. and Compaq Computer Corp. in adding at least some multimedia features to its business-oriented PC lines.

AST has limited the features to two models: a Premmia with a 33-MHz/66-MHz DX2 chip and a 340M-byte hard drive starting at $3,449, and a $1,627 Bravo LC with a 33-MHz 486SX and a 170M-byte hard drive. AST will bundle Macromedia, Inc.'s Presentation Pak, multimedia clip art and Microsoft Corp.'s Runtime Video for Windows on the Premmia. It will add Microsoft Publisher and Kodak Corp.'s Photo CD Access and Photo Sampler to the Bravo.

Watch your step

AST's cautious step into business-oriented multimedia reflects the market, analysts said.

"It's a big thing in consumer channels but hasn't been prevalent in the business channel," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass.

Zwetchkenbaum said a variety of factors, including digital signal processors, new 16-bit audio boards and Pentium chips, were beginning to spark an interest in the high-bandwidth applications.

While large corporations such as SmithKline Beecham, Inc. and Caterpillar, Inc. have embraced multimedia, many other companies continue to study how to apply the new technologies.

"At this moment it's a little bit premature for us," said Victor Mutnick, corporate vice president at New York Life Insurance Co. Mutnick said New York Life is examining ways to use multimedia and sees it as potentially useful for training and sales.

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Language key for communication

One of the most enticing benefits of object technology for IS managers will be the ability to use a common macro language across multiple applications since they will all, in theory, support the same OLE 2.0 interfaces.

"Having a common macro language is extremely important. I take the covers off a lot of applications. It will be nice to have one language that I can use to build links and interfaces between the applications," said K. C. Madden, a business decision-support consultant at Kraft General Foods International in Rye Brook, N.Y.

In fact, Tim Harmon, an analyst at Meta Group, suggested that the arrival of object technology and common macro languages will radically alter how IS staffs approach application development.

"What you'll have is a core development team that will represent about 15% of your staff, and the rest of the staff will do system integration and component assembly. And a lot of that work will be done in individual departments," Harmon said.

Things to come

Once these technologies are implemented, they promise to greatly simplify the use of software packages that are currently discrete entities unto themselves.

"I do a lot of cutting and pasting. The thought of simply double clicking to open another application is desirable, especially when using a presentation package and you need to open the original parent application to access a file," Madden said.

But in a trade-off to keep these environments manageable, IC managers will probably have to base their approved purchase lists around products that are compatible with the OLE 2.0 implementations employed in the suites from the major PC application software vendors.

As a result, applications from other vendors will essentially become "applets" that plug into a specific suite.

"This will be the path of least resistance for most customers, and the major PC software vendors are certainly counting on it," said Krystyna Filistowicz, an analyst at Datapoint.

— Michael Fisaro

Object technology

CONTINUED FROM PAGE 37

ganization have to support it. Most vendors will not comply with OLE 2.0 until sometime next year, and custom applications built by IS shops probably will not support OLE 2.0 until late next year or early 1995.

In fact, Microsoft has yet to ship a complete OLE 2.0 developer's kit to IS shops, and most developers will hold off major projects until higher-level development tools, such as class libraries and object-oriented programming languages, add support for OLE 2.0.

Waiting on Microsoft

Tools providers say they will not proceed until they see how Microsoft has implemented OLE 2.0 in its Microsoft Office 4.0 suite, which is scheduled to be completed early next year.

"OLE has a reputation for being hard to write for, so a lot of people are going to wait to do anything until the higher-level tools come out," Williams said.

"The OLE 2.0 development kit has not been widely circulated yet in a shrink-wrap form. Most people are working from prerelease kits and are itching to get ahold of it," said Roy Wetterstrom, managing partner at Micro Modeling Associates, Inc., a developer in New York.

But even when developers get the kits, they will find the tools for tracking individual objects in an application are not that robust.

"OLE is not that easy to work with right now, and there's nothing available yet to help you keep track of what's linked to what. I suspect, though, that once you link OLE applications, it will become easier. And the benefits will outweigh the complications," said Krystyna Filistowicz, an industry analyst at Dataquest, Inc. in San Jose, Calif.

> "OLE has a reputation for being hard to write for, so a lot of people are going to wait to do anything until the higher-level tools come out."
> — Brent Williams, International Data Corp.

In the meantime, IS shops will spend the next several months boning up on OLE 2.0. "It's definitely real significant technology that will allow us to build more intelligent applications and robust solutions. As a developer, the benefits will outweigh any of the costs," Claar said.

"People really like the idea of being able to take a module and use it in multiple applications," Wetterstrom added.

In fact, OLE 2.0 represents an advance over existing data integration technologies such as Dynamic Data Exchange (DDE) protocols, which accomplish many of the same tasks. OLE 2.0 is expected to provide a more structured environment for linking applications.

"The problem with DDE is that there is no documentation from anybody on how they used it," Claar said.

Obex the right Rx?

Microsoft's rivals say that while they intend to support OLE 2.0 in future iterations of their software, many of the benefits of object technology can be had in the short term without causing a major upheaval throughout the organization.

To this end, Lotus Development Corp. promotes the object store capability of its Notes database, which provides a mechanism for linking related documents in a database. And Borland International, Inc. has recently begun delivering its Object Exchange (Obex) facility, which provides a relatively thin layer of object technology that can be used to encapsulate data so that it can be exchanged directly with another Obex-compliant application across either electronic mail or network protocols.

But Obex is only a short-term solution that wraps object interfaces around existing DDE protocols and E-mail to give users some of the capabilities of OLE 2.0, said Ezra Davidson, manager of IS at the Brown Organizations, a Los Angeles-based conglomerate that manages radio stations.

"I'll give Obex to my users, but I'm not going to build a corporate-wide strategy around it. I'll wait for OLE 2.0 to do that because it will give me the live links and a common macro language across multiple applications," he said.

— *Michael Vizard*

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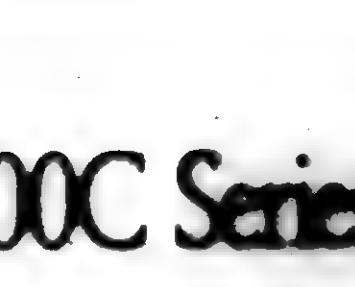

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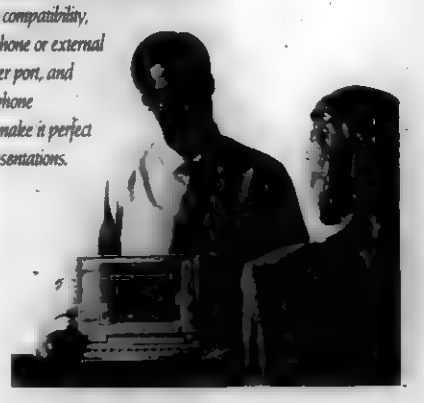

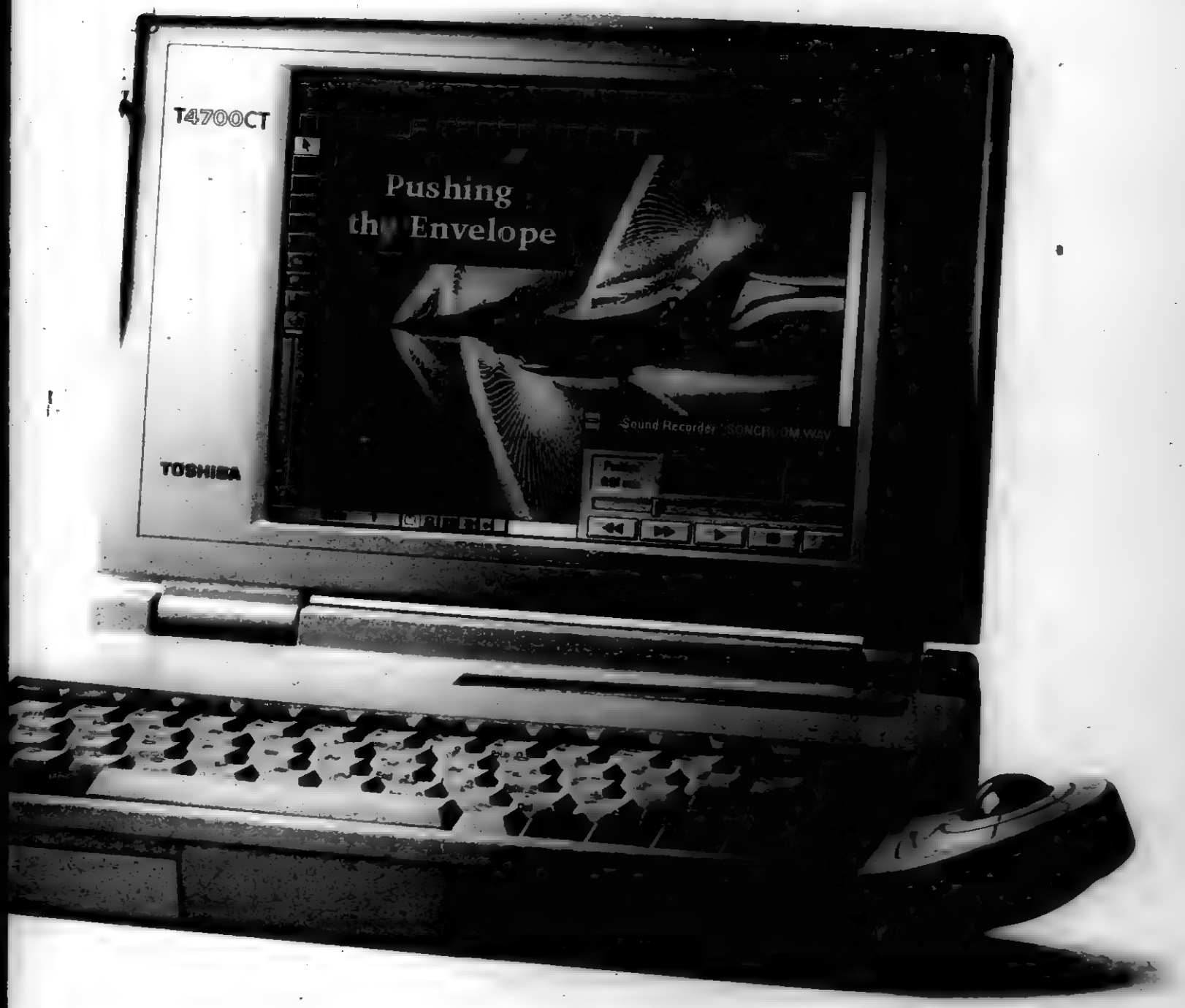

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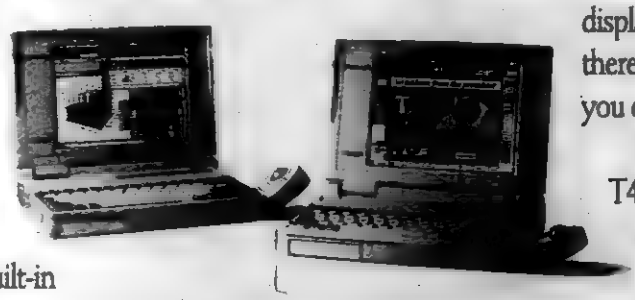

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Jeffrey Henning

Who's the PDA king?

Microsoft could do it again. Apple commercialized the GUI, but Microsoft popularized it and profited the most from it. Apple has just commercialized the personal digital assistant (PDA), but Microsoft has a good chance of popularizing it and profiting the most from it.

The secret to Microsoft's chance for success is that it understands the customer's near-term need for handheld computers better than Apple does.

When describing the Newton, Apple waxes eloquent about a personal assistant's helping people manage their public and private lives; about giving them access to libraries of digital information and helping them easily communicate with others.

It is a compelling vision, but Apple is espousing a vision of a new industry, and new industries take time to build. Software has to be written. Digital information has to be created, and communications hardware and services have to become less expensive.

Microsoft, for its part, is discussing a new market within the existing industry. Microsoft has partnered with Compaq, Intel and VLSI to develop its vision of handheld computing, which it calls the "mobile companion."

The premise of the mobile companion is simple: Users have PCs on their desks but go without computing power when they are away from their desks. In fact, a survey of 1,500 mobile professionals revealed that 58% had PCs at their desks, but only 10% had portable computers when they were away from their desks.

That same survey showed that 70% of the time mobile professionals are away from their desks, they are on-site. For such situations, notebook PCs are too heavy to lug around and too expensive to justify. ("You want me to buy you a PC for when you're in the office but away from your desk?!") Mobile companions, on the other hand, will be half the cost and one quarter the weight of notebooks.

Preaching to the converted

Apple has talked about using PDAs to access digital information, such as travel guides, reference works and electronic books. But there is an insufficient store of digital information to motivate users to purchase PDAs. Moreover, the most important digital information is the information that users create on their PCs. Such information has more value to them than any Fodor's city guide, which, after all, can be picked up for $20 in book form, giving you 80% of the functionality of Fodor's software.

Where Apple plans to create handheld computers for "the rest of us," Microsoft plans to create handheld computers for people who are already computer users. Not only does Microsoft have a target audience more likely to spend money on computers, it also has a target audience willing to put up with conventional technology.

Apple's Newton Intelligence operating system is widely considered to be the most advanced PDA technology planned — but for its market, it has to be.

Same tricks

Microsoft's PDA-like operating system, At Work for Handhelds, is not expected to be particularly innovative, being a subset of Windows with an API that's 80% compatible. This means that At Work for Handhelds reuses past Windows technology rather than pioneering new technology. This makes it easier for independent software vendors — already fluent in the arcane Windows API calls — to develop At Work for Handhelds software.

At Work will feature none of the sophisticated interface capabilities of Newton Intelligence since its prospective users are already comfortable with computers and don't need an easier-to-use interface. Microsoft does not need superior technology to succeed.

Apple's long shot

All is not lost for Apple. Many of the advantages of the mobile companion will be in terms of software designed for PC data access.

If Apple prods its Newton developers to build applications that provide PC data access, the Newton may turn out to be better suited to meet customers' needs for accessing PC data.

Apple's biggest challenge, however, may be in marketing to the installed base of PC users. It's a Windows world, and Windows customers are, for the most part, satisfied with Microsoft. Moreover, these customers view Apple with some suspicion because of its aggressive rivalry with Microsoft.

Unless Apple takes strong action soon to make the Newton more suitable for PC users, it may find itself once again blazing the trail that Microsoft develops into a superhighway.

Henning is a senior industry analyst at BIS Strategic Decisions in Norwell, Mass.

This will rock the com

Audio. Scanner. Floppy. 165,000 Xstones.

The new line of HP ENVIZEX stations is shaking other X terminal makers with its sophisticated features, raw speed and low prices.

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Typical cost: $4,695* for the 165,000 Xstones, 19" color X station. No wonder we're the world's #1 X terminal vendor.† For more details, call 1-800-637-7740, Ext. 7881. In Canada call 1-800-387-3867, Dept. 2308. Then get your company on a roll.

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*CD quality audio, local scanner support and internal floppy drive available as options. Speakers not included. †International Data Corporation, X Business Group, January 1993, by sales revenue.

[redacted]

Software

Baarns Consulting Group, Inc. has announced The Baarns Utilities 5.0, a utilities program designed for Microsoft Corp.'s Excel 4.0 and Excel 5.0.

According to the Sylmar, Calif., company, the product was designed to work with the Excel 5.0 menu structure, plus it offers an autodialer and 23 enhanced utilities.

The utilities include Baarns AutoDial, Baarns AutoSave, Baarns Delete, Baarns Paste Date/Time, Baarns Reminders, Baarns Startup and the Baarns Template Wizard.

A single-user version of The Baarns Utilities costs $89.95.

▶ *Baarns Consulting Group*
(818) 364-6148

Future Labs, Inc. has announced TalkShow Version 2.0, desktop document conferencing software for Windows.

According to the Cupertino, Calif., company, the product can be used for corporate desktop conferencing over wide-area networks because it supports NetBIOS for LANs, TCP/IP and IPX.

Features include multipoint conferencing over modems, a zoom feature, a phone directory, a colored highlighter, a whiteboard pointer and a document presentation tray.

TalkShow 2.0 costs $199 per single-user license.

▶ *Future Labs*
(408) 973-7228

Vermont Creative Software has introduced Vermont HighTest, a software testing tool.

According to the Richford, Vt., company, HighTest was designed for users who produce software for Windows applications. The product records "test scripts" as the user runs a program.

Screen images, keystrokes, mouse events and the internal details of window controls are recorded.

HighTest's interactive Suite Manager joins the test scripts, forming test suites.

Without programming, the Suite Manager creates script hierarchies and sets up loops for multiple script execution.

Vermont HighTest costs $495.

▶ *Vermont Creative Software*
(802) 848-7731

Clinical Research Systems, Inc. has announced Clinical Research System for Windows (CRSWIN), a PC software product for management and analysis of clinical trial and patient data.

According to the Minneapolis company, CRSWIN was created for users interested in collecting, analyzing and managing clinical information, including medical device manufacturers, pharmaceutical manufacturers, universities, hospitals and clinical trial management organizations.

CRSWIN features built-in word processing and can study management functions such as monitoring, reporting, analysis, data entry and data validation.

CRSWIN was designed to run as a single-user or network system in the Windows environment.

Single-user pricing starts at $7,500.

▶ *Clinical Research Systems*
(612) 835-4018

North Coast Software, Inc. has announced Conversion Artist 2.0, an image conversion application for Windows.

According to the Barrington, N.H., company, Conversion Artist 2.0 includes an assortment of imaging and prepress features such as color correction, style filters and image editing.

Screen capture, batch conversion of multiple images and 35 popular image formats and format variants are also included.

Conversion Artist 2.0 costs $149.95.

▶ *North Coast Software*
(603) 664-6000

Asymetrix Corp. has announced an upgraded version of Asymetrix MediaBlitz, a multimedia utility for Windows.

According to the Bellevue, Wash., company, the product allows all levels of Windows-based users to add multimedia to their applications.

Users can combine and synchronize sound, video, graphics and animation to produce a multimedia score. The scores can be used alone or in applications that support Object Linking and Embedding.

The upgrade also features media editing tools, extended graphics capabilities and text support, transition effects and portability capabilities.

MediaBlitz 3.0 costs $95.

▶ *Asymetrix*
(206) 637-1600

Hardware

Micro Express has introduced the NB8266, an active-matrix color notebook.

According to the Santa Ana, Calif., company, the notebook includes 4M bytes of memory, expandable to 20M bytes, a 200M-byte hard disk, 3.5-in. floppy disk drive, color LCD display and a built-in trackball mouse.

The notebook includes a PCMCIA expansion slot and intelligent power management to maximize battery life.

The NB8266 costs $4,499.

▶ *Micro Express*
(714) 852-1400

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petition.

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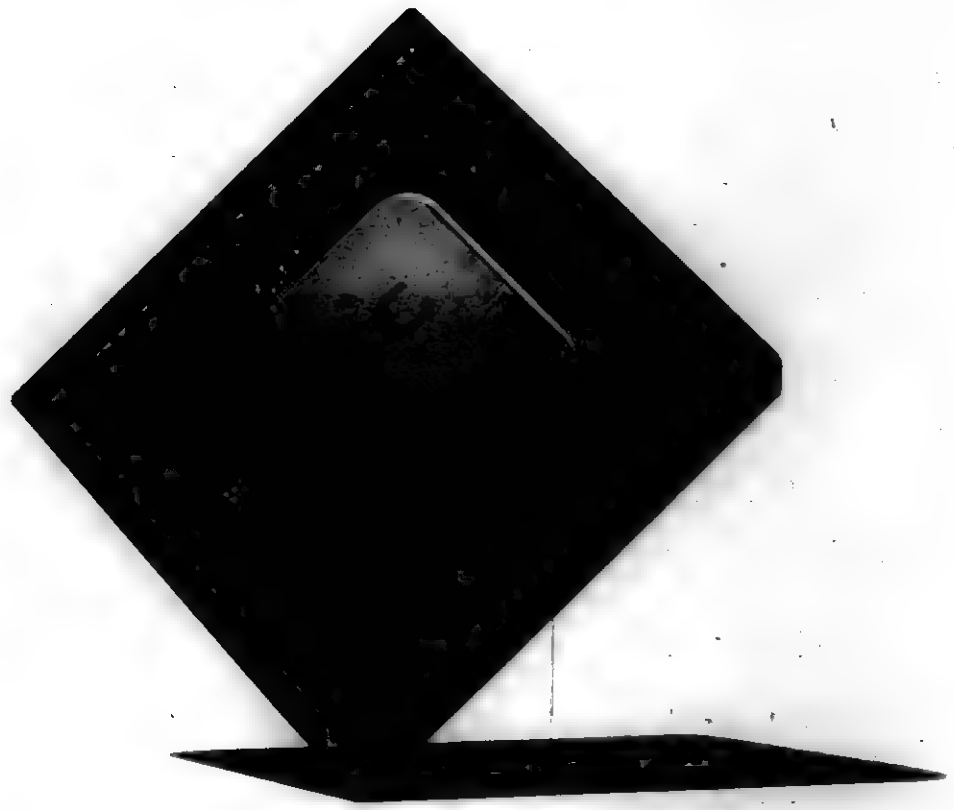

The brains behind Windows NT.™

When Microsoft® went searching for a processor to develop Windows NT,™ where did they turn? To the best brains in the business.

The mighty MIPS R4400 RISC microprocessors.

Which isn't surprising, really. The NEC V_R4400™ 150MHz MIPS processor is already at the heart of the most powerful workstations in the world.

And now, thanks to Windows NT, the same 64-bit brain that powers these machines can be right on your desk. Manipulating spreadsheets. Processing data. And, perhaps, even changing the course of history.

The reason Microsoft chose the MIPS RISC architecture is simple—raw, unadulterated speed. In fact, NEC's V_R4400 runs Windows NT almost twice as fast as Pentium,™ and nearly four times as fast as the 486™ DX2/66.*

So before you buy a computer to run Windows NT, think about what's inside. After all, it only makes sense to choose the quickest processor that processed the program.

If you're responsible for evaluating new PCs running Windows NT, look for the new V_R4400-based systems. They run faster, save you money and even let you use your existing DOS and Windows 3.1 applications.

If you want to discover more about our V_R-Series microprocessors, and to receive a list of systems vendors shipping V_R-Series based PCs, please call NEC Electronics Inc. at 1-800-366-9782. Or fax us at 1-800-729-9288 and ask for Info Pack #167. For information on NEC MIPS-based PCs, call NEC Technologies, Inc. at 1-800-NEC-INFO.

NEC

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Backup industry to become more open

By Stephen P. Klett Jr.

The backup market has lagged the computer industry as a whole in embracing standards. However, recent announcements by Palindrome Corp. and Mountain Network Solutions, Inc. indicate that storage vendors are beginning to change their proprietary attitudes.

The two companies have started shipping backup software for Novell, Inc.'s NetWare environment that they claim is 100% compliant with Novell's Storage Management Services (SMS). SMS is a standard set of application programming interfaces designed to aid reliable backup and storage management application development in a heterogeneous environment.

What full SMS-compliance means for users is that they no longer have to upgrade their backup software when a new version of NetWare is released. In addition, they are no longer locked into one vendor for client support, and they can interchange tape, other media and files among different backup software packages.

"SMS compliance is important because if a change is made to NetWare, you don't want to have to update your backup software and change all your agents as well," said Michael Kaunitz, network administrator at St. Paul Reinsurance Management Corp. in New York.

Both Palindrome's Network Archivist SMS 3.0 and Mountain Network's FileSafe for Windows Rescue NLM support all three main components of the SMS architecture (see story at right).

While many vendors have come out with products boasting SMS compatibility, most have complied with only one or two SMS levels, analysts said. Santa Clara, Calif.-based Mountain Network and Scotts Valley, Calif.-based Palindrome are the first to support all three, they said.

While Kaunitz, who uses Legato Systems, Inc.'s Networker 2.2, agreed that the first two compliance levels were essential, he questioned the practicality of System Independent Data Format (SIDF), the third level, which ensures interchangeability among storage media.

Legato, in Palo Alto, Calif., was one of the first companies with SMS-compliant backup and recovery software when it released Networker for NetWare in April last year. However, Legato is pushing its own standard tape format called Open Tape Format, which more than 30 vendors support, including IBM, Sun Microsystems, Inc. and Silicon Graphics, Inc.

With Open Tape Format, Legato is aiming Networker at users who want enterprisewide storage management from any point on the network. "SIDF is NetWare-centric while [Open Tape Format] is network-centric," said Edward Cooper, vice president of marketing at Legato. "We don't care what server you use for backup."

Kaunitz said Legato's cross-platform approach makes more sense than SIDF, especially for users mov-

Backup industry, *page 51*

SMS compliance

Most NetWare backup software supports the first two levels of Novell's SMS standard

VENDOR	PRODUCT	SMS SUPPORT	PRICE
Conner Storage Systems	Backup Exec for NetWare 4.0	Storage Management Engine (SME) Target Service Agents (TSA)	
Legato Systems, Inc.	NetWorker 2.2 for NetWare	SME, TSA	
Mountain Network Solutions, Inc.	FileSafe for Windows Rescue NLM	SME, TSA System Independent Data Format (SIDF)	
Cheyenne Software, Inc.	ArcServe 5.01 for NetWare Windows Edition	SME, TSA	
Palindrome Corp.	Network Archivist SMS 3.0	SME, TSA SIDF	

The building blocks

Both Palindrome's Network Archivist SMS 3.0 and Mountain Network's FileSafe for Windows Rescue NLM support each of the following three main components that make up the SMS architecture:

- Storage Management Engine (SME): Communicates with network clients through a common interface that ensures the ability to support new platforms and versions of NetWare without requiring a change.
- Target Service Agents (TSA): Software modules that identify and isolate the operating systems of the various nodes on the network and prepare them for backup/restoration to the NetWare server.
- SIDF: Defines a standard format for storing data on storage media and provides tape interchangeability within the Novell environment. It evolved from a consortium of more than 20 vendors, including Compaq Computer Corp. and Digital Equipment Corp.

Notes, Microsoft apps linked

Software packages promise expanded groupware capabilities

By Michael Vizard

Corporate Software, Inc. in Canton, Mass., is out to create a business on top of the schism over groupware between Microsoft Corp. and Lotus Development Corp.

At Lotusphere '93 in Lake Buena Vista, Fla., last week, Corporate Software announced that it has begun beta-testing two utilities that will allow Notes users to access information in Microsoft Project for Windows project management software and Microsoft Schedule+ group scheduling software.

Meanwhile, Cambridge Publishing Group, Inc. in Columbus, Ohio, last week said it will ship a similar Notes-to-Project package, Project Link, on Jan. 1, at a price of $99.

Corporate Software's utilities are built on top of the Mail Express Gateway, which links Microsoft Mail to Lotus' Notes. Corporate Software announced the gateway earlier this year.

Looking for the link

"Project management software is an ideal workgroup application for Notes," said John Casey, director of CSI Technologies, the Corporate Software unit charged with developing new applications.

CSI Technologies' primary focus will be to build tools that link Notes with various applications from Microsoft.

Earlier this year, Microsoft, along with WordPerfect Corp. and Borland International, Inc., announced its intention to add Notes support to its applications. Since then, however, Microsoft has not outlined any specific plans for Notes.

"We don't want to build any products that Microsoft intends to build themselves, so we are negotiating with them to see what they want to build vs. what we can build," Casey said.

Users looking for better way

Meanwhile, users report they are looking for ways to better integrate Microsoft applications with Notes.

Paul Pritchard, manager of end-user computing at Compucom Systems, Inc., a PC reseller and Windows shop in Dallas, said it appears that Microsoft's intention to support Notes is just a feint to hold the market in place while it works on its own workgroup strategy for Windows and Windows NT.

As a result, Pritchard said his company will move ahead with Notes and look to third-party vendors for tools to integrate Notes and Microsoft applications.

Pricing for the latest Corporate Software utilities, scheduled to be available in the first quarter, has yet to be determined.

SQL Access seeks user input through board

By Kim S. Nash

The SQL Access Group has named an advisory board of five industry analysts in an effort to inject more user opinion into standards proposals for getting packaged and user-built applications to talk more smoothly to relational databases.

The group also plans to build more uniform relational database communications blueprints to let users more easily swap databases and query and development tools.

"Our push is to make all tools work with all databases," said Merrill Holt, vice chairman. Holt is also a principal product manager at Oracle Corp.

However, because archrivals such as Oracle and Sybase, Inc. belong to SQL Access Group, cross-product query languages and other interfaces are likely to be slow in coming, Holt acknowledged.

Ultimately, however, competing companies will see the wisdom in cooperating because working together could propel database sales, he said.

"If the overall database market grows because we can deliver interoperability, then this is good for all vendors," he explained.

Because hardware and software makers account for 34 of the group's 39 members, SQL Access Group has been criti-

SQL Access, *page 50*

SQL Access

CONTINUED FROM PAGE 49

cized for not representing user views. Membership fees and the substantial investment of time required to participate have kept some users out, according to John Deutsch, chairman. To join, users, or specification reviewers, must pay a onetime fee of $2,500, plus $5,000 annually. To actually help build specifications, the annual fee is $10,000.

SQL Access had relied primarily on a close relationship with the vendor/user consortium X/Open Co. for user feedback, said Deutsch, who is also technical director at Information Builders, Inc. An unpaid advisory board, which will more closely reflect user views, is scheduled to meet twice a year, with its next confab slated for June 1994. The first meeting was in November.

Elsewhere, the 4-year-old group announced that its call level interface (CLI) specification has advanced from a primitive "snapshot" guideline to the next stage of maturity, dubbed a "preliminary specification."

The SQL Access CLI defines interaction between third-generation languages such as C or Cobol and SQL, which is used to talk to relational databases. Microsoft Corp., Fulcrum Technologies and other software firms had built CLI into products such as Open Database Connectivity gateways when CLI was still in snapshot stages.

Data access

Business Objects enhances database query facility

By Michael Vizard

Business Objects, Inc. in Cupertino, Calif., this week will release Version 3.0 of Business Objects, which adds a CASE Access utility that automatically maps Business Objects to a data dictionary running on a SQL database.

In addition, the release adds support for a companion product that lets users perform multidimensional analysis on data stored in Business Objects, a report writer and the ability to access SQL databases via Microsoft Corp.'s Open Database Connectivity interface.

According to Business Objects executives, the ability to automatically map the software — which was designed to allow end users to query databases without knowing any SQL commands — was required to make it easier to configure systems for end users.

> Nintendo chose the tool because it gives users access to data but retains some IS control.

But information systems departments may still prefer to map Business Objects to SQL databases manually because most SQL databases were not created with the goal of giving end users the ability to do queries.

"Most of the names used in a database are not all that user-friendly, so you may not want to adopt those names. We find it more effective to work with users to create names for the object they want to work with and then map them to the SQL database. Most of the names in the SQL database tables were created with application developers in mind," said Brian Cheney, PC project leader at Nintendo America, Inc. in Bellevue, Wash.

Giving users access to data

Cheney said Nintendo adopted Business Objects because it was looking for a tool that could give users access to data, while keeping a modicum of control in the hands of IS. In contrast, PC applications that have SQL interfaces are not linked into any database management services.

"We wanted to protect ourselves from runaway queries," Cheney said. In addition, he noted that since Business Objects is used primarily as a read-only querying tool, IS managers do not have to worry about users tampering with the integrity of a database through updates.

CASE Access will initially support computer-aided software engineering (CASE) data dictionaries from Oracle Corp. Drivers for products from other CASE vendors will be available in 1994.

Pricing for Business Objects, which runs on Windows, Macintosh and Unix platforms, is priced at $595 per user. The database administrator module is priced at $3,495. Business Analyzer is priced at $250.

Backup industry

CONTINUED FROM PAGE 49

ing to client/server environments.

While analysts said the appearance of compliant products was a good sign for SMS' viability as a standard, they said a good deal of confusion still surrounds full SMS compliance.

"There's a lot of finger-pointing going on right now among all the vendors, which makes it hard to tell how much of this SMS hype is a marketing ploy," said Stan Corker, an analyst at International Data Corp. in San Diego. However, Corker said Palindrome and Mountain Network's added SMS capabilities probably make up for some of the weaknesses of proprietary backup software.

Changing their proprietary nature is becoming a necessity because of customer preoccupation with open systems, which may result in a better quality product, said Nick Blozan, product manager for SMS at Mountain Network.

Network Archivist SMS 3.0 integrates backup, automatic archiving and hierarchical storage management. FileSafe for Windows offers traditional backup/restore functions plus automated disaster recovery features. Both are available now as NetWare Loadable Modules and cost $1,695 and $495, respectively.

Forms Engine takes off in federal agencies

By Gary H. Anthes
WASHINGTON

Surely no organization has more forms, or more forms users, than the federal government. That may explain why a PC-based software package that helps users design, fill out, transmit, print and store forms is moving into high gear here.

Called Forms Engine, the product was developed for the U.S. Army by Computing Devices International, a unit of Ceridian Corp. in Falls Church, Va. Under the agreement with the Army, Forms Engine is available free to any federal agency, and it has found uses so far in the White House, NASA, the departments of Agriculture, Commerce, State and Veterans Affairs and a few other places.

There are some 250,000 users in the government, and there is a Forms Engine Users Forum, according to one user.

Changes live

Veterans Affairs has given Forms Engine to about 300 of its employees, according to Mike Berger, director of records management.

"One fellow E-mailed me the first time he used it and said, 'Forms Engine has changed my life. I never knew how much I hated [manual] forms until the first time I did it automated.'" Berger said.

Veterans Affairs, like all agencies, abounds with multipart paper forms. For example, the old travel expense forms have 10 parts separated by carbon paper. They could be filled out using typewriters and impact printers, but those are giving way to laser printers — which cannot handle the multipart forms — as part of the agency's systems modernization program.

Enter current figures

Now, Forms Engine users enter travel expense data on the PC-based Forms Engine, Berger said. Users can call up their last submitted travel form and change those fields unique to the current trip. Totals and extensions are done automatically, and the resulting form is routed to a laser printer to print the number of copies specified.

In addition to boosting speed and accuracy, Forms Engine eliminates the need to procure, ship and store paper forms, Berger said. He said the old travel forms cost 19 cents each, and although he did not know the cost of the Forms Engine equivalent, he said it will save the agency money.

Berger said the agency does not yet use the communications feature of Forms Engine, which uses a store-and-forward technique to route forms to various network nodes for storage or approval. "That's logically the next step toward the paperless office," he said.

Outside the government

John E. Hodor, program manager at Computing Devices, said he is setting up a new company next month called Software Systems Engineering to sell Forms Engine outside of the government. It will be priced at $49 for a single user. The company will continue to support federal users and provide the software free to the government, he said.

Forms Engine runs on Intel Corp. 80286 machines or higher running MS-DOS 3.1 or later. It needs 400K bytes of free memory and a hard disk.

It can import word processing files and send forms in encrypted mode. A later version will be able to interact with a number of databases. It also contains a 60,000-word spell checker.

Although Software Systems Engineering will train users in forms design and programming for a fee, Hodor said he anticipates that most users will contract with his company to do that. Charges to implement most forms will fall between $200 and $500, he said.

System melds image technology

E-Quip Office-in-a-Box aimed at small offices

By Ellis Booker

Alacrity Systems, Inc. in Hackettstown, N.J., recently introduced a hardware/software system that adds fax and office copier functions to a document imaging software package.

Alacrity's $499 E-Quip Office-in-a-Box bundles Alacrity's E-Quip document filing and retrieval software with a sheet-fed, gray-scale scanner (it doubles as a copier) and an add-in card that provides a 9.6K bit/sec. Class II send/receive fax modem and a 2.4K bit/sec. data modem.

The software also includes an optical character recognition tool from Calera Recognition Systems, Inc.

The bundled offering is "aimed squarely at [small office/home office] users," said Alacrity President Jim Folts.

Bundling hardware and software to take the guesswork out of an imaging system has been done with some dedicated systems, but Alacrity is the first to try the approach on a general-purpose PC Windows platform.

"This [product] addresses not just document imaging but scanning, copying and printing," said Barry Tepper, an industry analyst at BIS Strategic Decisions in Norwell, Mass.

The functions of Office-in-a-Box are accessed through nine E-Quip applications, including Copier, Scan-to-Fax and Viewer. Selecting the copier icon, for instance, turns the PC and attached scanner and printer into a personal copier combination able to reduce or enlarge documents from 50% to 150% and collate the output. All the applications can work as background tasks.

Office-in-a-Box requires a 386-class or higher PC with 4M bytes of memory, Windows 3.1 or higher and DOS 5.0 or higher. It will be available through superstores, consumer electronics stores, office product distributors and selected dealers.

At the same time, Alacrity apparently wants to appeal to a broader base than single-user workstations. Recently, the company introduced a version of its document imaging software that runs under Microsoft Corp.'s Windows for Workgroups. E-Quip-Workgroup Imaging sells for $2,995 for a five-station kit. The kit includes a 50-MHz coprocessor card for each Windows for Workgroups client, which contains a fax server modem, a scanner interface and a high-speed printer interface.

[redacted]

Acorn Software, Inc. has announced VirtualBranches for OpenVMS VAX and VMS VAX.

According to the Marlboro, Mass., company, the product allows OpenVMS to view an optical jukebox as multiple virtual disk volumes that appear simultaneously mounted.

VirtualBranches enables configurations that offer an appearance and performance of 64 virtual volumes from a jukebox housing 32 double-sided optical platters and, in a larger jukebox, 288 virtual volumes from a 144-platter device.

VirtualBranches is priced from $5,800 for a Hewlett-Packard Co. 10LC Optical Disk Library.

▶ *Acorn Software*
(508) 485-9669

Open Systems, Inc. has announced Executive Information Summary, a module designed for the company's Open Systems Accounting Software family.

According to the Eden Prairie, Minn., company, the module provides up-to-the-second flash reports of strategic business performance indicators.

Users can retrieve status reports of sales, margins, inventory turns, balance sheet analysis and ratio analysis in the form of Executive Information Summary Dashboards.

Prices range from $900 to $1,200 per module.

▶ *Open Systems*
(612) 829-0011

NEC Technologies, Inc. has introduced the NEC Image RISCstation and the NEC Express RISCserver, two IBM RISC-based systems.

According to the Boxboro, Mass., company, the systems incorporate the 64-bit NEC V 4000 family of microprocessors based on the MIPS RISC architecture.

Designed to enhance the performance of Microsoft Corp.'s Windows NT, the systems take advantage of both multitasking and multithreaded I/O operations features.

The NEC Image RISCstation features 16M bytes of RAM expandable to 128M bytes, 10Base-T local-bus Ethernet, local bus SCSI-II and local bus video.

The NEC Express RISCserver comes with 32M bytes of RAM expandable to 128M bytes on the system motherboard and up to 512M bytes of total system RAM when using an optional memory expansion board.

The NEC Image RISCstation costs $3,749, and the NEC Express RISCserver is priced under $10,000.

▶ *NEC Technologies*
(508) 264-8000

[redacted]

Brace yourself for the kind of speed and performance that makes other servers look like they're standing still. The newest PS/2® Servers do more than run. They fly.

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85 Server

SynchroStream™ controller, IBM PS/2 Servers can exploit the full power of their Pentium™ 66 MHz or 60 MHz chips and 256KB of L2 cache. And we can prove it: in complex workloads using popular workgroup applications, the PS/2 Server 95 Array beat a similarly equipped Compaq SystemPro XL by a

95 Server

Lotus Development Corp. has announced Release 2 of the Lotus Notes:Document Imaging (LN:DI) family.

According to the Cambridge, Mass., company, LN:DI allows Notes users to easily incorporate paper-based information into their Notes applications.

Using the groupware services of Notes, users of various workgroup sizes and remote users can access and share scanned documents and fax images across LANs and wide-area networks.

Imaging systems can be enhanced in modular increments as needs grow, and users can add imaging support to their desktops.

Usability enhancements for the LN:DI Image Viewer include support for Object Linking and Embedding and an improved scanning user interface.

The LN:DI Image Viewer costs $99.

▶ *Lotus Development*
(617) 577-8500

Chorus Systems, Inc. and **The Santa Cruz Operation** have introduced Chorus/Fusion for Santa Cruz Open Systems Software.

According to Chorus Systems in Beaverton, Ore., the product has a microkernel architecture and extends Santa Cruz Operation systems software to ease integration of complex real-time systems. It also allows for clustered computing.

Components within the product include the Chorus/Fusion Real-Time Santa Cruz Operation Open Server, the Chorus/Fusion Real-Time Node and the Chorus/Fusion Development System.

Chorus/Fusion Development System costs $29,950; the Chorus/Fusion Real-Time Server runtime (in 10-unit quantities) is priced at $1,118, and the Chorus/Fusion Real-Time Node runtime (in 100-unit quantities) costs $400.

▶ *Chorus Systems*
(503) 690-2300

I-Kinetics, Inc. has introduced I-Bridge, a family of software products that allow Windows applications to directly access databases, programs and files on Unix servers.

Through a single driver with automatic data conversion, clients of I-Bridge can communicate with a variety of Unix data sources, including different databases.

According to the Cambridge, Mass., firm, an interactive user interface tool called I-Bridge Wizard is also included.

A starter system, including a Unix server module and two Windows client modules, costs $995.

▶ *I-Kinetics*
(617) 661-8181

Dun & Bradstreet Software has announced that its SmartStream Decision Support 2.0 application is available for Sun Microsystems, Inc.'s Solaris 2.2/SPARC computing environment.

According to the Atlanta company, SmartStream Decision Support is part of the SmartStream Series, a client/server-based enterprise solution comprising integrated business applications, comprehensive decision-support facilities and a work-flow enabled platform.

Pricing for SmartStream Decision Support running on the Solaris 2.2/SPARC distributed computing environment begins at $100,000.

▶ *Dun & Bradstreet*
(404) 239-4636

Innovatech Corp. has introduced DocWorx, an open-architecture electronic image management software product.

According to the San Diego company, the software provides complete features for the capture and input, storage and management and retrieval and output of electronic images, along with document routing.

DocWorx software modules consist of a relational database server, DocWorx clients, fax server, jukebox server, scanner interface module, high-speed image print software module, character recognition module and full text-retrieval engine.

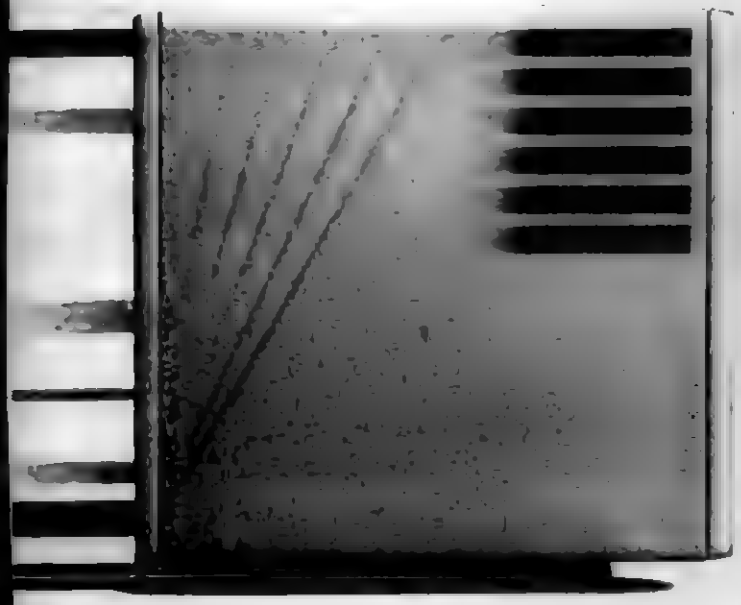
The software runs on existing networks and computer platforms and can seamlessly integrate almost any leading off-the-shelf hardware component into the system. DocWorx was designed for commercial and government markets using applications that include litigation support, image management of shareholder accounts and operations records and check processing.

Pricing starts at $5,000 for a single scalable development system.

▶ *Innovatech*
(619) 793-8789

Product shorts

Procom Technology, Inc. has announced the LANForce-5, a disk array subsystem that provides fault-tolerant storage at RAID Level 0, 1, 3 and 5. The product supports up to seven Fast SCSI-2 drives and provides 1.1 to 12G bytes of protected storage. Cost: $7,995 to $21,495, depending on the capacity of drives in the system. Procom Technology, Irvine, Calif. (714) 852-1000.... **Structural Dynamics Research Corp.** has announced I-DEAS Master Series software for IBM's PowerPC-based workstations running under IBM's AIX Unix operating system. The product provides integrated systems for solid modeling, computer-aided testing, finite element modeling and analysis and drafting and manufacturing. Cost: $6,000 to $69,000. Structural Dynamics, Milford, Ohio (513) 576-2400.



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IBM

*IBM internal study. for more information and configuration of competitor machines, call 1 800 772-2227. IBM intends to support future overdrive processor upgrades based on Intel Pentium technology for the PS/2 Server 85 (9585) 433 and 466. IBM and PS/2 are registered trademarks and SynchroStream is a trademark of International Business Machines Corporation. Pentium is a trademark of Intel Corporation. All other brands or product names are registered trademarks, trademarks, or service marks of their respective holders. © 1993 IBM Corp.

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FastRoute From GDC Delivers High-Throughput LAN Connectivity With Advanced V.fast Technology.

The new FastRoute Dial-Up Bridge/Router from General DataComm puts you on the fast track to easy, seamless LAN interconnection.

A dial-up solution with full V.fast capabilities, FastRoute can provide the highest effective LAN-to-LAN throughput in the industry over regular phone lines. So its performance is superior, and its value unparalleled.

In another technical achievement, FastRoute combines multiprotocol routing with dial-up bridging. That means the unit can operate effectively in complex environments with all kinds of specialized protocols and all types of challenging remote connectivity applications.

FastRoute is easy to set up and contains a number of breakthrough ease-of-use features, including remote downloading of software and configuration as well as the ability to run multiple sessions over the same physical link. FastRoute's AutoLearn capability allows routing table setup and storage without manual intervention.

Additionally, the unit's router hunt group feature provides unique convenience. FastRoute can automatically dial up any of five different stored numbers for outbound connections to remote sites. For remote users seeking inbound routing, FastRoute can exchange routing table information, so a remote site can connect to ***any*** available central site unit.

This provides a very cost-effective method of achieving LAN interconnection from multiple remote sites with maximum performance. Every time you connect, you're guaranteed a one-to-one connection with full throughput benefits.

When you need on-demand LAN connectivity from remote sites, FastRoute provides a high-throughput solution without leased line expense.

Besides its many branch office applications, it's ideal for dial restoral to back up dedicated router links, and for remote network management.

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DECnet/OSI ships early, but interest low

By Craig Stedman

■ Still trying to find a wider market for its DECnet/OSI backbone networking software, Digital Equipment Corp. has started shipping a version supporting the Alpha AXP version of OpenVMS ahead of a schedule that was laid out earlier in the year.

The company in June said the introduction of DECnet/OSI for OpenVMS AXP would be delayed from the second half of this year into early 1994.

But Mary Ellen Fortier, DECnet/OSI marketing manager, said last week the company was able to finish development of the product more quickly than anticipated.

Digital now offers DECnet/OSI for OpenVMS on both the Alpha and VAX hardware lines, in addition to supporting its DEC OSF/1 operating system on Alpha. However, analysts said demand for the OSI transport remains low, with interest limited to a few specific markets and geographies.

"Obviously there are people who have implemented OSI, but I think the time for doing that on a broad scale has passed," said Richard Villars, director of computer network architecture research at International Data Corp. in Framingham, Mass.

OSI gets some use with workstations and minicomputers due mainly to federal government purchases, but even in those sectors it has less than a 10% market share, Villars added. "It's just hard to build a groundswell for it, especially for the full [protocol] stack or the transport layers."

Matt Holdrege, senior network specialist at PacifiCare Health Systems, Inc. in Cypress, Calif., said his company has "no need" for DECnet/OSI. PacifiCare, a health maintenance organization, uses the proprietary DECnet Phase IV for VAX-to-VAX networking and TCP/IP for its multivendor operations.

Support concerns

"TCP/IP matches OSI in every step," Holdrege said. He added that he is "very concerned" that Digital may eventually support only DECnet/OSI, which incorporates the DECnet Phase IV protocol but uses a different command language for network management than the earlier product does.

"We don't want to be forced by DEC to start using OSI," said Holdrege, who is chairman of the Digital Equipment Computer Users Society's network management working group. "Going to DECnet/OSI from Phase IV would require a massive amount of work for people with large systems and networks."

Bill Stella, senior vice president of information services at Arkwright Mutual Insurance Co. in Waltham, Mass., said he too is not interested in DECnet/OSI for the time being. Arkwright has about 30 VAX systems spread throughout its offices, with more than 1,000 users connected to the machines.

Integrated addin
DECnet/OSI for OpenVMS AXP integrates OSI and DECnet Phase IV network protocols, allowing existing DECnet applications to run unchanged.
- OSI Application Gateways enable communications between OSI and TCP/IP systems.
- Features include OSI addressing, supporting networks of virtually any size.
- Built-in OSI supports File Transfer, Access and Management and Virtual Terminal Protocol.
- Supports any Alpha AXP system and OpenVMS version 1.5.
- Pricing ranges from $2,116 to $21,701, depending on license type and platform.

Equal support for OSI and TCP/IP

Fortier noted that Digital expects to see demand for OSI as a transport in the telecommunications and financial services industries, in addition to the government market. Companies with global networks that want to avoid address limitations are also viewed as potential customers for DECnet/OSI, she said.

However, Fortier added that the company plans to support DECnet/OSI and TCP/IP "equally across all our product lines." Digital is already shipping TCP/IP services for OpenVMS AXP and has committed to adding support for running OSI applications over TCP/IP to the OpenVMS versions of DECnet/OSI in the future.

Frank Dzubeck, president of Communications Network Architects, Inc., a Washington consultancy, said applications such as X.400 messaging and X.500 directory services are the key parts of OSI, not the transport itself. "OSI's real purpose is as a service layer," he said.

The transport is finding "certain pockets of interest" in such places as Germany, Japan and the federal government here for interagency communications, Dzubeck noted. DECnet/OSI is only likely to have "a niche presence" as a result, he said.

Steve Jackowski

Managing bandwidth

"More bandwidth" seems to be the prescription for all of today's networking headaches. Sure, more bandwidth is required for new bandwidth-hungry applications such as file serving, image transfer, multimedia and videoconferencing.

But just as we learned that you don't mix batch or print traffic on the same network segments as your interactive traffic, we should be forewarned that no matter how much bandwidth we have, similar problems will arise when real-time data, file transfer, transaction processing, voice, image and video have to compete in shared networks.

LANs are shared networks. So are frame relay and Asynchronous Transfer Mode networks. The promised savior, Open Systems Interconnect, has been vanquished by TCP/IP, whose connectionless services frustrate users of both the Internet and countless Internet Protocol router backbone networks. In a connectionless network, there are no guarantees. We all compete for service.

Competition for bandwidth will only increase our business problems as our networks become less and less predictable because, in competition, someone has to lose. Even the new ATM messiah has issues of congestion and end-to-end reliability; again, no guarantees. The hungriest applications will still consume most of the bandwidth increases.

So what's the answer? Bandwidth management.

Bandwidth management says that, instead of just throwing a bigger pipe at communications problems and letting applications and users compete for bandwidth, we'll effectively manage that pipe through three mechanisms: scheduling, regulation and resource reservation.

Scheduling sets the times at which data will be transmitted. Within a given node, this can prevent competition between applica-

Jackowski, *page 57*

Health care

Electronic medical network planned

By Mitch Betts
WASHINGTON

An industry task force, filling in many of the technodetails missing from the Clinton administration's health care reform legislation, called for large insurers, medical groups and employers to implement ANSI X12-based electronic billing and payment networks by the end of 1994.

The Workgroup for Electronic Data Interchange (WEDI) said the basic X12 standards are in place for electronic medical claims, and it will publish implementation manuals by mid-1994 for distribution to doctors, hospitals, payors and EDI vendors.

The WEDI blueprint would spell the end of patients filling out insurance claim forms, but it remains to be seen whether the industry can meet the aggressive deadline.

LeRoy Anderson, senior vice president at Sheldon I. Dorenfest and Associates Ltd., a Chicago consultancy specializing in health care information systems, said it is "next to impossible" for the industry to move that fast. He said widespread EDI implementation is more likely by late 1995 or mid-1996.

Anderson said some industry players lack the money for system upgrades and others lack the incentive to get on the EDI bandwagon. WEDI officials said a federal mandate will be needed to bring stragglers into the EDI fold.

EDI: HALFWAY CURE

PERCENTAGE OF MEDICAL FACILITIES THAT USE ELECTRONIC DATA INTERCHANGE FOR THE FOLLOWING APPLICATIONS:

CLAIMS PROCESSING: 68%

REMITTANCE PROCESSING: 54%

ELIGIBILITY VERIFICATION: 43%

BASE: MARCH 1993 SURVEY OF 571 HEALTH CARE INFORMATION SYSTEMS EXECUTIVES

SOURCE: Healthcare Information and Management Systems Society, Chicago

Some doctors have been reluctant to adopt EDI because of the hassle of needing four or five terminals for the proprietary formats of different insurers. But Lynn E. Jensen, vice president of the American Medical Association (AMA), said that barrier will fall when vendors of physician practice management systems upgrade their software to comply with the X12 standard.

Moving to standardized, paperless transactions could shave $42 billion from the nation's medical bill

Medical network, *page 56*

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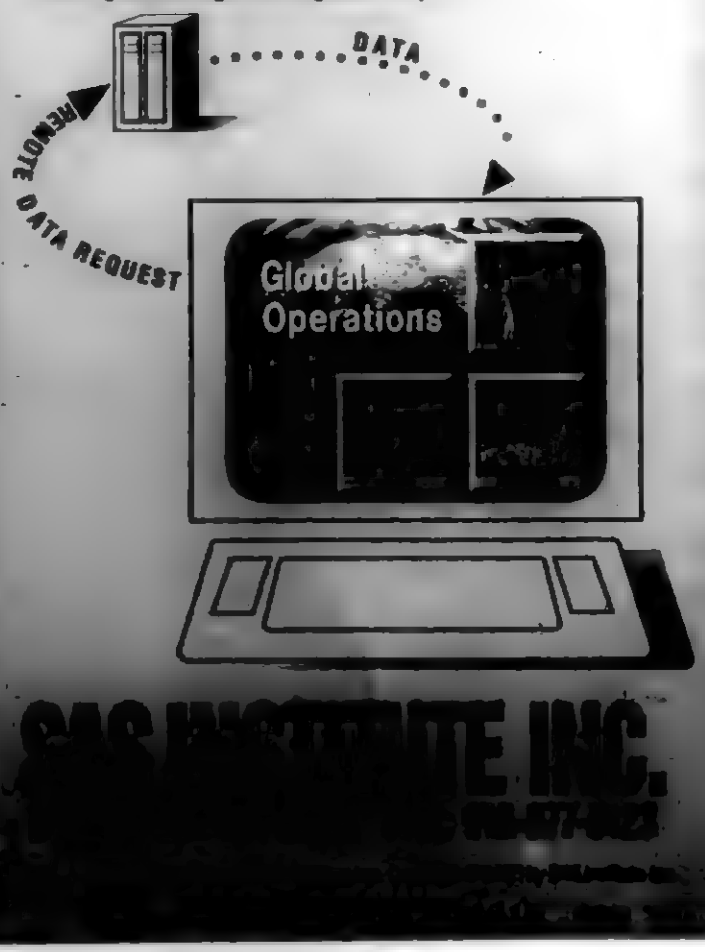

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High-speed networking

N.Y. hospitals join forces

Network will track patient care throughout region

By Mitch Betts

At a time when hospitals are under intense pressure to cut costs and beef up their information systems, hospitals in western New York state have decided they can no longer do it alone.

Eight hospitals in the Buffalo, N.Y., area, along with the State University of New York at Buffalo, are jointly creating a high-speed fiber network for sharing medical data that could improve patient care. The network is expected to be operational by year's end.

In essence, the Fiber Distributed Data Interface (FDDI) network provides the infrastructure to track the care of patients throughout the region, according to John Hammond, IS director at the Western New York Health Sciences Consortium.

The first applications are likely to be a shared clinical database and a centralized patient index, Hammond said. In addition, the network will be the conduit for an extensive, on-line medical library.

The on-line medical library, known as Hubnet and run by the university, will provide consortium members with the equivalent of 6.5 million pages of medical data, from sources such as the National Library of Medicine.

A distinct advantage of this shared library network is that it eliminates the need for each hospital to subscribe to medical information services. Moreover, the group can buy and support a bigger system than any single institution could afford on its own, said John Loonsk, director of medical computing at the university.

Teaming up

Members of the Western New York Health Sciences Consortium include the following:

- Buffalo General Hospital.
- Children's Hospital of Buffalo.
- Erie County Medical Center.
- Mercy Hospital of Buffalo.
- Millard Fillmore Hospitals.
- Roswell Park Cancer Institute.
- Sisters of Charity Hospital.
- Buffalo VA Medical Center.
- State University of New York at Buffalo.

Expenses consistent

"The hospitals will be paying about the same as before," Loonsk said, "and they'll be getting a lot more for their money."

The consortium contracted with Nynex Corp.'s New York Telephone unit to provide the FDDI network. "Compared with our current data-sharing capability, it's like expanding a highway from one to eight lanes," said John E. Friedlander, president and chief executive officer at Buffalo General Hospital, a key participant.

Gerald Wilson, vice president of information services at Buffalo General Hospital, said New York Telephone will serve as the switching hub for the network and route data to the right destinations.

Friedlander said the network dovetails with health care reform because it is "a multiprovider, fiscally responsible, shared solution, which otherwise would have been duplicated eight times over by each of the consortium participants."

Medical network

CONTINUED FROM PAGE 55

during the next six years, WEDI estimated. The task force, with members from a variety of insurance and medical interest groups, was formed in 1991 at the request of the U.S. Department of Health and Human Services.

Reform bills from Republicans and Democrats have incorporated previous WEDI recommendations, so the latest WEDI report is likely to affect the shape of federal legislation next year.

Confidentiality issue

WEDI unveiled model legislation to protect the confidentiality of patient data and recommended that the patient identifier be the Social Security number—an issue the Clinton administration found too hot to handle.

Privacy advocates have argued that a new numbering scheme should be invented because the Social Security number could be used to link health records with immigration, tax, welfare and marketing databases.

The issue was hotly debated within WEDI, insiders said, but the practicality and low cost of using the Social Security number won out.

WEDI's report meshes nicely with the administrative portions of Clinton's reform plan, noted Joseph T. Brophy, WEDI's co-chairman and a former IS executive at The Travelers Corp.

"Standardized and uniform data across the entire industry will make it possible to establish the regional data centers envisioned by the president," Brophy said.

Moreover, both WEDI and Clinton call for a health identification card that carries only basic administrative data.

WEDI said it will develop a standard for the data content and format of the card.

Major segments of the health care industry endorsed the WEDI recommendations, including the Health Insurance Association of America, the AMA and the Denver-based Medical Group Management Association.

Network management

StarSentry adds to range

By Elisabeth Horwitt

AT&T/NCR's StarSentry recently added significantly to the range of networking environments it can manage, through the support of third-party products.

With the support of Peregrine Systems, Inc.'s ServerView/StarSentry and StationView/StarSentry, NCR's platform can manage Novell, Inc. NetWare servers and clients.

Bridgeway Corp.'s EvenIX provides StarSentry with the ability to monitor various systems that do not comply with the Simple Network Management Protocol.

NetWork Application Technology Inc.'s Multi-Vendor Support Series, EtherMeter, is said to monitor and diagnose LAN traffic using the Remote Monitoring standard. It then sends the results to StarSentry.

Isicad, Inc.'s Command 5000 is said to collect and display network asset and configuration information on the StarSentry graphical user interface.

Jackowski: Managing bandwidth

CONTINUED FROM PAGE 55

tions for the network and its bandwidth. In a network, coordinated scheduling among network processors reduces network bottlenecks. At the lowest level, coordinated network scheduling can reduce or eliminate contention on networks like Ethernet to guarantee access to high-priority applications.

Regulation ensures that applications stay within their bounds and do not flood the network with data to the detriment of other applications. Resource reservation provides guarantees that streams of data can be delivered in a timely fashion.

Making reservations

If an application on one system needs to transmit priority data to another, it can reserve the network resources to guarantee delivery and associated quality of service. Normal quality-of-service options are throughput (message rate, number of messages and message size), network delay and reliability. Within these, refinements can be made based on the type and content of traffic.

In particular, it is possible to set the rate of a stream, the priority of a stream (in priority-based networks), the deadline for the data (including individual frames) and the types of errors that are acceptable. For example, in video transmission, bit errors may be acceptable.

To enable these types of bandwidth services, new protocols are being implemented. Perhaps most prevalent among these is the ST-II, the Internet Streams Protocol (RFC 1190).

ST-II was designed to be used across the Internet for traffic that "absolutely, positively has to be there." It actually establishes a path and then reserves bandwith, buffers and CPU cycles for every processor along a communications route.

It guarantees that time-dependent data will arrive on schedule without competing against other network traffic — sort of a commuter lane for designated priority traffic.

The Department of Defense's Simulation Network uses ST-II for real-time simulation across the Internet and worldwide videoconferencing. Berkomm, the video conferencing and video mail service established during the German reunification, also uses it. And IBM's Ultimedia client/server products rely on ST-II to support multimedia applications running across networks.

Likely candidates

As bandwidth-intensive applications such as multimedia and videoconferencing are successfully deployed in networks, other more traditional network applications, which are likely to suffer from the additional competition, are viewed as candidates for the new reservation technology. Among these are backup, file transfer and imaging. ST-II is even being considered for SNA tunnelling across Internet Protocol backbone networks.

The key to successful implementation of bandwidth-management products will be their transparency to most applications.

Already, vendors of superserver products are implementing bandwidth management under the covers of their client/server offerings.

During the first quarter of 1994, regulation products will be available to the desktop. These will transparently control access and thus eliminate overrun and congestion in existing networks. Router vendors have already begun to support protocols like ST-II to enable routed multimedia and desktop videoconferencing, and operating system vendors are looking at the new technology to facilitate truly distributed computing.

Jackowski is vice president and chief technical officer of Syzygy Communications, Inc. in Scotts Valley, Calif., which specializes in consulting and development in the area of bandwidth-management technology.

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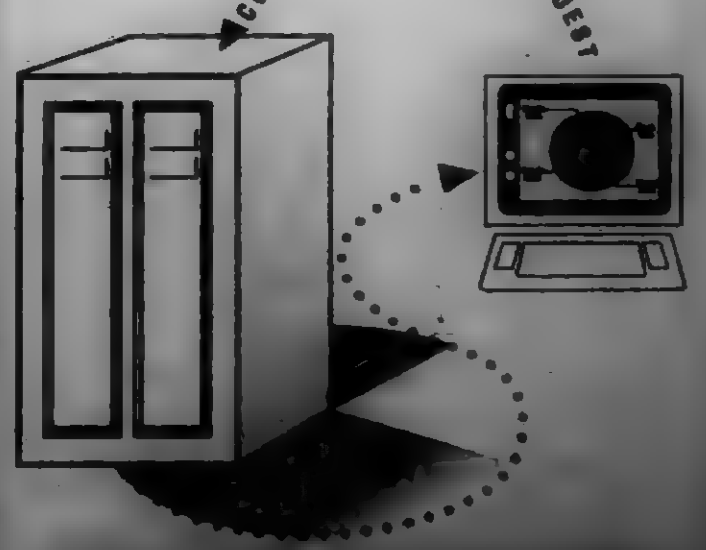

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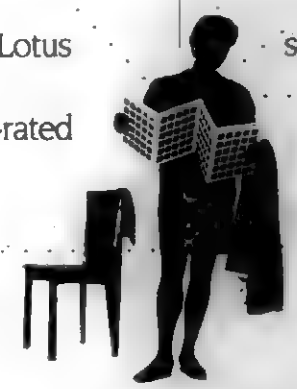

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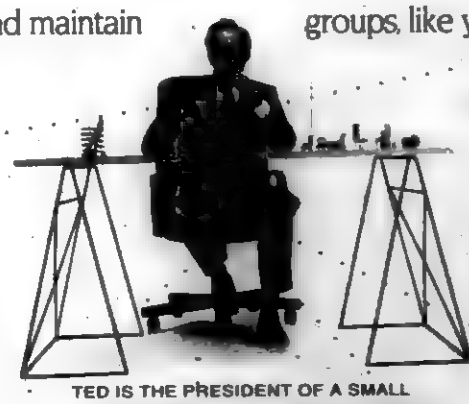

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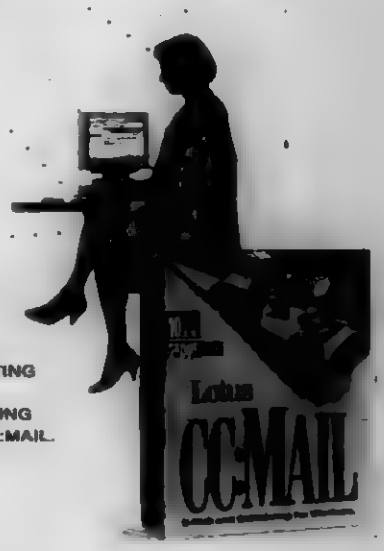

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Voice applications

Telequent links dissimilar ISDN services

By Ellis Booker

Telequent Communications Corp. in Billerica, Mass., recently announced software for linking Integrated Services Digital Network (ISDN) voice calls across multiple central office switches from different vendors.

Telequent's Distributed Call Center is said to overcome the incompatibility issues of ISDN switches from AT&T and Northern Telecom, Inc. to create regional or national virtual private networks.

United Technologies Corp.'s Pratt & Whitney division in East Hartford, Conn., has beta-tested the software since April.

According to Michael Morin, supervisor of data center operations, Telequent's offering was attractive because it used standard ISDN technology, which Pratt already uses extensively.

"Other solutions would have required proprietary hardware at each site," Morin said, adding that the Telequent setup requires only a single server at one site and only software changes to the ISDN telephones at the connected sites.

Routing made easy

Pratt's MIS Help Desk application allows about 40 individuals at four or five sites to have calls routed to them by the Automated Call Distributor server. The server is connected to sites hanging off of a private AT&T 5ESS digital switch.

Each shift has about 11 agents handling calls, although that number can increase automatically during peak hours "to take advantage of existing staff in other locations," Morin said. Incoming calls can also be routed to particular extensions based on their automatic number identification data, he said.

Telequent said more than 30 customers are using Distributed Call Center. The system requires a 386- or 486-class PC as a controller running The Santa Cruz Operation's Unix. The controller must be equipped with a $495 ISDN interface card from Telequent and Telequent's call routing/call management software. The software starts at $12,000 for up to 10 users.

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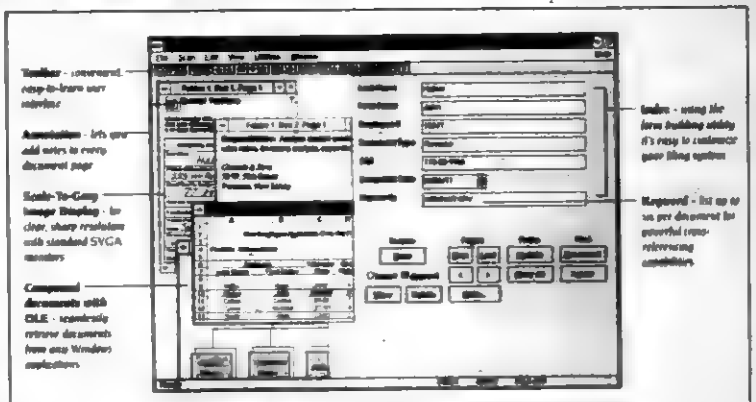

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HawkNet tool fine-tunes net performance

By Elisabeth Horwitt

HawkNet, Inc., in Carlsbad, Calif., has announced a product that is said to enable network administrators to fine-tune network performance on Novell, Inc. NetWare installations.

NetTune is said to provide a Windows-based graphical user interface for administrators to interactively adjust more than 60 internal network parameter settings, including communications settings, memory allocations and file and directory cache buffers. As adjustments are made to the parameters, users can immediately see the effect on server and network nodes, the vendor said.

Easier to adjust settings

Without the product, administrators have to set the parameters manually at the server console, or remotely with Novell's Rconsole utility, using complex commands, according to HawkNet.

NetTune provides graphical presentations of file server use patterns, which can be saved in a database file for later analysis and the accumulation of historical profiles of usage patterns.

The product runs as a NetWare Loadable Module on NetWare v3.11 and 4.01 servers, and as a Windows client application. NetWare parameters can be monitored and set from any NetWare client. The product is available this month, priced at $695 per server.

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The new ProLinea Net1 features a sleek design

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with an integrated monitor. But despite the extremely small footprint, it's anything but meek.

For starters, there's an integrated network interface for either Ethernet or Token Ring environments.

And it comes with a 486SX/25 processor and includes an extra-sharp 14" SVGA display.

The new ProLinea MT, on the other hand, features a mini-tower design with five slots and five bays. It includes Local Bus Graphics and is available in three processors, from 486SX/33 to 486DX2/66, and all are upgradeable to Pentium technology.

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Of course, no matter how many different models we make, each one has to be aggressively priced to continue the ProLinea tradition. That's why the ProLinea Net1 starts at just $1,099, the mini-tower at $1,449, and multimedia models at just $1,549.* All of which is good math no matter how you calculate it. For complete details, just call 1-800-345-1518. COMPAQ

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NetManage, Inc. has introduced Newtwatch, a Simple Network Management Protocol (SNMP)-based desktop management system for Windows.

According to the Cupertino, Calif., company, the product provides desktop management and desktop analysis on any TCP/IP network running SNMP.

Newtwatch can also analyze and manage network resources including routers, bridges and hubs. By pointing and clicking, users can zoom in on a remote PC and see what software it is running; they can also dynamically view statistics, view and administer hardware and network configuration, manage hosts and maintain network lists by either icon or table views.

Also included is a software-only TCP/IP packet trace and analysis package, called Newtrace, that lets users capture, view and analyze all inbound and outbound TCP/IP traffic on a Windows-based PC.

Newtwatch costs $495 per copy.

▶ *NetManage*
(408) 973-7171

Newport Systems Solutions, Inc. has introduced Call Connection Manager support for its line of LAN2LAN/MPR and LAN2PC products.

According to the Newport Beach, Calif., company, Call Connection Manager can be used for applications that occasionally require users to dial up a remote LAN, such as electronic-mail messages and network backup.

Call Connection Manager supports dial backup, activity calling, bandwidth on demand and call scheduling to establish and disconnect calls.

The product supports LAN2LAN/MPR in a dedicated, stand-alone PC and on Novell, Inc.'s NetWare platform.

The base product with two wide-area network ports costs $2,490.

▶ *Newport Systems Solutions*
(714) 752-1511

Hewlett-Packard Co. has introduced the HP J2540 Router PR, a remote-access router with built-in flash memory, plug-and-play capabilities and advanced network management.

According to the Palo Alto, Calif., company, the product supports industry-standard TCP/IP and Novell, Inc. IPX routing protocols and bridging.

The router offers network management using Simple Network Management Protocol and provides one Ethernet port with a choice of baby "N" connector or attachment unit interface connector and one synchronous wide-area connection for point-to-point protocol and Dialed Services through V.25 bis.

A flash memory feature is also included.

The HP J2540 Router PR costs $2,995.

▶ *Hewlett-Packard*
(415) 857-1501

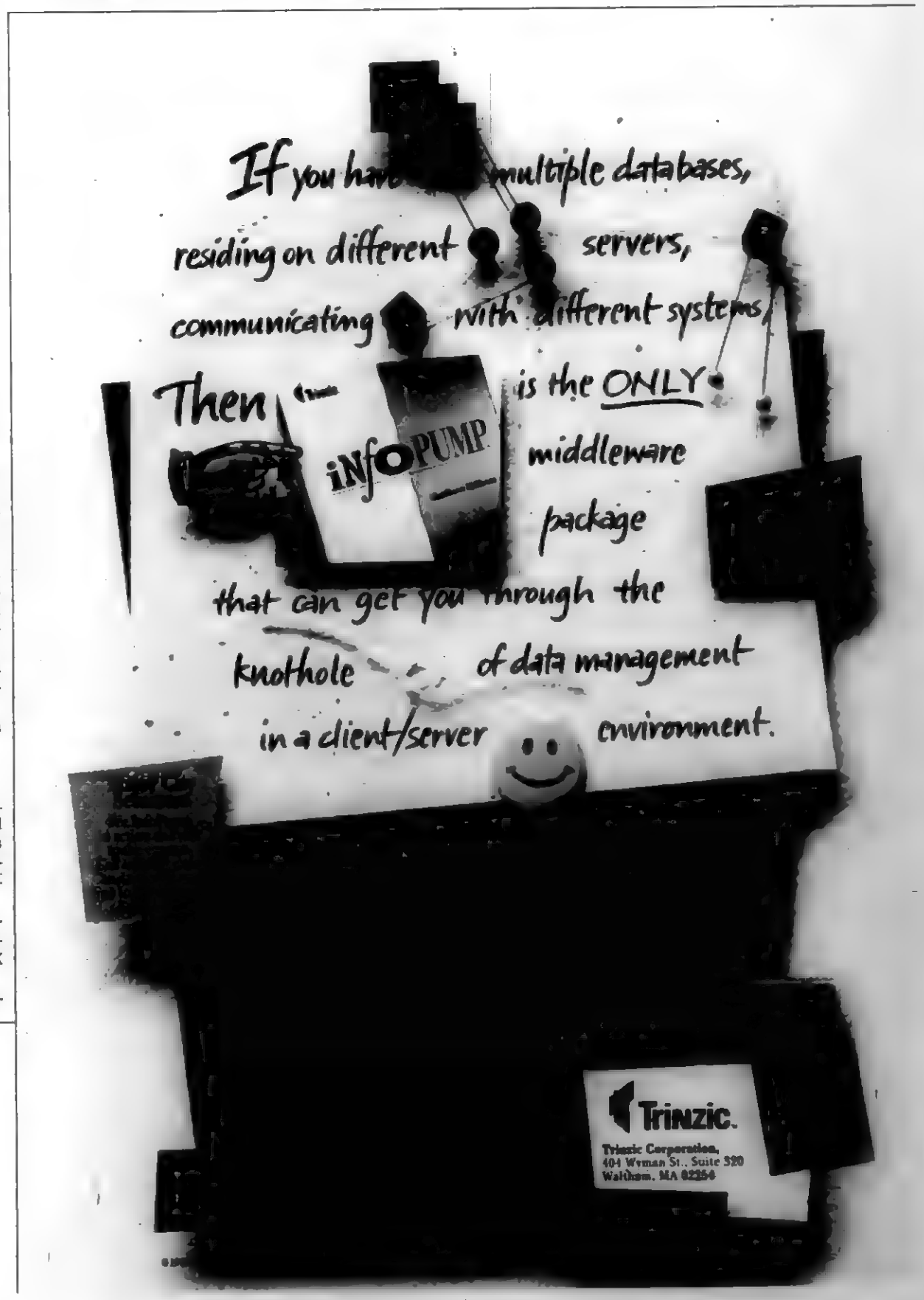
Multi-Tech Systems, Inc. has announced an X.25-compatible MultiModem II based on AT&T's 16.8K/19.2K bit/sec. V.32terbo open standard.

According to the company, which is based in Mounds View, Minn., the MT1932XP combines the functions of a full-duplex dial or leased-line modem, a send/receive fax machine, an X.25 packet assembler/disassembler (PAD) and a dial-up X.32 pad in a single desktop modem.

Support for up to four "virtual" X.25 or X.32 sessions through a single PAD port is provided, and the MT1932XP offers standard or asynchronous modem operation over dedicated or dial-up phone lines.

The product costs $949 and comes bundled with MultiExpress Datacomm and MultiExpress fax software. It will ship in the first quarter of 1994.

▶ *Multi-Tech Systems*
(612) 785-3500



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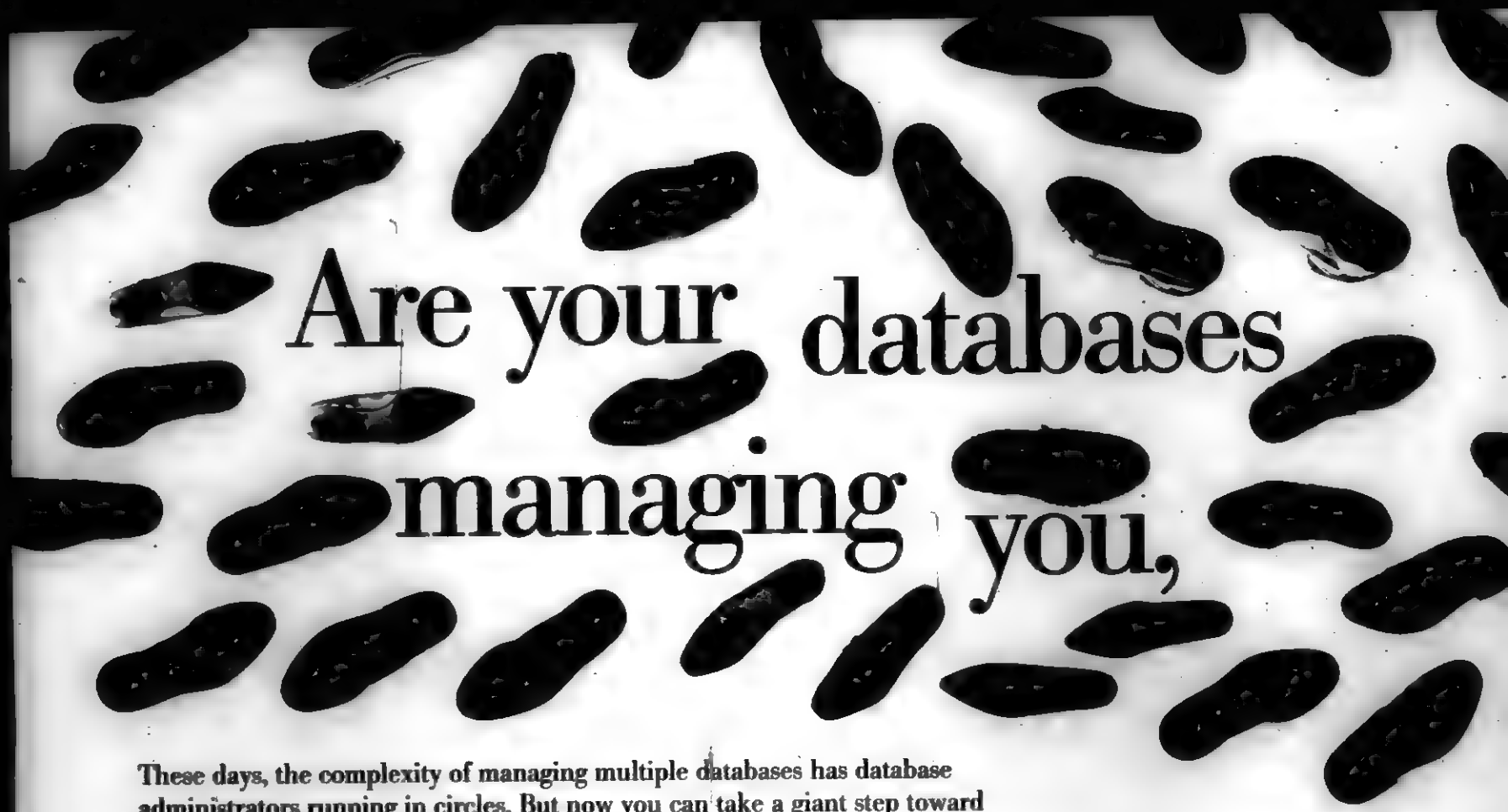

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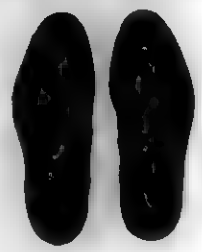

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Vendors skip TPC benchmark ratings

Budgetary and time constraints cited as driving forces

By Mark Halper

There was something conspicuously absent in the recent spate of multiuser computer system announcements: benchmark performance ratings under the Transaction Processing Performance Council seal.

TPC numbers, once a mainstay of new product performance claims, have taken a backseat as vendors concentrate more on emphasizing the applied sciences of their machines.

In an era of budgetary restraints, the price of running TPC benchmark tests is nudging the numbers further from the foreground. What's more, vendors are opting to put off the time-consuming benchmarking process to quicken the pace of product introductions and shipments.

The three to six weeks it can take to complete a test can be critical time for a customer in dire need of a new system.

"It seems like manufacturers are pulling back in their enthusiasm for getting these benchmarks out quickly," said Craig Sultan, an analyst at Montgomery Securities, Inc. in San Francisco.

Kim Shanley, chief operating officer of the San Jose, Calif.-based TPC, said the council has issued about as many test results this year as last year, around 100. And he said the council has signed on new clients, including Amdahl Corp., Silicon Graphics, Inc. and NEC Corp.

He noted, however, that vendors are taking a longer time to issue results because they are running the more time-consuming and costly TPC-C test. This test measures five simultaneous processes, rather than the single-process TPC-A and TPC-B tests.

The council implemented TPC-C last year to provide more realistic performance measurement. A TPC-C test averages two to three months and a cost of $500,000, while TPC-A testing takes about four to six weeks and costs about $100,000, Shanley said.

TPC results were all but missing during the past two months, when Hewlett-Packard Co., Sequent Computer Systems, Inc. and Pyramid Technology Corp. introduced high-end wares.

Sequent and Pyramid issued no TPC numbers at all. While HP reported a TPC rating of 2,110.5/tpmC for a six-processor Unix version of its Corporate Business System running an Informix Software, Inc. database, it did not provide TPC rankings for any other processor configurations (the Unix line ranges to 12 CPUs) or for any of the proprietary versions of the system. Instead, it issued its own estimates.

Pat Adamiak, product line manager for HP's proprietary line, the HP 3000, explained that earlier this year his group "decided to back off on how much we use [TPC numbers]."

While TPC rankings demonstrate raw performance of a particular task, they do not accurately reflect real-world performance, he said.

For instance, a TPC ranking would not demonstrate how effectively a system such as the HP 3000 runs a complex work load of chores including order entry, year-end financial accounting and manufacturing resource planning, he said.

Vendors are mindful that users want realistic performance portrayals.

"Some believe the benchmarks, and some believe it's just more vendor marketing hype — or benchmarketing," Adamiak said.

"When it gets down to the real world, benchmarks are benchmarks, and the needs of the users of specific applications are different," said Bill Rieke, director of strategic systems and a Pyramid user at The Promus Cos., a Memphis-based owner of several hotel chains.

Pyramid has yet to release TPC rankings for the Nile multiprocessing system it unveiled in early October, although it said it will do so eventually. "It takes a lot of resources and time to run benchmarks," said Judson Grosbong, Pyramid director of product marketing.

Kevin Joyce, Sequent product manager for future systems, noted that TPC tests "are not something you can do overnight, and they're getting very expensive to do." Sequent did not issue TPC numbers with its Symmetry 2000 line in October but said it would eventually do so.

Why not?

Some of the reasons vendors are balking at issuing TPC rankings:
- Increasing emphasis on real-life performance.
- The "Oracle cloud."
- TPC tests are expensive.

Casting aspersions

Montgomery Securities analyst Craig Sultan noted that a cloud hangs over the TPC testing process, following allegations by The Standish Group that Oracle Corp. cheated on testing procedures. Oracle has denied that claim.

Cross-platform scheduler released

By Johanna Ambrosio

Fourth Dimension Software, Inc. (4D) has joined the ranks of distributed systems management purveyors. The company's first wares, available now, let users schedule jobs on several different computing platforms.

Called Control-M, the package runs on IBM computers including MVS-based mainframes, the AS/400 and RS/6000 machines under AIX. In addition, Control-M runs on Sun Microsystems, Inc.'s architecture under the Solaris operating system and on Digital Equipment Corp. VAXs under VMS.

Unique to 4D's implementation, said Meta Group, Inc. analyst Fred Joy, is the ability to schedule jobs that depend on each other on different platforms — for example, a payroll job has to finish on the mainframe to feed the information to a check-writing job on a Unix machine. This is called cross-platform dependency. "I'm not aware of anything else out there that does this," Joy said.

To manage all the platforms in one location, 4D has also announced the Enterprise Control Station (ECS), which provides a common user interface and shared database for all supported 4D products. Besides the scheduling software, 4D will introduce over the next few years packages for distributed security, console automation and backup, among other tasks, according to 4D Chairman Yosale Hollander. All will use the ECS as the central means of control.

With ECS, Hollander said, users can manage by exception. In other words, users are alerted only to problems or incidents that seem out of the ordinary. This allows one operations staffer to manage several machines at once, he said.

Monitor consolidation

Some customers are excited about the prospect of monitoring different functions from one location. "I'm real anxious to get ECS up and running," said Jim Rinke, manager of scheduling and control at Texaco, Inc. in Houston. "Right now we have three consoles to monitor three different JES systems." The company has tested Control-M on the RS/6000 — it is now using the mainframe version — but has no production scheduling going on in the RS/6000.

Next year, 4D will introduce versions of Control-M that include Unix machines from Hewlett-Packard Co., Data General Corp. and Unisys Corp. as well as Novell, Inc.'s NetWare, IBM's OS/2 and Microsoft Corp.'s Windows NT. Control-M prices range from $750 to $60,000.

4D, which provides mainframe systems management software, is based near Tel Aviv, with U.S. headquarters in Irvine, Calif.

Relational databases

Object Design boosts its database product

By Kim S. Nash

Object Design, Inc. unveiled an upgrade to its flagship ObjectStore object-oriented relational database last week that sports features designed to make the product more appetizing for mainstream business applications.

With Release 3.0, the company rearchitected ObjectStore but promises the product is compatible with existing versions. New features include the following:

- The ability to back up and recover without shutting down the database and accompanying applications.
- Interoperability across operating systems. Previously, an ObjectStore database running on Solaris from Sun Microsystems, Inc., for example, could not talk to a database on IBM's OS/2.
- Reduced minimum database size, down to 2K bytes from 16K bytes, which can make the product less cumbersome to deploy across networks.

"In the past, we've focused on building higher

Object, *page 72*

What's in store

Object Design is working with IBM to build gateways between ObjectStore and several IBM databases, including DB2, DB2/2 and IMS. The gateways are due out late next year.

Prices for ObjectStore 3.0 start at $3,500. An average workgroup configuration will cost between $15,000 and $25,000, depending on number of users and platform, according to Object Design.

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New architectures

HP moves into 'post-RISC' era

Users await advent of powerful system that runs multiple operating systems

By Mark Halper

A week after Hewlett-Packard Co. began outlining plans for a "post-RISC" architecture, users, while concerned with migration issues, said they would look forward to the next generation for simultaneous support of multiple operating systems, among other reasons.

While users eagerly await the quantum performance leaps that the 64-bit chip and its billions of instructions per second portend [CW, Dec. 6], users seemed equally intrigued by the prospect that HP would use the device to sell an all-in-one box supporting HP's proprietary MPE/IX, its HP/UX Unix and perhaps other operating systems, such as Microsoft Corp.'s Windows NT.

> "This could be the platform . . . that could run MPE and Unix concurrently." — Eric Fisher, Fisher Consulting Systems, Inc.

HP's MPE customers now purchase the company's HP 3000 line, while Unix users buy the HP 9000. Customers who run both systems say an all-in-one box would ease their purchasing processes and facilitate interoperability between MPE and HP/UX (see related story page 74).

"It would be nice to put everything on the same machine," said Rodger Lindquist, manager of business systems development at Hercules, Calif.-based Bio Rad Laboratories, Inc., which uses an HP 3000 for business applications and an HP 9000 for service and communications functions.

"Nobody has come up with one engine that fits all yet, but if they could, would it be a good thing? I think so," said Isaac Blake, technical support/advanced planning supervisor for the city of Tempe, Ariz. "We need to make the operating system a secondary issue."

Kernel the key

Peter Rosenbladt, group research and development manager for HP's computer systems organization, clarified that support for multiple operating systems is inherent in the design of an operating system's kernel rather than in the processor architecture.

By using a "microkernel" operating system design, developers narrow the content of a kernel, thereby increasing the chance of its mating with more than one operating system by decreasing the chance of mismatches.

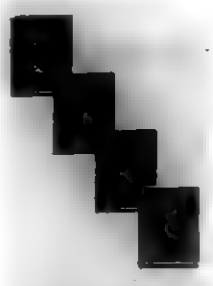
But, Rosenbladt acknowledged, microkernels are written to specific processors. And the next-generation chip could be the first from HP that would support MPE/IX and HP/UX in the same box.

Ironically, before HP offers that capability, it is expected to offer NT in the same box as MPE/IX and, separately, in the same box as HP/UX.

That will happen when HP finishes its reworking of its present PA-RISC chip to support the same byte ordering scheme used by Intel Corp.'s Pentium and x86 line of processors, which power the present population of NT machines.

Unlike the PA-RISC chip, "post-RISC" architecture — as senior vice president and head of research Joel Birnbaum refers to HP's next generation — uses a Very Long Instruction Word (VLIW) technology that enhances the processor's internal parallel processes.

While the architecture combines some of HP's present superscalar RISC designs, some users questioned whether it also moves away from RISC's reduced instruction set dictums by making instructions more complex.



Future of HP

An all-in-one box would help HP reduce costs by eliminating the overhead of dual marketing and support operations and cutting back on a few manufacturing processes now employed to differentiate the guts of the HP 3000 from the all but identical HP 9000.

HP's leading "post-RISC" proponent, research chief Joel Birnbaum, is regarded by many as the father of commercial RISC. He helped IBM develop the technology and left for HP after IBM declined to market it.

HP derived its VLIW processor technology from two now-defunct companies: Multiflow and Cydrome.

Quantity, not complexity

Eric Fisher, principal at Fisher Consulting Systems, Inc., pointed out that VLIW technology is consistent with RISC in that it does not make instructions more complex; rather, it simply increases the number of instructions per cycle.

Fisher further noted that VLIW's internal parallelism would make it "ideal" for a microkernel design that accommodates multiple operating systems.

"This could be the platform on which HP will deliver something which has been rumored — a machine that could run MPE and Unix concurrently," he said, noting HP could also throw NT into the mix.

Meanwhile, Rosenbladt said HP is also exploring a switch from a CMOS fabric to Bi-CMOS to improve microprocessor performance. He noted, however, that "Bi-CMOS is not now a mainline microprocessor technology, nor is it likely to become one."

Bi-CMOS provides faster circuitry than CMOS but is far more expensive. Its typical applications include memory chips.

Object

CONTINUED FROM PAGE 69

and higher performance, but now we're trying to make objects safe for business-critical applications," said Ian Schmidt, director of product marketing.

Moving to mainstream

Most ObjectStore users deploy the product in scientific and engineering applications such as computer-aided design.

Object Design, like other object database makers, sees opportunity in persuading information systems shops to use object technology in more mainstream systems, such as manufacturing and inventory [CW, Nov. 22].

Meanwhile, IBM has a large hand in shaping future versions of ObjectStore. IBM bought an estimated 20% equity stake in the company early this year, while AT&T made an undisclosed but "much smaller" investment last month, according to another Object Design employee.

IBM role

IBM's influence is likely to be evident in upgrades planned for next year, Schmidt said. For example, ObjectStore is expected to be ported to run on symmetric multiprocessing machines, starting with IBM hardware, he said. "Whatever we do, IBM will play a large part in our direction," he said.

Versions of ObjectStore will also be shrunk for various vendors' laptop computers, he noted. Unlike rivals in the object-oriented database market, ObjectStore runs in several desktop environments in addition to Unix, including Novell, Inc.'s NetWare, OS/2 and Windows.

A Microsoft Corp.'s Windows NT edition is in beta testing at 60 sites and is due to ship in next year's first quarter.

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Briefs

Czech bank automates

Banka Bohemia A.S. in Prague has installed one of Stratus Computer, Inc.'s XA/R fault-tolerant computers to automate its international payments processing, which it previously handled through manual telex and cable systems. The XA/R system was sold by Ing. C. Olivetti & Co., one of Stratus' resellers. It runs international payments software developed by Manof Communications Systems (International) Ltd. in Israel. Banka Bohemia is trying to sell time on the system to other Czech banks.

IBM package spots fraud

IBM recently unveiled software intended to spot billing fraud and abuse in the health care industry. The software, which looks for suspicious physician billing patterns by comparing medical claims in a medical specialty or region, has been tested by two insurance companies and is slated to be available by the end of the year, IBM said.

Japan's top vendor

For the fourth straight year, *Nikkei Computer* magazine has named Nihon Unisys Ltd., a venture of Unisys Corp. and Mitsui & Co. in Japan, as the top-rated Japanese computer vendor as determined by nearly 5,000 Japanese computer users.

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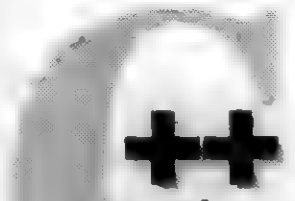

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Minicomputers

HP 3000 gap turns users to third parties

By Mark Halper

■ Customers of Hewlett-Packard Co.'s proprietary HP 3000 minicomputer need software that partitions the machine's PA-RISC microprocessor to allow multiple users simultaneous access and minimize agonizing waits.

Although users said HP has indicated its intentions to develop what it calls a High End Scheduler, they do not expect the product soon and are relying on third-party products.

HP did not elaborate on its product plans.

Traffic jams

While users said they remain impressed with the sheer power that HP continues to build into the 3000, they said they are concerned about bottlenecks that can cause a high-priority user to wait while a lower-priority user completes a task.

"Today, all available CPU power goes to a single process," noted Jerry Affholter, systems manager at Medstat Systems in Ann Arbor, Mich. Without the CPU allocation software, he noted, "you cannot allocate percentages of the CPU. Instead, you have to line up requests."

"The user community as a whole has been requesting a CPU dispatcher from HP for a while," said Isaac Blake, technical support/advanced planning supervisor for the city of Tempe, Ariz.

Blake noted that while Tempe has little need for the software because it uses scattered smaller boxes that provide departments with access when needed, "for people who have large behemoth boxes, I can see where it's a concern."

Medstat, which runs a "behemoth" HP 3000 Corporate Business System accessed by Fortune 100 companies for decision support and analysis of health benefit options, is one company that could use CPU dispatching.

"We need guaranteed CPU allocation for our clients," Affholter explained.

"If we simply throw power at the machine, that doesn't assure them they won't have to wait," he said.

Medstat's urgent need for better CPU dispatching derives from a classic bane: raised customer expectations. Affholter explained that Medstat's clients have come to expect the same sort of CPU response during daytime hours that they are accustomed to during off-peak times when they are not competing for CPU access.

"During the day, their throughput could be 10 times less, and their expectations are shattered," Affholter said.

Waiting for HP

Blake noted that although third-party products such as Overlord from Kelly Computer Systems in Mountain View, Calif. address the problem, users would prefer a product from HP.

"They feel comfortable that if they have a problem, they can just call HP," he noted.

But for HP, the decision of whether to offer a dispatcher could boil down to simple economics, Blake noted.

"The question HP fights is, do you bundle everything into an operating system and then have to maintain it?" Blake said.

Users were not optimistic that HP would offer its dispatcher soon. The company actively tends to a list of user demands, but, according to Affholter, the dispatcher is not high in the queue.

"I don't think it's in the Top 20," he said.

Briefs

Informix, NCR join forces

Informix Software, Inc. plans to join **NCR Corp.** to build a version of the Informix-OnLine database for massively parallel processors, according to Phil White, Informix chief executive officer. **Sybase, Inc.** recently announced an alpha release of its SQL Server database, codeveloped with NCR. Informix also plans to create a 64-bit edition of OnLine for **Digital Equipment Corp.**'s Alpha platform, White said. The products are expected to ship late next year or in early 1995.

ISSC, TI offer utilities aid

IBM's Integrated Systems Solutions Corp. (ISSC) and **Texas Instruments, Inc.** have joined to offer client/server procurement and materials management solutions to the utilities industry. TI will provide business process reengineering and software, while ISSC is responsible for implementation, integration and support. The alliance is aimed at reducing purchasing and management costs and shortening procurement cycles. **Arizona Public Service** is helping develop software to support parts procurement, inventory and electronic data interchange.

NCR sails with Seafirst

Seafirst Bank of Seattle has contracted with **NCR** to install NCR self-service banking systems at locations such as bank branches, shopping malls and retail stores. The systems give functions such as the ability to calculate loans, obtain information on investment options, reorder checks and stop payments. In another deal, NCR won a $5.5 million contract to supply **Glendale Federal Bank** in Glendale, Calif., with automated teller machines at 200 locations.

System wins award

Government Services Canada has awarded a $5.5 million systems integration contract to **American Management Systems** for a system designed to streamline the administration of $6.1 billion in annual purchases.

Stratus ports file package

SoftCom Systems, Inc., a software vendor acquired in October by **Stratus Computer, Inc.**, plans to port **Sterling Software, Inc.**'s Connect:Direct file transfer software to run on Stratus' XA/R fault-tolerant systems. It will also distribute the package. Connect:Direct is slated to be available for Stratus' proprietary VOS operating system in the first quarter of next year and for its FTX Unix derivative shortly thereafter. Prices are expected to range from $25,000 to $40,000. SoftCom was known as BellSouth Systems Integration prior to the acquisition.

Claims system debuts

Digital and **Price Waterhouse** are jointly marketing an image-based claims processing system to carriers of workers' compensation and disability insurance. The new system combines Price Waterhouse software with Digital's DECclaims image management technology and a computing platform, including PCs and Alpha AXP servers running **Oracle Corp.**'s database and **The Santa Cruz Operation**'s SCO Unix operating system. The joint offering grew out of a project in which the two companies installed a claims processing system at the **Injured Workers' Insurance Fund** in Towson, Md.

Oracle, Sherpa tools link

Sherpa Corp. and **Oracle** said they will integrate their products for manufacturing companies. The companies will link Oracle's Manufacturing package with Sherpa/PIMS, a set of tools for managing the data required to design, manufacture, support and improve the production process. The two companies will link the products through Oracle application programming interfaces and will develop a common data model.

HP, IBM provide recovery

Hewlett-Packard Co. and **IBM** said they will provide joint disaster recovery services for customers in combined HP and IBM environments.

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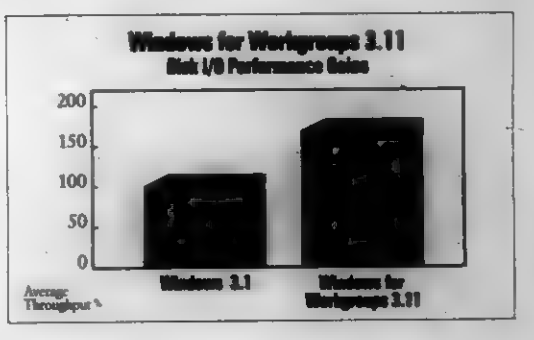

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The disk I/O performance gains represented were measured with Disk WinMark™ performance tests using WinBench™ version 3.11 from Ziff-Davis Labs. Two test configurations were used and the performance results averaged to produce a single percentage: Northgate® Slimline 320 with Intel® 80386/20 CPU, 8MB RAM, 2048KB RAM Cache, 200MB hard disk, IDE controller, and no hardware disk cache; Zenith® Znote 425L with Intel 80486/25 CPU, 4MB RAM, 512KB RAM Cache (SmartDrive 5.0 with Windows 3.1, 32-bit file access with Windows for Workgroups 3.11), 200MB hard disk, IDE controller and no hardware disk cache. Tests were run using shipping versions of Windows 3.1, Windows for Workgroups 3.11 and MS-DOS® 6.2. Tests not independently verified by Ziff Communications Company. Zenith is a registered trademark of Zenith Electronics Corporation. Intel is a registered trademark of Intel Corporation. WinMark and WinBench are trademarks of Ziff-Davis. Northgate is a registered trademark of Northgate Computer Systems, Inc.

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digital

Software Engineering of America is offering the VSE version of Total Remote Management Solution (TRMS) 4.2, an integrated report management system for on-line viewing, distribution and archiving of end-user/production reports.

According to the Franklin Square, N.Y., company, features include the ability to accumulate more than one report simultaneously, menu-driven interfaces under VTAM and CICS, a high-speed VSAM database structure, full internal security, PC report downloading and the ability to perform archiving while accumulating and bundling reports.

TRMS/VSE is priced from $18,000 to $40,350.

▶ *Software Engineering of America*
(516) 328-7000

Compuware Corp. has announced Release 3.0 of File-AID/PC, a product designed to improve the efficiency of programmers working with PC-based IMS databases in the Micro Focus environment.

According to the Farmington Hills, Mich., company, File-AID/PC Release 3.0 offers editing, navigating and printing capabilities along with support for downloading and editing additional types of IMS databases.

The product offers command keys that enable users to move more directly to specific database segments when producing or analyzing test IMSVS86 data.

Prices for File-AID/PC Release 3.0 start at $12,000.

▶ *Compuware*
(313) 737-7300

Cray Research has announced the Cray Research Network Disk Array, a bulk storage device designed to reside on high-performance computer networks.

According to the Eagan, Minn., company, the product enables users to store data on the network instead of on a storage device connected to and accessible only from a single system on the network.

The device can be partitioned between multiple systems on the network.

If the normal path is unavailable, users receive an alternate access path and the product is connected through a High Performance Parallel Interface switch.

Pricing for the Network Disk Array begins at $450,000.

▶ *Cray Research*
(612) 683-7100

Storage Concepts, Inc. has introduced the Concept 810 Series of real-time redundant arrays of inexpensive disk (RAID) storage subsystems.

According to the Irvine, Calif., company, the product provides 20M byte/sec. sustainable transfer rates with an upgrade path to rates as fast as 50M byte/sec.

The Concept 810 offers up to 10G bytes of storage capacity and is targeted for applications that include teleradiology, digital X-ray and pictorial archiving and communications systems.

Prices for the Concept 810 Series start at $16,800.

▶ *Storage Concepts*
(714) 852-8511

Business Partner Solutions, Inc. has introduced MobilEra Monitor, a message queue and system audit journal monitor that notifies IBM AS/400 users of any system error conditions, such as authorization failures, password violations, critical storage messages or pending disk failure.

According to the Westmont, Ill., company, the product notifies operators if batch jobs finish within a configured start and stop time.

The product can also submit a user-written job to react and fix the problem.

Mobile Monitor costs $505 per license.

▶ *Business Partner Solutions*
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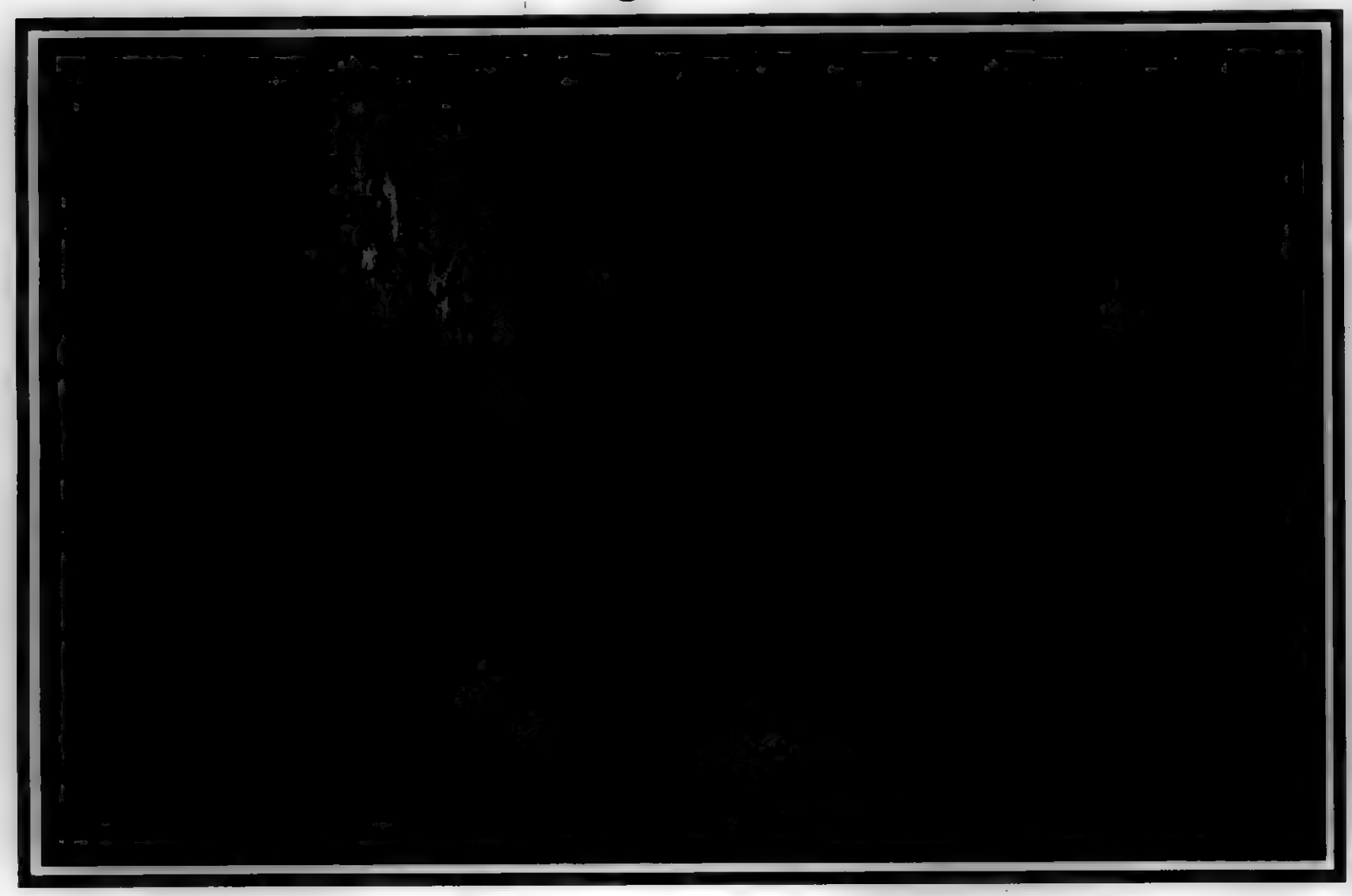

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Next steps up to developers' praise

Company hopes to ride 486 through corporate America's door

By James Daly

Six months after its introduction, Next Computer, Inc.'s NextStep 486 is finding a welcome home in corporations weary of wrestling with complicated in-house application development.

End users hope the object-oriented programming that NextStep 486 affords will relieve the software bottleneck that has prevented them from quickly writing and adapting programs to take advantage of powerful computer systems and shifting business opportunities.

"When you're building something extremely complex, [NextStep 486] is a godsend," said Steven Jacobson, a deputy at the Los Angeles County Sheriff's Department who used NextStep 486 to build a decision-support system capable of handling several hundred users.

In May, Next took the formerly proprietary NextStep and ported it to the Intel Corp. platform. Since then, NextStep 486 users have praised a design that makes it easier to reuse large chunks of software code.

At least for the tough jobs.

On less sophisticated applications, however, "the delta between NextStep and other application development environments is not all that great," Jacobson said. "If you're just putting together an order-entry system, NextStep may seem like overkill."

Betting it all

For Next, the success — or failure — of the company hinges on its ability to market NextStep. "Next knows that its role in the cosmos is getting narrower and narrower," said Randall Stross, the San Jose (Calif.) State University historian and author of *Steve Jobs and the Next Big Thing*, a critical examination of the company. "NextStep is the whole ball of wax."

In February, the company abandoned its slow-selling workstations and focused solely on its highly regarded NextStep software. "We're not going after the whole banana anymore," Jobs said. Instead, Next has thrown all its weight behind NextStep 486, which Jobs calls the "Trojan horse" that will finally get the firm's foot in the door of corporate America.

Next continued to court the corporate market last month when it announced that SunSoft, Inc. will license NextStep and incorporate it into Solaris, Sun Microsystems, Inc.'s Unix derivative. A number of corporate developers said the move bolsters their confidence in NextStep's staying power.

The power of NextStep has already attracted orders from companies such as McCaw Cellular Communications, Inc., First Chicago Corp., Citicorp and WilTel Communications Systems, Inc. Most observers said NextStep delivers the kind of object-oriented programming environment that potential rivals such as Taligent, Inc. or Microsoft Corp.'s Cairo project will not deliver until late next year or early in 1995.

Although NextStep has been available for more than four years, the system's original proprietary nature has made it a difficult sell. "Next was never an option before because we had no interest in going to a new platform," said Mike Adelson, a project manager at Chrysler Corp. subsidiary Chrysler Financial Corp. in Southfield, Mich.

Adelson said NextStep 486 will be used in a client/server environment to support more than 100 branches throughout North America. The company's first application developed with the system will be for retail auto financing, Adelson said.

Putting NextStep on the Intel platform also lessens the fear factor. "People don't want to think that they have to junk their systems to tap into Next; this lessens that perceived risk," said Dwight Koop, executive director of information technology at Swiss Bank Corp. in Lisle, Ill.

Long way to go

But Next still faces an uphill battle to gain acceptance in the world of 486-based PCs.

First there are the thorny financial obstacles. The user version of NextStep 486 costs $795, but extra circuit boards, memory and disk drive capacity to bring a

Next, *page 84*

NEXTSTEP 486 VITAL STATISTICS

CORE TECHNOLOGY:
A multitasking and multithreaded Unix operating system based on the Mach operating system kernel.

ADD-ONS:
Comes bundled with client support for Sybase and Oracle databases.

COST:
$795; $1,995 for developer version.

SHIPMENTS IN 1993:
50,000

PROJECTED SHIPMENTS IN 1994:
100,000

REVENUE FROM NEXTSTEP 486 IN 1993:
$10 million to $12 million

COST TO CREATE NEXTSTEP:
$100 million

Source: Next Computer, Inc.

Client/server tools

LoadRunner cuts costs by estimating user support

By Melinda-Carol Ballou

Enabling developers to test performance and then tune client/server applications before deploying them can be key to their success, analysts say. However, it can also be prohibitively expensive to set up "real world" scenarios.

New testing tools from Mercury Interactive Corp. will allow developers to cut those expenses by testing client/server application performance through emulating the load placed upon it by a full range of users, according to company officials and industry analysts.

Dubbed LoadRunner, the new tool allows testers to run multiple emulated users in parallel, each operating a real client application off the server, they said. Rather than require a machine for every user, LoadRunner can run many virtual users on each machine, officials said. These tools carry over to client/server development, a concept played out in host-centric performance testing.

Beta testers of the product said they realized savings using LoadRunner.

US West Communications, Inc. in Denver has been using LoadRunner to evaluate the performance of a client/server application, according to Rand Lewis, a member of the technical staff.

"It's done a pretty good job of indicating how many users we can support with our application," Lewis said.

To use this tool, developers run typical transactions or other user processes with their application in "record mode," Lewis said. LoadRunner will record those actions and play back as many instances of a user process as are required to create a script. This script is sent against the server to test the application, Lewis said. Scripts can also be created and modified using the scripting language for LoadRunner.

"The value of LoadRunner is that we didn't have to bring in 100 users and pay them to test the application — it did the testing for us," Lewis said.

BT, another beta site for LoadRunner, was able to use only six Sun Microsystems, Inc. workstations to test an application that will run on 30 workstations, according to Mike BeHarry, a testing consultant at the company.

The release of these tools from Mercury Interactive is part of a wider trend. Client/server computing is spawning a market for graphical user interface (GUI)-based testing software that is likely to expand from around $50 million in 1993 to around $90 million by the end of 1994, according to Neil Weintraut, technology analyst at Hambrecht & Quist, Inc. in San Francisco.

In-house testing tools used for character- and host-based applications used to be the norm, largely because the developer controlled the development process. But the development scene is becoming dramatically more complex, with the advent of client/server, event-driven systems and GUIs, which make the testing process more unpredictable.

These factors and others (see chart) are resulting in the greater availability of commercial testing tools for client/server, Weintraut said.

Weintraut added that this has happened so fast that the majority of developers are not aware of the availability of these tools.

Key players in this market include Mercury Interactive, Autotester, Inc., Segue Software, Inc., Softbridge, Inc., Software Quality Automation, Inc., Microsoft Corp. with Microsoft Test and about 15 other companies, analysts said.

LoadRunner is shipping now; pricing starts at $70,000.

Tool time

THE ADVENT OF CLIENT/SERVER APPLICATION DEVELOPMENT IS GENERATING THE NEED FOR NEW COMMERCIAL TESTING TOOLS BECAUSE CLIENT/SERVER APPLICATIONS HAVE THE FOLLOWING CHARACTERISTICS:

- They are event-driven, so the response is relatively unpredictable.
- They are under end-user rather than programmer control.
- They must span a range of client and server platforms and developers are creating more of them.

Source: Hambrecht & Quist, Inc., San Francisco

Trinzic tackles database middleware

Tool addresses user complaints about EDA/SQL

By Melinda-Carol Ballou

Trinzic Corp. bolstered its product offerings at Database World in Chicago last week with the release of its InfoHub database access tool and updates to InfoPump data routing and Forest & Trees analysis and reporting tools.

With the release of InfoHub for client/server, Trinzic, based in Waltham, Mass., is targeting the middleware database arena owned primarily by Information Builders, Inc.'s EDA/SQL. According to Trinzic, InfoHub, in combination with Micro Decisionware, Inc.'s Database Gateway, will give users the ability to read, write, update and join data located on mainframe databases with sequential files from tools that support Microsoft Corp.'s Open Database Connectivity.

While some users have complained publicly of performance problems with EDA/SQL for transaction-intensive applications, Trinzic and Micro Decisionware officials claim InfoHub will address those problems.

Industry analysts said, however, that while it is important for developers to have alternatives to EDA/SQL in the middleware arena, it is not yet clear how InfoHub will perform. InfoHub and Micro Decisionware's gateway will provide access to Computer Associates International, Inc.'s IDMS, IBM's IMS, VSAM and DB/2 and Software AG of North America's Adabas. But EDA/SQL offers connections to a much broader range of databases, said Charles Venter, an analyst at Meta Group, Inc., a consulting firm in Stamford, Conn.

Information Builders is also expected to address some of the performance issues related to EDA/SQL's use of Focus code with the next release of EDA/SQL next spring [CW, Nov. 29].

Updates simplified

Trinzic's InfoPump 1.1 provides support for Banyan Systems, Inc.'s Vines and Digital Equipment Corp.'s Pathworks network protocols, as well as for IBM's DB/2 and Digital's Rdb relational databases. InfoPump offers server-to-server database routing, replication and synchronization, Lotus Development Corp.'s Notes and DBMS integration and host-to-server replication and downsizing, company officials said.

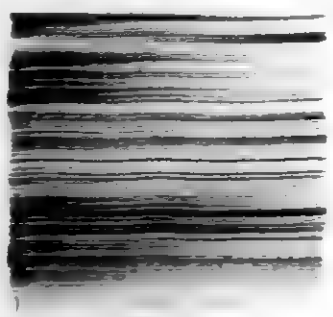
Users spoke of the advantages of the new version.

"We're using InfoPump to move information from traditional [mainframes] onto Lotus Notes applications," said Rodger Krammer, manager of technical systems support at publishing firm Houghton-Mifflin Co.'s Boston office, who runs InfoPump on Digital's Pathworks. "InfoPump offers the ability to update the data without having to go to extensive programming efforts ourselves."

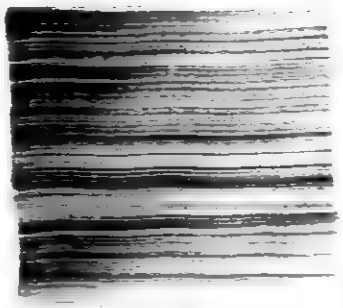
Trinzic officials said Forest & Trees 3.1 offers improved data access, better graphics than Version 3.0 and support for Dynamic Link Libraries. It also offers a "drill-down" capability for more detail on a particular slice of a pie chart, for example. Check box and radio button support make it easier to develop more intuitive applications.

All three products ship this month. InfoHub pricing starts at $55,000, MDI Gateway pricing starts at $6,995, and pricing for the MDI Access Server, required to run the gateway, starts at $60,000. InfoPump 1.1 on an OS/2 server is priced at $25,000, and Forest & Trees 3.1 is priced at $695.

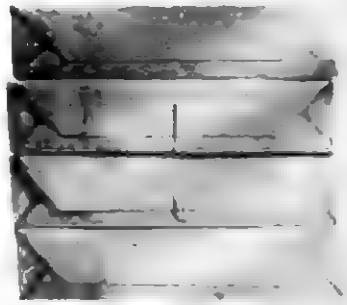
Our high-volume printing solutions are packed with these 2,000 exciting features.



More paper going in.
The HP Paper Feeder raises your input capacity to a whopping 2,000 sheets.



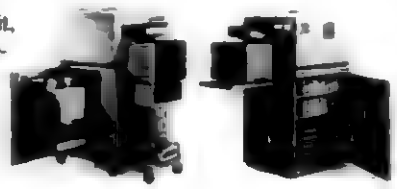
More paper coming out.
The HP Output Stacker lets you print all 2,000 pages before picking up a single document.



More paper nearby.
The HP LaserJet Printer Cabinet holds your printer, paper feeder, supplies, and—you guessed it—reams and reams of paper.

There's nothing terribly exciting about stacks of paper. Except that Hewlett-Packard's paper-handling solutions for the HP LaserJet III Si, 4Si and 4Si MX printers let you spend a lot less time dealing with them. And when it comes right down to it, why *save time* with a 17-page-per-minute printer if you have to *spend more time* putting paper in and taking documents out?

The 1,500-sheet HP Paper Feeder and HP LaserJet Printer Cabinet give network users double the input capacity plus a place to keep paper — where it won't get wrinkled or dog-eared.



For unattended printing, use the HP Paper Feeder with the 2,000-sheet HP Output Stacker*. It's the ideal solution for printing big jobs after hours.

If increasing productivity sounds more exciting than refilling paper trays, talk to your HP representative or reseller. Or call 1-800-752-0900, ext. 7889 for more information.

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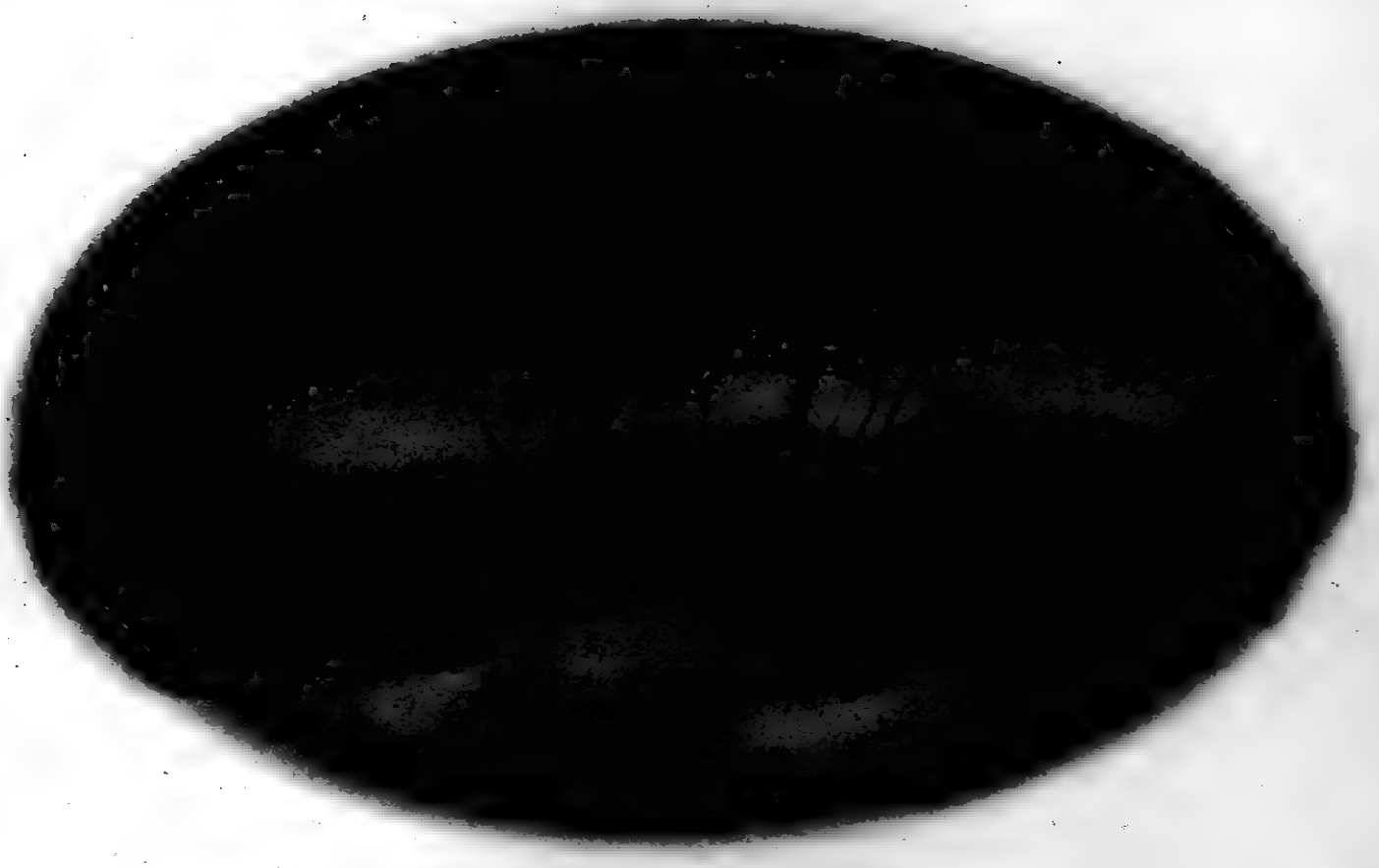

YOU KNOW HOW SOME THINGS ALWAYS LOOK GOOD FROM A DISTANCE?

MAYBE YOU'D BETT
LOOK AT MICROSOF

As anyone who's ever been in the desert can tell you, things aren't always as they appear. Whether it's an oasis in the sand. Or a suite of application software in the office.

Unless you look very closely, for example, you'd swear Microsoft® Office was a revolutionary new way to use, manipulate and share business data through integrated software. When, usable applications. All of which truly complete the desktop of every Windows™ user.

LOTUS SMARTSUITE 2.1 vs. MICROSOFT OFFICE PRO	
APPLICATIONS	
1-2-3® RELEASE 4 AMI PRO® 3.01 FREELANCE GRAPHICS® 2.01 APPROACH® 2.1 ORGANIZER™ 2.1	COUPON FOR EXCEL 5.0 WORD 6.0 COUPON FOR POWERPOINT® 4.0 ACCESS™ COUPON FOR 1 SEAT OF MICROSOFT MAIL
INTEGRATION	
LOTUS APPLICATION MANAGER COLLECT & COPY DDE, OLE CONSISTENT USER INTERFACE	MICROSOFT OFFICE MANAGER DDE, OLE (2.0 IN WORD) SEMI-CONSISTENT USER INTERFACE
WORKGROUP	
ALL APPS MAIL-ENABLED VERSION MANAGER™ INTEGRATED WITH NOTES® THRU NOTES/FX™	ALL APPS MAIL-ENABLED SCENARIO MANAGER
VALUE	
$269 COMPETITIVE UPGRADE	$549 COMPETITIVE UPGRADE

And while Microsoft claims Office is going to fully maximize cross-product integration and consistency, Lotus is already way down the road to achieving precisely that across all five applications. Sharing the same user interface. With common menus. And

in reality, Lotus® SmartSuite® achieved that distinction over a year ago.

A closer inspection will also demonstrate that not all of Microsoft Office's five applications are designed for general business users. And some new versions aren't yet available at all. Lotus SmartSuite, on the other hand, has five of the leading, award-winning, most SmartIcons.® To say nothing of task-oriented functions that cross applications. Collect and Copy for instance. With a single click, it lets users gather data from 1-2-3® and Freelance Graphics® and combine it into an Ami Pro® word processing document.

SmartSuite and Lotus Notes. The secret to integrating workgroups instead of just applications.

Of course, you might be just as easily deluded into believing that Microsoft Office is work-

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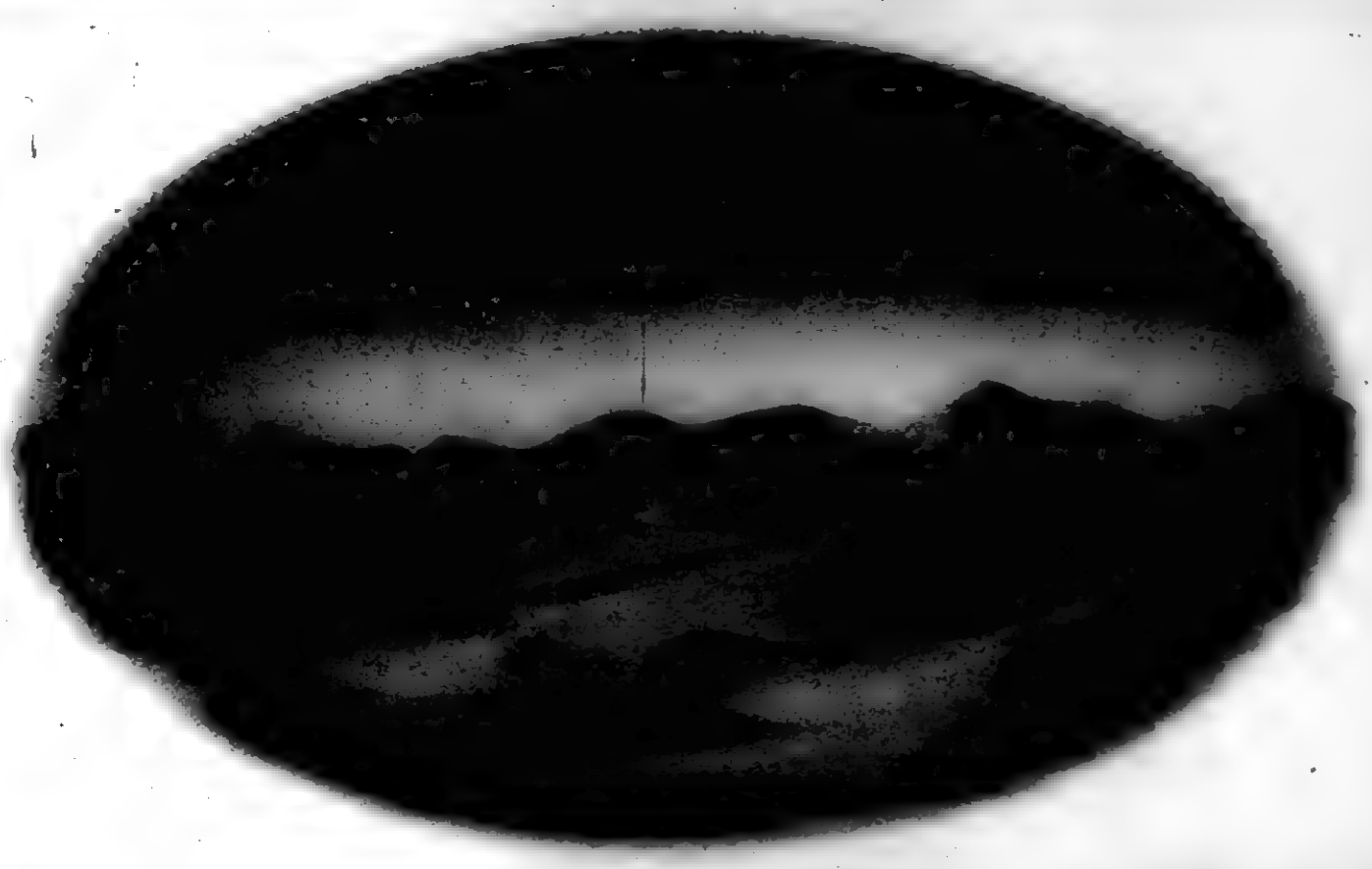

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group enabled. When, in fact, Office can only integrate applications, SmartSuite can actually integrate entire groups of people. With Lotus Notes® groupware, SmartSuite users can access, share, track and manage business data like never before. Not only can it be routed, it can be revised, stored and accessed concurrently by multiple users working in collaboration.

And right now, you can upgrade from any Lotus or competitive product to SmartSuite 2.1 for just $299.** Just visit your Lotus Reseller. Or call Lotus for a demo disk at **1-800-TRADE-UP, ext. 9317.*** We can assure you, this is one time you really will be able to believe your eyes.

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Oberon ships builder to SunSoft users

Small software company thinks big with object-oriented tool set

By Jean S. Bozman

Oberon Software, Inc., a Cambridge, Mass., start-up financed by Toyo Information Systems in Japan, said last week that it has shipped an object-oriented application builder for SunSoft, Inc.'s Project Distributed Objects Everywhere computing environment. Oberon plans to attract commercial users with a visual programming environment that strings together existing objects.

The SynchroWorks application builder is a visual system that allows users to assemble programs by moving icons on a workstation screen. It also allows users to create new objects and store them in an Object Design, Inc. ObjectStore database repository (see story page 69).

The Oberon system, beta-tested at Kash n' Karry Food Stores, Inc. in Tampa, Fla., will replace a homegrown object environment there, said Denise Matthys, the $1.2 billion firm's systems development manager. "We wanted to get out of the tool development business so we can focus on our own business," said Matthys, who has 25 Sun Microsystems, Inc. Unix servers and hundreds of X terminals. Kash n' Karry's programmers had been using a C++ scripting language based on Internet shareware, she said.

Oberon's application builder links its built-in object database with a user's Oracle Corp. or Sybase, Inc. relational database. That means that images for multimedia applications can be stored in an ObjectStore database but mapped against data stored in a corporation's relational database, said Win Burke, Oberon's marketing vice president.

Oberon and other object-oriented tool set builders have an edge over traditional relational database firms that are wary of developing and selling their own object tool kit, said Julie Rodwin, an analyst at R. M. Fichera Associates in Groton, Mass. "One of the conflicts [the relational database management system firms] face is how far they want to go with objects," Rodwin said. "They have an enormous installed base to protect, so the smaller companies like Oberon, Servio and Harbor Software that are coming out with object-oriented tools are going to be further ahead."

SynchroWorks supports SunSoft's Solaris 1.X and Solaris 2.3 for SPARC systems. Release 2.0, due for 1994 shipment, will support the Object Management Group's Common Object Request Broker Architecture, Burke said.

SynchroWorks applications can be built on top of C, C++, Objective C and Next Computer, Inc.'s NextStep object-oriented class library.

Support for other Unix software platforms, including Hewlett-Packard Co. and IBM RS/6000 workstations, is still being evaluated, Burke said.

Prices for SynchroWorks range from $995 for a single-user trial license to $29,000 for a four-user license and $89,000 for a 16-user license, Oberon said.

Next steps up

CONTINUED FROM PAGE 79

typical 486-based PC up to the sophisticated color, sound and video capabilities of the Next machine can add several hundred dollars.

There are psychological hurdles to clear as well. Analysts said the chances of Next's taking over this object-oriented development market are slim because Microsoft and Taligent are perceived as the real operating system powerhouses of the future.

"NextStep is as good as anything that's out there, but the move [to develop custom in-house applications] may not be as fast as Jobs likes," said David Card, director of systems research at International Data Corp. in Mountain View, Calif.

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Uniface develops portable Mac environment

By James Daly

Do your Macintosh enthusiasts feel cut off from enterprise data and applications? Or are your DOS users jealously eyeing the Macintosh interface?

If so, Uniface Corp. wants you to lend it an ear.

The Alameda, Calif.-based company last week unveiled an industrial-strength application development environment for the Apple Computer, Inc. Macintosh that is portable across platforms.

The Macintosh Uniface development environment enables developers hammering out client/server applications to build one version on the Macintosh and then port it to other platforms.

For instance, applications can be ported to Windows-based PCs or character-based terminals using DOS without rewriting code, said chief architect Mark Hersey. With Uniface on Windows and Motif, the application can be deployed using the native look and feel of the Macintosh, according to Anu Shukkla, vice president of worldwide marketing.

Uniface is a graphical client/server environment that enables complex systems to be built quickly through the use of a central Model Repository. This approach allows applications to be easily modified or scaled to greater complexity.

Uniface also provides read/write access to major commercial database management systems, including offerings from Oracle Corp., Sybase, Inc., The ASK Group, Inc., Informix Software, Inc. and Hewlett-Packard Co.

General availability of the Uniface Macintosh development environment will be in the first quarter, with a single Macintosh development license selling for $4,400.

Uniface for the Macintosh will run on any Motorola, Inc. 68030 or 68040 Macintosh computer and requires 4M bytes of RAM, 15M bytes of available disk space and System 7.0.1.

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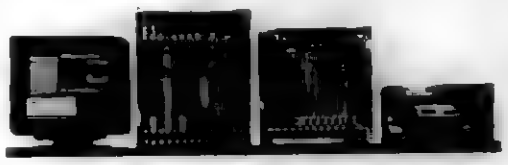

The LattisSphere System brings hardware and software together for a whole new level of network control.

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Briefs

Q+E licenses EDA/SQL

Q+E Software, Inc. announced that it has licensed Information Builders, Inc.'s Enterprise Data Access/SQL (EDA/SQL) offering as part of a plan to make Open Database Connectivity libraries available to Information Builders customers. Meanwhile, Borland International, Inc. announced it has licensed Q+E's libraries for its products. In other news, Information Builders announced its intention to support IBM's System/390 parallel query server with EDA/SQL.

Gemini ports to Kubota

Gemini Technology Corp. has ported its Gemini Visual System (GVS) software, a three-dimensional image-generation kit for developing real-time simulation and virtual reality applications, to Kubota Pacific Computer, Inc.'s Alpha AXP-based Kenai graphics workstations. The object-oriented GVS package was previously available on Silicon Graphics, Inc.'s systems. Gemini also signed on to resell the Kenai machines, which include Kubota's Denali graphics subsystem.

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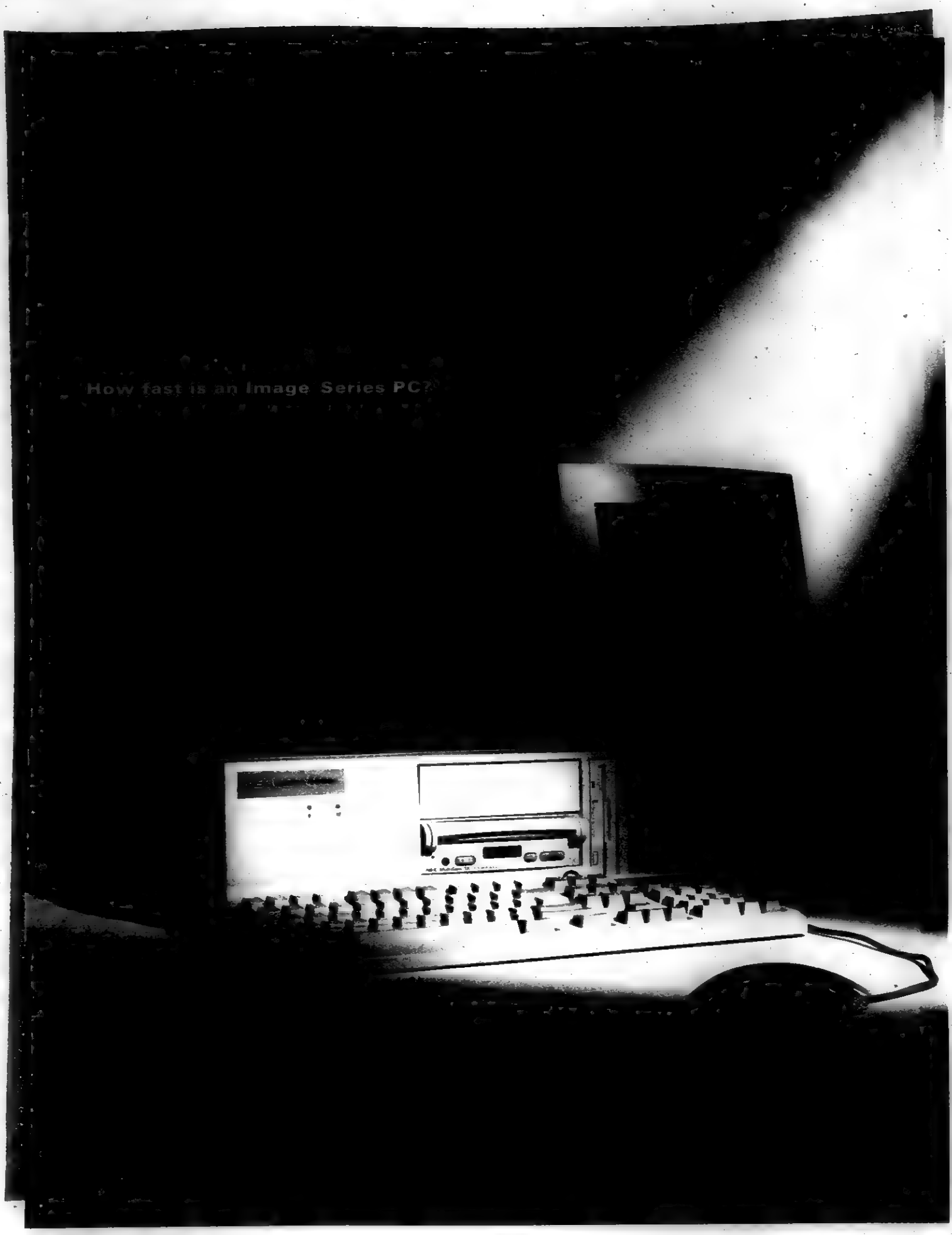

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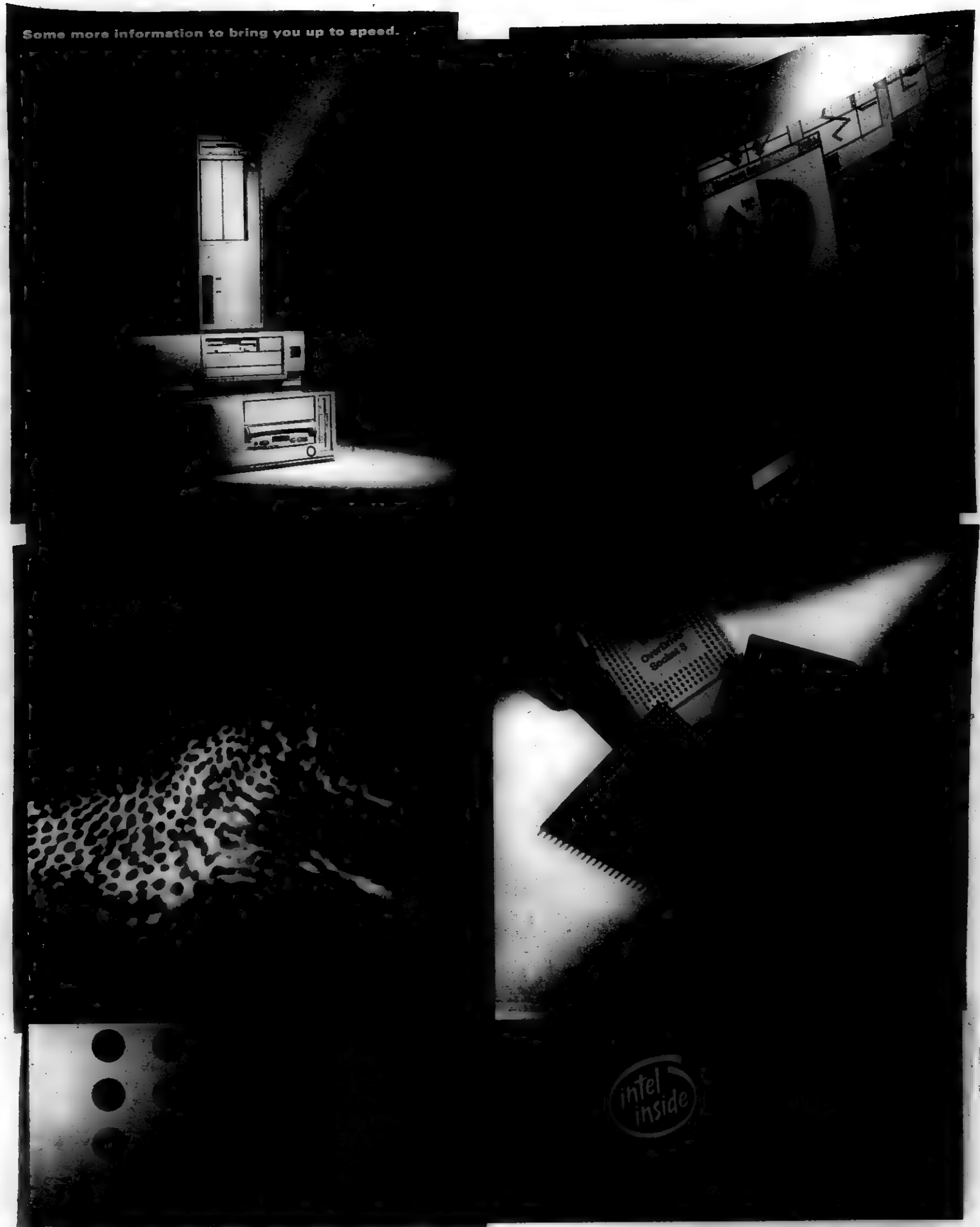
Some more information to bring you up to speed.



NEC

TeamTest 2.5 tests PowerBuilder objects

By Melinda-Carol Ballou

SQA, Inc. in Woburn, Mass., has announced a new version of its client/server testing tool that offers specialized support for Powersoft Corp. PowerBuilder's object-oriented development environment and other features.

The PowerBuilder support allows users of automated test procedures written in SQA TeamTest to "see" directly into PowerBuilder objects such as DataWindows and DropDown Windows. The contents of these objects are typically invisible to other Windows products, SQA officials said. But by using an application programming interface provided by Powersoft, SQA TeamTest determines the contents of those windows and can then run tests against user-defined criteria to determine if the contents are correct.

"While PowerBuilder is a very popular tool for developing client/server applications, one of the areas that has to be supported is regression testing," said Rich Finkelstein, president of Performance Computing, a consulting firm based in Chicago. "These kinds of capabilities are well-known and understood in the mainframe world and are only now beginning to be applied to client/server."

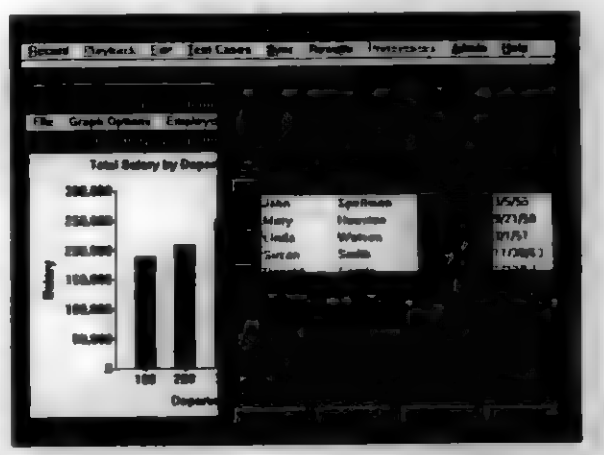
Regression testing lets developers test the consequences of modifications made to the programs on which they are working. This testing ensures that other portions of the application are working properly and have not been affected by changes made elsewhere. Finkelstein said the new version of SQA TeamTest will broaden the reach of developers by allowing them to perform tests on the contents of PowerBuilder objects.

These PowerBuilder DataWindows often contain data retrieved from a database server or data a user has entered to update a database. By testing the data values in a DataWindow, SQA TeamTest allows client-based testing of database servers in a client/server setup.

Since this specialized support does not use bitmap comparisons and operates directly on numeric and alphanumeric data, the data can be tested without regard to the visual display characteristics of the DataWindow. This offers independence from the graphical user interface design of the application.

Version 2.5 also has a text comparator, which allows rapid inspection and detection of differences in text-based test cases, and the ability to capture and test the contents of nested pull-down menus, list boxes, combo boxes, tabular spreadsheet-style controls and any Windows controls that support clipboard copy.

SQA TeamTest 2.5 is in beta testing now and is scheduled to be available during the first quarter of next year. It is priced at $1,495 per license.



SQA TeamTest 2.5 *lets developers test data 'inside' PowerBuilder DataWindows*

Procase Corp. has announced Version 2.1 of Smartsystem, a software development product.

According to the San Jose, Calif., company, this version of Smartsystem offers enhanced functionality, customer bug fixes and performance and usability improvements.

The product lets programmers and managers understand and fix large amounts of unfamiliar source code by graphically showing code structure.

The results provide users with information regarding errors and dependencies. The product also performs impact analysis.

It also provides a make-file reader to facilitate building a database.

Other features include code-comprehension capabilities and Call Graph capabilities that show dependencies involving global data. Function pointers are also included.

Smartsystem pricing starts at $35,000. The per-user price ranges from $5,000 to $10,000, depending on the configuration.

▶ *Procase*
(408) 433-9500

TerraLogics, Inc. has announced availability of TerraView Version 4.0, a geographic mapping software development kit.

According to the Lowell, Mass., company, TerraView 4.0 allows application developers to embed geographic maps directly into the source code of Windows applications developed with Gupta Corp.'s SQL Windows, Microsoft Corp.'s Visual C++ and C/C++ Version 7, Borland International, Inc.'s C++ 3.1 and Powersoft Corp.'s PowerBuilder.

Features include style sheets, raster data support, dynamic renditioning and faster updating of mobile symbols for real-time tracking and display applications.

TerraView 4.0 costs $4,985.

▶ *TerraLogics*
(508) 656-9900

Michaels, Ross & Cole Ltd. has introduced the Template Programming Language (TPL) in Release 4.0 of its MRC-Productivity Series, a fourth-generation language/computer-aided software engineering application development and report writing tool.

According to the Lombard, Ill., company, TPL allows users to create templates for display files and programs.

Users can specify ahead of time what code will be generated from the template because TPL uses a proprietary set of internal processing rules.

Prices range from $4,000 to $69,500.

▶ *Michaels, Ross & Cole*
(708) 916-0662

Wang Laboratories, Inc. has announced its Open/image User Objects for PowerBuilder.

According to the Lowell, Mass., company, the product allows developers using Powersoft Corp.'s PowerBuilder 3.0 to integrate powerful image document management capabilities into new or existing applications built using the PowerBuilder programming environment.

Users can add to their applications imaging functions such as displaying, scanning, manipulating, printing and faxing black-and-white, gray-scale and color images.

Open/image User Objects for PowerBuilder costs $795 for the development environment.

▶ *Wang*
(508) 459-5000

Evergreen CASE Tools, Inc. has announced EasyCASE 4.1 for Windows: Workgroup Edition.

According to the Redmond, Wash., company, the product allows multiple EasyCASE users to concurrently access a project located in a common area on a server.

The Workgroup Edition features chart and data dictionary locking at the record and file levels, a read-only mode, access control with security (passwords, serial numbers, access privileges, permissions and lockout), a user list and project export and merge capabilities.

The product works with any DOS, Windows or Novell, Inc. network that is NetBIOS-compatible.

EasyCASE 4.1 for Windows: Workgroup Edition prices start at $695.

▶ *Evergreen CASE Tools*
(206) 881-5149

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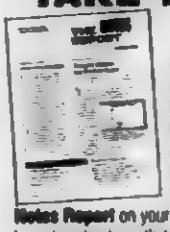

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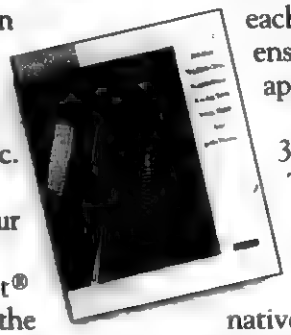

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MAKING THE MEXICAN CONNECTION

NAFTA's passage means Mexico is no longer a foreign market. Get ready for the trials and tribulations — both technical and cultural — of doing business south of the border.

Tony Stone Images

▲ Angel of Independence, *Mexico City*

BY MITCH BETTS

In the suburbs of Mexico City you'll find a Third World networking infrastructure: ancient, analog and unreliable. It may take three or four tries to get a connection for a business telephone call.

Less than 10 miles away, in the heart of Mexico City's commercial district, digital traffic can ride on a new fiber-optic cable that rivals or surpasses capabilities in parts of the U.S.

That is the technological paradox of modern Mexico, where restaurant tables have cellular phones so business executives can bypass the poor telephone system. Experts say U.S. companies that don't do their homework before opening facilities or negotiating joint ventures in Mexico will be in for some big surprises.

Because of high business (nonwage) costs in Mexico, McIlhenny Co. (the Louisiana-based maker of Tabasco hot sauce) has shifted all of its production from Mexico back to the U.S., while General Motors Corp. recently shifted production of the 1995 Chevrolet Cavalier from a plant in northern Mexico to Lansing, Mich.

They discovered that the country's much-ballyhooed low wages were offset by factors such as crumbling highways, decrepit railroads, bureaucratic hassles and high employee-training costs.

Nevertheless, U.S. companies will continue to open facilities in Mexico in hopes of scoring big profits from Mexico's market of 81 million people, including 24 million active consumers eager to buy U.S. products. Bobby L. Martin, former chief information officer at Wal-Mart Stores, Inc., for example, was recently promoted to head that company's new international division with the mission of tapping into the Mexican market [CW, Oct. 11].

Passage of the North American Free Trade Agreement (NAFTA) will mean even more U.S. business activity south of the border, prompted by the elimination of trade tariffs and a more favorable investment climate. Retail, medical, fast food, industrial and consumer product

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NAFTA

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companies are all gearing up for the Mexican gold rush.

Allergan, Inc., the Irvine, Calif.-based eye-care firm, expects its Mexican sales to double in five years, so it has struggled to set up an IBM AS/400 at its small Mexican plant, despite the lack of on-site technical help or computer expertise. The demographic trend in Mexico toward an older population means a growing market for Allergan's products and services for glaucoma and cataracts, says Mel Engle, senior vice president for Latin America and Canada.

In contrast to the newcomers, Woolworth Corp. was doing business in Mexico long before anyone dreamed of NAFTA. The retailer's Woolworth Mexicana unit has 30 department stores, plus a dozen Foot Locker stores and more specialty stores on the way, according to Philip W. Richards, vice president of corporate MIS in New York.

"Business [in Mexico] is absolutely booming. It's the most exciting market we have," he says.

Richards says the biggest headache is the antiquated state of the telephone network, which he bypasses using satellite and cellular networks.

Richards also bypasses many of the management challenges of dealing with Mexico by handling all data processing — with the obvious exception of point-of-sale terminals — remotely in the U.S. Given the economies of scale and the fading of national borders, companies such as Woolworth and Reader's Digest Association, Inc. are consolidating their North American data centers in the U.S.

Experts say NAFTA, combined with Mexico's privatization of state-run utilities, will lead to faster upgrades of Mexico's infrastructure.

The good news is that Mexico's version of Ma Bell, Telefonos de Mexico (TelMex), is modernizing with a special emphasis on the digital services that large businesses crave.

The telephone network was sorely neglected in the 1980s, making it difficult to get static-free modem connections, according to Stephen Dalla Betta, Latin America analyst at Pyramid Research, Inc. in Cambridge, Mass. As a result, multinational corporations bypassed TelMex by installing private satellite networks.

The most obvious cultural barrier *with Mexico is language, and it's helpful for U.S. companies to have a Spanish-speaking IS staffer deal with Mexico. Software also must often be multilingual.*

Answering the call

The ongoing transformation of the lumbering TelMex bureaucracy into a user-focused competitor began in 1990, when the Mexican government sold a 20% stake to private investors including Southwestern Bell Corp. and France Telecom. The new owners have been investing $2.5 billion a year to install digital switches and fiber-optic cables. TelMex knows it must get its act together soon because its protected monopoly position in long-haul voice and data traffic will end in 1996.

By then, TelMex expects to have achieved 88% digitalization of the network — well on its way to the goal of 100% by the year 2000. But TelMex must focus on the large urban areas and business districts first, which explains why network quality is spotty.

That also explains why General Electric Co.'s GE Information Services unit is moving its network node from the suburbs to the commercial center of Mexico City to take advantage of the new fiber-optic cable there.

In terms of network quality, says Travis Good, manager of Mexican business development at GEIS in Rockville, Md., the suburbs and downtown are like two different worlds.

Which means that life is not easy for information systems managers given the task of connecting Point A to Point B.

"I've ordered circuits [from TelMex] from Mexico City to Guadalajara and Monterrey, but they've been very late in delivery — I mean months late — and they're still incredibly expensive," reports Reuben Lantto, director of telecommunications at Minneapolis-based Cargill, Inc., which has beef processing and grain operations in Mexico.

Although the technical challenges of doing business in Mexico are considerable, Lantto and other IS managers say that bridging the cultural gap is even tougher. Frankly, it takes a while for hard-charging Americans to get used to the slow pace of business dealings in Mexico, also known as the "mañana syndrome."

Attitude adjustment

IS executives stress that the stereotype of "lazy Mexicans" is wrong — Mexican professionals work hard and long hours. But different views on the urgency of project deadlines "requires some adapting on both sides of the border," says John Rudasill, president of the computer services unit of Carolina Freight Corp. in Cherryville, N.C., which has three trucking terminals in Mexico.

"It takes an awful long time to get anything done" in Mexico, says George Bargman, telecommunications supervisor at Vulcan Materials Co. in Birmingham, Ala. Lantto agrees, saying IS managers should add one, two or even three months to any promised delivery dates.

A key factor for buyers in Mexico may

NAFTA, *page 94*

WHAT YOU SHOULD KNOW

TIPS FOR EXECUTIVES VISTING MEXICO:

- *Driving* is especially tricky in Mexico, due to poor road shoulders, rain-slick surfaces, heavy truck and bus traffic and loose livestock. Drive slower than you would in the U.S. Avoid highway bandits by not driving at night and steering clear of crime-ridden highways such as Routes 1, 15 and 40.

- *Air pollution* in Mexico City is severe and often unhealthy, especially from December to May.

- If you plan to take a *laptop computer* into Mexico, plan ahead to avoid customs problems and import taxes. Write a statement that it is for personal use, and have the statement certified at a Mexican consulate in the U.S.

- The daily cost of *meals and lodging* for a business traveler in Mexico City is $216, considerably cheaper than in Tokyo ($455), Paris ($353) or New York ($330).

- *Business etiquette:* First names are rarely used. Business hours are typically 9 a.m. to 6 or 7 p.m., with a two-hour lunch in between. Meetings, often held during breakfast or very long lunches, start with social talk to establish a trusting relationship. Mexicans are easily offended if they are addressed in a brusque manner. Family matters take precedence over business.

Sources: U.S. Department of State, Washington; Runzheimer International, Rochester, Wis.; Mexican Investment Board, New York; Kent State University, Ohio; "Mexico Business Monthly", Maplewood, N.J.

RESOURCES

American Chamber of Commerce in Mexico: (011-525) 705-0995.

U.S. Department of Commerce:
- Trade Information Center, advice for new exporters: (800) USA-TRADE.
- Mexico desk officer: (202) 482-2332.
- Mexico trade information by fax: (202) 482-4464.

Mexico's NAFTA help desk: (011-525) 211-3545.

Comdex/Comexpo trade show, Mar. 8-11, 1994, in Mexico City: (617) 449-6600.

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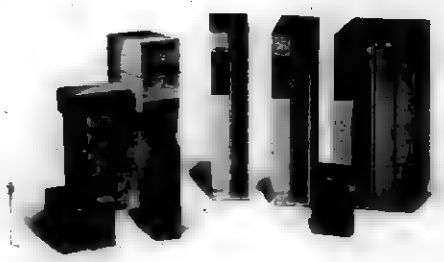

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NAFTA

CONTINUED FROM PAGE 92

be the availability of support and maintenance services. Lantto advises: Check out references, and if you need technical support in several Mexican cities, make sure the service organization has nationwide coverage.

Of course, the most obvious cultural barrier is language. It certainly helps for U.S. companies either to have a Spanish-speaking IS staffer to deal with Mexico or to depend on outsourcing vendors that do, IS executives say.

Training on-site

One of the best project management techniques is for a Spanish-speaking IS project leader to go to Mexico for a year or two and train Mexicans in the operation, then turn it over to them, says Edward M. Roche, an expert on international IS issues at New York University.

However, it is also true that many Mexican programmers and systems analysts — those who have graduated from college or technical schools — know enough English computer jargon to get the job done. After all, Mexicans often use English versions of PC software, and most computer terminology comes from the U.S.

Consumer products maker Tambrands, Inc. requires its top managers in Mexico to speak English, but the company must ensure that the software the workers on the plant floor use is multilingual, says Diane Forrest, vice president of IS in White Plains, N.Y.

The need for multilingual software and local vendor support makes buying software for use in Mexico a bit more complex, Forrest says, especially when the company wants standard applications in both the U.S. and Mexico.

Most of the software used in Mexico is brought in from the U.S., although domestic software houses have emerged. Passage of NAFTA should bring product prices down slightly because of the elimination of import tariffs.

Business barriers

Even after overcoming the language barrier, IS managers will find that Mexicans simply have a different way of doing business, which greatly affects business processes and the information systems tied to them.

The postal system in Mexico is terrible, for example, so invoices are hand-delivered by salespeople, who also collect payment, says Laurence Noclain, vice president of Resource Evaluation, Inc.'s consulting practice in Mexico City. Furthermore, Mexican billing systems are hampered by manual processes, data-entry errors and fragmented accounting databases.

"By U.S. standards," Noclain says, "administrative operations in Mexico are prone to error and full of inefficiencies that can be a significant drain on operating profit."

For example, Noclain says, it is an accepted Mexican business practice for salespeople to negotiate discounts for particular customers orally — unbeknownst to the billing department at headquarters.

As a result, the accounting system will mislead executives about forthcoming revenue, and customers are unhappy when the discount does not show up on their bill.

IS managers report no problems finding qualified IS professionals or hardware and software products in Mexico's big cities. The Mexican government opened the computer market to foreign suppliers in March 1990, so the options for buyers have grown considerably, and competition has intensified.

Frederick W. Schroath, an expert on international business at Kent State University in Ohio, advises IS executives about to take the Mexico plunge to focus more on the future — the modern services that will be available in six or 12 months — than on current problems. "This is a country that is changing very rapidly," he says. "Looking around today is deceptive; you've got to ask people about what tomorrow will bring." ■

Betts is *Computerworld*'s national correspondent, based in Washington, D.C.

BEST BETS

The U.S. government figures these U.S. industries are the "best prospects" for making big bucks in the Mexican market:

PRODUCT CATEGORY	1992 U.S. EXPORTS*
Franchising	$3,500
Automotive parts and service	$2,530
Chemical production machinery	$559
Plastics	$455
Industrial chemicals	$393

* Estimated (in millions)

Source: American Embassy, Mexico City

NAFTA NETWORKING

The North American Free Trade Agreement provides a "bill of rights" ensuring reasonable access to the public network by business telecommunications users

- There can be no regulatory restrictions on transborder data flows or access to databases anywhere in North America.
- Users can connect private lines with other private lines or with public networks (such as for intracorporate communications).
- Pricing for private lines must be cost-based and available at a flat rate — an important point for large users that try to avoid volume- or time-sensitive rates.
- Companies can use the protocols and terminal equipment of their choice.

Source: Debevoise & Plimpton, Washington

Intelligence Files

Outsourcing to the max

Since late 1989, BP Exploration, Inc., the oil and gas exploration unit of British Petroleum, has cut its information systems staff from 1,400 workers (including 600 consultants) to 150.

The IS budget has gone from $360 million to $110 million. Most IS functions have been outsourced, including operation of BP Exploration's information technology infrastructure and application development.

Who are the survivors? Only IS professionals who fulfill one of three roles: business consultants who work with user departments and function within BP Exploration; "partner resource managers" who manage relationships with outsourcing firms; or technicians who specialize in technologies that have yet to be outsourced.

The outsourcing move follows BP's philosophy of concentrating human and capital investments on core activities and competencies, while divesting and outsourcing noncore activities.

Source: David Hall, coordinator, Information Technology Human Resource Development, BP Exploration, speaking at Retooling '93 conference, Atlanta, Dec. 2, 1993.

Academic researchers get 'brand' database

The Marketing Science Institute in Cambridge, Mass., and A. C. Nielsen in Northbrook, Ill., have formed a partnership to provide a state-of-the-art database for academic researchers.

The database, which the institute described as "unprecedented in its scope and level of detail," allows researchers to obtain realistic broad-based and long-term data.

Its purpose will be to "simulate research on assessing brand performance and to help advance the effective management of brands," according to Rudolph Struse, Nielsen Marketing Research senior vice president, who made the announcement.

Access to the database, which will become available early next year, will be overseen by the institute. Researchers wanting more information should contact Katherine Jocz, director of research management at the Marketing Science Institute, (617) 491-2060.

Source: "Review," Fall 1993, the newsletter of the Marketing Science Institute, Cambridge, Mass.

Data processing pays off for professionals

Seasoned data processing professionals can expect to reap higher financial rewards next year, according to a recent survey released by Edward Perlin Associates, a management consulting firm in New York.

The survey looked at the rates of increases in salary budgets, bonus amounts and staff turnover at 51 companies nationwide.

It included a broad spectrum of industries and found that merit budgets showed small growth in 1993 (2.8% to 6%), but salaries were augmented by large bonuses based on a percentage of base pay.

For senior managers, the average bonus in 1993 was 29% of base salary, with a range of 0% to 92% reported by respondents. Middle managers received an average bonus of 14.4%, with a range of 5% to 39% reported.

The survey also projected that starting salaries for entry-level computer programmer positions will increase by just under 2% in the coming year, bringing the average base salary from $31,500 to $32,100.

Staff turnover was also studied, with the companies reporting an average of 10.2% staff turnover in 1993 (actual rates ranged from 0% to 32%).

Source: Edward Perlin Associates, New York

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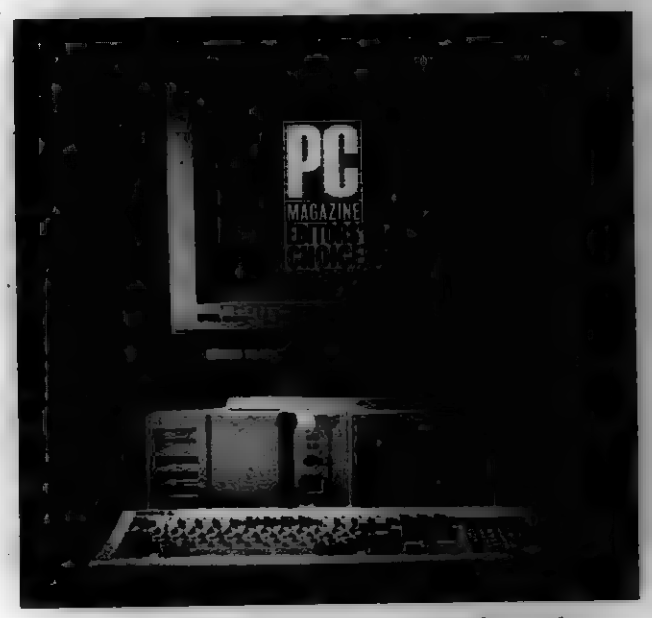

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–PC Computing, October 1993

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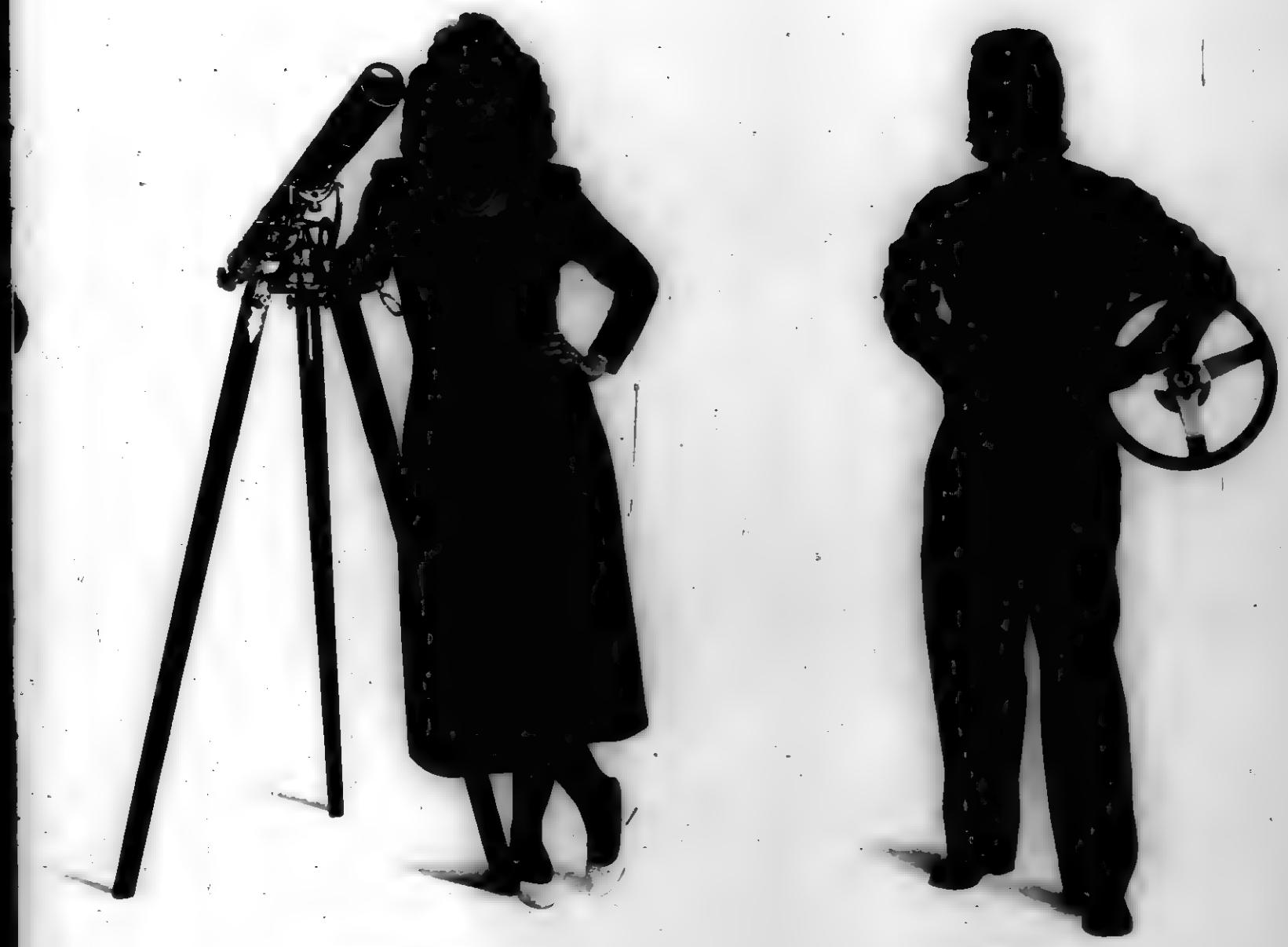

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Executive Track

Ronald S. Bolin was recently appointed director of information services at **Polygram Manufacturing and Distribution Centers** in King's Mountain, N.C. He will report to chief financial officer Larry Brigden. Bolin will be responsible for evaluating and using The ASK Group, Inc.'s ManMan MRP2 system for the company. Prior to joining Polygram, Bolin was manager of information systems at Krauss Maffei Corp.'s U.S. headquarters in Cincinnati.

Paul J. Hoedeman, 38, has been named vice president and chief information officer of aerospace operations for the AlliedSignal Aerospace unit of **AlliedSignal, Inc.** in Morristown, N.J. Hoedeman was formerly vice president and CFO at AlliedSignal. J. Thomas Zusi, 50, replaces Hoedeman in that capacity.

Yannick Le Coudic, 46, has been named vice president of MIS at **Lubrizol Corp.**, a Cleveland-based chemical concern. Le Coudic was formerly a division head, responsible for research and development administration services.

Thomas Lewis has been named senior vice president and CIO at **USF&G Corp.**, a Baltimore-based property and casualty insurer. Lewis, 41, was most recently vice president and general manager responsible for Europe, the Middle East and Africa for object-oriented software developer Seer Technologies, Inc. in Cary, N.C. He replaces John Roblin, who left the insurer in March.

Irene O'Donnell has joined **Keyfile Corp.** in Nashua, N.H., as vice president of administration. She will be responsible for MIS, manufacturing, purchasing, facilities and human resources. Prior to joining Keyfile, O'Donnell was co-founder and vice president of operations and treasurer of Newton Technology, Inc., a software publishing company in Newton, Mass.

Dr. Edward E. Heller Jr. has been named president of the Computerized Patient Record Institute. He has served for the past seven years as vice president of information resources at Massachusetts General Hospital in Boston, where he had strategical and operational system responsibilities for the hospital and coordinating responsibilities for other corporate entities.

Thomas R. Burch has been appointed vice president and CIO at **St. Vincent Hospitals** in Indianapolis. He was formerly vice president of operations for the hospitals.

Reporter's Notebook

Ex-CIO jokes: Several popped up at the Retooling '93 conference held recently in Atlanta. Richard W. Swanborg Jr., principal at Ernst & Young, joked about a laid-off CIO standing on a street corner with palm outstretched, asking passersby, "Brother, can you paradigm?" Chuck Gibson, vice chairman of CSC Index, recalled a conversation with another ex-CIO: "I left the same way I came in: fired with enthusiasm."

Linguistic advice: Getting management to increase training budgets is a perennial problem. One solution: Don't refer to "training fees" — talk about "tuition investments." It's a much more positive way to look at money spent on training, says Mary E. Texer, manager of technical training at the Federal Reserve Bank of Minneapolis.

Mission-critical mainframe systems: Most companies still keep the lion's share of their mission-critical systems on mainframes, judging by a show of hands at a technical session on reskilling information systems personnel. More than 75% of the audience raised their hands when Informix vice president Joseph J. Durzo asked how many kept 90% of their mission-critical systems on the mainframe.

—Compiled by Allan E. Alter

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Calendar

JAN. 9-JAN. 15

ObjectWorld. Boston, Jan. 10-13 — Program tracks include Technology of Objects, Objects in Business and Software Developer's Track. Sponsored by Object Management Group and IDG World Expo. Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

JAN. 16-JAN. 22

Client/Server Conference & Exposition. San Jose, Calif., Jan. 18-21 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-7460.

Re-engineering: The Implementation Perspective. Boston, Jan. 19-21, also to be offered Feb. 9-11 — A seminar providing an introduction to the concepts and objectives of re-engineering with an analysis of the business factors driving it. Instructor will be Michael Hammer, The Center for Re-engineering Leadership in Cambridge, Mass. Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

Storage & Interfaces '94 International Technology Conference. Santa Clara, Calif., Jan. 19-27 — Nine separate but related forums and seminars will be offered during these dates. Contact: Technology Forums, St. Peter, Minn., (507) 931-0967.

NOMDA/LANDA Emerging Technologies Expo '94. Orlando, Fla., Jan. 20-22 — Contact: National Office Machine Dealers Association/Local Area Network Dealers Association (NOMDA/LANDA), Kansas City, Mo. (816) 941-3100.

JAN. 23-JAN. 29

Demo '94. Palm Springs, Calif., Jan. 23-26 — Features new products. Contact: InfoWorld Editorial Events, San Mateo, Calif. (415) 312-0545.

Comnet '94. Washington, Jan. 24-27 — Focus will be on companywide enterprise networking issues. Sponsored by *Computerworld* and *Network World*. Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Fourth Annual "Achieving Quality Software" Tutorial and Conference. San Diego, Jan. 26-28 — Speakers include Barry Boehm, University of Southern California, and Ron Radice, director of the Software Process Program. Contact: Vince Heald, Beck-Eilman Agency, La Mesa, Calif. (619) 469-3500.

10th International Conference on Engineering Information Systems: Product Data Management & Alternatives. Dallas, Jan. 26-28 — Contact: Management Roundtable, Boston, Mass. (617) 232-9080.

JAN. 30-FEB. 5

14th Annual Florida Educational Technology Conference. Tampa, Fla., Jan. 31-Feb. 4 — Contact: Bureau of Educational Technology/Florida Education Center, Tallahassee, Fla. (904) 488-0980.

Executive Technology Summit '94. Sponsored by The Society for Information Management and *Computerworld*. Tarpon Springs, Fla., Feb. 2-4 — Contact: ATI Travel Management, Chicago, Ill. (312) 644-6642.

FEB. 6-FEB. 12

Building Enterprise Architectures. Washington, Feb. 8-10 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

FEB. 13-FEB. 19

Sigda: Workshop on Field Programming Gate Arrays. Berkeley, Calif., Feb. 14-15 — Contact: Association for Computing Machinery, New York, N.Y. (212) 944-1318.

The Sixth Annual Software Support Conference. San Francisco, Feb. 14-16 — Contact: Jan Rosenthal, Institute for International Research, New York, N.Y. (212) 661-3500.

Mobile World. Dallas, Feb. 15-17 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Networks Expo '94. Boston, Feb. 15-17 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

Distribution/Computer Expo '94. West Irvine, Calif., Feb. 16-17 — Contact: C.S. Report, Uwchland, Pa. (215) 458-6410.

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FOR SOME, IT'S SIMPLY A GOOD WAY TO GET A CONFERENCE ROOM. FOR OTHERS, IT'S AN ENTREE TO STREAMLINING THE BUSINESS.

BY ALAN RADDING

Groupware is big, no arguing with that. But it's hard to tell how much of its popularity is due to the fact that just about *anything* can fall under this category.

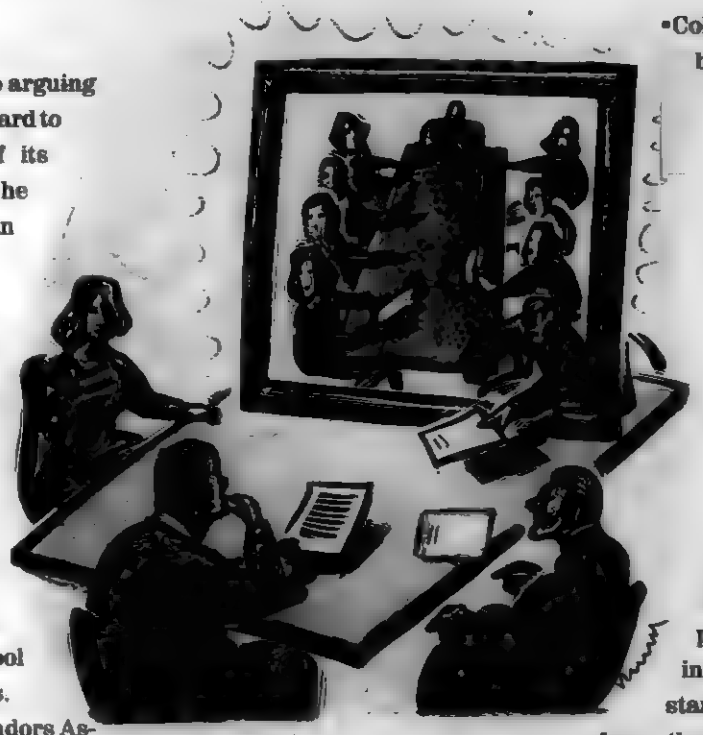
The term is being applied to everything from project management software to multiuser databases to remote access tools to document imaging software.

Current definitions of groupware don't give information systems managers much guidance. One early definition called it "a co-evolving human tool system" — whatever that means.

The Groupware Users and Vendors Association in San Francisco identifies approximately 200 vendors that provide groupware products and services ranging from basic electronic-mail packages to integrated applications such as Notes from Lotus Development Corp.

Even if vendors and analysts can't agree on a precise definition, an outline of the functionality required for group collaboration is emerging. It includes:

- Messaging with intelligent filtering and routing capabilities (page 103).
- Scheduling (page 105).
- Conferencing (page 103).



Bill Russell

Notes and companions
PAGE 106

Buyers' Scorecard:
Project management software
PAGE 110

Firing Line:
Futurus Team
PAGE 112

- Collaborative software that combines a number of groupware functions (page 106).

A forms capability is also emerging as a hot new feature. Sophisticated E-mail-based forms can replace traditional forms, such as expense reimbursement and purchase order paperwork; they can also take over the task of routing the forms to the appropriate people.

More importantly, today's forms incorporate an underlying logic that allows them to process the form or serve as the input device to a database. For instance, when salespeople fill out a form, they're also entering data into a database because of the SQL logic underlying the form.

The future of groupware will likely see the blending of the above categories.

Despite the emergence in the past 18 months of numerous groupware- and work-flow-oriented packages, few organizations are actually using them in production mode, says Michael Bragen, a software industry analyst in Lexington, Mass. As a result, the known needs of the market at this point are limited.

Radding is a free-lance writer in Newton, Mass.

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HOW MUCH GROUPWARE IS ENOUGH?

It started innocently enough with senior executives checking messages and mail from the road, including scanned copies of paper mail. Before long, any document for any project pursued at Harmon Contract, Inc. was stored in a Notes database, be it a permit, a waiver, a materials list or a subcontractor schedule.

But Harmon, a large construction firm in Minneapolis, really got serious about Lotus Development Corp.'s Notes groupware product when it acquired five small companies and tied them together with $400,000 worth of PC LANs, Notes and Lotus' SmartSuite group of personal productivity products.

The clincher was when the newly enlarged Harmon won its first bid, a $6 million project, in large part because even the customer could send messages and check on documents by accessing Harmon's Notes database.

For companies such as Harmon, a single groupware application can blossom into a way of streamlining business processes cheaply or at least without paying a Big 6 firm tens of thousands of bucks.

"Notes applies itself well to what people see as the problems holding back the business," says Robert Larson-Hughes, formerly information systems director at Harmon, now a principal at Notes consulting firm Larson-Hughes & Associates.

In fewer cases, groupware is single-purpose. "We had a crying need to schedule facilities," reports Bill Sims, director of operations for the Miami Project to Cure Paralysis at the University of Miami School of Medicine. The group adopted Network Scheduler from PowerCore, Inc., but users have resisted other groupware.

"People see it as more bells and whistles that we don't need," Sims says.

For those of you trying to stay ahead of the groupware curve, the lesson is: First get a feel for how far people want to take this phenomenon and then buy products that match a specific need.

That's not easy to do because groupware tends to take on a life of its own once implemented. Users who first want conferencing or scheduling tend to eventually outgrow those systems. So if you start with "just a little," you might be sorry before long.

Success lies in not getting "stuck" with a product that can't expand. That means considering whether any single-function product you purchase will be able to integrate with other groupware or whether it has additional modules.

With multifunctional products, be sure they're open enough to integrate with the enterprise or other existing personal productivity applications.

E-MAIL

THE ORIGINAL GROUPWARE

WorkGroup Technologies, Inc.

Electronic mail is a given in any groupware system — but not just E-mail in the messaging sense.

Today's E-mail has to have smarts. Not only does it have to deliver messages, but it should also distribute and route them based on subject matter. An urgent late-night message to the help desk from a high-level executive can automatically trigger a beeper call to a support technician. Or a sales order form for a new customer can trigger a request to an outside service for a credit report.

When New England Medical Center in Boston first experienced Beyond, Inc.'s BeyondMail almost two years ago, "we got all kinds of ideas for intelligent messaging like tying in beepers and faxes," says Sarah McGillowey, support manager. For example, the system might page a doctor based on lab test results that arrive at the doctor's E-mail mailbox.

But even intelligence in E-mail is becoming less of a differentiating factor since most mainstream products now have rules and filtering capabilities. Companies such as Futurus Corp. in Atlanta, which makes Futurus Team, are scrambling to stay ahead by layering other functions on top of E-mail, such as scheduling and conferencing. Microsoft Corp., Lotus Development Corp. and WordPerfect Corp. are adding forms capabilities to their basic E-mail packages.

In fact, by the end of the decade, "E-mail and scheduling products will actually be part of the workgroup infrastructure," says Bob Flanagan, a senior analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "They'll become utilities and services that are required by end users."

Pictured is BeyondMail

E-MAIL PRODUCTS

CC:MAIL, LOTUS DEVELOPMENT CORP., CAMBRIDGE, MASS.
MAIL, MICROSOFT CORP., REDMOND, WASH.
BEYONDMAIL, BEYOND, INC., CAMBRIDGE, MASS.
COORDINATOR, DA VINCI SYSTEMS CORP., RALEIGH, N.C.
TEAM, FUTURUS CORP., ATLANTA, GA.
HIGGINS, ENABLE SOFTWARE CORP., BALLSTON LAKE, N.Y.

CONFERENCING

STILL IN DEVELOPMENT

WorkGroup Technologies, Inc.

Conferencing software won't be fully realized until desktop videoconferencing becomes practical — sometime around 1997, says Matt Cain, program director at Meta Group, Inc. in Westport, Conn.

Today, real-time, full-motion videoconferencing takes up too much bandwidth and requires too much high-end hardware, making it very expensive.

Until then, users are making do with other forms of electronic conferencing software: electronic meeting support, shared screens, "whiteboards" (a shared common screen), on-line chat services and electronic bulletin boards.

Shared-screen products allow geographically dispersed users to view the same on-screen information in real time. Participants use on-screen pointers and pen tools to point to screen items. The meeting organizer controls what appears on the screen and can also structure the meetings by allowing, for example, participants to rank various options and then display the results.

Whiteboard products, on the other hand, typically are used for brainstorming sessions. Meeting participants are usually present, although videoconferencing is being added to some products. Each user has a PC from which he can project his ideas onto a screen. Some systems provide a structured format that allows users to prioritize ideas or vote, rank or otherwise quantify group preferences.

When choosing a conferencing product, consider who controls the screen, the interaction rate, whether interaction is in real-time, platform support and wide-area network support, says David Coleman, chairman of GroupWare '94 and the Groupware Users and Vendors Association.

Pictured is SunSoft's Show Me

OTHER CONFERENCING PRODUCTS

VISIONQUEST, COLLABORATIVE TECHNOLOGIES CORP., AUSTIN, TEXAS
MEETING ROOM, EDEN SYSTEMS CORP., INDIANAPOLIS
DESKTOP CONFERENCING, FUJITSU NETWORKS INDUSTRY, INC., STAMFORD, CONN.
ASPECT FOR THE MAC, GROUP TECHNOLOGIES, INC., ARLINGTON, VA.
TELECONFERENCING SOFTWARE SYSTEM, PICTURETEL CORP., DANVERS, MASS.
SHOW ME, SUNSOFT, INC., A DIVISION OF SUN MICROSYSTEMS, INC., MOUNTAIN VIEW, CALIF.
TEAMTALK, TRAX SOFTWORKS, INC., CULVER CITY, CALIF.
GROUP SYSTEMS V, VENTANA CORP., TUCSON, ARIZ.
TEAMFOCUS, IBM, ENDICOTT, N.Y.
TIMBUKTU, FARALLON COMPUTING, INC., ALAMEDA, CALIF.
LIVEBOARD, GROUP COMMUNICATIONS (XEROX CORP.), PALO ALTO, CALIF.

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SCHEDULING

BIGGEST BANG FOR THE BUCK

WorkGroup Technologies, Inc.

Organizations that want an immediate return on investment turn to scheduling products first. Scheduling and calendaring systems do such things as:

- Keep track of users' individual calendars.
- Overlay those calendars to find free time for meetings.
- Notify users of meetings.
- Provide for automatic RSVP.
- Send reminders as meetings draw near.

"When the network goes down, the thing people scream for most is the scheduler," says Chuck Brown, technical services administrator for the city of Savannah, Ga. The city uses Campbell Services, Inc.'s On Time, a network-based scheduler that runs on its Banyan Systems, Inc. Vines network.

Initially, On Time was considered only for top managers, "but it quickly expanded to everybody," Brown says.

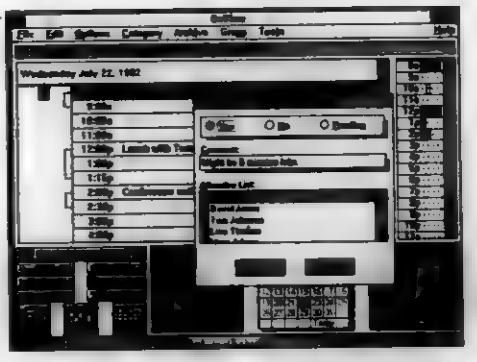
Similarly, Cambridge Neuroscience, Inc., a biotechnology firm in Cambridge, Mass., adopted Meeting Maker from On Technology, Inc., also in Cambridge, when it experienced "a lot of meeting room conflict," recalls Mark Schnegg, information systems manager.

The company tried to solve the problem using its electronic-mail system, but that only reduced the effort required to inform people about a meeting. It did nothing to automate the coordination of schedules and allocation of resources such as conference rooms.

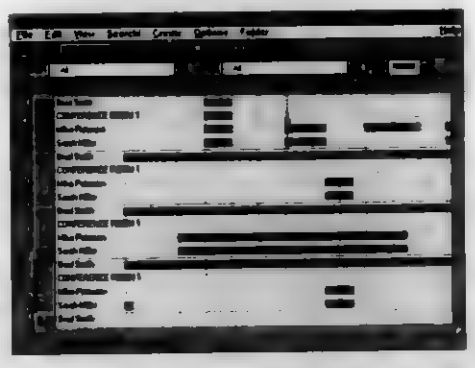
The firm selected Meeting Maker because it supports both Macintosh and PC users. Management was initially skeptical, Schnegg concedes, but today 100 users faithfully coordinate their schedules through Meeting Maker.

The current crop of schedulers, however, often come up short in areas such as support for central directories, resource scheduling (as opposed to people scheduling), automatic reconciliation for remote users and adjusting for time zones.

"We would really like an on-line address book and automatic reconciliation," Brown says. While scheduling resources, such as conference rooms or video equipment, seems a natural, not all systems provide it.



Campbell Services' On Time differentiates itself by using real-time message delivery rather than a store-and-forward approach



PowerCore, Inc.'s Network Scheduler offers Windows, Macintosh and Notes add-on versions of its scheduling system

RATING THE SCHEDULERS

THE FOLLOWING RATINGS WERE PROVIDED BY DOU RUSTICI, AN INDEPENDENT CONSULTANT DOING RESEARCH FOR AN UPCOMING PUBLICATION FOR THE PATRICIA SEYBOLD GROUP IN BOSTON. THE STUDY CONCENTRATES ON IMPLEMENTING CALENDARING ON A ENTERPRISEWIDE BASIS.

AVERAGE RATING	AVERAGE RATING	AVERAGE RATING	AVERAGE RATING	AVERAGE RATING	AVERAGE RATING
3.5	2.3	4.0	3.0	3.3	4.6

BEFORE YOU BUY

It has yet to be determined just what users need in groupware- and work-flow-oriented packages. Here's a preliminary idea of what to look for when choosing a system:

PLATFORM SUPPORT. Packages should operate on the broadest possible array of operating systems, networks, mail systems, databases and equipment.

Compatibility with mainframe and minicomputer database management systems formats is emerging as a requirement, particularly if the systems are to be considered available to enterprisewide use. A few of the systems on the market can read and write to SQL database formats.

Support for key network operating systems is fairly ubiquitous. Operating system and hardware platform support is not as advanced. It is still important to investigate vendor claims of multiplatform compatibility for Unix, OS/2 and the Macintosh.

EASE OF USE. Graphical user interfaces have come a long way toward making groupware easier to use. However, most kits can require substantial training, particularly on the wide-area network design end.

PRICING. Mail-enabled applications tend to be priced below high-end groupware solutions such as Notes from Lotus Development Corp. High-end systems are in the $200-per-seat range, while single-function products cost less than $100 per seat. Recent pricing strategy changes among vendors (notably Lotus with Notes) and competitiveness among software makers has contributed to lower price points across the board.

SCALABILITY. No product selling itself groupware can be limited to a small number of users and still be considered scalable. But this is more a function of compatibility with [illegible] system than the software itself.

The key to scaling efficiently over [illegible] through the mail system is having an [illegible] means of shipping data. For example, systems [illegible] large image files or require [illegible] of large databases drag down [illegible] performance. While this might work with a [illegible] users, it is likely to keel over under its own (messaging) weight with 1,000 users.

MODULARITY. Lotus has done well in marketing the concept of "modular functionality" with Notes. Other products are catching up in this department. Shareware is an common "groupware application programming interface" or work-flow standard in the industry, the lowest common denominator is the OSI/X.400, which has been historically difficult to integrate.

Written by Michael A. Brogan, a software industry analyst in Lexington, Mass.

THE FOUR MUSKETEERS

SOME PRODUCTS DEFY CATEGORIZATION ALTOGETHER. THE FOLLOWING VENDORS ALL OFFER E-MAIL AND THE ABILITY TO COLLABORATE ON APPLICATIONS. FROM THERE, THEY DIVERGE DRASTICALLY ON THEIR APPROACHES TO GROUPWARE.

LOTUS NOTES

LOTUS DEVELOPMENT CORP.

Notes was developed from a store-and-forward document database perspective. Its "notebook page" or "document" metaphor works exceptionally well for storing, viewing, manipulating and collaborating on documents.

•**Data types handled:** Lotus, like Oracle Corp., has recognized that "documents" can include graphics, audio and video. With Eastman Kodak Co., Lotus supports photos through its Document Imaging facility. Notes 4.0, due out next year, will support videoconferencing with PictureTel Corp.

•**SQL access:** Lotus' DataLens product enables access to SQL databases. Vendors such as Gupta Technologies, Inc. and Powersoft Corp. provide Notes interfaces.

•**Third-party relationships:** Many firms, such as Digital, have established technical relationships with Lotus, and many products are integrated with Notes or can pull data from Notes.

•**Training:** Of the products examined here, Notes is probably the most complex.

•**Application development:** Notes offers the most comprehensive application development environment of the four products.

•**Work flow:** An application programming interface (API) brings in third-party tools such as Action Technology, Inc.'s work-flow tools and Reach Corp.'s Workman for more complex, process-oriented applications.

DIGITAL LINKWORKS

DIGITAL EQUIPMENT CORP.

LinkWorks was developed from an object-oriented perspective. It is the only product of the four that is not an application; it is a framework that supports transparent group-enabling of personal and shared applications. It does not require you to change the way you work or the applications you use. Instead, it group-enables applications through encapsulation and by separating data and programs.

•**Available functions:** Electronic routing (serial, parallel and conditional), electronic signatures, versioning.

•**Data types handled:** LinkWorks easily integrates structured and unstructured data, which can be managed from a central point.

•**SQL access:** Can access Oracle, The ASK Group, Inc.'s Ingres, Digital's own Rdb and Informix Corp. relational databases.

•**Security:** LinkWorks provides a highly specific security system that lets an administrator isolate

databases and desktops. It has more of a top-down central management focus, whereas Notes has a more bottom-up and client-centric approach.

•**Routing capabilities:** Routing is less formalized than Notes. Users can develop their own work flows and routing processes by using a graphical user interface. Users point to the person and order in which the document will flow by identifying recipients on an on-screen organizational chart.

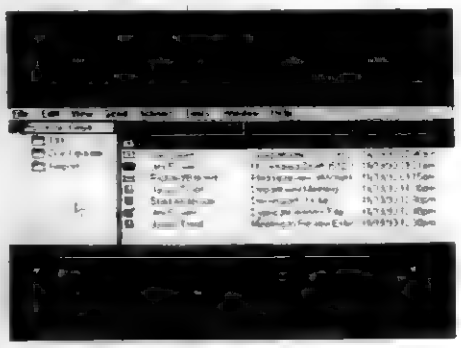
WORDPERFECT OFFICE

WORDPERFECT CORP.

WordPerfect Office's roots are in messaging. The product competes more directly with Oracle Office and is complementary to Notes. WordPerfect is working on a Notes gateway to WP Office.

•**Available functions:** Office supports electronic mail, scheduling/calendaring, simple work-flow forms and document routing with full-status tracking. WordPerfect's purchase of SoftSolutions, Inc. will allow WordPerfect to integrate SoftSolutions' document management software into Office. Office will then store long-term messages to be available for full-text search and retrieval.

•**Security:** As a client-oriented messaging system, Office implements security at the mailbox level through encryption of stored and



transported messages.

•**Work-flow capabilities:** Simple forms routing provided via E-mail.

•**Application development:** WP Office does not store documents or have direct database access, nor is it a development environment like Notes. Developers can access WP Office functions through APIs.

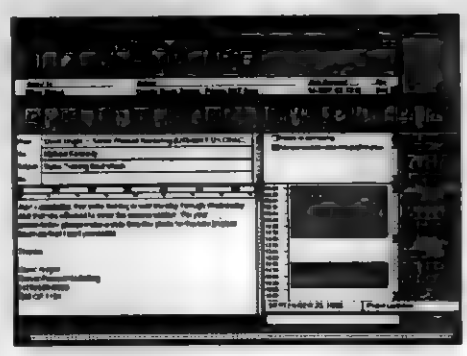
ORACLE OFFICE

ORACLE CORP.

Oracle Office was developed from a transaction-based relational database perspective. Being database-oriented, Oracle Corp. tends to favor the server side of client/server, as opposed to Lotus, which favors power on the client.

•**Available functions:** Office includes electronic mail/messaging, calendaring/scheduling, advanced directory services and integrated proofreading. Oracle is adding intelligent document manipulation and collaboration functionality. Document management capabilities will appear in 1994. This new layer will offer subject- and concept-oriented search and retrieval, version control and other functionality needed to collaborate around documents.

•**Application development:** It is



built on the Oracle database, a robust development environment.

•**SQL access:** Office accesses Oracle data as well as all other relational databases via gateways.

Written by David Coleman, conference chairman of GroupWare '94. His Internet address is davidc121@aol.com.

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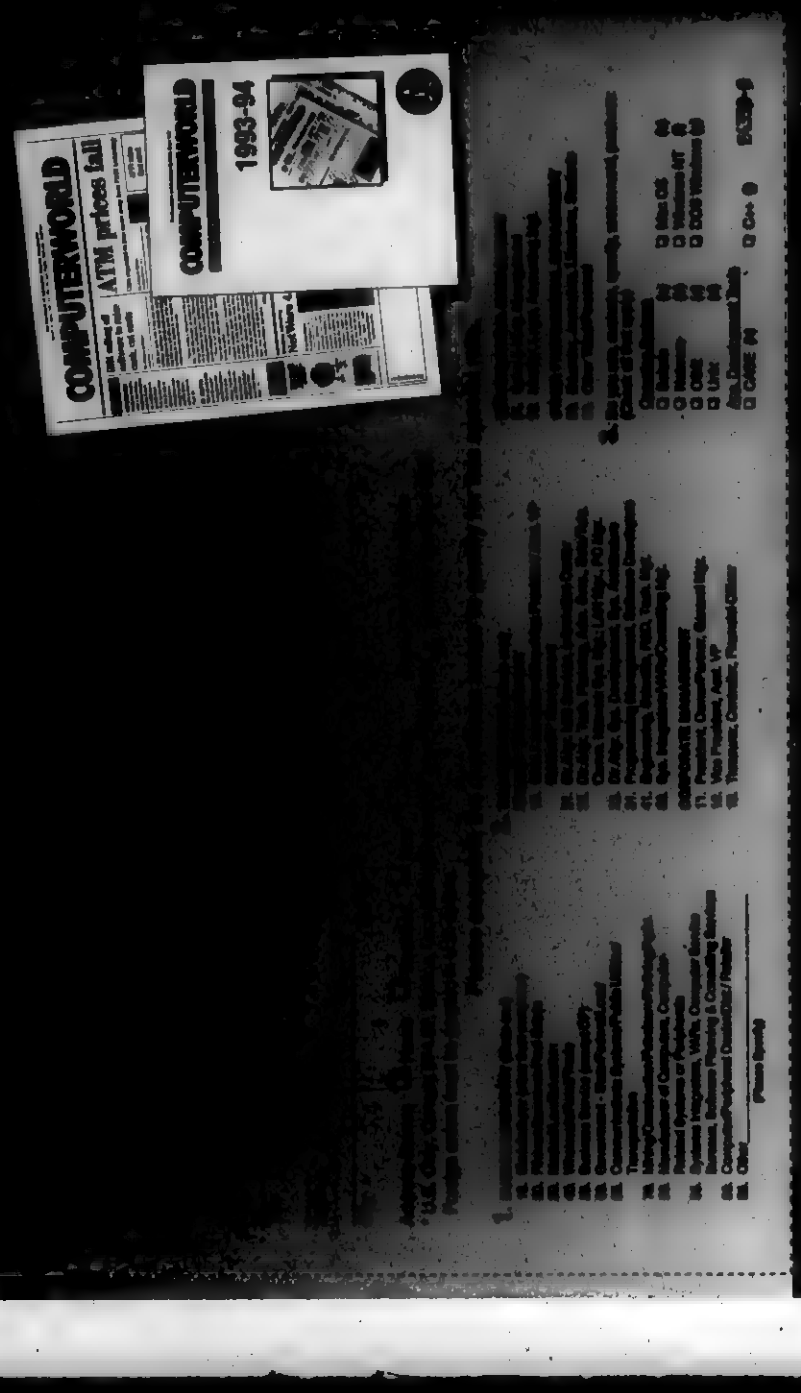
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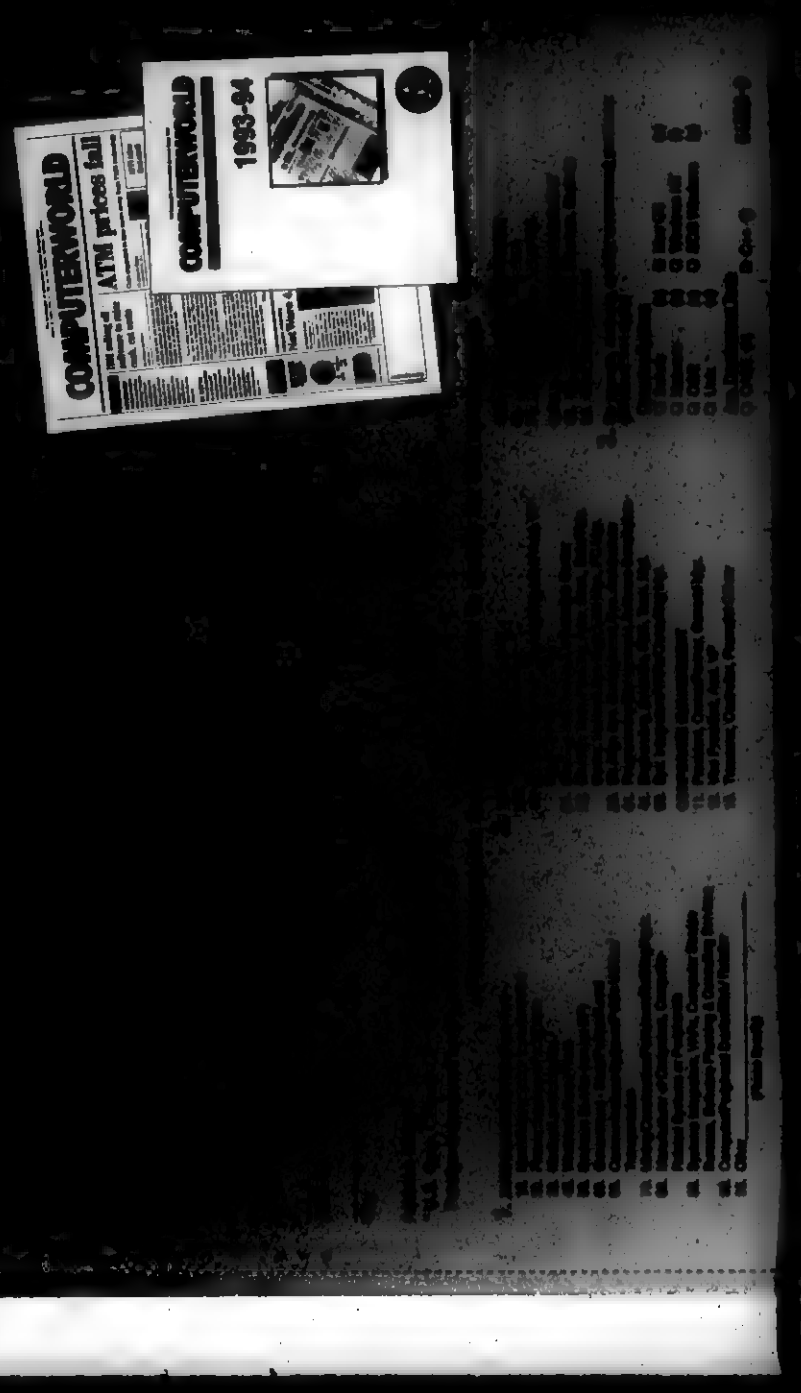
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BEHIND THE SCENES WITH RAY OZZIE

CREATOR

Everybody's on the groupware bandwagon now. Time was, Lotus Development Corp.'s Notes had the whole wagon to itself. Its timing had a lot to do with the vision of one Ray Ozzie, who started thinking about groupware when he was a computer science major at the University of Illinois.

Ozzie was struck by the school's host-based educational system, Plato, which included both a central bulletin board-style repository and an electronic-mail system. Students and faculty used the system to communicate and work with people all over the country. Ozzie became determined to re-create that type of environment on the PC platform.

Through a mutual friend, Ozzie met Mitch Kapor, founder of Lotus. He struck a deal that allowed him to spin off a company in 1984 to begin work on Notes. Ozzie is now president of that spin-off, Iris Associates in Westford, Mass. The 45-employee company handles the development of Notes, while Lotus handles marketing and sales.

"Groupware" is a fuzzy term. How do you define it?

"I use it to mean any kind of software that lets people share things or track things with other people. Calendaring software and E-mail are groupware by my definition. A mail-enabled spreadsheet is not, because that's not the core purpose of the application."

How do you translate that broad idea of "working together" into a product design?

"There are two basic models of collaboration: sending things to other people and sharing things among people. Sending is like the mail model; sharing is more like the central data model where people go to look for things in a central place.

"In order to build collaborative applications, you need both. Many of the interesting applications people want can't be built on a mail base. Similarly, you can't build it all on a sharing model. In work flow, you want to route something from person to person to person instead of having to go get it from somewhere."

Your competitors don't necessarily agree with that vision. Borland International, Inc. is working to create workgroup versions of their applications that will communicate by mail, instead of releasing a separate groupware product.

"In Borland's case, they've chosen to build groupware functionality on a mail substrate, not on a database. While there are many useful things you can do sharing things with mail, it simply doesn't scale to real-world applications once the group gets above the two- to three-people size."

What about Microsoft Corp.'s approach to groupware?

"Microsoft has a multitiered strategy. On the operating systems side, I'm sure that Microsoft's Cairo will have a nice object store. But it's going to be in one operating system, which will be a subset of the operating system that people use in real life.

"One of the compelling things about Notes is that the entire database system is on both the server and the client. You can use it 'disconnected' — off the network — just as easily as when you are on the LAN. But Windows NT takes 32M bytes of memory to run the object store.... You aren't going to be able to put that on your laptop."

Where is groupware technology headed in the near future?

"One of the interesting things that has developed is people using groupware for interenterprise communications. More and more customers are beginning to work with partners, suppliers, etc. who also happen to be using Notes. Because of the security model, it's easy to connect their systems together and still retain security. In the future, the interenterprise component will be much more important.

"Another very important thing is integration with other desktop applications. Technologies such as OLE [Object Linking and Embedding] establish a great base on which we can build to integrate Notes with spreadsheets, word processors, etc. Groupware can be the container for those applications and take care of getting the information to the place where it needs to be. We can add value to other applications even though they aren't Notes apps."

DON'T EVEN TRY TO PITCH IT AS 'GROUPWARE'

USER

JOE WEBER'S' FIRST ATTEMPT AT BRINGING GROUPWARE INTO HIS COMPANY FAILED TO THRILL USERS. BUT WHEN HE SOLD IT AS A WAY FOR MANUFACTURING TO KEEP UP PROCEDURE AND SAFETY MANUALS, USERS WERE HOOKED.

Earlier this year, it was time again for Joe Weber to face a recurring data management issue: document management for workgroups at manufacturing sites.

In the past, the Fortune 500 East Coast chemical corporation where Weber works had attacked the problem with mainframe-based, full-text search/document management software. Those systems are fast, but they are also costly to develop and maintain.

So Weber, an information resources specialist, and his colleagues decided to leverage the graphical PC operating systems — OS/2 and Windows — that had spread through the firm. He put a box of Lotus Development Corp.'s Notes under his arm and went out to talk with some of his users.

"Look, groupware!" Weber said.

"That's nice," the users said. "Go away."

Weber changed his strategy. "Instead of trying to sell 'groupware,' we're now trying to sell specific applications that happen to be groupware applications," he says.

One of the first applications, developed in consultation with the company's manufacturing sites, was a document management system that gave all the necessary people easy access to a constantly changing set of procedure manuals and safety documents.

Though faster and less expensive than developing mainframe applications, sculpting applications out of the Notes programming language was still a challenge, Weber says. "Some of the sample applications in Notes gave us some ideas, but they didn't work for us until we did some major tweaking," he says.

But in terms of user acceptance and savings in development costs, Weber says the Notes environment "exceeded our expectations." About half of the target users spend almost all of their computer time in the Notes environment.

What's on Weber's wish list? A run-time Notes module would be a real boon. "I don't want to have to spend 400 bucks for a full package to be used by a technician in a lab who will never develop a Notes application," he says.

Written by Paul Karon, a free-lance writer in Los Angeles.

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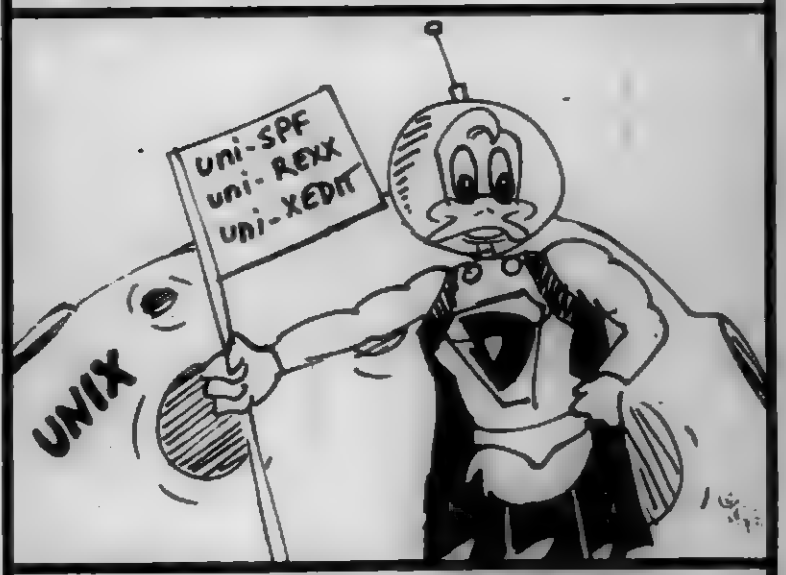

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COMPUTERWORLD BUYERS SATISFACTION SCORECARD

Integration garners high ratings for Microsoft Project for Windows

By Kevin Burden

Before the hype surrounding groupware packages focused the spotlight of interest on the habits of workgroups, groups of workers were communicating and coordinating projects through project management software.

Project management packages typically have been powerful applications with equally high-powered prices. They were notoriously complex and extremely difficult to learn. In the case of some high-end packages, this still holds true.

But low-end Windows-based packages are broadening accessibility to project applications. The graphical user interface has brought a level of intuitive ease of use and substantially reduced the learning curve.

In the Buyers' Satisfaction Scorecard, users of the two leading Windows-based packages, Microsoft Corp.'s Project for Windows and Symantec Corp.'s Time Line, rated their satisfaction with the software's key abilities.

Although the market-leading Microsoft Project scored the highest in 13 of the 20 categories, Time Line's scores were very close, which explains why Symantec calls Time Line "No. 2 with a bullet."

Split decision

Microsoft Project scored very high in overall reliability and its ability to interface with other applications. But it scored low in price and ability to transfer information to multiple platforms.

Time Line also excelled in reliability, and users said they were very satisfied with the package's ease of use. Time Line received low marks for its database functions and its ability to perform what-if scenarios.

Microsoft Project incorporates both Dynamic Data Exchange and Object Linking and Embedding, which helped it with its high integration rating. These features allow users of Project to effectively interface to external applications and create custom solutions.

Time Line's spreadsheet-like interface and outline structure give the screen a familiar look and, hence, a high ease-of-use rating. Time Line also incorporates a technology called Co-Pilot that monitors a user's actions and makes suggestions along the way.

The most popular high-end project managers are Primavera Systems, Inc.'s Project Planner, Welcom Software Technology's Open Plan, Lucas Management Systems' Artemis Prestige and Project Software & Development, Inc.'s Project/2 Series X.

Levels of difficulty

These packages were designed to handle many levels of complexity, which is why there are different levels of project management software. High-level, mission-critical projects require an equally involved, function-packed application to manage many resources.

The prices of these packages are all in the $1,500-and-up range per single user, compared with less than $700 for a low-end application. Obviously, high-end packages are intended for the skilled project stakeholder, not the novice computer user.

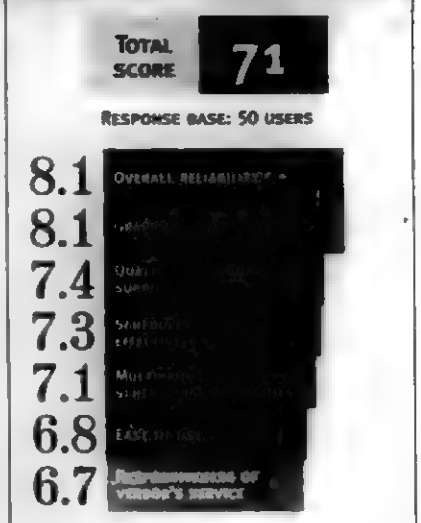
Buyers' Satisfaction Scorecard is a user survey of market-leading products conducted and tabulated by First Market Research Corp. in Austin, Texas. For a complete methodology, contact Kevin Burden at (800) 343-6474, Ext. 717. ■

AREAS OF EXCELLENCE

■ Both project management packages excelled in particular areas, outperforming the other by a measurable margin.

■ Ratings are based on a 1-to-10 scale, where 10 is best. The level of importance indicates the priority users place on the category in the purchase process.

MICROSOFT CORP. PROJECT FOR WINDOWS

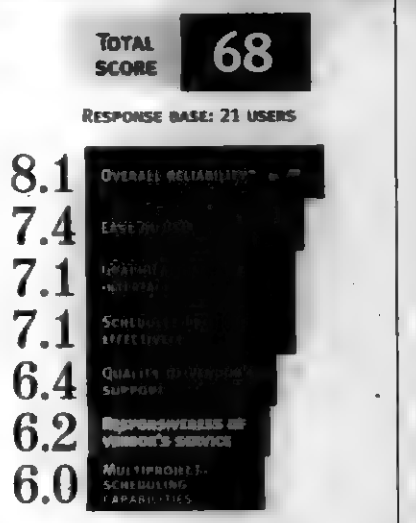


RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy this product again?

(NUMBER OF RESPONDENTS)
REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

SYMANTEC CORP. TIME LINE FOR WINDOWS

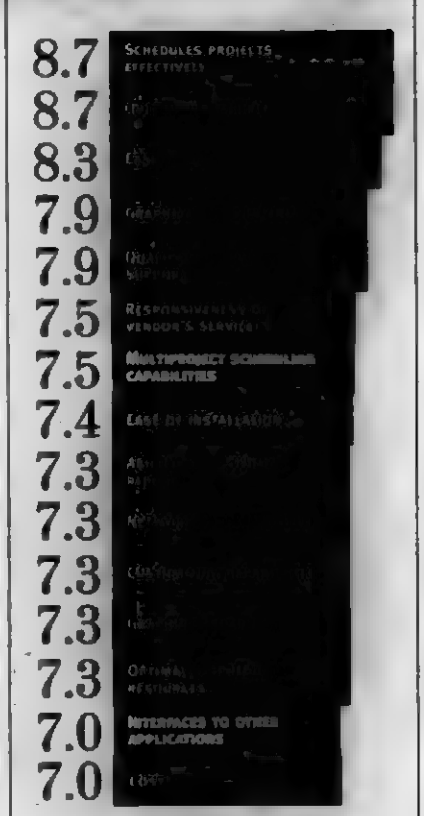


RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy this product again?

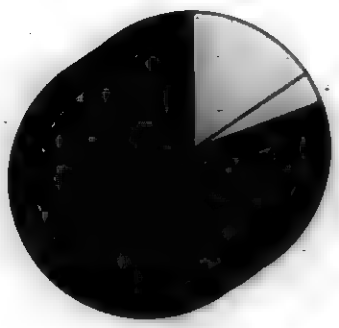
(NUMBER OF RESPONDENTS)
REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

RATINGS IN ORDER OF IMPORTANCE



RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST

Why is Compuware the company so many turn to for programming productivity tools?



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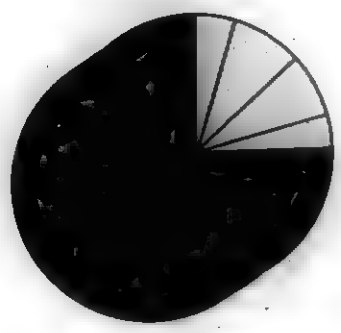

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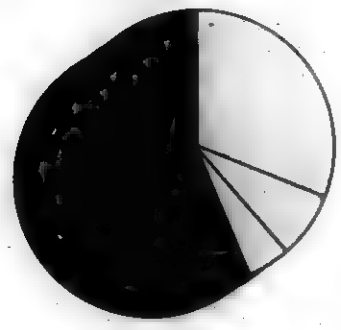

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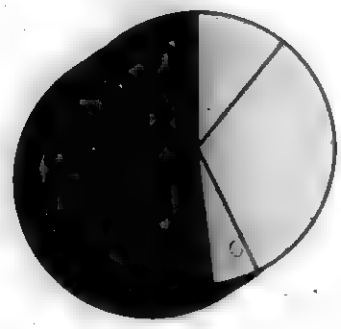
over all other products



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Futurus Team Combo:
No frill, low-cost groupware basics

Futurus Team Combo 3.0

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

- **Evaluators said Futurus Corp.'s 3-year-old Futurus Team Combo provided basic electronic mail, scheduling and databases at a very low price.**
- **They expressed concerns that new versions of the software were being released prematurely and without adequate technical support.**

The meat and potatoes requirements of groupware traditionally meet the simple purposes of electronic mail, scheduling and some database functionality.

Enter Futurus Team Combo, a straightforward implementation of the groupware concept that has been available in several versions since 1987.

A sparse yet easy-to-use groupware package, Futurus Team, from Atlanta-based Futurus, includes all of the essential components of groupware. Version 3.0 of Futurus Team, announced in August, includes a few maintenance and printing enhancements but does not significantly add to the basic functionality of embedded E-mail, scheduling and databases.

The evaluators participating in this survey included technical and management personnel from a regional food distributor, a manufacturer, a global electronics firm and a metal products company. Average use of Futurus Team was approximately three years.

All evaluators worked with Windows and DOS versions of the client software, as well as recent upgrades to Futurus Team Version 3.0.

The evaluators collectively oversaw more than 1,000 client installations of the groupware. The electronic and manufacturing firms had regional and global links to off-site Futurus Team servers.

The format for this evaluation was created with the help of Howard Rubin Associates and Technology Investment Strategies Corp.

Installation

The evaluators said initial installation and upgrades of Futurus Team went smoothly and usually took less than one hour. Upon installation, the program reads the Novell, Inc. NetWare bindery and adds users and network addresses to its own user list. Additional modules that add Message Handling Service (MHS) and wide-area network services made installation more complex.

Food distributor: "It directly read our existing Novell users."

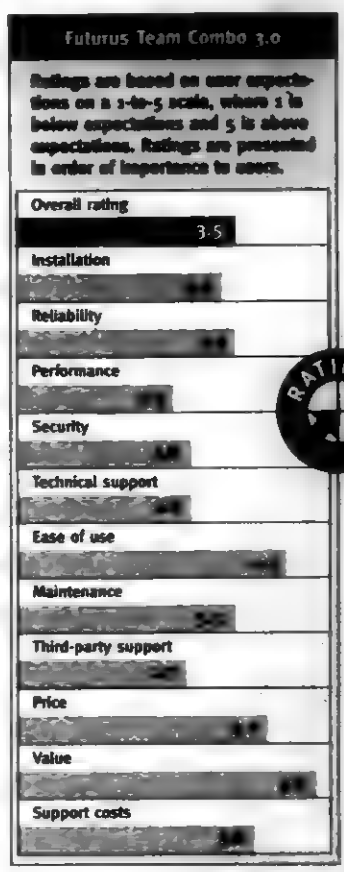
Electronics: "The documentation doesn't go into sophisticated setups using MHS and WAN modules. MHS was painful."

Reliability

Failures were infrequent with the DOS versions of Futurus Team, although more than one evaluator complained about the integrity of the newer Windows software.

Manufacturer: "There is little to nothing wrong with the software."

Metal products: "They gave me four [Windows] fixes, two of which were inoperable."



Performance

Evaluators were less than content with software performance and expressed a desire for faster printing of Futurus mail and faxes.

Food distributor: "They have been improving printing, but the rest of the functions are immediate."

Security

Futurus Team uses MS-DOS and Novell security capabilities to protect messages and files. For three of the evaluators, that was sufficient for security purposes.

Food distributor: "Some executives are hesitant to use [Futurus Team] because the mail is not encrypted."

Electronics: "A technically aware person could break the security, which is based on Novell NetWare."

Technical support

Evaluators said support from Futurus was not generally required. However, they rated the company slightly less than average because of bugs in the newer Windows software.

Manufacturer: "They have been good with support calls, but they are never proactive about [informing customers of] bugs."

Ease of use

Training new users on Futurus Team was a snap, the evaluators said. Training ranged from a simple instructional handout to one hour of hands-on coaching.

Manufacturer: "We provide a one-hour training class on an ongoing basis."

Electronics: "If you know Windows, it's self-evident."

Maintenance

Futurus Team required little maintenance. The evaluators reported maintenance times of about one hour to two days per week. They did say they wanted an easier method to rid the system of old and archived mail.

Metal products: "They haven't provided good utilities to remove built-up data."

Price

The evaluators were in agreement that Futurus Team was one of the less expensive E-mail and scheduling packages available on a per-seat basis. They reported initial expenses of $35 to $65 per user and upgrade costs averaging $10 per seat.

Value

Even the harshest critic of bugs in the new Futurus Team software for Windows said the program was an excellent value.

Manufacturer: "Considering what it cost, the value is astronomical."

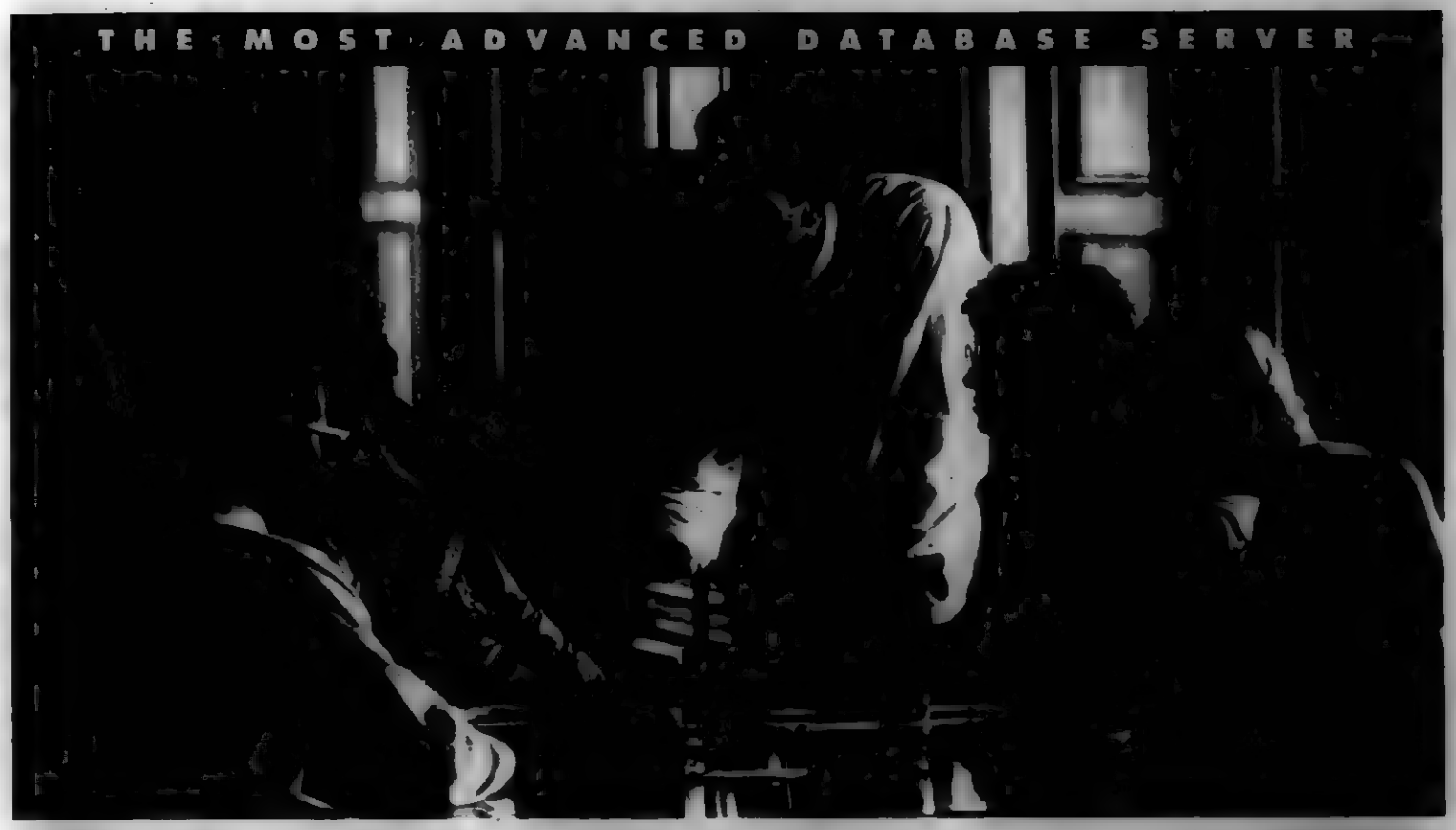
Futurus responds

▶ **Technical problems:** Upgrades will be less frequent, as Team is now a more stable Windows product. This will result in fewer client disruptions and expense.

▶ **User lists:** Futurus Team reads the Novell NetWare bindery at installation time, but the product does not yet provide for synchronization thereafter.

▶ **Third-party support:** Futurus awaits agreement among several groupware vendors on suggested data interchange issues before [making the Futurus Team programming interface and file format information available]. Our Team Combo phone message center already uses a DBF database structure.

Written by Computerworld *senior editor Garry Ray.*



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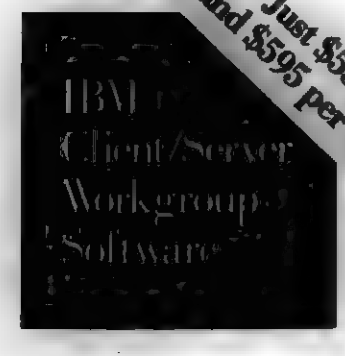

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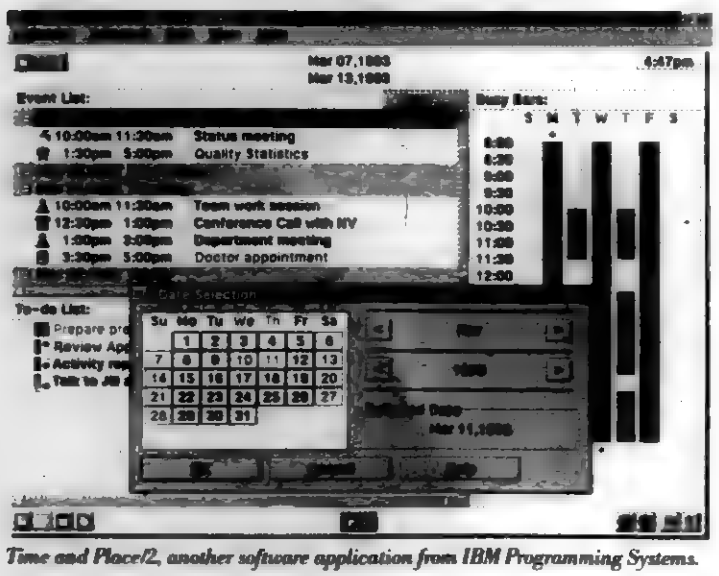

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Sick Software

Inferior software doesn't spontaneously generate. Creeping user requirements, excessive schedule pressure and management malpractice are among the factors that put software at risk

By Capers Jones

The year 1993 marks the 50th anniversary of the software and computing professions (the contract to build the ENIAC computer is dated June 5, 1943). At 50 years of age, neither the industry nor the people within it are young. The 50-year mark is often a time of midlife crisis for people. It is also a time of midlife crisis for industries, and software is now in the midst of one.

This is an excerpt from Capers Jones' forthcoming book, *Assessment and Control of Software Risks*, to be published by PTR Prentice Hall this month. (Copyright 1994 PTR Prentice Hall.)

To date, the computing and software industries have been great economic and intellectual triumphs for the U.S. About 40% of all the software that is operating in the world originated in the U.S.

If the U.S. intends to be the world's most successful software provider in the 21st century, as it has been in the 20th, then we must avoid complacency and approach software engineering with energy, rigor and effective methods and tools.

Software has long been regarded as one of the most risk-prone of all engineering activities. Risks such as schedule slips and cost overruns tend to occur on more than 50% of all large systems. It is not uncommon to see even more severe risks, such as cancellation of a project prior to completion or serious quality deficiencies.

Some risk factors are so serious that unless we handle them, projects and enterprises may be in jeopardy. After studying thousands of software projects at hundreds of enterprises, we've come up with 50 major problems that affect software. What follows are five of the risk factors that have the greatest potential for doing serious damage.

Sick software, *page 116*

Sick software

CONTINUED FROM PAGE 115

Inadequate measurement

Tracking and cost-collection systems for software projects tend to leak and omit major portions of software expense. Unpaid overtime, managerial effort, administrative effort, user effort and many specialist groups such as quality assurance and technical writing are often omitted from project data.

In some cases, there is no project tracking at all and, hence, the leakage is 100%. For enterprises that attempt software cost tracking, the average leakage ranges from 35% to 50%.

A major leak from cost-tracking systems is the work performed by users. For large civilian MIS applications, user work on tasks such as requirements, participating in reviews, writing portions of the documentation and acceptance testing can sum to almost 20% of the total effort. Yet this effort is almost never recorded because user time is not part of most projects' cost accounting structure.

FREQUENCY

Inadequate measurement is present in more than 80% of all U.S. companies, government agencies and military services. Even basic cost and resource tracking in the U.S. tends to omit unpaid overtime and managerial costs and is often in error by 30% to 70%.

COST IMPACT

The direct costs of inadequate measurement are normally considered to be zero. Note that there is a catch-22 associated with the direct costs of measurement: Only companies that measure know what it costs and what its value is.

Almost two-thirds of the total resources in the software industry are spent on things that have no positive benefit to the enterprise (based on a study carried out within ITT). The 65% wastage is the effort spent on harmful or nonproductive activities: buying productivity tools that do not work; delayed projects; unnecessary projects; reworking carelessly developed projects; canceled projects; and bug and defect repairs for problems that might have been prevented or removed early.

Thus, for a large Fortune 500 enterprise with an annual software budget of $500 million, about $325.5 million will be dissipated because of "friction" associated with current software problems.

The most effective preventive methods of inadequate measurement are cultural. Those enterprises in which the corporate culture is oriented toward excellence and "management by fact" have the best situation for prevention.

Excessive schedule pressure

Irrational schedules and excessive schedule pressure have occurred on more than 65% of all large projects we've assessed to date. Excessive schedule pressure is a key contributor to poor quality, canceled projects, low morale, fatigue, burnout and high attrition rates among software personnel.

FREQUENCY

Excessive schedule pressure is the most common of all serious software engineering problems. It has been observed in about 75% of all MIS software projects larger than 1,000 function points in size. For projects larger than 5,000 function points, the frequency approaches 90%.

COST IMPACT

The direct costs of excessive schedule pressure are difficult to measure because one of its by-products is a massive amount of unpaid overtime, sometimes exceeding 30 hours per week!

An indirect cost of excessive schedule pressure is that of low quality. The number of bugs reported in the first year of projects with excessive schedule pressure can be up to four times higher than normal. This can raise the first-year defect repair costs to more than $200 per function point, as opposed to less than $50 per function point for more carefully developed software.

Unfortunately, by the time excessive schedule pressure becomes visible, it is usually too late to control it.

Watch for these Software Risks

Few projects have more than 15 software risk factors at any time, but many projects have half a dozen simultaneously. Here are the five most frequently encountered risk factors for large MIS shops:

MIS projects

(accounting systems, claims handling systems, etc.)

RISK FACTOR	PERCENT OF PROJECTS AT RISK
Creeping user requirements	80%
Excessive schedule pressure	65%
Low quality	60%
Cost overruns	55%
Inadequate configuration control	50%

These findings are based on Software Productivity Research, Inc.'s assessment of thousands of software projects at hundreds of client companies.

Management malpractice

The root cause of management malpractice can be traced back to inadequate training in the six basic tasks of software project management: sizing, estimating, planning, tracking, measurement and assessment.

FREQUENCY

For licensed professions such as medicine and law, the incidence of malpractice is about 5%. For unlicensed professions such as software management, the incidence of malpractice exceeds 15%. The most frequent kinds of software management malpractice are severe schedule errors, severe cost overruns and inadequate quality control.

COST IMPACT

It is difficult to quantify management malpractice in dollars and cents. However, the U.S. average for software projects in 1993 is about $1,000 per function point. For many of the projects where the costs exceeded $1,500 per function point, we've found management malpractice to be among the contributing factors.

Management malpractice may also be associated with more than half of all canceled projects in the U.S.

Methods of prevention include the following: establishing criteria for managerial selection, appraisals and promotion; establishing annual opinion surveys and using them as a way of gaining visibility of malpractice; creating a human resources or personnel function; establishing a mentorship program under which senior managers will attempt to pass on their knowledge to new managers; establishing a management training curriculum that includes both personnel and technical subjects; setting aside days per year for management training; improving the training in the domains in which management malpractice is most common (i.e., planning, estimating, quality control); and establishing a management compensation plan that is not significantly below competitive averages.

Creeping user requirements

The rate of growth of creeping user requirements is about 1% per month. Thus, for a three-year project, about one-third of delivered functionality will have been added after the requirements phase.

FREQUENCY

Creeping requirements are endemic to the software industry and seem to occur on more than 70% of all applications over 1,000 function points. The severity of requirement creep is directly proportional to the size of the application. The average creep for a sample of 60 projects was 35%. The largest observed creep in unanticipated requirements was 200%.

COST IMPACT

The cost impact of creeping requirements can be quantified with very high precision by means of function point metrics. Assume that the average cost to build a project is $1,000 per function point, and the project starts with requirements that total to 1,000 function points. Using these numbers, the project has an initial cost estimate of $1 million.

Now assume that new requirements are added that total to 25%, or some 250 new function points. The project will now cost $1.25 million because the creeping requirements portion cost $250,000.

In real life, the situation is somewhat more complex because the costs of creeping requirements may be higher than the costs of the original functionality if the requirements occur too late in the development cycle.

The use of prototypes is beneficial in minimizing this problem. Creeping requirements are usually less than 10% for projects that use this technology. Joint application design (JAD) technology is also effective, and it, too, can reduce creeping requirements to below 10%.

Canceled projects

The cancellation rate for software projects is directly proportional to the overall size of the system and is acute above 10,000 function points or 1 million source statements.

For large systems in excess of 10,000 function points, such as operating systems, telecom systems and the like, the cancellation rate approaches 50%. Ominously, an "average" canceled project is about a year late and approaches or exceeds twice its planned budget at the time of cancellation.

FREQUENCY

Canceled software projects correlate with the size of the project. For projects larger than 10,000 function points, the probability of cancellation is greater than 65%. For projects larger than 5,000 function points, the probability of cancellation is around 50%. For projects between 1,000 and 5,000 function points, the probability of cancellation is around 25%. Below 1,000 function points, cancellation rates drop rapidly.

COST IMPACT

For 1993, the approximate dimensions of canceled projects in the U.S. are these: 12 million function points worth of canceled projects, with a total dollar waste of $14.3 billion and a loss of productive staff time of over 285,000 person-years of total software effort. The frequency of canceled projects in Japan appears to be only about half that of the U.S.

.....

The risks cited here are only the tip of the iceberg. The encouraging aspect of software risk management is that new methods such as process assessments and the use of functional metrics are proving to be remarkably effective in identifying risks that were long hidden.

A combination of vigorous process assessments, accurate measures and metrics and multithread process improvement programs can minimize or eliminate many risk factors and begin to make the phrase "software engineering" take on serious meaning. ■

Jones is an international consultant, speaker and author. He is chairman and co-founder of Software Productivity Research, Inc. in Burlington, Mass.

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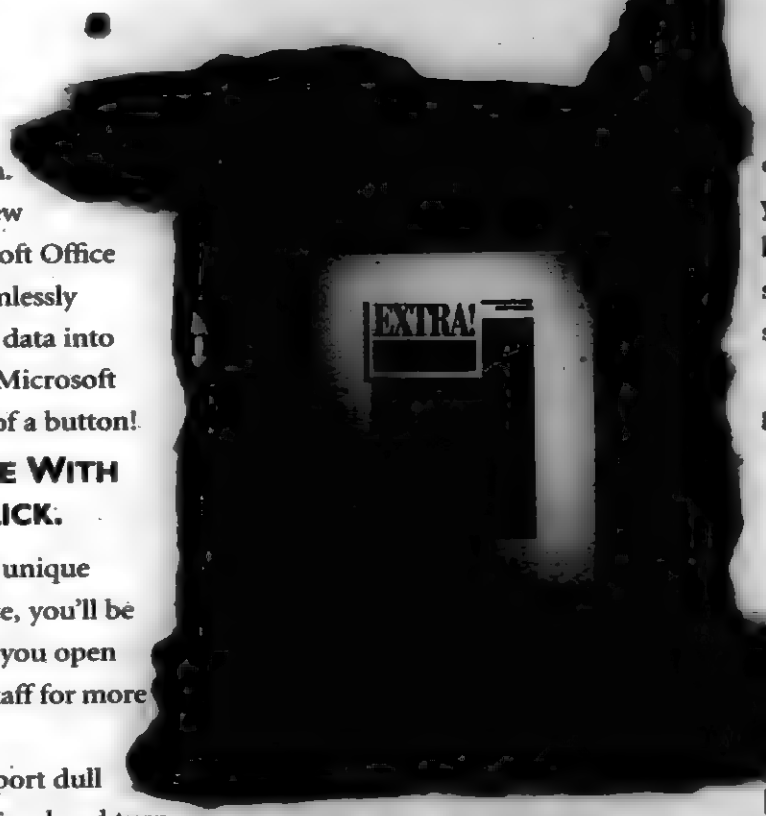

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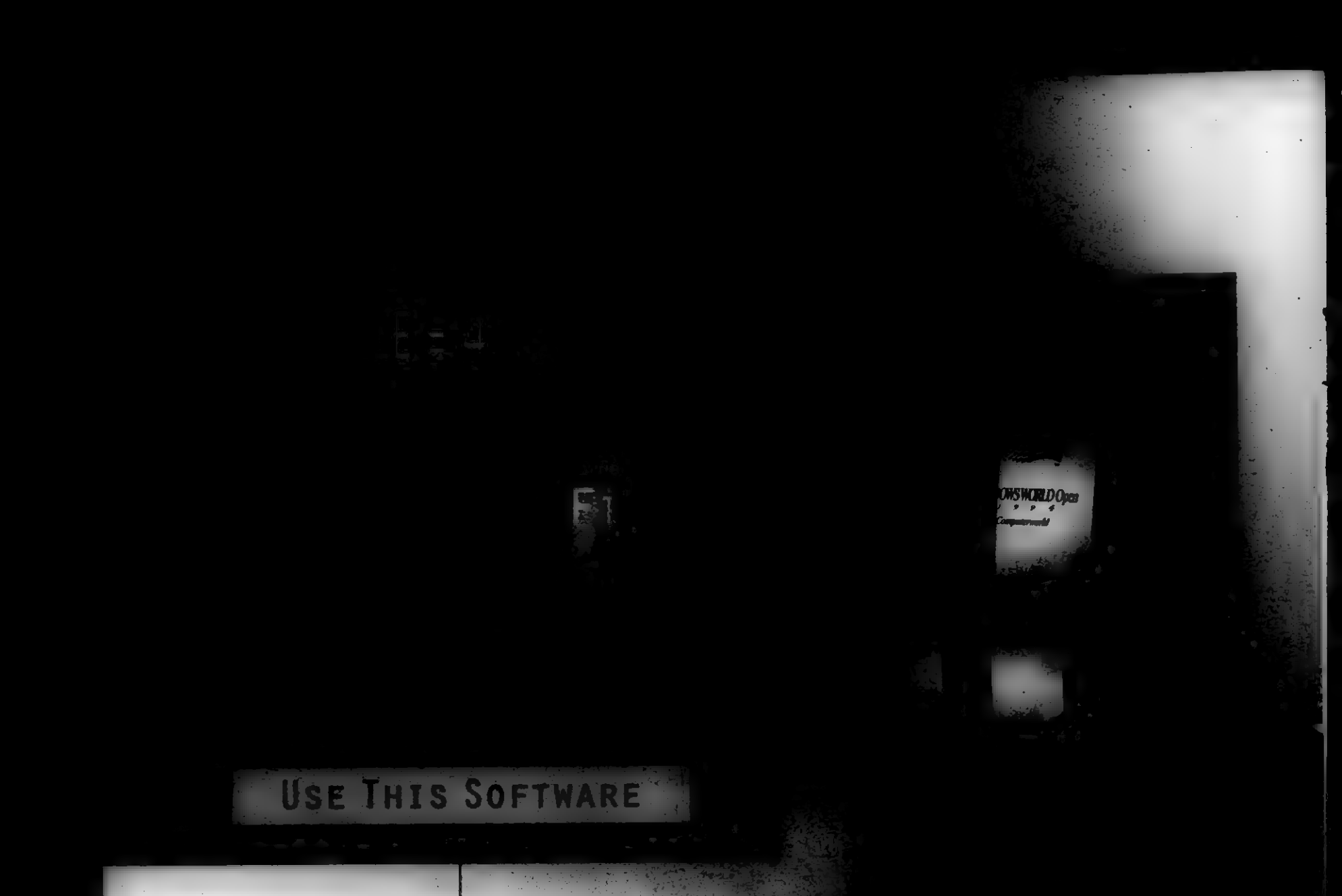

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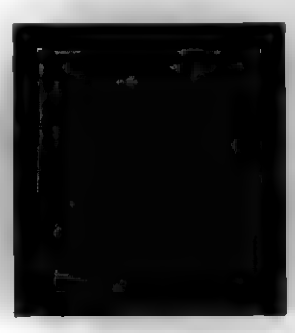

Jobs in

By Leslie Goff

Support veterans are not replacing their mainframe skills in the face of distributed computing; they're expanding them.

While programmers and systems analysts generally choose between moving into the PC world and continuing to work on the mainframe, service and support personnel have had to assume new responsibilities for their companies' growing infrastructure.

"The support aspect of my job more than doubled," says Johnny Bauer, a technical support analyst at the Goodyear Beaumont Chemical Plant in Beaumont, Texas. "I started spending more time outside the data center and on the phone taking users' calls. Their biggest problem was a lack of training in Windows."

For Bauer, who has nine years of data center experience under his belt, picking up support for his site's new client/server environment was expected by upper management. "It was rough to keep one step ahead of the users," Bauer says. "But I just picked it up as I went along through manuals and trial and error."

Bauer purchased a home PC and began teaching himself the Windows applications that his users were learning. Since Goodyear Chemical put in its first PC four years ago, Bauer has learned about client/server, Token Ring, fiber optics, OS/2, Windows and a number of software applications.

You have to be able to relate to the business unit users and managers even if you're the fix-it person.
Glen Jurmann, office technology section manager, Baxter Healthcare Corp., Deerfield, Ill.

At the same time, he continues handling his data center duties.

Like Bauer, Glen Jurmann, office technology section manager at Baxter Health Care in Deerfield, Ill., says his staff has beefed up their understanding of networks, application development tools, the inner workings of PCs and a myriad of operating systems and platforms.

Jurmann adds that to effectively support Baxter's user base, which often adds homegrown programs to the applications mix, his staff has to understand the interoperability of all those platforms and how they interact with corporate data.

Support personnel who were comfortable in the IS ivory tower are going to have a hard time [with distributed systems], but if you're willing to roll up your sleeves, you'll have more opportunity.
Jim Shay, divisional systems support manager, Eaton Corp., Milwaukee

"The protocols being used to access [corporate] data vary from LAN to LAN. While we're standardizing this as much as we can, there will always be advanced users developing their own applications," Jurmann says.

The computer-literate work force represents another change for the support staffer. Many can now resolve minor problems that used to require a service call — but these users often know just enough to be dangerous.

"They aren't afraid to try things that a few years ago they wouldn't attempt," says Sam Campbell, a technical support analyst at John Deere Des Moines Works in Des Moines, Iowa. "We have to go in and be the cleanup guys."

For instance, John Deere Des Moines Works uses a number of plotters for engineering designs. Campbell says he would initially install shared plotters on the network and configure them himself. As users became more literate, however, they started changing the configurations and "did not always reconfigure them the way they needed to operate in a shared environment," he says.

Yet despite the extra challenges, moving out of the data center into the user community has its advantages. For the self-motivated support staffer, distributed computing can mean the opportunity for increased visibility among business unit management, says Jim Shay, divisional systems support manager at Eaton Corp. in Milwaukee.

"If you're willing to roll up your sleeves, you'll have more opportunity, especially if you have a knack for systems integration," Shay says. "People who can deliver that kind of service will do really well, but you need to wrap up a package of soft skills, adaptability, hard work and problem-solving."

Goff is a free-lance writer in New York.

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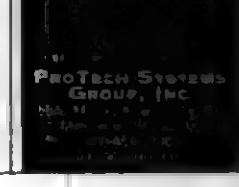

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By David Baum

In some companies, knowledge of a fourth-generation language (4GL) may be the only thing standing between you and the back door. Many organizations are adopting 4GL technology as a way of reducing head counts, and the "survivors are often those with 4GL skills," says Victor Janulaitis, president of Positive Support Review, a recruiting firm in Santa Monica, Calif.

Numerous products fall under the 4GL label, from end-user query languages and forms-oriented report generators to complete application development environments. Unfortunately, if your skills stop at third-generation languages, the shift to 4GLs is not an easy one to make.

One of the main reasons for that is a lack of standards, says Keith Therrien, president of TAD Consulting in Reading, Mass. Most 4GLs are structured around the products they support, such as a database or report writer. Syntax varies widely from one 4GL to the next, and they adhere to no common, external standards other than a few screen standards.

Most of the new graphical user interface-based 4GL products are also event-driven, points out Dave Smith, an application development manager at Sapiens USA in Goleta, Calif. "In a traditional 3GL program, the user responds to predefined prompts, and the structure of the program is prompt, read, input," Smith says. "The program is in control and the user responds."

In an event-driven program, however, the program must respond to events initiated by the user. "You can't think in terms of putting up a prompt, waiting for a response and then moving down a particular path in the program," Smith says.

"Instead of one procedural, monolithic block of code that follows a linear progression, the program is a series of small pieces of processing attached to many discrete events," he says.

The main challenge to learning a 4GL is understanding its particular model and event sets, Smith adds. Possible events associated with a particular field, for example, might include initially inputting data into the field and updating the data, as well as the actions that occur as the user moves the pointer in and out of the field. "These are all little places where you can attach your processing," Smith explains.

Smith and Therrien also agree that a good understanding of SQL is important. "You may not have to actually program in SQL because many of the 4GLs take care of that for you," Therrien says. "But you still need to understand relational concepts and what the 4GL is going to do behind the scenes to implement them."

Adds Smith: "You are still mapping the world of your application into a relational model. You need to know all the basic relational concepts — what constitutes a transaction, what a join is, what an outer join is."

Ken Fleming, director of technology at Encompass in Cary, N.C., stresses the importance of actually training with a 4GL, particularly for 3GL programmers: "3GL coders will bring a procedural mind-set to the 4GL environment and fail to use the new environment to its full potential."

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[redacted] 4GL skills can make programmers' salaries 7% to 12%, according to Victor Janulaitis, president of Positive Support Review, a recruiting firm in Santa Monica, Calif.

"Often you can make some [redacted] as an average programmer with 4GL skills than you could get with an excellent programmer with [redacted] skills," he says.

4GL skills tied to with graphical user interface development are particularly important right now, especially in client/server and Oracle installations, Janulaitis adds.

"I see [redacted] companies that are starting to make their move to [redacted]," he says.

Keith Therrien of Reading, Mass.-based TAD Consulting concurs. "It's painful going through the transition from 3GLs to 4GLs, but once you come out the other side, you generally don't want to go back."

—David Baum

Baum is a free-lance writer in Santa Barbara, Calif.

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Assistant Director of Information Resources for Academic Computing

Butler University seeks an experienced, service-oriented person to oversee instructional needs for new and existing faculty in Macintosh, DOS/Windows, VAX and internet software applications. He/she will proactively interact with faculty to provide computer related consulting and advice, as well as to inform faculty of new applications as they become available.

Requirements include strong computing background, excellent communication skills, and computer training or teaching experience. Preference will be given to candidates with experience in this type of position in higher education. Must possess Master's degree or equivalent combination of education and experience.

The Information Resources department provides computing assistance for all forms of computing on campus. This position is an administrative appointment and will be the principal computing liaison with the faculty. The salary range is $35-40,000.

Butler is an independent university located in a residential area with an enrollment of approximately 4,000 students. The computing environment at Butler includes Macintosh & IBM compatible micros in 12 labs (2/3 Mac, 1/3 PC), automated library system and a Digital VAXcluster. Full time faculty all have computers in their offices. All systems on campus are networked, and interconnected to the internet. Send resume along with names and phone numbers of 3 professional references to: Jon Sorenson, Chair of Search Committee, Department of Mathematics and Computer Science, Butler University, 4600 Sunset Avenue, Indianapolis, Indiana 46208. Email: Sorenson@Butler.Edu Review of applicants will begin January 20, 1993

Data Processing

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APPLICATION DEADLINE: Applications and job descriptions can be obtained by calling (502) 782-3489 and specifying request. Resume with cover letter should be submitted to: Human Resources Department, City of Bowling Green, P.O. Box 430 (1001 College Street), Bowling Green, KY 42102, specify salary history and minimum salary requirement. Applicants will be provided with a complete employment application, job description, and benefits summary. Deadline to submit resume: 4:00 p.m., Friday, January 7. The City of Bowling Green is an Equal Opportunity Employer.

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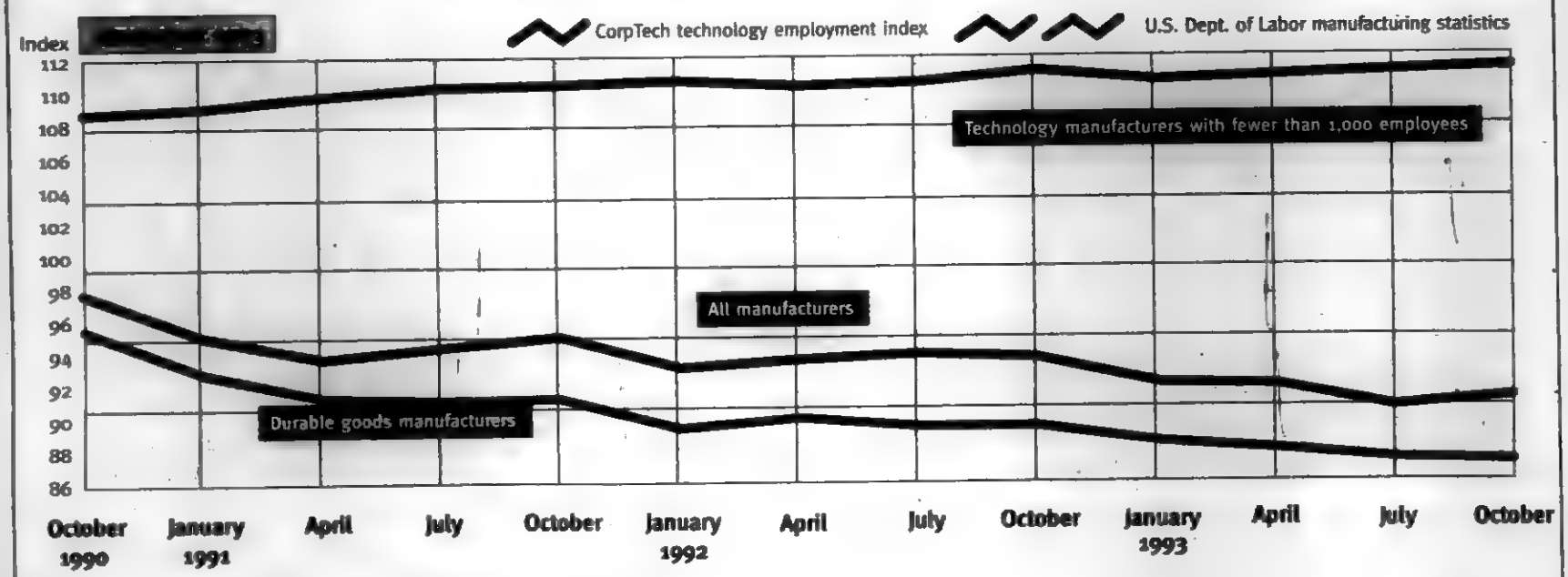

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E-mail

Practical tips for finding the E-mail package that's right for YOU

By Brownyn Fryer

Electronic mail has become a necessity. Yet purchasing a package on the fly can lead to problems as networks grow.

Experts who have recently gone through the evaluation process recommend the following criteria-setting tips:

Evaluate needs

Most information systems managers make the mistake of looking at off-the-shelf packages before fully evaluating current and future needs, says Joe Tumminaro, vice president of technology at J. Frank & Associates, a Palo Alto, Calif., consulting firm. "Once you've made the commitment, changing your mind is much more difficult than it is with most software."

Before you even begin looking at packages, most experts recommend getting detailed answers to questions:

- What hardware and operating system platforms must the mail system support?
- How many users must it support now? In two years? Five years?
- Will remote users at multiple sites need to use the system?
- What kinds of gateways do you need?
- Must users access external services, such as CompuServe?

Check under the hood

The most common E-mail problems occur in the following areas. If you cannot test for them, ask the vendor for reference sites to show you how they fared.

- **Interoperability:** For companies with heterogeneous computing environments, interoperability across platforms is an overriding problem. "As Macintoshes, PCs and Unix systems are added to a network, there can be lots of fallout," Tumminaro says. For this reason, it's important to make sure that a message can be sent from a Unix system to a Macintosh or from a LAN to a wide-area network. Try sending a large embedded file across the network.

Attachments and embedded files should be sent across intact and the message's format and content preserved.

- **Scalability:** As a network grows, adding updates or integrating directories can become increasingly difficult. "Make sure the package can support from two to 20,000 users without having to do massive administration," says Nina Burns, president of Creative Networks, Inc. in Palo Alto, Calif. "If you have more than one directory, check to see whether a built-in gateway will allow you to automatically propagate new local and remote users to other directories on other E-mail systems."
- **Architecture:** Look at not only the package's underlying architecture but at the vendor's plans for improving it, says David Ferris, president of Ferris Networks in San Francisco. "Ask yourself how good a job the vendor is doing in designing the software and make sure it has a clear plan for supporting X.400 or SMTP backbones, client/server systems, network management and the like."
- **Remote communication:** Outside personnel should be able to send and receive mail transparently. The package should support a number of modems and use open communications protocols, Tumminaro says. At the same time, check to see how the system connects to outside communications services.
- **User interface:** The system should be as simple as possible to use and administer. "Administration tasks, such as updates, should be straightforward and occur without requiring taking the server off-line," Burns says. "The administrator should also be able to perform routine tasks from one central site."

Test the vendor

- **Third-party solutions:** No E-mail package is perfect; therefore, third-party support is important, Ferris says. "These products have real holes, and the vendors can't do everything. Third parties fill the gaps. The more third parties, the merrier."
- **Service/support:** Before signing on the dotted line, make sure to secure the vendor's full cooperation in answering questions and solving problems. That way, you can find out what kind of support you can expect afterward. Also make sure the vendor will assume responsibility for sorting out complex interconnects between systems, Tumminaro says.

"You want a single vendor to support all the possible interconnects all the way through."

- **References:** Ask to speak to sites that most closely resemble your own. Find out what other mail systems they use, as well as what they plan to add within two to five years including X.400 backbones, gateways and so forth. Find out how users are on the system and what desktop applications are used. Ask what kind of interoperability and capacity testing the company has done.

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bryer is a free-lance writer in Menlo Park, Calif.

You can't tell an E-mail package by its cover

Ron Mechsner, a technology analyst at Mercedes-Benz of North America, Inc. in Montvale, N.J., learned the hard way that there is more to E-mail than a pretty face. In September 1992, he sought an E-mail package that would let 1,200 Windows users in the U.S. access the company's mail system running on its mainframe in Stuttgart, Germany.

Mechsner and his staff opted for a LAN version that touted a graphical user interface as well as a gateway to the mainframe. Instead of conducting a full evaluation of their requirements however, they were smitten with the vendor's promise that it would meet their immediate needs. "It sounded perfect," Mechsner says. "It seemed to have everything we were after."

With a three-month deadline, the company installed the package on a pilot network. It soon discovered the package was a Version 1.0 product the vendor had bought from someone else. "It was like a Hollywood set," Mechsner says. "We opened the door of what looked like a real product and found out it was a piece of cardboard held up by two-by-fours."

After wrangling with the vendor for months and missing its deadline, the staff decided to abandon the project and start from scratch. This time they were careful to perform a full evaluation of their needs beforehand. The vendor's support, Mechsner says, was key to the final decision.

—*Brownyn Fryer*

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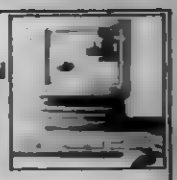

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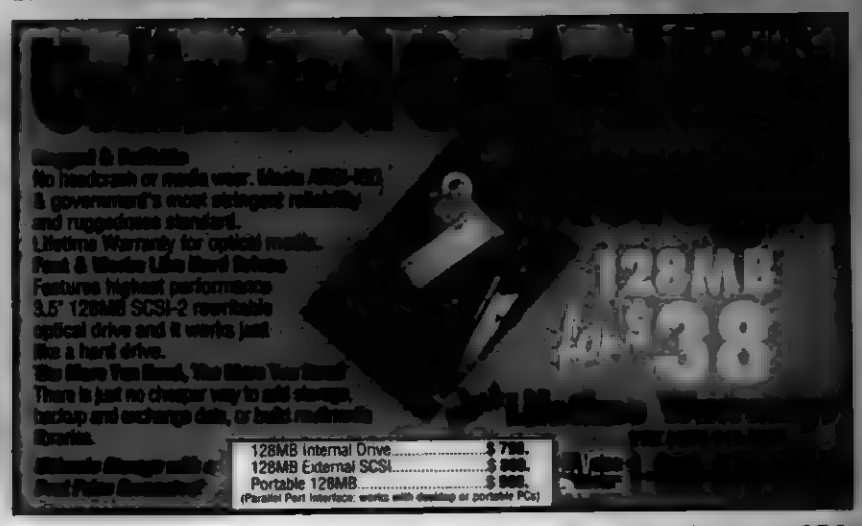

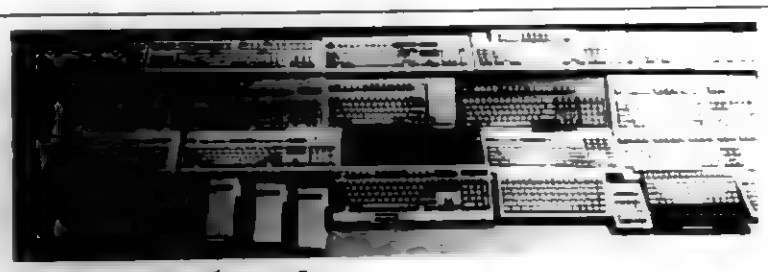

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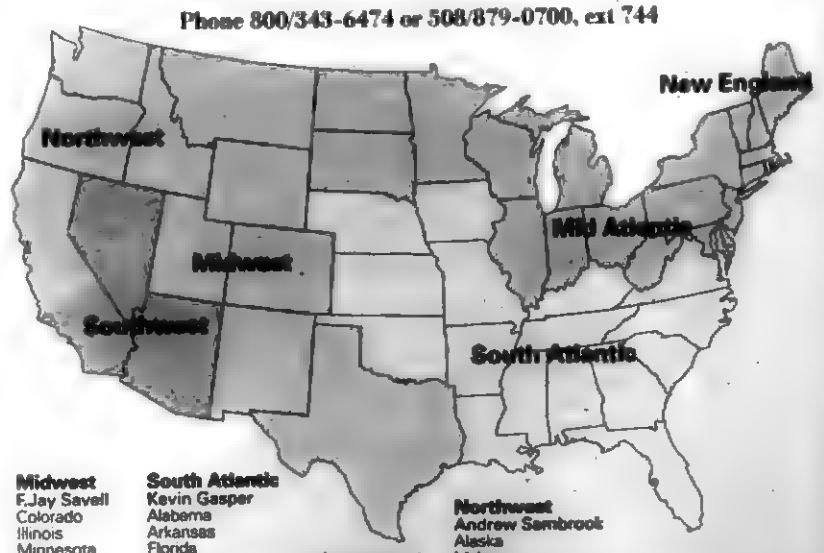

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Jan. 17	Dec. 31	Jan. 7	**CW Guide To: Spreadsheets and Spreadsheet Utilities** The New Capabilities *Buyers' Satisfaction Scorecard:* Windows Packages from Borland, Lotus, Microsoft, etc. *Firing Line:* Latest Windows Offering			
Jan. 24	Jan. 7	Jan. 14	**Closer Look:** ATM	**ComNet** Washington D.C., 1/25 - 1/27		
Jan. 31	Jan. 14	Jan. 21	**CW Guide To: Departmental Servers and Superservers** Matching a System to Departmental Needs (including Alpha, Tricord, Netframe, Sun, RS/6000, NCR, Sequent, Wyse, Compaq) *Buyers' Satisfaction Scorecard:* Leading RISC Servers *Firing Line:* Latest Server Product	**Executive Technology Summit** Tarpon Springs, Florida 2/2 - 2/4		
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Feb. 7	Jan. 21	Jan. 28	**Special Quarterly Report:** Re-engineering the Workplace		Starch	Mails: Feb. 9 Close: Jan. 3
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Apr. 4	Mar. 18	Mar. 25	**Closer Look:** Personal Productivity Software			
Apr. 11	Mar. 25	Apr. 1	**CW Guide To: NT vs. OS/2 vs. Unix** Desktop and Server Choices *Buyers' Satisfaction Scorecard:* Leading Server Operating Systems from IBM, Microsoft, Sun, etc. *Firing Line:* Latest Desktop Operating Systems from a Leading Vendor		Starch	Mails: April 13 Close: Mar. 17
Apr. 18	Apr. 1	Apr. 8	**Management Special:** IS Architecture in Times of Change	**AIIM** New York 4/18 - 4/21 **SIM Conference** Florida, 4/20 - 4/22		
Apr. 25	Apr. 8	Apr. 15	**CW Guide To: Data Access Tools** New Tools for Quick Access to Data Buried in Older Flat-file and Hierarchical Databases *Buyers' Satisfaction Scorecard:* Leading SQL-based Data Access Tools *Firing Line:* Latest Data Access Tool from a Leading Vendor			
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May 9	Apr. 22	Apr. 29	**CW Guide To: Mobile Computing** From Notebooks to PDAs *Buyers' Satisfaction Scorecard:* Leading Notebook Computers *Firing Line:* Latest Sub-notebook Product from a Leading Vendor	**International DB2 Users Group** San Diego, 5/8 - 5/12		Mails: May 11 Close: April 14
May 16	Apr. 29	May 6	**Special Quarterly Report:** Re-engineering the Workplace		Starch	
May 23	May 6	May 13	**Windows World Open Supplement** **CW Guide To: The Impact of OLE 2.0** What OLE can do for IS and How to Make Sure Your Favorite Desktop Software Vendor is Up to Speed *Buyers' Satisfaction Scorecard:* Leading OLE Applications *Firing Line:* Latest OLE Development Tool	**Windows World** **Comdex Spring** Atlanta, 5/23 - 5/26 **DB Expo** San Francisco, 5/24 - 5/27		
May 30	May 13	May 20	**Annual Job Satisfaction Survey** How IS Professionals and Managers Really Feel About Their Jobs and Careers			
June 6	May 20	May 27	**CW Guide To: Distributed DBMS** Selecting the Right Engine for a Distributed Database Architecture *Buyers' Satisfaction Scorecard:* Leading Relational DBMS *Firing Line:* Latest Relational DBMS Product	**Computerworld Smithsonian Awards** Washington, DC		Mails: June 8 Close: May 2
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June 27	June 10	June 17	**Closer Look:** PCMCIA Cards	**PC Expo** New York, NY, 6/28 - 6/30		

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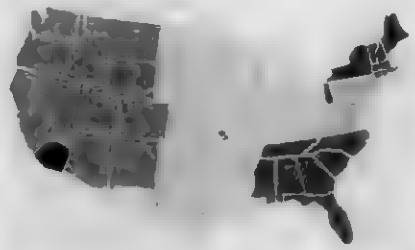

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Kendall Square Research finally reappeared after appearing on the losers side in seven of the last nine weeks. Intel and Motorola were pulling down by lowered earnings from a Wall Street analyst.

On Broadway and Seymour

It has been a rough year for Broadway & Seymour, Inc. (BSIS). The question for investors is whether the company has turned the corner.

Broadway & Seymour provides data processing services, imaging products and systems integration for banks and pension plan administrators. The company has enjoyed consistent growth (see chart) until this year, when acquisition charges and slipping margins contributed to a third-quarter loss of $5.7 million, or 76 cents per share. The operating loss was 10 cents per share.

Rich Edwards and Eric Upin, analysts at Robertson, Stephens & Co. in San Francisco, issued a neutral report Dec. 2, saying they "expect investors to remain on the sidelines" until concrete evidence surfaces that Broadway & Seymour's business has stabilized.

The analysts expressed concern over the company's balance sheet; Broadway & Seymour's cash position has fallen to a half-million dollars, 95% below last January's levels. The process of absorbing Gateway Conversion Technology is still ongoing, and Broadway & Seymour will also acquire Elite Data Processing's law firm management software in February.

Edwards and Upin said they believe Broadway & Seymour will have to reduce its current cost structure to return to prior profitability levels.

On the other hand, Paul Bloom, an analyst at Volpe, Welty & Co. in San Francisco, rated the company's shares a Buy in a Nov. 22 report. Though Bloom said he expects the fourth fiscal quarter to be slow, he noted that BSIS shares currently trade at a low multiple of estimated earnings for the next fiscal year. The company has a strong pipeline of prospective deals, Bloom said. *—Derek Slater*

Brighter days

Recent woes have interrupted a track record of solid financial results for Broadway & Seymour

	1991	1992	1993
Revenue (in millions)	$49.4	$53.3	$64.0
Profit (in millions)	$1.5	$1.7	$3.6

Figures for fiscal years, which end Jan. 31 of the same calendar year

Source: Company records

Exch	52-Week High	52-Week Low		Dec. 10 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						
OTC	46.00	19.63	3 COM CORP. (H)	45.00	2.00	4.7
NYS	91.13	69.13	AMERICAN INFO TECHS CORP.	76.38	-1.25	-1.6
NYS	65.00	47.75	AT&T	55.00	0.63	1.1
OTC	6.44	0.94	ARTEL COMMUNICATION CORP.	3.19	-0.06	-1.9
OTC	26.25	12.50	BANYAN SYSTEMS INC. (H)	25.50	1.00	4.1
NYS	69.13	69.25	BELL ATLANTIC CORP.	59.63	-1.38	-2.3
NYS	63.88	50.25	BELLSOUTH CORP.	57.00	-0.50	-0.9
NYS	14.75	4.25	BOLT, BERANEK & NEWMAN	13.00	-0.25	-1.9
OTC	18.50	9.50	BROOKTROUT TECHNOLOGY	13.25	0.25	1.9
NYS	119.00	70.75	CABLETRON SYSTEMS	110.75	-3.00	-2.6
OTC	36.50	11.25	CENTIGRAM COMMUNICATIONS	34.00	-0.25	-0.7
OTC	55.50	22.88	CHIPCOM CORP.	45.00	-5.00	-10.0
OTC	62.25	34.38	CISCO SYSTEMS INC. (H)	59.63	-0.88	-1.4
OTC	18.38	8.00	COMPRESSION LABS INC.	13.50	-0.63	-4.4
OTC	36.00	21.75	CROSSCOMM	28.75	-1.50	-5.0
OTC	4.63	1.59	DATA SWITCH CORP. (L)	1.59	-0.16	-8.9
NYS	19.88	12.38	DIGITAL COMM. ASSOC.	18.75	0.00	0.0
OTC	11.75	3.50	DIGITAL SYSTEMS INT'L INC.	3.50	-0.13	-3.4
OTC	73.13	18.00	DSC COMMUNICATIONS	58.75	-3.38	-5.4
OTC	9.50	4.75	FIBRONIX INT'L INC.	5.25	-0.25	-4.5
OTC	23.00	8.75	FIBRNET CORP.	19.25	-1.00	-4.9
OTC	8.38	1.75	GANDALF TECHNOLOGIES INC.	2.75	-0.25	-8.3
OTC	2.06	0.69	GATEWAY COMMUNICATIONS	0.88	-0.06	-6.7
NYS	15.75	4.75	GENERAL DATACOMM INDS.	10.00	-0.13	-1.2
ASE	3.63	2.00	GO VIDEO	3.00	0.00	0.0
NYS	39.88	33.13	GTE CORP.	36.13	-0.75	-2.0
NYS	94.75	69.00	ITT CORP.	91.75	3.75	4.3
OTC	29.88	18.81	MCI COMMUNICATIONS CORP.	24.38	-0.50	-2.0
OTC	6.50	1.50	MICROCOM INC.	5.13	-0.13	-2.4
OTC	24.25	3.50	NETRIX CORP.	6.13	0.00	0.0
OTC	19.00	6.50	NETWORK COMPUTING DEVICES	6.75	0.00	0.0
NYS	11.50	5.38	NETWORK EQUIPMENT TECH.	8.88	-1.00	-10.1
OTC	20.13	8.00	NETWORK GENERAL	16.13	1.38	9.3
OTC	13.88	6.88	NETWORK SYSTEMS CORP.	9.25	-0.13	-1.3
OTC	73.88	16.13	NEWBRIDGE NETWORKS CORP.	53.75	-3.63	-6.3
NYS	46.00	21.38	NORTHERN TELECOM LTD.	29.63	1.25	4.4
OTC	35.25	17.00	NOVELL INC.	19.88	-5.00	-20.1
NYS	48.88	40.31	NYNEX CORP.	41.63	-0.38	-0.9
OTC	30.00	19.00	OCTEL COMMUNICATIONS CORP.	25.00	-1.75	-6.5
OTC	6.13	3.75	PENRIL DATA COMM NETWORKS	6.13	-0.25	-3.9
OTC	30.50	14.50	PICTURETEL CORP.	20.75	0.00	0.0
OTC	11.50	3.63	PROTEON INC.	7.25	0.00	0.0
NYS	38.88	17.75	SCIENTIFIC ATLANTA INC.	32.25	-1.38	-4.1
NYS	47.00	34.19	SOUTHWESTERN BELL CORP.	42.50	-0.25	-0.6
NYS	40.25	25.13	SPRINT CORP.	32.25	-0.63	-1.9
OTC	27.00	12.50	STANDARD MICROSYSTEMS CORP.	24.63	-0.13	-0.5
OTC	19.75	10.00	STRATACOM INC.	17.00	-0.63	-3.5
OTC	42.75	20.00	SYNOPTICS COMMUNICATIONS	24.38	-2.38	-8.9
OTC	9.88	2.88	TELEBIT CORP.	7.25	-0.38	-4.9
OTC	17.88	5.13	TELEMATICS INT'L INC.	15.63	0.00	0.0
OTC	35.25	17.00	LIS ROBOTICS	27.75	1.75	6.7
NYS	50.75	37.75	U S WEST INC.	46.50	-0.38	-0.8
OTC	65.00	29.50	WELLFLEET COMMUNICATIONS (H)	61.50	-2.50	-3.9
OTC	19.50	7.25	XIRCOM	15.00	-0.63	-4.0
PCs and Workstations						
OTC	5.56	2.50	ADVANCED LOGIC RESEARCH	3.38	-0.13	-3.6
OTC	65.25	22.00	APPLE COMPUTER INC.	30.00	-1.50	-4.8
OTC	25.50	12.75	AST RESEARCH INC.	21.50	-3.00	-12.2
NYS	8.00	2.50	COMMODORE INT'L	3.50	0.13	3.7
NYS	74.38	41.75	COMPAQ COMPUTER CORP. (H)	71.88	-1.75	-2.4
OTC	49.88	13.50	DELL COMPUTER CORP.	36.38	-3.63	-12.9
NYS	89.25	63.63	HEWLETT PACKARD CO.	76.13	-0.50	-0.7
NYS	46.75	33.50	SILICON GRAPHICS	44.38	-0.38	-0.8
OTC	41.00	21.13	SUN MICROSYSTEMS INC.	27.00	-0.75	-2.7
NYS	48.00	24.63	TANDY CORP.	47.00	0.50	1.1
OTC	7.00	2.50	ZEOS INTERNATIONAL LTD.	3.63	0.00	0.0
Large Systems						
ASE	8.50	4.38	AMDAHL CORP.	6.13	0.63	11.4
NYS	8.75	3.63	CONVEX COMPUTER	5.25	-0.25	-4.5
OTC	5.13	2.25	CRAY COMPUTER	2.25	-0.25	-10.0
NYS	30.88	20.38	CRAY RESEARCH INC.	26.50	-0.50	-1.9
NYS	13.88	7.75	DATA GENERAL CORP.	9.38	-0.38	-3.8
NYS	49.25	30.38	DIGITAL EQUIPMENT CORP.	35.00	-1.25	-3.4
NYS	47.38	32.75	HARRIS CORP.	45.75	-0.50	-1.1
NYS	63.38	40.63	IBM	53.63	0.25	0.5
OTC	25.75	5.25	KENDALL SQUARE RESEARCH (L)	6.88	1.50	27.9
NYS	141.50	87.00	MATSUSHITA ELECTRONICS	133.00	1.00	0.8
OTC	23.75	12.75	NETFRAME	17.50	1.38	8.5
OTC	26.00	9.25	PARALLAN COMPUTER	13.38	-1.38	-9.3
OTC	23.25	8.50	PYRAMID TECHNOLOGY	13.25	-1.25	-8.6
OTC	24.00	11.25	SEQUENT COMPUTER SYS.	16.38	-0.13	-0.8
OTC	6.00	1.38	SEQUOIA SYSTEMS INC.	4.06	-0.38	-8.4
NYS	41.25	20.25	STRATUS COMPUTER INC.	29.13	1.38	5.0
NYS	16.88	8.50	TANDEM COMPUTERS INC.	11.13	0.75	7.2
OTC	28.50	10.63	TELCOM SYSTEMS (H)	26.75	-0.75	-2.7
NYS	13.88	9.63	UNISYS CORP.	11.25	-0.63	-5.3
Software						
OTC	37.00	14.50	ADOBE SYSTEMS INC.	21.75	-2.63	-10.8
OTC	25.25	11.75	ALDUS CORP.	23.63	-1.13	-4.5
OTC	9.25	5.50	AMERICAN SOFTWARE INC.	5.50	-0.88	-13.7
OTC	28.13	9.50	ASK COMPUTER SYSTEMS	14.63	-0.38	-2.5
OTC	56.75	37.00	AUTODESK INC.	43.25	-2.00	-4.4
OTC	6.50	2.38	BACHMAN INFO. SYSTEMS	3.25	0.50	18.2
OTC	42.00	24.00	BGS SYSTEMS INC.	26.50	-0.50	-1.9
OTC	84.13	38.75	BMC SOFTWARE INC.	49.00	-1.25	-2.5
OTC	28.25	20.38	BOOLE & BABBAGE	26.50	0.50	1.9
OTC	27.25	12.75	BORLAND INT'L INC.	15.13	-1.00	-6.2
OTC	4.63	2.75	CE SOFTWARE	3.38	-0.25	-6.9
ASE	40.25	16.41	CHEYENNE SOFTWARE INC.	30.38	-3.13	-9.3
OTC	19.50	8.25	CHIPSOFT	18.00	0.25	1.4
OTC	10.50	5.63	COGNOS INC.	10.25	1.75	20.6
NYS	44.25	18.00	COMPUTER ASSOCIATES	40.50	-0.88	-2.1
NYS	6.50	2.13	COMPUTERVISION CORP.	3.25	0.13	4.0
OTC	34.25	19.25	COMPUWARE CORP.	27.50	2.50	10.0
OTC	14.25	5.75	COMSHARE INC.	10.63	1.13	11.8
OTC	20.38	5.38	COREL CORP. (H)	19.50	-0.25	-1.3
OTC	15.25	3.63	EASEL CORP.	3.88	-0.38	-8.8
OTC	25.25	15.75	4TH DIMENSION	20.50	0.38	1.9
OTC	19.25	5.25	FRAME TECHNOLOGY	9.63	-0.38	-3.8
OTC	17.50	8.00	GROUP 1 SOFTWARE	9.00	0.25	2.9
OTC	35.25	13.50	GUPTA	15.75	0.75	5.0
OTC	12.00	4.88	HOGAN SYSTEMS INC.	9.63	-1.00	-9.4
OTC	27.75	11.25	IMRS	23.75	1.25	5.6
OTC	44.75	27.00	INFORMATION RESOURCES	38.50	1.38	3.7
OTC	27.25	13.38	INFORMIX CORP.	19.00	-0.13	-0.7
OTC	14.00	8.50	INTERGRAPH CORP.	9.75	-0.38	-3.7
OTC	13.63	4.88	INTERLEAF INC.	6.88	-0.38	-5.2
OTC	15.25	6.75	INTERSOLV INC.	10.50	0.25	2.4
OTC	18.75	7.75	KNOWLEDGEWARE INC. (H)	18.00	0.75	4.3
OTC	54.75	15.50	LEGENT CORP.	23.25	-0.25	-1.1
OTC	52.63	18.75	LOTUS DEVELOPMENT (H)	52.63	2.38	4.7
OTC	23.00	4.25	MATHSOFT	6.13	-0.38	-5.8
OTC	20.25	4.50	MCAFEE ASSOCIATES	7.00	0.75	12.0
OTC	11.63	4.38	MECA SOFTWARE	6.38	0.00	0.0
OTC	15.25	7.63	MENTOR GRAPHICS (H)	14.63	-0.13	-0.8
OTC	46.00	14.50	MICRO FOCUS (L)	15.00	-0.25	-1.6
OTC	13.25	4.38	MICROGRAFX INC.	8.75	0.88	11.1
OTC	98.00	70.50	MICROSOFT CORP.	81.13	-4.38	-5.1
OTC	36.13	9.44	ORACLE CORP. (H)	34.13	1.50	4.3
NYS	44.75	22.90	PARAMETRIC TECHNOLOGY	39.50	-0.75	-1.9
OTC	40.50	23.50	PEOPLESOFT	38.75	-0.25	-0.8
OTC	7.13	3.50	PHOENIX TECHNOLOGIES	3.88	-0.13	-3.1
OTC	49.88	22.00	POWERSOFT	34.50	-4.38	-11.3
OTC	59.75	13.50	PLATINUM SOFTWARE	28.50	5.75	25.3
OTC	25.00	7.25	PLATINUM TECHNOLOGY	9.63	-0.38	-3.8
OTC	60.25	32.25	PROGRESS SOFTWARE CORP.	51.25	1.75	3.5
OTC	6.50	1.94	QUARTERDECK OFFICE SYS.	2.06	-0.13	-5.7
OTC	32.00	16.00	RAINBOW TECHNOLOGIES INC.	17.50	-0.88	-4.8
OTC	11.38	4.25	RASTEROPS	7.75	-0.25	-3.1
OTC	15.25	6.50	ROSS SYSTEMS	7.75	-0.25	-3.1
OTC	28.75	17.25	SAPIENS INTL. CORP. N.V.	19.00	-2.75	-12.6
OTC	14.50	5.50	SOFTWARE PUBLISHING CORP.	8.25	0.13	1.5
OTC	17.25	5.63	SOFTWARE TOOLWORKS INC.	11.25	-0.63	-5.3
OTC	2.88	0.75	SPINNAKER SOFTWARE	2.28	0.22	10.6
OTC	13.75	6.75	STATE OF THE ART	7.38	-0.38	-4.8
NYS	33.63	17.63	STERLING SOFTWARE INC.	27.38	-1.50	-5.2
OTC	21.63	9.63	STRUCT. DYNAMICS RESEARCH	16.38	-3.13	-16.0
OTC	43.50	21.00	SYBASE INC. (H)	40.38	-1.38	-3.3
OTC	20.50	9.25	SYMANTEC CORP.	16.00	-1.88	-10.5
OTC	25.50	10.00	SYSTEM SOFTWARE ASSOC.	14.50	-0.75	-4.9
OTC	6.50	2.75	TRIKON CORP.	5.88	0.50	9.3
OTC	26.50	13.50	VIEWLOGIC SYSTEMS	19.75	-2.00	-9.2
OTC	22.00	5.50	WALKER INTERACTIVE SYSTEMS	10.50	0.75	7.7
OTC	3.19	0.84	WORDSTAR	1.25	0.13	11.1
Semiconductors						
NYS	32.88	15.88	ADVANCED MICRO DEVICES	17.50	-1.13	-6.0
NYS	28.00	14.38	ANALOG DEVICES INC.	22.13	-1.38	-5.9
OTC	38.63	14.75	ATMEL CORP.	30.00	2.75	10.1
OTC	8.88	2.75	CHIPS AND TECHNOLOGIES	5.94	-0.31	-5.0
OTC	39.75	13.00	CIRRUS LOGIC	35.88	-0.13	-0.3
NYS	16.75	8.63	CYPRESS SEMICONDUCTOR CORP.	12.13	-0.50	-4.0
NYS	19.00	11.75	DALLAS SEMICONDUCTOR	13.63	0.00	0.0
OTC	74.50	38.25	INTEL CORP.	58.00	-5.25	-8.3
NYS	19.25	10.00	LSI LOGIC CORP.	13.75	-0.13	-0.9
OTC	26.75	12.25	LATTICE SEMICONDUCTOR	13.25	-1.00	-7.0
NYS	83.63	16.25	MICRON TECHNOLOGY	47.63	-0.63	-1.3
NYS	107.50	48.75	MOTOROLA INC.	91.00	-5.38	-5.6
NYS	21.75	10.13	NATIONAL SEMICONDUCTOR	14.75	-0.63	-4.1
OTC	14.50	6.50	SIERRA SEMICONDUCTOR	8.38	0.00	0.0
OTC	52.75	25.75	SYNOPSYS	46.50	0.38	0.8
NYS	84.25	45.13	TEXAS INSTRUMENTS	60.38	-3.25	-5.1
OTC	18.88	6.50	VLSI TECHNOLOGY	39.75	0.38	3.6
OTC	14.38	4.88	WEITEK	9.00	0.13	1.4
ASE	10.38	3.63	WESTERN DIGITAL CORP. (H)	9.50	-0.38	-3.8
OTC	54.50	23.75	XILINX	47.75	5.25	12.4
OTC	40.75	19.00	ZILOG INC.	27.50	-0.50	-1.8
Peripherals and Subsystems						
OTC	24.75	10.50	AMERICAN POWER CONVERSION	19.25	0.75	1.3
OTC	23.00	15.50	BANCTEC INC. (H)	22.50	-0.13	-0.6
OTC	17.00	3.50	CAMBEX CORP.	5.00	0.35	5.3
ASE	18.38	3.88	COGNITRONICS CORP.	4.88	-0.25	-4.9
NYS	25.50	9.00	CONNER PERIPHERALS	13.13	-1.25	-8.7
OTC	38.50	17.50	CREATIVE TECHNOLOGIES INC.	26.00	-1.25	-4.6
OTC	30.75	6.50	DATA RACE INC.	9.88	0.13	1.3
ASE	12.50	7.50	DATARAM CORP.	9.38	-0.13	-1.3
NYS	39.00	9.75	EMC CORP.	31.88	-2.63	-7.6
OTC	10.50	5.25	EMULEX CORP.	6.38	0.13	2.0
OTC	20.00	14.00	EVANS & SUTHERLAND	10.25	0.75	4.3
OTC	18.75	7.50	EXABYTE	17.75	0.13	0.7
OTC	34.00	13.34	INTELLIGENT INFO. SYSTEMS	24.88	-0.13	-0.5
OTC	8.25	2.50	IOMEGA CORP.	3.25	0.00	0.0
OTC	12.50	5.75	IPL SYSTEMS INC.	8.25	0.50	6.5
OTC	24.00	13.75	KOMAG INC.	16.25	0.25	1.6
OTC	18.38	4.38	MAXTOR CORP.	6.00	-0.25	-4.0
OTC	9.88	5.75	MICROPOLIS CORP.	7.25	-0.75	-9.4
NYS	117.00	97.25	3M CORP.	108.13	-0.75	-0.2
OTC	8.00	4.00	PRINTRONIX INC.	7.75	0.50	6.9
NYS	17.25	7.50	QMS INC.	9.25	-1.13	-10.8
OTC	17.88	9.38	QUANTUM CORP.	13.25	-1.50	-10.2
OTC	9.13	3.13	RADIUS INC. (H)	7.13	-1.88	-20.8
NYS	17.75	11.75	RECOGNITION EQUIPMENT	15.00	-1.38	-8.4
OTC	12.75	3.63	REXON INC.	5.13	0.75	17.1
OTC	25.13	13.13	SEAGATE TECHNOLOGY	20.50	-3.63	-15.0
NYS	45.00	18.00	STORAGE TECHNOLOGY	30.75	-1.25	-3.9
NYS	27.88	18.50	TEKTRONIX INC.	21.75	-0.13	-0.6
NYS	89.50	69.88	XEROX CORP.	89.50	7.38	9.0
Services						
NYS	6.38	1.63	ALLERGAN INC.	3.63	-0.25	-6.5
OTC	23.75	14.88	AMERICAN MGMT. SYSTEMS	18.63	-1.38	-6.9
NYS	4.63	2.38	AMACORP INC.	4.00	0.25	6.7
OTC	23.84	35.00	ANALYSTS INT'L	17.50	-0.88	-4.8
NYS	56.50	46.88	AUTO DATA PROCESSING	55.38	0.25	0.5
NYS	19.88	13.00	CERIDIAN CORP.	18.88	0.63	3.4
NYS	21.00	13.13	COMDISCO INC.	19.38	-0.13	-0.6
OTC	13.38	6.00	COMPUTER HORIZONS	12.13	0.00	0.0
NYS	100.25	70.00	COMPUTER SCIENCES	97.75	0.25	0.3
NYS	9.00	6.00	COMPUTER TASK GROUP	7.13	0.25	3.6
NYS	37.00	19.00	COMPUSA INC.	22.50	-4.50	-16.7
OTC	14.13	8.38	CONTROL DATA SYSTEMS INC.	10.38	0.25	2.5
OTC	16.00	7.00	CORPORATE SOFTWARE	14.88	0.00	0.0
OTC	11.25	6.63	EGGHEAD DISCOUNT SOFTWARE	9.25	0.25	2.8
NYS	35.88	26.00	GENERAL MOTORS E (EDS)	26.75	-1.63	-5.7
OTC	35.50	13.75	IMAGOM CORP.	17.50	0.50	3.9
OTC	27.63	10.88	INTELLIGENT ELECTRONICS	24.75	-1.25	-4.8
OTC	17.00	9.63	MERISEL	17.00	2.38	16.2
OTC	37.00	7.00	MICROAGE INC.	36.25	0.50	1.4
OTC	32.75	21.50	PAYCHEX	33.25	0.50	1.5
NYS	87.25	21.63	POLICY MANAGEMENT SYS.	25.88	2.88	12.5
NYS	43.75	24.13	REYNOLDS AND REYNOLDS	43.75	-0.50	-1.1
OTC	25.75	13.38	SEI CORP. (H)	24.88	0.38	1.5
OTC	26.00	17.50	SHARED MEDICAL SYSTEMS	23.00	0.50	2.2
OTC	12.63	5.75	SHL SYSTEMHOUSE	6.63	0.00	0.0
OTC	30.75	20.00	SOFTWARE SPECTRUM INC.	23.00	0.00	0.0
OTC	42.75	28.00	SUNGARD DATA SYSTEMS	35.00	-0.13	-0.4

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Briefs

Earnings decline

Reeling from increased costs associated with recent acquisitions, Novell, Inc. last week reported fiscal fourth-quarter earnings of $68.9 million, off slightly from the $69.5 million profit posted in the same period last year. A $262 million third-quarter write-off for the Provo, Utah, firm's acquisition of Unix Systems Laboratories, Inc. caused a fiscal 1993 loss of $35.1 million. Excluding the write-off, Novell earned $282 million for the year, a 13% increase from last year. Fourth-quarter sales rose 19% to $309 million, boosting fiscal 1993 revenue to $1.12 billion, a 20% increase from last year.

Xerox restructures

Xerox Corp. plans to lay off roughly 10% of its 97,500-member work force next year as part of a renewed effort to increase productivity and lower operating costs. In addition, the Stamford, Conn., company plans to close and/or consolidate a number of facilities and streamline and simplify business processes. The company said it is still evaluating outsourcing some of its operations. Xerox plans to take a $700 million charge to cover restructuring costs.

SHORT TAKES Stratus Computer, Inc. in Marlboro, Mass., plans to acquire Isis Distributed Systems, Inc., a message-oriented middleware developer in Ithaca, N.Y., in a deal valued at $24 million.... Proteon, Inc. in Westboro, Mass., has named Bruce Bergman president and chief executive officer. He succeeds Elliot Honan, who remains vice president of finance. Bergman at one time ran Xylogics, Inc.... Iomega Corp. in Roy, Utah, has named Kim Edwards CEO. She succeeds Fred Wenninger, who resigned in October.... CS Acquisition Corp. has completed its cash tender offer to purchase all shares of Corporate Software, Inc. in Canton, Mass.

Microsoft brings it on home

Renews push in home finance and enters children's software market

By Thomas Hoffman

Just as Microsoft Corp.'s stellar growth in business software has started its descent to earth, the Redmond, Wash., juggernaut developer is setting its sights on a new course: the burgeoning home market.

Last week, the world's largest independent software vendor laid out its plans to capture a sizable share of the fast-growing $2.8 billion home software market. Microsoft said it plans to quickly ramp up production of consumer software titles and will go on an all-out marketing blitz to gain mind-share.

Microsoft, which currently offers 35 entertainment and personal productivity packages — including Microsoft Works, Flight Simulator and Microsoft Money — is planning to boost the number of titles it sells to 100 by the end of next year, according to Microsoft chairman and chief executive officer Bill Gates.

In addition, the company plans to increase consumer awareness of its Microsoft Home product line by airing more than 600 cable television commercials on its offerings during the next two months, according to Patty Sonesifer, vice president of Microsoft's consumer division. Financial analysts put the 60-day advertising campaign at a cost of $1 million.

Last week, the company bolstered its presence in the children's educational market when it introduced Fine Artist and Creative Writer. Creative Writer, a word processing/publishing program targeted at and codeveloped by the 8- to 14-year-old crowd, is an imaginative interactive package designed to make essay writing and education fun, combining simulated animal sounds, graphics and pictures with myriad educational avenues to explore.

Neither Fine Artist nor Creative Writer are equipped with stodgy user manuals. Instead, users are guided through their educational odysseys with the help of McZee, a big-nosed, bespectacled geek who could easily pass as an unflattering caricature of Microsoft's prominent founder.

Easy to use

Analysts said the products are considerably more imaginative and easier to use than existing products. "Creative Writer shows the real capabilities of how to use a computer's power in a very creative way," said Walter Miao, vice president of technology at Link Resources Corp., a New York market research firm.

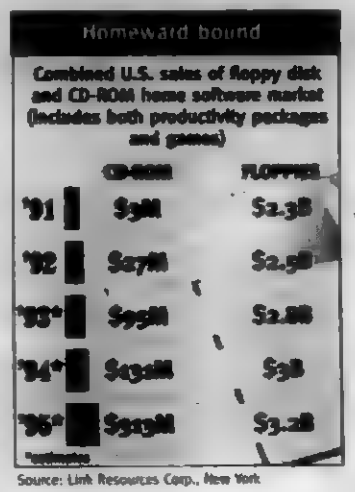
Miao, who along with his 9-year-old daughter Erica have been testing the package for the past few months, said they are both smitten with the product. "She really uses it to stimulate some of her creative thought processes in writing an essay or a short story. And I'm so convinced about it that I told her teachers to check it out," Miao said.

That is high praise for Microsoft, which despite its domination in DOS and Windows packages for corporate users, has, to date, been an also-ran in the home software market compared with smaller but more established players such as educational developer Broderbund Software, Inc. and game giant Nintendo of America, Inc.

Although the company's $200 million in annual consumer software revenue comprises only 5% of its total sales, Gates said he believes the home software market is the hottest growth market in the PC industry and estimated that Microsoft's consumer revenue could reach $600 million by 1997. Gates and industry analysts said they believe the floppy disk home software market will give way to up-and-coming CD-ROM products by 1996.

Analysts were reluctant to call Gates' bluff on his home software revenue projections. "Six hundred million dollars is a drop in the bucket for a $4 billion company like Microsoft," said Timothy R. McCollum, a financial analyst at Dean Witter Reynolds in New York. "They certainly have the marketing clout to succeed in this arena," added Terence Quinn, managing director at Furman-Selz, Inc. in New York.

Still, Microsoft has its work cut out for it in the personal finance market. Last week, the company introduced an upgraded Microsoft Money 3.0, which will include features such as electronic billing payments for users through an on-line connection established with National Payment Clearinghouse when the product begins shipping in February.



Source: Link Resources Corp., New York

Losing out

But analysts said Microsoft has been one-upped by personal finance rival and market leader Intuit, Inc., which last week stole Microsoft's thunder by announcing its mid-1994 plans to introduce a more complete suite of electronic services for its 5 million Quicken software customers through Visa International and its 18,000 member banks (see story below).

"The Microsoft Money team is doing a good job, but they keep getting their lunch stolen from them by [Intuit President] Scott Cook. He's keeping one step ahead of them," noted Jesse Berst, editor and publisher of "Windows Watcher," a newsletter in Redmond, Wash.

Analysts said Microsoft will have a difficult time trying to wrest customers away from Intuit, since personal finance software users are reluctant to jump from one product to another, given the bothersome chore of having to migrate data and files from one package to another. "Unless there's a real whiz-bang product out there, personal finance users are apt to stay with their existing system," said Abhijeet Rane, a research analyst at Link Resources.

Binary banking

Visa and Intuit are developing an interactive electronic banking service for Visa's member banks and 160 million U.S. cardholders. Services to be offered include electronic billing payments, automated account reconciliation and intrabank funds transfer.

Intuit, a Menlo Park, Calif., developer of Quicken, a market-leading personal finance package for home PC users, will develop the front-end software for Intellibanking customers with modem-ready PCs and personal digital assistants. Visa will connect its member institutions through its VisaNet network, allowing members to then customize the services for their customers, according to Scott Loftesness, group vice president at the San Mateo, Calif.-based consumer payment service.

Loftesness said the firm will begin piloting the system in the first half of next year and roll out production-ready applications to member banks in the second half of the year. Loftesness declined to provide estimated revenue for the service.

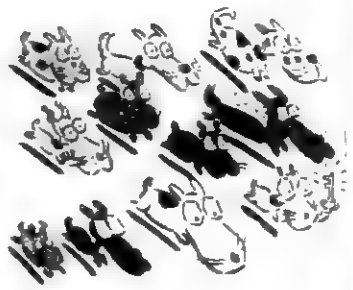
Visa member banks that have already committed to the program include Wells Fargo Bank, Banc One Corp. and Meridian Bank. — *Thomas Hoffman*

Wysiwyg

What would YOU want to be arrested for?

"I would want to release all the dogs from all the pounds all over the world!

I love dogs and hate the idea of them being caged up. I would want to be known as the man who liberated the dogs."



—Richard Rabins, Co-chairman, Alpha Software Corp.

"Hacking into the CIA's JFK files."

—Ron Zambonini, President and COO, Cognos Corp.

"Evading the new Clinton tax plan."

—George Klaus, President and CEO, Frame Technology Corp.

Illustrations by Michael Moran

The 5th Wave *by* Rich Tennant

Inside Lines

Here we go again

Microsoft is telling developers it may position Chicago as both a desktop and server product. Given its 32-bit, multitasking capabilities, there is no reason why the product can't function as a server. This contradicts the message Microsoft has been spouting for the past year that Chicago would be a client to Windows NT and Cairo's server.

Nantucket bug spray

IBM quietly slipped into limited beta testing last week a fix for OS/2 2.1 that, according to one tester, takes care of "lots and lots and lots of minor little bugs." One bug the fix eliminates causes conflicting messages to appear on screen during system shutdown. The messages do not make it clear whether the system has shut down so users can safely turn their machines off. The Service Pak is expected to be available sometime in the first quarter of next year.

Too hot to handle (for now)

Intel has a small problem with its top-of-the-line 66-MHz Pentium chip: It doesn't run at 66 MHz. In this month Intel will announce a higher-voltage (hence, faster) version of the chip, according to sources at hardware makers. The current chip runs (slowly) at 5V, but the new chip, initially specified at 5.6V, will run at 5.4V, the sources said. This will delay 66-MHz Pentium systems from many vendors for at least five months, as they have to redesign processor boards to include a new voltage regulation circuit.

Can we help?

Novell's schedule for shipping Processor Independent NetWare has slipped from the first half of next year to the second half, with target dates of September or October now being mentioned, according to executives at Digital, which plans to support the software on its Alpha AXP systems. William Dunmire, vice president at Digital's Computer Systems Group, said Digital is "trying to work with Novell to see if we can bring that back in a little bit."

Relief at last

The biggest plus of Microsoft's beta version of the NT NetWare redirector, according to the scuttlebutt on CompuServe, is that it lets one NT Advanced Server act as a NetWare gateway for its clients. Windows desktops thus get access to NetWare and NT services via one redirector — NT's — instead of needing two. Novell's beta version of the NT NetWare redirector lacks the gateway function, which Novell feels limits performance.

Tempest in a teapot

A minor brouhaha erupted in the financial community last week over an analyst report that predicted Lotus would garner another $60 million in revenue for the next quarter as a result of restructuring a revenue-sharing program with IBM for OS/2 products. Lotus executives last week confirmed that there is a revenue sharing program with IBM and that it was recently restructured. However, the restructuring will not lead to any substantial additional revenue for Lotus, and the company is not alerting analysts to raise their quarterly estimates.

Microsoft found itself in the slightly embarrassing position of having to technically "entertain" 15 to 20 technical types from IBM, Apple, Taligent and Sun to this week's Professional Developers Conference in Anaheim, Calif. It seems that a couple dozen operating systems programmers from those companies — at least one of whom claimed to sign a nondisclosure agreement — were hoping to get a 12- to 18-month head start on Microsoft's plans for Windows NT, Chicago and Cairo. Microsoft sat down with officials from each company and decided one by one who was appropriate and who wasn't, allowing those who were working on complementary technologies to attend. Phone, fax or CompuServe news editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

Software Digest

RATINGS REPORT®

The Independent Comparative Ratings Report for Selecting IBM PC Business Software

Vol.10, #11, November 1993

WINDOWS DATABASES FOR END USERS

	Software Digest Rating	Overall Evaluation (out of 10 pts.)
Lotus Approach™ 2.1	★★★★	**8.0**
Filemaker® Pro	★★★	7.7
Microsoft® Access™	★★★	7.4
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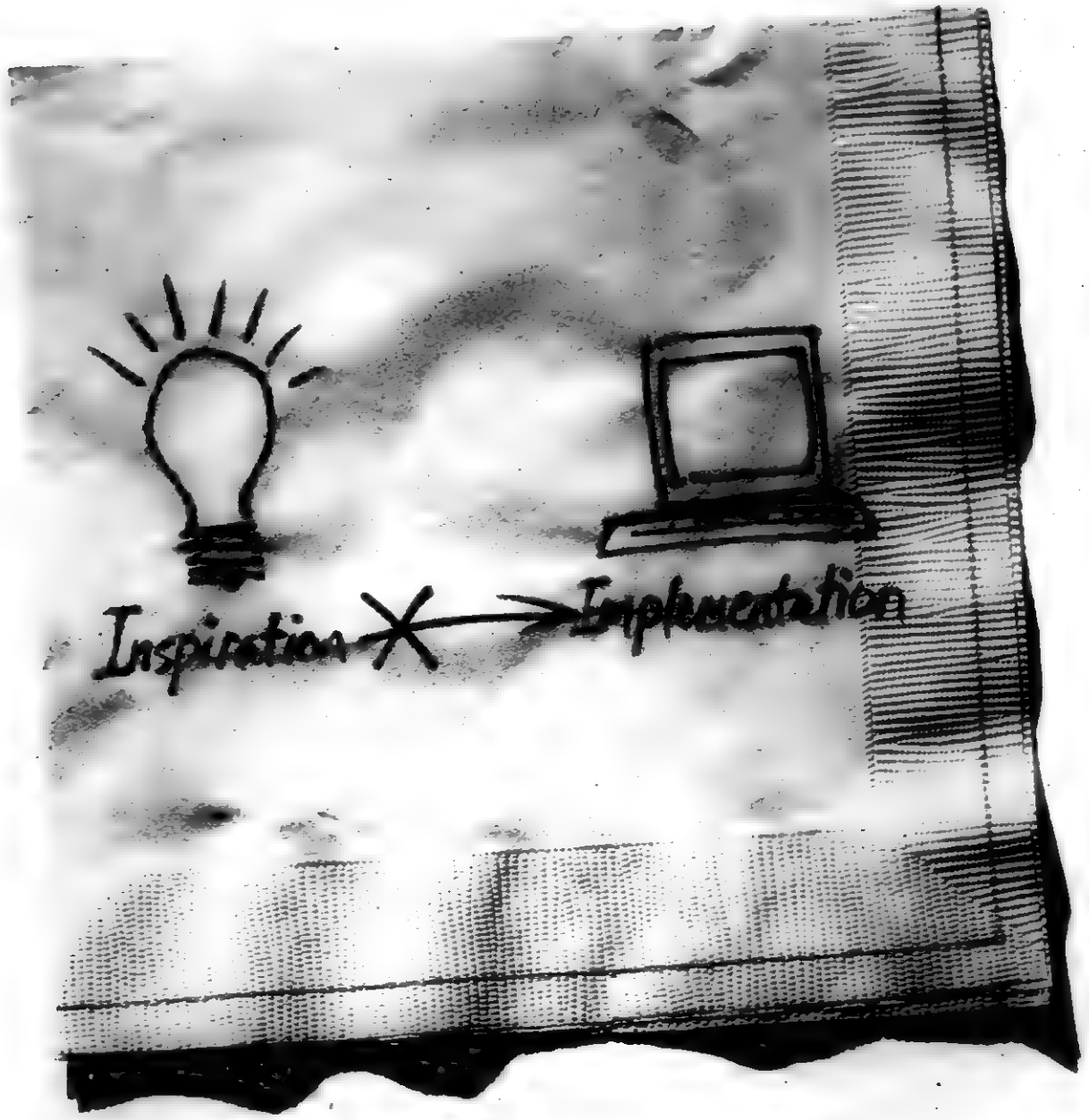

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COMPUTERWORLD

Feds try to renovate by rebuilding E-mail

By Gary H. Anthes
WASHINGTON

An electronic-mail message sent from the General Services Administration to the Environmental Protection Agency, just a few blocks away, moves from a GSA LAN to a Sprint Corp. communications center in Reston, Va. It arrives at an AT&T facility near Brunswick, N.J., only to be sent back to the EPA here, passing through several gateways en route.

GSA's Michael Corrigan

The odds are reasonably good that neither snow nor rain nor system crashes will keep the message from completing its appointed round. However, this is not exactly the scheme on which President Clinton would build a government-wide E-mail infrastructure.

Boosted by the president's "reinventing government" effort, E-mail initiatives are sprouting up all over Washington as federal officials increasingly view mail-enabled applications — electronic commerce, electronic filing and interpersonal messaging, for example — as a key way to make government more efficient and responsive.

"As in the business world, electronic messaging is becoming es-

E-mail, *page 24*

Chicago bulls ahead

Microsoft aims high; developers decry API shortcomings

By Stuart J. Johnston and Ed Scannell

■ Microsoft Corp. officials, laying out operating systems strategies for 5,000 developers last week, boldly predicted that 50 million copies of Windows 4.0 will ship the first year the product is available.

But with the product, code-named Chicago, still awaiting a finished set of application programming interfaces, some developers attending Microsoft's Professional Developers Conference in Anaheim, Calif., were uncomfortable with how and when they should begin the development process.

Consequently, developers may drag their feet on building applications, resulting in fewer programs that exploit Chicago's 32-bit multitasking and multithreading capabilities when the operating system ships sometime in the second half of next year, attendees said.

Selling 50 million copies of Chicago by 1995 will be quite a feat. Microsoft has sold 45 million copies of Windows since its 1985 inception, according to International Data Corp. in Framingham, Mass.

"I think you've got a floor full of people out there who [were not] sure whether they will have apps ready [when Chicago ships]," said one industry observer who attended the conference.

"Microsoft is saying, 'Here is the future,' but a lot of the APIs have not been settled yet," said a developer at the conference, which required nondisclosure agreements of attendees. "Alpha II [the latest test version of Chicago, released last week] is a nice exercise, but it doesn't tell me squat about what I should be doing with the next version of my application."

Seeking NT features

At least one corporate developer confronted Microsoft officials about the need to provide a feature similar to Windows NT's individual user profiles to accommodate multiple users on a single machine. The individual profile allows PC managers to customize a broad range of system settings and which applications will start as the operating system loads.

Chicago, *page 16*

Novell closes up Unix manager

By Elisabeth Horwitt

Novell, Inc. is attempting to foist a proprietary management system onto Unix System V Release 4 and UnixWare, reneging on promises to keep these systems truly open, said user, analyst and vendor sources last week.

"Once again, Novell is not paying attention to trends in industry." — Brian Anderson, CIO, Transocean Ltd.

To push Unix customers and OEMs to support its NetWare Management System, Novell quietly withdrew support this fall for Distributed Manager.

Distributed Manager is a Unix systems management platform that Novell's recently acquired Unix Systems Group had been in the process of developing with several partners, including Unisys Corp. and Siemens/Nixdorf Informationssysteme AG.

Novell has been talking about providing UnixWare management through NetWare Distributed Management Services, the upcoming upgrade to NMS, since NDMS was announced this fall. What irks vendors and users is Novell's apparent reversal on support for efforts by Unix industry members, including its own subsidiary, to come up with a common management platform specifically tailored to the Unix environment.

Novell, *page 10*

BENCHMARKING on empty

IS YOUR BENCHMARKING EFFORT REALLY JUST INDUSTRIAL TOURISM? If your IS organization is repeating the mistakes that Texas Instruments, Pfizer and others have made, you aren't on the highway to a high-performance organization — you're just puttering down a dead-end street.

SEE MANAGEMENT, PAGE 73.

Pfizer's Claude Christiano

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Technology's helping hand

Food banks automate to feed the hungry

By Johanna Ambrosio

As America's hungry queue up at soup kitchens and shelters this holiday season, technology will play a substantial role in helping to feed them.

"I can't imagine running a holiday without a computer," said Debbie O'Connell, assistant coordinator of the Hunger Hotline at Project Bread, a food bank in Boston.

With the help of one computer with a database, the hot line will help match 540,000 individuals with shelters and soup kitchens in their neighborhoods between Thanksgiving and Christmas this year. Computers "save so much work, and they free up time to do more important things like take more

Food banks, *page 12*

▲ Gracie Keam *serves guests at Rosie's Place, a women's shelter in Boston*

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IN DEPTH

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COMMENTARY

■ **Digital** can't depend on its relationship with **Microsoft** to solve all its problems, writes **Charles Babcock**. *Page 6*

■ 1993 may not have been a great year, but it did produce a lot of good acronyms for rhyming. **Paul Gillin** checks it out and finds puns aplenty. *Page 34*

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Executive Briefing

Common errors in company benchmarking efforts: The first team you pick is frequently the **wrong team**, says Jeffrey Jackson, quality specialist at Alcoa. "They're usually all from the same area." Also, companies often **set their sights too high**, comparing themselves with companies they cannot possibly match. *Page 73*

E-Mail and beyond: The **Federal Government** is awash in **E-mail initiatives**, as various agencies seek the power of mail-enabled applications. Hitches: Government E-mail is now very rudimentary and uncoordinated. Some worry that the result may be an **electronic Tower of Babel**. *Page 1*

Also worried about mail-enabled applications is Columnist **John Gantz**. Specifically, he's concerned that Notes and other applications promoting information-sharing will foster an **unpredictable and ungovernable demand on network resources**. Even worse, IS managers haven't even started thinking about the issue. *Page 35*

Unix doings: **Novell** is making few friends in the Unix community with its decision to push a **proprietary management system** for UnixWare, shunning work in progress by **COSE**. *Page 1*

At the same time, many large-user members of **the OSF** are dismayed by the **vendor dominance** they see developing, now that the OSF is blending with COSE. "COSE is a virtual organization," said one vexed member. "There's no mailbox, no phone number and no open process." *Page 8*

No more object envy and other OOP developments: Cobol programmers won't have to feel left out of all the excitement for long. The full ANSI standard isn't expected until 1995, but at least one company, **Micro Focus**, is planning to have an object-oriented version of Cobol on the street in the first half of 1994. Actually, two alternatives will be offered: one that provides object-oriented extensions to Cobol and another that lets Cobol developers use Smalltalk. *Page 30*

There are also hopeful signs of general interoperability between the **Object Management Group's CORBA** standard and **Microsoft's OLE**. Behind-the-scenes negotiations are reportedly in progress. Benefit for users: the combination of OLE's desktop strength in integrating desktop applications and CORBA's power to integrate client and server applications on mixed platforms, without an intervening layer of software. *Page 69*

Feeling generous? Lots of food banks across the country are looking for **technical assistance** and donations of **computer equipment**. In some cases, helping an organization choose what equipment to buy would make a major difference. *Page 12*

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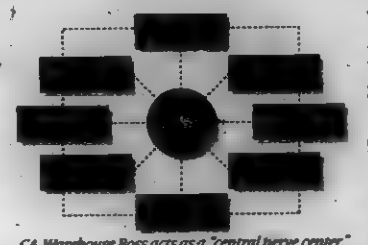

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Compaq exits printer business

By Michael Fitzgerald

After its initial splash in the network printer market, Compaq Computer Corp. has decided if it can't win, it won't swim.

The Houston-based PC maker said last week it would discontinue printer development immediately and stop making its PageMarq printers in the first half of next year, leaving several new products on the drawing board. While it will still sell its printers, it is closing down its peripherals division.

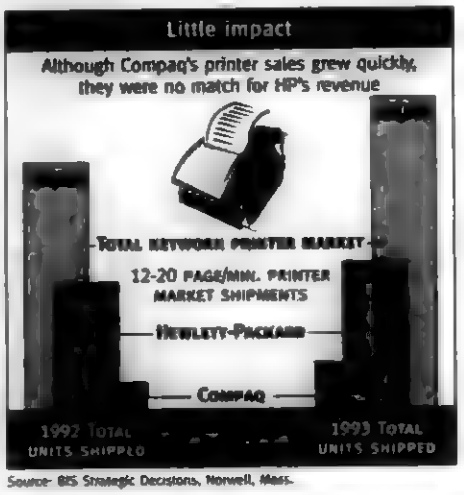
Despite Compaq's exit from the market, analysts said printer prices are not likely to rise, as plenty of competitors are still in the game and can pursue Compaq's share.

Compaq decided after a lengthy evaluation that it did not want to make the "significant investment" necessary to expand its printer business, noted Daryl White, Compaq's chief financial officer. Compaq will shift its research and development money into areas such as the convergence of PCs and consumer electronics, he said.

Couldn't compete

Analysts said Compaq has been concerned for some time about the return on its investment in the printer market. White acknowledged that "the crux" of withdrawing from the printer business was the investment required to continue battling in the highly competitive market, which is dominated by Hewlett-Packard Co.

Joel Wecksel, a Gartner Group, Inc. analyst in Stamford, Conn., said Compaq's "failure was its lack of understanding on how long and hard people like HP [work] in this market and its inability to link its printers strategically in people's minds with its computers."



Source: BIS Strategic Decisions, Norwell, Mass.

Wecksel said even though Compaq had taken some market share from HP, "it was kind of like being in the Kentucky Derby: Nobody remembers who's second."

Analysts also said management upheaval in the printer division hurt it by slowing its plans to expand into low-end markets.

Some users contacted said the lack of a diverse product line had made them decide against Compaq printers. Compaq had only two products targeted solely at the high end of the printer market.

Wayne Robertson, systems administrator at Saint Agnes Medical Center in Fresno, Calif., who typically buys Compaq products, said he decided against PageMarq despite a positive evaluation of the product. Compaq "did not have a middle or low-end machine, and I don't have any problems with HP. So why should we go through a change or internally support more than one brand?" he asked.

Compaq also may have been hurt by technical problems. One user, Nick Ashton-Hart, systems administrator at Patti Roscoe and Associates, Inc., a ground tour operator in San Diego, said the fuser, which fuses toner to the paper, in the company's PageMarq 20 had blown out after every 18,000 sheets. Eventually, his reseller replaced it with an HP printer. While Compaq did issue a service advisory in August regarding fusers, other users contacted reported no such problems.

White said despite the closing of the peripherals division, Compaq will keep developing other peripherals, which he declined to name. The division's employees will likely be transferred to other Compaq operations, he said.

IBM eyes plan to boost VAN market presence

By Michael Fitzgerald and Lynda Radosevich

IBM is developing a messaging-oriented value-added network designed to provide access to information across a multitude of networks, sources said last week. The network is expected to be announced in January or February.

The service, until recently code-named In-Touch, will allow users to easily send and retrieve messages, documents, faxes and voice mail over both corporate and external value-added services via wired and wireless networks.

Revenue booster?

IBM hopes the messaging service will help boost nonhardware-related revenue, which has become the company's mantra.

The system provides "electronic document management that includes voice and E-mail over wireless services" and will be built so it can run on personal digital assistants, according to a source close to IBM.

IBM last summer demonstrated a prototype interface using icons such as a phone and a notepad that users would click on to get information. IBM created a division to develop In-Touch in June, sources said. The service is expected to be up and running by mid-1994. IBM is changing the In-Touch name because another company owns it, one source said.

Initial targets will be large companies with mobile workers. IBM is still developing its strategy, but sources said it is looking at using its Advantis and Ardis backbones and hopes to leverage partnerships with the regional Bell operating companies and others.

IBM will compete with AT&T's EasyLink messaging service, sources said, and it hopes to beat archrival Microsoft Corp.'s Microserve to market.

General Magic seeks to upstage WinPad

By Michael Fitzgerald

General Magic, Inc. will try to gain an edge on Microsoft Corp. in the just-hatched market for personal digital assistants (PDA) on Jan. 6, with the announcement of a software developer's kit for its Magic Cap operating system and support from several major vendors.

General Magic will also announce at the Consumer Electronics Show in Las Vegas that AT&T will use its Telescript communications protocol to build an extension to its EasyLink messaging service, called PersonalLink, according to sources.

General Magic backers and potential PDA makers Sony Corp. and Motorola, Inc. will also be present at the announcement. However, neither company is expected to have its General Magic-based hardware available until the spring, the sources said.

Sony will, however, demonstrate software for the Magic Cap environment at the show.

The release of the software developer's kit will put General Magic a step ahead of Microsoft, which has not released a software developer's kit for its At Work for Handhelds OS, code-named WinPad. But Microsoft has put a beta-code software developer's kit in developers' hands and has held a developers conference for WinPad. Despite rumors to the contrary, Microsoft appears to be on target to deliver WinPad in late spring.

At stake for General Magic is the chance to lead the PDA market in the wake of Apple Computer, Inc.'s stumbling efforts with Newton. The company also hopes to circumvent Microsoft in a potentially fast-growing market.

WinPad support

Still, the Microsoft WinPad effort looks to have significant support from hardware manufacturers. WinPad is part of the Mobile Companion effort that also involves Compaq Computer Corp., Intel Corp. and VLSI Technologies, Inc. The four companies have said they will collaborate on a sub-2-pound, wireless, keyboard-enabled PDA meant to serve as a model for a new PC market.

Compaq would not confirm that it will have a 90- to 120-day window on other hardware makers, nor would it confirm that its hardware will ship simultaneously with WinPad's announcement.

At its Professional Developers Conference last week, Microsoft demonstrated a version of WinPad running on a Compaq Concerto notebook. It ran applications written in Visual Basic and exchanged address information with an application on a desktop PC.

Sources said NCR Corp. is also working on a Mobile Companion-like product, due out in early 1995, that supports a keyboard. Motorola is developing a version of its current handheld that accepts only pen input.

Analysts said they expect the PDA market to develop slowly. Activity will increase throughout the year, however, after WinPad and other products from companies such as IBM PC Co. are announced. Continued efforts by Apple, Sharp Corp. and Tandy Corp./Casio, Inc. may also buoy interest.

"If I were a user, I think I'd wait for a selection to come," remarked Jeffrey Henning, analyst at BIS Strategic Decisions in Norwell, Mass.

On the air

Apple is expected to announce on Jan. 5 a new on-line service aimed at consumers. The service could boost sales of its Newton PDA and may also help Apple expand its revenue stream.

Corrections

Due to an editing error, an item in the Dec. 13 issue should have said that ITT — not its ITT Hartford Life Cos. unit — eliminated its corporate information systems staff.

A story in the Dec. 6 issue incorrectly stated SmartSuite's share of Lotus Development Corp.'s total revenue. SmartSuite accounted for 34% of Lotus' desktop application sales.

Due to incorrect information supplied to *Computerworld*, a Computer Industry story in the Nov. 22 issue stated that no object-oriented database management system maker pulled in more than $10 million in sales in 1992. However, Object Design, Inc. recorded $11 million in sales last year.

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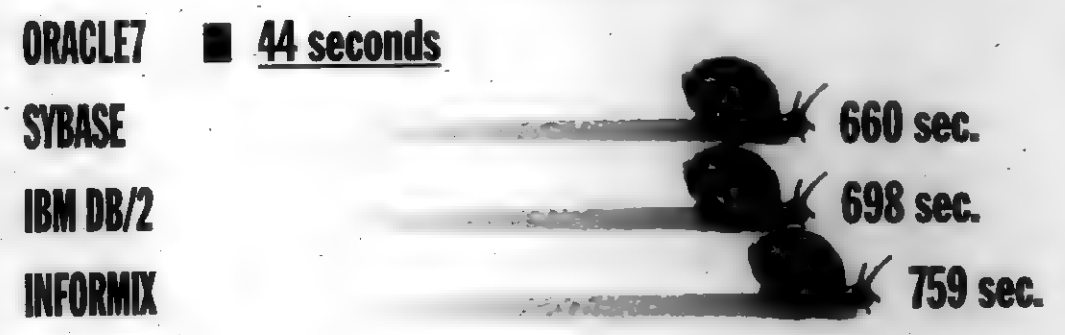

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Digital hitched to Microsoft star

With its traditional scientific/engineering customers emigrating to Unix workstations, Digital Equipment Corp. had to decide whether it should remain a proprietary vendor, become a Unix/open systems vendor or pursue a greater share of desktop sales.

In effect, it decided to do all three, although it seemed to stake its greatest hopes on running Microsoft's Windows NT as a desktop system on its new Alpha microprocessors. And therein lies the tale of Digital's current strength and weakness.

Digital is still following its instinct to be a systems integrator from the top to the bottom of organizations, even though that's a role that most integrators have found progressively more burdensome. Digital's trump card is the Alpha computer architecture, which was designed to be operating-system independent and hence play across all levels. But having spent $1 billion to bring the Alpha fabrication line into volume production, Digital now needs to line up Alpha customers.

Digital must build a strong new identity that is independent of its relationship with Microsoft.

Charles Babcock

Digital is pinning its hopes of achieving volume on selling end-user Alpha systems running Windows NT. So the Digital/Microsoft relationship, which previously consisted of sharing networking and PC integration technology, has shifted onto a higher plane of need and risk.

Technology exchange between the two has been replaced by an invisible umbilical cord, with continued life support dependent on NT success. Digital has never before been so dependent on the fortunes of an outside company.

Microsoft is not an unwilling partner in this relationship. I remember seeing Bill Gates speak at DECWorld '92 in Boston. Ken Olsen gave him a gracious introduction, and Gates offered what appeared to be a heartfelt summary of his early days as a programmer and where he thought the two companies were headed.

At the time of the Microsoft/IBM rift, Gates turned to Digital, I think, as a partner whose experience could help offset IBM's might. Digital also represented a reservoir of large system, peer-to-peer networking expertise that Microsoft needed.

To Jesse Lipcon, vice president of systems marketing at Digital, Microsoft needs Digital as much as ever. For one thing, Digital is the largest OEM of Microsoft's LAN Manager (it packages it into Pathworks). "Microsoft is trying to move upscale into the enterprise. That's what Digital brings to the game," Lipcon asserted at a plenary session at the recent Digital Equipment Computer Users Society conference in San Francisco.

But Digital's friends look at the tie that binds and worry. Windows NT is off to a slow start, and Digital is seeing Alpha tapped to function in a few NT servers. It would prefer to see NT running on hundreds of thousands of desktops powered by Alpha chips.

Microsoft has been forced to bow to reality by repositioning NT as a server system. I believe Digital is protesting this stance behind the scenes in hopes of spurring Microsoft to generate more NT end-user sales. In this instance, Digital should accept reality and not expect the impossible from an ally.

But where does that leave Alpha?

Digital needs to build confidence that it has reorganized its non-Alpha business into an ongoing, profitable enterprise to buy time for the Alpha architecture to assert itself. But it still hasn't formulated a convincing argument that its systems integration effort is a unique strength and can be both marketable and profitable.

Its last quarterly loss was small, but any red ink is a flag of caution to customers considering converting to a new computer architecture. Digital's dilemma is that it must forge a new identity before it can reap the benefit of its new technology, and it still seems tentative in going about this task.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Relational databases

Digital to port Rdb . . .

By Craig Stedman

■ Digital Equipment Corp. plans in February to try to allay user concerns about the future of its Rdb relational database by pledging to port the software to other hardware platforms. However, sources said the move would likely be limited and dependent on up-front customer demand.

Digital "wants to cost-justify everything they do, and it would be hard to do that with a plan that says you're going to just port to multiple platforms," said Lynn Berg, an analyst at Gartner Group, Inc. in Stamford, Conn. "Digital is not set up to be a generic database vendor."

"We don't plan to run on every platform or every box out there in the world," agreed Nelson Hsu, client/server and database marketing manager at Digital. "It's a matter of where the demand is going to be called for by our customer base."

Hsu confirmed that "a statement of strategy and direction" on non-Digital versions of Rdb will be part of the February announcement, which is also expected to include the formal introduction of Rdb for the DEC OSF/1 operating system — the first non-OpenVMS release of the database.

Rdb for DEC OSF/1 is due to ship in the first half of 1994 and a release for Microsoft Corp.'s Windows NT is planned for later in the year. Extending the NT version beyond Digital's Alpha AXP systems to support Intel Corp.'s Pentium chip and Silicon Graphics, Inc.'s Mips architecture would be "an easy transfer," Hsu said, although he did not commit to doing that.

Stumbling block

The portability issue has been a key stumbling block for some users who evaluated Rdb. The Chicago Stock Exchange started moving from Oracle Corp.'s database to Rdb in 1992 but put the project on hold earlier this year after deciding the conversion costs would be too high, especially given the likelihood that it will shift away from pure reliance on Digital hardware.

"We may not end up a year from now having Digital as the primary supplier of our computers, so the safe bet is to remain with a [database] that gives us flexibility," said Jason Leyva, director of systems engineering at the stock exchange. He said the decision to stay with Oracle could be reopened if Digital does support Rdb on other platforms.

Bob Cloninger, data processing manager at OK Industries, Inc. in Fort Smith, Ark., said he chose Borland International, Inc.'s Interbase database over Rdb several years ago to avoid "getting locked into VMS or another proprietary operating system. I want to be able to go wherever I need to go."

Analysts were split over Digital's strategy. Rdb has performance advantages for large production systems, said Judith Hurwitz, president of Hurwitz Consulting Group, Inc. in Watertown, Mass.

But Irv Shapiro, president of Metamor Technologies Ltd. in Chicago, said Rdb has become "a very hard sell" and limited portability would not be enough to change that.

More on the table

The February announcement is also expected to include DEC OSF/1 versions of Digital's DB Integrator and DBA Workcenter products, plus an updated release of the company's ACMS transaction-processing software that could be integrated with databases other than Rdb, sources said.

. . . and taps CIO from ranks

By Craig Stedman

Digital Equipment Corp. last week gave Robert McNulty, who heads its outsourcing and internal data center operations, the additional job of chief information officer. As CIO, McNulty takes charge of Digital's corporate application development.

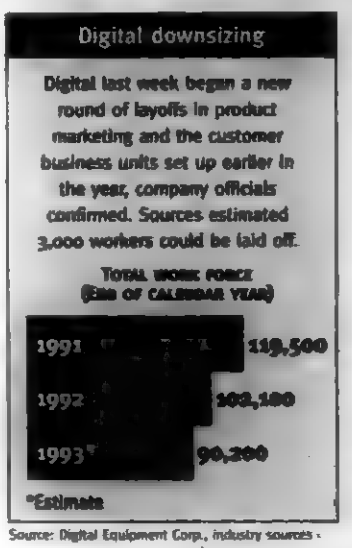
The move to combine all information systems under McNulty is a change from the company's original plan to have a separate CIO handling application development. Digital had trouble enticing outside prospects to take the CIO job after control of its data centers was shifted to the outsourcing unit [CW, Sept. 27].

Executives indicated in September that the CIO position had been offered to a Digital employee in Europe. However, McNulty said the company eventually decided "that we didn't need a separate CIO because our customers' needs are the same as our internal needs." The outsourcing unit is "treating Digital as our largest customer," he added.

Mike Melenovsky, an analyst at International Data Corp. in Framingham, Mass., said Digital's change in plans makes sense. "Program development has to be an integral part of the day-to-day running of IS," he said.

However, a consultant close to Digital noted it may be tricky to balance internal and external demands. "It becomes an issue of whether you serve the inside or outside master," he said. "Profits are driven by the outside world, so inside users can get ignored."

McNulty reports to a board of six Digital executives, which differs from the original plan to put the job solely under Chief Financial Officer William Steul.



Racal to ship first PCI LAN adapter

By Stephen P. Klett Jr.

While not in time for the Christmas rush, Racal InterLan, Inc. announced it will ship in March the first Peripheral Component Interconnect (PCI) LAN adapter card. The company said the board will result in data transmission rates that are up to four times faster than those possible with Extended Industry Standard Architecture (EISA)-based systems.

Bus breakdown

Racal InterLan's PCI adapter card promises significantly higher performance at an aggressive price

Bus	Bandwidth	Price*
XT/AT	8M byte/sec.	$125
EISA	32M byte/sec.	$300
PCI	132M byte/sec.	$250

*Approximate

Spurred by widespread acceptance of Windows and OS/2, PCI is a 32-bit, local-bus standard designed to eliminate the performance bottlenecks associated with running graphic-intensive applications, which bog down older bus architectures, such as XT/AT and EISA, and degrade network performance.

Making changes

Pacific Gas & Electric Co. in San Francisco, which buys approximately 2,000 PCs a year, said it expects to move totally away from XT/AT and EISA within two years in favor of VL or PCI.

Racal InterLan said the Ethernet adapter card will have a PCI interface and will be based on Advanced Micro Devices, Inc.'s PCnet chip set. The card will work with any PCI-compliant PC or server and will carry a price tag of roughly $250, according to Robert Pulley, engineering director at Racal InterLan in Boxboro, Mass.

With many vendors, including Compaq Computer Corp., Hewlett-Packard Co., IBM, Dell Computer Corp., Apple Computer, Inc. and Digital Equipment Corp., set to announce PCI-based systems in the first quarter, analysts said the appearance of supporting products is vital.

"Users need to know products such as adapter cards will be there when PCI becomes widely available or it won't take off," said Tracey Corbo, an analyst at International Data Corp. in Framingham, Mass. "This announcement is another sign the industry is starting to catch up with CPU technology by offering faster and wider paths" networkwide, she said.

While initial interest in PCI will be for high-end multimedia and video applications, proponents said they expect PCI to move into the low end as prices drop and users' understanding of its capabilities increases.

"Our goal with PCI was to create a bus that handles more than just graphics. It offers LAN advantages as well," said Mike Bailey, chairman of the PCI Special Interest Group, which owns and manages the PCI local-bus specification. For example, with adaptercards such as Racal InterLan's, users will be able "to simply plug in their existing LANs and be up and running with PCI," he said. PCI's higher bandwidth will also support emerging high-speed LAN technology such as 100M bit/sec. Ethernet, he added.

Because of its automatic configuration capability and processor independence, PCI is seen by some observers as a better alternative than the 32-bit VL-bus introduced by the Video Electronics Standards Association last year. However, users said PCI's prices would have to be in line with VL-based — and XT/AT and EISA-based — systems for them to move to the platform (see chart).

"PCI is a safer way to go because it has a controller between the CPU and bus, but cost is still the most important issue for us," said Abe Chait, project manager at Pacific Gas & Electric Co. in San Francisco. "However, PCI is heads above [VL], so if the price delta is close, we will go with PCI."

Unix

IS fears losing open systems influence

By Jean S. Bozman

Some of the world's largest Unix users, concerned about the restructuring of the Open Software Foundation (OSF) and the vendor orientation of the Common Open Software Environment (COSE), are looking for a new platform from which to help steer the evolution of open systems.

Even as members of the OSF board met last week without any luck in deciding the organization's new structure, members of the OSF's end-user steering committee held an electronic meeting to ensure their continued participation in the creation of open systems standards.

Users worry that without their input, open systems efforts will be driven largely by vendors that are more interested in proprietary systems than open standards. This is particularly important as the OSF restructures, blending many of its development resources with those of the COSE coalition.

"The people who are putting these changes together are the small club of the systems-vendor sponsors of OSF," said Ted Hanss, chairman of the OSF end-user steering committee, "and they have not invited any end user or [independent software vendor] to review the proposed changes."

For the past four weeks, the end-user committee has fired off letters to IBM and Hewlett-Packard Co. but has not received any responses, Hanss said. Of the OSF's 400 members, about 100 are vendors, more than 60 are independent software vendors and more than 200 are user sites, he noted.

HP and IBM did not comment by press time.

The boundaries of the debate transcend the OSF and include other standards and Unix industry groups, Hanss said. "Our next step is to actually draft some kind of public statement to raise the visibility of the fact that end users want a strategic-level input into the open systems processes," he said. "The general principles apply not only to OSF but also to X/Open and [the Object Management Group] and COSE."

Steering committee members hinted last week that they plan in January to disclose a new form of user feedback for the Unix vendors. But they gave no details, other than to say that OSF board member Mike Johnson, former head of information technology at Unilever PLC in London, would be involved.

OSF Chief Executive Officer David Tory last week acknowledged users' frustrations. "The critical issue is that users want to make sure they can continue to participate in X/Open and in OSF at the same level, at an equal level, as before," Tory said. He did not comment directly on COSE, however.

COSE closed

But users on the 21-person steering committee are worried that they have no forum to voice complaints through COSE, which is fast overtaking the OSF as a development mechanism for the world's top Unix vendors. Some users are concerned that IBM, HP and Sun Microsystems, Inc., which is not an OSF member, prefer to work quickly in the COSE group, without being slowed by user feedback.

"COSE is a virtual organization," said Tony Carrato, a founder and consultant at Mile-High Information Services, Inc. in Denver who serves on the OSF end-user steering committee. "There's no mailbox, no phone number and no open process."

Even users outside the OSF steering committee are concerned about user input to Unix vendors — other than direct feedback. "I'm mad that some of the big vendors who have the big sign on the window that says 'open' really have no intention to be open and are working on all kinds of ways to stay proprietary," said Bill Connor, corporate vice president and information technology director at Motorola, Inc.'s General Systems Division in Arlington Heights, Ill.

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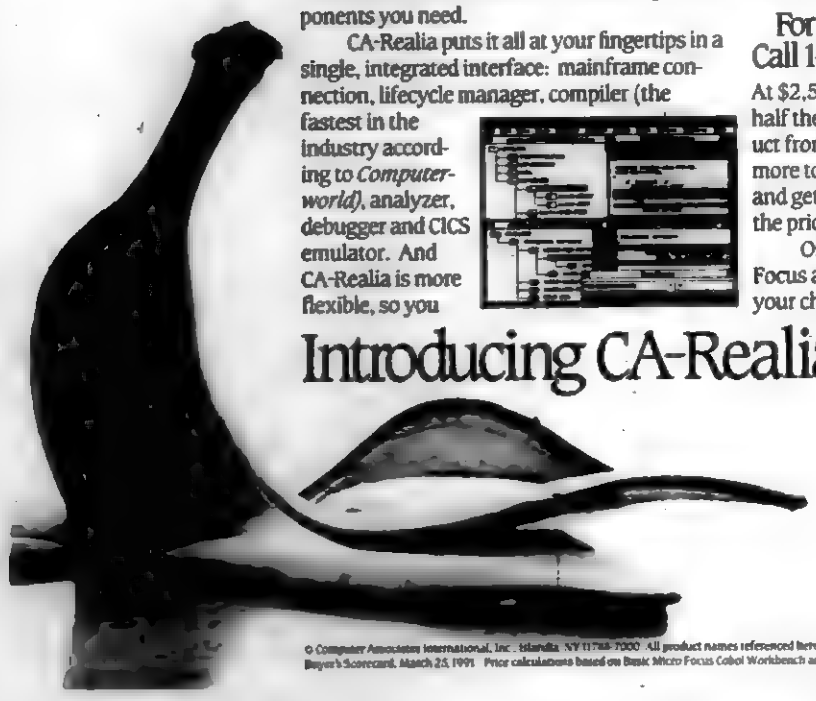

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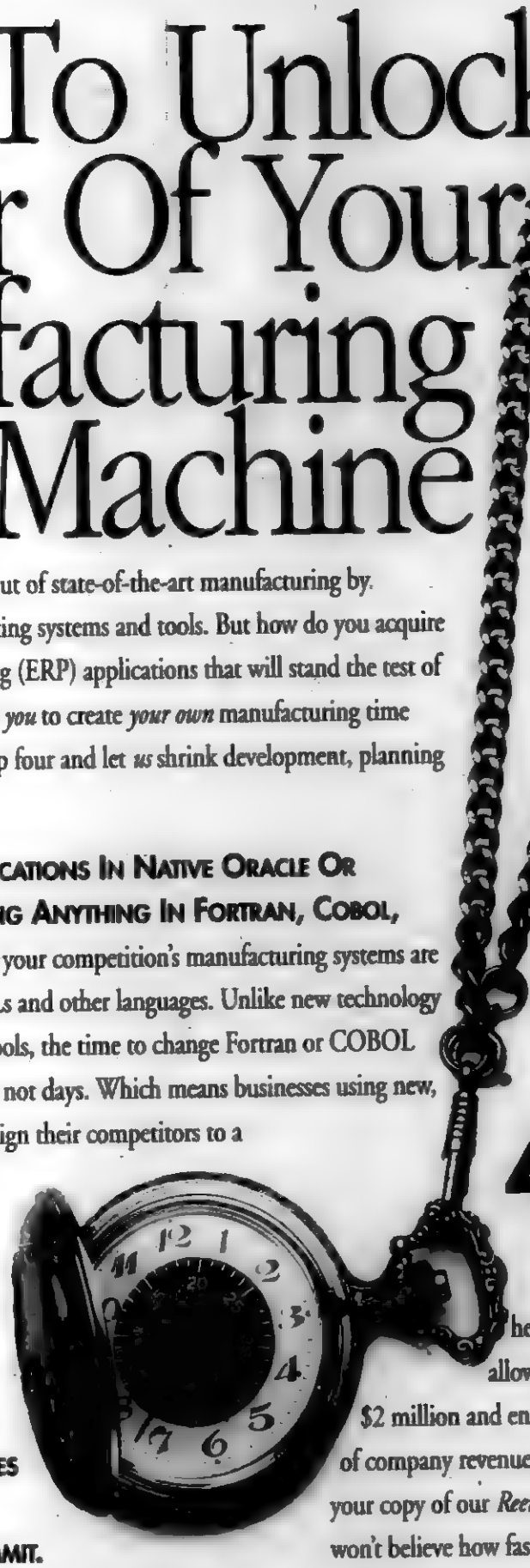

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News Shorts

IBM to split Personal Systems division

IBM plans to reorganize its Personal Systems Division, according to an internal memo sent to IBM employees last week, sources said. IBM's Advanced Workstation Division (RS/6000) and the Personal Software Products units will be shifted to its Large Systems Division, reporting to John Thompson. The IBM PC Co. and the Power Personal Systems group will report to the James A. Cannavino's replacement, who sources said was expected to be named this week. Cannavino was recently named IBM's senior technology officer. The move was made to bring IBM's non-PC systems groups together and give the company greater focus, an internal source said.

Kendall ousts founder

Henry Burkhardt III, founder and president of **Kendall Square Research Corp.**, has resigned from the troubled parallel processing vendor. Burkhardt left the Waltham, Mass., company two weeks after being stripped of his chief executive officer title following allegations that the firm had recorded inflated sales figures. Those allegations led to a Securities and Exchange Commission investigation and a shareholder suit. Kendall said it plans to reorganize to increase its emphasis on the commercial market and establish an independent audit and finance department.

3Com to acquire Synernetics

3Com Corp. last week agreed to purchase Ethernet switching vendor **Synernetics, Inc.** in North Billerica, Mass., for $104 million. Synernetics projects its 1993 revenue will be $27 million, 45% of which is from sales to 3Com. The deal, expected to be completed in January, makes 3Com the leader in the market in terms of revenue, according to projections by Dataquest, Inc., which estimates the 1993 Ethernet switching market at $60 million. Synernetics will remain in Massachusetts as 3Com's Ethernet switching division.

Multimedia patent reevaluated

The **U.S. Patent and Trademark Office** announced last week that is will reexamine the controversial multimedia patent awarded to **Compton's NewMedia, Inc.** [CW, Nov. 22], according to the *San Francisco Chronicle*. The office ordered the reexamination after receiving newly released information on what is know as "prior art" — technology widely used prior to Compton's being granted the patent. Compton's claims its patent covers the basic technology used by virtually every multimedia program sold today.

Tivoli opens object management frame

Tivoli Systems, Inc. last week announced an open licensing program for Tivoli Management Framework 2.0, a set of specifications for object-oriented systems management tools. Software vendors would build application programming interfaces to the framework for performance monitoring, backup, recovery and other utilities for Unix environments. The goal is to get tools from different vendors to work together using common Tivoli blueprints.

SHORT TAKES **Cabletron Systems, Inc.** has become the 12th member of the Fast Ethernet Alliance, a group of networking companies creating specifications for 100M bit/sec. Ethernet technology. . . . Client/server applications maker **PeopleSoft, Inc.** signed up **Andersen Consulting** to resell PeopleSoft packages to various government and public-sector users. . . . **The ASK Group, Inc.** said it has begun shipping development and connectivity tools for Microsoft Corp.'s Windows NT.

More news shorts, *page 16*

Novell

CONTINUED FROM PAGE 1

Novell also has apparently backed off from active support of the Common Open Software Environment (COSE) consortium's plans to develop common Unix systems management specifications.

While Novell remains a group member and supports the COSE desktop environment, the systems management effort is "very informal and fluid right now," said Novell Chief Technology Officer Kanwal Rekhi. "If COSE comes up with systems management specifications, we will look at them."

But the COSE systems management group has a concrete objective of coming up with a common set of standards, many of them existing, that the leading Unix vendor members can agree to implement, said Larry Robinson, a Hewlett-Packard Co. spokesmen and COSE group member. The initial goal is to have a core set of Unix desktop management facilities sometime next year.

Talking to Tivoli

Novell is "actively discussing" integration of NDMS with Tivoli Systems, Inc.'s Unix systems management platform, which is the basis of Distributed Manager, Tivoli President Frank Moss said.

Rekhi would not confirm or deny the talks. Such a move would potentially allow NDMS to interoperate with the growing number of Unix systems management platforms and applications that comply with the Object Management Group's Common Object Request Broker Architecture.

"Once again, Novell is not paying attention to trends in industry and is implying that NetWare is the foundation of the computing world," said Brian Anderson, chief information officer at Transocean Ltd., a San Bruno, Calif., container transport company. "I need to manage Unix, not just their Unix and Novell, but other network operating systems as well."

Tighter links

Upcoming developments to bring UnixWare and NetWare together include the following:

- NDMS services to manage UnixWare servers and clients (no time frame)
- Access for UnixWare clients to NetWare v3.11 and NetWare 4.01 servers (now)
- UnixWare systems interaction with NetWare Directory Services (mid-1994)
- NDMS may run on Unix (no time frame)

Transocean's Unisys U6000 servers run an OEM version of Novell's Unix System V Release 4.

The idea of using NDMS to manage Unix sounds good to staunch Novell shops that buy into Novell's concept of UnixWare application servers working in tandem with NetWare's file and print services.

"I look forward in the long run for UnixWare and NetWare to become more integrated with one another and to having NDMS manage UnixWare," said Charles Tilbury, a network analyst at the University of Texas' M. D. Anderson Cancer Center. "For us, it makes sense to manage the two together; we're a big Novell shop."

However, a number of companies with a broad mix of NetWare and Unix servers are turning to Simple Network Management Protocol-based enterprise platforms such as HP's OpenView and IBM's NetView/6000. While HP and IBM are aggressively extending their platforms' reach into a variety of systems, Novell's platform — even with NDMS — will only manage UnixWare. NDMS currently has no shipment date.

Reliance on another

Lourdes Hospital, for example, is counting on Cabletron Systems, Inc.'s OEM version of HP's OpenView to provide the "openness and flexibility we need" to manage a mixture of NetWare, IBM's AIX and probably UnixWare in the near future, said Tom Witteman, PC support specialist at the Binghamton, N.Y., institution.

For Unisys, Novell's withdrawal of Distributed Manager means "a total reevaluation of our enterprise management strategy," which had been based on the platform, said Bob Sprowls, Unisys' director of Unix product marketing.

Novell is offering Distributed Manager developers the option of migrating their applications to Tivoli's management framework. Unisys is considering this option, as well as platforms such as OpenView, Sprowls said.

NMS' "NetWare-centricity" makes it unsuitable as Unisys' enterprise systems management platform, he indicated.

UnixWare gets NetWare 4.01 links

Global directory service still to come; other updates unveiled

By Elisabeth Horwitt

Novell, Inc. last week provided a few small but important functional improvements to UnixWare, its version of Unix System V Release 4 with embedded NetWare support.

Client systems running UnixWare 1.1 will be able to access NetWare 4.01 servers for the first time, Novell said. However, UnixWare systems will not be able to tap into NetWare 4.01 NetWare Directory Services (NDS) until the introduction of UnixWare Version 2.0, slated for delivery in mid-1994, a company source said.

Novell is still weighing whether to implement the global directory service directly on UnixWare or provide NDS on NetWare with hooks to a variety of Unix systems, the source said. The latter implementation would allow a broader range of Unix products to transparently access resources on NetWare servers and also make their resources available to NetWare clients.

UnixWare 1.1 also includes Advanced Merge for Windows, a feature enabling Windows applications running UnixWare to access NetWare services. Version 1.1 is said to resolve the performance problems inherent in the earlier version, the source said.

Further enhancements

Other enhancements in UnixWare 1.1 include the following:

- Compliance with OSF/Motif 1.2 runtime libraries, which provides UnixWare systems with a look and feel that conforms more closely to the Common Open Software Environment's Common Desktop Environment, Novell said.
- Support for TCP/IP bundled into UnixWare Personal Edition, with support for Point-to-Point Protocol and Serial Line Internet Protocol remote networking protocols.
- Support that will enable network administrators to bring up both NetWare and UnixWare system activity on a single Simple Network Management Protocol management console.
- Support for a broader range of CD-ROMs, SCSI adapters and network adapter cards, as well as for IBM Token Ring source routing.

UnixWare 1.1 will be available through Novell Gold, Platinum and Unix Master Resellers, free of charge to UnixWare 1.0 customers and those who register prior to July 1994.

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Food banks

CONTINUED FROM PAGE 1

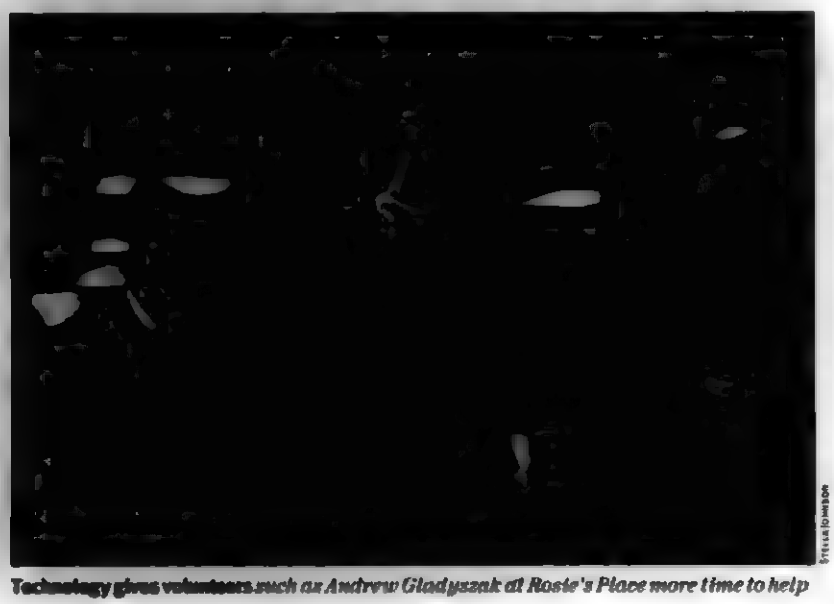
calls," she said.

Before computers arrived in offices, hot line workers had to rustle through mounds of paper and notebooks to find information on which shelters and soup kitchens had space for clients. But the data was often outdated, and the computerized method is just "infinitely better," O'Connell said. "Especially during the holidays, things got lost or overbooked or underbooked. We can do a lot more now."

Some 190 major food banks — and countless other smaller ones — act as regional food pantries, serving every county in the nation. They distribute food donated by manufacturers, farmers, restaurants, hotels and other sources to 150,000 soup kitchens, shelters, day-care centers and other client agencies, which in turn cook and serve the food.

Of the major food banks, about one-fifth still operate without any computers, likely "because of a lack of funding," said John Muller, data processing manager at Second Harvest in Chicago. Second Harvest is a national nonprofit organization that puts food banks in touch with sources of food close to them and acts as an information clearinghouse.

The rest of the country's major food banks and hunger agencies are computerized to differing degrees: The Los Angeles Regional Food Bank has an RS/6000 and seven stand-alone Macintoshes, and New York's City Harvest has 20 networked IBM-compatible computers. North Carolina Harvest in Charlotte is looking to buy its first computer. About one-third of agencies that are computerized have some kind of LAN, Muller said, typically with three to five workstations attached.



Technology gives volunteers *such as Andrew Gladyszak at Rosie's Place more time to help*

Only the largest food banks have an in-house systems administrator. Most make do with part-time technical help that is donated or paid for with scarce funds. Staffers at Project Bread get in touch with a paid part-time computer consultant — known only as "Kwok" — by leaving yellow notes around his PC.

Computers are even reaching down to the most grassroots level — the individual shelter and soup kitchen. The Olive Branch Mission in Chicago uses a Compaq Computer Corp. server with six networked 486-based PCs for word processing and accounting and to track information.

The Failure to Thrive Clinic at Boston City Hospital provides medical resources as well as social and nutritional counseling to undernourished inner-city children and their families. The 18 staff members — mostly part-time — have four 80286-based computers to share among them.

Lisa Harmer, administrator of one of the clinic's departments, said that when she started working there a year ago, there were no computers at all. "I'm an MBA, and I had never seen ledger paper until then, except in *A Christmas Carol*. So I bought a 486 for my home, and I did our budgets, grant applications and personnel records on it." Then the donations started rolling in, including a new PS/2 Model 25 a few weeks ago.

Indeed, much of the computer gear is donated and therefore old and outdated — unable to run even medium-size databases without crashing.

"This is a complicated organization, and I need more than a pat on the head telling me to go out and get a Mac," said Doris Bloch, executive director of the Los Angeles Regional Food Bank, the nation's largest, which will ship about 36 million pounds of food this year. "Nothing against the Mac, but there's no way to track this amount of inventory on it."

Many of the computer-related issues that nonprofits face are things corporate information systems managers can readily understand. Second Harvest, which uses a Unix machine running an Informix Corp. database with 30 IBM-compatible PCs hard-wired to the Unix box, is trying to put together an electronic-mail network for food banks to share information electronically.

"To do that we have to reconcile DOS, Windows and Macintosh" computers, Muller said. "Synchronizing a variety of automation is probably my greatest challenge. We want to allow the food banks to pass information back and forth."

For many of these organizations, computers are no longer a luxury.

"A computer allows small staffs to do a lot of important things rather than keeping records, like drumming up more food donors," said Lindsey Ford, grants director at Share Our Strength, a Washington fund-raising organization for hunger groups.

Bloch agreed. "A nonprofit has to run every bit as businesslike as a private-sector company. And to do that, you need darn good data."

Midwest bureau chief Ellis Booker contributed to this story.

Hunger today

- **More than 12 million American children experienced hunger in 1991.**
  Source: Center on Hunger, Poverty and Nutrition Policy, Tufts University
- **More than 20 million Americans suffer from hunger.**
  Source: Former Select Committee on Hunger, U.S. House of Representatives
- **On average, 22% of the requests for emergency food assistance in U.S. cities went unmet in 1992. In two-thirds of these cities, emergency food assistance facilities were forced to turn people away because of a lack of resources.**
  Source: U.S. Conference of Mayors, Task Force on Hunger and Homelessness, 1992

SOS
Share Our Strength

Wishing on a star

A technology wish list from the nation's food pantries:

- **Most of all, the regional food banks need some technical expertise.** "Whether it is in networking, or how to streamline their operations, or helping them figure out what kinds of technology they need before they go out and buy it, there's a great demand for assistance," said Lindsey Ford, grants director at Share Our Strength.
- **Newer, bigger computers.** The Chicago Christian Industrial League would like more PCs to help homeless people get jobs by teaching them computer skills.
- **Printers, particularly laser printers.** Most food banks are sharing one or two printers among staffs that can total as many as 100 (including volunteers). Plus, laser printers help defray the costs of sending leaflets and such to typesetting shops.
- **Networks.** Project Bread in Boston, for example, has 25 stand-alone PCs that would help the organization more if they were linked. "The information is splintered because each group within Project Bread maintains its own database," said Joel Forman, business manager. "It would be much more efficient for everyone to be able to access the same files."

If you would like to donate time or equipment to food pantries in your area, contact your local United Way. Or call Share Our Strength in Washington at (202) 393-2925 or Second Harvest in Chicago at (312) 263-2303.

Big assist

In addition to using databases to track donors and agencies with which they do business, food banks use computers for many other tasks. The following are some examples:

- **Fundraising.** This is a major reason nonprofit organizations become interested in technology. With desktop publishing, food banks can crank out their own brochures, solicitation letters and thank-you notes. John Mooney, director of public relations at New York's City Harvest, said a scanner-equipped system would help his group save $3,000 in printing costs each year.
- **Record-keeping.** Because food banks deal with perishable items, state health departments require strict records of how old the food was when it was picked up, at what temperature it was stored and for what duration, before the food is given to the recipient agency. Food banks also use the computers to track how much food they pick up and distribute.
- **Tracking volunteers.** All nonprofit organizations rely on free help, and many use computers to track the kinds of skills and time volunteers contribute. For example, a group needing a designer could search its volunteer database for one.
- **Back-office functions.** These include keeping track of staffers' hours; word processing used for writing proposals to the government and other funding agencies; and budgeting.

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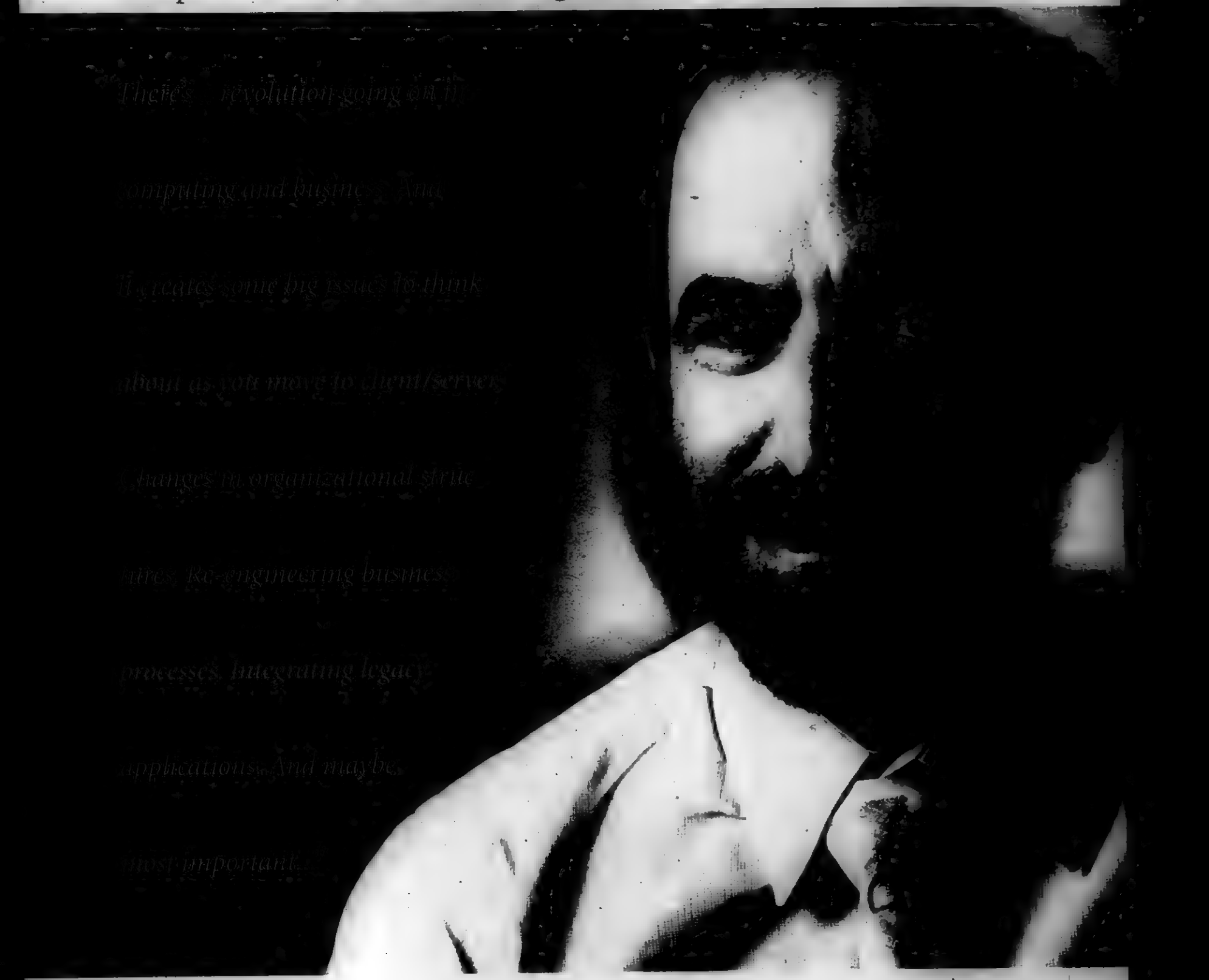

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HP lays out next-generation chip plans

Current offering receives power boost

By Mark Halper

Before Hewlett-Packard Co. moves to its "post-RISC" architecture, it has a few enhancements in store for its current PA-RISC, including a 125-MHz chip announced last week and a 64-bit, 200-MHz design due in mid-1995, the company said.

HP also provided details for the first time of its previously undisclosed plans for adding Windows NT support to PA-RISC and eventually moving to a new architecture [CW, Dec. 6, 13].

Users such as Dave Broisma, manager of information systems at Chrysler Corp. subsidiary Acustar Electrical in El Paso, Texas, noted that while it is always encouraging to hear about faster chips, his near-term upgrade plans are for the desktop, not the enterprise server.

"The thing to remember is that as you move to client/server, you're pushing processing and costs to the desktop, so you have to save somewhere," Broisma noted. "I'm not sure I'll need more powerful servers in the background."

Ron Gillet, vice president of IS at Houston-based energy company The Coastal Corp., noted that he does not have an urgent need for more processor power; his interest in future processors will be based on pricing. "The bottom line is none of that directly impacts me unless it lowers my costs," Gillet said.

Jan Silverman, HP marketing manager for advanced technologies, last week said HP's move to a post-RISC processor, which will rely in part on Very Long Instruction Word (VLIW) technology, will come in 1997 or 1998. That move, which augurs chip performance of billions of instructions per second compared with today's millions, has raised concern among users over compatibility with existing PA-RISC software.

Silverman last week reiterated earlier HP statements that the company will ensure the new architecture is compatible with the old.

But one of the most immediate PA-RISC changes is scheduled for next month when, Silverman said, HP will add a bi-endian version of PA-RISC and announce workstations (see story page 15) and minicomputers that use that chip, which will be called the PA-7100*LC*. HP said it also plans "a new class of LAN servers" built on the 7100*LC*.

Systems using the chip will ship in the first half of the year, and HP said the chip itself is immediately available to PA-RISC licensees, which include Hitachi Ltd., Convex Computer Co., Stratus Computer, Inc., Mitsubishi Electric Corp. and others.

Better little than big

The bi-endian chip is intended to move HP workstations and minicomputers into the Windows NT world via its "little endian" byte-ordering scheme, which arranges bytes in ascending order — a manner more suited for NT than HP's descending big endian-only design.

But the 7100LC was designed as a "low-cost" chip, and at a maximum of 80 MHz, does not offer the performance levels of faster PA-RISC processors. HP has earmarked it for low-end workstations and minicomputers.

Silverman pointed out, however, that the chip includes built-in multimedia support for image processing, a memory controller and an I/O controller, thereby reducing the cost of building that support on a system motherboard. The chip also uses off-the-shelf static RAM for cache support, compared with the more expensive RAM the 7100 requires.

Meanwhile, HP is cranking up the speed of the 99-MHz 7100 to 125 MHz in a chip intended solely for workstations.

Called the PA-7150, the chip will continue in the 7100's big endian-only vein, meaning it is not intended to support NT.

But HP has another processor on the drawing board, the PA-7200, that will provide NT support through a bi-endian design while also representing a performance boost, Silverman said.

The PA-7200 is due in late 1994 or early 1995 and will include higher bandwidth, lower latency, a dual-integer pipeline and more efficient cache management, he said.

HP will move to a 64-bit design in 1995 with the PA-8000 and to post-RISC in 1997 or 1998 with the PA-9000, Silverman said.

HP'S PROCESSOR ROAD MAP

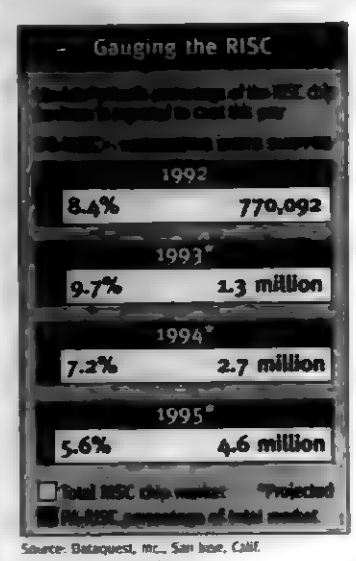
Last week:
PA-7100LC
- Bi-endian (NT, Unix, MPE/IX)
- Workstations and minis
- "Low cost," 80 MHz

PA-7150
- 125 MHz
- Workstations only
- Big endian only (Unix)

Late 1994, early 1995:
PA-7200
- Bi-endian
- Higher bandwidth, lower latency, a dual-integer pipeline and more efficient cache management

Mid-1995:
PA-8000
- 64 bits

1997-1998:
PA-9000
- "Post-RISC" using VLIW technology



Source: Dataquest, Inc., San Jose, Calif.

Double offering

Reversing an earlier public statement, HP last week said it will offer its forthcoming "bi-endian" PA-RISC 7100LC in both the HP 3000 and HP 9000, as well as in its workstations. The company plans to unveil low-end systems using that chip next month.

Minicomputers

Large systems users not waiting for NT

By Mark Halper

As Hewlett-Packard Co. edges toward support for Microsoft Corp.'s Windows NT operating system on its minicomputers, it is business as usual for many of HP's large systems customers, who do not see NT in their near-term, enterprise-level future.

Users view HP's NT endeavor as a logical marketing ploy in which HP is preparing to offer NT support when and if the fledgling operating system catches on at both data center and departmental levels.

HP is altering the PA-RISC chip that drives its proprietary HP 3000 and Unix-based HP 9000 minicomputers so that the chip will more readily accept an NT port [CW, Dec. 13]. HP is adding a "little endian" byte ordering scheme to PA-RISC's "big endian" design, a move that will greatly ease any eventual porting task (see story above). A little endian model arranges bytes in ascending order, while a big endian scheme arranges them in a descending fashion.

John Jazwiec, chief information officer at Barber-Colman Co., a Rockford, Ill., vendor of environmental and industrial controls, noted that he has a long-term commitment to the HP/UX Unix operating system on his high-end Corporate Business System HP 9000s.

Slow start at high end

"Will NT catch on at the high end? Not in the 1990s," Jazwiec observed, noting that NT is a long way from acceptance as an industrial-strength operating system with the reliability sought by information systems chiefs.

He sees a possible NT opening, however, in departmental servers. "The operating system for that level is still undecided," Jazwiec said. "I think NT is going to be strong because of the number of applications that can be ported to it." He added that it would be a plus to buy servers and data center equipment from the same vendor.

Jerry Kopecky, manager of MIS operations at IVI Travel, Inc., a Northbrook, Ill., HP 3000 and 9000 shop, said an NT-compatible PA-RISC machine would be more confidence-inspiring than an enterprise-level NT machine based on an Intel Corp. architecture.

"It would make me nervous running a corporatewide data center on an Intel architecture," Kopecky noted. "This seems to be one of the first initial attempts at putting a solid architecture out there" with NT.

Steve Dennehy, second vice president of strategic planning at Massachusetts Mutual Life Insurance Co. in Springfield, Mass., said he has no intention of migrating his HP 9000 boxes to NT. "All it would provide would be a different operating system. There would have to be some considerable value added," he said.

Rodger Lindquist, manager of business systems development at Bio Rad Laboratories, Inc. in Hercules, Calif., noted that offering an NT solution will help HP stem possible customer defections, such as the switch made by Lindquist's former employer. Dryer Grand Ice Cream, Inc. in Oakland, Calif., ditched its PA-RISC-based hardware for a less expensive Intel-based system from Sequent Computer Systems, Inc., Lindquist said.

Meanwhile, bringing NT into an operating system fold that also includes MPE/IX and Unix means HP will have to carefully ensure its existing customers that it is not refocusing its efforts away from them. Not long ago, MPE/IX users feared abandonment as HP began staking its future on Unix. HP has taken strong measures to douse those incendiary concerns but will now have to work extra hard at making sure the flames stay out.

"This will certainly cause the HP spin controllers to start spinning real hard," said Eric Fisher, principal at Fisher Systems Consulting in Groton, Mass.

HP to field two low-end workstations, small Unix server

Based on modified PA-RISC chip, machines are aimed at attracting commercial customers

By Jean S. Bozman
CUPERTINO, CALIF.

Hewlett-Packard Co. is expected to unveil two low-end workstations and a low-end server based on the new HP PA-RISC 7100LC chip next month, industry analysts said last week.

At the same time, HP confirmed that the 7100LC, a bi-endian chip, will power Unix workstations and low-end Unix servers when they ship early next year (see story page 14). All of the systems will run Unix off the bat but were designed to operate with Microsoft Corp.'s Windows NT [CW, Dec. 13].

The workstations, said to be priced at $3,995 and $8,900, will bring HP into direct competition with Sun Microsystems, Inc.'s Classic and LX workstations, Silicon Graphics, Inc.'s $5,000 Indy machine and IBM's PowerPC-based workstations. HP is also set to announce a small HP 9000 Model 800 "E" workgroup server priced at about $7,500, analysts said. Until now, the $5,000 HP 9000 Model 715 was the least-expensive HP workstation.

We're No. 2

HP is the No. 2 Unix workstation player. Last year, it trailed Sun's 35% market share with a 17% share, according to International Data Corp.

Commercial sites have anticipated the entry-level workstation for several months.

"It would be good for small workgroups," said Mike Emrick, a systems analyst at Wachovia Bank in Winston-Salem, N.C. "Banks have literally hundreds of branches, and you could serve 10 X terminals off one small server."

Emrick said he plans to test the new systems running Windows business applications under Sun's Wabi. Analysts said they expect 486 PC users to evaluate the low-end HP workstation as a move-up box. Meanwhile, some technical users said last week they expect to stick with their high-end machines.

Open to NT

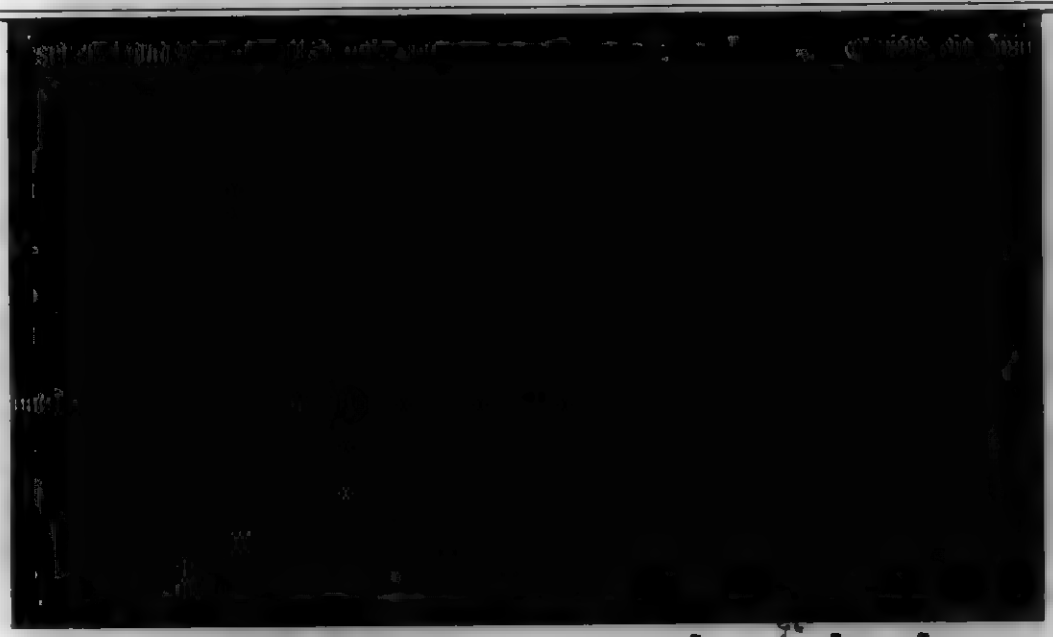
By using the new 7100LC bi-endian chip, HP is providing an engine so inexpensive that it can vie with high-end PCs, and the firm is also leaving the door open to Windows NT. "If they see themselves losing business because they're not offering NT, then I believe they will offer it," said Paul McGuckin, a Unix analyst at Gartner Group, Inc. in Stamford, Conn.

A mature workstation market, with 16% yearly growth, is driving many vendors to provide desktop alternatives for the booming PC market, said Nancy Battey, director of workstation research at International Data Corp. in Mountain View, Calif. "They're in a tumultuous environment where they've got to decide if they want to stay in high-end workstations, which represent under 2% of the overall desktop market," she said.

But other analysts noted that the move-down strategy will result in price pressures and user demands to support Windows applications, even those not supported by Wabi.

Multimedia and video applications will be supported directly on the 7100LC chip, HP said last week. "There will be no additional hardware needed for JPEG and MPEG decompression," said Larry Inman, program manager for advanced technologies marketing at HP's computer systems group here. JPEG and MPEG are the two leading video-compression algorithms, he said. Analysts said putting video-compression directly on the chip should speed throughput.

Other HP workstations do require video-compression cards from third-party suppliers.



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News Shorts

Former AT&T employee sentenced

A former AT&T employee and his uncle were sentenced to 18 months in prison for conspiring to extort $1 million from the communications giant. Federal prosecutors in Newark, N.J., said Louis Pacich, a former AT&T project coordinator, admitted to stealing computerized records from 4,000 customer accounts last April. Pacich's uncle, Richard Vignevic, then contacted AT&T and falsely warned the vendor that one of its employees was selling account information to AT&T competitors. Vignevic demanded $1 million from AT&T to plug the leak, prosecutors said.

Frame relay standard approved

The Frame Relay Forum agreed on a technology that should improve frame relay's performance as a wide-area transport mechanism in multiprotocol networks. The agreement standardizes the way frame relay transports or encapsulates the various protocols within a field, shielding the protocols from network interpretation until they arrive at the terminating router or bridge.

ThinkPad 500 back on shelves

IBM PC Co. says its ThinkPad 500 subnotebook is shipping again. The battery problem was fixed by replacing the unconventional lead-acid battery with a more conventional nickel-metal hydride battery. An IBM spokesman said current users will get two of the new batteries and a portfolio carrying case. IBM will pick up, update and return the system within three to five days. Customers should call IBM at (800) 426-7244.

Dell, Zeos release Pentium PCs

Two vendors released Pentium product lines last week. **Dell Computer Corp.**'s OmniPlex becomes the high-end Dell desktop, with 60- and 66-MHz processor models available. A model with 8M bytes of RAM, a 120M-byte hard drive and a super VGA monitor will cost $3,799. **Zeos International Ltd.**, meanwhile, will take the low-cost road with eight Pentium systems starting at $2,495. They use the Peripheral Component Interconnect bus.

Apple groupware to ship next month

Look for full availability of **Apple Computer, Inc.**'s PowerShare Collaboration Server software at next month's Macworld Exposition. PowerShare software provides System 7 users with a workgroup computing framework that includes server-based messaging, shared catalogs and network security services on AppleTalk networks. It will carry a price of $999.

SHORT TAKES **Reuters Holdings PLC** of London will purchase **Teknekron Software Systems** in Palo Alto, Calif., for $125 million. Teknekron provides software and systems integration for distributed systems used in digital trading. . . . **Novell, Inc.** has released an enhanced version of its NetWare HostPrint software, adding PostScript support, enhanced fault tolerance and support for its NetWare for SAA that makes any networked printer, including Unix printers, available for an IBM host job. . . . **Iowa Network Services, Inc.** will use routing equipment from **Wellfleet Communications, Inc.** over the next year to add services to its 1,300-mile fiber-optic network for delivering voice, data and Internet connectivity to subscribers. . . . **Cisco Systems, Inc.** and **Cascade Communications Corp.** said they will jointly develop a router/switch product for delivery in the second half of 1994. The product will handle wide-area networking technologies such as Asynchronous Transfer Mode and frame relay on the same platform as LAN routing Internet Protocol and Open Systems Interconnect routing.

Chicago

CONTINUED FROM PAGE 1

The developer said his company, which has 15,000 PCs, is not likely to upgrade from Windows 3.1 unless Chicago includes the so-called .INI files. Microsoft's decision to eliminate the .INI files was to simplify systems management, observers said.

What makes Microsoft's forecast of 50 million sales so bold is that it said it can achieve the figure with or without the availability of a rich selection of fully exploitive 32-bit applications. The company said it believes 35 million copies can be sold through bundling deals with hardware suppliers and another 15 million through retailers.

Microsoft is expected to benefit from continued PC sales growth next year — some 40 million units, according to International Data Corp. — and the expected user enthusiasm for Chicago's more advanced features, such as preemptive multitasking and an object-oriented interface.

Developing starts now

While Microsoft officials declined to comment on projections made at the conference, they said there is no reason why developers cannot do a lot of significant development work immediately. "I think it is a gross exaggeration to say you can't start writing applications; 32-bit applications were demoed at the conference," said Windows product manager Jeff Thiel.

Microsoft distributed more than 5,000 software development kits for Chicago at the conference, bringing the total number of kits shipped so far to well over 6,000, according to Microsoft officials. Microsoft demonstrated the latest pre-beta alpha version of Chicago — called Version 4.00.58s or Alpha II — running 32-bit Windows applications such as Micrografx, Inc.'s Picture Publisher and others.

Developers voice doubts

Developers at the conference said they were generally satisfied with the latest version's ability to run 32-bit Windows applications but wondered how efficiently it would ever run existing 16-bit Windows applications. Microsoft has readily admitted that much of the performance tuning for the product has yet to be done.

One beta user who was not at the conference but who received Alpha II early last week was disappointed with how slow it worked even on a 66-MHz 486 with 8M bytes of memory. "The file system appeared pretty slow. It takes a very long time to do things like open up folders," another user said. "And when you click on the [folder's] tabs, the screens are empty. They have some work ahead of them yet."

Some features that impressed beta users included a "network globe," which presents network administrators with a tree structure of all PCs on a LAN, and PC access to networked peripheral devices.

This alpha also adds smart menus invoked by the right mouse button; minimized applications now appear on a tool bar; and users now deal with files through a tree metaphor.

Exploring Cairo

Microsoft last week gave its most extensive demonstration of Cairo, the object-oriented follow-up to its Windows NT operating system, showing off the product's sophisticated search utility.

Called Explorer, the built-in utility can search for and locate specified data files and their attributes across multiple networks, depending on an individual user's designated access.

"It doesn't matter which application created the file or where it was created, [Explorer] can pull it in," said one developer at last week's conference.

The purpose of the demonstration was to flex the muscles of Cairo's 32-bit object-oriented file system. Microsoft officials advised developers to start developing an expertise in the technology now.

—Stuart J. Johnston and Ed Scannell

Symantec fires up C++

By Melinda-Carol Ballou

The game of one-upmanship in the C++ tools arena knows few boundaries.

As Microsoft Corp. unofficially previewed features for its upcoming release of Visual C++ last week, Symantec Corp. unveiled and began shipping Symantec C++ 6.1, which already supports a number of comparable features, Symantec officials said. The stage for all of this was Microsoft's home turf at its Professional Developers Conference.

Plans for new features

Microsoft began shipping Version 1.5 of its Visual C++ 16-bit tools as expected [CW, Oct. 28] and announced plans for the mid-1994 release of features in its 32-bit Version 2.0 such as hierarchical project management, a slicker user interface and drag and drop across multiple views for the development environment, according to developer sources briefed at the show.

However, Symantec said it will ship those capabilities this month, although they refused to comment directly on the Microsoft products.

Borland International, Inc. announced its latest round of tools last month [CW, Nov. 22]. Microsoft did not comment by press time.

In addition, the Symantec tools will offer template debugging support, 32-bit Microsoft Foundation Classes and a customizable color syntax editor.

Beta testers of Symantec 6.1 said the new project management support helps them to coordinate their work.

"We are making constant enhancements, and the only way that we are able to set up a standard is through project management," said Babu Sonti, senior systems analyst at Union Central Life Insurance Co. in Cincinnati. He added that version control is also important.

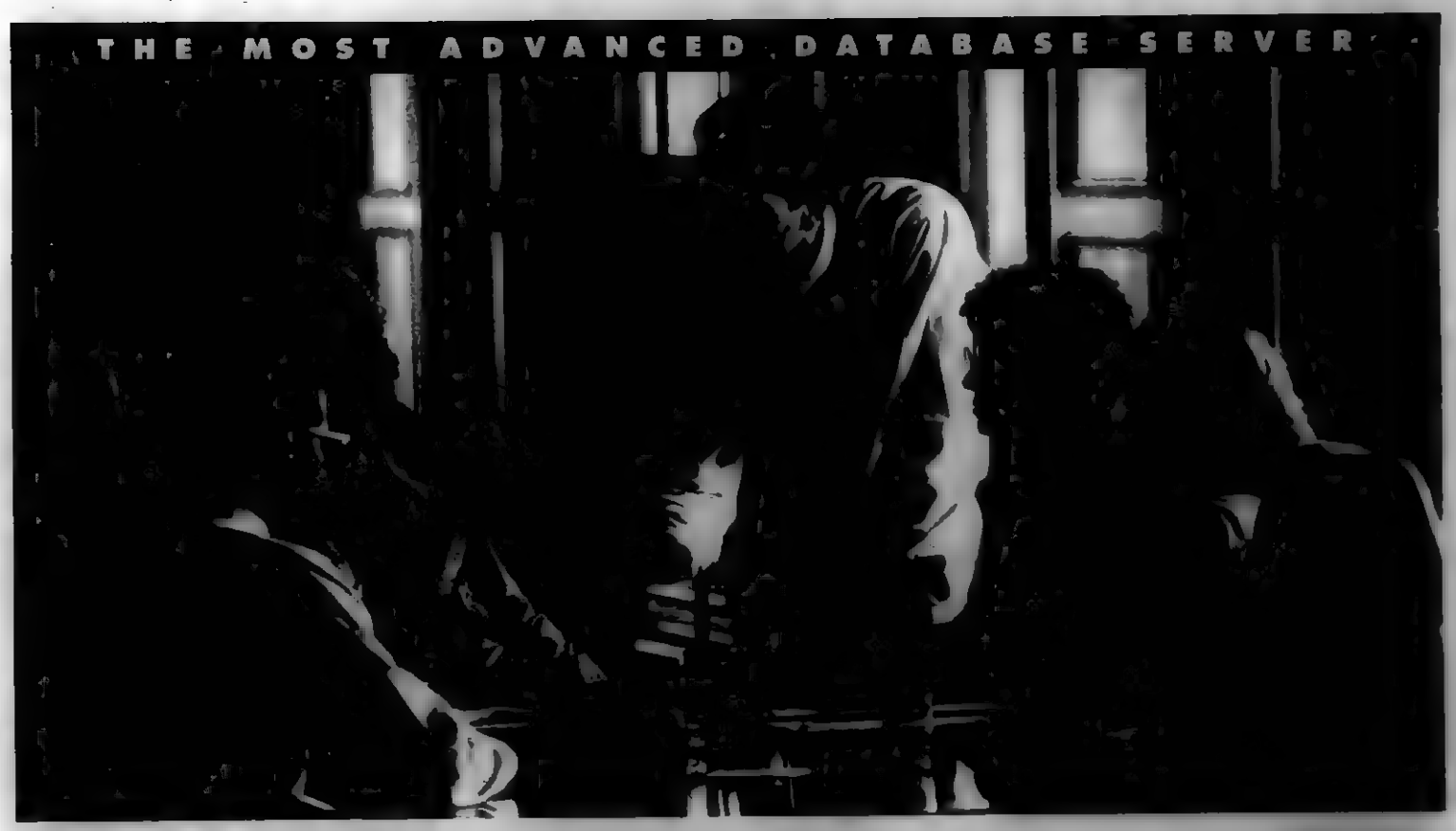
With Version 6.1, Symantec added integrated version control, incorporating Intersolv, Inc.'s PVCS and adding a graphical front end and allowing developers to do merges between different versions of software via dialog boxes.

Sonti expressed confusion about Symantec's foundation class strategy.

While Symantec is supporting Microsoft Foundation Classes in its C++ tools, it is developing another set of foundation classes for use in Bedrock, a cross-platform development technology that it is jointly creating with Apple Computer, Inc. (see story page 89).

Pushing OLE

Microsoft made a big push for Object Linking and Embedding (OLE) at last week's conference. Visual C++ 1.5, for instance, now offers Microsoft Foundation Classes 2.5 that support Open Database Connectivity, OLE 2.0 and OLE wizards that will allow developers to create OLE clients with the click of a button.



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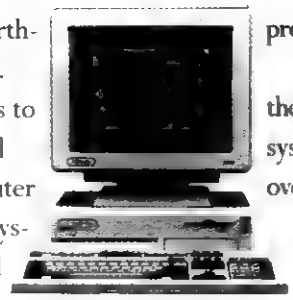

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Legent flexes client/server deals

Trade-in offer covers host software for five years

By Gary H. Anthes

Responding to pressure from budget-conscious users, Legent Corp. last week unveiled software licensing options intended to give users more flexibility and cost predictability when upgrading mainframes or moving from host to client/server systems.

By paying a onetime premium — 25% of the mainframe software's list price for a new purchase or 35% for an installed product — users earn the right to a trade-in credit if they buy that product's client/server equivalent from among the Cross-Platform Environment (Xpe) line within five years. The trade-in allowance shrinks from 75% to 10% of the mainframe product's list price at the end of the five-year period.

The program, called Flexplan, also does the following:

- Lets users upgrade through as many as three IBM mainframe tiers at no charge.
- Allows users to move a product from one mainframe to another any number of times at no charge.
- Guarantees no increase in maintenance costs during the five years.
- Removes authorization codes, which can be used to disable software in a dispute with a customer, from covered products.

Flexplan marks the second round of pricing option announcements this year. In February, Legent announced price-cap options and other licensing alternatives [CW, Feb. 15].

Attractive proposition

Dan Jones, information systems vice president at Meridian Bancorp in Reading, Pa., said his company had not yet decided to buy into Flexplan but that the concepts are attractive. "We have been working with a lot of our software vendors to come up with flat software charges," he said. "We want to be able to upgrade a processor and not get hit with a couple of hundred-thousand dollars in software upgrade fees."

"What's important about this is the concept of residual-value credit," noted Karen Cone, program director of the Software Asset Management Service at Gartner Group, Inc. in Stamford, Conn. "We think the concept should be applied throughout the software licensing world."

However, Cone cautioned that Flexplan carries a stiff price tag for some users. "It isn't cheap. So I think it's only interesting for those customers who are quite sure they'll make a change in the next five years," she said.

John Burton, Legent president and chief executive officer, acknowledged that Flexplan will be most advantageous to users who are planning to upgrade their mainframes or move to client/server. "But everyone is going to client/server," Burton said. "We happen to believe the mainframe will be one of the servers."

Burton also said Legent would offer users an option for "MIPS-based licensing," in which free upgrades could be made within a performance band measured in MIPS.

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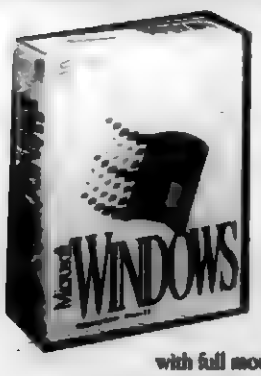

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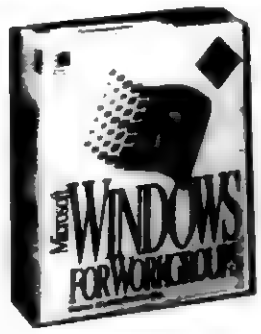

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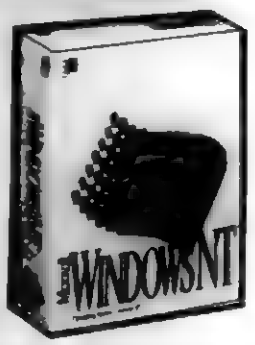

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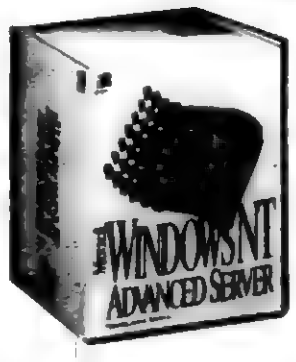

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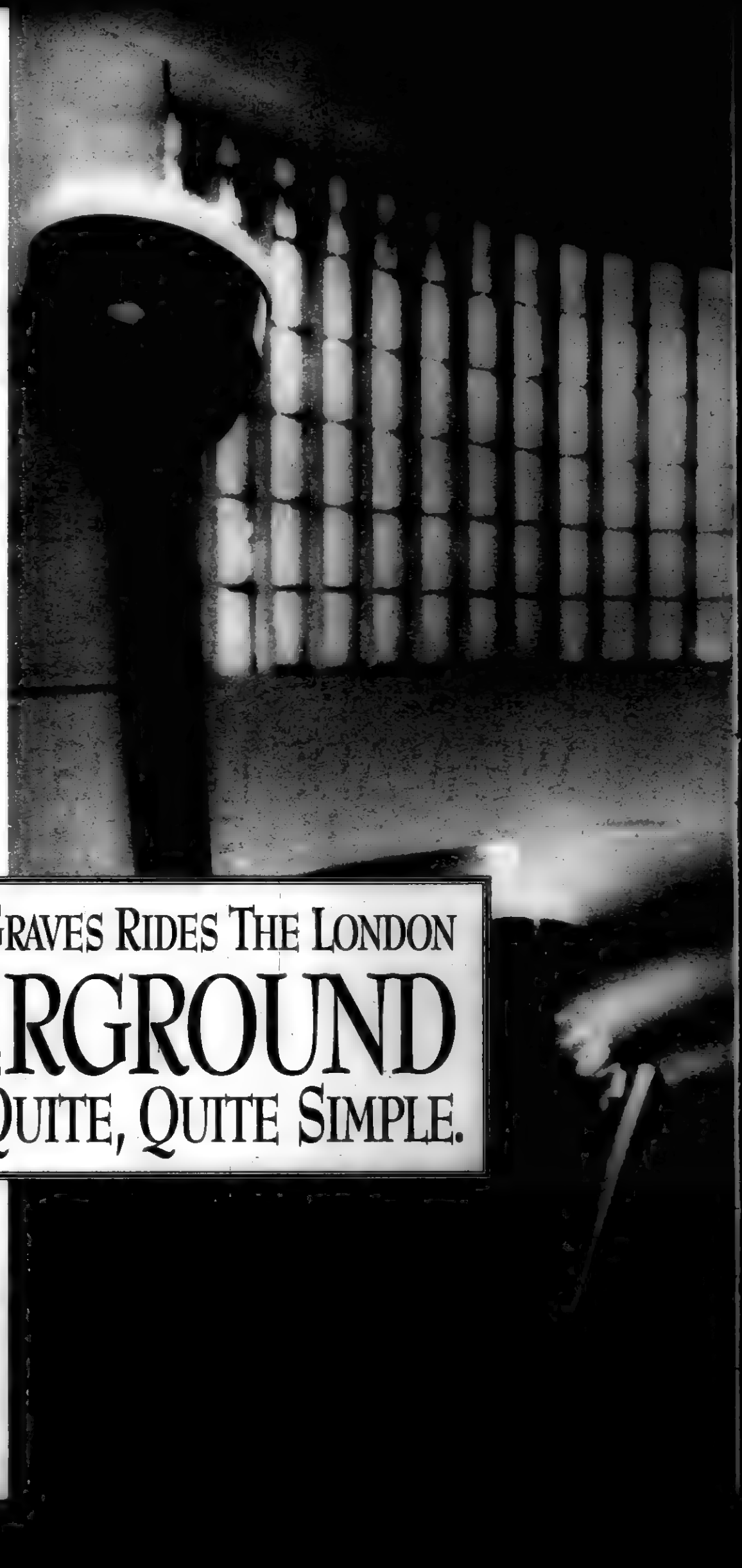

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Feds renovate by rebuilding E-mail

CONTINUED FROM PAGE 1

sential to government," said Thomas B. DeWitt, integrated telecommunications services manager at the GSA, which is behind a number of the E-mail initiatives. "The train is leaving the station. Be on it or be under it."

Slow to catch on

But while the president's National Performance Review calls for seamless communications across agencies and to the public through a "government information infrastructure," E-mail is still in relatively limited use, confined mostly to isolated pockets at individual agencies. Interagency E-mail is difficult to use, slow and unreliable (see chart at right).

Some observers worry that the government is building an electronic Tower of Babel that will not be able to deliver seamless service to millions of users.

"Individual agencies are building their own E-mail systems," said Dan Schneider, chairman of the interagency Working Group on Governmentwide Electronic Mail and a computer specialist at the Department of Justice. "The IRS is talking independently to the telecommunications carriers, the Social Security Administration is pursuing it independently, the National Institutes of Health is, too, and so forth."

Government officials readily acknowledged the shortcomings of the E-mail infrastructure but said they will address them as part of the National Performance Review-sponsored Governmentwide E-Mail Pilot Project.

Actually a collection of test projects, the interagency effort is intended to introduce electronic messaging to several agencies with widely divergent user needs and to use the lessons learned from those pilots to develop plans for long-term, governmentwide E-mail and commerce (see story page 25).

"I'm just delighted to see the administration pushing this," said Dan Lynch, chairman of Interopin in Mountain View, Calif. "Anything that encourages peer-to-peer communications in a service organization is a big benefit to everyone."

Building a bridge

The most feasible approach to interoperability, at least in the short term, is allowing users to keep their current E-mail systems while using technology to bridge them, according to Assistant Commissioner Michael Corrigan, director of the GSA's Office of Telecommunications Services.

The viability of that approach could be enhanced by giving agencies guidelines such as "Don't buy an E-mail system for which there is no X.400 or [Simple Mail Transport Protocol] gateway," he explained.

DeWitt said the question of whether some central party such as the GSA should dictate a "grand design" for E-mail, or whether it should simply be allowed to evolve from the bottom up, has not been answered. It is one of the issues on which the pilot projects are expected to shed light. "We are trying to see if the existing infrastructure meets our needs," he said.

> "As in the business world, electronic messaging is becoming essential to government."
>
> —*Thomas B. DeWitt, General Services Administration*

The interagency E-mail working group has recommended that the government build a unified federal government E-mail users' support environment (MUSE) consisting of comprehensive directory services, interfaces and standards by which disparate E-mail systems in and out of government could transparently interoperate.

Rather than having the government limit its E-mail use to nonfederal networks and commercial E-mail services and products, those services and products "should be required to accommodate to the published standard interface and discipline of the MUSE," the working group said in a recent report (see story page 25).

Post pattern

The E-mail working group, in a recently published report, said building a nationwide E-mail system modeled after the U.S. Postal Service (USPS) was superficially attractive but had no political support and was therefore unlikely. According to the report, "The national solution would contract for physical circuits all over the country and would install its own switches and routers, thereby blanketing the nation and providing the same ubiquity for E-mail as the USPS provides for postal mail."

Schneider estimated it would cost $30 million to $40 million to implement the MUSE if it were built on top of existing networks and information systems resources at an agency such as the Department of Health and Human Services.

The MUSE is the right approach, said Warren Suss, president of Warren Suss Associates, a consulting firm in Jenkintown, Pa., that specializes in high technology in the government. "Agencies need to be empowered to make their own decisions on [E-mail] for their own environments, but at the same time, the government wants to make sure it can talk across agencies to get business done," he said.

Corrigan called the MUSE "an interesting idea" and said it is the concept adopted this year by the German government, which ensured interoperability by putting common "message transfer agents" in front of each agency.

"But end-to-end capabilities can't be put on gateways," he said. "User-to-user confidentiality requires something on each PC. Security is not handled at all well with a gateway."

Kinder, gentler E-mail

Regardless of what shape the E-mail infrastructure ultimately takes, it is clear that the existing setup could be more efficient and user-friendly. Although the roundabout routing of interagency E-mail is generally transparent to users, as messages get larger and as volume increases "inefficiency may escalate," DeWitt said.

The GSA is considering establishing a high-speed metropolitan-area network to eliminate that circuitous routing.

There are now some 50 X.400 gateways between agency LANs and the Federal Telecommunications System-2000 (FTS-2000) packet networks, Corrigan said, which have been in place for less than 18 months. Interagency E-mail traffic through the gateways is still relatively small but is beginning to show "rapid exponential growth" as users become aware of the reach the gateways offer.

Another challenge users face is the lack of governmentwide directory services, a shortcoming that many commercial E-mail users also see. Not only is it often difficult to learn the E-mail addresses of people outside one's own agency, but even when addresses are known, the long and complex X.400 addresses are difficult to remember.

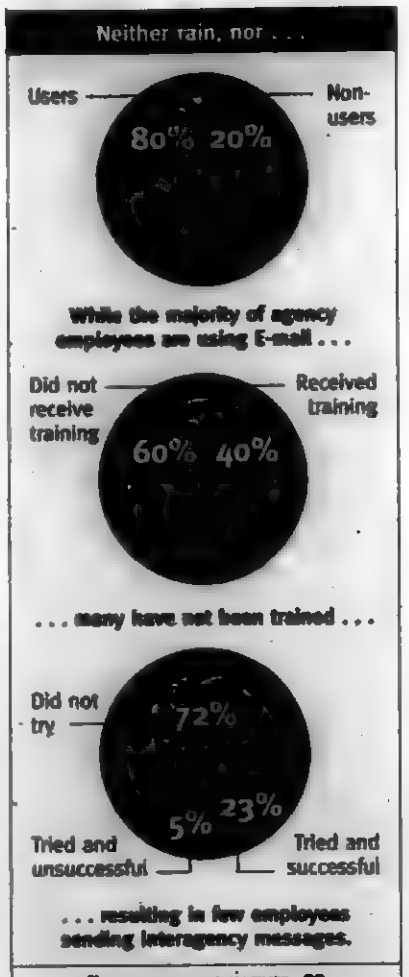
Information gap

Most people do not know their own X.400 addresses or, indeed, that they even have them, according to Corrigan. "Training is fast rising to the top of our list of issues," Corrigan said. "We're at ground zero on a lot of this stuff."

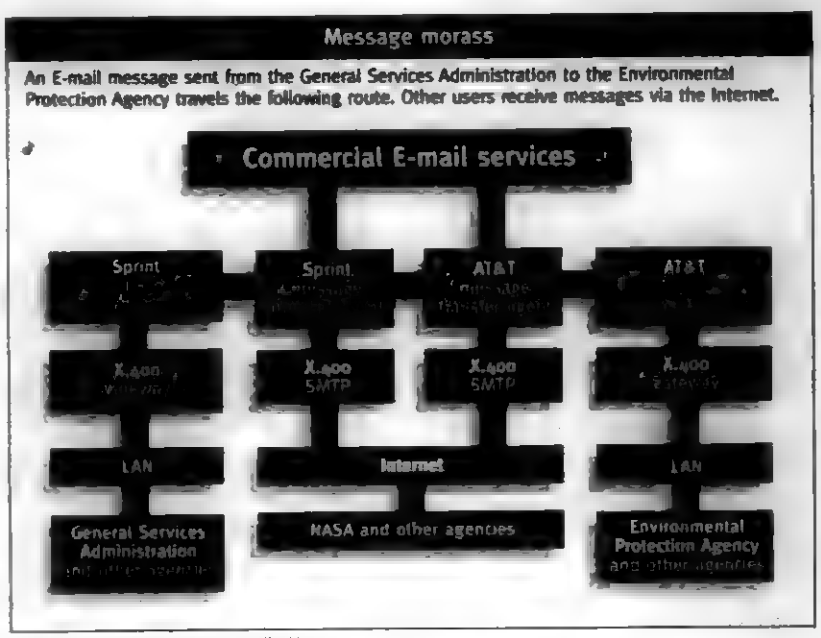
Corrigan said commercial products for distributed, X.500-based directory services that could solve these problems are not yet mature.

Currently, a half-dozen agencies are going through a labor-intensive synchronization effort in which they send in their E-mail lists to a single point where they are merged and sent back.

About 3,000 names are now on the consolidated list, but 100,000 more could be added immediately if the system had more capacity, said Martin Smith, chairman of an interagency directory services group.



Source: General Services Administration, Washington



Source: General Services Administration, Washington

Agencies push to upgrade E-mail use

By Gary H. Anthes

The White House Office of Science and Technology Policy wants to be a "model agency" for the Executive Office of the President in the use of E-mail.

In its pilot project, the science and technology office will get a direct 1.5M bit/sec. connection to the Internet for communicating with science and technology officials throughout the government.

Later, the systems will encompass all of the executive office and will provide packet video, digital signatures and other advanced services.

Eliminating the paper chase

The Office of Management and Budget's Legislative Reference Division serves as a clearinghouse for all executive branch agencies in their dealings with Congress. At present, it uses photocopiers, fax machines and couriers to move documents, such as draft legislation, around Washington for agency review. Sometimes these reviews must be completed in a matter of hours, a nearly impossible task. The office hopes that E-mail will eliminate the paper chase and greatly expedite reviews.

The National Security and Emergency Preparedness Office will use E-mail to boost the efficiency of its communications with 23 agencies that are part of the National Communications System, which was set up in the wake of the 1962 Cuban Missile Crisis to coordinate government response to emergencies.

Currently the office relies on telephone, fax, the Internet and whatever E-mail system each of the agencies has in place.

Interest in E-mail

The Administrative Conference of the United States, a government think tank that advises government agencies, does not use E-mail but wants to use it for its work in "alternate means of dispute resolution." It would use a network to make available training materials, models of dispute resolution and other materials to streamline the way disagreements are resolved.

"The E-mail labs are looking beyond transport and standards," said Warren Suss, president of Warren Suss Associates. "They are really trying to understand how to use the technology more effectively. It's a business process improvement issue."

Major Widget saves

No party will benefit more from the emergence of a unified E-mail users' support environment (MUSE) than large corporations, according to a federal interagency E-mail working group.

In a recent report, the group outlined the role of the MUSE for the hypothetical Major Widget Corp.:

- Widget's chemical subsidiary deals regularly with the Environmental Protection Agency (EPA). Using E-mail with encryption for authentication, Widget sends messages, maps, engineering drawings and scanned photographs to the EPA.
- The Occupational Safety and Health Administration (OSHA) sends bulletins and regulations to Widget by E-mail. OSHA has set up broadcast distribution lists by subject, geography and industry for this purpose.
- Widget found that using E-mail greatly reduced the time needed to get an export license from the Department of Commerce.
- The company used E-mail for dealing with the Securities and Exchange Commission on a new common stock issue and with the Department of Justice and the Federal Trade Commission when it acquired another company.

—Gary H. Anthes

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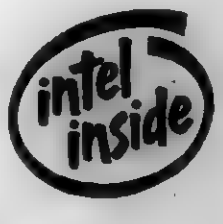

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PC vendors warm up to RISC technology

By Michael Fitzgerald and Ed Scannell

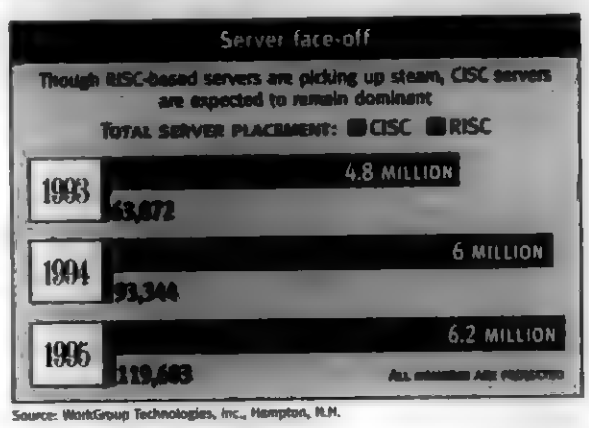
Industry hype aside, RISC-based PCs are not considered ready for prime time by users. And many PC makers are regarding them with caution as well.

PC vendors, however, are looking seriously at RISC processors for their next-generation servers. The evaluation is being driven by information systems managers such as Douglas Murphy, director of IS at Comcast Corp. "We're looking at [RISC vs. CISC] right now. We've made the decision to make the mainframe go away, and now the question is what do we replace it with," he said.

Some users have investigated multiprocessors based on Intel Corp.'s complex instruction set computing (CISC) chips to avoid Unix. But Intel's perceived lack of processing power and the complexity of building multiprocessing-capable software have slowed this market.

Symmetrical multiprocessing software is difficult to write, both on the operating system side and the application side. This means a RISC chip with good software support could outstrip Intel's performance and win business because of it.

"In the real world, it's always harder to get performance out of [symmetrical multiprocessing] than out of a uniprocessor box," said G. Glenn Henry, Dell Computer Corp.'s chief technology officer.



Source: WorkGroup Technologies, Inc., Hampton, N.H.

To fix this, Intel is beefing up its multiprocessor strategy behind symmetric multiprocessors, an approach that rings true with PC makers such as Compaq Computer Corp. and AST Research, Inc.

Users, however, said they are concerned that symmetrical multiprocessing support is still lacking. "I just had this conversation with Compaq, and the issue is, nobody's software exploits the capabilities" of symmetrical multiprocessing, said Allen Cournyer, senior vice president at Texas Commerce Bank in Houston. "I'd just as soon spend another $10,000 for a second server and have two boxes."

Analysts agreed that RISC vendors have a chance to establish a beachhead, though not a great one.

"Corporations don't look at RISC vs. CISC as an important differentiator," said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. Bluestein said the key for corporate users is to run software painlessly.

And because software, not hardware, is important to users, analysts said RISC vendors cannot get in the door until they have a level playing field in the application environment. This may hitch RISC hardware success to that of Microsoft Corp.'s multiplatform-capable Windows NT and IBM's WorkPlace OS, which allows multiple open systems to run on top of a microkernel, and the Taligent object-oriented environment.

Windows NT, built to run in single- or multiple-processor configurations, is the market's great digital hope. Meanwhile, OS/2 will soon be available in a symmetrical multiprocessing version. Vendors, however, said symmetrical multiprocessing software remains a challenge.

Assessing the RISC

While some very large vendors support RISC PCs and servers, most build RISC chips or are part of an alliance to build a RISC processor.

The mainstream of disinterested PC makers, including Compaq, Dell and AST, have refused to publicly commit to adding a RISC architecture to their product lines.

But Compaq President and Chief Executive Officer Eckhard Pfeiffer recently said, "We are looking very closely at [IBM's PowerPC]. It is the first product that has the potential to be the base for a RISC standard."

Pfeiffer could not resist taking a potshot at IBM, however. "Customers want a clearer message regarding [IBM's] plans for Intel and RISC," he said, suggesting that IBM should pick one business or the other.

James A. Cannavino, IBM's top technology executive, responded in a separate interview: "Eckhard asking us to choose between Intel and RISC is like asking GM to choose which cars it wants to stop selling. I intend to be in both markets and run them both at a profit."

IBM may be able to back up these ambitions given that it is the one company involved in the RISC market that can control its own destiny. IBM's chip manufacturing technology is arguably the best in the world and could fend off any aggressive price-cutting strategies by Intel.

Dell, which has a number of rumors swirling about its intentions, acknowledged that it has RISC prototypes up and running in its lab, but several officials have said these prototypes may never see the light of day.

"Look, monopoly is not good, and the profit distribution in the industry has to change, but we're not a market maker, we're a market taker," said Joel Kocher, Dell's president of marketing, in a recent interview. "We're a wait-and-see company, but right now we think Intel has a very strong argument going for it." — *Ed Scannell and Michael Fitzgerald*

Vendors align on info highway pieces

By Gary H. Anthes
WASHINGTON

A pair of corporate alliances announced last week signal that users and vendors alike are beginning to take seriously the much talked-about and emerging National Information Infrastructure (NII).

Twenty-eight companies — mostly computer and communications concerns — formed the Cross-Industry Working Team, a coalition intended to help define the architectural and technical requirements for the NII, as proposed by the Clinton administration.

Calling itself the XIWT, the group — including AT&T, Apple Computer, Inc., IBM, Intel Corp., Cable Television Laboratories, Inc., Nynex Corp. and others — will create a forum for technology discussions, develop architectural approaches that bridge industry gaps, plan pilot projects and advise the administration as needed, said Robert E. Kahn, president of Reston, Va.-based Corporation for National Research Initiatives, a nonprofit concern that organized the effort.

At a press conference here to announce the XIWT, members said they will focus on issues such as openness, interoperability, robustness, security, privacy, integrity and ubiquity of access.

Kahn said the group is not a standards-setting body, is not applications-oriented and will not attempt to dictate specific technologies to be used in the NII.

The NII has no precise definition, but is thought of as a high-capacity digital internetwork offering two-way communications in data, audio, video and images to businesses, schools and homes.

Citicorp, one of the few user organizations in XIWT, hopes to benefit by learning how it can use the NII to more effectively and efficiently serve its customers, said Dan Schutzer, vice president and director of advanced technology. "We believe in the virtual bank," Schutzer said. "More and more people will do their banking away from branches — at home, on the road, in the shopping mall. Wherever they are, they'll tap into us via public networks."

Schutzer said he also sees Citicorp's XIWT membership as a way to ensure that the NII does not evolve in ways that are not friendly to distributed financial applications such as funds transfer, billing and shopping. "We want to make sure it can get to the public in a usable, secure and affordable way and that we can build applications reasonably," he said.

While the XIWT focuses on technology, it is coordinating efforts with the 21st Century Infrastructure Project of the private-sector Council on Competitiveness, which focuses on matters of policy and applications (see story at right).

Setting policy

The Council on Competitiveness last week released a report on competition policy and the National Information Infrastructure. It found that technology and markets are fusing and regulations and policies are fragmented.

Therefore, it is impossible to predict the future of the markets or technology. Given those factors, "the key issue is not whether, but when and under what conditions, to permit full competition in all markets," the council concluded.

The council made these recommendations:

- Ensure interconnection and interoperability among networks. Telecommunications providers should unbundle their services and make them available in a building-block approach.
- Remove barriers to market entry. Allow telephone companies into the cable market, cable companies into the telephone business, local providers into long-distance and so forth. Put in regulatory safeguards to prevent unfair practices.
- Let prices reflect competitive market conditions.
- Protect universal service and share its costs among providers. Subsidize end users, not providers.

— *Gary H. Anthes*

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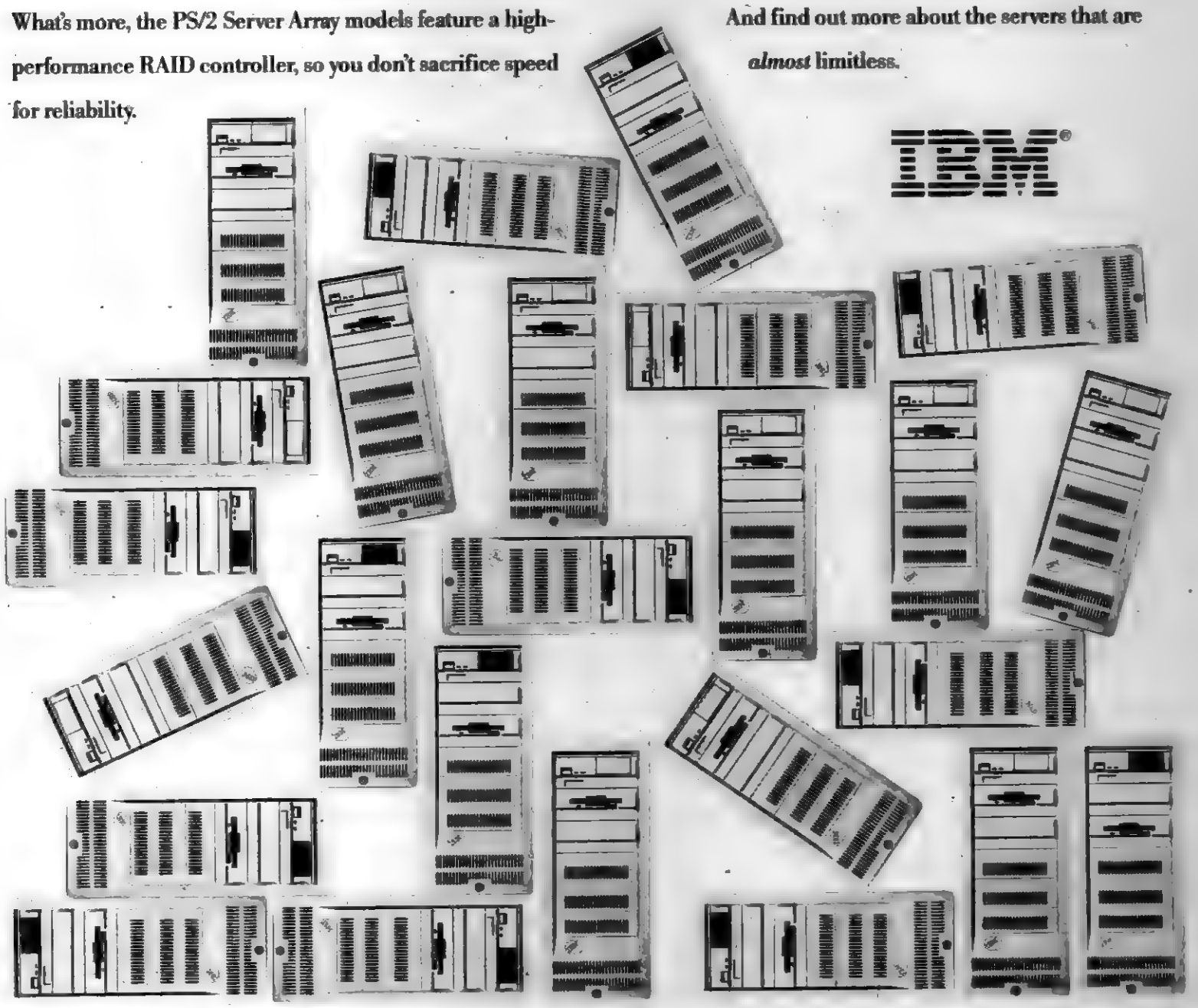

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Object-oriented Cobol to hit streets

By Melinda-Carol Ballou

Is object-oriented Cobol an oxymoron? Not exactly.

While committees are still hammering away to create a standard, Micro Focus, Inc. in Palo Alto, Calif., will make its object-oriented version of Cobol generally available in the first half of next year, industry sources said.

Already shipping in early-release form, the new Micro Focus tool is called Version 1.3. It is offered as an object-oriented option to the company's Cobol Workbench.

The ability to create applications that are accessed via graphical user interfaces (GUI) and to make use of reusable chunks of code — all within the familiar embrace of Cobol — is attractive to corporate developers who maintain billions of lines of Cobol that continue to run key corporate business processes.

"I still will have to teach people to think differently, but the Cobol syntax will be familiar and I can preserve some of my investment in the existing programming staff," said August Hill, a process specialist for information systems at Southwestern Bell Telephone Co. in St. Louis.

Hill said the big concern for his organization will be support across a range of platforms for object-oriented Cobol, which will initially ship on OS/2, DOS and Windows.

What's in a name?

Desktop vendors on the Object-Oriented Cobol Task Force for the ANSI Cobol Committee considered calling it COOL — Cobol Object-Oriented Language; however, larger, more staid systems vendors objected to that name. They thought that OOCT — Object-Oriented Cobol Transition — would be more appealing to their traditionally conservative user base. But current parlance puts the name at Object-Oriented Cobol.

"Cobol as it exists has a limited lifespan, and we like the concept of object-oriented because it lends itself better to GUI environments, better maintenance and reuse," said Nason Mills, a programmer at Policy Master PLC, a UK-based software developer for insurance companies that is beta testing the Micro Focus product. "We see it as a way to migrate some of our older programs. But without changing the way you design applications, it won't do anything for you" in terms of gaining object-oriented benefits.

The voice of caution

Some corporate IS developers, however, voiced caution. The full ANSI standard for object-oriented Cobol and IBM compilers that support it on the mainframe, for instance, are not expected until 1995. Although Micro Focus officials said they will offer compatibility with the standard when it emerges, they advised developers to wait to implement production applications.

Bruce Krapf, a senior technical consultant at Cigna Corp., said that while his organization is investigating the technology, it will not make the significant cultural changes involved to endorse it until the standard is set, commitments are clear from the major systems vendors and the language runs on a range of key platforms.

Micro Focus will offer two alternatives: Object-Oriented Cobol and Cobol/SmallTalk. While the former offers object-oriented extentions to Cobol, the latter enables Cobol programmers to make use of SmallTalk as their object-oriented programming language.

Object-Oriented Cobol features

Object-Oriented Cobol includes a programming language; runtime environment; foundation class library; GUI library; integrated development environment; and programmer-definable syntax and functions. This last feature allows programmers to create the syntax for their own programming functions, such as a function for debiting a bank account. These can be more user-friendly than syntaxes that are specified by the programming environment, according to Micro Focus officials and some beta users.

Object-Oriented Cobol will also support IBM's System Object Model and Distributed System Object Model.

Cobol/SmallTalk will include SmallTalk/V PM for OS/2 or SmallTalk/V Win for Windows. These products offer extensions to the SmallTalk/V class library for asynchronous communciations with Cobol. Cobol/SmallTalk also includes a Cobol Copybook for using Common Communication Interface to communicate between Cobol and SmallTalk/V. The company did not release pricing information.

Artificial intelligence

Expert system keeps UK TV ads in line

By Elizabeth Heichler
LONDON

■ The largest commercial broadcaster in the UK has found that artificial intelligence is solving a business problem that had grown too complex for humans.

With the help of a Windows-based software package developed using XpertRule from Attar Software Ltd. in Lancashire, England, and marketed in the U.S. by Cincom Systems, Inc. in Cincinnati, the Channel 4 television network is now able to schedule advertising spots more effectively, while redeploying four staff members who previously worked full-time to manually sequence the spots in commercial breaks.

"The software has affected our administration significantly. It's brilliant what it does," said Merlin Inkley, airtime manager at Channel 4's London headquarters. The job XpertRule is doing is "not impossible to do manually, but it's very difficult," he added.

Determining the ads

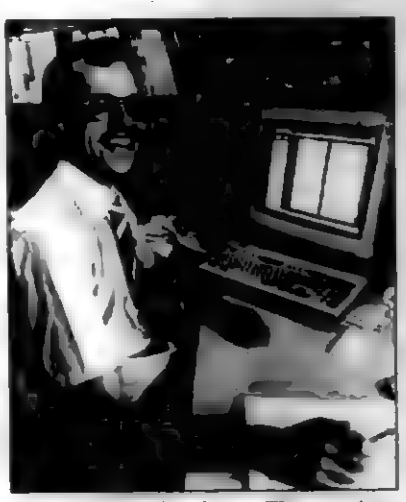
The problem with determining the best order in which to run ads during commercial breaks is complicated by the variety of options available to advertisers. In addition to demanding certain placement in the break, such as first or last in order, advertisers are also able to select among six "macro regions" of the UK into which they would like to transmit their ads.

While Channel 4's programming is broadcast nationwide, the ads shown during commercial breaks vary by region. Advertisers can also choose to have their ads transmitted to "supermacros," or specific combinations of the major regions. A further constraint on scheduling is that an advertisement sold to run in more than one region during a given break must be broadcast simultaneously in all those regions.

Thus, each four-minute commercial break can involve as many as 50 advertisements in various sequences.

"It's a very critical end of the business," said information systems manager Stephen Ottner. "On the sales side, they're trying to make it later and later before they close the books and put everything down to air, and on the transmission side, they're trying to get things earlier and earlier."

Prior to automating the process with the artificial intelligence software, the staff responsible for break sequencing would get a list of all the ads in each commercial break from the transaction processing system, an application written in the PacBase fourth-generation language environment on a Bull 9000 mainframe. Schedulers would then reorder the spots manually and feed the new list back to the mainframe.



Channel 4's Stephen Ottner: *The complex ad scheduling process is now automated enough for anyone to do*

The Channel 4 software for break sequencing, which has been running on a 486-based PC for about three months, uses genetic algorithm technology. Genetic algorithms literally take a "survival of the fittest" approach to problem-solving by trying different combinations of rules and discarding those that do not make progress against the problem. The application is typically able to sequence a commercial break in about 10 seconds.

Akeel Attar, managing director at Attar Software, said Channel 4's application did not lend itself to a conventional knowledge-based system. "The problem is that while the constraints are known, there are no known strategies," he said. "Decision-making is an area of expertise that can be captured, but with optimization of schedules, experts intuitively work by trial and error."

How XpertRule works

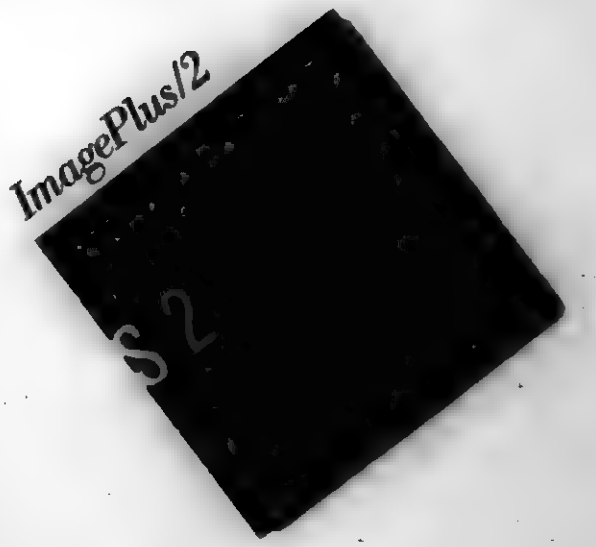
XpertRule's GenAsys genetic algorithm throws random solutions against the hard constraints (or must-haves) and soft constraints (desirables) of the problem and scores them. The software then "mates" those solutions that score well, or crosses them in the computer randomly to create a new solution that is likely to be better. The process goes on for a user-specified number of "generations" until the best acceptable solution has been reached.

Ottner had initially planned to make the automated break sequencing system a batch process once the users had gained confidence in it. However, what has happened in practice is that it is being used interactively, handling the bulk of the sequencing problem, while users in the traffic department then check to see if there is any fine-tuning to be done.

The system has had a big impact on staffing requirements. "Before, [scheduling] was a highly skilled craft; now, anyone with the business skills can do it. Any one of half-dozen people may now be sequencing breaks, but there aren't four people working on it full time," he said.

Ottner added that the system has also cut down on errors.

Heichler is an IDG News Service correspondent in London.



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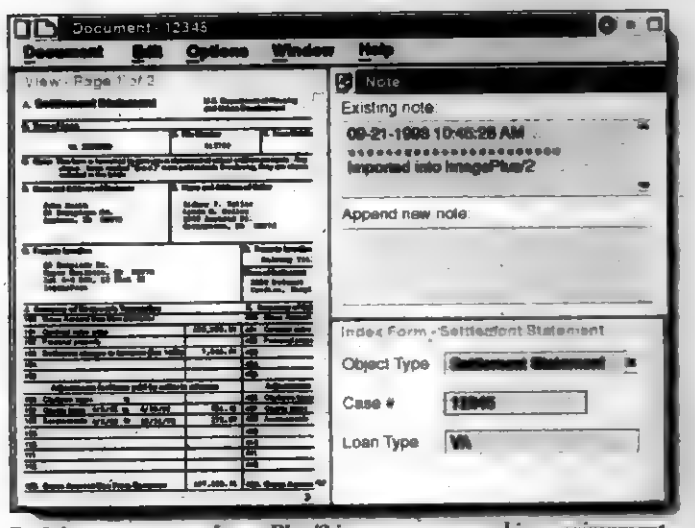

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IBM

Briefs

Cabletron profits rise

Internetworking vendor **Cabletron Systems, Inc.** posted third-quarter net profits of $31.1 million, a 43% increase from the comparable period last year. Revenue in the period jumped 42% to $156.5 million compared with last year's third quarter, according to the Rochester, N.H., firm.

Iomega expects loss

High-capacity floppy drive maker **Iomega Corp.** expects to post an operating loss for the fourth quarter ended Dec. 31, citing lower than expected revenue and profit margins, combined with higher than expected expenses. The Roy, Utah, company expects to take unspecified write-offs, which could widen the loss.

PC apps continue rise

Sales of PC applications reached $1.65 billion in the fourth quarter, a 16% increase from the comparable period last year, according to **The Software Publishers Association.** A total of $4.71 billion worth of PC applications were sold in the first nine months of this year, up 16.5% from the same period in 1992. Unit sales continued to grow at a 30% pace, but aggressive pricing has cut dollar growth considerably, the Washington organization said.

SHORT TAKES **Maplinfo Corp.** in Troy, N.Y., has filed an initial public offering of 1.4 million shares to be priced between $15 and $17 a share. . . . **Norand Corp.** in Cedar Rapids, Iowa, posted first-quarter net profits of $700,000 on revenue of $96.6 million. . . . **Texas Instruments, Inc.** is suing Cyrix Corp. for allegedly reneging on an agreement to turn over Intel Corp. x86-class technology. . . . **Reach Corp.** in Sunnyvale, Calif., promoted Chief Operating Officer Kim Peyner to president and COO. Peyner succeeds Anand Jagannathan, who remains chairman.

Loral to buy IBM federal unit

But profitable division carries FAA probe with it

By Mitch Betts
WASHINGTON

Defense contractor Loral Corp. bought its way into the federal systems integration market last week with a $1.6 billion bid for IBM Federal Systems Co. But it also bought itself a giant headache.

Analysts said New York-based Loral paid a premium price for a well-respected, profitable IBM division that has happy customers — with the glaring exception of the Federal Aviation Administration (FAA).

FAA Administrator David R. Hinson, citing cost overruns exceeding $1.2 billion, last week ordered a top-to-bottom independent review of IBM's project to modernize the U.S. air traffic control system. The Advanced Automation System, the cost of which now totals $5.9 billion, is over two years behind schedule (see story below).

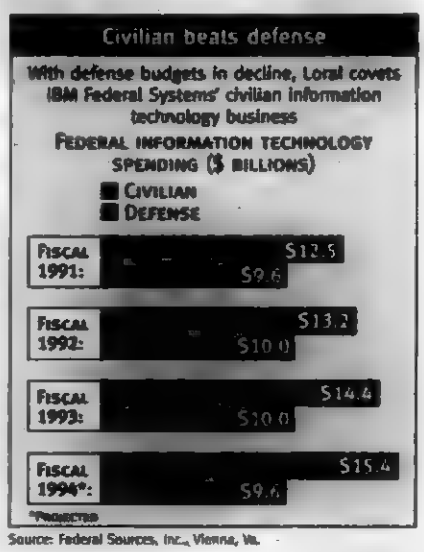
Several other customers of the IBM federal division said the Loral acquisition, effective Jan. 1, will have no impact on their operations, mostly because Loral will keep the 11,400-employee division intact and make no major personnel changes.

Robin Rushton, director of child support enforcement systems at the U.S. Department of Health and Human Services, said IBM assured her there would be no change in the people handling the agency's $16 million interstate network.

Likewise, IBM customer Herbert S. Becker, director of information technology services at the Library of Congress, said the acquisition will have no effect on his agency but added, "I think it's a mistake for IBM to sell a profitable part of the company."

Profit-maker

IBM Federal Systems earned a $71 million profit in 1992, or 3% of its $2.2 billion in revenue; 1993 results are expected to be about the same. Roughly 60% of the division's business comes from defense electronics; the rest comes from systems integration contracts with civilian agencies.



Source: Federal Sources, Inc., Vienna, Va.

Analysts said IBM sold Federal Systems to generate cash for investments in its core businesses [CW, Nov. 15]. At a time when it is fighting the likes of Microsoft Corp., IBM wants to eliminate distractions such as building electronic systems for antisubmarine warfare, said Steve LeCompte, an analyst at International Data Corp.'s IDC Government unit in Falls Church, Va.

Still a player

IBM will still have a presence in the federal government through its Federal Marketing Group, which sells conventional IBM systems and software to federal agencies.

For the acquisitive Loral, the deal provides an escape hatch from declining defense budgets. Although the purchase strengthens Loral's hand in certain defense niches, the real benefit is instant expansion into the civilian agency market for information systems, analysts said.

Robert Dornan, senior vice president of Federal Sources, Inc., a Vienna, Va., federal market consultancy, observed that the sale occurred just as the IBM federal division was piling up a string of contract wins with agencies ranging from the U.S. Army to the Internal Revenue Service.

Traffic jam

IBM's contract to modernize the FAA's air traffic control system has been a constant headache for the firm since the pact was awarded in 1988.

The FAA's decision to reexamine the project in light of $1.2 billion in cost overruns could lead the government to revoke portions of the contract or cancel $2 billion in future options. Cancellation of the main contract is unlikely because that would be costly and disruptive.

Moreover, there has been considerable debate about whether the blame lies with IBM, software subcontractor Computer Sciences Corp. or the FAA's mid-course changes in contract requirements, observers said.

The new air traffic control system, which involves more than 2.5 million lines of Ada code, includes the installation of networked RS/6000 workstations that must have no more than one minute of downtime over the next 20 years. Another complicating factor is a new requirement for "continuous operations," which means controllers must be able to use their workstations even when data is being updated.

In a letter to Congress, FAA Administrator David R. Hinson said the newfound cost overruns fall into three categories: costs associated with IBM's effort to "cure" the existing contract; additional software for the continuous operations requirement; and software upgrades that will be necessary after the initial implementation in 1996.

Hinson ordered a two-part review of the program. FAA officials will take 45 days to compile a concise report on the contract's schedule and financial status. In addition, an outside review team will investigate the program and "recommend realistic solutions."

— Mitch Betts

Start-up reveals document management plans

A group of former industry executives and engineers from a coterie of Silicon Valley firms last week formally disclosed what they have been working on for the past three years: a client/server document management system.

Documentum, Inc. was founded by former Xerox Corp. Executive Vice President Robert Adams and former chief engineers at Ingres Corp. Howard Shao and John Newton.

The company recently raised $7 million in venture capital — including $3.2 million from Xerox — to bring its total capitalization to $9 million, Documentum said.

Documentum plans to introduce in the first quarter its initial product: a document management server that will run on Unix-based Oracle and Sybase databases. It will support Windows, Motif and Macintosh clients, a spokesman said.

The start-up will compete with document management systems vendors including file management software developers such as Saros Corp. and publishing systems vendors such as Interleaf Corp., according to Mark Walter, a consultant at Seybold Consulting in Media, Pa. Documentum "fills the need for an information management system that is independent of editing applications users have on their desktops," Walter said.

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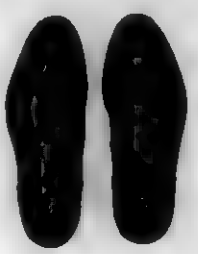
or are you managing them?



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The 1993 rhyme

'94's just 'round the bend
And as this year comes to an end
Let's review the pits and peaks
Of '93 with tongues in cheeks.

This year's No. 1 emergence:
Computer, cable, phone convergence;
Imagine TV futures yon:
500 channels, nothing on.

Wireless was all the rage,
Computers with a pocket page;
The only problem users see
Is total loss of privacy.

The year for Lotus' Notes was great,
Now it's hip to replicate;
While Borland launched its Obex caper
And Microsoft sold mostly vapor.

Though PC price cuts brought out buyers
PC makers froze new hires;
What explains this paradox?
Margins plummeting just like rocks.

Microsoft was most impressed,
Chicago entered Alpha test;
But users know that future days
Will most likely bring more delays.

Storage Tek's iceberg we hear
Failed again to ship this year;
Wait a minute, hold the phone
Sure this isn't last year's poem?

Initials everywhere you see: OSF and DCE,
ODBC, OS/2 and PCMCIA, whew!
NDM and NMS, SNMP, MIS,
ATM and EDI, SMDS, PCI.

And then there's acronyms you say:
COSE, WABI, DOS, OLE;
Does this madness have no end?
OOPS, I did it there again.

Borland's plan sure got some yucks,
Quattro Pro for 50 bucks;
Foes sneered "Borland's in a crisis"
Then rushed to slash their own list prices.

IBM's big mainframe sell
was iron built in parallel.
But users in a muted cheer
Said "Can we get to there from here?"

Got a bug you can't repair?
Hit it with some middleware;
This stuff can unlock data troves,
But how it does it, no one knows.

We hope next year's got more potential,
And good luck rains on you torrential
Just count this blessing if you can
At least you don't live in Japan.

Paul Gillin, *Editor*

Rates not an issue

Mr. Buonincontri's views about offshore programmers in the article "Remedy or ruin" [CW, Nov. 1] is built around some hollow points. Rates charged by foreign consultants should in no way compromise the quality of their work. This is evidenced by the success of companies such as TTA Consultancy Services (TCS) in India.

TCS has successfully provided software solutions for clients all over the world in the past decade. Another highly acclaimed Indian computer company, HCL, has even set up its own consulting firm in the U.S. This can't happen if there isn't quality in the services provided by these foreign firms.

In India we are forced to dig deeper into products such as CICS, DB2, Unix and find indigenous solutions to technical challenges. Many Indian programmers get their training while up against stiff deadlines. Rates charged by offshore consultants appear to be low because of the inflated cost of labor in the U.S., which is seen in many fields.

It is true that many foreign countries that provide software professionals also benefit from financial aid from the U.S. But it is also true that software or hardware sold to foreign countries by U.S. companies carry prices up to 300% higher than in the U.S.

At least part of the aid received by foreign countries flows back into the U.S. as profits to American computer companies.

Balaji Madhavan
Senior software engineer
Complete Business Solutions
Atlanta

Work-flow sights set too high

Regarding "Very little flow in work flow" [CW, Nov. 29], work-flow technology will never fulfill the desire for automation of ad hoc human processes.

This is no knock on work-flow technology, it's just that if you can really, completely, map out a process from start to finish, it isn't ad hoc. Work-flow technology can also give too much credibility to an ad hoc process that shouldn't exist.

Consider a company that invites focus groups to examine its products. It may be possible to speed up this effort using work-flow technology. Yet the whole concept of focus groups may be a bad one for that company. With work-flow technology, all this means is that one gets the wrong answers a lot faster.

Work-flow technology will perform great feats, but it's only a tool. Perhaps the expectations are too high. Without lowering them a bit, the nattering nabobs of negativity will denounce it all as just being a bunch of buzzwords — which we know isn't true at all.

Richard W. Jacobson
Ann Arbor, Mich.

Alive and well

Regarding "In a pickle" [CW, Dec. 6] and your opinion that it is only "... a slight exaggeration to say that open systems are dead." If this is indeed the mind-set of your publication, then *Computerworld* is "in a pickle" and is close to leaving the mainstream.

You think open systems is dead? It has just begun to take off. The largest mainframe company posts multibillion-dollar quarterly losses and you still think mainframes are the future.

Change in this industry is always complex, but the trend is clear to whomever turns to the Dec. 6 Friday Stock Ticker in your journal: Communications and Network Services, up 4.53%; PCs and Workstations, up 0.62%; Large Systems (that's mainframes), off 2.52%

The winner won't be Unix, PCs, Windows, NT or proprietary minicomputers.

The winners will be and are those companies and systems that are able to share, access and use the most of a variety of computer resources.

Dick Heyman
Fort Collins, Colo.

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Hard skills for hard times

Joseph Maglitta

In February 1979, our new systems manager, "Compu-Fred" tromped into our small newspaper office lugging a big carton and announced, "We're computerizing." A phone-chilling wind blew across the room.

"Fred," I pleaded," I have the technical acumen of a corn dog. Toasters baffle me. Just kill me now and save us both a horde of headaches."

"It's cool," Compu-Fred assured, knifing open the carton with a smile. "You'll learn to love computers."

I didn't believe him, especially the first time a flash of lightning zapped our terminal link with the main office 10 minutes before deadline. As alphanumeric chum marched mockingly across my stunned screen, I silently cursed the entire brotherhood of computer installers.

Call it irony or call it justice, but IS professionals today face what I so cruelly encountered nearly 15 years ago: The Killer Unknown (KU).

The KU, industrial historians would probably tell you, is the big new hoop that faces a profession every 10 or 20 years. Jump through and you get to continue you career. Balk and you walk.

For many, the KU was (and remains) computerdom. For IS today, it's the spectral, dangerous world of politics, leading, partnering and empowering — softball *and* hardball played simultaneously.

You've learned the soft skills. You ditched the acronyms and learned to listen. Now try hardball politics.

Sure, "soft" people prowess — listening, coaching, communicating — remains vital. But the rocky shoals of re-engineering and client/server projects mean that IS must also grow a spiny shell over its soft new interior.

Today's IS survivor/leader must be like a good Chinese dinner: sweet and sour in the same dish, spicy on occasion. Someone who's slick as Willie cutting deals with peers, who can sell and make hell, who can whisper and yell, and who always can answer "What's in it for me?"

I'm no Nostradamus, but I knew the future when I saw it nearly 15 years ago.

Do you see it today?

It's time to update the classic notion of the well-rounded person — the "universal man" of the Renaissance — and transplant it into the conference rooms and tape libraries of IS.

If you're game, hundreds of books and smart consultants are dying to help you cultivate the homey touch of Wendy's Dave Thomas combined with the blood lust of Frank Lorenzo.

My own small contribution is an item I found many years ago in a small-town newspaper. Loosely restated, it went something like this:

"One should be able to write a sonnet, build a house, cradle a child, dig a ditch, cook a dinner, ride a horse, read great literature, chart the stars and serve society with equal ease. Specialization is for insects."

You'll be able to spot folks who don't get the right balance between hardball and softball. They'll be the ones walking around with T-shirts that say: "Ask me about my latest fiasco" or "Fire me first!"

Today I have a PC in my home. I write about computers all day and like it. I read computer magazines, sometimes in bed. Why, my less intelligent friends even call to ask which systems to buy.

So maybe Michelangelo you'll never be. But at the very least, developing into a more rounded person could save you from becoming a square peg.

Thanks, Compu-Fred.

Maglitta is a *Computerworld* senior editor, corporate strategies.

A desktop monster awaits us

John Gantz

There is a line in a poem by William Blake that refers to a beast that "slouches toward Jerusalem." Or maybe it was Bethlehem. Anyway, as poetry, I always thought it was cool, but I never really knew what the line meant. What beast?

I still don't know exactly what Blake was talking about, but I've been thinking about that line recently because I've begun to discern a beast slouching its way toward the IS manager's office.

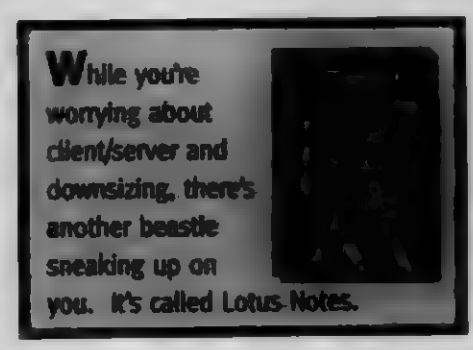
IS executives already have plenty of nightmare material — LANs running mission-critical applications, Cobol programmers who can't seem to learn C++, shrinking budgets, mergers and what not. So what's one more beast bumping around out there?

Plenty. While we're all trying to wrestle client/server architecture and downsizing strategies to the ground, I think we may be missing the threat of another distributed technology under our very noses.

The beast I'm worried about is Lotus Notes and all the follow-ons and knockoffs that will soon appear as so-called mail-enabled applications pass from novelty technology to mainstream technology.

At first glance, the rapid growth of such applications doesn't seem too scary. Mail-enabled applications are usually installed with IS support. IS professionals generally run the networks and have an opportunity to standardize on one or only a few E-mail packages.

But these are first-generation applications. The second generation springs up from the user base, and herein lies the trouble. Notes and other applications that promote information sharing — and intensive data replication — will create unpredictable and unremitting demand for resources.



While you're worrying about client/server and downsizing, there's another beastie sneaking up on you. It's called Lotus Notes.

Users won't put in a chit for a new application that can feed into general capacity planning exercises. They'll just create applications at their desktops. And if one of those applications turns out to be popular, it will blow out the LAN server, hog the router network and make everyone realize they could use a Pentium machine.

What's more, these applications, developing like mushrooms in the dark, will drastically increase the amount of mission-critical data running on remote LANs.

And you won't have any idea which data running on your LANs and enterprise networks is mission-critical and which is not.

Still not worried? OK, think about this. These applications are already starting to grow up department by department in different and incompatible flavors. A few years down the line, when support costs, LAN traffic, database upgrades and Notes programmer salaries are all spiraling out of control, the job mandate for managing and integrating all this stuff will be ceded back to IS, the same way it was with desktop PC applications.

And, trust me, we won't be ready. We won't know how those user applications were developed. We won't have useful documentation, and we won't have compatible systems. We'll only have a job description that says, "Integrate it all." We'll need our own Notes network just to keep track of help desk requirements. We'll be in the belly of that beast.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Reseller
99. Other_____
(Please Specify)

2. TITLE/FUNCTION (Circle one)
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10. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data/Tele. Comm, Network Sys. Mgt.; LAN Mgr., PC Mgr.
30. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
99. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Educator, Journalists, Librarians, Students
99. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Check all that apply)

Operating Systems
- ❑ Solaris (a)
- ❑ Netware (b)
- ❑ OS/2 (c)
- ❑ Unix (d)
- ❑ Mac OS (e)
- ❑ Windows NT (f)
- ❑ DOS/Windows (g)

App. Development Tools
- ❑ CASE (h)
- ❑ C++ (i)

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Multimedia portends notebooks with flair

closer look: Notebooks

By Michael Fitzgerald

Coming soon to an airplane seat near you: near-real episodes of combat, live data feeds and music videos. All in annoying sound and garish color.

These features, which may foster the desire to kill the person in the next seat, will be possible by mid-1994, as analysts and vendors point toward the following solid trends in the high end:

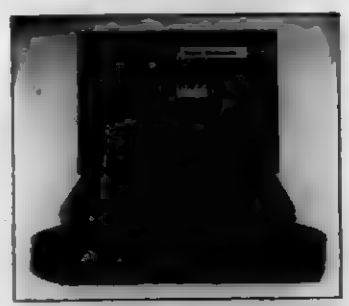
- Multimedia functions becoming widespread, as well as the use of subnotebooks.
- Color taking over as constraints ease, leading to a market that may represent more than half of all systems shipped by year's end.
- PCMCIA add-ons allowing vendors to strip floppies and functions out of notebooks, reducing product size and weight.
- Wireless communications becoming reality, possibly changing the way information flows throughout an organization.

All together now

Bruce Stephen, director of PC hardware pricing and research at International Data Corp. (IDC) in Framingham, Mass., agreed there is a high likelihood that all these factors will come together by mid-year. "The market is moving very quickly" technology-wise, he said.

Of all the forces, however, multimedia appears to be the hottest notebook-related technology, as vendors prepare to tout sound and video as useful business features and not just better ways to play games.

Overall, notebooks should continue to sell at a rapid pace. IDC projects worldwide unit sales of 6.5 million next year, compared with 5.1 million units in 1993, with new categories such as subnotebooks selling roughly 800,000 units. Information systems managers say that as workers do more work on the road and at home, they need to bring their information with them.



IBM's ThinkPad 750C *attaches to its docking station with built-in speakers*

The dizzying rate of technologic change in the notebook market during the past three years should continue. Vendors will play leapfrog in their efforts to lead the market in features and technology.

This means IBM PC Co., last year's unexpected top contender, could follow in the footsteps of Apple Computer, Inc. and AST Research, Inc., previous holders of the "out of nowhere" spot. And that Dell Computer Corp. really could succeed in its attempt to come back to the notebook market.

Picky market for vendors

"I think the market is very fickle," Stephen said. "This year's favored vendor can move out of favor in a short period of time."

Regardless of who achieves most favored vendor status, multimedia will be very important.

Andrew M. Seybold, editor in chief of the Brookdale, Calif., newsletter "Outlook on Professional Computing," said that while "a lot of first-generation multimedia functions are being built into the docking stations rather than the notebooks," sound and video capability and even CD-ROM drives will migrate into notebooks by mid-1994.

The push to add features may stop a price war from occurring in the notebook market. The price war potential inherent in notebooks — the most profitable and fastest growing segment of the PC hardware market — comes from heightened competition, improved availability of color screens that should end major vendors' product shortages and the rapid fall of 486 chip prices under the weight of Pentium. Some speculated that 486SX-based color notebooks could sell for under $2,000 next year.

PCMCIA conundrum

PCMCIA cards will be everywhere in 1994, as vendors stuff different add-in functions on them, including voice recognition. The main problem is managing certain cards, such as modems and hard drives, so they don't totally drain a battery. Some vendors have power management software to turn off the juice to the cards when they are not in use.

Users seem to like trend

Sheldon Laube, national director of information and technology at Price Waterhouse, said, "We're really excited about on-board audio because our training stuff is all going to go through on-board delivery, and if you can combine both text and audio you get a much better retention rate than text alone." He added

Notebooks, page 44

Borland makes importing, exporting a breeze with Obex

Exchanging files between Quattro Pro for Windows, DOS and Paradox easy

PRODUCT test DRIVE

- Paradox for Windows
- Quattro Pro for Windows
- Quattro Pro for DOS

By Elaine DeJoy

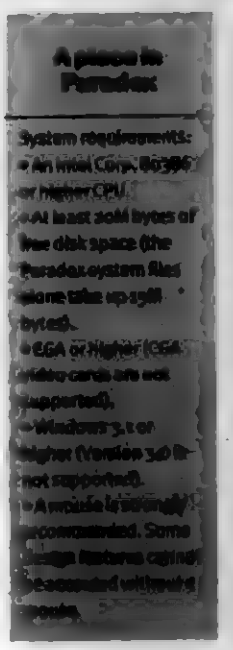
Have you ever contemplated taking a file from one program and exporting or importing it to another program? No? Here's a good reason to reconsider.

Borland International, Inc.'s products — Paradox for Windows, Quattro Pro for Windows and Quattro Pro for DOS — have made exporting and importing files a breeze using the Borland Object Exchange (Obex) facility.

Obex is essentially a set of Dynamic Data Exchange protocols wrapped in an object interface that allows a file to be directly inserted into another file format.

Easier for users and directors

For information systems directors, the promise of Obex is that it will allow users to query databases and import that data into their spreadsheets without assistance from the IS director.



For instance, you can take a database or table created in Paradox and make it into a spreadsheet file with just a few clicks on the mouse, without reentering any data.

To accomplish this, a user needs only to invoke the File/Retrieve command in Quattro Pro and enter the drive, directory, path, filename and extension at the File Name dialog box — for example, d:\pdoxwin.\working.\test.db.

Believe it or not, Quattro Pro grabs that Paradox file and converts it to a Quattro Pro file. Not only will the data be intact, but if the Paradox file contained any large field lengths — say, 15 or 25 characters — Quattro Pro will keep that field length the same.

Quattro Pro to Paradox

Conversely, you can import a file from Quattro Pro for Windows into Paradox. From Quattro Pro, use the File/Save As command and save the file with a ".db" extension (used for Paradox files). Answer a few more questions prompted by Quattro Pro, and then go out and use the file in Paradox: Use the File/Open/Table command and select the file you imported, and you will have that file in a Paradox table form. Again, the process is simple, and the same procedure can be performed using Quattro Pro for DOS and Paradox.

There are other ways to export and import the files by using Paradox's File/Utilities Export/Import commands, but they involve more clicks of the mouse.

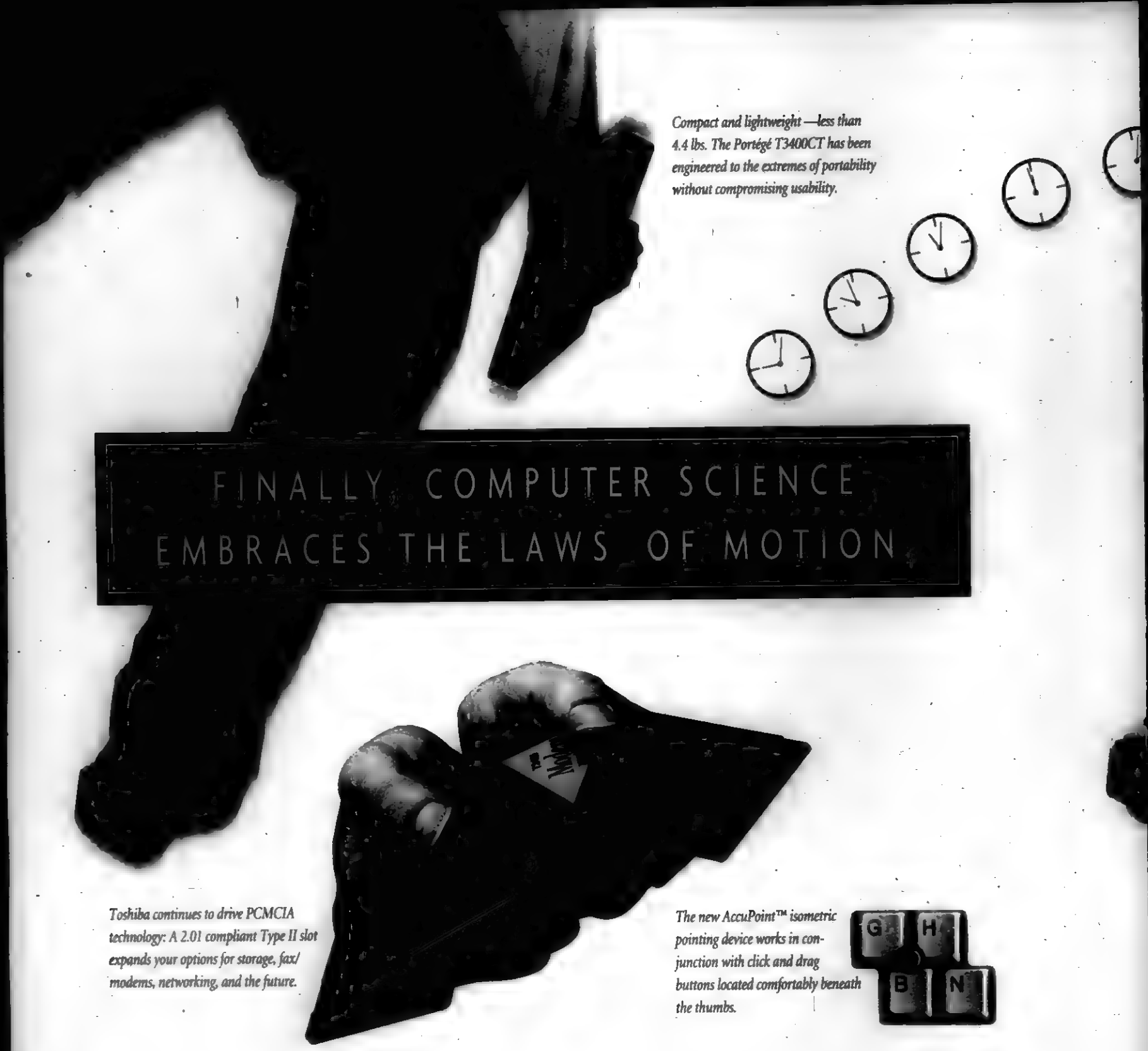
In summary, the tests conducted to export and import files from the above programs worked admirably. But if you run into a problem and try to contact Borland's Technical Support group, be prepared for a wait to speak with someone. In fact, you may be better off consulting the user guides provided with the software, since waiting for someone to answer your support call can easily require 30 minutes.

Tips

You might run into problems performing a Paradox import from Quattro Pro for DOS. Quattro Pro for DOS was released on Aug. 20 and Paradox was released on Sept. 28. The problem is that Quattro Pro for DOS stores a created notebook (or file) in a ".wq2" extension, which Paradox will not accept.

But there is a solution. When a notebook (or file) is created in Quattro Pro for DOS, use the File/Save As feature and then type the file name, but make sure you type a ".wq1" extension at the end.

DeJoy is a free-lance writer based in South Kingstown, R.I.



Compact and lightweight —less than 4.4 lbs. The Portégé T3400CT has been engineered to the extremes of portability without compromising usability.

Toshiba continues to drive PCMCIA technology: A 2.01 compliant Type II slot expands your options for storage, fax/modems, networking, and the future.

The new AccuPoint™ isometric pointing device works in conjunction with click and drag buttons located comfortably beneath the thumbs.

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intel inside

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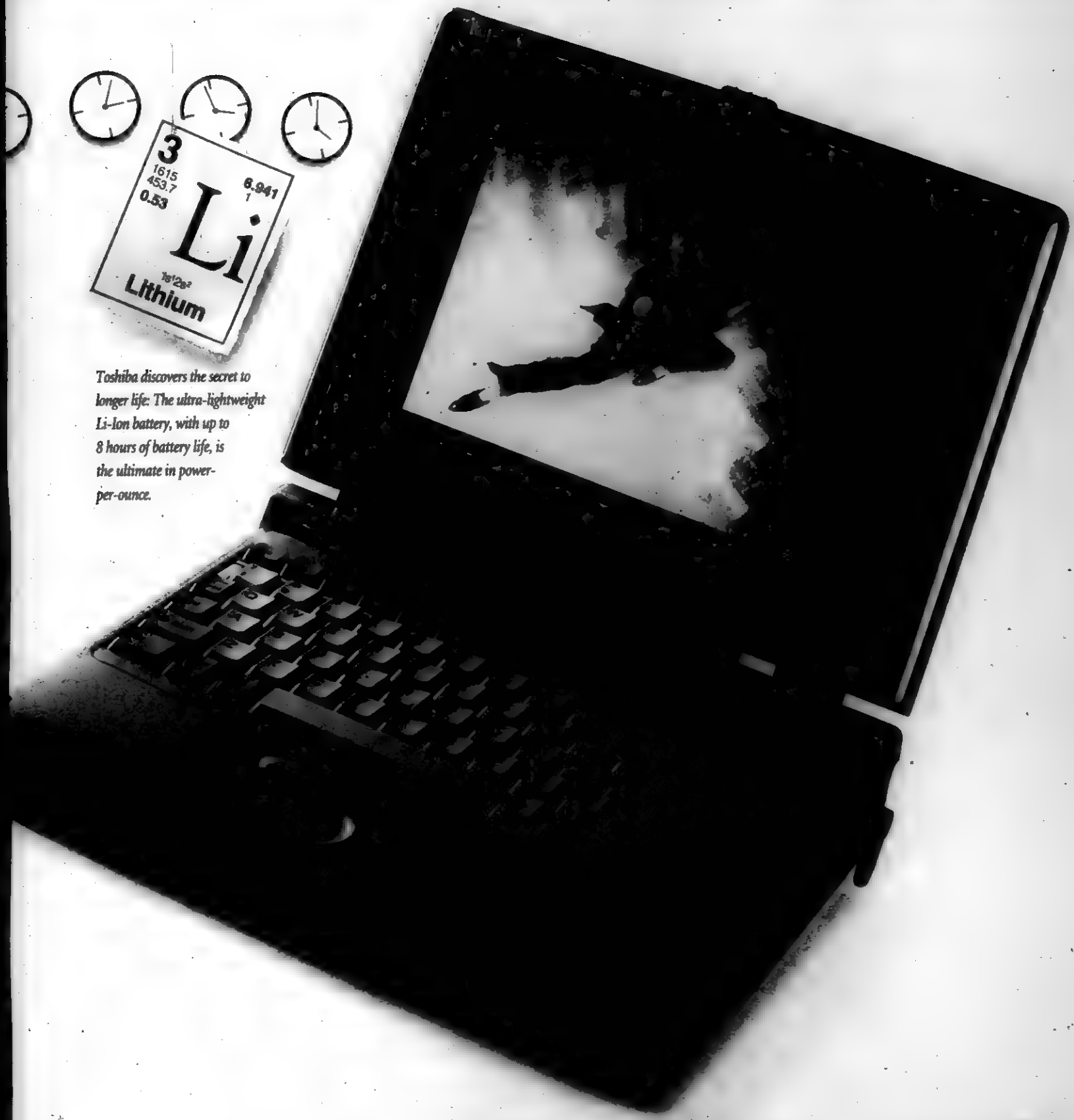

Toshiba discovers the secret to longer life: The ultra-lightweight Li-Ion battery, with up to 8 hours of battery life, is the ultimate in power-per-ounce.

T3400CT
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- 7.9" x 9.9" x 1.8"
- 4.4 lbs.

T3400
- 8.4" STN monochrome display
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Both Models
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- Integrated BitBLT graphics accelerator
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Project management

CA-SuperProject goes OS/2

By Thomas Hoffman

Computer Associates International, Inc.'s second major application for OS/2 has sparked a favorable stir among early users seeking multitasking capabilities in project management.

CA's recent delivery of CA-SuperProject for OS/2 comes on the heels of the company's November release of CA-Realizer for Windows and OS/2, a Basic graphical user interface development environment.

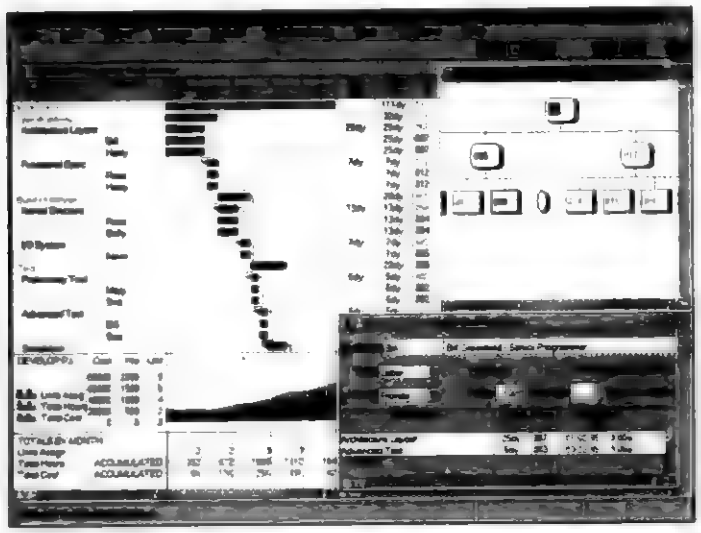
Early CA-SuperProject for OS/2 beta testers described the product as a functionally rich suite that delivers on project management requirements such as multitasking and file sharing. This is particularly important because the DOS and Windows-based versions of the product were not as functionally complete as the OS/2-based package is.

"I was happy to see that CA was coming out with an OS/2 version," said Greg Schmidt, project manager for wide-area network implementation at MCI Communications Corp. in Colorado Springs. While SuperProject is running under OS/2, "you can do other things," such as multitasking, Schmidt added. "With Windows, you're kind of limited."

Multitasking functionality

Schmidt said one MCI unit used CA-SuperProject for Windows for several months, but because Schmidt's group manages MCI's WAN projects across the U.S., it required the OS/2 package's multitasking functionality. Schmidt's group has been using the OS/2 package for several months.

CA-SuperProject for OS/2 is bundled with the Windows version for $649 — a 27% price reduction from the original $895 cost of the stand-alone Windows version. Users of other CA-SuperProject packages and competitive products can upgrade to the OS/2 version for $149. The package also includes the Timesheet Professional for Windows module, a time card and expense system.



CA-SuperProject for OS/2 *can handle up to 64,000 simultaneous tasks, or twice as many as the Windows version.*

In addition to its multitasking capabilities, the native 32-bit OS/2 product also exploits drag-and-drop features in the OS/2 WorkPlace Shell. Plus, CA-SuperProject files are now binary-compatible across four platforms — OS/2, Windows, DOS and Digital Equipment Corp.'s VAX/VMS — so a project file saved on one environment can be directly opened on another. All project team members can work on the same project, even when logged on to different hardware platforms.

Georgianna Hall, a business analyst at Washington Gas Light Co., a natural gas utility serving the greater Washington area, considered and tested Applied Business Technology Corp.'s (ABT) Project Workbench package running Windows before settling on CA's Windows-based SuperProject in the summer of 1992. Hall said the Windows-based ABT package offered a fairly narrow range of capabilities and did not perform well on OS/2.

The utility began testing CA-SuperProject for OS/2 in March. Hall said she and her associates, who are linked together over a Novell, Inc. NetWare LAN, have ordered 12 copies of the software.

Amy D. Wohl, president of Wohl Associates, a Bala Cynwyd, Pa. consultancy, said CA is positioning CA-SuperProject for OS/2 on the high end of the project management PC software market for enterprisewide use.

The package can handle more tasks simultaneously than Windows-based products such as ABT's Project Workbench or Microsoft Corp.'s Project, she said.

Beta in the works

CA is planning to deliver a beta version of CA-SuperProject for Sun Microsystems Computer Corp.'s Solaris Unix environment in mid-January, followed shortly thereafter by a Microsoft Corp. Windows NT beta version of the project management package, according to Marc Sokol, CA's vice president of product strategy.

Christopher Lindquist

Upgrades, patches and general buzz

Keep an eye on your hardware and software vendors. They all claim to be working for you, but they know where the real market opportunity is — your TV set.

Yep, they all want to be the brains in the controller box governing the one-eyed bandit in our living rooms. Microsoft, Silicon Graphics, Hewlett-Packard, AT&T, Lotus — all the big ones — have at least one hand occupied keeping track of the latest plans for household data delivery.

Of course, they're also thinking about some new offerings because the proposed data superhighway will have more to do with fun-on-order and selling cubic zirconia than with pumping your accounting files around. That means fewer research and development dollars for the products you care about. Just something to keep in mind for the year 2000.

Tracking MS-DOS

An even more immediate concern for some of you is the MS-DOS 6.2 upgrade, or "StepUp." While a few users are reporting problems with 6.2, it appears to be much more stable than its not-so-honorable ancestor, MS-DOS 6.0. The biggest issue for some potential customers has been an inability to find the upgrade at all. If you're in the same boat, you can find it available for download on CompuServe's MS-DOS forum or through anonymous File Transfer Protocol at ftp.microsoft.com, listed as stepup.exe in the \peropsys\msdos\msdos6.2 directory.

Oh, and if you're running Stacker 3.1 while trying to install 6.2, be sure to check the time stamps on the Stacker files. If you see 3:10a on files created June 6, 1993, you're OK. If they have later dates and times, you'll need a patch from Stac before beginning. The patch can be downloaded from the Stac forum on CompuServe. Microsoft says it tested 6.2 using the earlier version of Stacker 3.1, then Stac changed the files without notice, resulting in compatibility problems.

Intellectual property

Also on the Microsoft front, a couple of Usenet users were wondering whether Redmond got its money's worth from its rather robust legal staff. The general consensus was, yes, they probably earned their keep, and as one user put it, "The only real question is whether Apple's lawyers will sue 'Mickeysoft' lawyers for stealing the 'look and feel' of their suit to use against Sun."

Interbase resurfaces

Borland is attracting some attention (or trying to, at least). It's finally finished polishing Ashton-Tate's "family jewel," the Interbase engine, and is calling for volunteers to try out the latest version of the database server. Interbase, as you may recall, was the much-hyped product Ashton-Tate purchased shortly before going belly-up. At the time, users said Interbase had a technology lead on several major database vendors, but many moons have passed and competing technology has improved. We'll see if Borland has what it takes to wow the masses.

Oh, and if you're interested in testing Interbase, call (408) 431-1000 to order an on-disk InterBase Tester Application.

Borland's also getting some attention for recently slipped Borland C++ 4.0 ship dates. If the Scotts Valley crew is lucky, the much-awaited compiler will be on store shelves by the time you read this. If not, expect to hear the groans of some mighty cranky coders. One CompuServe user even noted that he saw a December demo of Borland C++ that was done with Version 3.1. That sure didn't raise his confidence about seeing 4.0 anytime soon.

Wishful thinking?

The PowerPC forum on the Internet is sure taking some hot traffic these days. Everyone has an opinion on whether the PowerPC is really the Intel/Sun/Alpha/Mips-killer it's supposed to be. Unfortunately, almost all the opinions are based on other opinions, and until someone comes up with some facts (and some hardware), the PowerPC is just more pie in the sky. I don't care how many PowerPC machines IBM had in its booth at Comdex.

Sources of infection

This report just in from the virus front: A Usenet poll of virus-afflicted readers turned up Michelangelo, Stoned and 512 as the three most prevalent viruses.

Lindquist is technical editor at *Electronic Entertainment* magazine. He can be reached electronically over MCI Mail at clindquist, CompuServe at 73361,263 or the Internet at chrisl@netcom.com.

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The new ProLinea Net1 features a sleek design

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IPLIES.

And it comes with a 486SX/25 processor and includes an extra-sharp 14" SVGA display.

The new ProLinea MT, on the other hand, features a mini-tower design with five slots and five bays. It includes Local Bus Graphics and is available in three processors, from 486SX/33 to 486DX2/66, and all are upgradeable to Pentium technology.

While each ProLinea is unique, they all share features in common. Every ProLinea is already loaded with MS-DOS 6 and MS Windows. And each also includes TabWorks, a new software interface available only from Compaq that makes using Windows even easier. (And you more productive.)

Of course, no matter how many different models we make, each one has to be aggressively priced to continue the ProLinea tradition. That's why the ProLinea Net1 starts at just $1,099, the mini-tower at $1,449, and multimedia models at just $1,549.* All of which is good math no matter how you calculate it. For complete details, just call 1-800-345-1518. COMPAQ

intel inside

with an integrated monitor. But despite the extremely small footprint, it's anything but meek.

For starters, there's an integrated network interface for either Ethernet or Token Ring environments.

Notebooks

CONTINUED FROM PAGE 37

that "dual-scan [passive-matrix color] has gotten good enough, so we buy mostly color."

Laube said while dual-scan color screens are slower than thin film transistor (TFT) active-matrix color, they are significantly less pricey.

Price Waterhouse consultants sidestep the performance issue by connecting their notebooks to display devices when making presentations.

Presentations are a key use for notebooks, and other users said TFT color was the only acceptable way to make on-screen graphics presentable. "Most [of our] agents will use the notebook sometime during the sale, and with passive matrix you can't really see" the presentation, said Victor Mutnick, corporate vice president at New York Life Insurance Co.

The market's other major focus next year will be communications, particularly wireless communications. Wireless has become something of a grail, given its potential to allow users access to information despite uncooperative hotel phone systems, digital office telephone networks or no phone at all.

Still, some IS managers are simply looking to upgrade from 2.4K bit/sec. modems to something faster. "We feel cellular is too expensive. Our folks still don't do that much communicating from the client's office," Mutnick said.

New York Life will probably move to 9.6K bit/sec. modems next year, he said.

Color screen shortage here to stay

Technology has its drawbacks, as users slavering at the thought of notebooks with active-matrix color screens discovered this year. The screens were simply too hard to make in the volumes the market desired, resulting in shortages that even vendors acknowledged were unacceptable.

Major vendors such as Compaq Computer Corp., IBM PC Co. and Toshiba America Information Systems, Inc. stopped predicting when they might be able to deliver products this year, though users with pull were often able to get their orders well before expected.

While smaller vendors, particularly NEC Technologies, Inc. — which makes its own displays — were able to meet their demand, users interested in thin film transistor (TFT) active-matrix screens have been sadly disappointed by virtually every large vendor.

However, some relief is in sight, analysts and vendors said. Constraints are expected to last through the first half of next year, but Sharp Corp. and NEC are ramping up production. Display Technologies, Inc., the IBM/Toshiba joint venture, expects to nearly double production next year, and manufacturers such as Seiko-Epson Corp. have hit the market with new flat panels. But shortages will last until 1995, as demand for color skyrockets.

An intriguing alternative to TFT is active addressing, which purports to combine the low costs of passive-matrix screens with the performance of active-matrix ones. Active addressing is pushed by a Motif, Inc., a Motorola, Inc. and InFocus Systems, Inc. joint venture. Motif has told analysts it will have 9.6-in. and 10.4-in. versions of its displays available next year, which could take some market share away from TFT displays.

—Michael Fitzgerald

COLOR NOTEBOOKS

PROJECTED 1994 U.S. NOTEBOOK SHIPMENTS

BREAKDOWN BY SCREEN TYPE

ACTIVE-MATRIX COLOR SCREEN: **671,000**

PASSIVE-MATRIX COLOR SCREEN: **716,000**

MONOCHROME SCREEN: **1.6 million**

TOTAL NOTEBOOK MARKET: **2.99 million**

Source: International Data Corp., Framingham, Mass.

Pentiums: Eating up power

Hot-running Pentium provides a variety of challenges that could leave notebook makers eating desktop dust for all of 1994.

Although some vendors plan Pentium-based notebooks, the lack of 32-bit software, certain architectural components and the like will make it difficult for vendors to put a full-fledged Pentium system on the market next year.

Manufacturers say they can build Pentium notebooks despite the chip's thermal issues and tendency to drain power like some sort of superscalar vampire. But some say the notebooks will take little advantage of Pentium, so many manufacturers say they will wait.

Others will forge ahead. Taiwanese manufacturers such as Twinhead International, Inc. and Clevo Corp. plan to introduce notebooks based on Pentium in the first half of next year, though these will lack features such as a Peripheral Component Interconnect bus, an integral part of most optimized Pentium systems.

Heat wave

Pentium's thermal issues are not insignificant, either, and Intel has promised a 3.3V version of Pentium for the second half of the year. But conventional wisdom says Pentium notebooks will not appear in any volume until the first quarter of 1995.

Pentium heat issues may even lead notebook makers to implement the PowerPC 603, a low-volt chip out of the IBM/Apple Computer, Inc./Motorola, Inc. venture that runs much cooler than Pentium does.

Battery life will be improved by 3.3V technology, but there may still be thermal issues even then. Accordingly, companies such as Aavid Engineering, Inc., a Laconia, N.H., maker of heat sinks, are applying technologies tested out in mainframes to cool off Pentium.

Aavid is essentially bringing the idea of liquid cooling to the notebook realm with Oasis, a fluid-cooling technology that puts a packet filled with 3M Corp.'s Fluorinert cooling liquid on top of the chip and dissipates heat by piping it out to the display.

—Michael Fitzgerald

[redacted]

Direct Technology Ltd. has announced a Windows Edition of Automater QA, its automated software testing tool.

According to the New York company, Automater QA Windows Edition features extensive reporting and analysis of test results, intelligent screen recognition, bit-map checking, an intelligent identity facility and automatic checking of Windows objects such as dialogs or menus.

Development packs cost $7,495 and runtime versions are priced at $1,250. Volume discounts are available.

▶ *Direct Technology*
(212) 475-2747

Caere Corp. has introduced OmniPage Professional 5.0 and OmniPage 5.0, optical character recognition (OCR) software.

According to the Los Gatos, Calif., company, OmniPage Professional 5.0 uses its three-dimensional OCR for accuracy over a broad range of business documents. It offers true WYSIWYG formatting for complex documents with True Page processing.

Full 24-bit color image-editing capabilities are integrated with True Page for capturing and editing graphics and text.

OmniPage Professional 5.0 is a full-featured OCR package. OmniPage 5.0 is a full-featured text product for mainstream office documents.

OmniPage Professional 5.0 costs $695; OmniPage 5.0 is priced at $495.

▶ *Caere*
(408) 395-7000

Global Training Technologies, Inc. and **Lotus Development Corp.** have announced the availability of Global Training's End User Basics Computer Based Training Module for Lotus Notes Release 3, computer-based training lessons that teach the fundamentals of Notes.

According to Global Training Technologies in Santa Monica, Calif., each lesson comprises instructional text, color graphics, interactive exercises and review questions. End User Basics consists of seven chapters and includes a Navigational Course Map and a Notes Skills Assessment Test.

End User Basics costs $295 per single-user license.

▶ *Global Training Technologies*
(310) 587-3300

Binar Graphics, Inc. has introduced SkyScraper, a desktop manager designed for OS/2.

According to the San Rafael, Calif., company, SkyScraper offers a visual representation of the multitasking capabilities of OS/2.

Users can run numerous applications simultaneously, with each one maximized, and switch from one application to another with a single click.

SkyScraper's tool bar is configurable and the product provides an "Arrange Applications" feature.

SkyScraper system requirements include OS/2 2.0 or higher, 386SX or above, 200K bytes of hard disk space and 4M bytes of RAM or more.

SkyScraper costs $99.

▶ *Binar Graphics*
(415) 491-1566

Product shorts

Kalock Corp. has introduced a 540M-byte removable disk drive. It features an access time of 11 msec and offers transfer rates of up to 8.3M byte/sec., error-correction code on-the-fly and 4,200 rpm. Cost: $950 for a package that includes the K-STOR II dual docking module, software, controller, carrying case and installation guide. Kalock, Sunnyvale, Calif. (408) 747-1315. . . . **American Business Software, Inc.** has introduced No-Problem, a data/data file retrieval program that protects the user against data loss on the hard disk or in RAM. In the event of a software crash or power failure, the product reconstructs and replays on-screen the input up to the point of failure, except for the last keystroke. Cost: $99. American Business Software, Orange City, Fla. (904) 775-7692.

Why is this traveling troubleshooter so tranquil?

He just took off with a 4-pound color notebook from

Lotus Organizer - [Untitled]
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Training
Meeting
Project 1
Project 2
Project 3

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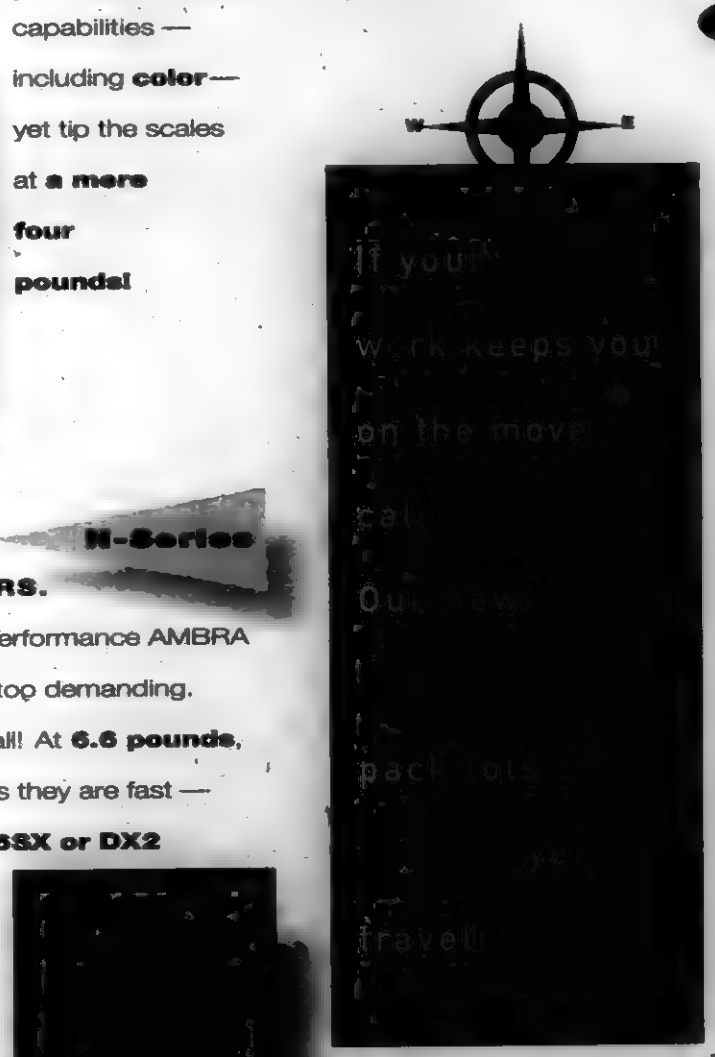

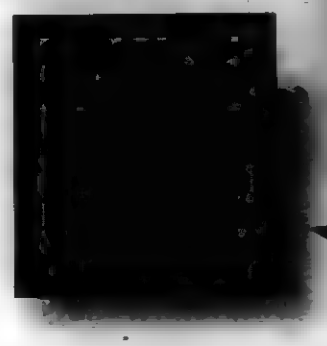

Cool mono
Hot color

From **clean-edged** **STN** **images** to easy cursor tracking, AMBRA lightweight notebooks' STN color and mono screens are the picture of **price/performance.** Our larger notebooks' STN color screens offer the added benefits of extra-generous viewing area and **dual-scan technology.**

PC Computing calls **active matrix color** "beautiful to behold."[1] One glance at the uniformly brilliant, fast-refresh, glare-free **TFT** screen of our premium notebook, and you're sure to agree!

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Work steadily through "stop and start" day! AMBRA SN-Series notebooks let you easily halt mid-application, and later pick up in the same place.

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Tie into an onsite network!

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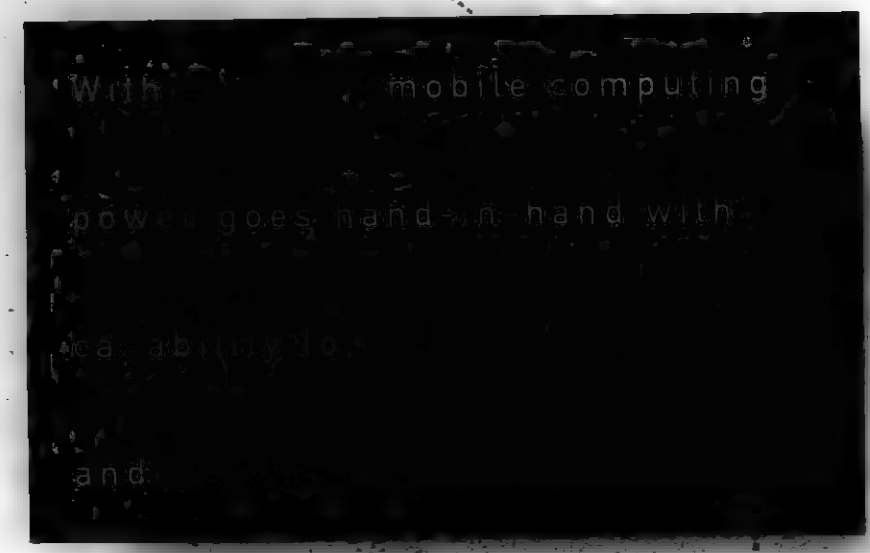

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"TRAVELER" OPTION BUNDLE: $286

For N-Series: Includes PCMCIA 2.4/9.6 kbps fax/modem and extra battery

"INSTANT OFFICE" OPTION BUNDLE: $327

For N-Series: Includes docking station, 15" FST color monitor, full-size keyboard

"QUICK DOCK" OPTION BUNDLE: $417

For SN-Series: Includes port replicator, 14" UVGA color monitor, full-size keyboard

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1 parallel port
1 video port
1 keyboard port
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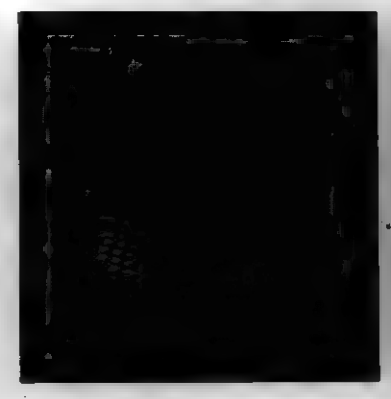
■SN-Series Docking Station
2 ISA slots
2 serial ports
1 parallel port
1 video port
1 keyboard port
$249

■SN-Series Port Replicator
2 serial ports
1 parallel port
1 video port
1 keyboard port
$89

NOTEBOOKS



LIGHTWEIGHT NOTEBOOKS

N-Series

N450T

- 486DX2, 50 MHz
- 8MB RAM, max: 12MB
- 3.5" 1.44MB diskette drive
- 200MB hard disk
- 9.5" TFT active matrix color screen
- 1 PCMCIA slot, Type III
- Integrated 16mm trackball
- MS-DOS,® Windows™ 3.1
- Carrying case
- 6.6 lbs, including battery

$3,999

N450C

- 486DX2, 50 MHz
- 4MB RAM, max: 12MB
- 3.5" 1.44MB diskette drive
- 200MB hard disk
- 9.5" STN dual-scan color screen
- 1 PCMCIA slot, Type III
- Integrated 16mm trackball
- MS-DOS, Windows 3.1
- Carrying case
- 6.6 lbs, including battery

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N433C

- 486SX, 33 MHz
- 4MB RAM, max: 12MB
- 3.5" 1.44MB diskette drive
- 120MB hard disk
- 9.5" STN dual-scan color screen
- 1 PCMCIA slot, Type III
- Integrated 16mm trackball
- MS-DOS, Windows 3.1
- Carrying case
- 6.6 lbs, including battery

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SN-Series

SN425C

- 486SX, 25 MHz, SL-Enhanced
- 4MB RAM, max: 20MB
- 170MB removable hard disk
- 7.8" STN color screen
- 1 PCMCIA slot, Type II
- Integrated 16mm trackball
- Suspend/Resume
- MS-DOS, Windows 3.1
- Slip case
- 4 lbs, including battery

$1,899

(With external 3.5" 1.44MB diskette drive, add $99.)

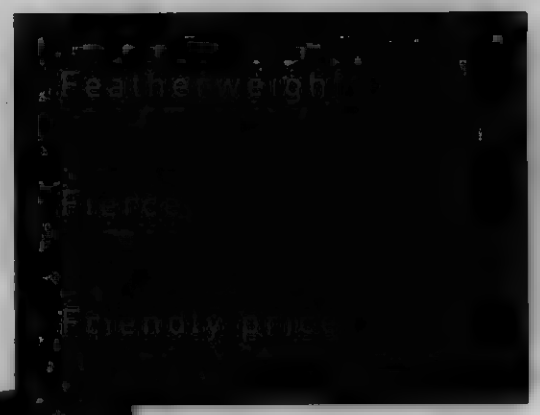
SN425

- 486SX, 25 MHz, SL-Enhanced
- 4MB RAM, max: 20MB
- 80MB removable hard disk
- 8.2" monochrome LCD
- 1 PCMCIA slot, Type II
- Integrated 16mm trackball
- Suspend/Resume
- MS-DOS, Windows 3.1
- Slip case
- 4 lbs, including battery

$1,399

(With 170MB hard drive, add $150. With external 3.5" 1.44MB diskette drive, add $99.)

intel inside



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AMBRA covers every mobile system with a 30-day money-back guarantee and a one-year limited warranty. For just $99, an optional Executive warranty is available.[2] With either warranty, you can rely on toll-free technical support around the clock!

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[1] Ron White, "In Search of the Ultimate Notebook," *PC Computing*, July 1993. [2] Please call for details regarding AMBRA's money-back guarantee, limited warranty and Executive warranty. Return shipping and insurance charges are the responsibility of the customer. [3] Offerings may differ in Canada.

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intel inside

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If your office desperately needs a new server and you're concerned about your company outgrowing it, there's a much smarter way to go. Call the number below and order a new Dell server.

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Unix systems help predict weather

National Weather Service plans for 115 sites by mid-1996

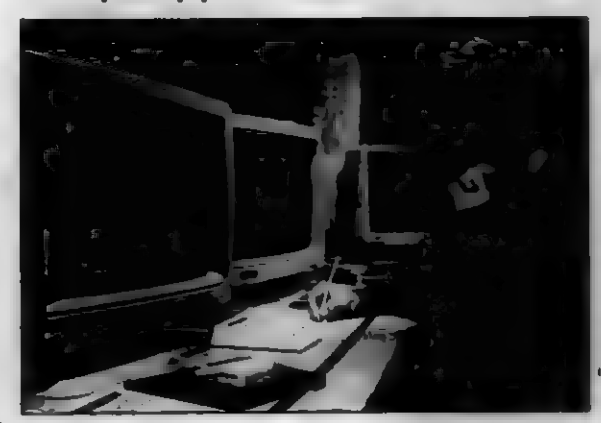
By Jean S. Bozman

Unix workstations will play a leading role in the National Weather Service's rollout of enhanced forecasting systems at 115 sites nationwide. The Midwest, hard-hit by river flooding last summer, will be one of the first areas to install the workstations.

The systems, Hewlett-Packard Co. HP 9000 Model 750s, will add simulation and visualization to mainframe-based systems that output data on printer paper. The nationwide rollout will place networks of eight to 10 Unix workstations in forecasting offices by mid-1996. Each workstation can support X Window System terminal users.

The project is part of a $227 million contract won by PRC, Inc. in McLean, Va., to deliver the Advanced Weather Interactive Processing System (AWIPS) as part of a nationwide $4 billion overhaul of the weather service's computer systems.

AWIPS will automate manual systems that force forecasters to combine data from radar screens, mainframes and clipboards. Weather forecasters will use terminals to access a set of Hitachi Data Systems Corp. mainframes in Suitland, Md., running IBM's VM operating system, which will stay in place. Some forecasting offices still use older Data General Corp. and Prime Computer, Inc. minicomputers, said Richard Farnsworth, deputy chief of the Hydrologic Research Lab in Silver Spring, Md. But graphical output is limited, and much of the data appears as rows of numbers from long paper printouts.



An AWIPS prototype *is used as a demonstration system at the Denver National Weather Service Forecast Office*

The graphical Unix workstations will be able to run simulations of weather patterns and to forecast data in a more timely and accurate way, said Mike Hudlow, director of the weather service's Office of Hydrology. "The coverage will be better with higher resolution of the data," Hudlow said, "and there will be the capability to interact with the [weather] models."

Once the workstations are installed, forecasters will be able to view data from the 113 Nexrad advanced radar storm-monitoring systems that the weather service is installing across the U.S. [CW, Jan. 11]. Forecasters will also be able to view satellite data broadcast from National Weather Service headquarters.

Forecasting accuracy

The Unix systems will exchange data with one another — and with systems from other federal agencies, such as the U.S. Geological Survey, Hudlow said. The plan is to pair each National Weather Service forecasting center with a Nexrad site, weather service executives said. Before, data from less accurate radar systems was fed into forecasting models. Once in place, the new systems will electronically receive Nexrad data, which is estimated to be 60% to 80% more accurate than older radar sources.

Because of recent river flooding, the Kansas City, Mo., and Minneapolis offices will use "advanced development" versions of the Unix system to monitor the Mississippi and Missouri riv-

Unix systems, *page 52*

ON SITE

National Weather Service
Silver Spring, Md.

Challenge: To update 20-year-old forecasting systems with a network of Unix workstation systems.

Technology: Hewlett-Packard's HP 9000 Model 750 workstations, Unix applications written in C, a Motif user interface and a packet-switched wide-area network to link LANs in local forecasting offices.

Benefits: More timely and accurate forecasts of storms and floods, high-resolution graphics and reduction of manual work through electronic input of data.

Product strategies

Acer revamps its server line

By Stephen P. Klett Jr.

■ Acer America Corp. breathed new life into its server strategy last week, rolling out three servers — including a high-end symmetric multiprocessing machine designed to run Microsoft Corp.'s Windows NT — and merging its server lines under the name AcerAltos.

Previously, Acer separated its servers into two product lines: the Altos family of Unix servers running its proprietary Altoe/SCO Unix operating system and the AcerFrame family of servers for off-the-shelf operating systems such as Novell, Inc.'s NetWare.

While analysts said the need for server companies to support Windows NT was a given, they said the merger of the two Acer lines would give the company's server strategy cohesion and strengthen its presence in the value-added reseller (VAR) channel.

"Merging the lines will help clear up confusion over what Acer is doing with Altos, which will help it keep a strong relationship in the VAR channel in light of competition from minicomputer makers primarily Unisys and DEC," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. Merging the lines will also give users one point of contact for support, he added.

The following three models are the first to debut under the AcerAltos name:

- 17000: A high-end, symmetric multiprocessor server for more than 32 users, supports up to four 60-MHz Intel Corp. Pentium CPUs. Starts at $12,000.
- 7000: A midrange server for eight to 64 users, available with a 66-MHz I486DX2 or 60-MHz Pentium CPU. Starts at $3,350.
- 700: An entry-level server for one to 16 users, available with a 33-MHz 486DX or 66-MHz 486DX2 CPU. Starts at $1,300.

Windows NT support

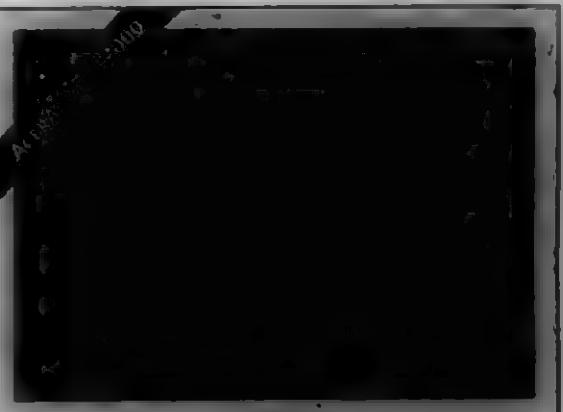
The symmetric multiprocessing capabilities of the 17000 provides Acer's first support for Windows NT and Windows NT Advanced Server. Other operating systems Acer supports include Banyan Systems, Inc.'s Vines, The Santa Cruz Operation's SCO Unix and IBM's OS/2.

With the addition of NT support, Acer is positioning itself to capture share in a market with enormous potential for growth, said Norman Choy, group product manager for advanced systems at Acer in San Jose, Calif. "If NT is even just moderately successful, it will still represent a huge installed base that we want to get in on," Choy said.

The biggest challenge for Acer is trying to meet users' mission-critical needs, according to Ronald Chwang, president and chief operating officer. "If a server goes down, IS is under extensive pressure to bring it back up quickly without losing data," Chwang said. "As server companies, we need to provide as reliable a product as ■ possible to help alleviate this pressure."

To boost server reliability, Acer offers disk mirroring and dual power supplies on selected AcerAltos models, bringing the total number of configurations to 29. And, although he declined to give specifics, Choy said customers can expect to see an external redundant arrays of inexpensive disks (RAID) subsystem early next year.

The lack of a RAID subsystem is a major hole that Acer needs to fill — and quickly, Giusto said. "A RAID subsystem is an absolute necessity for server companies," he said. "If Acer can't come out with one by the end of the first quarter, it will be a problem for them."



CPU:
Up to four 60-MHz Pentium microprocessors

CACHE:
256K-byte, second-level write-back cache per CPU

MEMORY:
32M bytes of RAM, expandable to 256M bytes

EXPANSION:
Eight 32-bit EISA slots, two 16-bit XT/AT bus slots

PRICE:
Ranges from $12,000 to $50,000

Vendors deliver turnkey LAN platform

By Stephen P. Kletti Jr.

A vender alliance led by ITT Datacom has announced a turnkey networking platform to help users over the compatibility hurdles associated with running high-speed LANs over copper cabling.

Called ISNS-100, the platform consists of ITT Datacom's Structured Cabling System (ISCS); DeskPro M and I workstations and ProSignia and ProLiant servers from Compaq Computer Corp.; and copper Fiber Distributed Data Interface (FDDI) network adapters and intelligent hubs from SysKonnect, Inc.

ISCS is ITT Datacom's proprietary wiring design for running FDDI over copper. According to the company, it supports data transmission rates of up to 100M bit/sec. over distances of up to 156 meters.

More on the way

ITT said it plans to provide versions of ISNS-100 for emerging technologies such as fast Ethernet and Asynchronous Transfer Mode as well.

Less compatibility testing

With ISNS-100, the alliance hopes to reduce the technology adoption "window" for companies looking to install advanced networking technology by eliminating the need for users to test, evaluate and prototype disparate network products for compatibility, said Kevin Johnson, director of North American operations at ITT Datacom in Santa Ana, Calif.

This is the primary reason beta user MCI Telecommunications Corp. in Colorado Springs decided to give ISNS-100 a try, according to Charles Stallings, senior communications engineer. Usually, he said, FDDI requires a "piecemeal" approach. "It's not that you couldn't do it, but you had to put your own blood, sweat and tears into it," he said.

While analysts said the ITT Datacom cabling offers superior performance compared with traditional Category-5 cable, they questioned if it was worth the roughly 30% higher cost to users.

"These guys have a lot of evangelism to do ... because no one seems to be screaming for higher capacity than Category-5," said Todd Dagres, vice president of data communications research at The Yankee Group in Boston. "Your average PC LAN is going to be perfectly happy with Category-5 for at least the next 20 years."

In addition, Dagres said the long-term prospects for ISNS-100 were limited because most users will probably go to fiber or wireless LANs.

First announced at Interop August '93 [CW, Aug. 30], ISNS-100 will ship in January and is now being sold through ITT Datacom. Pricing information was not available.

Compaq's much-publicized backlog woes, though of "major concern," are not expected to impact ITT Datacom's delivery date, Johnson said. The main reason for his confidence, he added, is that Compaq has guaranteed ITT Datacom preference over any other reseller.

Johnson also acknowledged that installing ISNS-100 forces users to "embark on a complete rethinking of their network" because it requires laying in new cabling and new desktop equipment. However, he said ITT Datacom does not see this as a barrier to the technology's implementation because less than one-half of 1% of existing cabling schemes can support high-speed copper transmission. "Users seriously considering the technology know they have to make major changes," he said.

Network management

Exide offers power monitoring software

By Elisabeth Horwitt

Exide Electronics Group, Inc. has announced OnliNet 3.0 NVX, said to be the first network power management software to provide real-time information on the quality of incoming power for combined Novell, Inc. NetWare and Unix networks.

The product is also said to monitor and record performance data for uninterruptible power supplies (UPS) at the same time that it conditions and protects the system from surges and spikes coming in from the utility.

Users can monitor power quality as well as the status of UPS devices on Novell and Unix networks from a graphical user interface that displays power and battery conditions on real-time graphic charts. Also included are meter graphics, event logs and information on UPS performance. The product can also do scheduled shutdown and restart of networked NetWare and Unix systems.

Exide's Powerware network power management software family provides power management for OS/2, Microsoft Corp.'s Windows NT, NetWare and a variety of Unix systems, including Novell's UnixWare, the vendor said.

The product family includes power management systems that can report power system status to a Simple Network Management Protocol-compliant network management platform.

Unix systems

CONTINUED FROM PAGE 51

ers as test sites for the new machines, Hudlow said. Kansas City already has its workstations, and the Minneapolis units were being installed last week, he said.

Those sites are just two of 12 regional River Forecasting Centers in the continental U.S., he said, but last summer's flooding created "more pressure for them to come up to speed" with the new systems. Other forecasting sites will not get their machines until 1995 or 1996; full-scale production at all sites begins in 1996.

The use of Unix and standards is part of a broader federal move to migrate from proprietary mainframes to open systems, according to George Smith , a research hydrologist in the Office of Hydrology's Silver Spring, Md., headquarters. "In 1990, the Office of Hydrology recognized that we needed to start moving into a Unix and X Windows environment," Smith said. "We can build an interface to a [Unix] standard and know that those functions will be available on any vendor's Unix."

Rollout ready

The National Weather Service intends to place Unix systems at 115 forecasting offices nationwide by 1996. The systems, which have been piloted for two years, will be deployed early in Kansas City, Mo., and Minneapolis to monitor river flooding from the Mississippi and Missouri Rivers, according to the National Weather Service's Office of Hydrology.

That will protect National Weather Service's investment in new computers and system software, he added.

The new Unix applications, which are being developed in C language, will support the Open Software Foundation's Motif graphical user interface and relational databases from Informix Software, Inc., Smith said.

Originally, the forecasting software was built in 1990 to run on an IBM RT and then on an IBM RS/6000, he said. Some of the IBM RS/6000 systems are running in several forecasting offices as prototypes, but PRC is porting all applications to the HP workstations. At the time of the AWIPS bid, the HP machines were faster. The AWIPS software and hardware was tested for two years in Tulsa, Okla. on an RS/6000.

Conner Storage Systems, a division of Conner Peripherals, Inc., has added Backup Exec for NetWare 4.0 software to its MS series line of digital audio tape, ¼-inch cartridge, digital linear tape and helical scan backup products.

According to the Lake Mary, Fla., company, the software provides support for Novell, Inc.'s NetWare 3.x and 4.x, including directory services and support for Novell's Storage Management Services initiative.

Backup Exec for NetWare 4.0 offers a variety of disk backup and disk management features and provides data management functions that include job scheduling, file grooming and reporting.

Backup Exec for NetWare 4.0 costs $995.

▶ *Conner Storage Systems*
(407) 263-3500

JetForm Corp. has announced an interim release of JetForm for E-Mail 3.1 that supports VIM 2.0, the electronic-mail application programming interface for Lotus Development Corp.'s CC:Mail and Notes Mail.

According to the Waltham, Mass., company, JetForm for E-Mail is a multiplatform, intelligent forms fill-in product that includes a set of work-flow tools.

Used with standard E-mail systems, JetForm for E-Mail fills forms and routes information throughout a corporation by using existing equipment and networks.

Work-flow features such as forms routing and tracking are offered.

The interim upgrade to JetForm for E-Mail costs $25 for all current users.

▶ *JetForm*
(617) 647-7700

Platinum Software Corp. has announced Platinum for Windows, a LAN-based financial accounting system.

According to the Irvine, Calif., company, Platinum for Windows shares a common data model with and is constructed on the same tool set as the client/server-based Sequel to Platinum.

The product includes integration with other desktop applications, an advanced report generator, work-flow capabilities, a graphical user interface with the enhanced look and feel of Excel 5.0 and an improved help system.

Prices for Platinum for Windows range from $1,500 to $15,000 per module.

▶ *Platinum Software*
(714) 727-1250

NetGuard Systems, Inc. has announced the NSI 7000, said to be a fail-safe subsystem for network file servers.

According to the Seal Beach, Calif., company, the product was designed to protect Novell, Inc. NetWare-based LANs from catastrophic hardware and software failures at both the server and the disk drive levels.

A virtual file server architecture that produces a complete fail-safe environment for mission-critical LAN applications is used in the subsystem.

NSI subsystems include two NetGuard NetWare Loadable Modules and a DOS executable program.

The NSI 7000 subsystems prices start at $8,995.

▶ *NetGuard Systems*
(310) 799-5533

Digital

Update

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LinkWorks software has proven itself in real-world workgroup applications. And it can work for you, too. This powerful software has the capability to help you easily and continually simplify work processes, resulting in gains in productivity of not just 10 percent or 20 percent, but many times over. Currently, LinkWorks software supports approximately ten thousand users worldwide.

Today, the LinkWorks product connects Digital's current ALL-IN-1 and TeamLinks product sets *(see article inside)*. And it supports Macintosh, Microsoft Windows-based PC and UNIX clients, and Intel-based SCO UNIX, RISC ULTRIX, and DEC OSF/1 AXP servers. Future releases will support the Windows NT, OpenVMS AXP, and OpenVMS VAX platforms. LinkWorks software also will support Presentation Manager on OS/2 and connected clients for Microsoft Windows.

FOR MORE INFORMATION ON DIGITAL'S LinkWorks PRODUCT, CALL 800-DIGITAL (800-344-4825), AND REFERENCE CODE BOF.

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The System Engineering Customer Center, located in Salem, New Hampshire, is designed to provide complete access to the expertise, equipment, tools, networks, and applications needed to architect, design, implement, and characterize solutions that require resources beyond those available at the vast majority of customer sites. Your link to lab facilities is Digital's Team Work Center — a fully equipped setting structured to meet your business, security, and comfort requirements. Alternatively, you could connect remotely to a configuration that has been installed to your specifications.

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- A Comprehensive Blend of Skills and Expertise

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- Unique Asset Base

With more than 22,000 square feet of lab floor space, our own loading dock, and networks capable of staging multiple test systems simultaneously, Digital has developed extraordinarily cost-effective methods for staging everything from standalone systems to the world's largest clusters. Plus, we have inventory capable of meeting most customer configuration requirements, including the ability to assure high system availability.

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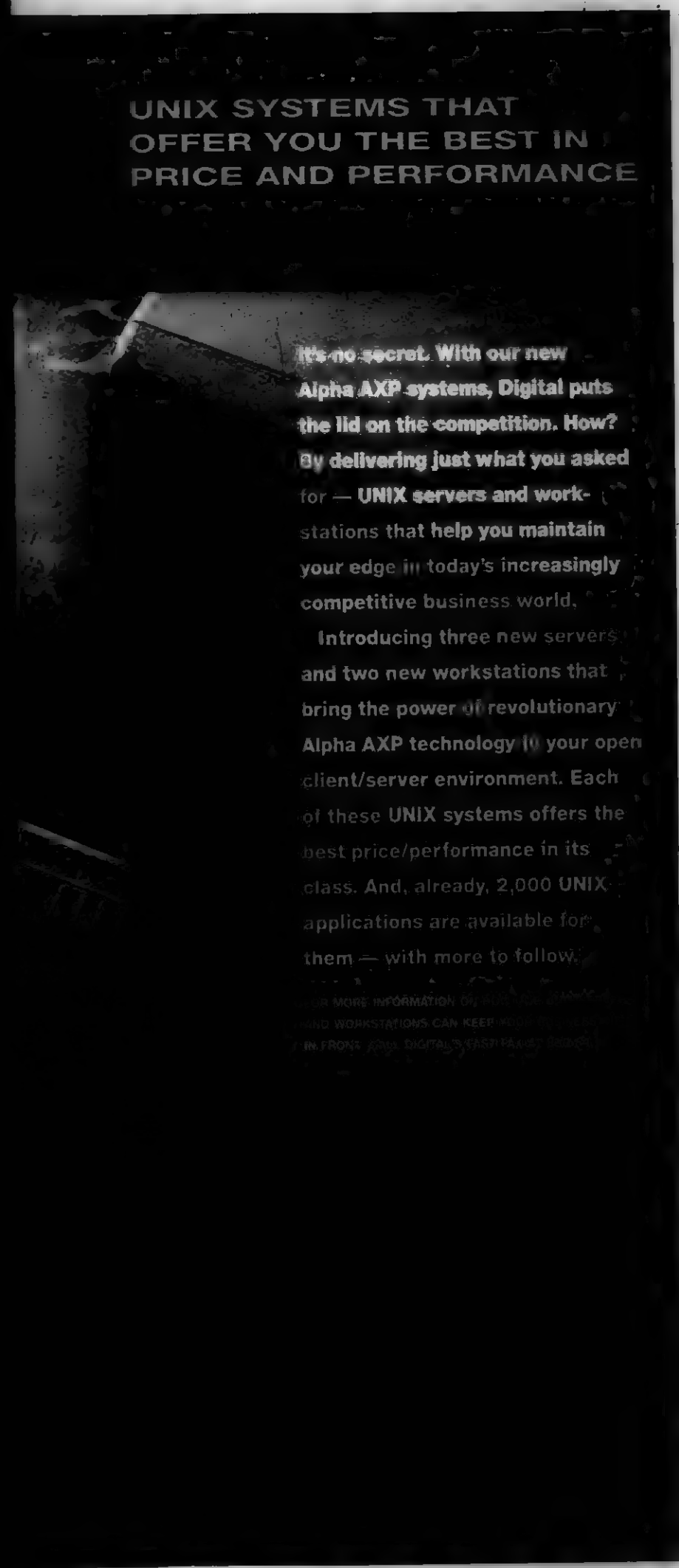

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The ALL-IN-1 Integrated Office System is Digital's proven application integration and development platform for delivering personal and workgroup applications as well as customized business solutions. And now, with businesses migrating to more productive and cost-efficient distributed environments and end users requesting more choice of personal applications on the desktop, Digital has extended ALL-IN-1 software to embrace client/server technology. How? Through the implementation of ALL-IN-1 server components and TeamLinks software as a client to an ALL-IN-1 server. This means that millions of ALL-IN-1 users around the world can take advantage of all the features of Windows and Macintosh PCs while maintaining connectivity and high throughput to existing information sources, documents, and mail and directory services of the ALL-IN-1 product.

And that's not all. With the evolution of ALL-IN-1 software to client/server, Digital has implemented a new pricing scheme in support of TeamLinks clients, making this combination the most cost-effective solution available today. Plus, our commitment to ship TeamLinks for ALL-IN-1 on the Alpha AXP platform by summer 1994 enables even better price performance along with greatly enhanced X.400 mail capabilities.

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FOR A LIMITED TIME, TeamLinks MAIL FOR WINDOWS (QB-0N1AC-AA) IS AVAILABLE AT $49 PER CLIENT — A SAVINGS OF $30 PER CLIENT — WHEN PURCHASED AS A 50-LICENSE PACK. TO ORDER, OR FOR MORE INFORMATION ON TeamLinks OR ALL-IN-1 SOFTWARE, CALL 800-DIGITAL (800-344-4825), AND REFERENCE CODE INK.

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The result? You achieve a flexible, cost-effective way to create high-performance LANs.

Protocol and vendor independent, Digital's GIGAswitch offers performance scaling to meet the needs of any size system — giving you the freedom to choose where and how your applications and information are used, regardless of computer platforms or FDDI network components. In short, the GIGAswitch protects your existing investment in FDDI technology and training. And, with the ATM line card, it paves the way for smooth migration to ATM when you're ready.

PRODUCT	ORDER NUMBER	PRICE
GIGAswitch with 2-port FDDI card	DEFGA-BA	$30,000
Redundant Switch Control Processor (SCP) option	DEFGP-AA	15,000
Redundant power supply option	DEFGB-AA	3,000
2-port FDDI line card	DEFGL-AA	9,000
Multi-Mode fiber ANSI MIC PMD	DEFXM-AA	835
Single-Mode fiber ANSI ST PMD	DEFXS-AA	3,195

TO ORDER DIGITAL'S GIGAswitch PRODUCT, CALL 800-DIGITAL (800-344-4825), AND REFERENCE CODE SWY.

BREAKING THE LOGJAM AT HAMMOND LUMBER

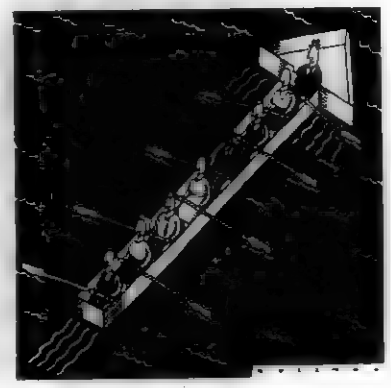
DISKEEPER Software and Alpha AXP Technology Make It Happen

Earlier this year, Hammond Lumber hit a logjam. Its VAX 4000 Model 200 system — with as many as 130 user processes running point-of-sale accounting, credit, and inventory applications — clearly needed an upgrade. Over time, the system had been handling more and more users, resulting in a gradual decline in response time.

Based in Belgrade, Maine, Hammond Lumber is a chain of five retail outlets, plus one sawmill operation. Tom Jewett, the company's computer consultant, helped Hammond executives make the decision to move to Digital's Alpha AXP platform.

Jewett also advised that the company continue to utilize Executive Software's DISKEEPER application for disk defragmentation. DISKEEPER software had succeeded in efforts to keep Hammond's VAX system working at peak efficiency. Plus, it was already shipping on the OpenVMS Alpha AXP platform.

Hammond executives also discovered that the application development environment they wanted — namely, Synergy Application Development Environment from Digital Information Systems Corporation (DISC) of Rancho Cordova, California — ran on the Alpha



AXP platform. Because Tom Jewett and Hammond developers write the company's applications, a sophisticated application development environment was essential.

"The choice to move to the Alpha AXP platform was pretty straightforward once we realized how much CPU power and memory we would get," Jewett explains. "Plus, the immediate availability of DISKEEPER for the Alpha AXP platform and Synergy software reassured us that the software environment we needed would be easy to implement on the new system."

Digital's 21st century architecture will see Hammond well into the future. "The Alpha AXP platform gives us plenty of power for the more sophisticated inventory application that we plan to implement," says Jewett. This application can support an inventory database of up to 10,000 items and has the sophisticated indexing support needed to do complex database lookups quickly.

"OUR NEW APPLICATION DEVELOPMENT ARCHITECTURE DEMANDS MORE FROM A COMPUTER SYSTEM. WE THOUGHT WE COULD GET THE PERFORMANCE WE NEEDED FROM THE ALPHA AXP PLATFORM AND DISKEEPER SOFTWARE. WE WERE RIGHT."

TOM JEWETT, CONSULTANT HAMMOND LUMBER

Award-Winning Efficiency for OpenVMS Systems

For the past six years in a row — each year that it's been on the market — Executive Software's DISKEEPER product has won a *Digital News & Review* Target Award for "Best Resource Management Software" product. Target Award winners are selected by votes from Digital system users.

DISKEEPER software is a customized disk defragmenter that converts fragmented files and spaces to contiguous files while user jobs are running, without loss of data and without interfering with system activity.

The utilization of DISKEEPER software results in OpenVMS disks that are "well-kept" or that have the most free space, usually in one large contiguous area. As a result, DISKEEPER software maximizes the I/O efficiency of OpenVMS.

The first company to port a disk defragmentation product on the Alpha AXP platform, Executive Software found the porting process to be straightforward, with virtually no code modifications.

"Digital's Alpha AXP technology will broadly impact the computer industry," says Craig Jensen, Executive Software CEO. "Disk I/O will probably become the most critical limitation to the performance power of the Alpha AXP platform, and DISKEEPER software has a reputation for speeding this up."

For Hammond Lumber, the combination of DISKEEPER software and Alpha AXP technology has been an unqualified success. Says Tom Jewett, "Without any reprogramming, we've cut the time for batch jobs by 66 percent."

FOR INFORMATION ON DISKEEPER SOFTWARE, CALL EXECUTIVE SOFTWARE AT 800-829-4357. FOR INFORMATION ON SYNERGY, CALL DIGITAL INFORMATION SYSTEMS CORPORATION AT 800-FON-DISC (800-366-3472).

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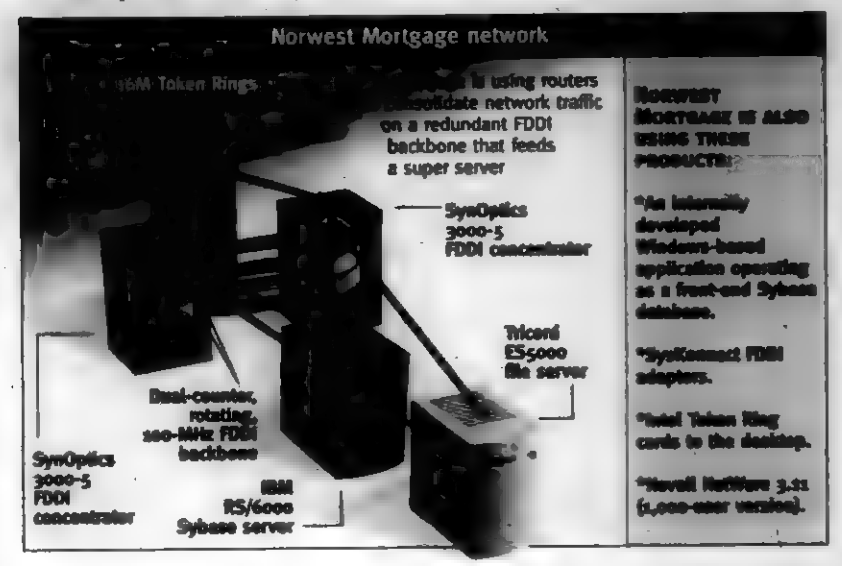
Searching for the perfect LAN

By Lynda Radosevich
MINNEAPOLIS

Scrambling to support a fast-growing company and new business procedures, the information systems organization at Norwest Mortgage, Inc.'s Minneapolis division has spent the last two years constantly revamping its network infrastructure.

Each initiative has unearthed new issues, but the division has settled on a stable, distributed computing network and diskless PCs in order to keep mortgage-related documentation moving.

"There's always problems associated with any change. We just hoped to outweigh them with the new benefits," said Matt Jacoby, a senior network analyst at the Minneapolis division's Management Information Data and Services (MIDAS).



After several false starts, the company is using a highly reliable, distributed yet centrally managed network architecture. It includes one router to "collapse" network traffic from many Token Rings onto a redundant Fiber Distributed Data Interface (FDDI) backbone that feeds one super file server and database server (see chart).

"Right now we see every business sector beginning to deploy this type of network design because of improved management capabilities, greater security and easier network troubleshooting," said Fred J. McClimans, program director of local-area communications at the Gartner Group, Inc. in Stamford, Conn.

The collapsed architecture allows Norwest Mortgage to run a Windows-based mortgage-tracking application for 700 users at high speeds, and it has "zero" downtime, according to Eric Nystrom, MIDAS integrated systems manager.

Norwest Mortgage's Minneapolis division provides the final processing of Norwest's mortgage documentation and prepares the mortgages for resale to outside companies. Norwest Mortgage, headquartered in Des Moines, Iowa, has branches around the country. The 700-employee Minneapolis division receives and processes more than 2,000 Federal Express Corp. shipments of closed mortgages each day.

Two years ago, Norwest Mortgage processing systems were based on IBM mainframes. Then, at the beginning of a companywide business process restructuring effort, senior management encouraged divisions to move to distributed systems. This was done to provide more sophisticated end-user tools at users' desktops and flexible systems that could keep up with the rapidly changing financial services industry.

The Minneapolis office brought in PCs for spreadsheets and word processing. Because mortgage processing was still on the mainframe, most of the loan and mortgage analysts had both PCs and dumb terminals on their desks, according to Jacoby.

Tough beginning

In mid-1991, the MIDAS group linked the PCs on a Standard Microsystems Corp. ARCnet, but the network never jelled and the machines would only stay up for 20 minutes, according to Jacoby. So in the spring of 1992, the systems group ripped out the cabling, threw away the adapters and installed 16M bit/sec. Intel Corp. Token Ring networks, diskless Intel 1486 PCs and Compaq Computer Corp. SystemPro file servers in the various departments.

Norwest, *page 60*

ON SITE

Norwest Mortgage
Minneapolis

Business goal: To support the processing needs of fast-growing mortgage processing business.

Technology goal: To improve system flexibility and cost effectiveness while adding users and switching to Windows-based applications.

Method: Consolidate servers and move to a centrally managed "collapsed" FDDI backbone.

Result: Improved reliability and 25% better end-user response time; IS control over the spread of servers.

Interview

Internetworking rough spots

Much of corporate America is in the throes of blending hierarchical SNA and LAN internetworks — efforts that are posing new challenges for IS departments. Frank Daubeck, president of Communication Networks Architects, Inc., a Washington consultancy, identified the following as the Top 5 internetworking problems that user companies face today and some possible solutions.

Problem No. 1: Lack of user confidence that smaller vendors' products can cope with the intricacies of SNA.
Solution: Several factors will work together to alleviate the confidence problem. Once interoperable Data Link Switching is available from several vendors and IBM releases Advanced Peer-to-Peer Networking with High-Performance Routing, users are likely to breathe easier.

Problem No. 2: Random time-outs of SNA sessions.
Solution: IBM's dependent logical unit structure, together with Data Link Switching, will take care of that problem.

Frank Daubeck

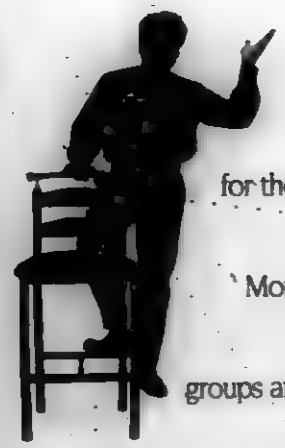
Problem No. 3: Prioritization when mixing deterministic SNA traffic with nondeterministic LAN traffic. It is a mathematical nightmare that can end up with LAN traffic burstiness swamping SNA traffic.
Solution: None as yet. *(Editor's note: Several router vendors are implementing traffic prioritization schemes in their software to help in this arena. Particularly sensitive to the SNA vs. LAN traffic issue are Proteon, Inc., Advanced Computer Communications and Cisco Systems, Inc.)*

Problem No. 4: Lack of network management. Users need ways to correlate systems management and logical management (inherent in products such as NetView) with physical network management.
Solution: IBM has sold NetView on the mainframe as sort of a manager of managers because the logical and physical worlds come together in one place and you can do correlation and manage it together. AT&T's Accumaster Integrator also did this. Today there really aren't many options.

Problem No. 5: Confusion over whether frame relay is powerful enough to support multiprotocol networking and whether users should wait for Asynchronous Transfer Mode (ATM).
Solution: Frame relay is a robust solution for SNA/LAN integration, but users need to be aware of vendors that drop traffic that exceeds their committed information rate. ATM is also a good solution, but it's not here yet. When it does arrive, it will probably not be available everywhere.

Interview by Joanne Cummings, a free-lance writer in Marlboro, Mass.

FOUR MILLION PEOPLE MAKE THAT FOUR



FRANK IS A COMPUTER BUFF. IN FACT, HE'S THE UNOFFICIAL cc:MAIL ADMINISTRATOR – WHICH TAKES HIM ALL OF 45 MINUTES A WEEK.

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Lotus ccMail, recently rated the #1 e-mail system by *Infoworld*† and *Software Digest*,†† offers benefits no other e-mail can match. Like a unique, rules-based architecture which lets you automatically man-age, filter, even reroute your mail. And Lotus Organizer™ 1.1, the top-rated personal information manager, is integrated into ccMail Group Pack so you can schedule meetings quickly and easily. Just enter a suggested time for a meeting and Organizer will consult your coworkers' schedules and tell you whether they're available. And it does this without revealing personal schedules. Plus, ccMail has a built-in spell checker, flexible search options, an intuitive user interface and dozens of features that make it easy to use.

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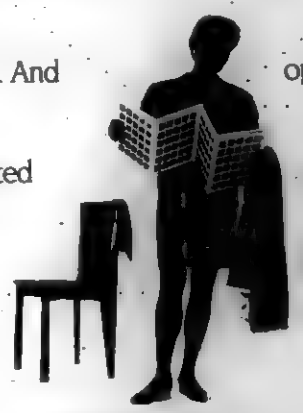

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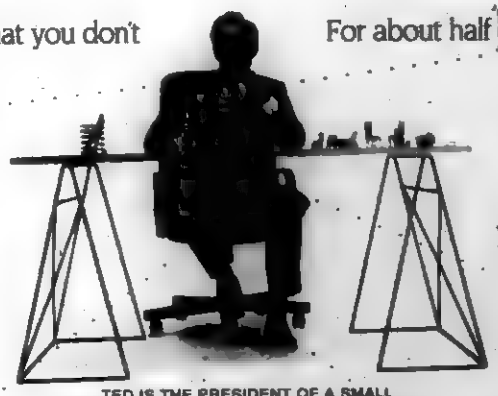
Fortunately, it is available right now. Just visit your Lotus Authorized Reseller or call 1-800-448-2500.



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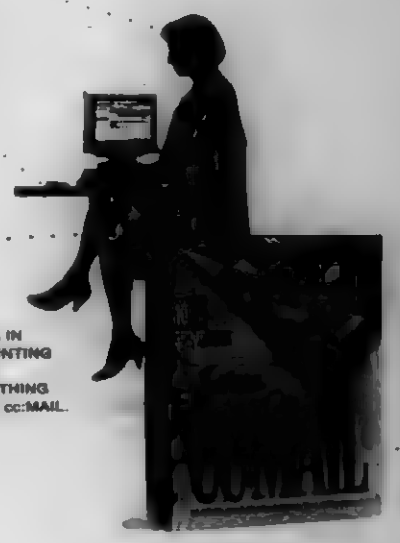

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Switch to offer low-cost T3

Lets users aggregate T1s to gain bandwidth needs

By Joanie M. Wexler

■ Users looking to leverage public or private broadband backbone networks but cannot afford today's stiff local-access charges for T3 services will soon receive a lower-cost option from T3Plus Networking, Inc.

The company has scaled its high-end BMX45 switch to accommodate up to seven discrete T1 (1.5M bit/sec.) access links with an inverse multiplexer, which is scheduled to ship in the first quarter of next year. The device is meant to allow users to aggregate multiple T1s to accumulate the bandwidth they need rather than foot the bill for pricey T3 links, explained Alan Menezes, director of marketing. T3 links run at 45M bit/sec.

Most inverse multiplexers on the market today run at below-T1 speeds and are used largely for dialing up bandwidth for on-demand videoconferencing.

Expanded access

Currently, users of the BMX45 have just T3 access to multimegabit backbone circuits such as fractional T3 services, he explained. Users also must have fiber or radio on their premises to use T3, while T1 is copper-based and much more ubiquitous.

"In between T1 and T3 [tariff] rates, there is a big void," said Michael Zboray, program director of enterprise network strategies at Gartner Group, Inc. in Stamford, Conn. "In many places in this country, somebody has to pull new plant for T3. At 'super-T1' rates, no one has to install new plant."

He said the $20,000-and-up inverse multiplexer "is going to really take off" because users can ratchet speeds above T1 without having to buy a "big hunk" of T3, reducing the entry barrier to high-speed networking.

For example, Thang Tran, network services engineer at T3Plus shop Southern California Edison Co., said the new capability would enable his company to back up its T3 backbone with T1 circuits and provide high-speed links to remote sites "where T3 is neither feasible nor cost-effective."

T3Plus Networking said it will add bandwidth management capabilities to the BMX45. Automatic frequency adjustment, for example, will monitor several aggregated T1s. If one fails, it will not disrupt the whole circuit of 6M or 7M bit/sec. of bandwidth; rather, the BMX45 will automatically drop out the bad line and adjust transmission frequency to lower speeds, Menezes explained.

Likewise, it will reinstate the line when it is fixed and readjust the frequency, he said.

Also, dynamic bandwidth allocation should allow network managers to specify minimum and maximum bandwidth parameters for a given application running across a given circuit.

Router technology

3Com adds frame relay, X.25 to ease low-end use

By Joanie M. Wexler

3Com Corp. recently unveiled plans to add frame relay and X.25 connections to its low-end routers that incorporate its Boundary Routing software architecture next year.

Boundary Routing, which shipped last March, shifts the complexity of router decision-making to higher-end, centralized routers. The idea is to ease installation, configuration and maintenance headaches in expertise-shy remote sites.

Frame relay is due out in the first quarter, and X.25 — aimed at the European market — is due in the second quarter, said Alison Seaman, 3Com product manager. She predicted that 3Com will have shipped 2,000 Boundary Routing-equipped devices by February.

Likes the link

The upcoming frame relay link is appealing to Barclay Williams, systems administrator at *News & Record*, a daily metropolitan newspaper and printing company in Greensboro, N.C. The reason is that the company is looking to extend its corporate network to its advertisers' sites using public network services, Williams said.

Making the connection

The initial WAN connection supported by Boundary Routing when it shipped in March was the Point-to-Point Protocol, a handshaking process that allows two devices to connect over a serial line. In May, the company added a dial-up connection to give users the option of a backup link.

"It makes economical sense for us to have a flexible link like frame relay to these sites as opposed to permanent leased lines," he explained.

Most of *News & Record*'s advertisers' submissions are shipped electronically to a service bureau where they are printed, then scanned into the newspaper's computer system, Williams said. Frame relay would eliminate the service bureau step and "also give us a huge quality improvement because of inherent difficulties in scanning," he explained.

The company first turned to Boundary Routing to make a similar arrangement with three commercial printing customers. The simplicity of the device means the customers "don't need the technical expertise to maintain it; they just make sure it's on," Williams said. "We can do all the maintenance at our end, which we should do because they're our customers."

Just plug it in

Boundary Routing is "about as simple as plugging in a microwave oven," said Ed Kurata, senior project engineer at independent networking equipment benchmarker LANQuest Labs in San Jose, Calif.

Recent testing by LANQuest showed a 50% time savings in LAN administration over a fully configured 3Com NetBuilder II, 3Com's high-end box, according to Kurata. He pointed out that the NetBuilder II has about the same configuration requirements as comparative router models from Cisco Systems, Inc., Wellfleet Communications, Inc. and other vendors.

The tests timed how long it took from unboxing the router to getting it operational. The time to add an additional protocol to the Boundary Router was cut by 90%, Kurata said, because only the hub device in Boundary Routing's hub-and-spoke-style setup needs to be configured.

A hub-and-spoke configuration means that each Boundary Router ties into just one central router, with no meshed links among remote sites.

Searching for the perfect LAN

CONTINUED FROM PAGE 57

"In some cases, the equipment was only two-months-old," Nystrom said. However, the new setup provided the stable network needed to support 300 users on a DOS-based mortage processing application that was developed in-house, he said.

But that setup was quickly outdated by business changes. The company began to grow very rapidly, spurred in part by lower interest rates. For instance, in one year, the company opened roughly 200 branch offices, according to Manny Siperl, vice president in loan production.

Despite supporting more users and applications, the network runs 70% faster on the FDDI architecture.

The postclosing operation grew to roughly 500 users, and workgroups and analysts moved around the building during reorganizations.

Few budget concerns

Unlike most IS organizations, MIDAS was and is unhampered by budget restraints because its growth means that Norwest Mortgage places a premium on technology service rather than cost-cutting, according to Jacoby.

Because the loan analysts' files were stored on local file servers, the IS group had to move quickly to keep up. Every time someone changed offices, IS had to move all the related files to a server close to that person. Otherwise, Jacoby said, "information had to hop from server to server, and performance dropped."

To rectify this, MIDAS moved to a collapsed Token Ring backbone in early summer 1992. In this scheme, each server connected directly to a port of a central router. The router, in turn, funneled data to a central backbone where file servers and other resources were located.

Although the design worked, the Token Ring backbone was soon saturated. In the fall of 1992, the postclosing operation began migrating to a new Windows application and finished moving data off the mainframe to an IBM RS/6000 server running Sybase, Inc. database software. Also, the employee pool grew to about 700.

So last June, the MIDAS group replaced five Compaq servers with a Tricord Systems, Inc. PowerFrame superserver with fully mirrored disk drives running a 1,000-user version of Novell, Inc.'s NetWare 3.11. Consolidating the server functions simplified security and management but created a bottleneck between the server and end users' desktops. The bottleneck was compounded by the fact that diskless PCs need frequent access to the file server.

FDDI to the rescue

To break the bottleneck, the MIDAS group installed the dual-ring FDDI backbone. If one ring goes down, traffic is routed through the other. All the Token Ring traffic is collapsed into a Wellfleet Communications, Inc. router before heading onto the FDDI backbone composed of two SynOptics Communications, Inc. concentrators. Dual-attached FDDI cards from SysKonnect, Inc. allow the Tricord server, which has only one network address, to participate in the redundant ring architecture.

Despite supporting more users and bandwidth-hungry Windows applications, the network operates 70% faster due to the FDDI architecture. This means that users can process more loan documents per day, although actual productivity increases have not been measured, Jacoby said.

After toiling to create a fast, stable network, Norwest Mortgage plans to change it again, possibly as soon as a year from now. Then, the likely architecture will include an Asynchronous Transfer Mode backbone with 100M bit/sec. FDDI over copper running to the desktop.

[redacted]

Motorola UDS has announced the CELLect 14.4 PCMCIA and CELLect 14.4 pocket-size modems for cellular and wireline data transfer.

According to the Huntsville, Ala., company, the modems offer V.32bis 14.4 bit/sec. modems with V.42 error correction and V.42bis data compression.

The products also provide a maximum throughput rate of 57.6K bit/sec. and support standard asynchronous speeds down to 300 bit/sec.

The CELLect 14.4 PCMCIA costs $549 and the CELLect 14.4 pocket-size modem is available for $399.

▶ *Motorola UDS*
(205) 430-8000

Hewlett-Packard Co. has introduced the HP EtherTwist LAN Switch, an Ethernet LAN switch designed to increase performance on 10M bit/sec. Ethernet networks.

According to the Palo Alto, Calif., company, the product adds an Ethernet switching capability to HP's EtherTwist line of stackable 10Base-T hubs, bridges and routers.

For management and control, the product provides address-to-port references and uses on-the-fly switching to reduce the time it takes packets to move through the network.

The 10Base-T ports of the HP LAN Switch support half-duplex or full-duplex communications mode.

The HP EtherTwist LAN Switch costs $4,200.

▶ *Hewlett-Packard*
(415) 857-1501

Chipcom Corp. has introduced a family of products based on the IEEE 10Base-FB standard for running Ethernet over fiber cable.

According to the Southboro, Mass., company, the family consists of three modules for Chipcom's Online System Concentrator intelligent switching hub: a stand-alone fiber hub and two transceivers, including a dual-link, fault-tolerant transceiver.

Created primarily for building backbone networks, the products also support desktop connections such as fault-tolerant links to mission-critical servers and computers.

The family was designed for organizations with enterprise networks, typically with more than 500 users.

Prices range from $545 to $4,150.

▶ *Chipcom*
(508) 460-8900

Telepartner International has announced TeleServer, an advanced communications server designed to deliver a range of connectivity options that include support for wireless computer users.

According to the Farmington, Conn., company, Telepartner supports wireless, X.25 and asynchronous direct-dial remote access technologies while simultaneously supporting various workstation environments.

TeleServer incorporates DynaFlash, a technique that compresses outbound data by up to 80% into its server and workstation components, according to the company.

The server component is priced at $9,700 for up to 16 simultaneous users, $11,700 for up to 32 simultaneous users and $14,200 for up to 64 simultaneous users.

▶ *Telepartner International*
(203) 674-2640

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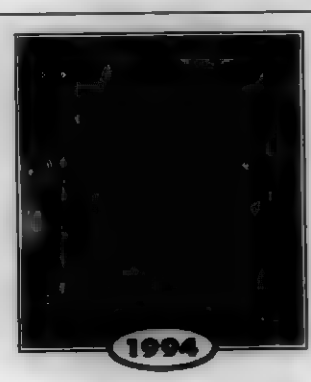

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EIS applications

Pushing decision support beyond executive suite

By Ellis Booker

Using a broad brush for its 2-year-old executive information system (EIS), Sherwin-Williams Co.'s $1.8 billion Paint Stores Group in Cleveland has spent the past two years giving some 110 district managers access to it.

Before the EIS was deployed, managers had the unenviable task every Monday morning of telephoning the 20 to 25 stores in their districts to get sales figures for the previous week. Each manager would then draft a sales report for the district and send it up the chain of command to one of the 14 area vice presidents.

"The goal was not to get rid of the phone procedure but to give the district managers more information to work with," said Bill Thompson, director of MIS at the Paint Stores Group.

"It's kind of intuitive that you'll do better when you know more," he said.

Sherwin-Williams selected the Arthur Performance Tracking System from Comshare Retail, a division of Comshare, Inc. in Ann Arbor, Mich.

The Arthur databases, fed by NCR Corp. point-of-sale (POS) systems in the retail outlets, reside on Sherwin-Williams' Amdahl Corp. mainframe.

From the bottom up

While many EIS applications start at the top of a company and only later trickle down the organizational chart, Sherwin-Williams started the EIS application with its numerous midlevel managers and moved it up to senior executives.

According to Thompson, all the area vice presidents use the system, as does at least one of the four division heads. Senior executives have the same graphical user interface as the managers, although the executives are able to compare a larger set of stores.

Thompson's information systems staff analyzed district managers' needs and developed databases that reflect inventory movement, store and territory results and the performance of each sales representative. In the current implementation, managers can review each store's results, by product, for the previous five weeks. They can also perform "what-if" analyses on this data.

"Our idea was to produce results geographically, with a color-coded map," Thompson said, adding that the application required placing PCs on the managers' desktops.

Prior to the EIS, fewer than 15% had PCs in their offices. Thompson expanded the reach of the EIS platform by bundling spreadsheet and word processing software into the EIS application.

No global messaging

But one feature missing from the EIS is global messaging. "We've always been able to send [messages] to the stores, and we can broadcast bulletins to the district guys," Thompson said. But for now, he added, he does not see the need to have these managers message one another or send messages up the chain of command.

Thompson said the EIS, which cumulatively contains gigabytes of inventory and POS data, is only as good as the data fed into it. "We're fortunate in that we already had a pretty solid POS system," he said.

ON SITE

Sherwin-Williams Paint Stores Group
Cleveland

Challenge: To provide 110 district managers with more information about their stores.

Technology: Mainframe-based EIS from Comshare in Ann Arbor, Mich.

Results: Adopted by all district managers and a significant percentage of their superiors.

PCs to get full access to All-In-1 software

By Craig Stedman

Digital Equipment Corp. plans in the second half of next year to give PC users full access to its venerable All-In-1 office software for developing client/server applications built on graphical user interfaces (GUI). But analysts said they wonder whether the move is coming too late in the game to make much difference.

"DEC has really been behind the power curve here," said Jack Gold, a senior research analyst at Meta Group, Inc., a consulting firm in Westport, Conn. "Frankly, they should have done this a long time ago, and it's still essentially a year away. Some customers are going to be unhappy about that."

"This is what people wanted five years ago," said another industry analyst, who asked not to be identified. He noted that Digital has supported PCs under All-In-1 since 1986, but thus far it has not opened up the product's scripting language to desktop application developers. As a result, the company has limited the usefulness of the PC support.

That will change with the next major releases of All-In-1 and Digital's PC-based TeamLinks office client software, said Stephen Martin, marketing manager for the company's messaging and workgroup systems. Both are expected to ship during the third quarter of next year, he added.

TeamLinks currently can access data stored in All-In-1 file cabinets and use All-In-1 as a mail server. Martin said the next releases of the products will give TeamLinks access to the All-In-1 scripts, allowing development of GUI-based applications using Microsoft Corp.'s Visual Basic language.

Existing All-In-1 programs written for terminals can be modified with the addition of a PC front end, providing "a relatively inexpensive way to turn a host application into a client/server application," Martin said. The back-end All-In-1 code would require only "minor changes," he added.

Alpha All-In-1

All-In-1 is supposed to finally get support on Digital's Alpha AXP systems line under the OpenVMS operating system in the same time frame that Version 3.1 of the software is due out with the PC scripting support, Digital's Stephen Martin said. Plans for All-In-1 also include the addition of full X.400 mail compatibility, he indicated.

May lose customers

Digital hopes the PC scripting capability will help keep customers from moving off All-In-1 as they shift from terminals to desktop systems. The company estimates that All-In-1 still has 4 million individual users, although some analysts said they think the figure is much smaller.

One customer no longer on the All-In-1 bandwagon is GTE Telecommunications Products and Services in Atlanta. George Kerns, assistant vice president for cellular information management at the GTE unit, said its strategic mail platform is now Microsoft Mail running over Novell, Inc. NetWare LANs.

GTE is still using some All-In-1 applications developed internally, such as a jobs listing program and software written for its legal department, Kerns said. But he described All-In-1 as "a waning product" and said the company plans to phase it out over an undetermined period of time.

The planned PC support would not be enough to change Kerns' mind. "Even if they kind of refresh [All-In-1] a little bit, it's not going to get any new momentum from our side," he said. "The water's already over the dam."

Tom Koulopoulos, president of Delphi Consulting Group, Inc. in Boston, said he views Digital's plan for All-In-1 "as a survival strategy more than anything else." The installed base would get "a nice comfortable approach for moving into client/server," but interest in the product is still likely to decline, he added.

Outside interest?

The set of APIs being built into TeamLinks for developing All-In-1 applications will also be made available to other software vendors, said Stephen Martin, a Digital marketing manager. He added, though, that Digital is uncertain of how much demand there would be for using the APIs and has not yet settled on a method for distributing them in the event that other companies wanted to develop All-In-1.

May grow old

Martin acknowledged that as users become interested in developing distributed, object-oriented applications during the next few years, All-In-1 will no longer fit their needs.

Digital wants to entice those customers to switch to its new LinkWorks workgroup integration software, with All-In-1 possibly retaining a role as a background network services package for mail and other applications.

LinkWorks is the company's key office software product for the future, Gold said. The product, introduced in October, is fine technically, but questions remain about whether it can be marketed effectively, he said.

"Let's face it, Digital is not a marketing company," Gold said.

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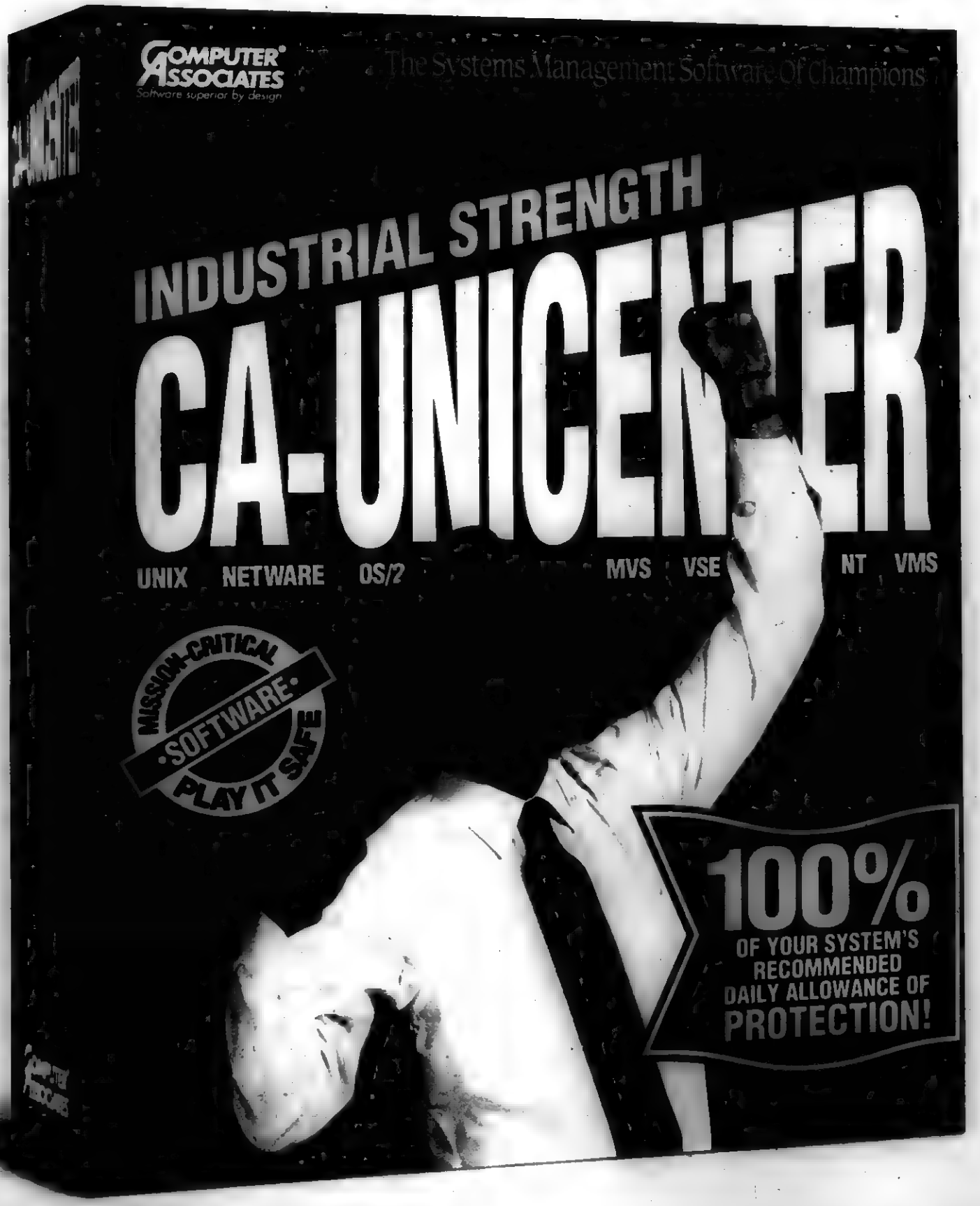

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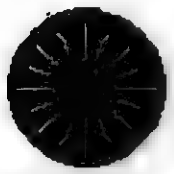

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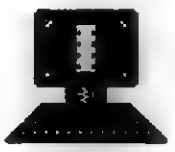

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Basics apply at database show

By Kim S. Nash

CHICAGO

Nuts and bolts products — especially tools to connect mainframe databases to Unix-based systems — were the big emphasis at the Database and Client/Server World Show early this month, as user demand grows for products that make client/server easier to implement.

But Microsoft Corp. did introduce a SQL Server database engine running on Alpha machines from Digital Equipment Corp. The product, due to ship by month's end, is priced between $695 and $19,995.

Possibly more practical, however, were products unveiled by smaller firms designed to plug gaps in client/server connectivity. Gupta Corp., Information Builders, Inc. and other database and application development firms showed new or enhanced gateways, query tools and other utilities that help users fold data housed in IBM mainframe databases into client/server schemes.

Database and related companies "are starting to wake up to the fact that to sell products in the client/server era, connectivity holes cannot be ignored," said Dan Richards, an analyst at Database Associates in Morgan Hill, Calif. Richards helps users design databases for client/server computing.

Announcements included the following:

▶ Information Builders unveiled a comarketing pact with Unisys Corp., where Unisys will resell Information Builders' Focus fourth-generation language and EDA/SQL gateway product. The goal is to entice IBM mainframe users to migrate applications to Unisys' U6000 series Unix-based hardware.

▶ Micro Focus, Inc. signed a joint distribution agreement with XDB Systems, Inc. that calls for Micro Focus to sell XDB Workbench, a testing and maintenance tool for IBM DB2 applications. Micro Focus also disclosed that IBM's workstation-level CICS technology will be added to Micro Focus compilers and other development tools.

▶ Red Brick Systems showed speed and efficiency improvements to Red Brick Warehouse database that lets users build more complex queries by using parallel processing technologies. An Open Database Connectivity driver is due out in first-quarter 1994, with versions of the warehouse for symmetric multiprocessing machines from Hewlett-Packard Co., IBM and NCR Corp. and Sequent Computer Systems, Inc.

▶ Gupta introduced SQLConsole, a graphical tool for monitoring and managing Gupta's SQLBase Server database. Among other tasks, the PC-based product monitors database performance and shows administrators where and when data bottlenecks happen and how best to resolve them. SQLConsole, which is priced at $595, replaces Gupta's SQLMonitor product. SQLMonitor users can upgrade for $100, the company said.

[redacted]

Prism Solutions, Inc. has introduced Prism Warehouse Manager software.

According to the Sunnyvale, Calif., company, Prism Warehouse Manager Release 3.5 extracts, integrates and moves DB2, Computer Associates International, Inc.'s IDMS and Digital Equipment Corp.'s DEC RMS legacy data to a data warehouse in a mainframe, parallel processing or client/server environment.

Prism Warehouse Manager costs $75,000.

▶ *Prism Solutions*
(408) 481-0240

Connectronix Corp. has introduced WinTronix/400, a file-transfer software module.

According to the Salt Lake City company, the product was designed to allow users to transfer data to or from an IBM AS/400 using Windows.

The product is an Advanced Program-to-Program Communications application that lets PCs, notebooks or laptop computers transfer data when the user is attached to the AS/400 through Twinax, Ethernet, Token Ring, Synchronous Data Link Control or async adapters.

WinTronix/400 costs $99.

▶ *Connectronix*
(801) 975-7477

[redacted]

Thomas Hoffman

The power of one

How in the world did Unisys have such a good year selling mainframes?

Here are the mostly ugly realities of the mainframe market in 1993:

• Most mainframe vendors, including IBM and Amdahl, got battered this year.

• Users are moving in strong numbers to distributed architectures. Many are replacing their mainframes outright with nimbler and more cost-effective servers and workstations. Others are consolidating whatever mainframes they have into fewer, more powerful boxes.

• The European market, traditionally a sizable contributor to U.S. mainframe revenue, continued to wallow in the economic doldrums.

On the surface, Unisys' success doesn't make sense. In 1993, the total worldwide mainframe market, including players such as IBM, Unisys and Siemens-Nixdorf, shrank 7% to an estimated $25.9 billion from $28.1 billion in 1992, according to International Data Corp. in Framingham, Mass.

And you can't blame Unisys' success completely on the 10% annual decline of the IBM System/390 large-scale market, where Unisys doesn't really compete. While IBM and Amdahl were getting shellacked, Hitachi was having a record year, due primarily to sound product and strategy execution.

So how did Unisys, which was on the brink of financial ruin three years ago, manage to increase its 1993 estimated mainframe revenue by about 9%? Several factors came into play, including corporate America's most stunning financial turnaround since Chrysler.

The biggest contributor to Unisys' mainframe revenue growth this year was pent-up demand, particularly for its A11, A16 and 2200/500 machines. While some of that demand was product-related — users were waiting on improved processor performance, along with TCP/IP, OSI, Posix and Unix interoperability — a fair amount resulted from loyal Unisys customers who had put off their big iron purchases until the vendor became financially stable.

> On the surface, Unisys' success doesn't make sense.

With Unisys having tallied eight straight profitable quarters and counting, its big iron customer demand has followed.

Unruh influence

Since Unisys Chairman and Chief Executive Officer James A. Unruh took the helm in October 1990, the company has undergone a massive transformation, including the re-engineering of its mainframe development. The Blue Bell, Pa., vendor scrapped what had been separate development groups for its four mainframe lines and consolidated common core technology development for equipment such as consoles, power supplies and user memory into a single unit.

The results of what Unisys calls "layered engineering" are impressive: In 1990, it took Unisys 2½ years to bring a mainframe product to market from scratch. Today, it can get one out the door in less than 18 months.

Nor should Unisys' strong technical capabilities be overlooked. The high-end 2200/900 machine was brought forth with a whole new architecture, including the introduction of the Extended Processor Capability, by which users can connect up to 32 processors in parallel over high bandwidth.

The introduction of the 2200/500 marked another milestone — not just for Unisys but for the entire industry. The mid-range machine was the industry's first replacement of standard bipolar emitter-coupled logic processors with lower-cost CMOS technologies.

And despite the massive cost-cutting efforts he enforced three years ago, Unruh made sure that Unisys continued to churn out high-quality products. For the fourth consecutive year, *Nikkei Computer* magazine has rated Nihon Unisys Ltd. — a joint venture between Unisys and Mitsui & Co. in Japan — the top-rated Japanese mainframe vendor, based on a survey of 5,000 Japanese big iron users. The company beat out the likes of Fujitsu, Hitachi and IBM. Closer to home, Unisys continues to score high marks in Datapro Information Services Group's annual U.S. and European mainframe user satisfaction surveys.

However, it would be misleading to say that Unisys is finally eating IBM's lunch. Most research firms place Unisys' share of the mainframe market at less than 5%, and most of the company's sales are admittedly from its own installed base.

Still, Unisys did win several major competitive bids against IBM this year, including a $25 million overhaul of the Nasdaq Stock Market's information systems, and a hotly contested mainframe pact with the U.S. Department of Housing and Urban Development. And while IBM and other plug-compatible manufacturers continue to point to financial weakness in Europe as a trouble spot, Unisys is seizing the lion's share of burgeoning Eastern European bank automation contracts. These include a $57 million deal it landed in June to automate operations at Orszagos Takarekpenztar, the National Savings Bank of Hungary.

Steady growth

So does all this mean that Unisys will set the mainframe market on its ear next year? Not exactly. Frank Brandenberg, deputy president of Unisys' computer systems group, predicts revenue growth in the 4% to 6% range, although the introduction of several new A series and 2200 systems, combined with an improving European market, could raise the figure closer to 8% or 9%.

IBM continues to undergo the mother of all transitions, and its 1994 rollout of its parallel query and parallel transaction systems have to be executed well. Amdahl's open systems diversification will require tremendous marketing execution and a retraining of its sales force, following its alliances with Sun, EDS and other forthcoming partnerships.

So who says the mainframe is dead? 1994 promises to be pretty lively, especially if Unisys maintains its current pace.

Hoffman is *Computerworld*'s Mid-Atlantic correspondent.

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  - 12. Vice President, Asst. VP
  - 13. Treasurer, Controller, Financial Officer
- IS/MIS/DP MANAGEMENT
  - 14. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
  - 21. Dir./Mgr. MIS Services, Information Center
  - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data/Tele. Comm. Network Sys. Mgt.; LAN Mgr., PC Mgr.
  - 29. Dir./Mgr. Sys. Development, Sys. Architecture
  - 31. Programming Management, Software Development
  - 41. Engineering, Scientific, R&D, Tech. Mgt.
  - 69. Sys. Integrator/VAR/Consulting Mgt.
- OTHER PROFESSIONAL MANAGEMENT
  - 51. Sales & Mktg. Management
  - 70. Medical, Legal, Accounting Mgt.
- OTHER PROFESSIONAL MANAGEMENT
  - 80. Educator, Journalist, Librarian, Student
  - 99. Other Titles/Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Check all that apply)

Operating Systems
- ☐ Solaris (01)
- ☐ Netware (02)
- ☐ OS/2 (03)
- ☐ Unix (04)
- ☐ Mac OS (05)
- ☐ Windows NT (06)
- ☐ DOS/Windows (07)

App. Development Tools
- ☐ CASE (01)
- ☐ C/C++ (02)

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Linking of object-oriented standards limited

Interoperability pact between Digital, Microsoft does not go far enough

By Melinda-Carol Ballou

Although the gap is narrowing between two major object-oriented standards, issues remain that will take some time to resolve.

Behind-the-scenes negotiations now in progress, according to sources, could result in more general interoperability between the Object Management Group's (OMG) Common Object Request Broker Architecture (Corba) and Microsoft Corp.'s Object Linking and Embedding (OLE), but the outcome is still unclear. Microsoft denied that such negotiations are occurring.

Taking a big step

In the meantime, however, Microsoft took a large "step forward," according to industry analysts, when it announced its intention to provide interoperability between OLE and Digital Equipment Corp.'s Corba implementation [CW, Nov. 22, Dec. 6].

But observers also voiced concerns because Microsoft officials made clear that the agreement with Digital does not involve a more general Microsoft commitment to directly support the Corba standard with OLE.

As the situation currently stands, this means that compatibility between OLE objects and Corba objects must be mediated by a future version of Digital's Object Broker. Once an interoperability standard for Corba is set sometime next year and adopted by vendors, corporate developers can use Object Broker as part of the means to translate between OLE objects and other vendors' Corba implementations.

Alternately, developers could use the Digital/Microsoft Common Object Model specifications, now being defined by the two companies, to create their own connections between OLE and other Corba systems. Some of the other vendors supporting Corba include IBM with its Distributed System Object Model and Novell, Inc. with its use of Hyperdesk Corp. technology, as well as Sun Microsystems, Inc. and Hewlett-Packard Co.

The way it should be

The preferred solution from a developer's point of view would be direct interoperability between the robust object-oriented capabilities of Corba-compliant object models and OLE objects, according to some industry analysts. This would provide the flexibility to integrate a range of Corba systems directly with OLE without another layer of software to do the translation.

An on-site developer at Bellcore in Livingston, N.J., spoke enthusiastically about the potential for a connection between OLE and Corba. "OLE makes it easier to integrate applications on the desktop, and Corba will allow users to integrate applications on the fly between clients and servers on mixed platforms," said Samir Desai, a member of the tech-

Object-oriented, *page 72*

Quest for technology

Twelve vendors stated their intentions earlier this month to answer the OMG's request for technology for Corba interoperability, including: IBM, the Open Software Foundation, Iona, Digital, Hyperdesk, AT&T/NCR Corp., SunSoft, Inc., NEC Corp., HP, Symbiotics, Inc., Expersoft Corp. and ICL. They will submit their proposals to the OMG in March.

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Programming environments

Apple, Symantec rethink role Bedrock will play

By James Daly

■ Apple Computer, Inc. and Symantec Corp. are rethinking the role of the Bedrock programming environment and casting about for a new place for what was once described as their premier platform for building PowerPC applications.

Bedrock was designed to allow a programmer to write a single version of an application and then recompile it for Macintosh or Windows without recoding. What has thrown a monkey wrench into the plans is OpenDoc, an Apple-designed software architecture for embedding features of different applications into a single document under Macintosh, Windows or Unix.

OpenDoc was announced in June as a competitor to Microsoft Corp.'s Object Linking and Embedding (OLE) architecture and is scheduled to be available this summer.

Reevaluation

"We're reevaluating the way that Bedrock is designed to make sure that is really the way we want to move," confirmed a spokesman for Apple's Business Systems division. A Symantec spokeswoman added, "What needs to be determined is how [Bedrock] would work with technology like OLE and OpenDoc."

Specifics? Don't look for many — at least not yet. Unfortunately, neither Apple nor Symantec would get into the nitty-gritty detail about what portions of Bedrock are being reassessed or which may be reused in the OpenDoc environment. "I think that's because they are not exactly sure themselves what they need to do," said one source working with Apple. "It's a touchy issue."

Bedrock not dead

Both Apple and Symantec officials emphasized that Bedrock is not dead. A Symantec spokeswoman said Bedrock is in beta-testing and Symantec is scheduled to ship low-level foundation classes (such as those that would be required in memory management features) in the first half of 1994.

Some developers said they were concerned about Bedrock's fate. "I've heard a lot of talk, but I haven't heard many specifics," said Dave Harding, product manager for WordPerfect Corp.'s WordPerfect for the Macintosh. "We can't base critical business decisions on something that seems so uncertain."

Harding said the idea of a multiplatform development environment is a good one but that developer support is not behind Bedrock. "If other publishers are hot on Bedrock, I haven't spoken with them," he said.

Apple developers said cross-platform development platforms are critical, especially considering the financial lure of the successful Windows environment. "Apple is a realist — it has to be a realist if it's going to survive," said Jeffrey Cherniss, executive vice president at Avanti Software, Inc. in Palo Alto, Calif.

Bedrock was announced in June 1992 and originally scheduled to be released earlier this year. Apple told users that Bedrock was the successor to Apple's current object-oriented framework technology, MacApp, for PowerPC development. But that no longer appears to be the case.

Bedrock provides a common set of building blocks, or "objects," that become the basic structure for an application. Such a framework enables developers to quickly and easily create a single version of source code that can then be tailored to platform-specific versions of an application, according to Symantec Vice President Gene Wang.

Initially, Bedrock will support Macintosh and Windows, with future versions addressing other desktop platforms such as OS/2, Unix and Microsoft's Windows NT.

Ideas that tie

In September, seven vendors (IBM, Apple, WordPerfect, Novell, Inc., Oracle Corp., Taligent, Inc. and Xerox Corp.) announced an effort to tie together a series of data-sharing technologies. The Component Integration Lab hopes to integrate OpenDoc; Bento for storing and exchanging multimedia information; Open Scripting Architecture for the coexistence of multiple scripting systems; and IBM's Systems Object Model for dynamic object linking.

Separate pieces

OpenDoc, on the other hand, breaks computerized components into individual parts that can then be manipulated.

For example, many applications may have similar functions but are implemented in different ways. A text-editing capability, for instance, can be implemented six different ways on as many different programs.

OpenDoc got another boost last week, when Apple unveiled updated versions of Hypercard and AppleScript that both take steps toward the OpenDoc compound-document architecture.

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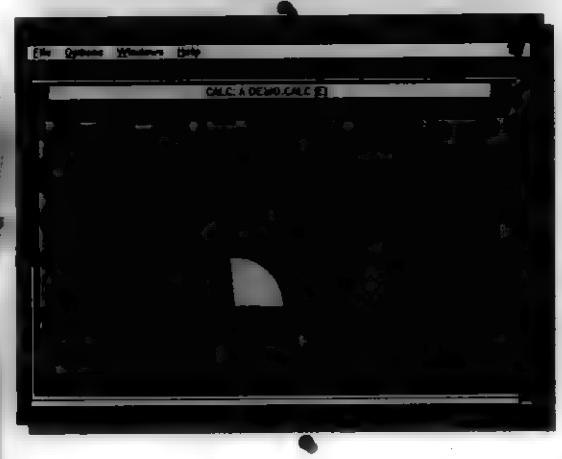

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CA-Realizer 2.0: An alternative to Microsoft's Visual Basic

PRODUCT test DRIVE
CA-Realizer

By Garry Ray

If you have ever touched a programming language, you probably know of Basic. And if you have ever written a program for Windows, you probably know about Microsoft Corp.'s Visual Basic.

Less prominent than Visual Basic is another Basic development environment that was actually released before Microsoft's object-oriented version in 1991.

Called CA-Realizer, this Basic development environment from Computer Associates International, Inc. in Islandia, N.Y., was recently upgraded to Version 2.0. The new version includes enhancements of primary interest to OS/2 users and other IBM shops.

Reasons to try

But why consider any other Basic language given the popularity of Microsoft's Visual Basic? There are a few key reasons why you might do so.

First, the programming models used by Visual Basic and CA-Realizer are entirely dissimilar. CA-Realizer retains the familiar procedural model employed by most programming languages for the last 30 years. Visual Basic's event-driven programming model requires a significant jump into object-oriented thinking. That can be tough as well as unnecessary for many programming projects.

A second key reason to look at CA-Realizer is ease of maintenance. While Visual Basic programmers might argue otherwise, the event-driven model does have a vexing aftereffect. Application source code is located within multiple program objects, making programs somewhat difficult to trace and debug. For small- to moderately-size programs, CA-Realizer's procedural model is a bit easier to handle.

CA-Realizer 2.0 is delivered *with full OS/2 and Windows development environments*

Finally, the new version of CA-Realizer provides a feature that Visual Basic is unlikely to duplicate: OS/2 compatibility.

With Version 2.0, the core Realizer package is delivered with full OS/2 and Windows development environments. Selecting the appropriate one is merely a matter of running one of two installation programs. But compatibility extends in other directions. Once a program has been written within either development environment, its compiled source code can be run under either operating system.

To make this possible, CA-Realizer includes a Dynamic Link Library and a runtime support library for both operating systems. Porting code from one operating system to the other is primarily a matter of installing these runtime files in the appropriate directory. Once done, porting is a matter of copying the compiled program files to the second operating system.

Although a number of CA-Realizer features remain essentially untouched from previous versions, they are worth mentioning.

Among the more useful Realizer features are a group of controls that can be integrated into Realizer applications. (The manual calls these "Programmable Application Tools.") Similar to Visual Basic custom controls, the Realizer controls include a spreadsheet, a text editor, business graphics and a table tool.

Less time-consuming

Any and all of these controls can be made an integral part of any application. An example is a program that collects data from a database file, loads it into a spreadsheet control and performs a series of automated calculations. Developing an experimental application using the spreadsheet and business graphics controls requires less than a half day's work. Notable is that CA-Realizer can directly read Microsoft's Excel and Lotus Development Corp.'s 1-2-3 spreadsheet files, Xbase databases (including headers) and other file formats.

To compile and deliver applications, CA-Realizer also includes a project manager that keeps track of all source code, binary and resource files and makes it easy to compile the application when complete.

Another project manager function creates complete installation disks, including the Realizer runtime files, for delivery to end users.

In all, CA-Realizer offers a great deal of breadth and utility for quick delivery of business applications. Its familiar programming model, assortment of development tools and portability make it a good choice for day-to-day development.

Version 2.0 is available from Computer Associates for $90 until March 31, 1994, and $247 thereafter.

Relational databases

New applications encourage Alpha-betizing systems

By Ed Scannell

In an attempt to bolster the momentum of its Alpha Four relational database, Alpha Software Corp. has delivered a collection of add-on applications that help inexperienced users be more productive.

The 10 applications that make up AppPacks are tailored to help nonprogrammers more easily create typical database applications, as well as give end users ideas about how to create new ones.

> AppPacks make "programming functions a lot clearer," said John Sadler, systems manager at Legacy.

"The idea [behind AppPacks] is to show users how to use some of the basic building blocks within Alpha Four to create applications," said Selwyn Rabins, Alpha Software's president.

People can use the applications without modification or use them as a "learning tool" to find out more about how to do database development.

Legacy, Inc., a furniture store in Rehoboth Beach, Del., uses Alpha Four and AppPacks to track orders and maintenance histories. Systems manager John Sadler said the AppPacks make "programming functions a lot clearer." Still, he said, "some of the new features" in Version 3.0 of the database itself, which Alpha began shipping in June, "were beyond my grasp, and I couldn't figure out how to do some things."

He also makes extensive use of the application's contact management features to manage the store's vendor relationships.

Perhaps one of the biggest advantages of using AppPacks is that it lets users do various report and form designs on existing databases so they can have different views of the data. Typically, this helps users gain more insight into what their data is telling them.

Business help

Among some of the core business applications are accounts payable and receivable modules to track invoices and payments; a time and billing package to record work done for clients; a program for mailing list management; and an invoicing and inventory program to automate inventory tracking.

Another application is an Employee Records program that maintains personnel files and allows users to view all employee performance, review or salary histories.

Available now, AppPacks is priced at $39. Users can purchase Version 3.0 of Alpha Four in a single-user edition with five of the AppPack applications for $149. For users with competitive products, including FoxPro and Borland International, Inc.'s dBase, the price to switch over to Version 3.0 and five applications is $99.

Object-oriented standards

CONTINUED FROM PAGE 69

nical staff at Bellcore.

Digital officials earlier this month notified OMG of their intention to offer the technology that they are jointly defining with Microsoft as the interoperability standard for Corba 2. If adopted, the Digital technology could become the path for OLE objects to interoperate with Corba. But with 11 other companies also submitting technologies, the outcome is uncertain.

Another complication is that Digital and Microsoft have yet to make public exactly how OLE and Corba objects will interoperate.

"I don't think they know yet," said John Rymer, an analyst at Patricia Seybold Group in Boston. "I think there will be a number of interoperability options that will come out of this work — from the low-level gateway option they now offer and extending all the way to a common object model, with gradations in between."

In the meantime, industry sources said discussions are continuing at the executive level between Microsoft officials and vendors, including IBM and Sun, about interoperability between other Corba models and OLE.

A Microsoft spokesman said "nothing serious" is now in the works for such a connection, but he added that it "may be something we would do in the future."

TAKE IT FROM WORLD-CLASS BENCHMARKERS: IT DOESN'T TAKE MUCH FOR BENCHMARKING TO DEGENERATE INTO MERE INDUSTRIAL TOURISM.

BENCHMARKING on empty

Charlie Samuels

BY JULIA KING

Gary Sprehe says his company's first attempt at benchmarking was a huge disappointment — and no wonder.

Inspired by the strides in quality improvement that earned Xerox Corp. the Malcolm Baldrige Award in 1989, Texas Instruments, Inc. set out to make its information systems operation run more smoothly and be more productive and less costly. The solution: benchmarking.

TI planned to base its changes on information gleaned from its benchmarking partner GTE Corp. in Stamford, Conn., which TI officials considered to have one of the best IS organizations around. But according to Sprehe, vice president of information technology at the Dallas-based company, after six or seven meetings with GTE experts, the TI team still had little idea of what changes they needed to make or even where to start.

TI had made a fundamental benchmarking error: It hadn't analyzed its own processes before benchmarking them against another company. "We didn't have an understanding of our own processes. We weren't focused." The result: "We didn't learn much," Sprehe says.

Benchmarking appears to be a "disarmingly simple technique," but there's more to it than meets the eye, says James Staker, vice president and director of the Strategic Planning Institute's Council on Benchmarking, a consortium of corporate benchmarking partners in Cambridge, Mass.

Benchmarking is the practice of learning better ways to do things from

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Benchmarking

CONTINUED FROM PAGE 73

companies that already do them better. The most important thing to know up front: The process only appears easy.

"The whole purpose of benchmarking is to find out what makes a difference. But if a company hasn't thoroughly analyzed its own processes, it can't possibly recognize what one of its benchmarking partners is doing differently," says Jim Webber, president of Omicron, a five-company consortium in Mountain Lakes, N.J., focused on IS benchmarking.

"I've turned down companies that haven't done a self-assessment," says Samuel Bookhart, formerly a benchmarking manager at Du Pont Co.'s fibers sector in Wilmington, Del., and now an independent consultant in Chadds Ford, Pa. "You're not ready to benchmark unless you know what your own problems are."

Eager to dive in head first, companies often neglect to focus their study. These "industrial tourists," as they are known in benchmarking circles, are the same companies that come away from meetings without useful information. They're also the ones that the most sought-after benchmarking partners make a point of avoiding.

One of the lessons learned by Claude Christiano, vice president of corporate accounting at Pfizer, Inc. in New York, was to provide his benchmarking partners with a list of questions he wished to pursue before each meeting.

"Otherwise, you get off the topic and start trading war stories. You have to stay on the topic because it's rare to have a whole day with a company. Usually, you get only two or three hours," he says. Pfizer is comparing notes with 15 benchmarking partners as part of a process re-engineering effort in the financial area.

People factor

Companies that have picked the wrong people in the organization to benchmark, or placed unreasonable demands on them, have also come up short of their benchmarking expectations.

Six months into Pfizer's re-engineering study, Christiano discovered that it can be impossible to benchmark and do your regular job at the same time.

"In the beginning, everybody on the project was doing process mapping, going on benchmarking trips, plus trying to do their regular jobs under the old system. Nobody had an extra seven hours a day to dedicate to re-engineering and benchmarking," he says.

As a result, everyone was working twice as hard, and it became difficult for employees to work on the benchmarking effort, Christiano says. Now, a 10-person cross-functional team, including two representatives from IS, work solely on re-engineering and benchmarking activities.

Jeffrey Jackson, a quality specialist at Pittsburgh-based Aluminum Co. of America, has reservations about including people "too close to tactical day-to-day operations" on a benchmarking team.

"It could become a job security issue. Their job could be eliminated or changed so there's an internal bias," Jackson says.

Like Christiano, he has learned that "typically, the first benchmarking team that sits down together is the wrong team. They're usually all from the same area. Until they map the processes and see who's involved, they don't have the right people," Jackson says.

Choosing the standard

Picking the right people also means picking the right companies to benchmark against.

Ironically, benchmarking against the best of the best can provide little benefit. High-performing firms are inappropriate role models for low performers.

"The practices that distinguish higher-performing organizations are almost always ineffective" when adopted by medium- or lower-performing organizations, according to a study on international quality practices conducted by Ernst & Young and The American Quality Foundation in New York and published in September 1992.

The study even found that benchmarking marketing and sales systems can have a negative impact on lower performers. Such firms will probably "find organizations on the threshold of medium performance, rather than world-class organizations, to be more helpful models," the study said.

But even when benchmarking against world-class companies makes sense, it's not always possible. Just because you want to benchmark with them doesn't mean they want to benchmark with you.

The most-sought-after benchmarking partner can be inundated with hundreds of inquiries a year. Some, like Pfizer, opt to streamline the benchmarking process by working only with a few select companies on a continual basis.

Norman Jenkins, director of quality at Baldrige Award winner Globe Metalurgical, Inc., complains that "people actually call us for our test methods that cost us hundreds of thousands of dollars to develop. We're not going to just mail you our test methods."

Following its receipt of the award in 1988, Globe Metalurgical, like all Baldrige winners, was obligated to share with other companies what it had learned about quality and how it won the award. The Cleveland-based specialty metals company, with annual sales of approximately $150 million, spent $1 million hosting seminars and making various presentations to meet its obligations as a Baldrige winner, Jenkins says.

"Now, our objective is to make a buck and not be a philanthropic quality organization to show everyone the right way to go," he says.

Willingness to change

All the benchmarking in the world won't transform a company if employees aren't willing to take the lessons of benchmarking to heart. But one point on which there seems to be some disagreement is how to motivate workers to achieve benchmarking goals.

Webber insists that achieving benchmarks should under no circumstances be tied to management firings or other personnel changes. The fear of not measuring up will kill any desire to benchmark, he says.

But AT&T has chosen to use the threat of outsourcing as an incentive. AT&T's 42 business units, which have headquarters in Morristown, N.J., have the option of go-

Benchmarking, *page 78*

HOW TO avoid the pitfalls of benchmarking

Don't spend time and money improving a process if it will do little to boost your company's bottom line.	Putting a dollar value on benchmarks works to assure buy-in for change from top management.
Don't benchmark when your company is undergoing a major management or computing change. Measuring performance under such conditions is impossible.	The best time is when you're planning to re-engineer an internal business process. The benchmark then [illegible] a target goal.
Don't benchmark unless you have the economic wherewithal to implement change.	It gives you the ability to diagnose and remedy the problems.
Don't expect to exactly copy the best practices of other companies. Benchmarking is not a copying process.	Other companies' best practices can be synthesized, and customized to work in your corporate culture.

CONSIDER THIS INCIDENT FROM THE ANNALS OF MOTOROLA

When Motorola's top executives established the company's first major quality goal back in 1981, they knew precisely what they wanted to change and to what degree. Or so they thought.

"Being run by engineers, Motorola is very metrics-oriented," explains Ken Okrzat, director of strategic programs for corporate software. "So we set a goal of tenfold improvement [in overall quality across the company] in five years."

In 1985, a year before its self-imposed deadline, Motorola knew it would meet its goals. But one big problem remained. After benchmarking with other companies the same year, "we realized we were still behind best-of-class," Okrzat recalls.

The Schaumburg, Ill.-based company then established new goals of improving a hundredfold between 1987 and 1992. After meeting that mark in 1989, Motorola set even more aggressive quality improvement goals.

The lesson learned: "No matter how good you think you are, you're not that good. If you're going to get better, you have to learn from someone who is better," Okrzat says.

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Mastering project management

IS PROS ARE SEEKING AND FINDING PROJECT MANAGEMENT TRAINING PROGRAMS

[redacted] oe Kolinger knows it takes more than just a title to be a true project manager. It means being a master of a business discipline.

"Project management is more than just scheduling," says Kolinger, a project manager at Pacific Bell's systems technology division in San Francisco. "A schedule isn't worth the paper it's printed on unless you've gone through the appropriate steps."

When properly applied to information systems development, the formal steps of project management can result in lower development costs and quicker delivery of systems.

Until recently, however, the IS community has expressed little interest in the discipline of formal project management, notes Gopal Kapur, president of the Center for Project Management, a San Ramon, Calif.-based education, training and consulting firm.

But interest is growing, and so is the number of resources available for IS professionals who wish to exchange ideas and information on formal project management as it relates to systems development.

Training — often leading to professional certification — has been the emphasis of most organizations addressing project management. Examples include the American Management Institute, the Institute for Certification of Computer Professionals and, most notably, the Project Management Institute (PMI).

PMI was founded in 1969 and developed one of the early models of formal project management, including curriculum and certification guidelines. The Upper Darby, Pa.-based firm sponsors two IS-related special interest groups, one for software developers and one for telecommunications specialists (see chart).

Of the larger IS professional associations, only the Association for Systems Management in Cleveland offers a course on project management. But IS professional organizations are stepping up their involvement in formal project management. Omicron, an IS consortium in Mountain Lakes, N.J., offers a project management seminar on demand.

The Chicago Research and Planning Group (CRPG), another regional IS consortium, plans to offer project management training sometime next year. Its members named project management as one of five education tracks they are most interested in seeing the CRPG develop, according to Richard Arns, CRPG president.

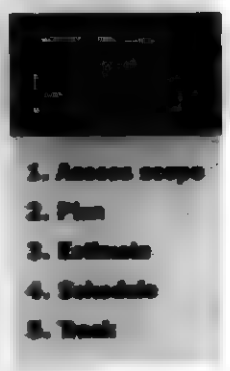
A wide variety of project management courses are available from consultants and training vendors, many of whom have alliances with PMI. A number of academic programs are also available (some accredited by PMI) — through both full-time enrollment and continuing education — such as Boston University's Center for Management Development, which offers a certification program requiring completion of five seminars.

The proliferation of these resources is no coincidence. More companies are adopting formal project management techniques in response to the high costs of runaway development projects, particularly over the course of the last few years as IS budgets were

Mastering, *page 78*

ORGANIZATIONS THAT CAN HELP

ORGANIZATION	SERVICES OFFERED	FEES	CONTACT
[redacted]	Provides project management training, including certification, for attendees who have completed three or more project management courses. Sponsors three-day introductory course for IS professionals, "Information Systems Project Management," 20 times/year across the U.S.	IS project management course: $1,150 members, $1320 nonmembers; AMA membership: $160/year individual, $350-$1,495/year corporate.	Registration: Doreen P. Waldman (518) 891-0065; membership: (212) 903-8270.
[redacted]	Cosponsors with its local chapters a three-day workshop, "Project Management & Control," aimed at analysts, programmer/analysts, senior programmers, project leaders, managers, engineers, auditors and user coordinators. Call for 1994 dates.	$820 for ASM members, $895 for nonmembers. Membership $100/year plus one-time $15 application fee for new members.	Paula Wenrod, Education Services (216) 243-6900, ext. 122.
[redacted]	Offers certification in different specialties, including IS management, which encompasses project management. Applicants must pass a broad core exam plus two specialty exams of their choice. Exams are computer-based and administered through Sylvan Learning Centers in 220 locations across North America.	Each exam $140; study manual, $69 (no membership fee).	Carolyn DuShane, communications director (708) 299-4227.
[redacted]	Nonprofit organization dedicated to advancing formal project management. Maintains two IS-related specific interest groups. Offers certification testing, sponsors 65+ local chapters in North America, hosts annual seminar symposium, conducts annual awards program. Offers accredited graduate education in project management through affiliations with universities across the U.S.	Each exam $140; study manual, $69 (no membership fee).	Carolyn DuShane, communications director (708) 299-4227.
[redacted]	Aimed at PMI members involved in software development. Conducts a technical track for presentation of papers on project management in IS and a group business meeting at PMI's annual symposium. Publishes a quarterly newsletter. Distributes a database of members detailing their technical backgrounds.	$15/year (must be a member of PMI; see listing above).	Julie Wilson, co-chair/treasurer (714) 640-3489 or call PMI (see number above).
[redacted]	Aimed at PMI members involved in all areas of telecommunications. Conducts a technical track for presentation of papers on project management in telecommunications and a group business meeting at PMI's annual symposium. Publishes a quarterly newsletter. Developing a benchmarking process that establishes standards for project management in telecommunications.	$15/year.	Wade Stome, membership (619) 588-9360. Send annual dues to Larry Simonson, treasurer, at address listed at left.



Joe Kolinger, a project manager at Pacific Bell's systems technology division in San Francisco

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* International Data Corporation,
"Data General's Ascent in the UNIX Market" October 1993
** "The CW Guide to Servers," Computerworld, March 22, 1993
*** "Clash of the Drive Arrays," PC Week, October 11, 1993
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Benchmarking

CONTINUED FROM PAGE 74

ing to an outside provider for services such as payroll processing if the company's own accounting department doesn't meet prescribed benchmarks within five years after they are set.

"This puts an incentive on providers of services," says Tom Heslin, manager of benchmarking and comparative analysis for finance. So far, he says that all of AT&T's financial processes have cut costs and reduced personnel as a result of benchmarking.

Alcoa has chosen to use carrots instead of sticks: It has made dramatic gains by tying benchmarking targets to performance pay increases for managers as well as unionized and nonunion employees.

In 1991, managers were directed to choose several benchmarks and then were given two years to close existing gaps by 80%. Employees and managers were eligible for large bonuses, up to 22% of base pay, if they met Alcoa's benchmarking goals.

"The result was that most businesses have been able to close the gap," Jackson says.

What's the bottom line when it comes to avoiding the hidden dangers of benchmarking? Take a tip from Ken Obrzut, director of strategic programs for corporate software at Motorola, Inc. in Schaumburg, Ill.: "Everyone wants to know 'What's in it for me?' " Without proper preparation and incentives, your benchmarking experience can resemble the aimless ramblings of a tourist without a road map.

King is a free-lance writer in Ridley Park, Pa.

Mastering

CONTINUED FROM PAGE 76

hit by the recession. "The cost of software development is too expensive to continue to exist as we know it," Kolinger says.

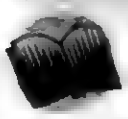
"To get control of our growing portfolio of critical projects that will help us turn a profit, we have to cut down on rework, learn better how to do things right the first time, learn better how people can be most efficient and spend time on the stuff that counts," he says.

Kolinger, whose company offers internal and external project management training, says the implementation of project management techniques may be essential to the longevity of any IS staff.

With more control over their work, employees will be more satisfied with their own jobs and the work environment — and that is a major victory in itself.

"Frankly," he says, "lots of people are getting burned out. One thing that motivates me is that I'm tired of the tyranny of runaway projects and what they do to people's lives, let alone the company."

Goff is a free-lance writer in New York.



ESTIMATING MIS PROJECTS by Gopal Kapur, Center for Project Management, San Rafael, Calif., $79. Details algorithms and processes behind task-based estimating and uses exercises and anecdotes to analyze both successes and failures in project estimating; available from the Center for Project Management, 1 Annabel Lane, Suite 108, San Ramon, Calif. 94583 (510) 275-8000.

IMPLEMENTATION OF PROJECT MANAGEMENT by Lian C. Steckenbruck (Addison-Wesley, Reading, Mass., 1981) $37.95. Outlines project management techniques; available from the Project Management Institute (see chart page 75).

THE MYTHICAL MAN-MONTH: ESSAYS ON SOFTWARE ENGINEERING by Frederick P. Brooks Jr. (Addison-Wesley, Reading, Mass., 1975) $23.75, paperback. Classic source on project management concepts written by former IBMer following a runaway development project.

PROJECT MANAGEMENT by Dr. Harold Kerzner (Van Nostrand Reinhold, New York, fourth edition 1992; originally published 1979) $54.95. Outlines basic project management concepts.

Calendar

JAN. 16-JAN. 22

Storage & Interfaces '94 International Technology Conference. Santa Clara, Calif., Jan. 19-27 — Nine separate but related forums and seminars will be offered during these dates. Contact: Technology Forums, St. Peter, Minn., (507) 931-0967.

Client/Server Conference & Exposition. San Jose, Calif., Jan. 18-21 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-7460.

NOMDA/LANDA Emerging Technologies Expo '94. Orlando, Fla., Jan. 20-22 — Contact: National Office Machine Dealers Association/Local Area Network Dealers Association (NOMDA/LANDA), Kansas City, Mo. (816) 941-3100.

Re-engineering: The Implementation Perspective. Boston, Jan. 19-21, also to be offered Feb. 9-11 — Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

JAN. 23-JAN. 29

Demo '94. Palm Springs, Calif., Jan. 23-26 — Features new products. Contact: InfoWorld Editorial Events, San Mateo, Calif. (415) 312-0545.

Comdex '94. Washington, Jan. 24-27 — Focus will be on companywide issues. Sponsored by *Computerworld* and *Network World*. Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Fourth Annual "Achieving Quality Software" Tutorial and Conference. San Diego, Jan. 26-28 — Speakers include Barry Boehm, University of Southern California, and Ron Radice, director of the Software Process Program. Contact: Vince Heald, Beck-Eilman Agency, La Mesa, Calif. (619) 469-3500.

10th International Conference on Engineering Information Systems: Product Data Management & Alternatives. Dallas, Jan. 26-28 — Contact: Management Roundtable, Boston, Mass. (617) 232-8080.

JAN. 30-FEB. 5

14th Annual Florida Educational Technology Conference. Tampa, Fla., Jan. 31-Feb. 4 — Contact: Bureau of Educational Technology/Florida Education Center, Tallahassee, Fla. (904) 488-0980.

Executive Technology Summit '94. Sponsored by The Society for Information Management and *Computerworld*. Tarpon Springs, Fla., Feb. 2-4 — Contact: ATI Travel Management, Chicago, Ill. (312) 644-6642.

FEB. 6-FEB. 12

Building Enterprise Architectures. Washington, Feb. 8-10 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

FEB. 13-FEB. 19

Sigda: Workshop on Field Programming Gate Arrays. Berkeley, Calif., Feb. 14-15 — Contact: Association for Computing Machinery, New York, N.Y. (212) 944-1318.

The Sixth Annual Software Support Conference. San Francisco, Feb. 14-16 — Contact: Jan Rosenthal, Institute for International Research, New York, N.Y. (212) 661-3500.

Mobile World. Dallas, Feb. 15-17 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Distribution/Computer Expo '94. West Irvine, Calif., Feb. 16-17 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

Concepts '94. Orlando, Fla., Feb. 16-19 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

FEB. 20-FEB. 26

Share Winter 1994. Anaheim, Calif., Feb. 20-25 — Contact: Share, Inc., Chicago, Ill. (312) 822-0932.

Documation '94 Conference & Exposition. Los Angeles, Feb. 21-25 — Contact: Graphic Communications Association, Alexandria, Va. (703) 548-2987.

MacFair '94. New York, Feb. 26 — Contact: New York MacUsers' Group, Inc., New York, N.Y. (212) 473-1600.

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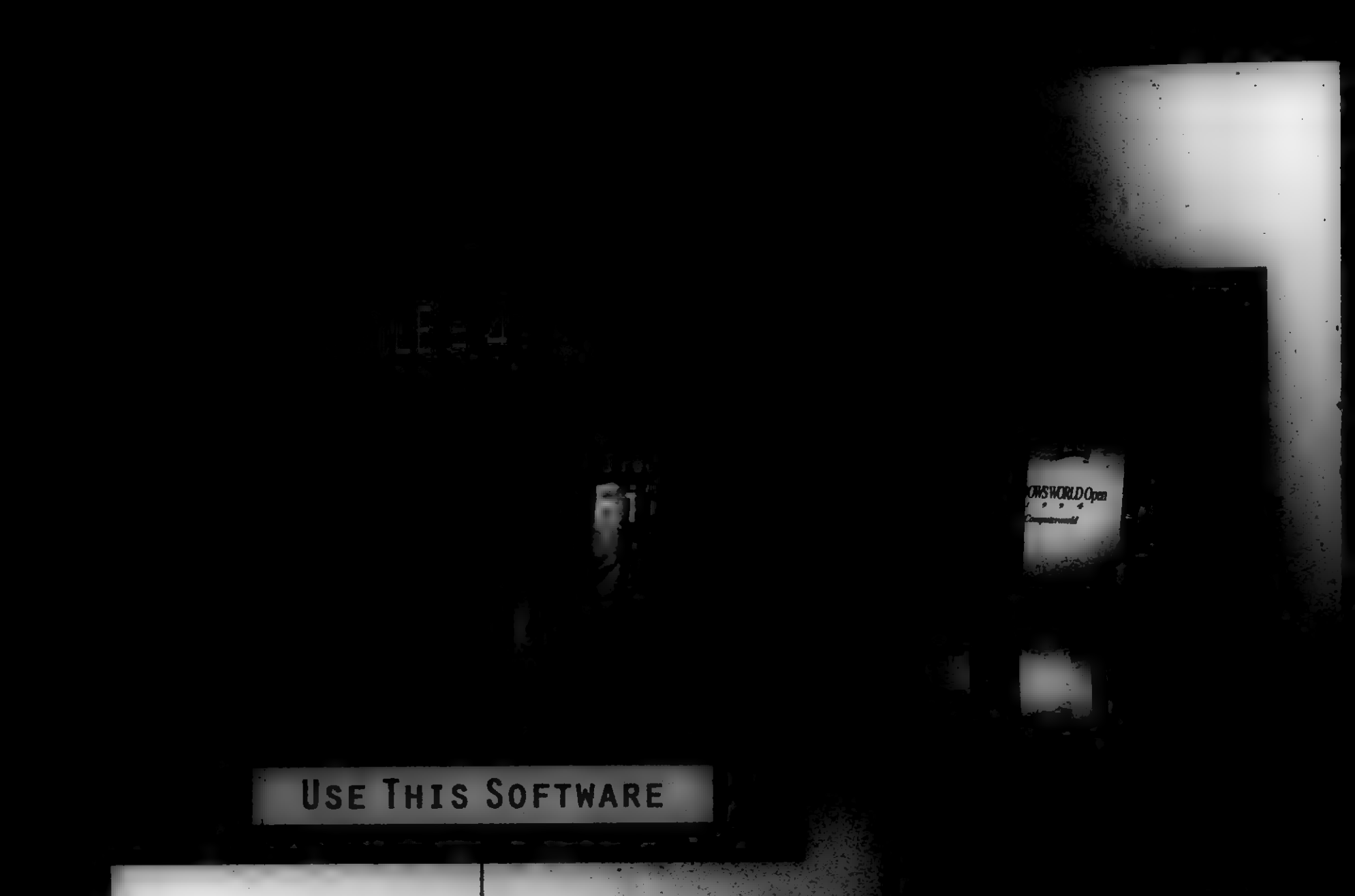

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DIRECTORY OF 1993

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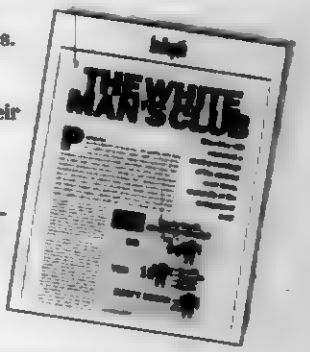

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12• IS chiefs defend their use of foreign programmers. By Gary Anthes

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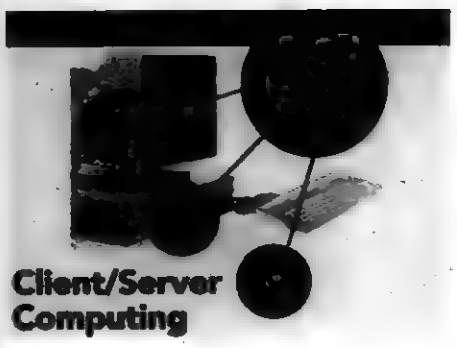

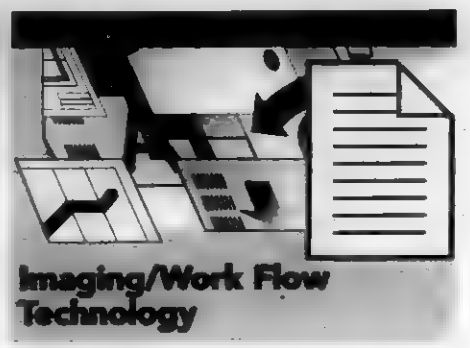

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managers play it cool

IS staffs respect technical proficiency but want managers with a hands-off approach

By Julie Hart

Without a doubt, most information systems professionals — management and staff alike — agree that middle managers need to stay abreast of technologies to be effective managers.

"Any professional manager in information technology that doesn't stay current won't succeed," says James F. Sutter, vice president of corporate IS at Rockwell International Corp. in Seal Beach, Calif.

This doesn't mean, however, that a working knowledge is required. In fact, in many cases, direct reports want their managers to steer clear of hands-on technical tasks and maintain a purely conceptual understanding of technology.

Knowing the issues

"I don't do programming, but I can if I need to," says Ed Smith, systems manager at American Express Travel Related Services Co. in Fort Lauderdale, Fla. Instead, Smith concentrates on providing his 12 programmers with the resources they need and removing any roadblocks. "What's most important for me as a manager is to know the issues so I can address them," he said.

Still, managers say you should not rule out detail-level knowledge altogether. For instance, Joe Podolsky's staff at Hewlett-Packard Co. in Palo Alto, Calif., recently built a set of client/server applications. When a debate arose regarding the division of modules between server and client machines, Podolsky's working knowledge of client/server technology helped move development ahead.

"I examined various data models and made suggestions," says the planning and quality manager. Podolsky also offered advice on the cost of data transmission over the network, pointing out potential savings. Ultimately, the programmers agreed on a solution and completed the project.

Hank Taylor, network services manager at HP, heads a group of 300 people dedicated to developing and providing network services such as voice, data and electronic data interchange.

While Taylor requires his management team to stay current on technical issues, he doesn't expect them to perform technical duties such as network reconfigurations or programming. "As you go down in an organization, the technical skills get stronger," Taylor says.

Understanding technology

Smith says this approach is becoming more prevalent at American Express. "Because we give our staff the ability to empower themselves, we trust that they know what they're doing [technically]. My job is to lead my staff. To do this well, it's important that I have an understanding of the technology they're working with."

To keep up in a fast-paced environment, Smith relies on his group's training department, which offers technical managers custom courses that provide an overview of specific technologies, rather than hands-on training.

For example, Smith can take courses in Information Engineering Facility, DB2, PCs and client/server. His staff attends more detailed versions of the same courses.

Beyond workshops and trade magazines, managers say their staffs are the most important resource for keeping up with technology.

"I don't handle hands-on troubleshooting or development," Sutter says. "My managers typically don't either, but I expect them to be as current as possible in their area of management. If you stay close to your staff, you'll stay close to the issues."

Hart is a free-lance writer in Santa Clara, Calif.

Opinions from the ranks

Direct reports want a coach, not a techie

"My boss has a lot of technical skills, which is helpful. I can't see someone who has never programmed before managing a technical department. If we get stuck we can go to him, but he doesn't tell me how to do my job. His biggest job is helping us how to prioritize our tasks."

Regera Smith, programming and operations coordinator, City of Tempe, Ariz.

"My ideal manager is a person that gives me a reasonable amount of time to get the job done and allows me to work out problems on my own. Mine does both. If my manager wanted to get involved in hands-on work, we might have some conflicts since there are always two ways to program. And if my manager were technical he might not delegate as much and might get in the way of my job."

Glen Case, senior programmer, Davies Cab Co., Solon, Ohio

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JOB Defense

By Leslie Goff

If you can't justify your job, you had better learn to. Any information systems position is subject to review, and the hardest jobs to make a case for are those that don't make an immediate, visible impact on the bottom line.

Positions often perceived as overhead include systems planner, advanced technologies researcher, standards planner and IS trainer. These jobs are critical to maintaining effective service levels but their value to the company is difficult to communicate.

Defending your position

"In IS, jobs are somewhat more difficult to defend than in other areas because they are positions that not everyone understands," says Robert M. Rubin, vice president of IS at Elf Atochem North America in Philadelphia and president of the Society for Information Management.

Most often, managers are the ones who must defend a position, but many agree that it's a two-way street. IS staffers must be willing to assume responsibility at lower levels within the company and prove their own value through hard work. "The days of having staff who just wait to be told what to do are gone," says Bob Cerny, manager of advanced development at Elkay Manufacturing Co. in Oakbrook, Ill. "We need people who are self-starters, who will go out and determine what needs to be done and do it."

Moreover, staffers must develop the skills that make them indispensable. Don Tabler, an advisory systems planner at IBM's Integrated Systems Solutions Corp. in Chicago, says IS staffers were nervous when his former employer, Continental Bank Corp., announced it was evaluating bids to outsource its IS function. Continental's chairman told them to "do whatever makes you marketable, and you will always have a job," Tabler recalls. "After that, when the bank asked me to do something, I would evaluate whether it would make me more marketable," Tabler says. "Sometimes I would say no to things like working with older technologies that were not particularly valuable anymore."

Now Tabler serves his former employer as part of ISSC's outsourcing service. He is developing OS/2 applications and helping to develop the company's network.

What's your contribution?

Both staff and management must understand how a position contributes to the bottom line and find ways to communicate that to business management. One approach is to be prepared to explain the consequences of not having the position in place, Rubin says. This strategy works particularly well for defending systems planner and advanced technology research and development positions.

Cerny says he justifies research and development staff by creating a picture of what the company would look like after a few years without them. "I can assure you that our competitors are looking at what will come out in five years and, if we're not equipped to be on top of that, they will be," he says. "People looking at what's in the labs today are cogitating how we can use it in the future."

Good offense is best defense

Taking the tack that the best defense is a good offense, Dorothy Deran, director of IS development at Syntex Corp. in Palo Alto, Calif., says she tries to justify IS positions within the context of each project estimate she delivers.

Deran, who is also president of the Data Processing Managers Association, says project estimates share a common problem in that they cover what is needed to build a system but seldom take into account what is needed to support it. "I try to identify [positions] as part of the baseline support required to keep the project and the applications current with the business environment."

For instance, it may be difficult to convince management that IS needs a dedicated training staff if a corporate training department is in place. However, IS trainers may be essential to effective baseline support.

Keeping statistics

Another part of a good offense is to keep statistics whenever possible, Rubin says. For instance, his IS staff includes a position responsible for IS contract negotiations and evaluations. The job involves researching industry pricing trends and keeping current with past contracts.

"We can document the amount of money we save by going back through our contracts, and this person has saved us a tremendous amount of money," Rubin explains.

The final word on making an IS position pertinent to the corporate bottom line, Rubin says, is to always ask yourself the hardest questions and be prepared to answer them. "It's like a baseball player swinging a leaded bat in the on-deck circle," Rubin says. "When he gets up to the plate, the real bat seems pretty light."

Goff is a free-lance writer in New York.

OFFENSIVE Strategy

If your job is under scrutiny, be prepared to prove that it contributes to the company's bottom line.

- Develop a picture of what happens when the position is eliminated.
- Identify the trade-off to management in concrete terms.
- Keep track of how much money you save the company.

ROBERT M. RUBIN, vice president of IS at Elf Atochem North America in Philadelphia, recommends using an example similar to the following when preparing your case:

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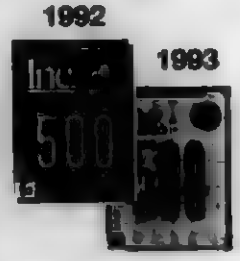

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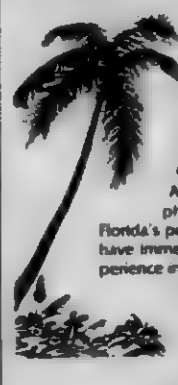

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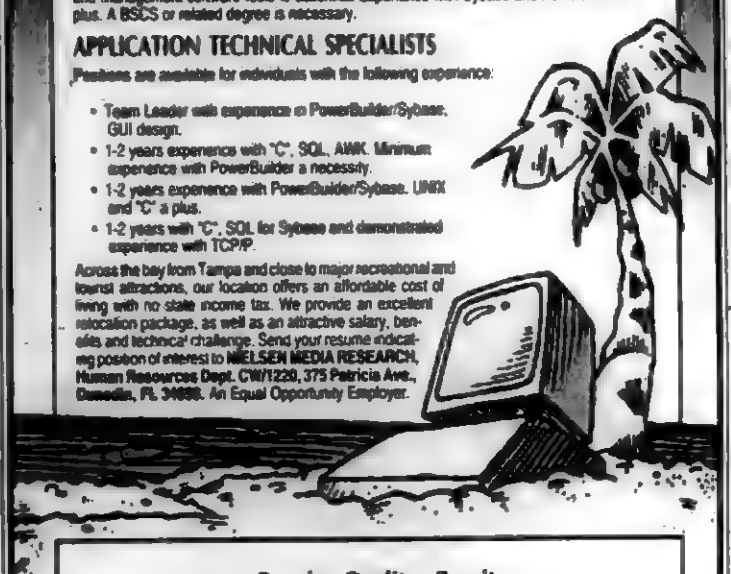

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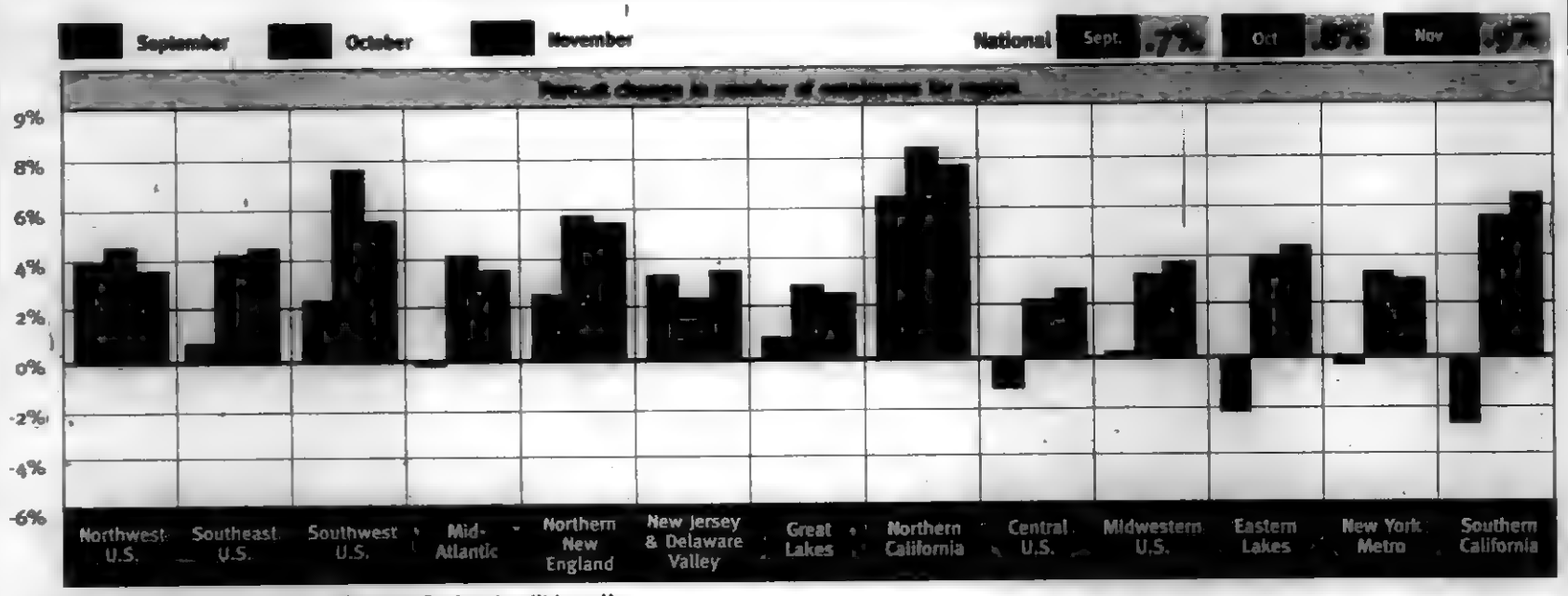
Computerworld/CorpTech Career Index

For most regions, September showed the lowest percentage change in employees



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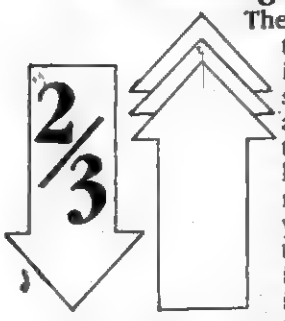
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

For every 10 of today's computer job seekers . . .
2 are Active ☐ ☐
7 are Passive ☐ ☐ ☐ ☐ ☐ ☐ ☐
1 is a Non-mover ☐

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 629,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

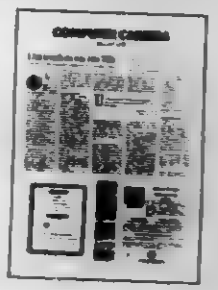
Computerworld needs just 2 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional rate of just $199.42 per inch, your cost-per qualified candidate reached is better than any newspaper. Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad



Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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"In computer trade press advertising, Computerworld Direct Response Cards are first in quantity and quality - and lowest in cost per qualified lead."

- Charles A. Mills
President
Firesign Computer Company

Firesign Computer Company is a data communications software developer with 17 years in the business. Having tripled in size during the past two years, this San Francisco-based company retains rep firms on the East Coast and in Europe to service a worldwide customer base that extends as far as Australia and New Zealand. For President Chuck Mills, finding new sales prospects for the company's flagship product Outbound means advertising in *Computerworld Direct Response Cards* every month.

"Outbound's claim to fame is unattended file transfer. Supporting MVS and VM mainframes and OS/2, DOS, and Windows PC networks, it is the only product whose main thrust is unattended mainframe-to-PC file transfer. Virtually invisible to the PC user, Outbound saves time, provides flexibility, and eliminates training - all while automatically ensuring consistent reliability.

"By its very nature, Outbound has a cross-industry and cross-functional appeal, with potential users ranging from mainframe network software managers to information center professionals to project analysts. So when it comes to targeting our audience, we need a broad-spectrum advertising vehicle with a broad reader base. It's no surprise, then, that *Computerworld Direct Response Cards* have proven to be our best choice.

"In computer trade press advertising, *Computerworld Direct Response Cards* are first in quantity and quality - and lowest in cost per qualified lead. They consistently generate over 70 responses every month - and a full two-thirds are very qualified leads. Some months, we've even received as many as 120 responses. On a cost-per-lead basis, *Computerworld Direct Response Cards* are also our best value dollarwise.

"As an added benefit, I see *Computerworld Direct Response Cards* having an equalizer effect. Here, unlike other advertising vehicles, companies with smaller advertising budgets like ours stand out and make just as big an impact as much larger companies. *Computerworld's* large circulation also gives us reach to the right cross-section of potential buyers. And, since we continue to receive responses for many weeks after each deck hits, we obviously benefit from both a long shelf life and an active pass-along readership.

"As long as *Computerworld Direct Response Cards* remain our top lead generator, we'll definitely maintain our advertising presence in every deck. Looking ahead, I also foresee expanding our *Computerworld Direct Response Card* advertising should we develop a new data communication software product requiring similar exposure."

Computerworld Direct Response Cards give you a cost-effective way to reach *Computerworld's* powerful buying audience of over 135,000 computer professionals. Every month. They're working for Firesign Computer Company - and they can work for you. Call Norma Tamburrino, National Account Manager, Computerworld Direct Response Cards, at (201)587-0090 to reserve your space today.

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PURCHASE *plight*

Experiences from the trenches based on 20/20 hindsight

By Joe Panepinto

The art of making a deal comes by way of experience. Only after you purchase do you learn how to do it right. While buying strategies for hardware and software depend on many things, the experiences of others can help streamline your negotiations. In the following examples, customers explain what they would have done differently.

20/20 Talk with other customers

Ramon Padilla, information systems manager for Jefferson County in Louisville, Ky., was not promised the moon, he was promised something worse — a voice-processing system that did not exist. Discussions with a salesman and an examination of the marketing literature on the system confused the features of two models of the system so badly that Padilla expected the system he ordered to have a combination of features that did not exist.

"I learned that the bill of goods a salesman sells you and the product that is delivered is not always the same thing," Padilla says. "I didn't talk to other people who already had one of these systems in place. They did a good snow job on me; what can I say?"

20/20 Have only one contact

A potentially more costly mistake almost occurred because the county had more than one point of contact for the project. Padilla placed a large order that included maintenance services, but he let his purchasing department negotiate the price. When the vendor called Padilla to deliver the equipment, it said it was charging for shipping costs. However, Padilla checked with purchasing and found that the shipping charges were included in the price. Leslie Tomac, IS manager at Source One in Denver, agrees. "Establish an honest relationship with more than one vendor that is competent" Tomac says. "Your single contact doesn't have to be a techie, but you do have to be able to rely on them."

Padilla has also found that when ordering from the larger mail-order houses, shipping charges are often negotiable. He now restricts his mail-order dealings to companies "that have been around a while and have a good return policy," he says. Depending on what is being delivered, he has managed to get shipping fees waived for orders under $1,000. "I haven't been burned by mail-order at all," Padilla says. "Maybe that's why I'm not afraid to hit the mail-order catalogs."

20/20 Consult on-line services

You can also find good buying information on CompuServe forums. For instance, sometimes Padilla will post a question about a particular product; other times, he just reads the threads to find out about complaints customers have about certain vendors.

20/20 Do your own testing

Perhaps Shelton Levert, IS manager in the Cuyahoga County Prosecutor's Office in Cleveland, should start logging on to on-line services because he has had little luck asking vendors directly.

Levert recently purchased a bar-code system for file scanning without checking with offices that had similar systems. The vendor's pitch sounded good and its knowledge of the software and systems requirements was impressive, so Levert gave it the job. Once the system was in, however, Levert's users started to find problems with the system that the vendor had not mentioned.

"We learned only after the system was up and running some of the things a little homework would have helped us find — the ink on the labels rubbed off, there are different types of labels and wands that would have suited our purposes better, stuff like that," Levert says.

It has been a lesson well learned. Levert doesn't even trust other users of a system to give him accurate information.

"Someone tells you a product is good, and you trust them because you think they're knowledgeable," Levert says. "But it turns out they are only knowledgeable about one product — the one they are using."

Panepinto is a free-lance writer in Amherst, Mass.

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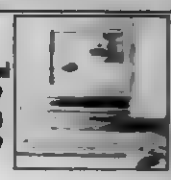

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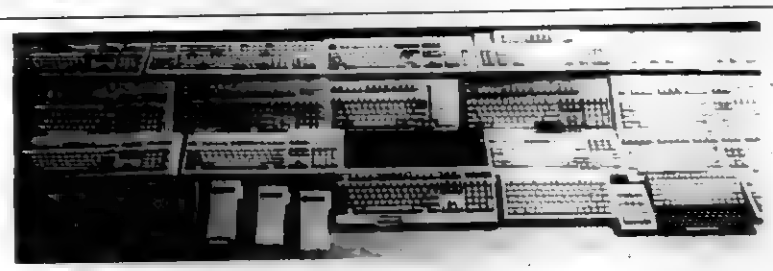

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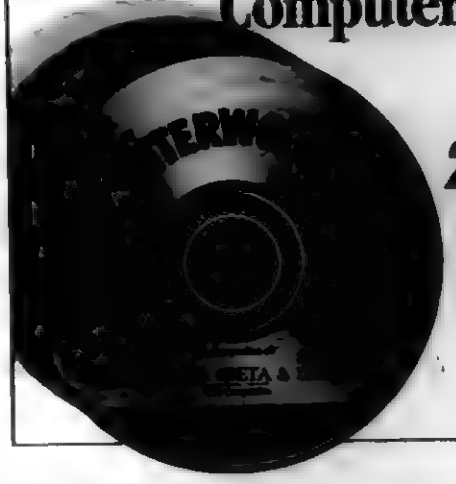

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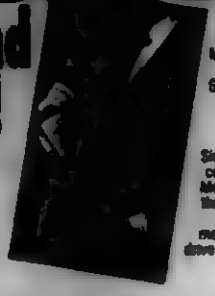

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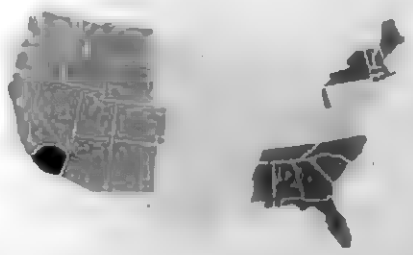

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Computervision Corp.	19.2	Iomega Corp.	-17.3
American Software Inc. (L)	16.7	Wyse Tech	-16.2
Network Computing Devices (L)	16.0	Cambex Corp.	-13.5
Policy Management Sys.	15.5	Software Toolworks Inc.	-12.5
Parallan Computer	14.9	Micro Focus	-12.1

Dollar

IBM	4.75	CompUSA Inc.	-4.63
Lotus Development	4.50	SynOptics	-4.50
Compaq Computer Corp.	4.13	Inacom Corp.	-4.00
Matsushita Electronics	4.00	Progress Software Corp.	-3.75
Policy Management Sys.	4.00	Reynolds and Reynolds (D)	-3.00
3M Corp	4.00	Mentor Graphics (M)	-2.50
Paychex	3.50	Boole & Babbage	-2.25
Zilog Inc.	3.25	Picturetel Corp.	-2.25

Compaq discontinued its unprofitable printer business this week, while 3Com Corp. confirmed its excellent quarterly results and announced the acquisition of switching technology vendor Synernetics.

The big score

If you put $1,000 into Microsoft Corp. (MSFT) stock on the last day of 1988, your holdings are worth about $7,250 today. Not bad.

Other leading information technology stocks have also done well in that five-year period, though most don't stack up to Microsoft's phenomenal returns. The same amount put into either Computer Associates International, Inc. (CA) or Compaq Computer Corp. (CMPQ), for example, would have yielded a gain of about $1,500.

Of course, in 1993 it is easy to pick Microsoft out of the 1988 pack, but hindsight nets nothing in real dollars. The challenge is to sort through the myriad current choices and pick out the big winner for the *next* five years.

Wall Street analysts said finding overall markets that have room for explosive growth is the first key; management teams and business fundamentals take a backseat. Despite Microsoft founder Bill Gates' business acumen, "we wouldn't be sitting here talking about Microsoft if the PC software market hadn't ballooned the way it did," said James Kedersha, vice president of institutional research at Cowen & Co.

"Obviously, though, it's a combination of things. Even in a great market, bad management can snatch defeat from the jaws of victory," Kedersha said.

—Derek Slater

Many happy returns

Microsoft's stock has dramatically outperformed many other big names in the industry during the past five years

Company	Investment 12/30/88	Current value
Microsoft Corp.	$1,000	$7,250
Computer Associates International, Inc.	$1,000	$2,588
Compaq Computer Corp.	$1,000	$2,495
Wordstar International, Inc.	$1,000	$514
IBM*	$1,000	$439

Current values calculated as of mid-December 1993

*IBM's current value does not include the stock's accumulated dividend for five years

Source: Nordby International, Inc., Louisville, Colo.

Exch	52-Week Range			Dec. 17 Wk Net 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						
OTC	47.75	19.63	3 COM Corp. (H)	47.75	2.88	6.6
NYS	91.13	69.88	American Info Techs Corp.	78.25	1.88	2.5
NYS	65.00	49.38	AT&T	54.63	0.13	0.2
OTC	4.44	0.94	Aptel Communication Corp.	1.19	0.00	0.0
OTC	26.50	12.50	Banyan Systems Inc. (H)	25.38	-0.13	-0.5
NYS	69.13	49.25	Bell Atlantic Corp.	60.25	0.88	1.5
NYS	63.88	50.38	BellSouth Corp.	57.50	0.63	1.1
NYS	14.75	4.25	Bolt, Beranek & Newman	12.88	0.38	3.0
OTC	18.50	9.50	Brooktrout Technology	13.00	-0.75	-5.5
NYS	119.00	74.50	Cabletron Systems	110.88	-0.25	-0.2
OTC	36.50	11.25	Centigram Communications	30.00	2.50	7.5
OTC	55.50	23.25	Comcom Corp.	45.00	1.38	3.2
OTC	62.25	35.88	Cisco Systems Inc.	60.13	0.88	1.5
OTC	18.38	8.00	Compression Labs Inc.	12.63	-0.50	-3.8
OTC	36.00	22.00	CrossComm	27.13	-2.13	-7.3
OTC	4.63	1.50	Data Switch Corp. (L)	1.69	-0.06	-3.5
OTC	11.75	3.50	Digital Systems Int'l Inc.	3.63	0.06	1.7
OTC	73.13	10.38	DSC Communications	57.88	-1.25	-2.1
OTC	9.50	4.75	Fibronics Int'l Inc.	5.13	0.00	0.0
OTC	6.38	1.75	Gandalf Technologies Inc.	2.56	-0.06	-2.4
OTC	2.06	0.69	Gateway Communications	0.91	0.03	3.5
NYS	15.75	5.63	General Datacomm Inds.	9.38	0.13	1.4
ASE	3.63	2.00	Go Video	2.69	-0.19	-6.5
NYS	39.88	33.75	GTE Corp.	35.88	0.13	0.3
NYS	94.75	69.00	ITT Corp.	93.00	0.00	0.0
OTC	29.88	18.81	MCI Communications Corp.	26.25	1.50	6.1
OTC	6.50	1.50	Microcom Inc.	4.63	-0.38	-7.5
OTC	24.25	3.50	Netix Corp.	6.00	0.00	0.0
OTC	19.00	6.25	Network Computing Devices (L)	7.25	1.00	16.0
NYS	11.50	5.38	Network Equipment Tech.	8.88	-0.13	-1.4
OTC	20.13	8.00	Network General	16.75	1.25	8.1
OTC	13.50	6.88	Network Systems Corp.	8.50	-0.63	-6.8
OTC	73.88	19.13	Newbridge Networks Corp.	52.13	-0.75	-1.4
NYS	46.00	31.38	Northern Telecom Ltd.	29.38	-0.25	-0.8
OTC	35.25	17.00	Novell Inc.	20.00	-0.38	-1.8
NYS	48.88	40.31	Nynex Corp.	41.13	-0.50	-1.2
OTC	30.00	19.00	Octel Communications Corp.	27.00	1.75	6.9
OTC	6.13	3.75	Penril Data Comm Networks	6.13	0.06	1.0
OTC	30.50	14.50	Picturetel Corp.	18.25	-2.25	-11.0
OTC	11.50	3.63	Proteon Inc.	6.75	-0.50	-6.9
NYS	38.88	17.75	Scientific Atlanta Inc.	32.50	0.88	2.8
NYS	47.00	34.19	Southwestern Bell Corp.	43.13	0.50	1.2
NYS	40.25	25.13	Sprint Corp.	32.63	0.25	0.8
OTC	27.00	12.50	Standard Microsystems Corp.	25.75	0.88	3.5
OTC	19.75	10.25	Stratacom Inc.	16.75	-0.50	-2.9
OTC	42.75	20.00	Synoptics Communications	27.25	2.75	11.2
OTC	9.88	2.88	Telebit Corp.	7.13	0.00	0.0
OTC	17.88	5.13	Telematics Int'l Inc.	14.75	-1.00	-6.3
OTC	35.25	17.00	US Robotics	28.00	0.25	0.9
NYS	50.75	37.75	US West Inc.	46.50	0.13	0.3
OTC	65.00	29.50	Wellfleet Communications	62.25	-0.13	-0.2
OTC	19.50	7.25	Xircom	14.50	-1.00	-6.5
Personal Computers						
OTC	5.56	2.50	Advanced Logic Research	3.25	-0.13	-3.7
OTC	65.25	22.00	Apple Computer Inc.	29.63	1.38	4.9
OTC	25.50	12.75	AST Research Inc.	23.25	1.25	5.7
NYS	7.75	2.50	Commodore Int'l.	3.38	0.00	0.0
NYS	74.50	41.75	Compaq Computer Corp.	74.50	4.13	5.9
OTC	49.88	13.50	Dell Computer Corp.	24.63	1.63	7.1
NYS	89.25	64.38	Hewlett Packard Co.	77.88	3.25	4.4
NYS	23.38	11.75	Silicon Graphics	22.75	0.56	2.5
OTC	41.00	21.13	Sun Microsystems Inc.	27.00	0.50	1.9
NYS	48.13	24.63	Tandy Corp.	48.13	1.63	3.5
OTC	7.00	2.50	Zeos International Ltd.	3.75	0.25	7.1
Large Systems						
ASE	8.50	4.38	Amdahl Corp.	6.63	0.50	8.2
NYS	8.75	3.63	Convex Computer	6.00	0.75	14.3
OTC	5.13	2.13	Cray Computer	2.13	-0.13	-5.6
NYS	30.88	20.38	Cray Research Inc.	25.75	-0.38	-1.4
NYS	13.88	7.75	Data General Corp.	8.63	-0.75	-8.0
NYS	49.25	30.38	Digital Equipment Corp.	35.38	0.38	1.1
NYS	47.38	32.88	Harris Corp.	45.50	-0.63	-1.4
NYS	59.63	40.63	IBM	59.63	4.75	8.7
OTC	25.75	5.25	Kendall Square Research	5.88	-1.38	-19.0
NYS	141.50	87.00	Matsushita Electronics	138.50	4.00	3.0
OTC	23.75	12.75	NetFrame	16.25	-1.00	-5.8
OTC	26.00	9.25	Parallan Computer	14.50	1.88	14.9
OTC	23.25	9.50	Pyramid Technology	14.25	1.00	7.5
OTC	24.00	11.25	Sequent Computer Sys.	14.50	-1.38	-8.7
OTC	6.00	1.38	Sequoia Systems Inc.	4.25	0.00	0.0
NYS	61.25	20.25	Stratus Computer Inc.	29.13	-0.38	-1.3
NYS	16.88	8.50	Tandem Computers Inc.	10.38	-0.88	-7.8
OTC	28.50	10.63	TriCord Systems	26.50	-0.75	-2.8
NYS	13.88	9.88	Unisys Corp.	12.75	1.38	12.1
Software						
OTC	37.00	14.88	Adobe Systems Inc.	21.50	-0.38	-1.7
OTC	25.25	12.50	Aldus Corp.	23.38	1.50	6.9
OTC	9.25	5.13	American Software Inc. (L)	6.13	0.88	16.7
OTC	28.13	9.50	Ask Computer Systems	14.25	0.00	0.0
OTC	56.75	37.00	Autodesk Inc.	44.00	0.50	1.1
OTC	6.50	2.38	Bachman Info. Systems	2.94	-0.06	-2.1
OTC	42.00	24.00	BGS Systems Inc.	26.25	0.50	1.9
OTC	84.13	38.75	BMC Software Inc.	49.00	0.50	1.0
OTC	28.25	20.38	Boole & Babbage	24.00	-2.25	-8.6
OTC	27.25	12.75	Borland Int'l Inc.	15.50	0.50	3.3
OTC	4.63	2.75	CE Software	3.56	0.19	5.6
ASE	40.25	16.63	Cheyenne Software Inc.	29.63	-0.38	-1.3
OTC	19.50	8.25	ChipSoft (H)	17.13	-0.13	-0.7
OTC	10.75	5.63	Cognos Inc. (H)	10.38	0.50	5.1
NYS	44.25	19.50	Computer Associates	40.13	-0.50	-1.2
NYS	8.50	2.13	Computervision Corp.	3.88	0.63	19.2
OTC	34.25	19.25	Computrade Corp.	26.00	-1.00	-3.7
OTC	14.25	5.75	Consilium Inc.	10.75	0.63	6.2
OTC	20.38	5.38	Corel Corp.	19.50	0.50	2.6
OTC	15.25	3.63	Easel Corp.	4.50	0.75	20.0
OTC	23.00	8.25	Falsoft Corp.	18.50	-1.25	-6.3
OTC	25.25	15.75	4th Dimension	20.50	-0.50	-2.4
OTC	19.25	5.25	Frame Technology	8.88	-0.88	-9.0
OTC	17.50	8.00	Group I Software	8.00	-1.00	-11.1
OTC	35.25	13.50	Gupta	16.75	0.63	3.9
OTC	12.00	5.25	Hogan Systems Inc.	9.25	-0.50	-5.1
OTC	27.75	11.25	IMRS	25.75	1.50	6.2
OTC	44.75	27.00	Information Resources	38.50	-0.25	-0.6
OTC	27.25	13.38	Informix Corp	18.75	-0.13	-0.7
OTC	14.00	8.50	Intergraph Corp.	9.50	-0.38	-3.8
OTC	13.63	4.88	Interleaf Inc.	6.88	-0.13	-1.8
OTC	15.25	4.75	Intersolv Inc.	10.25	0.00	0.0
OTC	18.75	7.75	Knowledgeware Inc.	18.50	0.25	1.4
OTC	54.75	15.50	Lotus Development	54.50	18.75	Lotus Development
OTC	23.00	4.25	Mathsoft	6.25	0.50	8.7
OTC	20.25	4.50	McAfee Associates	9.25	2.25	32.1
OTC	11.63	4.38	Meca Software	4.38	0.00	0.0
OTC	15.50	7.63	Mentor Graphics (H)	14.63	0.75	5.4
OTC	46.00	13.63	Micro Focus	13.63	-1.88	-12.1
OTC	13.25	4.38	Microprose Inc.	6.88	0.13	1.4
OTC	98.00	70.38	Microsoft Corp.	80.00	1.38	1.7
OTC	37.75	9.44	Oracle Corp. (H)	14.88	-0.75	-2.1
OTC	44.75	27.50	Parametric Technology	39.75	-0.25	-0.6
OTC	40.50	23.50	Peoplesoft	31.00	1.63	5.5
OTC	7.13	3.50	Phoenix Technologies	3.88	0.00	0.0
OTC	40.00	22.00	Powersoft	36.25	1.88	5.5
OTC	39.75	13.50	Platinum Software	27.25	-1.63	-5.6
OTC	25.00	7.25	Platinum Technology	9.75	0.38	4.0
OTC	60.25	32.25	Progress Software Corp.	47.25	-3.75	-7.4
OTC	4.50	1.94	Quarterdeck Office Sys.	2.13	0.00	0.0
OTC	32.00	16.00	Rainbow Technologies Inc.	17.25	-0.63	-3.5
OTC	11.38	4.25	Rasterops	7.25	-0.13	-1.7
OTC	15.25	6.50	Ross Systems	6.63	-0.88	-11.7
OTC	28.75	18.00	Sapiens Int'l. Corp. N.V.	19.75	0.00	0.0
OTC	14.50	5.50	Software Publishing Corp.	7.75	-0.63	-7.5
OTC	17.25	6.38	Software Toolworks Inc.	9.63	-1.38	-12.5
OTC	2.88	0.75	Spectrum Software	1.94	-0.19	-8.8
OTC	13.75	6.75	State of the Art	7.00	0.13	1.8
NYS	33.63	17.63	Sterling Software Inc.	26.75	0.00	0.0
OTC	21.63	9.63	Strata Dynamics Research	17.13	0.75	4.6
OTC	43.50	31.00	Sybase Inc.	42.50	2.00	4.9
OTC	20.50	9.25	Symantec Corp.	16.00	0.25	1.6
OTC	35.50	10.00	System Software Assoc.	13.50	1.50	10.7
OTC	6.50	2.88	Tomaz Corp	5.25	-0.50	-8.7
OTC	26.50	13.50	ViewLogic Systems	20.63	0.63	3.1
OTC	22.00	9.50	Walker Interactive Systems	9.63	-0.38	-3.8
OTC	3.19	0.84	Wordstar	1.25	0.06	5.2
Semiconductors						
NYS	32.88	17.00	Advanced Micro Devices	18.00	0.50	2.9
NYS	28.00	16.88	Analog Devices Inc.	22.25	0.50	2.3
OTC	38.63	15.38	Atmel Corp.	30.13	0.75	2.6
OTC	6.88	2.75	Chips and Technologies	5.25	-0.56	-9.7
OTC	30.75	13.00	Cirrus Logic	14.13	-1.75	-4.9
NYS	16.75	8.63	Cypress Semiconductor Corp.	13.25	1.00	8.2
NYS	19.00	11.75	Dallas Semiconductor	14.88	1.63	12.3
OTC	74.50	42.50	Intel Corp.	57.75	1.50	2.7
NYS	19.25	10.25	LSI Logic Corp.	14.13	0.50	3.7
OTC	26.75	12.25	Lattice Semiconductor	13.38	0.13	0.9
NYS	63.63	18.13	Micron Technology	46.38	-0.63	-1.3
NYS	107.50	48.75	Motorola Inc.	88.50	-0.75	-0.8
NYS	21.75	10.13	National Semiconductor	15.00	0.25	1.7
OTC	14.50	6.50	Sierra Semiconductor	7.88	-0.56	-6.6
OTC	52.75	25.75	SynOptics	42.88	4.50	9.7
NYS	84.25	45.25	Texas Instruments	60.75	1.38	2.3
OTC	18.88	6.50	VLSI Technology	10.25	-0.25	-2.4
OTC	14.38	4.88	Weitek	9.75	-1.50	-16.2
ASE	10.38	3.63	Western Digital Corp.	9.88	0.38	3.9
OTC	54.50	22.25	Xilinx	45.50	1.50	3.3
OTC	40.75	19.00	Zilog Inc.	30.50	1.25	11.9
Peripherals and Subsystems						
OTC	24.75	10.50	American Power Conversion	20.75	1.50	7.8
OTC	23.50	15.50	Banctec Inc.	21.50	0.50	2.2
OTC	17.00	3.50	Cambex Corp.	4.00	-0.63	-13.6
ASE	18.38	3.88	Cognitronics Corp.	4.75	-0.25	-5.0
NYS	25.50	9.00	Comdisco Inc.	13.75	0.75	5.8
OTC	38.50	17.50	Creative Technologies Inc.	20.50	2.50	9.6
OTC	30.75	6.50	Data Race Inc.	10.75	1.00	10.3
ASE	12.50	7.50	Dataram Corp.	8.75	-0.50	-5.4
NYS	19.50	4.88	EMC Corp.	15.63	-0.13	-0.8
OTC	10.50	5.25	Exabyte Corp.	6.38	-0.13	-1.9
OTC	20.00	14.00	Evans & Sutherland	17.00	-0.63	-3.5
OTC	18.75	7.50	Exabyte	16.75	-1.00	-5.6
OTC	34.88	13.66	Intelligent Info. Systems	26.00	1.88	7.8
OTC	8.25	2.50	Komag Corp.	2.69	-0.94	-17.9
OTC	12.50	5.75	IPL Systems Inc.	8.75	-0.50	-5.4
OTC	24.88	13.75	Komag Inc.	14.50	0.75	5.8
OTC	15.50	4.38	Maxtor Corp.	6.00	0.00	0.0
OTC	9.88	5.75	Micropolis Corp.	6.50	-0.25	-3.7
NYS	117.00	97.25	3M Corp	111.75	4.00	3.7
OTC	8.00	4.00	Printronix Inc.	7.63	-0.38	-4.7
NYS	17.25	7.50	QMS Inc.	9.38	0.13	1.4
OTC	17.88	9.38	Quantum Corp.	13.63	0.38	2.8
OTC	9.13	3.13	Radius Inc.	7.00	0.00	0.0
NYS	17.75	11.75	Recognition Equipment	14.75	0.13	0.9
OTC	12.75	5.63	Reton Inc.	5.38	0.63	13.2
OTC	25.13	13.13	Seagate Technology	21.50	1.13	5.5
NYS	45.00	18.00	Storage Technology	32.75	1.38	4.4
NYS	27.88	19.13	Tektronix Inc.	23.00	1.25	5.7
NYS	90.00	69.88	Xerox Corp. (H)	87.88	-0.50	-0.6
Services						
NYS	6.38	1.63	Allerion Inc.	4.11	0.86	26.9
OTC	23.75	14.88	American Mgmt. Systems	19.88	2.00	11.2
NYS	6.63	2.38	Analysts Inc.	4.13	0.25	6.5
OTC	23.84	15.00	Analysts Int'l.	16.75	-1.50	-8.2
NYS	56.50	46.88	Auto Data Processing	55.63	0.38	0.7
NYS	19.38	13.00	Ceridian Corp.	18.25	-0.38	-2.0
NYS	21.00	13.13	Comdisco Inc.	18.25	-0.63	-3.3
OTC	13.38	6.56	Computer Horizons	11.50	-0.25	-2.1
NYS	100.25	70.00	Computer Sciences	96.00	-0.13	-0.1
NYS	9.88	6.00	Computer Task Group	6.75	-0.25	-3.6
NYS	37.00	18.88	CompUSA Inc.	18.88	-4.63	-19.7
OTC	14.13	8.75	Control Data Systems Inc.	10.00	-0.38	-3.6
OTC	16.00	7.00	Corporate Software	14.75	-0.13	-0.8
OTC	11.25	6.63	Eggnead Discovery Software	9.25	-0.25	-2.6
NYS	35.88	26.00	General Motors E (EDS)	27.75	0.38	1.4
OTC	25.50	13.75	Inacom Corp.	13.75	-4.00	-22.5
OTC	27.63	12.00	Intelligent Electronics	24.50	-0.13	-0.5
OTC	18.13	9.75	Mentor (H)	17.88	1.00	5.9
OTC	38.50	7.00	Microage Inc. (H)	24.50	-2.50	-4.8
OTC	37.75	21.50	Paychex	35.50	1.50	10.9
NYS	87.25	21.63	Policy Management Sys.	28.88	4.00	15.1
NYS	44.75	24.13	Reynolds and Reynolds (D)	41.25	-3.00	-6.8
OTC	25.75	13.38	SEI Corp.	25.25	-0.25	-1.0
OTC	26.00	17.50	Shared Medical Systems	24.00	1.38	6.1
OTC	12.63	5.75	SHL Systemhouse	6.63	0.00	0.0
OTC	30.75	20.00	Software Spectrum Inc.	22.00	-0.75	-3.3
OTC	42.75	28.00	Sungard Data Systems	35.25	0.75	2.2

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Wysiwyg

Great Names

William Gates
Assistant controller
Administrator of information systems
Academy of Motion Picture Arts and Sciences
Beverly Hills, Calif.

Match the item on the left with its code name on the right

Taligent, Inc.'s object-oriented operating system	***Able***
Motorola, Inc.'s planned PDA offering	***Snowball***
Louis Gerstner's code name when he was on the nomination list for the top IBM job	***Alarm Clock***
Apple's next-generation PowerBook	***Pink***
Computer Associates' CA-Visual Objects for Clipper	***Aspen***
Microsoft Corp.'s upcoming Windows for Workgroups upgrade	***Blackbird***

From the classifieds in the Gulf Coast Newspaper (Alabama):

(Not only a mega and byte drive, but a screen that prints, too! Can you beat that!)

PACKARD BELL COMPUTER 43
Mega & Byte hard drive w/floppy disk.
VGA screen w/printer.
$750
Or Best Offer!

New Viruses

Mario Cuomo Virus
It would be a great virus, but it refuses to run.

Source: *High Tech Joke Book*
(Oak Ridge Public Relations, Inc.)

Answers: A: Pink; B: Alarm Clock; C: Able; D: Blackbird; E: Aspen; F: Snowball

ILLUSTRATIONS BY DAVE MARSHALL

The 5th Wave *by* Rich Tennant

Inside Lines

From the bottom to the top

Digital plans a January/February introduction of low-end Alpha AXP workstations that were held back from the company's last big hardware rollout in October. The DEC 3000 Model 300LX and 800X machines will be clock-speed upgrades of Digital's existing machines with a 10% performance bump and similar pricing. On a grander scale, Digital is looking to ship a four-processor superserver in the spring and then, in late 1994, to bring out new versions of its data center Alpha machines supporting 12 processors, up from a six-processor limit on the current models. The data center systems would be based on a second-generation Alpha microprocessor.

Dropping the UnixWare ball

Novell evidently lost a potential UnixWare customer — a major oil company that acted as a beta site — through lack of follow-up once the beta testing was over. "They dropped us like a hot potato. They wouldn't even send us a release version, as Microsoft did for NT," said an IS manager who participated in the beta test. "It's pretty sad; the full-blown server edition was nice, even if the desktop was not so good." The company may reconsider if Novell finally brings adequate performance for Windows applications running on UnixWare, as its newly released UnixWare 2.1 is said to do.

Unicenter driven

Fiat SpA, the Torino, Italy, carmaker, is finalizing an enterprise-wide licensing agreement with Computer Associates that financial analysts placed in the $10 million to $20 million range. Fiat will buy up to 500 copies of CA-Unicenter for its Hewlett-Packard HP 9000, Sun servers and IBM RS/6000 Unix machines. Sanjay Kumar, CA executive vice president of operations, mentioned the contract, slated for completion by year's end, to a group of financial analysts at a CA briefing last week. CA and Fiat declined to comment on the deal.

Airing IT out

Lufthansa German Airlines has selected Electronic Data Systems as the finalist in its outsourcing negotiations. Lufthansa, based in Cologne, could not be reached last week, but EDS said it hopes to sign a deal by early in the first quarter of 1994. EDS declined to elaborate on the shape or size of the project. Merrill Lynch analyst Steve McClellan estimated the potential value at $2 billion.

Changing its policy

The latest outsourcing evaluation of note comes from the hallowed halls of the insurance industry. Insurance companies have by and large been uninviting to outsourcers. But New York-based Marsh & McLennan, a $2 billion-plus outfit, could change all that. The insurance and reinsurance firm is in the midst of deciding whether to hand over control of its IBM mainframe and AS/400 shop.

No paper tiger

Paper Software, Inc., a tiny start-up that has licensed its graphical interface technology to IBM for use with its PC DOS product, is working on another GUI product that allows Macintosh users to seamlessly run Windows applications. In a brief beta version demonstration, Windows applications appeared to suffer no performance degradation.

The ever-sprawling Internet has found its way to the North Pole. That's right, now even St. Nick has an Internet address: santa.@north.pole.org. Children around the world are encouraged to send traditional holiday messages from their homelands to the on-line Mr. Claus, who has promised to reply. Santa's elves, who said Santa's biggest challenge right now is preparing an on-time, bug-free release of Christmas, intend to use the incoming greetings to compile a database of Christmas cheer messages. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's *24-hour voice-mail tip line at (508) 820-8555.*

Computerworld Editorial (January-June, 1994)

Issue Dates	Ad Closings Color*	Ad Closings B&W	Editorial Features	Show Distribution	Ad Readership Study Issue	Response Card Deck
Dec. 27 & Jan. 3	Dec. 10	Dec. 17	**Special Edition:** Annual Forecast Issue			
Jan. 10	Dec. 24	Dec. 31	**Closer Look:** Object Database Management Systems		Starch	Mails: Jan. 12 Close: Dec. 11
Jan. 17	Dec. 31	Jan. 7	**CW Guide To: Spreadsheets and Spreadsheet Utilities** The New Capabilities *Buyers' Satisfaction Scorecard:* Windows Packages from Borland, Lotus, Microsoft, etc. *Firing Line:* Latest Windows Offering			
Jan. 24	Jan. 7	Jan. 14	**Closer Look:** ATM	**ComNet** Washington D.C., 1/25 - 1/27		
Jan. 31	Jan. 14	Jan. 21	**CW Guide To: Departmental Servers and Superservers** Matching a System to Departmental Needs (including Alpha, Tricord, Netframe, Sun, RS/6000, NCR, Sequent, Wyse, Compaq) *Buyers' Satisfaction Scorecard:* Leading RISC Servers *Firing Line:* Latest Server Product	**Executive Technology Summit** Tarpon Springs, Florida 2/2 - 2/4		
February		Dec. 27	**CLIENT/SERVER JOURNAL**	All Shows Feb. - April	Harvey	
Feb. 7	Jan. 21	Jan. 28	**Special Quarterly Report:** Re-engineering the Workplace		Starch	Mails: Feb. 9 Close: Jan. 3
Feb. 14	Jan. 28	Feb. 4	**CW Guide To: Management Tools for Large Networks** What Works When Systems are Distributed *Buyers' Satisfaction Scorecard:* Multivendor Network Management Software from DEC, HP, IBM,Sun, etc. *Firing Line:* Latest Management Package	**Networks Expo** Boston, 2/15 - 2/17		
Feb. 21	Feb. 4	Feb. 11	**Closer Look:** Windows and OS/2 Imaging Software			
Feb. 28	Feb. 11	Feb. 18	**CW Guide To: Work Flow Software** The Reality Behind the Promises *Buyers' Satisfaction Scorecard:* Leading Work Flow Software Systems *Firing Line:* Latest Work Flow Managers	**GroupWare '94** Boston, 2/28 - 3/3		
Mar. 7	Feb. 18	Feb. 25	**Closer Look:** Desktop Laser Printers		Starch	Mails: Mar. 9 Close: Jan. 31
Mar. 14	Feb. 25	Mar. 4	**CW Guide To: RAID** Choosing Among the Various Levels of Disk Array Technology *Buyers' Satisfaction Scorecard:* Leading Server-based RAID Systems *Firing Line:* Latest Mainframe RAID Subsystem			
Mar. 21	Mar. 4	Mar. 11	**Closer Look:** Unix Workstations	**UniForum** San Francisco, 3/23 - 3/25		
Mar. 28	Mar. 11	Mar. 18	**CW Guide To: Wireless Networks** The Spectrum of Technologies, Including LANs, WANs and Radio Frequency *Buyers' Satisfaction Scorecard:* Leading Wireless LANs *Firing Line:* Wireless Services Product			
Apr. 4	Mar. 18	Mar. 25	**Closer Look:** Personal Productivity Software			
Apr. 11	Mar. 25	Apr. 1	**CW Guide To: NT vs. OS/2 vs. Unix** Desktop and Server Choices *Buyers' Satisfaction Scorecard:* Leading Server Operating Systems from IBM, Microsoft , Sun, etc. *Firing Line:* Latest Desktop Operating Systems from a Leading Vendor		Starch	Mails: April 13 Close: Mar. 17
Apr. 18	Apr. 1	Apr. 8	**Management Special:** IS Architecture in Times of Change	**AIIM** New York 4/18 - 4/21 **SIM Conference** Florida, 4/20 - 4/22		
Apr. 25	Apr. 8	Apr. 15	**CW Guide To: Data Access Tools** New Tools for Quick Access to Data Buried in Older Flat-file and Hierarchical Databases *Buyers' Satisfaction Scorecard:* Leading SQL-based Data Access Tools *Firing Line:* Latest Data Access Tool from a Leading Vendor			
May		Mar. 30	**CLIENT/SERVER JOURNAL**	All Shows May - July	Harvey	
May 2	Apr. 15	Apr. 22	**Closer Look:** Distributed Computing Environment	**Interop + Networld** Las Vegas, 5/2 - 5/6		
May 9	Apr. 22	Apr. 29	**CW Guide To: Mobile Computing** From Notebooks to PDAs *Buyers' Satisfaction Scorecard:* Leading Notebook Computers *Firing Line:* Latest Sub-notebook Product from a Leading Vendor	**International DB2 Users Group** San Diego, 5/8 - 5/12		Mails: May 11 Close: April 14
May 16	Apr. 29	May 6	**Special Quarterly Report:** Re-engineering the Workplace		Starch	
May 23	May 6	May 13	**Windows World Open Supplement** **CW Guide To: The Impact of OLE 2.0** What OLE can do for IS and How to Make Sure Your Favorite Desktop Software Vendor is Up to Speed *Buyers' Satisfaction Scorecard:* Leading OLE Applications *Firing Line:* Latest OLE Development Tool	**Windows World** **Comdex Spring** Atlanta, 5/23 - 5/26 **DB Expo** San Francisco, 5/24 - 5/27		
May 30	May 13	May 20	**Annual Job Satisfaction Survey** How IS Professionals and Managers Really Feel About Their Jobs and Careers			
June 6	May 20	May 27	**CW Guide To: Distributed DBMS** Selecting the Right Engine for a Distributed Database Architecture *Buyers' Satisfaction Scorecard:* Leading Relational DBMS *Firing Line:* Latest Relational DBMS Product	**Computerworld Smithsonian Awards** Washington, DC		Mails: June 8 Close: May 2
June 13	May 27	June 3	**Closer Look:** AS/400		Starch	
June 20	June 3	June 10	**CW Guide To: Mainframes** How Big Iron Vendors are Answering the Challenges of the Mainframe's Changing Role *Buyers' Satisfaction Scorecard:* Leading Mainframes from Amdahl, HDS, IBM, etc. *Firing Line:* Latest Mainframe Model			
June 27	June 10	June 17	**Closer Look:** PCMCIA Cards	**PC Expo** New York, NY, 6/28 - 6/30		

Editorial contacts (508) 879-0700 CW Guide: The Guide includes a package of articles on the stated topic, in addition to Buyers' Scorecard and Firing Line
Features Editor: Joanne Kelleher, *Management Features:* Allan Alter, *Closer Look:* James Connolly, *CW Guide Articles:* Mary Brandel & Derek Slater, *Buyers' Satisfaction Scorecard:* Michael Sullivan-Trainor, *Firing Line:* Garry Ray

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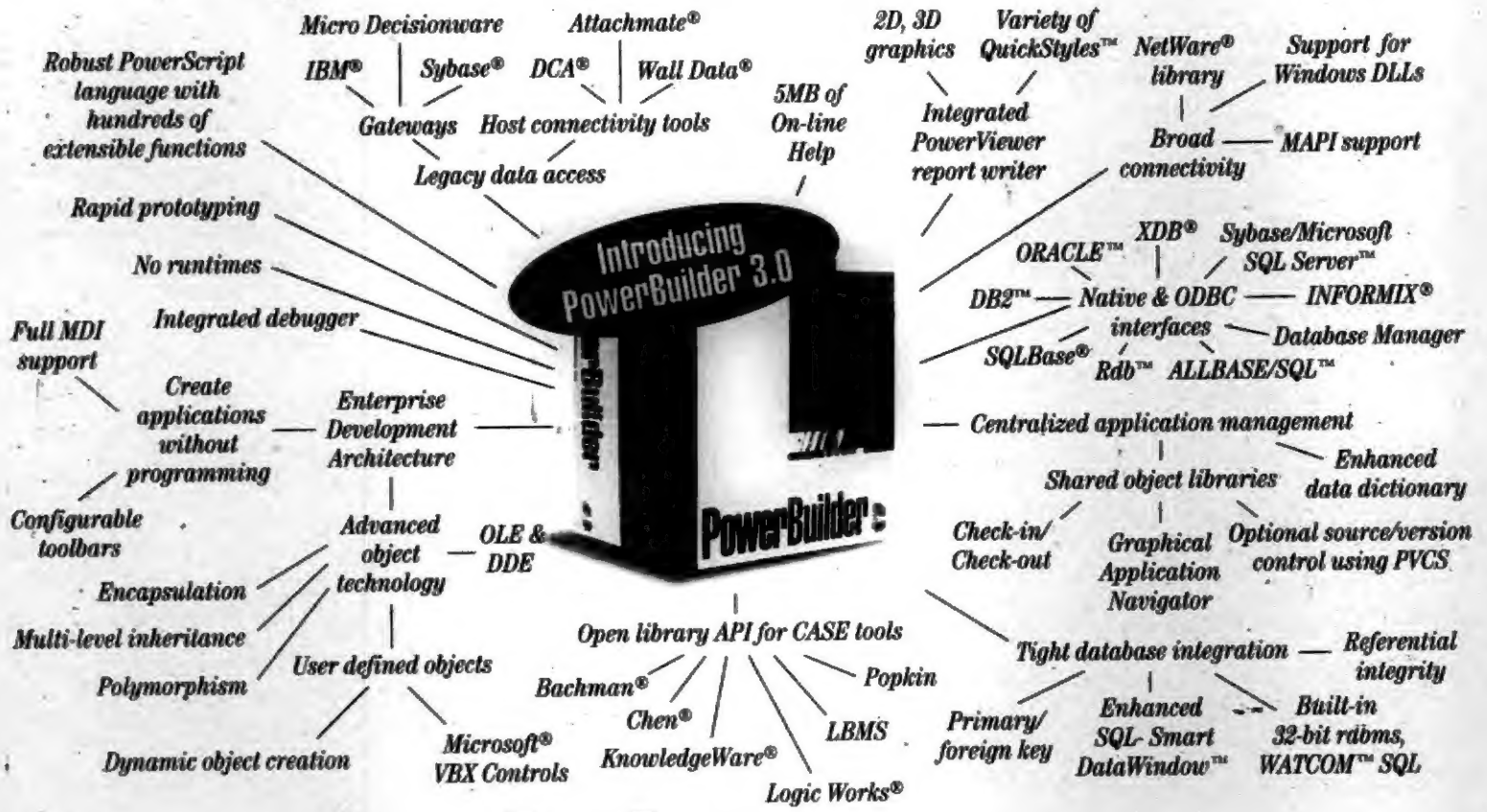

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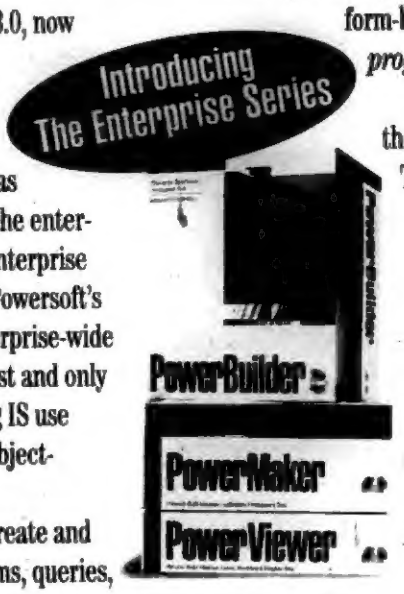

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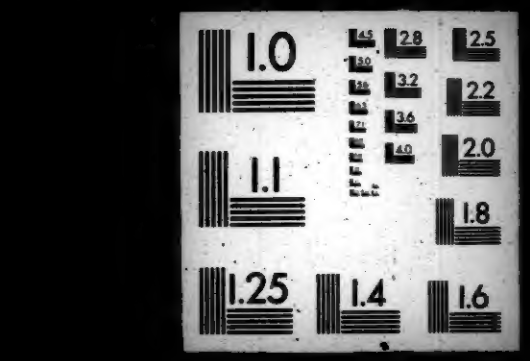
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